CONCHO

[Dakota Neel]
[HSE Coordinator]

March 2, 2019

Bradford Billings
Oil Conservation Division
Santa Fe

Ryan Mann
New Mexico State Land Office
2827 N. Dal Paso Suite 117
Hobbs, NM 88240

Re: Closure Letter
Houma State #1
API #: 30-015-31491
RP#: 2RP-4417
Eddy County, NM

Mr. Billings/Mr. Mann,

COG Operating, LLC (COG) is pleased to submit for your consideration the following closure report for the Houma State #1. This release occurred on September 27, 2017. Following the releases a site assessment of the impacted soils was conducted. A remediation work plan was submitted to and subsequently approved by the New Mexico Oil Conservation Division (NMOCD) and New Mexico State Land Office (NMSLO). A copy of the approved work plan is attached.

BACKGROUND

On September 27, 2017, a crude oil release occurred at the Houma State # 001. The release was the result of corrosion on the circulation line. On September 27, 2017, Concho reported the release to the NMOCD District 2 Office located in Artesia, New Mexico and the release was assigned the incident number 2RP-4417. The release was reported as approximately thirteen (13) barrels of crude oil released with approximately ten (10) barrels of crude oil recovered, resulting in a net loss of approximately three (3) barrels.

Remediation activities were conducted in accordance with the NMOCD/NMSLO approved workplan. During the excavation additional delineation was completed in the area of T1. The analytical results for this can be found in Appendix 1.

REMEDIAL ACTIONS

- The impacted areas of T1, T2, and AH2 were excavated to a depth of four (4) feet BGS and a 20 mil plastic liner was installed.
- The impacted area of AH1 was excavated to a depth of six (6) inches BGS.
- All of the excavated material was transported to an NMOCD approved solid waste disposal facility.
- The excavation was backfilled with like material and contoured to match the surrounding location.
- The site will be reseeded with the NMSLO Shallow Seed Mixture.

CLOSURE REQUEST

COG Operating, LLC respectfully requests closure approval for 2RP-4417. Should you have any questions or concerns please do not hesitate to contact me.

Sincerely,

Dakota Neel
HSE Coordinator

Enclosed:

Appendix I: Laboratory Analytical Results
Appendix II: Work Plan (Copy)
Appendix III: Initial C-141 (Copy)
Appendix IV: Final C-141

March 2, 2019

APPENDIX I

CARDINAL Laboratories

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

July 30, 2018

DAKOTA NEEL

COG OPERATING

P. O. BOX 1630

ARTESIA, NM 88210

RE: HOUMA STATE #1H

Enclosed are the results of analyses for samples received by the laboratory on 07/25/18 13:55.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	07/25/2018	Sampling Date:	07/18/2018
Reported:	07/30/2018	Sampling Type:	Soil
Project Name:	HOUMA STATE #1H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: T1 - 14.5' (H802029-01)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/28/2018	ND	1.89	94.3	2.00	4.46	
Toluene*	<0.050	0.050	07/28/2018	ND	1.95	97.7	2.00	4.17	
Ethylbenzene*	<0.050	0.050	07/28/2018	ND	1.98	99.2	2.00	4.22	
Total Xylenes*	<0.150	0.150	07/28/2018	ND	5.82	97.0	6.00	4.83	
Total BTEX	<0.300	0.300	07/28/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *107 %* *69.8-142*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	07/26/2018	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	07/27/2018	ND	195	97.3	200	1.20	
DRO >C10-C28*	**85.5**	10.0	07/27/2018	ND	234	117	200	1.40	
EXT DRO >C28-C36	**23.2**	10.0	07/27/2018	ND					

Surrogate: 1-Chlorooctane *96.7 %* *41-142*

Surrogate: 1-Chlorooctadecane *110 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	07/25/2018	Sampling Date:	07/18/2018
Reported:	07/30/2018	Sampling Type:	Soil
Project Name:	HOUMA STATE #1H	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: T1 - 15' (H802029-02)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/28/2018	ND	1.89	94.3	2.00	4.46	
Toluene*	<0.050	0.050	07/28/2018	ND	1.95	97.7	2.00	4.17	
Ethylbenzene*	<0.050	0.050	07/28/2018	ND	1.98	99.2	2.00	4.22	
Total Xylenes*	<0.150	0.150	07/28/2018	ND	5.82	97.0	6.00	4.83	
Total BTEX	<0.300	0.300	07/28/2018	ND					

Surrogate: 4-Bromofluorobenzene (PID *108 %* *69.8-142*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	07/26/2018	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	07/27/2018	ND	195	97.3	200	1.20	
DRO >C10-C28*	**77.0**	10.0	07/27/2018	ND	234	117	200	1.40	
EXT DRO >C28-C36	**16.4**	10.0	07/27/2018	ND					

Surrogate: 1-Chlorooctane *92.2 %* *41-142*

Surrogate: 1-Chlorooctadecane *104 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name:	COG Operating LLC	**BILL TO**	
Project Manager:	Dakota Neel	**P.O. #:**	
Address:	2208 West Main	**Company:**	COG Operating LLC
City:	Artesia	**State:** NM **Zip** 88210	**Attn:** Robert McNeill
Phone #:	(575) 748-6930	**Fax #:**	**Address:** 600 W Illinois
Project #:		**Project Owner:**	**City:** Midland
Project Name:	Houma State #1H		**State:** TX **Zip:** 79701
Project Location:			**Phone #:** (432) 221-0388
Sampler Name:	Dakota Neel		**Fax #:**

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST											
Lab I.D.	**Sample I.D.**	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	BTEX	TPH	Chloride									
H802029																									
1	T1- 14.5'					x					x		7/18/18	3:00 PM	x	x	x								
2	T1-15'					x					x		7/18/18	3:00 PM	x	x	x								

Relinquished By:	Date: 7-25-18	**Received By:**		Phone Result: ☐ Yes ☐ No	Add'l Phone #:
	Time: 1:55			Fax Result: ☐ Yes ☐ No	Add'l Fax #:
Relinquished By:	Date:	**Received By:**		REMARKS: Bush. CL only	
	Time:				
Delivered By: (Circle One)		**Sample Condition** Cool ☐ Yes ☐ No / Intact ☐ Yes ☐ No	**CHECKED BY: (Initials)** TO #15		
Sampler - UPS - Bus - Other:	2.4° Corrected 2.35°				

FORM-006 R 2.0

s. Please fax written changes to 575-393-2476

APPENDIX II

2M Environmental Services, LLC
1219 W. University Blvd.
Odessa, TX 79764

May 9, 2018

Mike Bratcher
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division, District 2
811 S. First Street
Artesia, New Mexico 88210

Ryan Mann
District Resource Specialist
Field Operation Division
New Mexico State Land Office
2827 N. Dal Paso Suite 117
Hobbs, New Mexico 88240
rmann@slo.state.nm.us

Re: Soil Investigation Summary and Proposed Remediation Workplan
Houma State # 001 Release (2RP-4417)
GPS: N 32.8355064 W 103.978096
Unit Letter "F", Section 16, Township 17 South, Range 30 East, NMPM
Eddy County, New Mexico

Dear Mr. Bratcher and Mr. Mann,

2M Environmental Services, LLC. (2M), on behalf of COG Operating, LLC. (Concho), has prepared this Soil Investigation Summary and Proposed Remediation Workplan (Workplan) for the Houma State # 001H Release Site (Release Site). The purpose of this Workplan is to propose remediation activities designed to advance the Houma State # 001 Release Site toward a New Mexico Oil and Conservation District (NMOCD) approved Site Closure Status. The legal description of the Release Site is Unit Letter "F", Section 16, Township 17 South, Range 30 East, in Eddy County, New Mexico. The subject property is administered by the New Mexico State Land Office (NMSLO). The GPS coordinates for the site are N 32.8355064 W 103.978096. A Site Location Map and Site Detail and Soil Sample Locations Map are provided as Figure 1 and Figure 2, respectively.

On September 27, 2017, a crude oil release occurred at the Houma State # 001. The release was the result of corrosion on the circulation line. On September 27, 2017, Concho reported the release to the NMOCD District 2 Office located in Artesia, New Mexico and the release was assigned the incident number 2RP-4417. A Release Notification and Corrective Action Form (Form C-141) was subsequently submitted to the NMOCD on September 29, 2017. The release was reported as approximately thirteen (13) barrels of crude oil released with approximately ten (10) barrels of crude oil recovered, resulting in a net loss of approximately three (3) barrels. A copy of the NMOCD Release Notification and Corrective Action Form C-141 is attached to this Workplan.

A groundwater database maintained by The New Mexico Office of the State Engineer (NMOSE) did not identify any registered water wells in Section 16, Township 17 South, Range 30 East. A reference map utilized by the New Mexico Oil Conservation Division (NMOCD) Artesia District Office indicates groundwater should be encountered at approximately three hundred (300) feet below ground surface (bgs). Based on the NMOCD site classification system, zero (0) points will be assigned to the subject area ranking as a result of this criterion. No water wells were observed within one-thousand feet of the Release Site. Based on the NMOCD site classification system, zero (0) points will be assigned to the subject area ranking as a result of this criterion. No surface water was observed within one thousand (1,000) feet of the release. Based on the NMOCD site classification system, zero (0) points will be assigned to the subject area ranking as a result of this criterion.

Based on the NMOCD Site Classification criteria, the Release Site remediation levels are 10 mg/Kg for benzene, 50 mg/Kg for benzene, toluene, ethylbenzene and xylenes (BTEX) and 5,000 mg/Kg for total petroleum hydrocarbons (TPH). Chloride remediation levels for the Release Site will be 600 mg/Kg, per NMOCD request.

On October 16, 2017, Concho representatives utilized a hand auger and/or a backhoe to collect thirty-three (33) delineation soil samples (AH1- Surface through AH1-5', AH2-Surface through AH2-5', T1-1' through T1-6', T1-8', T1-10', T1-12', T1-14', T2-Surface through T2-6', T2-8', T2-10', T2-12', T2-14') from the stained surface soil. In addition to the soil samples described above, six (6) soil samples (North Surf, North 1', South Surf, South 1', East Surf, and East 1') were collected utilizing a hand auger and/or backhoe approximately five (5) feet from the outer perimeter of the stained surface soil. The soil samples were submitted to Xenco Laboratories in Midland, Texas for determination of concentrations of BTEX using Method SW 846-8021B, TPH using Method SW 846-8015M, and chloride using Method E-300.1. The analytical results are provided as an attachment (Table 1 Concentrations of Benzene, BTEX, TPH, and Chloride in Soil).

Based on the analytical results of the soil samples collected on October 16, 2017, Concho proposes the following field activities designed to remediate the Houma State # 001 Release:

- Utilizing a backhoe, if applicable, surface staining will be address in the area represented by sample point AH1.
- The area represented by sample point AH2, will be excavated to a depth of approximately four (4) feet bgs. where possible. Due to safety concerns, excavation activities inside the earthen firewall of the battery will be conducted in a manner that protects the structural integrity of the production equipment.

- Background soil samples will be collected outside the impacted area to determine if chloride concentrations at depths greater than four (4) feet in the area represented by sample points T1 and T2 is naturally occurring or impacted.
- If background soil samples indicate chloride concentrations in the areas represented by sample points T1 and T2 is higher than naturally occurring levels additional vertical delineation will be needed in the area represented by T1. Additionally, the areas represented by sample points T1 and T2 will be excavated to a depth of approximately four (4) feet bgs. and a 20-mil polyurethane liner will be installed.
- If background soil samples indicate chloride concentrations in the areas represented by sample points T1 and T2 is naturally occurring the data will be presented to the NMOCD and NMSLO. Additionally, permission will be requested will be requested to excavate T1 and T2 to two and one-half (2.5) feet below ground surface.
- Excavated soil will be stockpiled on a plastic liner adjacent to the excavation pending sample results.
- Collect composite stockpile samples every 50 cubic yards of excavated soil. Soil samples will be submitted to the laboratory for determination of concentrations of BTEX, TPH, and chloride.
- On receipt of analytical results, Concho will backfill the excavation as follows:
    - If laboratory analytical results indicate composite stockpile soil samples are below NMOCD limits for TPH, BTEX, and chloride concentrations, the stockpiled soil will be used to backfill the excavated area.
    - If laboratory analytical results indicate composite stockpile soil samples are above NMOCD limits for TPH, BTEX, and/or chloride concentrations, the excavation will be backfilled with locally purchased non-impacted "like" soil or caliche. In addition, impacted soil will be transported under manifest to a NMOCD approved disposal facility.

- The backfilled areas, not located on the caliche pad, will be seeded during the summer monsoon season in Southeastern New Mexico to aid in revegetation. The USDA Soil Map describes the soil at the Release Site as the Kermit-Berino fine sand. Based on this description, the NMSLO Shallow (SH) Sites Seed Mixture will be used to revegetate the Release Site and will be planted in the amount specified in the pounds pure live seed (PLS) per acre. The seed mixture will be spread by a hand-held broadcaster and raked. Since a hand-held broadcaster is used for dispersal, the pounds pure live seed per acre will be doubled as described in the Southeast New Mexico Revegetation Handbook. Site inspections will be performed to assess the revegetation progress and evaluate the site for the presence of primary or secondary noxious weeds. If noxious weeds are identified, the NMSLO will be contacted to determine an effective method for eradication. If the site does not show revegetation after one growing season, the area will be reseeded as appropriate. The NMSLO seed mixture details and corresponding pounds pure live seed per acre are included in this Workplan.
- Prepare and submit a "Remediation Summary and Site Closure Request" to the NMOCD and NMSLO.

Concho is prepared to begin the activities outlined in this Proposed Remediation Workplan on NMOCD and NMSLO approval.

If you have any questions, or if additional information is required, please feel free to call me at 432-614-6793 (office) or 432-230-3763 (cell).

Thank you,

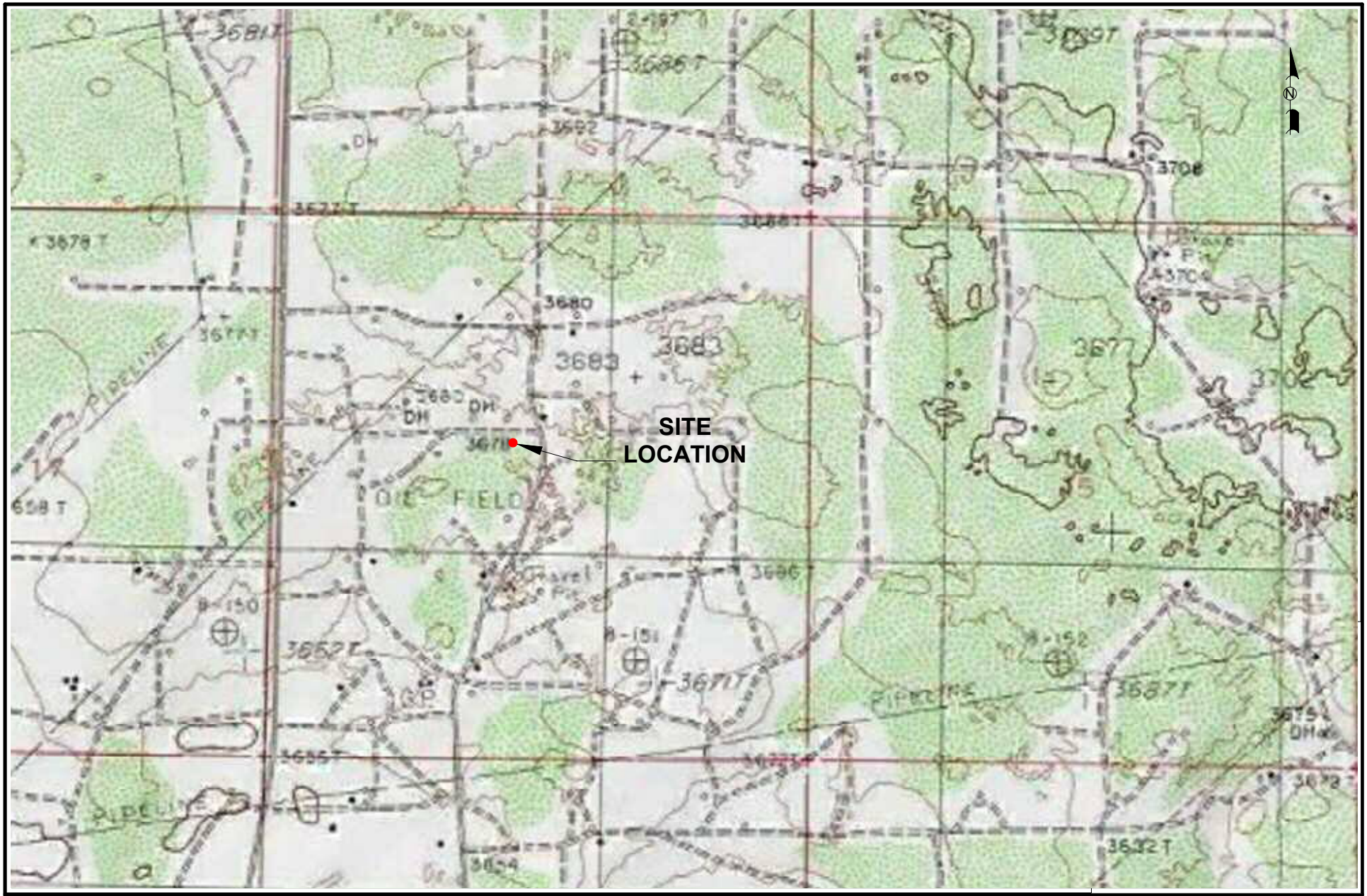
Matthew Green

Matthew Green, P.G.
President
2M Environmental Services, LLC.

Attachments:

Figure 1 - Site Location Map
Figure 2 - Site Detail and Soil Sample Locations Map
Table 1 - Concentrations of Benzene, BTEX, TPH and Chloride in Soil
Laboratory Analytical Results
Release Notification and Corrective Action (Form C-141)
USDA Soil Description
NMSLO Seed Mixture

cc: File



LEGEND:

Native Grassland

2000 1000 0 1000 2000

Distance in Feet

Figure 1

Site Location Map

COG Operating LLC

Houma State #001 H Tank Battery

Eddy County, TX

Scale: 1" = 2000'
CAD By: JR
Checked By: MG
Date: March 18, 2018
Lat. N 32.8355064°, Long. W 103.978096°

2M Environmental Services, LLC

LEGEND:

- Excavate Area to 4' bgs
- Aesthetically Address Surface Staining
- Excavate Area to 4' bgs and install HDPE liner
- Horizontal Delineation Soil Sample Location
- Vertical Soil Sample Location

40 20 0 20 40

Distance in Feet

Figure 2
Site Details &
Soil Sample Location Map
COG Operating LLC
Houma State #001 Battery
Eddy County, TX

Scale: 1" = 40'
CAD By: JR
Checked By: MG
Draft: March 18, 2018
Lat. N 32.8355064° Long. W 103.978096°

2M Environmental Services, LLC

TABLE 1

CONCENTRATIONS OF BENZENE, BTEX, TPH AND CHLORIDE IN SOIL

COG OPERATING, LLC

HOUMA STATE #001H RELEASE SITE
EDDY COUNTY, NEW MEXICO

All concentrations are reported in mg/Kg

SAMPLE LOCATION	SAMPLE DATE	METHODS: SW 846-8021B						METHOD: SW 8015M					E 300.1
		BENZENE	TOLUENE	ETHYL-BENZENE	m, p - XYLENES	o - XYLENE	TOTAL XYLENES	TOTAL BTEX	TPH GRO C_6-C_{12}	TPH DRO C_{12}-C_{28}	TPH ORO C_{28}-C_{35}	TOTAL TPH C_6-C_{35}	CHLORIDE
Limits		**10 mg/Kg**						**50 mg/Kg**				**5,000 mg/Kg**	**600**
AH1 - Surface	10/16/2017	0.00965	0.00718	0.00293	0.00428	0.00436	0.00864	0.02840	45.2	592	72.0	709	<1.98
AH1 - 1'	10/16/2017	<0.00998	0.0206	0.0608	0.157	0.0712	0.228	0.310	<24.9	35.0	<24.9	35.0	43.5
AH1 - 2'	10/16/2017	<0.0100	<0.0100	0.0203	0.0425	<0.0100	0.0425	0.0628	29.5	238	28.1	296	6.43
AH1 - 3'	10/16/2017	<0.00202	<0.00202	<0.00202	<0.00404	<0.00202	<0.00404	<0.00404	<25.0	<25.0	<25.0	<25.0	11.5
AH1 - 4'	10/16/2017	<0.00201	<0.00201	<0.00201	<0.00402	<0.00201	<0.00402	<0.00402	<25.0	<25.0	<25.0	<25.0	64.5
AH1 - 5'	10/16/2017	<0.00198	<0.00198	<0.00198	<0.00396	<0.00198	<0.00396	<0.00396	<25.0	<25.0	<25.0	<25.0	49.4
AH2 - Surface	10/16/2017	0.0352	0.397	0.359	0.355	0.150	0.505	1.2962	3,430	9,930	1,330	**14,700**	10.6
AH2 - 1'	10/16/2017	**16.3**	107	67.9	73.2	31.9	105	**296.2**	5,190	8,440	985	**14,600**	9.02
AH2 - 2'	10/16/2017	**20.8**	145	115	121	50.4	171	**451.8**	5,930	8,230	1,040	**15,200**	<4.94
AH2 - 3'	10/16/2017	**29.6**	157	116	118	48.5	167	**469.6**	4,590	6,760	700	**12,100**	11.3
AH2 - 4'	10/16/2017	0.0120	0.0766	0.0675	0.0834	0.0356	0.119	0.275	27.3	59.0	<25.0	86.3	<5.00
AH2 - 5'	10/16/2017	<0.00199	<0.00199	0.00336	0.00651	0.00263	0.00914	0.0125	31.0	61.3	<24.9	92.3	9.44
T1 - Surf	10/16/2017	0.0247	2.63	3.69	4.48	2.13	6.61	13.0	1,050	10,900	382	**12,300**	<4.96
T1 - 1'	10/16/2017	<0.0200	<0.0200	0.0613	0.102	0.0302	0.132	0.194	94.7	596	36.2	726.9	7.27
T1 - 2'	10/16/2017	0.0215	0.365	0.377	0.438	0.191	0.629	1.39	2,420	5,820	343	**8,580**	7.95
T1 - 3'	10/16/2017	<0.00994	<0.00994	0.101	0.225	0.0978	0.323	0.424	42.0	215	<24.9	257	248
T1 - 4'	10/16/2017	<0.00200	<0.00200	<0.00200	<0.00399	<0.00200	<0.00399	<0.00399	<24.9	<24.9	<24.9	<24.9	**683**
T1 - 5'	10/16/2017												**877**
T1 - 6'	10/16/2017												**3,340**
T1 - 8'	10/16/2017												**4,190**
T1 - 10'	10/16/2017												**2,810**
T1 - 12'	10/16/2017												**733**
T1 - 14'	10/16/2017	<0.00201	<0.00201	<0.00201	<0.00402	<0.00201	<0.00402	<0.00402	<25.0	<25.0	<25.0	<25.0	**902**
T2 - Surface	10/16/2017	1.74	72.5	98.2	118	52.0	170	**342.44**	4130	10500	267	**14,900**	<4.95
T2 - 1'	10/16/2017	4.59	96.2	94.8	97.9	40.9	139	**334.59**	3360	6850	256	**10,500**	15.2
T2 - 2'	10/16/2017	6.45	101	95.7	97.9	40.9	139	**342.15**	2660	5310	220	**8,190**	<4.97
T2 - 3'	10/16/2017	<0.00199	<0.00199	<0.00199	<0.00398	<0.00199	<0.00398	<0.00398	<24.9	<24.9	<24.9	<24.9	<5.00
T2 - 4'	10/16/2017	<0.00200	<0.00200	<0.00200	<0.00401	<0.00200	<0.00401	<0.00401	<25.0	<25.0	<25.0	<25.0	**1,360**
T2 - 6'	10/16/2017												**1,740**
T2 - 8'	10/16/2017												**925**
T2 - 10'	10/16/2017												555
T2 - 12'	10/16/2017												121

TABLE 1

CONCENTRATIONS OF BENZENE, BTEX, TPH AND CHLORIDE IN SOIL

COG OPERATING, LLC

HOUMA STATE #001H RELEASE SITE
EDDY COUNTY, NEW MEXICO

All concentrations are reported in mg/Kg

SAMPLE LOCATION	SAMPLE DATE	METHODS: SW 846-8021B						METHOD: SW 8015M					E 300.1
		BENZENE	TOLUENE	ETHYL-BENZENE	m, p - XYLENES	o - XYLENE	TOTAL XYLENES	TOTAL BTEX	TPH GRO C_6-C_{12}	TPH DRO C_{12}-C_{28}	TPH ORO C_{28}-C_{35}	TOTAL TPH C_6-C_{35}	CHLORIDE
Limits		**10 mg/Kg**						**50 mg/Kg**				**5,000 mg/Kg**	**600**
T2 - 14'	10/16/2017	<0.00200	<0.00200	<0.00200	<0.00399	<0.00200	<0.00399	<0.00399	<25.0	<25.0	<25.0	<25.0	197
North Surf	10/16/2017	0.00558	<0.00364	<0.00364	<0.00727	<0.00364	<0.00727	0.00558	<25.0	<25.0	<25.0	<25.0	<5.00
North 1'	10/16/2017	0.0233	0.0334	0.00385	<0.00707	<0.00353	<0.00707	0.06055	<24.9	<24.9	<24.9	<24.9	<4.98
South Surf	10/16/2017	<0.00345	<0.00345	<0.00345	<0.00690	<0.00345	<0.00690	<0.00345	<25.0	<25.0	<25.0	<25.0	<4.96
South 1'	10/16/2017	0.0110	0.0157	0.00446	0.00485	0.00262	0.0075	0.03863	<24.9	<24.9	<24.9	<24.9	<1.99
East Surf	10/16/2017	0.00880	<0.00199	<0.00199	<0.00398	0.00221	0.00221	0.01101	<25.0	<25.0	<25.0	<25.0	<1.97
East 1'	10/16/2017	0.00352	0.00806	<0.00199	<0.00398	<0.00199	<0.00398	0.01158	<25.0	<25.0	<25.0	<25.0	<1.96

Analytical Report 566220

for

COG Operating, LLC

Project Manager: Sheldon Hitchcock

Houma State #1

31-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)

31-OCT-17

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

Reference: XENCO Report No(s): **566220**
Houma State #1
Project Address: Houma State #1

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) 566220. 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. 566220 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 566220

COG Operating, LLC, Midland, TX

Houma State #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH1 - Surface	S	10-16-17 12:30		566220-001
AH1 - 1'	S	10-16-17 12:30	1	566220-002
AH1 - 2'	S	10-16-17 12:30	2	566220-003
AH1 - 3'	S	10-16-17 12:30	3	566220-004
AH1 - 4'	S	10-16-17 12:30	4	566220-005
AH1 - 5'	S	10-16-17 12:30	5	566220-006
AH2 - Surface	S	10-16-17 12:45		566220-007
AH2 - 1'	S	10-16-17 12:45	1	566220-008
AH2 - 2'	S	10-16-17 12:45	2	566220-009
AH2 - 3'	S	10-16-17 12:45	3	566220-010
AH2 - 4'	S	10-16-17 12:45	4	566220-011
AH2 - 5'	S	10-16-17 12:45	5	566220-012

CASE NARRATIVE

Client Name: COG Operating, LLC

Project Name: Houma State #1

Project ID:
Work Order Number(s): *566220*

Report Date: *31-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-3031663 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3031744 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3031768 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 566220

COG Operating, LLC, Midland, TX

Project Name: Houma State #1

Project Id:
Contact: Sheldon Hitchcock
Project Location: Houma State #1

Date Received in Lab: Thu Oct-19-17 11:45 am
Report Date: 31-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566220-001		566220-002		566220-003		566220-004		566220-005		566220-006	
	Field Id:	AH1 - Surface		AH1 - 1'		AH1 - 2'		AH1 - 3'		AH1 - 4'		AH1 - 5'	
	Depth:			1-		2-		3-		4-		5-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-16-17 12:30		Oct-16-17 12:30		Oct-16-17 12:30		Oct-16-17 12:30		Oct-16-17 12:30		Oct-16-17 12:30	
BTEX by EPA 8021B	***Extracted:***	Oct-27-17 10:00		Oct-26-17 16:00		Oct-26-17 16:00		Oct-26-17 16:00		Oct-26-17 16:00		Oct-27-17 10:00	
	Analyzed:	Oct-27-17 15:44		Oct-27-17 10:04		Oct-27-17 09:26		Oct-27-17 08:10		Oct-27-17 08:29		Oct-27-17 15:25	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		0.00965	0.00202	<0.00998	0.00998	<0.0100	0.0100	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198
Toluene		0.00718	0.00202	0.0206	0.00998	<0.0100	0.0100	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198
Ethylbenzene		0.00293	0.00202	0.0608	0.00998	0.0203	0.0100	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198
m,p-Xylenes		0.00428	0.00403	0.157	0.0200	0.0425	0.0201	<0.00404	0.00404	<0.00402	0.00402	<0.00396	0.00396
o-Xylene		0.00436	0.00202	0.0712	0.00998	<0.0100	0.0100	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198
Total Xylenes		0.00864	0.00202	0.228	0.00998	0.0425	0.0100	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198
Total BTEX		0.0284	0.00202	0.310	0.00998	0.0628	0.0100	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198
Chloride by EPA 300	***Extracted:***	Oct-25-17 15:20		Oct-25-17 15:20		Oct-25-17 15:20		Oct-25-17 15:20		Oct-25-17 15:20		Oct-25-17 15:20	
	Analyzed:	Oct-26-17 10:32		Oct-26-17 10:39		Oct-26-17 10:59		Oct-26-17 11:06		Oct-26-17 11:13		Oct-26-17 11:20	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		<1.98	1.98	43.5	1.98	6.43	1.99	11.5	1.96	64.5	2.00	49.4	4.95
TPH by Texas1005	***Extracted:***	Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00	
	Analyzed:	Oct-26-17 23:33		Oct-26-17 23:55		Oct-27-17 00:15		Oct-27-17 00:35		Oct-27-17 01:38		Oct-27-17 01:58	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
C6-C12 Range Hydrocarbons		45.2	24.9	<24.9	24.9	29.5	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0
C12-C28 Range Hydrocarbons		592	24.9	35.0	24.9	238	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0
C28-C35 Range Hydrocarbons		72.0	24.9	<24.9	24.9	28.1	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0
Total TPH		709	24.9	35.0	24.9	296	25.0	<25.0	25.0	<25.0	25.0	<25.0	25.0

Houston - Dallas - San Antonio - Atlanta - Tampa - Boca Raton - Latin America - Odessa - Corpus Christi

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 566220

COG Operating, LLC, Midland, TX

Project Name: Houma State #1

Project Id:

Contact: Sheldon Hitchcock

Project Location: Houma State #1

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

Report Date: 31-OCT-17

Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566220-007		566220-008		566220-009		566220-010		566220-011		566220-012	
	Field Id:	AH2 - Surface		AH2 - 1'		AH2 - 2'		AH2 - 3'		AH2 - 4'		AH2 - 5'	
	Depth:			1-		2-		3-		4-		5-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-16-17 12:45		Oct-16-17 12:45		Oct-16-17 12:45		Oct-16-17 12:45		Oct-16-17 12:45		Oct-16-17 12:45	
BTEX by EPA 8021B	***Extracted:***	Oct-26-17 16:00		Oct-27-17 15:00		Oct-27-17 10:00		Oct-27-17 10:00		Oct-26-17 16:00		Oct-26-17 16:00	
	Analyzed:	Oct-27-17 03:34		Oct-27-17 22:37		Oct-27-17 18:22		Oct-27-17 18:03		Oct-27-17 10:23		Oct-27-17 09:45	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		0.0352	0.00202	16.3	1.99	20.8	2.01	29.6	2.01	0.0120	0.00201	<0.00199	0.00199
Toluene		0.397	0.00202	107	1.99	145	2.01	157	2.01	0.0766	0.00201	<0.00199	0.00199
Ethylbenzene		0.359	0.00202	67.9	1.99	115	2.01	116	2.01	0.0675	0.00201	0.00336	0.00199
m,p-Xylenes		0.355	0.00403	73.2	3.98	121	4.02	118	4.02	0.0834	0.00402	0.00651	0.00398
o-Xylene		0.150	0.00202	31.9	1.99	50.4	2.01	48.5	2.01	0.0356	0.00201	0.00263	0.00199
Total Xylenes		0.505	0.00202	105	1.99	171	2.01	167	2.01	0.119	0.00201	0.00914	0.00199
Total BTEX		1.30	0.00202	296	1.99	452	2.01	469	2.01	0.275	0.00201	0.0125	0.00199
Chloride by EPA 300	***Extracted:***	Oct-25-17 15:20		Oct-25-17 15:20		Oct-25-17 15:20		Oct-25-17 15:20		Oct-25-17 15:20		Oct-25-17 15:20	
	Analyzed:	Oct-26-17 11:26		Oct-26-17 11:33		Oct-26-17 11:54		Oct-26-17 12:00		Oct-26-17 12:21		Oct-26-17 12:28	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		10.6	4.96	9.02	4.94	<4.94	4.94	11.3	5.00	<5.00	5.00	9.44	4.95
TPH by Texas1005	***Extracted:***	Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00	
	Analyzed:	Oct-27-17 02:18		Oct-27-17 02:40		Oct-27-17 03:00		Oct-27-17 03:21		Oct-27-17 04:23		Oct-27-17 04:43	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
C6-C12 Range Hydrocarbons		3430	125	5190	125	5930	125	4590	125	27.3	25.0	31.0	24.9
C12-C28 Range Hydrocarbons		9930	125	8440	125	8230	125	6760	125	59.0	25.0	61.3	24.9
C28-C35 Range Hydrocarbons		1330	125	985	125	1040	125	700	125	<25.0	25.0	<24.9	24.9
Total TPH		14700	125	14600	125	15200	125	12100	125	86.3	25.0	92.3	24.9

Kelsey Brooks
Project Manager

Flagging Criteria

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

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

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

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

F RPD exceeded lab control limits.

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

U Analyte was not detected.

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

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

K Sample analyzed outside of recommended hold time.

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

Form 2 - Surrogate Recoveries

Project Name: Houma State #1

Work Orders : 566220,

Project ID:

Lab Batch #: 3031679 **Sample:** 566220-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 23:33

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	54.4	49.9	109	70-130	
1-Chlorooctane	112	99.7	112	70-130	

Lab Batch #: 3031679 **Sample:** 566220-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 23:55

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	48.1	49.9	96	70-130	
1-Chlorooctane	102	99.7	102	70-130	

Lab Batch #: 3031679 **Sample:** 566220-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 00:15

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	46.5	50.0	93	70-130	
1-Chlorooctane	97.8	99.9	98	70-130	

Lab Batch #: 3031679 **Sample:** 566220-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 00:35

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	49.5	49.9	99	70-130	
1-Chlorooctane	100	99.8	100	70-130	

Lab Batch #: 3031679 **Sample:** 566220-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 01:38

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	47.6	50.0	95	70-130	
1-Chlorooctane	96.9	99.9	97	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: Houma State #1

Work Orders : 566220,

Project ID:

Lab Batch #: 3031679 **Sample:** 566220-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 01:58

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	49.7	49.9	100	70-130	
1-Chlorooctane	107	99.8	107	70-130	

Lab Batch #: 3031679 **Sample:** 566220-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 02:18

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	59.4	49.9	119	70-130	
1-Chlorooctane	111	99.8	111	70-130	

Lab Batch #: 3031679 **Sample:** 566220-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 02:40

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	54.9	50.0	110	70-130	
1-Chlorooctane	113	100	113	70-130	

Lab Batch #: 3031679 **Sample:** 566220-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 03:00

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	58.2	49.8	117	70-130	
1-Chlorooctane	110	99.6	110	70-130	

Lab Batch #: 3031679 **Sample:** 566220-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 03:21

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	55.7	49.8	112	70-130	
1-Chlorooctane	108	99.6	108	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: Houma State #1

Work Orders : 566220,

Project ID:

Lab Batch #: 3031663 **Sample:** 566220-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 03:34

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0269	0.0300	90	80-120	
4-Bromofluorobenzene	0.0298	0.0300	99	80-120	

Lab Batch #: 3031679 **Sample:** 566220-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 04:23

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	47.3	50.0	95	70-130	
1-Chlorooctane	97.0	99.9	97	70-130	

Lab Batch #: 3031679 **Sample:** 566220-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 04:43

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	48.0	49.9	96	70-130	
1-Chlorooctane	99.3	99.7	100	70-130	

Lab Batch #: 3031663 **Sample:** 566220-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 08:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0270	0.0300	90	80-120	
4-Bromofluorobenzene	0.0299	0.0300	100	80-120	

Lab Batch #: 3031663 **Sample:** 566220-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 08:29

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0267	0.0300	89	80-120	
4-Bromofluorobenzene	0.0301	0.0300	100	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: Houma State #1

Work Orders : 566220,

Project ID:

Lab Batch #: 3031663 **Sample:** 566220-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 09:26

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0270	0.0300	90	80-120	
4-Bromofluorobenzene	0.0298	0.0300	99	80-120	

Lab Batch #: 3031663 **Sample:** 566220-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 09:45

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0268	0.0300	89	80-120	
4-Bromofluorobenzene	0.0277	0.0300	92	80-120	

Lab Batch #: 3031663 **Sample:** 566220-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 10:04

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0267	0.0300	89	80-120	
4-Bromofluorobenzene	0.0323	0.0300	108	80-120	

Lab Batch #: 3031663 **Sample:** 566220-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 10:23

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0246	0.0300	82	80-120	
4-Bromofluorobenzene	0.0328	0.0300	109	80-120	

Lab Batch #: 3031744 **Sample:** 566220-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 15:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0259	0.0300	86	80-120	
4-Bromofluorobenzene	0.0270	0.0300	90	80-120	

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

Form 2 - Surrogate Recoveries

Project Name: Houma State #1

Work Orders : 566220,

Project ID:

Lab Batch #: 3031744 **Sample:** 566220-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 15:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0268	0.0300	89	80-120	
4-Bromofluorobenzene	0.0293	0.0300	98	80-120	

Lab Batch #: 3031744 **Sample:** 566220-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 18:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0260	0.0300	87	80-120	
4-Bromofluorobenzene	0.0306	0.0300	102	80-120	

Lab Batch #: 3031744 **Sample:** 566220-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 18:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0256	0.0300	85	80-120	
4-Bromofluorobenzene	0.0325	0.0300	108	80-120	

Lab Batch #: 3031768 **Sample:** 566220-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 22:37

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0274	0.0300	91	80-120	
4-Bromofluorobenzene	0.0261	0.0300	87	80-120	

Lab Batch #: 3031679 **Sample:** 7633287-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 22:32

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	53.6	50.0	107	70-130	
1-Chlorooctane	111	100	111	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: Houma State #1

Work Orders : 566220,

Project ID:

Lab Batch #: 3031663 **Sample:** 7633348-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 01:41

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	80-120	
4-Bromofluorobenzene	0.0264	0.0300	88	80-120	

Lab Batch #: 3031744 **Sample:** 7633415-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 13:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0271	0.0300	90	80-120	
4-Bromofluorobenzene	0.0246	0.0300	82	80-120	

Lab Batch #: 3031768 **Sample:** 7633435-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 19:59

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0337	0.0300	112	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

Lab Batch #: 3031679 **Sample:** 7633287-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 22:52

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	53.6	50.0	107	70-130	
1-Chlorooctane	107	100	107	70-130	

Lab Batch #: 3031663 **Sample:** 7633348-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 23:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0334	0.0300	111	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: Houma State #1

Work Orders : 566220,

Project ID:

Lab Batch #: 3031744 **Sample:** 7633415-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 11:38

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	0.0331	0.0300	110	80-120	

Lab Batch #: 3031768 **Sample:** 7633435-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 18:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0301	0.0300	100	80-120	
4-Bromofluorobenzene	0.0357	0.0300	119	80-120	

Lab Batch #: 3031679 **Sample:** 7633287-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 23:13

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	52.7	50.0	105	70-130	
1-Chlorooctane	114	100	114	70-130	

Lab Batch #: 3031663 **Sample:** 7633348-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 00:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	80-120	
4-Bromofluorobenzene	0.0322	0.0300	107	80-120	

Lab Batch #: 3031744 **Sample:** 7633415-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 11:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0305	0.0300	102	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: Houma State #1

Work Orders : 566220,

Project ID:

Lab Batch #: 3031768 **Sample:** 7633435-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 18:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0296	0.0300	99	80-120	
4-Bromofluorobenzene	0.0341	0.0300	114	80-120	

Lab Batch #: 3031663 **Sample:** 566216-016 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 00:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0309	0.0300	103	80-120	

Lab Batch #: 3031679 **Sample:** 566220-005 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 00:56

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.5	49.9	101	70-130	
1-Chlorooctane	99.8	99.7	100	70-130	

Lab Batch #: 3031744 **Sample:** 566341-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 12:16

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0313	0.0300	104	80-120	

Lab Batch #: 3031768 **Sample:** 566146-004 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 19:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0340	0.0300	113	80-120	
4-Bromofluorobenzene	0.0359	0.0300	120	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: Houma State #1

Work Orders : 566220,

Project ID:

Lab Batch #: 3031663 **Sample:** 566216-016 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 00:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0313	0.0300	104	80-120	

Lab Batch #: 3031679 **Sample:** 566220-005 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 01:17

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	44.5	50.0	89	70-130	
1-Chlorooctane	88.7	99.9	89	70-130	

Lab Batch #: 3031744 **Sample:** 566341-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 12:35

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0251	0.0300	84	80-120	

Lab Batch #: 3031768 **Sample:** 566146-004 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 19:20

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0315	0.0300	105	80-120	
4-Bromofluorobenzene	0.0355	0.0300	118	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.

BS / BSD Recoveries

Project Name: Houma State #1

Work Order #: 566220 **Project ID:**

Analyst: ALJ **Date Prepared:** 10/26/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031663 **Sample:** 7633348-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.0901	89	0.101	0.0884	88	2	70-130	35	
Toluene	<0.00202	0.101	0.0949	94	0.101	0.0937	93	1	70-130	35	
Ethylbenzene	<0.00202	0.101	0.108	107	0.101	0.104	103	4	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.211	104	0.201	0.205	102	3	70-135	35	
o-Xylene	<0.00202	0.101	0.108	107	0.101	0.104	103	4	71-133	35	

Analyst: ALJ **Date Prepared:** 10/27/2017 **Date Analyzed:** 10/27/2017

Lab Batch ID: 3031744 **Sample:** 7633415-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.103	102	0.100	0.0897	90	14	70-130	35	
Toluene	<0.00202	0.101	0.107	106	0.100	0.0932	93	14	70-130	35	
Ethylbenzene	<0.00202	0.101	0.119	118	0.100	0.104	104	13	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.221	109	0.201	0.201	100	9	70-135	35	
o-Xylene	<0.00202	0.101	0.113	112	0.100	0.102	102	10	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: Houma State #1

Work Order #: 566220 **Project ID:**

Analyst: ALJ **Date Prepared:** 10/27/2017 **Date Analyzed:** 10/27/2017

Lab Batch ID: 3031768 **Sample:** 7633435-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.0809	80	0.100	0.0812	81	0	70-130	35	
Toluene	<0.00202	0.101	0.0881	87	0.100	0.0911	91	3	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0941	93	0.100	0.0971	97	3	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.183	91	0.200	0.190	95	4	70-135	35	
o-Xylene	<0.00202	0.101	0.0911	90	0.100	0.0942	94	3	71-133	35	

Analyst: MNV **Date Prepared:** 10/25/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031640 **Sample:** 7633224-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	242	97	250	242	97	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

BS / BSD Recoveries

Project Name: Houma State #1

Work Order #: 566220 **Project ID:**

Analyst: ARM **Date Prepared:** 10/26/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031679 **Sample:** 7633287-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Range Hydrocarbons	<25.0	1000	1070	107	1000	973	97	9	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1080	108	1000	1020	102	6	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: Houma State #1

Work Order # : 566220 **Project ID:**

Lab Batch ID: 3031663 **QC- Sample ID:** 566216-016 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/27/2017 **Date Prepared:** 10/26/2017 **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	<0.00200	0.0998	0.119	119	0.0996	0.107	107	11	70-130	35	
Toluene	<0.00200	0.0998	0.110	110	0.0996	0.0972	98	12	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.105	105	0.0996	0.0886	89	17	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.212	106	0.199	0.188	94	12	70-135	35	
o-Xylene	<0.00200	0.0998	0.104	104	0.0996	0.0930	93	11	71-133	35	

Lab Batch ID: 3031744 **QC- Sample ID:** 566341-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/27/2017 **Date Prepared:** 10/27/2017 **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	0.00630	0.101	0.0589	52	0.100	0.0644	58	9	70-130	35	X
Toluene	0.0546	0.101	0.0688	14	0.100	0.0685	14	0	70-130	35	X
Ethylbenzene	0.0235	0.101	0.0584	35	0.100	0.0668	43	13	71-129	35	X
m,p-Xylenes	0.124	0.202	0.132	4	0.200	0.141	9	7	70-135	35	X
o-Xylene	0.0410	0.101	0.0641	23	0.100	0.0714	30	11	71-133	35	X

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: Houma State #1

Work Order # : 566220 **Project ID:**

Lab Batch ID: 3031768 **QC- Sample ID:** 566146-004 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/27/2017 **Date Prepared:** 10/27/2017 **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	0.0656	65	0.101	0.0651	64	1	70-130	35	X
Toluene	<0.00202	0.101	0.0749	74	0.101	0.0712	70	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0752	74	0.101	0.0759	75	1	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.147	73	0.201	0.149	74	1	70-135	35	
o-Xylene	<0.00202	0.101	0.0734	73	0.101	0.0751	74	2	71-133	35	

Lab Batch ID: 3031640 **QC- Sample ID:** 566219-004 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/25/2017 **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	<1.99	99.6	101	101	99.6	101	101	0	90-110	20	

Lab Batch ID: 3031640 **QC- Sample ID:** 566220-008 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/25/2017 **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	9.02	247	258	101	247	261	102	1	90-110	20	

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: Houma State #1

Work Order # : 566220 **Project ID:**

Lab Batch ID: 3031679 **QC- Sample ID:** 566220-005 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/27/2017 **Date Prepared:** 10/26/2017 **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	<24.9	997	1020	102	999	893	89	13	75-125	25	
C12-C28 Range Hydrocarbons	<24.9	997	1050	105	999	940	94	11	75-125	25	

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

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

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

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

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

XENCO LABORATORIES

Setting the Standard since 1990

Stafford,Texas (281-240-4200)

Dallas Texas (214-902-0300)

San Antonio, Texas (210-509-3334)

Midland, Texas (432-704-5251)

Phoenix, Arizona (480-355-0900)

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CHAIN OF CUSTODY

Page 1 Of 2

Xenco Quote #

Xenco Job # 566220

Client / Reporting Information

Company Name / Branch: COG Operating LLC

Company Address: 2407 PECOS Avenue Artesia NM 88210

Email: alieb@concho.com dneel2@concho.com rhaskell@concho.com slhitchcock@concho.com

Phone No: 575-748-1553

Project Contact: Aaron Lieb

Samplers's Name- Aaron Lieb

Project Information

Project Name/Number: Houma State #1

Project Location: Houma State #1

Invoice To: COG Operating LLC, Attn: Robert Mcneill, 600 W. Illinois, Midland TX 79701

PO Number:

Analytical Information

Matrix Codes

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

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	None	TPH/ EXTENDED	BTEX	Chloride							Field Comments
1	AH-1 - Surf	0	10/16/17	12:30	S	1									X	X	X							
2	AH-1 - 1'	1				1									X	X	X							
3	AH 1 - 2'	2				1									X	X	X							
4	AH 1 - 3'	3				1									X	X	X							
5	AH 1 - 4'	4				1									X	X	X							
6	AH 1 - 5'	5				1									X	X	X							
7																								
8																								
9																								
10																								

Turnaround Time (Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [ ] Next Day EMERGENCY
- [x] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [ ] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Notes:

Temp: 3.2 IR ID:R-8

CF:(0-6: -0.2°C)

(6-23: +0.2°C)

Corrected Temp: 3

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		10/20/17 1000	Sid Butler 10-19-17 10A	Sid Butler	10-19-17 1145	Connie Hennessy
2	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
3						
4	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. / Thermo. Corr. Factor
5						13<

Notice: 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 loses 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

Setting the Standard since 1990

Stafford,Texas (281-240-4200)

Dallas Texas (214-902-0300)

San Antonio, Texas (210-509-3334)

Midland, Texas (432-704-5251)

Phoenix, Arizona (480-355-0900)

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CHAIN OF CUSTODY

Page 2 Of 2

Xenco Quote #

Xenco Job # 566220

Client / Reporting Information

Company Name / Branch: COG Operating LLC

Company Address: 2407 PECOS Avenue Artesia NM 88210

Email: alieb@concho.com dneel2@concho.com rhaskell@concho.com slhitchcock@concho.com

Phone No: 575-748-1553

Project Contact: Aaron Lieb

Samplers's Name- Aaron Lieb

Project Information

Project Name/Number: Houma State #1

Project Location: Houma State #1

Invoice To: COG Operating LLC, Attn: Robert Mcneill, 600 W. Illinois, Midland TX 79701

PO Number:

Analytical Information

Matrix Codes

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

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	TPH/ EXTENDED	BTEX	Chloride	Field Comments
1	AH2 - Surf	0	10/16/17	12:45	S	1									X	X	X	
2	AH2 - 1'	1'				1									X	X	X	
3	AH2 - 2'	2'				1									X	X	X	
4	AH2 - 3'	3'				1									X	X	X	
5	AH2 - 4'	4'				1									X	X	X	
6	AH2 - 5'	5'				1									X	X	X	
7																		
8																		
9																		
10																		

Turnaround Time (Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [ ] Next Day EMERGENCY
- [X] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [ ] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

FED-

Notes:

Temp: 3.2 IR ID:R-8

CF:(0-6: -0.2°C)
(6-23: +0.2°C)

Corrected Temp: 3

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		10/20/17 10:00	1 Sid Butler 10-19-17 10A	2 Sid Butler	10-19-17 1145 A	2
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. 13C / Thermo. Corr. Factor

Notice: 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 loses 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 #: 566220

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 566216

for

COG Operating, LLC

Project Manager: Sheldon Hitchcock

Houma State #1

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): **566216**
Houma State #1
Project Address: Houma State #1

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) 566216. 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. 566216 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 566216

COG Operating, LLC, Midland, TX

Houma State #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T1 - Surf	S	10-16-17 13:00	0	566216-001
T1 - 1'	S	10-16-17 13:00	1	566216-002
T1 - 2'	S	10-16-17 13:00	2	566216-003
T1 - 3'	S	10-16-17 13:00	3	566216-004
T1 - 4'	S	10-16-17 13:00	4	566216-005
T1 - 5'	S	10-16-17 13:30	5	566216-006
T1 - 6'	S	10-16-17 13:30	6	566216-007
T1 - 8'	S	10-16-17 13:30	8	566216-008
T1 - 10'	S	10-16-17 13:30	10	566216-009
T1 - 12'	S	10-16-17 13:30	12	566216-010
T1 - 14'	S	10-16-17 13:30	14	566216-011
T2 - Surface	S	10-16-17 14:00	0	566216-012
T2 - 1'	S	10-16-17 14:00	1	566216-013
T2 - 2'	S	10-16-17 14:00	2	566216-014
T2 - 3'	S	10-16-17 14:00	3	566216-015
T2 - 4'	S	10-16-17 14:00	4	566216-016
T2 - 6'	S	10-16-17 14:00	6	566216-017
T2 - 8'	S	10-16-17 14:00	8	566216-018
T2 - 10'	S	10-16-17 14:00	10	566216-019
T2 - 12'	S	10-16-17 14:00	12	566216-020
T2 - 14'	S	10-16-17 14:05	14	566216-021

CASE NARRATIVE

Client Name: COG Operating, LLC

Project Name: Houma State #1

Project ID:
Work Order Number(s): *566216*

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-3031544 Chloride by EPA 300
Lab Sample ID 566216-015 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 566216-005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -018, -019, -020, -021.
The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3031655 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3031663 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3031744 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3031768 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 566216

COG Operating, LLC, Midland, TX

Project Name: Houma State #1

Project Id:

Contact: Sheldon Hitchcock

Project Location: Houma State #1

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

Report Date: 30-OCT-17

Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566216-001		566216-002		566216-003		566216-004		566216-005		566216-006	
	Field Id:	T1 - Surf		T1 - 1'		T1 - 2'		T1 - 3'		T1 - 4'		T1 - 5'	
	Depth:	0-		1-		2-		3-		4-		5-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-16-17 13:00		Oct-16-17 13:00		Oct-16-17 13:00		Oct-16-17 13:00		Oct-16-17 13:00		Oct-16-17 13:30	
BTEX by EPA 8021B	***Extracted:***	Oct-27-17 15:00		Oct-27-17 10:00		Oct-26-17 11:00		Oct-26-17 16:00		Oct-26-17 11:00			
	Analyzed:	Oct-27-17 23:04		Oct-27-17 16:22		Oct-26-17 23:11		Oct-27-17 10:42		Oct-26-17 20:21			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
Benzene		0.0247	0.0200	<0.0200	0.0200	0.0215	0.00198	<0.00994	0.00994	<0.00200	0.00200		
Toluene		2.63	0.0200	<0.0200	0.0200	0.365	0.00198	<0.00994	0.00994	<0.00200	0.00200		
Ethylbenzene		3.69	0.0200	0.0613	0.0200	0.377	0.00198	0.101	0.00994	<0.00200	0.00200		
m,p-Xylenes		4.48	0.0400	0.102	0.0401	0.438	0.00397	0.225	0.0199	<0.00399	0.00399		
o-Xylene		2.13	0.0200	0.0302	0.0200	0.191	0.00198	0.0978	0.00994	<0.00200	0.00200		
Total Xylenes		6.61	0.0200	0.132	0.0200	0.629	0.00198	0.323	0.00994	<0.00200	0.00200		
Total BTEX		13.0	0.0200	0.194	0.0200	1.39	0.00198	0.424	0.00994	<0.00200	0.00200		
Chloride by EPA 300	***Extracted:***	Oct-25-17 11:00		Oct-25-17 11:00		Oct-25-17 11:00		Oct-25-17 11:00		Oct-25-17 13:00		Oct-25-17 13:00	
	Analyzed:	Oct-26-17 01:32		Oct-26-17 01:39		Oct-26-17 01:46		Oct-26-17 01:53		Oct-26-17 02:33		Oct-26-17 02:54	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		<4.96	4.96	7.27	4.97	7.95	5.00	248	4.92	683	4.93	877	4.97
TPH by Texas1005	***Extracted:***	Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00			
	Analyzed:	Oct-26-17 23:27		Oct-26-17 23:47		Oct-27-17 00:07		Oct-27-17 00:27		Oct-27-17 01:27			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL		
C6-C12 Range Hydrocarbons		1050	125	94.7	25.0	2420	125	42.0	24.9	<24.9	24.9		
C12-C28 Range Hydrocarbons		10900	125	596	25.0	5820	125	215	24.9	<24.9	24.9		
C28-C35 Range Hydrocarbons		382	125	36.2	25.0	343	125	<24.9	24.9	<24.9	24.9		
Total TPH		12300	125	727	25.0	8580	125	257	24.9	<24.9	24.9		

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 566216

COG Operating, LLC, Midland, TX

Project Name: Houma State #1

Project Id:
Contact: Sheldon Hitchcock
Project Location: Houma State #1

Date Received in Lab: Thu Oct-19-17 11:45 am
Report Date: 30-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566216-007		566216-008		566216-009		566216-010		566216-011		566216-012	
	Field Id:	T1 - 6'		T1 - 8'		T1 - 10'		T1 - 12'		T1 - 14'		T2 - Surface	
	Depth:	6-		8-		10-		12-		14-		0-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-16-17 13:30		Oct-16-17 13:30		Oct-16-17 13:30		Oct-16-17 13:30		Oct-16-17 13:30		Oct-16-17 14:00	
BTEX by EPA 8021B	***Extracted:***									Oct-26-17 11:00		Oct-26-17 11:00	
	Analyzed:									Oct-26-17 20:40		Oct-26-17 22:52	
	Units/RL:									mg/kg	RL	mg/kg	RL
Benzene										<0.00201	0.00201	1.74	0.495
Toluene										<0.00201	0.00201	72.5	0.495
Ethylbenzene										<0.00201	0.00201	98.2	0.495
m,p-Xylenes										<0.00402	0.00402	118	0.990
o-Xylene										<0.00201	0.00201	52.0	0.495
Total Xylenes										<0.00201	0.00201	170	0.495
Total BTEX										<0.00201	0.00201	342	0.495
Chloride by EPA 300	***Extracted:***	Oct-25-17 13:00		Oct-25-17 13:00		Oct-25-17 13:00		Oct-25-17 13:00		Oct-25-17 13:00		Oct-25-17 13:00	
	Analyzed:	Oct-26-17 03:00		Oct-26-17 03:07		Oct-26-17 03:14		Oct-26-17 03:34		Oct-26-17 03:41		Oct-26-17 03:48	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		3340	24.8	4190	24.8	2810	25.0	733	4.98	902	4.96	<4.95	4.95
TPH by Texas1005	***Extracted:***									Oct-26-17 14:00		Oct-26-17 14:00	
	Analyzed:									Oct-27-17 01:47		Oct-27-17 02:07	
	Units/RL:									mg/kg	RL	mg/kg	RL
C6-C12 Range Hydrocarbons										<25.0	25.0	4130	125
C12-C28 Range Hydrocarbons										<25.0	25.0	10500	125
C28-C35 Range Hydrocarbons										<25.0	25.0	267	125
Total TPH										<25.0	25.0	14900	125

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 566216

COG Operating, LLC, Midland, TX

Project Name: Houma State #1

Project Id:
Contact: Sheldon Hitchcock
Project Location: Houma State #1

Date Received in Lab: Thu Oct-19-17 11:45 am
Report Date: 30-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566216-013		566216-014		566216-015		566216-016		566216-017		566216-018	
	Field Id:	T2 - 1'		T2 - 2'		T2 - 3'		T2 - 4'		T2 - 6'		T2 - 8'	
	Depth:	1-		2-		3-		4-		6-		8-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-16-17 14:00		Oct-16-17 14:00		Oct-16-17 14:00		Oct-16-17 14:00		Oct-16-17 14:00		Oct-16-17 14:00	
BTEX by EPA 8021B	***Extracted:***	Oct-26-17 11:00		Oct-26-17 11:00		Oct-26-17 11:00		Oct-26-17 16:00					
	Analyzed:	Oct-26-17 18:28		Oct-26-17 18:46		Oct-26-17 20:59		Oct-27-17 02:00					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Benzene		4.59	0.498	6.45	0.505	<0.00199	0.00199	<0.00200	0.00200				
Toluene		96.2	0.498	101	0.505	<0.00199	0.00199	<0.00200	0.00200				
Ethylbenzene		94.8	0.498	95.7	0.505	<0.00199	0.00199	<0.00200	0.00200				
m,p-Xylenes		97.9	0.996	97.9	1.01	<0.00398	0.00398	<0.00401	0.00401				
o-Xylene		40.9	0.498	40.9	0.505	<0.00199	0.00199	<0.00200	0.00200				
Total Xylenes		139	0.498	139	0.505	<0.00199	0.00199	<0.00200	0.00200				
Total BTEX		334	0.498	342	0.505	<0.00199	0.00199	<0.00200	0.00200				
Chloride by EPA 300	***Extracted:***	Oct-25-17 13:00		Oct-25-17 13:00		Oct-25-17 13:00		Oct-25-17 13:00		Oct-25-17 13:00		Oct-25-17 13:00	
	Analyzed:	Oct-26-17 03:55		Oct-26-17 04:01		Oct-26-17 04:08		Oct-26-17 04:29		Oct-26-17 04:35		Oct-26-17 04:56	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		15.2	4.96	<4.97	4.97	<5.00	5.00	1360	25.0	1740	24.6	925	4.96
TPH by Texas1005	***Extracted:***	Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00					
	Analyzed:	Oct-27-17 02:27		Oct-27-17 02:46		Oct-27-17 03:06		Oct-27-17 03:25					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
C6-C12 Range Hydrocarbons		3360	125	2660	125	<24.9	24.9	<25.0	25.0				
C12-C28 Range Hydrocarbons		6850	125	5310	125	<24.9	24.9	<25.0	25.0				
C28-C35 Range Hydrocarbons		256	125	220	125	<24.9	24.9	<25.0	25.0				
Total TPH		10500	125	8190	125	<24.9	24.9	<25.0	25.0				

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Kelsey Brooks
Project Manager

Certificate of Analysis Summary 566216

COG Operating, LLC, Midland, TX

Project Name: Houma State #1

Project Id:
Contact: Sheldon Hitchcock
Project Location: Houma State #1

Date Received in Lab: Thu Oct-19-17 11:45 am
Report Date: 30-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566216-019		566216-020		566216-021							
	Field Id:	T2 - 10'		T2 - 12'		T2 - 14'							
	Depth:	10-		12-		14-							
	Matrix:	SOIL		SOIL		SOIL							
	Sampled:	Oct-16-17 14:00		Oct-16-17 14:00		Oct-16-17 14:05							
BTEX by EPA 8021B	***Extracted:***					Oct-26-17 16:00							
	Analyzed:					Oct-27-17 07:51							
	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						
Chloride by EPA 300	***Extracted:***	Oct-25-17 13:00		Oct-25-17 13:00		Oct-25-17 13:00							
	Analyzed:	Oct-26-17 05:02		Oct-26-17 05:09		Oct-26-17 05:16							
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL						
Chloride		555	4.95	121	4.93	197	4.98						
TPH by Texas1005	***Extracted:***					Oct-26-17 14:00							
	Analyzed:					Oct-27-17 03:45							
	Units/RL:					mg/kg	RL						
C6-C12 Range Hydrocarbons						<25.0	25.0						
C12-C28 Range Hydrocarbons						<25.0	25.0						
C28-C35 Range Hydrocarbons						<25.0	25.0						
Total TPH						<25.0	25.0						

Kelsey Brooks
Project Manager

Flagging Criteria

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

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

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

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

F RPD exceeded lab control limits.

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

U Analyte was not detected.

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

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

K Sample analyzed outside of recommended hold time.

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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

Form 2 - Surrogate Recoveries

Project Name: Houma State #1

Work Orders : 566216,

Project ID:

Lab Batch #: 3031655 **Sample:** 566216-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 18:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0244	0.0300	81	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

Lab Batch #: 3031655 **Sample:** 566216-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 18:46

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0256	0.0300	85	80-120	
4-Bromofluorobenzene	0.0346	0.0300	115	80-120	

Lab Batch #: 3031655 **Sample:** 566216-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 20:21

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	0.0288	0.0300	96	80-120	

Lab Batch #: 3031655 **Sample:** 566216-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 20:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	80-120	
4-Bromofluorobenzene	0.0278	0.0300	93	80-120	

Lab Batch #: 3031655 **Sample:** 566216-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 20:59

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0280	0.0300	93	80-120	
4-Bromofluorobenzene	0.0294	0.0300	98	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: Houma State #1

Work Orders : 566216,

Project ID:

Lab Batch #: 3031655 **Sample:** 566216-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 22:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	80-120	
4-Bromofluorobenzene	0.0331	0.0300	110	80-120	

Lab Batch #: 3031655 **Sample:** 566216-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 23:11

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0242	0.0300	81	80-120	
4-Bromofluorobenzene	0.0271	0.0300	90	80-120	

Lab Batch #: 3031676 **Sample:** 566216-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 23:27

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	61.5	49.9	123	70-130	
1-Chlorooctane	113	99.8	113	70-130	

Lab Batch #: 3031676 **Sample:** 566216-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 23:47

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	57.7	50.0	115	70-130	
1-Chlorooctane	98.8	100	99	70-130	

Lab Batch #: 3031676 **Sample:** 566216-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 00:07

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	39.3	49.9	79	70-130	
1-Chlorooctane	113	99.7	113	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: Houma State #1

Work Orders : 566216,

Project ID:

Lab Batch #: 3031676 **Sample:** 566216-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 00:27

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	46.4	49.8	93	70-130	
1-Chlorooctane	82.0	99.6	82	70-130	

Lab Batch #: 3031676 **Sample:** 566216-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 01:27

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	47.2	49.9	95	70-130	
1-Chlorooctane	84.5	99.7	85	70-130	

Lab Batch #: 3031676 **Sample:** 566216-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 01:47

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	51.2	50.0	102	70-130	
1-Chlorooctane	92.7	99.9	93	70-130	

Lab Batch #: 3031663 **Sample:** 566216-016 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 02:00

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0285	0.0300	95	80-120	
4-Bromofluorobenzene	0.0302	0.0300	101	80-120	

Lab Batch #: 3031676 **Sample:** 566216-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 02:07

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	63.7	50.0	127	70-130	
1-Chlorooctane	128	99.9	128	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: Houma State #1

Work Orders : 566216,

Project ID:

Lab Batch #: 3031676 **Sample:** 566216-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 02:27

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	42.9	50.0	86	70-130	
1-Chlorooctane	124	100	124	70-130	

Lab Batch #: 3031676 **Sample:** 566216-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 02:46

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	44.0	49.8	88	70-130	
1-Chlorooctane	107	99.6	107	70-130	

Lab Batch #: 3031676 **Sample:** 566216-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 03:06

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	51.8	49.8	104	70-130	
1-Chlorooctane	93.0	99.6	93	70-130	

Lab Batch #: 3031676 **Sample:** 566216-016 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 03:25

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	52.1	50.0	104	70-130	
1-Chlorooctane	94.2	99.9	94	70-130	

Lab Batch #: 3031676 **Sample:** 566216-021 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 03:45

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	51.2	49.9	103	70-130	
1-Chlorooctane	92.4	99.8	93	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: Houma State #1

Work Orders : 566216,

Project ID:

Lab Batch #: 3031663 **Sample:** 566216-021 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 07:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0267	0.0300	89	80-120	
4-Bromofluorobenzene	0.0301	0.0300	100	80-120	

Lab Batch #: 3031663 **Sample:** 566216-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 10:42

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0263	0.0300	88	80-120	
4-Bromofluorobenzene	0.0349	0.0300	116	80-120	

Lab Batch #: 3031744 **Sample:** 566216-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 16:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0273	0.0300	91	80-120	
4-Bromofluorobenzene	0.0353	0.0300	118	80-120	

Lab Batch #: 3031768 **Sample:** 566216-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 23:04

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0290	0.0300	97	80-120	

Lab Batch #: 3031655 **Sample:** 7633345-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 15:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0264	0.0300	88	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: Houma State #1

Work Orders : 566216,

Project ID:

Lab Batch #: 3031676 **Sample:** 7633285-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 19:49

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	58.3	50.0	117	70-130	
1-Chlorooctane	105	100	105	70-130	

Lab Batch #: 3031663 **Sample:** 7633348-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 01:41

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	80-120	
4-Bromofluorobenzene	0.0264	0.0300	88	80-120	

Lab Batch #: 3031744 **Sample:** 7633415-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 13:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0271	0.0300	90	80-120	
4-Bromofluorobenzene	0.0246	0.0300	82	80-120	

Lab Batch #: 3031768 **Sample:** 7633435-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 19:59

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0337	0.0300	112	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

Lab Batch #: 3031655 **Sample:** 7633345-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 13:17

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	0.0312	0.0300	104	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: Houma State #1

Work Orders : 566216,

Project ID:

Lab Batch #: 3031676 **Sample:** 7633285-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 20:09

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	60.7	50.0	121	70-130	
1-Chlorooctane	112	100	112	70-130	

Lab Batch #: 3031663 **Sample:** 7633348-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 23:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0334	0.0300	111	80-120	

Lab Batch #: 3031744 **Sample:** 7633415-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 11:38

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	0.0331	0.0300	110	80-120	

Lab Batch #: 3031768 **Sample:** 7633435-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 18:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0301	0.0300	100	80-120	
4-Bromofluorobenzene	0.0357	0.0300	119	80-120	

Lab Batch #: 3031655 **Sample:** 7633345-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 13:36

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0294	0.0300	98	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: Houma State #1

Work Orders : 566216,

Project ID:

Lab Batch #: 3031676 **Sample:** 7633285-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 20:29

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	63.5	50.0	127	70-130	
1-Chlorooctane	110	100	110	70-130	

Lab Batch #: 3031663 **Sample:** 7633348-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 00:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	80-120	
4-Bromofluorobenzene	0.0322	0.0300	107	80-120	

Lab Batch #: 3031744 **Sample:** 7633415-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 11:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0305	0.0300	102	80-120	

Lab Batch #: 3031768 **Sample:** 7633435-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/27/17 18:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0296	0.0300	99	80-120	
4-Bromofluorobenzene	0.0341	0.0300	114	80-120	

Lab Batch #: 3031655 **Sample:** 566321-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 13:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0318	0.0300	106	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: Houma State #1

Work Orders : 566216,

Project ID:

Lab Batch #: 3031676 **Sample:** 566219-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 21:08

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	57.9	50.0	116	70-130	
1-Chlorooctane	108	99.9	108	70-130	

Lab Batch #: 3031663 **Sample:** 566216-016 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 00:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0309	0.0300	103	80-120	

Lab Batch #: 3031744 **Sample:** 566341-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 12:16

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0313	0.0300	104	80-120	

Lab Batch #: 3031768 **Sample:** 566146-004 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 19:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0340	0.0300	113	80-120	
4-Bromofluorobenzene	0.0359	0.0300	120	80-120	

Lab Batch #: 3031655 **Sample:** 566321-002 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 14:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0337	0.0300	112	80-120	
4-Bromofluorobenzene	0.0355	0.0300	118	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: Houma State #1

Work Orders : 566216,

Project ID:

Lab Batch #: 3031676 **Sample:** 566219-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 21:28

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	59.0	49.9	118	70-130	
1-Chlorooctane	111	99.8	111	70-130	

Lab Batch #: 3031663 **Sample:** 566216-016 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 00:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0313	0.0300	104	80-120	

Lab Batch #: 3031744 **Sample:** 566341-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 12:35

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0251	0.0300	84	80-120	

Lab Batch #: 3031768 **Sample:** 566146-004 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/27/17 19:20

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0315	0.0300	105	80-120	
4-Bromofluorobenzene	0.0355	0.0300	118	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.

BS / BSD Recoveries

Project Name: Houma State #1

Work Order #: 566216 **Project ID:**

Analyst: ALJ **Date Prepared:** 10/26/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031655 **Sample:** 7633345-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.0958	96	0.0998	0.0867	87	10	70-130	35	
Toluene	<0.00200	0.100	0.101	101	0.0998	0.0908	91	11	70-130	35	
Ethylbenzene	<0.00200	0.100	0.110	110	0.0998	0.0997	100	10	71-129	35	
m,p-Xylenes	<0.00401	0.200	0.216	108	0.200	0.196	98	10	70-135	35	
o-Xylene	<0.00200	0.100	0.108	108	0.0998	0.0977	98	10	71-133	35	

Analyst: ALJ **Date Prepared:** 10/26/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031663 **Sample:** 7633348-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.0901	89	0.101	0.0884	88	2	70-130	35	
Toluene	<0.00202	0.101	0.0949	94	0.101	0.0937	93	1	70-130	35	
Ethylbenzene	<0.00202	0.101	0.108	107	0.101	0.104	103	4	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.211	104	0.201	0.205	102	3	70-135	35	
o-Xylene	<0.00202	0.101	0.108	107	0.101	0.104	103	4	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: Houma State #1

Work Order #: 566216 **Project ID:**

Analyst: ALJ **Date Prepared:** 10/27/2017 **Date Analyzed:** 10/27/2017

Lab Batch ID: 3031744 **Sample:** 7633415-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.103	102	0.100	0.0897	90	14	70-130	35	
Toluene	<0.00202	0.101	0.107	106	0.100	0.0932	93	14	70-130	35	
Ethylbenzene	<0.00202	0.101	0.119	118	0.100	0.104	104	13	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.221	109	0.201	0.201	100	9	70-135	35	
o-Xylene	<0.00202	0.101	0.113	112	0.100	0.102	102	10	71-133	35	

Analyst: ALJ **Date Prepared:** 10/27/2017 **Date Analyzed:** 10/27/2017

Lab Batch ID: 3031768 **Sample:** 7633435-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.0809	80	0.100	0.0812	81	0	70-130	35	
Toluene	<0.00202	0.101	0.0881	87	0.100	0.0911	91	3	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0941	93	0.100	0.0971	97	3	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.183	91	0.200	0.190	95	4	70-135	35	
o-Xylene	<0.00202	0.101	0.0911	90	0.100	0.0942	94	3	71-133	35	

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

BS / BSD Recoveries

Project Name: Houma State #1

Work Order #: 566216 **Project ID:**

Analyst: MNV **Date Prepared:** 10/25/2017 **Date Analyzed:** 10/25/2017

Lab Batch ID: 3031539 **Sample:** 7633172-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	248	99	250	246	98	1	90-110	20	

Analyst: MNV **Date Prepared:** 10/25/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031544 **Sample:** 7633220-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	248	99	250	253	101	2	90-110	20	

Analyst: ARM **Date Prepared:** 10/26/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031676 **Sample:** 7633285-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Range Hydrocarbons	<25.0	1000	965	97	1000	981	98	2	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1000	100	1000	1010	101	1	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: Houma State #1

Work Order # : 566216 **Project ID:**

Lab Batch ID: 3031655 **QC- Sample ID:** 566321-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/26/2017 **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	0.00211	0.100	0.111	109	0.101	0.113	110	2	70-130	35	
Toluene	0.00542	0.100	0.0991	94	0.101	0.0928	87	7	70-130	35	
Ethylbenzene	<0.00201	0.100	0.0881	88	0.101	0.0768	76	14	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.176	88	0.202	0.152	75	15	70-135	35	
o-Xylene	<0.00201	0.100	0.0847	85	0.101	0.0753	75	12	71-133	35	

Lab Batch ID: 3031663 **QC- Sample ID:** 566216-016 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/27/2017 **Date Prepared:** 10/26/2017 **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	<0.00200	0.0998	0.119	119	0.0996	0.107	107	11	70-130	35	
Toluene	<0.00200	0.0998	0.110	110	0.0996	0.0972	98	12	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.105	105	0.0996	0.0886	89	17	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.212	106	0.199	0.188	94	12	70-135	35	
o-Xylene	<0.00200	0.0998	0.104	104	0.0996	0.0930	93	11	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: Houma State #1

Work Order # : 566216 **Project ID:**

Lab Batch ID: 3031744 **QC- Sample ID:** 566341-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/27/2017 **Date Prepared:** 10/27/2017 **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	0.00630	0.101	0.0589	52	0.100	0.0644	58	9	70-130	35	X
Toluene	0.0546	0.101	0.0688	14	0.100	0.0685	14	0	70-130	35	X
Ethylbenzene	0.0235	0.101	0.0584	35	0.100	0.0668	43	13	71-129	35	X
m,p-Xylenes	0.124	0.202	0.132	4	0.200	0.141	9	7	70-135	35	X
o-Xylene	0.0410	0.101	0.0641	23	0.100	0.0714	30	11	71-133	35	X

Lab Batch ID: 3031768 **QC- Sample ID:** 566146-004 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/27/2017 **Date Prepared:** 10/27/2017 **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	0.0656	65	0.101	0.0651	64	1	70-130	35	X
Toluene	<0.00202	0.101	0.0749	74	0.101	0.0712	70	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0752	74	0.101	0.0759	75	1	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.147	73	0.201	0.149	74	1	70-135	35	
o-Xylene	<0.00202	0.101	0.0734	73	0.101	0.0751	74	2	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: Houma State #1

Work Order # : 566216 **Project ID:**

Lab Batch ID: 3031539 **QC- Sample ID:** 566212-008 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/25/2017 **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	47.3	249	310	106	249	310	106	0	90-110	20	

Lab Batch ID: 3031539 **QC- Sample ID:** 566215-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/25/2017 **Date Prepared:** 10/25/2017 **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	5.80	248	266	105	248	269	106	1	90-110	20	

Lab Batch ID: 3031544 **QC- Sample ID:** 566216-005 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/25/2017 **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	683	247	892	85	247	873	77	2	90-110	20	X

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: Houma State #1

Work Order # : 566216 **Project ID:**

Lab Batch ID: 3031544 **QC- Sample ID:** 566216-015 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/25/2017 **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	<5.00	250	269	108	250	269	108	0	90-110	20	

Lab Batch ID: 3031676 **QC- Sample ID:** 566219-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/26/2017 **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	941	94	998	957	96	2	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	999	977	98	998	967	97	1	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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CHAIN OF CUSTODY

Page 1 Of 3

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Dallas Texas (214-902-0300)
San Antonio, Texas (210-509-3334)
Midland, Texas (432-704-5251)
Phoenix, Arizona (480-355-0900)
www.xenco.com

Xenco Quote #
Xenco Job # 566216

Client / Reporting Information

Company Name / Branch: COG Operating LLC
Company Address: 2407 PECOS Avenue Artesia NM 88210
Email: alieb@concho.com dneel2@concho.com rhaskell@concho.com slhitchcock@concho.com
Phone No: 575-748-1553
Project Contact: Aaron Lieb
Samplers's Name- Aaron Lieb

Project Information

Project Name/Number: Houma State #1
Project Location: Houma State #1
Invoice To: COG Operating LLC, Attn: Robert Mcneill, 600 W. Illinois, Midland TX 79701
PO Number:

Matrix Codes
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

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	T1- Surf	0	10/16/17	1:00pm	S	1									X	X	X	
2	T1- 1'	1	|	|	|	1									X	X	X	
3	T1- 2'	2	|	|	|	1									X	X	X	
4	T1- 3'	3	|	|	|	1									X	X	X	
5	T1- 4'	4	|	|	|	1									X	X	X	
6	T1- 5'	5	|	1:30pm	|	1											X	
7	T1- 6'	6	|	|	|	1											X	
8	T1- 8'	8	|	|	|	1											X	
9	T1- 10'	10	|	|	|	1											X	
10	T1- 12'	12	|	|	|	1											X	

Turnaround Time (Business days)
- [ ] Same Day TAT
- [ ] Next Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 3 Day EMERGENCY
- [ ] 5 Day TAT
- [x] 7 Day TAT
- [ ] Contract TAT

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information
- [ ] Level II Std QC
- [ ] Level III Std QC+ Forms
- [ ] Level 3 (CLP Forms)
- [ ] TRRP Checklist
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] TRRP Level IV
- [ ] UST / RG -411

Temp: 3.2 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 3

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	10/20/17 6:00	1 Sid Butler 10-19-17 10A	2 Sid Butler	10-19-17 1:45	2 [signature]
Relinquished by: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. 1.3 / Thermo. Corr. Factor

Notice: 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 loses 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.

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San Antonio, Texas (210-509-3334)

Midland, Texas (432-704-5251)

Phoenix, Arizona (480-355-0900)

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CHAIN OF CUSTODY

Page 2 Of 3

Xenco Quote #

Xenco Job # 566217

Client / Reporting Information

Company Name / Branch: COG Operating LLC

Company Address: 2407 PECOS Avenue Artesia NM 88210

Email: alieb@concho.com dneel2@concho.com rhaskell@concho.com slhitchcock@concho.com

Phone No: 575-748-1553

Project Contact: Aaron Lieb

Samplers's Name- Aaron Lieb

Project Information

Project Name/Number: Houma State #1

Project Location: Houma State #1

Invoice To: COG Operating LLC, Attn: Robert Mcneill, 600 W. Illinois, Midland TX 79701

PO Number:

Analytical Information

Matrix Codes

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

No.	Field ID / Point of Collection	Collection: Sample Depth	Date	Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	TPH/ EXTENDED	BTEX	Chloride	Field Comments
1	T1-14'	14'	10/16/17	1:30pm	S	1									X	X	X	
2	T2-SURF	0		2:00 pm	S	1									X	X	X	
3	T2-1'	1				1									X	X	X	
4	T2-2'	2				1									X	X	X	
5	T2-3'	3				1									X	X	X	
6	T2-4'	4				1									X	X	X	
7	T2-6'	6				1											X	
8	T2-8'	8				1											X	
9	T2-10'	10				1											X	
10	T2-12'	12				1											X	

Turnaround Time (Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [ ] Next Day EMERGENCY
- [x] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [ ] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Notes:

Temp: 3.2 IR ID:R-8

CF:(0-6: -0.2°C)

(6-23: +0.2°C)

Corrected Temp: 3

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		10/20/17 10:00	1 Sid Butler 10-14-17 10A	2 Sid Butler	10-19-17 1145 A	2
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. 13 / Thermo. Corr. Factor

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Midland, Texas (432-704-5251)

Phoenix, Arizona (480-355-0900)

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CHAIN OF CUSTODY

Page 3 Of 3

Xenco Quote #

Xenco Job # 566216

Client / Reporting Information

Company Name / Branch: COG Operating LLC

Company Address: 2407 PECOS Avenue Artesia NM 88210

Email: alieb@concho.com dneel2@concho.com rhaskell@concho.com slhitchcock@concho.com

Phone No: 575-748-1553

Project Contact: Aaron Lieb

Samplers's Name- Aaron Lieb

Project Information

Project Name/Number: Houma State #1

Project Location: Houma State #1

Invoice To: COG Operating LLC
Attn: Robert Mcneill
600 W. Illinois
Midland TX 79701

PO Number:

Analytical Information

Matrix Codes

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

No.	Field ID / Point of Collection	Collection: Sample Depth	Date	Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	TPH/ EXTENDED	BTEX	Chloride	Field Comments
1	T2 - 14'	14	10/16/17	2:05pm	S	1									X	X	X	
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Turnaround Time (Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [ ] Next Day EMERGENCY
- [x] 7 Day TAT
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- [ ] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

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- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Temp: 3.2
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 3

IR ID:R-8

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		10/20/17 1000	Sid Butler 10-19-17 10A	2 Sid Butler	10-19-17 1145	2
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. 13C / Thermo. Corr. Factor

Notice: 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 loses 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 #: 566216

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 566219

for

COG Operating, LLC

Project Manager: Sheldon Hitchcock

Houma State #1

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): **566219**
Houma State #1
Project Address: Houma State #1

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) 566219. 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. 566219 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 566219

COG Operating, LLC, Midland, TX

Houma State #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
North Surf	S	10-16-17 14:00	0	566219-001
North 1'	S	10-16-17 14:00	1	566219-002
South Surf	S	10-16-17 14:00	0	566219-003
South 1'	S	10-16-17 14:00	1	566219-004
East Surf	S	10-16-17 14:00	0	566219-005
East 1'	S	10-16-17 14:00	1	566219-006

CASE NARRATIVE

Client Name: COG Operating, LLC

Project Name: Houma State #1

Project ID:
Work Order Number(s): *566219*

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-3031638 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3031732 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 566219

COG Operating, LLC, Midland, TX

Project Name: Houma State #1

Project Id:
Contact: Sheldon Hitchcock
Project Location: Houma State #1

Date Received in Lab: Thu Oct-19-17 11:45 am
Report Date: 30-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566219-001		566219-002		566219-003		566219-004		566219-005		566219-006	
	Field Id:	North Surf		North 1'		South Surf		South 1'		East Surf		East 1'	
	Depth:	0-		1-		0-		1-		0-		1-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-16-17 14:00		Oct-16-17 14:00		Oct-16-17 14:00		Oct-16-17 14:00		Oct-16-17 14:00		Oct-16-17 14:00	
BTEX by EPA 8021B	***Extracted:***	Oct-26-17 10:30		Oct-26-17 10:30		Oct-26-17 10:30		Oct-25-17 10:30		Oct-25-17 10:30		Oct-25-17 10:30	
	Analyzed:	Oct-26-17 12:24		Oct-26-17 12:42		Oct-26-17 13:04		Oct-26-17 04:58		Oct-26-17 07:41		Oct-26-17 08:01	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		0.00558	0.00364	0.0233	0.00353	<0.00345	0.00345	0.0110	0.00201	0.00880	0.00199	0.00352	0.00199
Toluene		<0.00364	0.00364	0.0334	0.00353	<0.00345	0.00345	0.0157	0.00201	<0.00199	0.00199	0.00806	0.00199
Ethylbenzene		<0.00364	0.00364	0.00385	0.00353	<0.00345	0.00345	0.00446	0.00201	<0.00199	0.00199	<0.00199	0.00199
m,p-Xylenes		<0.00727	0.00727	<0.00707	0.00707	<0.00690	0.00690	0.00485	0.00402	<0.00398	0.00398	<0.00398	0.00398
o-Xylene		<0.00364	0.00364	<0.00353	0.00353	<0.00345	0.00345	0.00262	0.00201	0.00221	0.00199	<0.00199	0.00199
Total Xylenes		<0.00364	0.00364	<0.00353	0.00353	<0.00345	0.00345	0.00747	0.00201	0.00221	0.00199	<0.00199	0.00199
Total BTEX		0.00558	0.00364	0.0606	0.00353	<0.00345	0.00345	0.0386	0.00201	0.0110	0.00199	0.0116	0.00199
Chloride by EPA 300	***Extracted:***	Oct-25-17 13:00		Oct-25-17 13:00		Oct-25-17 13:00		Oct-25-17 15:20		Oct-25-17 15:20		Oct-25-17 15:20	
	Analyzed:	Oct-26-17 05:23		Oct-26-17 05:30		Oct-26-17 05:36		Oct-26-17 09:58		Oct-26-17 10:19		Oct-26-17 10:25	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		<5.00	5.00	<4.98	4.98	<4.96	4.96	<1.99	1.99	<1.97	1.97	<1.96	1.96
TPH by Texas1005	***Extracted:***	Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00		Oct-26-17 14:00	
	Analyzed:	Oct-26-17 20:48		Oct-26-17 21:48		Oct-26-17 22:08		Oct-26-17 22:28		Oct-26-17 22:47		Oct-26-17 23:07	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
C6-C12 Range Hydrocarbons		<25.0	25.0	<24.9	24.9	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0
C12-C28 Range Hydrocarbons		<25.0	25.0	<24.9	24.9	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0
C28-C35 Range Hydrocarbons		<25.0	25.0	<24.9	24.9	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0
Total TPH		<25.0	25.0	<24.9	24.9	<25.0	25.0	<24.9	24.9	<25.0	25.0	<25.0	25.0

Kelsey Brooks
Project Manager

Flagging Criteria

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

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

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

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

F RPD exceeded lab control limits.

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

U Analyte was not detected.

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

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

K Sample analyzed outside of recommended hold time.

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

Form 2 - Surrogate Recoveries

Project Name: Houma State #1

Work Orders : 566219,

Project ID:

Lab Batch #: 3031732 **Sample:** 566219-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 04:58

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	80-120	
4-Bromofluorobenzene	0.0313	0.0300	104	80-120	

Lab Batch #: 3031732 **Sample:** 566219-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 07:41

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0252	0.0300	84	80-120	
4-Bromofluorobenzene	0.0284	0.0300	95	80-120	

Lab Batch #: 3031732 **Sample:** 566219-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 08:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0247	0.0300	82	80-120	
4-Bromofluorobenzene	0.0277	0.0300	92	80-120	

Lab Batch #: 3031638 **Sample:** 566219-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 12:24

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0304	0.0300	101	80-120	
4-Bromofluorobenzene	0.0354	0.0300	118	80-120	

Lab Batch #: 3031638 **Sample:** 566219-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 12:42

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0354	0.0300	118	80-120	
4-Bromofluorobenzene	0.0351	0.0300	117	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: Houma State #1

Work Orders : 566219,

Project ID:

Lab Batch #: 3031638 **Sample:** 566219-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 13:04

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0331	0.0300	110	80-120	

Lab Batch #: 3031676 **Sample:** 566219-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 20:48

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	54.2	49.9	109	70-130	
1-Chlorooctane	97.6	99.8	98	70-130	

Lab Batch #: 3031676 **Sample:** 566219-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 21:48

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	53.2	49.8	107	70-130	
1-Chlorooctane	96.1	99.6	96	70-130	

Lab Batch #: 3031676 **Sample:** 566219-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 22:08

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	52.4	50.0	105	70-130	
1-Chlorooctane	94.4	99.9	94	70-130	

Lab Batch #: 3031676 **Sample:** 566219-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 22:28

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	51.6	49.9	103	70-130	
1-Chlorooctane	94.3	99.7	95	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: Houma State #1

Work Orders : 566219,

Project ID:

Lab Batch #: 3031676 **Sample:** 566219-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 22:47

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	53.4	49.9	107	70-130	
1-Chlorooctane	96.4	99.8	97	70-130	

Lab Batch #: 3031676 **Sample:** 566219-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 23:07

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	49.9	49.9	100	70-130	
1-Chlorooctane	92.6	99.8	93	70-130	

Lab Batch #: 3031732 **Sample:** 7633241-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/25/17 22:59

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0255	0.0300	85	80-120	
4-Bromofluorobenzene	0.0264	0.0300	88	80-120	

Lab Batch #: 3031638 **Sample:** 7633352-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 11:18

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0311	0.0300	104	80-120	
4-Bromofluorobenzene	0.0346	0.0300	115	80-120	

Lab Batch #: 3031676 **Sample:** 7633285-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 19:49

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	58.3	50.0	117	70-130	
1-Chlorooctane	105	100	105	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: Houma State #1

Work Orders : 566219,

Project ID:

Lab Batch #: 3031732 **Sample:** 7633241-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/25/17 21:07

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	0.0294	0.0300	98	80-120	

Lab Batch #: 3031638 **Sample:** 7633352-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 09:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0295	0.0300	98	80-120	
4-Bromofluorobenzene	0.0351	0.0300	117	80-120	

Lab Batch #: 3031676 **Sample:** 7633285-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 20:09

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	60.7	50.0	121	70-130	
1-Chlorooctane	112	100	112	70-130	

Lab Batch #: 3031732 **Sample:** 7633241-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/25/17 21:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0278	0.0300	93	80-120	
4-Bromofluorobenzene	0.0297	0.0300	99	80-120	

Lab Batch #: 3031638 **Sample:** 7633352-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 10:01

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	0.0354	0.0300	118	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: Houma State #1

Work Orders : 566219,

Project ID:

Lab Batch #: 3031676 **Sample:** 7633285-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 10/26/17 20:29

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	63.5	50.0	127	70-130	
1-Chlorooctane	110	100	110	70-130	

Lab Batch #: 3031732 **Sample:** 566212-007 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 21:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	80-120	
4-Bromofluorobenzene	0.0327	0.0300	109	80-120	

Lab Batch #: 3031638 **Sample:** 566321-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 10:19

SURROGATE RECOVERY STUDY

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

Lab Batch #: 3031676 **Sample:** 566219-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 21:08

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	57.9	50.0	116	70-130	
1-Chlorooctane	108	99.9	108	70-130	

Lab Batch #: 3031732 **Sample:** 566212-007 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/25/17 22:02

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	80-120	
4-Bromofluorobenzene	0.0320	0.0300	107	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: Houma State #1

Work Orders : 566219,

Project ID:

Lab Batch #: 3031638 **Sample:** 566321-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 10:37

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0336	0.0300	112	80-120	
4-Bromofluorobenzene	0.0356	0.0300	119	80-120	

Lab Batch #: 3031676 **Sample:** 566219-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 10/26/17 21:28

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	59.0	49.9	118	70-130	
1-Chlorooctane	111	99.8	111	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: Houma State #1

Work Order #: 566219 **Project ID:**

Analyst: ALJ **Date Prepared:** 10/25/2017 **Date Analyzed:** 10/25/2017

Lab Batch ID: 3031732 **Sample:** 7633241-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.126	125	0.101	0.125	124	1	70-130	35	
Toluene	<0.00202	0.101	0.124	123	0.101	0.124	123	0	70-130	35	
Ethylbenzene	<0.00202	0.101	0.119	118	0.101	0.121	120	2	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.239	118	0.201	0.242	120	1	70-135	35	
o-Xylene	<0.00202	0.101	0.116	115	0.101	0.118	117	2	71-133	35	

Analyst: ALJ **Date Prepared:** 10/26/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031638 **Sample:** 7633352-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.0831	82	0.100	0.0804	80	3	70-130	35	
Toluene	<0.00202	0.101	0.0941	93	0.100	0.0894	89	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0997	99	0.100	0.0943	94	6	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.196	97	0.200	0.185	93	6	70-135	35	
o-Xylene	<0.00202	0.101	0.0958	95	0.100	0.0907	91	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: Houma State #1

Work Order #: 566219 **Project ID:**

Analyst: MNV **Date Prepared:** 10/25/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031544 **Sample:** 7633220-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	248	99	250	253	101	2	90-110	20	

Analyst: MNV **Date Prepared:** 10/25/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031640 **Sample:** 7633224-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	242	97	250	242	97	0	90-110	20	

Analyst: ARM **Date Prepared:** 10/26/2017 **Date Analyzed:** 10/26/2017

Lab Batch ID: 3031676 **Sample:** 7633285-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Range Hydrocarbons	<25.0	1000	965	97	1000	981	98	2	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1000	100	1000	1010	101	1	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: Houma State #1

Work Order # : 566219 **Project ID:**

Lab Batch ID: 3031638 **QC- Sample ID:** 566321-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/26/2017 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00199	0.0996	0.118	118	0.0992	0.117	118	1	70-130	35	
Toluene	0.00315	0.0996	0.112	109	0.0992	0.103	101	8	70-130	35	
Ethylbenzene	<0.00199	0.0996	0.0959	96	0.0992	0.0847	85	12	71-129	35	
m,p-Xylenes	<0.00398	0.199	0.190	95	0.198	0.167	84	13	70-135	35	
o-Xylene	<0.00199	0.0996	0.0904	91	0.0992	0.0786	79	14	71-133	35	

Lab Batch ID: 3031732 **QC- Sample ID:** 566212-007 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	<0.00199	0.0996	0.123	123	0.100	0.112	112	9	70-130	35	
Toluene	<0.00199	0.0996	0.110	110	0.100	0.0992	99	10	70-130	35	
Ethylbenzene	<0.00199	0.0996	0.104	104	0.100	0.0924	92	12	71-129	35	
m,p-Xylenes	<0.00398	0.199	0.213	107	0.200	0.189	95	12	70-135	35	
o-Xylene	<0.00199	0.0996	0.106	106	0.100	0.0953	95	11	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: Houma State #1

Work Order # : 566219 **Project ID:**

Lab Batch ID: 3031544 **QC- Sample ID:** 566216-005 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/25/2017 **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	683	247	892	85	247	873	77	2	90-110	20	X

Lab Batch ID: 3031544 **QC- Sample ID:** 566216-015 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/25/2017 **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	<5.00	250	269	108	250	269	108	0	90-110	20	

Lab Batch ID: 3031640 **QC- Sample ID:** 566219-004 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/25/2017 **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	<1.99	99.6	101	101	99.6	101	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.

Form 3 - MS / MSD Recoveries

Project Name: Houma State #1

Work Order # : 566219 **Project ID:**

Lab Batch ID: 3031640 **QC- Sample ID:** 566220-008 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/25/2017 **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	9.02	247	258	101	247	261	102	1	90-110	20	

Lab Batch ID: 3031676 **QC- Sample ID:** 566219-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/26/2017 **Date Prepared:** 10/26/2017 **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	941	94	998	957	96	2	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	999	977	98	998	967	97	1	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.

XENCO LABORATORIES
Setting the Standard since 1990
Stafford,Texas (281-240-4200)
Dallas Texas (214-902-0300)

CHAIN OF CUSTODY

Page 1 Of 1

San Antonio, Texas (210-509-3334)
Midland, Texas (432-704-5251)
www.xenco.com

Phoenix, Arizona (480-355-0900)

Xenco Quote #
Xenco Job # 566219

Client / Reporting Information

Company Name / Branch: COG Operating LLC
Company Address: 2407 PECOS Avenue Artesia NM 88210
Email: alieb@concho.com dneel2@concho.com rhaskell@concho.com slhitchcock@concho.com
Phone No: 575-748-1553
Project Contact: Aaron Lieb
Samplers's Name- Aaron Lieb

Project Information

Project Name/Number: Houma State #1
Project Location: Houma State #1
Invoice To: COG Operating LLC
Attn: Robert Mcneill
600 W. Illinois
Midland TX 79701
PO Number:

Analytical Information

No.	Field ID / Point of Collection	Sample Depth	Date	Time	Matrix	# of bottles	HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE/ICE	TPH/ EXTENDED	BTEX	Chloride							Field Comments
1	North- Surf	0	10/16/17	2:00pm	S	1									X	X	X							
2	North- 1'	1	"	"	"	1								"	X	X	X							
3	South- Surf	0	"	"	"	1								"	X	X	X							
4	South- 1'	1	"	"	"	1								"	X	X	X							
5	East - Surf	0	"	"	"	1								"	X	X	X							
6	East - 1'	1		"	"	1								"	X	X	X							
7																								
8																								
9																								
10																								

Matrix Codes

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

Turnaround Time (Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [ ] Next Day EMERGENCY
- [x] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [ ] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Notes:
Temp: 3.2 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 3

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	10/20/17 10:00am	1 Sid Butler 10-19-17 10A	2 Sid Butler	10-19-17 1145 A	2 [signature]
Relinquished by: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. 13° / Thermo. Corr. Factor

Notice: 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 loses 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 #: 566219

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

NM OIL CONSERVATION
ARTESIA DISTRICT
SEP 29 2017
RECEIVED

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

nAB1727251108

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: COG Operating LLC [OGRID] 229137	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-230-0077
Facility Name: HOUMA STATE #001	Facility Type: Battery

Surface Owner: State	Mineral Owner: State	API No. 30-015-31491

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
F	16	17S	30E	2310	North	2310	West	Eddy

Latitude 32.8355064 **Longitude** - 103.978096

NATURE OF RELEASE

Type of Release: Oil	Volume of Release: 13 bbls Oil	Volume Recovered: 10 bbls Oil
Source of Release: Flowline	Date and Hour of Occurrence: 9-27-2017 9:00 am	Date and Hour of Discovery: 9-27-2017 9:00 am
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.*

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

Describe Cause of Problem and Remedial Action Taken.*

The release occurred when the circulation line inside the firewall began to leak from corrosion. The circulation line was isolated and will be replaced.

Describe Area Affected and Cleanup Action Taken.*

The release occurred within the unlined facility and impacted the adjacent pasture to the east of the facility. Vacuum trucks were dispatched to recover all standing fluid. Concho will have the spill area evaluated for 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: Dakota Neel	OIL CONSERVATION DIVISION Approved by Environmental Specialist: Signed By Mike Bratcher
Printed Name: Dakota Neel	
Title: HSE Coordinator	Approval Date: 9/29/17 Expiration Date: N/A
E-mail Address: dneel2@concho.com	Conditions of Approval: See attached Attached ☐
Date: September 29, 2017 Phone: 575-746-2010	

* Attach Additional Sheets If Necessary

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Eddy Area, New Mexico

KM—Kermit-Berino fine sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w4q
Elevation: 3,100 to 4,200 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 190 to 230 days

Farmland classification: Not prime farmland

Map Unit Composition

Kermit and similar soils: 50 percent
Berino and similar soils: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kermit

Setting

Landform: Alluvial fans, plains
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 7 inches: fine sand
H2 - 7 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: Deep Sand (R042XC005NM)
Hydric soil rating: No

Description of Berino

Setting

Landform: Fan piedmonts, plains
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 17 inches: fine sand
H2 - 17 to 50 inches: fine sandy loam

H3 - 50 to 58 inches: loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Minor Components

Active dune land

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 13, Sep 9, 2017

NMSLO Seed Mix Shallow (SH)

SHALLOW (SH) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Sideoats grama	Vaughn, El Reno	4.0	F
Blue grama	Lovington, Hachita	3.0	D
Little bluestem	Pastura, Cimmaron	1.5	F
Green sprangletop	VNS, Southern	1.0	D
Plains bristlegrass	VNS, Southern	1.0	D
Forbs:			
Firewheel (*Gaillardia*)	VNS, Southern	1.0	D
Shrubs:			
Fourwing saltbush	Marana, Santa Rita	1.0	D
Common winterfat	VNS, Southern	0.5	F
	Total PLS/acre	**13.0**	

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

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

APPENDIX III

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: COG Operating LLC [OGRID] 229137	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-230-0077
Facility Name: HOUMA STATE #001	Facility Type: Battery

Surface Owner: State	Mineral Owner: State	API No. 30-015-31491

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
F	16	17S	30E	2310	North	2310	West	Eddy

Latitude 32.8355064 **Longitude** - 103.978096

NATURE OF RELEASE

Type of Release: Oil	Volume of Release: 13 bbls Oil	Volume Recovered: 10 bbls Oil
Source of Release: Flowline	Date and Hour of Occurrence: 9-27-2017 9:00 am	Date and Hour of Discovery: 9-27-2017 9:00 am
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 occurred when the circulation line inside the firewall began to leak from corrosion. The circulation line was isolated and will be replaced.

Describe Area Affected and Cleanup Action Taken.*

The release occurred within the unlined facility and impacted the adjacent pasture to the east of the facility. Vacuum trucks were dispatched to recover all standing fluid. Concho will have the spill area evaluated for 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: Dakota Neel	OIL CONSERVATION DIVISION Approved by Environmental Specialist:	
Printed Name: Dakota Neel		
Title: HSE Coordinator	Approval Date:	Expiration Date:
E-mail Address: dneel2@concho.com	Conditions of Approval:	Attached ☐
Date: September 29, 2017 Phone: 575-746-2010		

* Attach Additional Sheets If Necessary

APPENDIX IV

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company: COG Operating LLC [OGRID] 229137	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-230-0077
Facility Name: HOUMA STATE #001	Facility Type: Battery

Surface Owner: State	Mineral Owner: State	API No. 30-015-31491

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
F	16	17S	30E	2310	North	2310	West	Eddy

Latitude 32.8355064 **Longitude** - 103.978096

NATURE OF RELEASE

Type of Release: Oil	Volume of Release: 13 bbls Oil	Volume Recovered: 10 bbls Oil
Source of Release: Flowline	Date and Hour of Occurrence: 9-27-2017 9:00 am	Date and Hour of Discovery: 9-27-2017 9:00 am
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 occurred when the circulation line inside the firewall began to leak from corrosion. The circulation line was isolated and will be replaced.

Describe Area Affected and Cleanup Action Taken.*

The release occurred within the unlined facility and impacted the adjacent pasture to the east of the facility. All remedial activities have been performed in accordance with the NMSLO and NMOCD approved workplan.

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: Dakota Neel	OIL CONSERVATION DIVISION Approved by Environmental Specialist: Ashley Maxwell	
Printed Name: Dakota Neel		
Title: HSE Coordinator	Approval Date: 05/09/2023	Expiration Date:
E-mail Address: dneel2@concho.com	Conditions of Approval:	Attached ☐
Date: March 2, 2019 Phone: 575-746-2010		

* Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 206624

CONDITIONS

Operator: Spur Energy Partners LLC 9655 Katy Freeway Houston, TX 77024	OGRID: 328947
	Action Number: 206624
	Action Type: [IM-SD] Incident File Support Doc (ENV) (IM-BNF)

CONDITIONS

Created By	Condition	Condition Date
amaxwell	None	5/9/2023