2057 Commerce Drive
Midland, TX 79703

432.520.7720 PHONE
432.520.7701 FAX

www.trcsolutions.com

APPROVED
By Olivia Yu at 10:31 am, Apr 30, 2018

NMOCD approves of the delineation completed and proposed remediation plan for 1RP-4948.

March 16, 2018

Olivia Yu
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division, District 1
1625 French Drive
Hobbs, NM 88240

Re: **Initial Investigation Summary and Proposed Remediation Strategy**
Pan Head Fee #023H
API No. 30-025-42756
GPS: 32.855150, -103.739437
UL "C", Sec. 11, T17S, R32E
Lea Co, NM
NMOCD Ref. No. 1RP-4948

TRC Environmental Corporation (TRC), on behalf of COG Operating, LLC (COG), has prepared this *Initial Investigation Summary and Proposed Remediation Strategy* for the release site known as the **Pan Head Fee #023H**. Details of the release are summarized below:

RELEASE DETAILS			
Type of Release: Crude Oil and Produced Water	**Volume of Release:** 4 bbls Produced Water, 1 bbls Oil		
	Volume Recovered: 3.5 bbls Produced Water, 0.5 bbls Oil		
Source of Release: Flowline	**Date of Release:** 01/28/18	**Date of Discovery:** 01/28/18	
Was Immediate Notice Given? Not Required	**If YES, to Whom?** Not Applicable		
Was a Watercourse Reached? No	**Volume Impacted the Watercourse:** Not Applicable		
Cause of Problem and Remedial Action Taken:			
The release was attributed to the failure of a flowline. During initial response activities, saturated soil was scrapped up from the surace of the well pad and transported to an NMOCD-approved disposal facility.			

A Site Location Map is provided as Attachment #1. A copy of the initial Release Notification and Corrective Action (NMOCD Form C-141) is provided as Attachment #5.

REGULATORY FRAMEWORK

Crude oil facilities in New Mexico are generally regulated by the New Mexico Oil Conservation Division (NMOCD). Impact of soil due to a surface release is addressed in the NMOCD guidance document titled *Guidelines for Remediation of Leaks, Spills and Releases* , dated August 13, 1993.

The guidance document provides direction for initial response actions, site assessment, sampling procedures and provides a total ranking score based on the depth to groundwater, distance to private and domestic water sources, and the distance to the nearest surface water body as follows:

RANKING SCORE CRITERIA		
General Site Characteristics		**Score**
Depth to Groundwater	< 50 Feet	**20**
	50-99 Feet	**10**
	> 100 Feet	**0**
Well Head Protection Area, <1,000 Feet from water source, or <200 Feet from private domestic water source	Yes	**20**
	No	**0**
Distance to Surface Water Body	< 200 Feet	**20**
	200 - 1,000 Feet	**10**
	> 1,000 Feet	**0**

A search of a groundwater database maintained by The New Mexico Office of the State Engineer (NMOSE) was conducted to determine the average depth to groundwater within the Section and identify any registered water wells within 1,000 ft. of the release site. If none were identified, the approximate depth to groundwater was extrapolated from a Depth to Groundwater Map utilized by the NMOCD. The results of the groundwater database search are provided as Attachment #3.

TOTAL RANKING SCORE FOR SITE		
Ranking Score Criteria		**Score**
Depth to Groundwater	125 Feet	**0**
Well Head Protection Area, <1,000 Feet from water source, or <200 Feet from private domestic water source	No	**0**
Distance to Surface Water Body	> 1,000 Feet	**0**
TOTAL RANKING SCORE FOR SITE		**0**

The NMOCD guidelines indicated the Site has an initial ranking score of **0** points. The NMOCD Recommended Remediation Action Levels (RRAL) for a Site with a ranking score of **0** points are as follows:

RECOMMENDED REMEDIATION ACTION LEVELS	
Benzene	**10 mg/kg**
Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX)	**50 mg/kg**
Total Petroleum Hydrocarbons (TPH)	**5,000 mg/kg**
Chloride	**600 mg/kg**

INITIAL INVESTIGATION

On **February 23, 2017**, an initial investigation was conducted at the Site by TRC. **Ten (10)** representative soil samples were collected from the affected area in an effort to determine if impacted soil affected above the NMOCD RRAL remained in-situ after initial response activities. The collected soil samples were submitted to an approved laboratory for analysis of benzene, BTEX, TPH and chloride concentrations. A table summarizing laboratory analytical results from soil samples collected during the initial assessment is provided below:

Sample ID	Depth	Soil Status	SW 846 8021b		SW-846 8015M					E300
			Benzene	Total BTEX	TPH GRO C_6-C_{10}	TPH DRO C_{10}-C_{28}	TPH ORO C_{28}-C_{35}	TOTAL TPH C_6-C_{28}	TOTAL TPH C_6-C_{35}	CHLORIDE
SP-1	6"	In-Situ	<0.00199	<0.00199	<15.0	<15.0	<15.0	-	<15	**742**
SP-1	1'	In-Situ	-	-	<15.0	<15.0	<15.0	-	<15	255
SP-2	6"	In-Situ	<0.00201	<0.00201	<15.0	<15.0	<15.0	-	<15	175
SP-2	1'	In-Situ	-	-	<15.0	<15.0	<15.0	-	<15	<4.99
SP-3	6"	In-Situ	<0.00202	<0.00202	<14.9	<14.9	<14.9	-	<14.9	**3,170**
SP-3	1'	In-Situ	-	-	<15.0	<15.0	<15.0	-	<15	<4.99
N	6"	In-Situ	<0.000199	<0.000199	<15.0	<15.0	<15.0	-	<15	<5.00
E	6"	In-Situ	<0.00200	<0.002	<15.0	65.0	<15.0	-	65	**796**
S	6"	In-Situ	<0.00200	<0.002	<15.0	<15.0	<15.0	-	<15	362
W	6"	In-Situ	<0.00201	<0.00201	<15.0	<15.0	<15.0	-	<15	**712**
NMOCD RRAL			**10**	**50**	**-**	**-**	**-**	**-**	**5,000**	**600**

Laboratory analytical reports are provided as Attachment #4. A "Site & Sample Location Map" is provided as Attachment #2.

PROPOSED REMEDIATION ACTIVITIES AND REMEDIATION WORKPLAN

Based on laboratory analytical results, site conditions and field observations made during the initial release assessment, COG proposes the following remediation activities designed to advance the Release Site toward an approved closure:

- Utilizing a backhoe, excavate the Release Site to a depth of approximately one (1) foot bgs in the areas represented by soil samples collected from sample points SP-1 and SP-3. The excavated soil will be stockpiled on-site, atop a 6 mil poly liner, pending transportation under manifest to a NMOCD approved disposal facility.
- Advance the excavation sidewalls beyond the areas characterized by soil samples W and E.
- The area represented by the sample point SP-2 will be aesthically addressed and contoured to meet the needs of the well pad.
- Upon excavating impacted soil from within the release margins, confirmation soil samples will be collected from the floor and sidewalls of the excavated area and submitted to the laboratory for determination of BTEX, TPH and chloride concentrations.
- On receipt of favorable analytical results (below NMOCD regulatory guidelines), the excavation will be backfilled with locally sourced non-impacted caliche.
- Upon completion of remediation activities, TRC will prepare and submit a "Remediation Summary and Site Closure Request" to the NMOCD on behalf of COG.

If you have any questions, or if additional information is required, please feel free to contact Becky Haskell or either of the undersigned by phone or email.

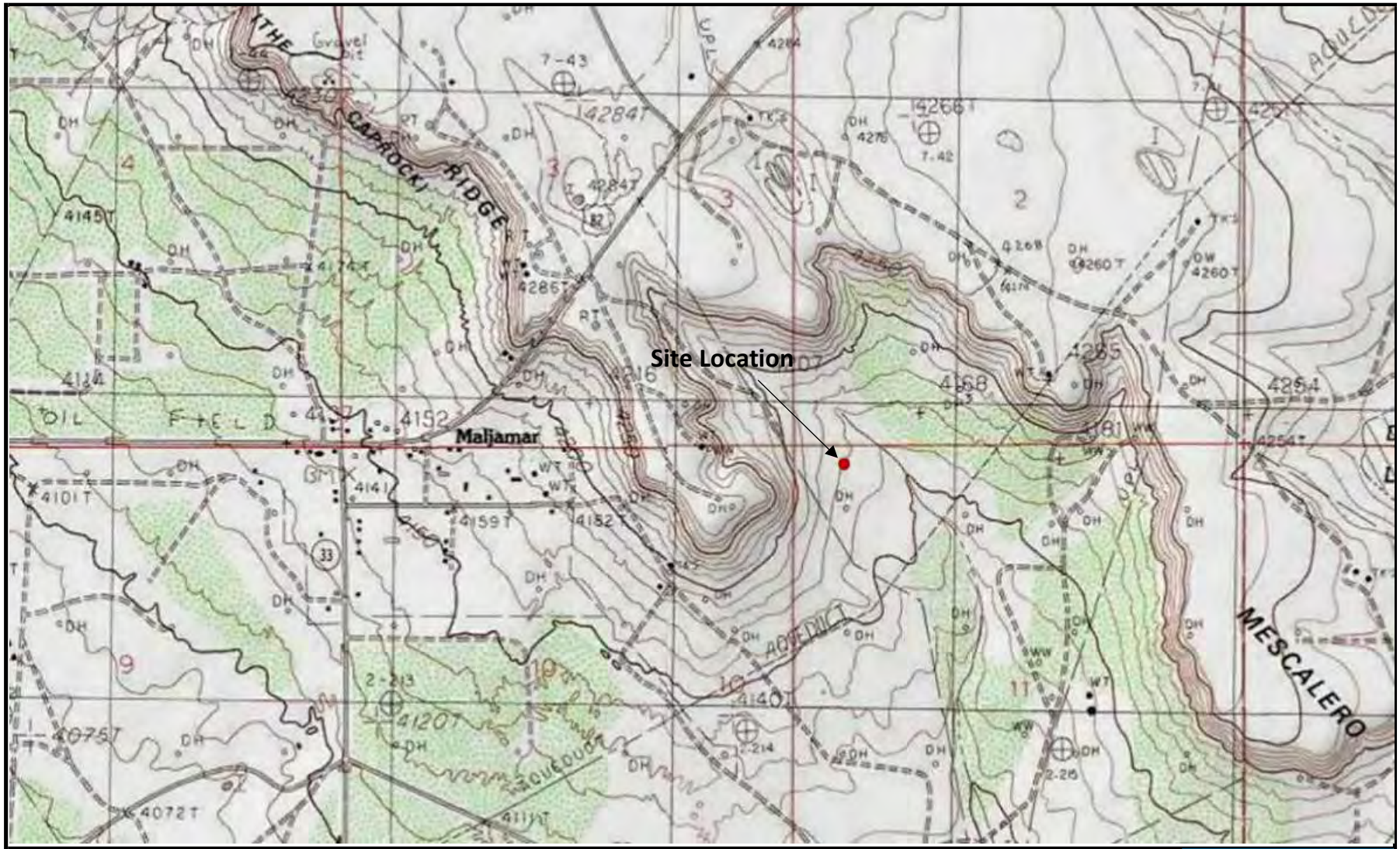
Respectfully,

Joel Lowry
Senior Project Manager
TRC Environmental Corp.

Curt Stanley
Senior Project Manager
TRC Environmental Corp.

Attachments:

Attachment #1-	Figure 1 - Site Location Map
Attachment #2-	Figure 2 - Site & Sample Location Map
Attachment #3-	Groundwater Database Search
Attachment #4-	Laboratory Analytical Reports
Attachment #5-	Release Notification and Corrective Action (FORM C-141)



LEGEND:

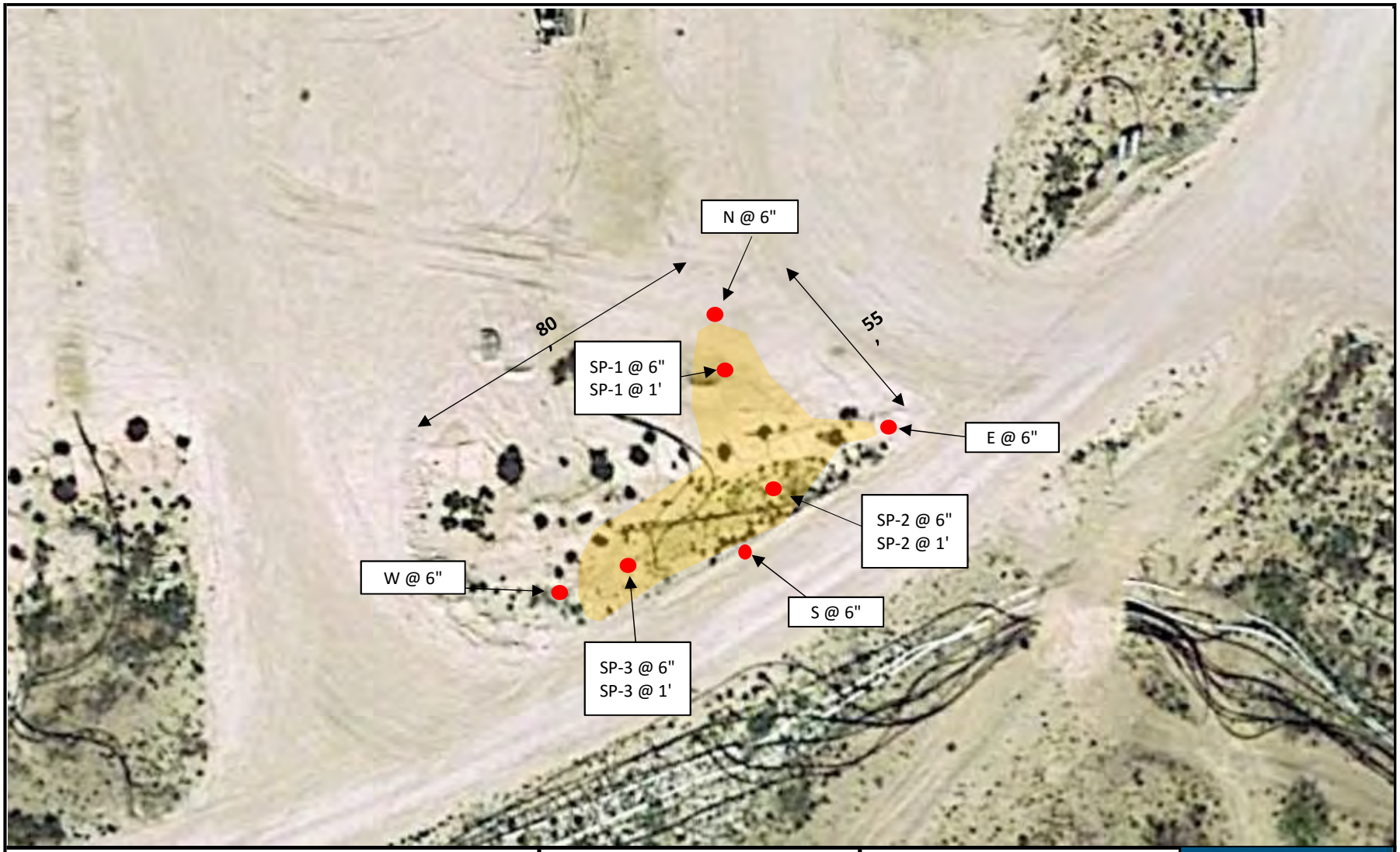
● Site Location

Figure 1

Site Location Map
COG Operating, LLC
Pan Head Fee #023H
Lea Co, NM

Scale 1" = 1,600'	
Drafted by: ZC | Checked by: JL	
Draft: March 7, 2018	
GPS: 32.855150, -103.739437	
UL "C", Sec. 11, T17S, R32E	
TRC Proj. No:	298626.0

TRC
Results you can rely on



LEGEND:

Inferred Release Margins

Soil Sample Location

Figure 2

Site & Sample Location Map
COG Operating, LLC
Pan Head Fee #023H
Lea Co, NM

Scale 1" = 50'	
Drafted by: ZC | Checked by: JL	
Draft: March 7, 2018	
GPS: 32.855150, -103.739437	
UL "C", Sec. 11, T17S, R32E	
TRC Proj. No:	298626.0

TRC
Results you can rely on

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

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

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

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twp	Rng	X	Y	Depth Well	Depth Water	Water Column
L 13047 POD1		L	LE				11	17S	32E	618187	3635254*	140		
RA 11684 POD1			LE	1	1	4	11	17S	32E	618216	3635124	275		
RA 11684 POD2			LE	1	1	4	11	17S	32E	618313	3635248	275		
RA 11684 POD3			LE	3	3	1	11	17S	32E	618262	3635371	275		
RA 11684 POD4			LE	1	3	2	11	17S	32E	618334	3635521	275		
RA 11684 POD5			LE	3	1	4	11	17S	32E	618353	3635047	275		

Average Depth to Water: --
Minimum Depth: --
Maximum Depth: --

Record Count: 6

PLSS Search:

Section(s): 11 **Township:** 17S **Range:** 32E

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

2/20/18 12:07 PM

WATER COLUMN/ AVERAGE DEPTH TO WATER

Analytical Report 577777

for

TRC Solutions, Inc

Project Manager: Joel Lowry

Pan Head Fee #023H

07-MAR-18

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-18-24), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):
Texas (T104704295-17-16), 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 (T104704400-18-14)
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)
Xenco-Atlanta (LELAP Lab ID #04176)

07-MAR-18

Project Manager: **Joel Lowry**
TRC Solutions, Inc
2057 Commerce
Midland, TX 79703

Reference: XENCO Report No(s): **577777**
Pan Head Fee #023H
Project Address: Lea Co, NM

Joel Lowry:

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) 577777. 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. 577777 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 577777

TRC Solutions, Inc, Midland, TX

Pan Head Fee #023H

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SP-1 @ 6"	S	02-23-18 15:00	6 In	577777-001
SP-1 @ 1'	S	02-23-18 15:05	1 ft	577777-002
SP-2 @ 6"	S	02-23-18 15:10	6 In	577777-003
SP-2 @ 1'	S	02-23-18 15:15	1 ft	577777-004
SP-3 @ 6"	S	02-23-18 15:20	6 In	577777-005
SP-3 @ 1'	S	02-23-18 15:25	1 ft	577777-006
N @ 6"	S	02-23-18 15:30	6 In	577777-007
E @ 6"	S	02-23-18 15:35	6 In	577777-008
S @ 6"	S	02-23-18 15:40	6 In	577777-009
W @ 6"	S	02-23-18 15:45	6 In	577777-010

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3042724 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3042728 BTEX by EPA 8021B
Lab Sample ID 577777-010 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Benzene 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: 577777-010.
The Laboratory Control Sample for Benzene is within laboratory Control Limits, therefore the data was accepted.
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 577777

TRC Solutions, Inc, Midland, TX

Project Name: Pan Head Fee #023H

Project Id:
Contact: Joel Lowry
Project Location: Lea Co, NM

Date Received in Lab: Wed Feb-28-18 02:30 pm
Report Date: 07-MAR-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	577777-001		577777-002		577777-003		577777-004		577777-005		577777-006	
	Field Id:	SP-1 @ 6"		SP-1 @ 1'		SP-2 @ 6"		SP-2 @ 1'		SP-3 @ 6"		SP-3 @ 1'	
	Depth:	6- In		1- ft		6- In		1- ft		6- In		1- ft	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Feb-23-18 15:00		Feb-23-18 15:05		Feb-23-18 15:10		Feb-23-18 15:15		Feb-23-18 15:20		Feb-23-18 15:25	
BTEX by EPA 8021B	***Extracted:***	Mar-03-18 10:00				Mar-03-18 10:00				Mar-03-18 10:00			
	Analyzed:	Mar-04-18 01:31				Mar-04-18 01:50				Mar-04-18 02:09			
	Units/RL:	mg/kg	RL			mg/kg	RL			mg/kg	RL		
Benzene		<0.00199	0.00199			<0.00201	0.00201			<0.00202	0.00202		
Toluene		<0.00199	0.00199			<0.00201	0.00201			<0.00202	0.00202		
Ethylbenzene		<0.00199	0.00199			<0.00201	0.00201			<0.00202	0.00202		
m,p-Xylenes		<0.00398	0.00398			<0.00402	0.00402			<0.00403	0.00403		
o-Xylene		<0.00199	0.00199			<0.00201	0.00201			<0.00202	0.00202		
Total Xylenes		<0.00199	0.00199			<0.00201	0.00201			<0.00202	0.00202		
Total BTEX		<0.00199	0.00199			<0.00201	0.00201			<0.00202	0.00202		
Chloride by EPA 300	***Extracted:***	Mar-06-18 10:00		Mar-06-18 10:00		Mar-06-18 10:00		Mar-06-18 10:00		Mar-06-18 10:00		Mar-06-18 10:00	
	Analyzed:	Mar-06-18 13:47		Mar-06-18 13:53		Mar-06-18 13:58		Mar-06-18 14:03		Mar-06-18 14:19		Mar-06-18 14:25	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		742	24.9	255	4.96	175	5.00	<4.99	4.99	3170	25.0	<4.99	4.99
TPH by SW8015 Mod	***Extracted:***	Mar-03-18 12:00		Mar-03-18 12:00		Mar-03-18 12:00		Mar-03-18 12:00		Mar-03-18 12:00		Mar-03-18 12:00	
	Analyzed:	Mar-04-18 12:34		Mar-04-18 12:59		Mar-04-18 13:25		Mar-04-18 13:51		Mar-04-18 14:16		Mar-04-18 14:42	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<14.9	14.9	<15.0	15.0
Diesel Range Organics (DRO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<14.9	14.9	<15.0	15.0
Oil Range Hydrocarbons (ORO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<14.9	14.9	<15.0	15.0
Total TPH		<15	15	<15	15	<15	15	<15	15	<14.9	14.9	<15	15

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 577777

TRC Solutions, Inc, Midland, TX

Project Name: Pan Head Fee #023H

Project Id:
Contact: Joel Lowry
Project Location: Lea Co, NM

Date Received in Lab: Wed Feb-28-18 02:30 pm
Report Date: 07-MAR-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	577777-007		577777-008		577777-009		577777-010					
	Field Id:	N @ 6"		E @ 6"		S @ 6"		W @ 6"					
	Depth:	6- In		6- In		6- In		6- In					
	Matrix:	SOIL		SOIL		SOIL		SOIL					
	Sampled:	Feb-23-18 15:30		Feb-23-18 15:35		Feb-23-18 15:40		Feb-23-18 15:45					
BTEX by EPA 8021B	***Extracted:***	Mar-03-18 10:00		Mar-03-18 10:00		Mar-03-18 10:00		Mar-04-18 08:00					
	Analyzed:	Mar-04-18 02:28		Mar-04-18 02:47		Mar-04-18 03:06		Mar-04-18 11:34					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Benzene		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00201	0.00201				
Toluene		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00201	0.00201				
Ethylbenzene		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00201	0.00201				
m,p-Xylenes		<0.00398	0.00398	<0.00399	0.00399	<0.00401	0.00401	<0.00402	0.00402				
o-Xylene		<0.00199	0.00199	<0.00200	0.00200	<0.00200	0.00200	<0.00201	0.00201				
Total Xylenes		<0.00199	0.00199	<0.002	0.002	<0.002	0.002	<0.00201	0.00201				
Total BTEX		<0.00199	0.00199	<0.002	0.002	<0.002	0.002	<0.00201	0.00201				
Chloride by EPA 300	***Extracted:***	Mar-06-18 10:00		Mar-06-18 10:00		Mar-06-18 10:00		Mar-06-18 10:00					
	Analyzed:	Mar-06-18 14:40		Mar-06-18 14:46		Mar-06-18 14:51		Mar-06-18 14:56					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride		<5.00	5.00	796	4.99	362	25.0	712	5.00				
TPH by SW8015 Mod	***Extracted:***	Mar-03-18 12:00		Mar-03-18 12:00		Mar-03-18 12:00		Mar-03-18 12:00					
	Analyzed:	Mar-04-18 15:08		Mar-04-18 15:34		Mar-04-18 12:08		Mar-04-18 16:25					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0				
Diesel Range Organics (DRO)		<15.0	15.0	65.0	15.0	<15.0	15.0	<15.0	15.0				
Oil Range Hydrocarbons (ORO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0				
Total TPH		<15	15	65	15	<15	15	<15	15				

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

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ 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: Pan Head Fee #023H

Work Orders : 577777,

Project ID:

Lab Batch #: 3042724 **Sample:** 577777-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 01:31

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0240	0.0300	80	70-130	
4-Bromofluorobenzene	0.0351	0.0300	117	70-130	

Lab Batch #: 3042724 **Sample:** 577777-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 01:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0228	0.0300	76	70-130	
4-Bromofluorobenzene	0.0332	0.0300	111	70-130	

Lab Batch #: 3042724 **Sample:** 577777-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 02:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0232	0.0300	77	70-130	
4-Bromofluorobenzene	0.0348	0.0300	116	70-130	

Lab Batch #: 3042724 **Sample:** 577777-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 02:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0241	0.0300	80	70-130	
4-Bromofluorobenzene	0.0327	0.0300	109	70-130	

Lab Batch #: 3042724 **Sample:** 577777-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 02:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0232	0.0300	77	70-130	
4-Bromofluorobenzene	0.0337	0.0300	112	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: Pan Head Fee #023H

Work Orders : 577777,

Project ID:

Lab Batch #: 3042724 **Sample:** 577777-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 03:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0237	0.0300	79	70-130	
4-Bromofluorobenzene	0.0354	0.0300	118	70-130	

Lab Batch #: 3042728 **Sample:** 577777-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 11:34

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0227	0.0300	76	70-130	
4-Bromofluorobenzene	0.0312	0.0300	104	70-130	

Lab Batch #: 3042788 **Sample:** 577777-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 12:08

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.1	99.9	93	70-135	
o-Terphenyl	46.9	50.0	94	70-135	

Lab Batch #: 3042788 **Sample:** 577777-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 12:34

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	100	108	70-135	
o-Terphenyl	54.3	50.0	109	70-135	

Lab Batch #: 3042788 **Sample:** 577777-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 12:59

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	99.9	107	70-135	
o-Terphenyl	52.8	50.0	106	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: Pan Head Fee #023H

Work Orders : 577777,

Project ID:

Lab Batch #: 3042788 **Sample:** 577777-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 13:25

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	99.9	107	70-135	
o-Terphenyl	50.7	50.0	101	70-135	

Lab Batch #: 3042788 **Sample:** 577777-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 13:51

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	99.7	107	70-135	
o-Terphenyl	51.6	49.9	103	70-135	

Lab Batch #: 3042788 **Sample:** 577777-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 14:16

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	99.6	107	70-135	
o-Terphenyl	54.4	49.8	109	70-135	

Lab Batch #: 3042788 **Sample:** 577777-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 14:42

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	111	99.7	111	70-135	
o-Terphenyl	55.3	49.9	111	70-135	

Lab Batch #: 3042788 **Sample:** 577777-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 15:08

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	103	99.8	103	70-135	
o-Terphenyl	52.3	49.9	105	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: Pan Head Fee #023H

Work Orders : 577777,

Project ID:

Lab Batch #: 3042788 **Sample:** 577777-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 15:34

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	99.8	105	70-135	
o-Terphenyl	54.5	49.9	109	70-135	

Lab Batch #: 3042788 **Sample:** 577777-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 16:25

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	99.8	105	70-135	
o-Terphenyl	53.9	49.9	108	70-135	

Lab Batch #: 3042724 **Sample:** 7640102-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/03/18 21:05

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0236	0.0300	79	70-130	
4-Bromofluorobenzene	0.0304	0.0300	101	70-130	

Lab Batch #: 3042788 **Sample:** 7640135-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/04/18 05:10

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	100	102	70-135	
o-Terphenyl	53.8	50.0	108	70-135	

Lab Batch #: 3042728 **Sample:** 7640119-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/04/18 11:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0238	0.0300	79	70-130	
4-Bromofluorobenzene	0.0311	0.0300	104	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: Pan Head Fee #023H

Work Orders : 577777,

Project ID:

Lab Batch #: 3042724 **Sample:** 7640102-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/03/18 19:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0252	0.0300	84	70-130	
4-Bromofluorobenzene	0.0341	0.0300	114	70-130	

Lab Batch #: 3042788 **Sample:** 7640135-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/04/18 05:38

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	118	100	118	70-135	
o-Terphenyl	58.7	50.0	117	70-135	

Lab Batch #: 3042728 **Sample:** 7640119-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/04/18 09:19

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0243	0.0300	81	70-130	
4-Bromofluorobenzene	0.0348	0.0300	116	70-130	

Lab Batch #: 3042724 **Sample:** 7640102-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/03/18 19:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0250	0.0300	83	70-130	
4-Bromofluorobenzene	0.0351	0.0300	117	70-130	

Lab Batch #: 3042788 **Sample:** 7640135-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/04/18 06:03

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	113	100	113	70-135	
o-Terphenyl	55.3	50.0	111	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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

Form 2 - Surrogate Recoveries

Project Name: Pan Head Fee #023H

Work Orders : 577777,

Project ID:

Lab Batch #: 3042728 **Sample:** 7640119-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 03/04/18 09:38

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0253	0.0300	84	70-130	
4-Bromofluorobenzene	0.0355	0.0300	118	70-130	

Lab Batch #: 3042788 **Sample:** 577773-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 06:55

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	115	100	115	70-135	
o-Terphenyl	59.5	50.0	119	70-135	

Lab Batch #: 3042724 **Sample:** 577665-005 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 08:20

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0231	0.0300	77	70-130	
4-Bromofluorobenzene	0.0345	0.0300	115	70-130	

Lab Batch #: 3042728 **Sample:** 577777-010 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 09:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0237	0.0300	79	70-130	
4-Bromofluorobenzene	0.0374	0.0300	125	70-130	

Lab Batch #: 3042724 **Sample:** 577665-005 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/03/18 20:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0328	0.0300	109	70-130	
4-Bromofluorobenzene	0.0373	0.0300	124	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: Pan Head Fee #023H

Work Orders : 577777,

Project ID:

Lab Batch #: 3042788 **Sample:** 577773-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 07:21

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	115	99.8	115	70-135	
o-Terphenyl	59.2	49.9	119	70-135	

Lab Batch #: 3042728 **Sample:** 577777-010 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 03/04/18 10:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0251	0.0300	84	70-130	
4-Bromofluorobenzene	0.0367	0.0300	122	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: Pan Head Fee #023H

Work Order #: 577777 **Project ID:**

Analyst: ALJ **Date Prepared:** 03/03/2018 **Date Analyzed:** 03/03/2018

Lab Batch ID: 3042724 **Sample:** 7640102-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.0998	0.0782	78	0.100	0.0821	82	5	70-130	35	
Toluene	<0.00200	0.0998	0.0829	83	0.100	0.0872	87	5	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0960	96	0.100	0.101	101	5	70-130	35	
m,p-Xylenes	<0.00399	0.200	0.191	96	0.201	0.198	99	4	70-130	35	
o-Xylene	<0.00200	0.0998	0.0953	95	0.100	0.0997	100	5	70-130	35	

Analyst: ALJ **Date Prepared:** 03/04/2018 **Date Analyzed:** 03/04/2018

Lab Batch ID: 3042728 **Sample:** 7640119-1-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	<0.00201	0.100	0.0887	89	0.101	0.0889	88	0	70-130	35	
Toluene	<0.00201	0.100	0.0951	95	0.101	0.0943	93	1	70-130	35	
Ethylbenzene	<0.00201	0.100	0.109	109	0.101	0.108	107	1	70-130	35	
m,p-Xylenes	<0.00402	0.201	0.215	107	0.202	0.213	105	1	70-130	35	
o-Xylene	<0.00201	0.100	0.106	106	0.101	0.104	103	2	70-130	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: Pan Head Fee #023H

Work Order #: 577777 **Project ID:**

Analyst: OJS **Date Prepared:** 03/06/2018 **Date Analyzed:** 03/06/2018

Lab Batch ID: 3043009 **Sample:** 7640276-1-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	246	98	250	245	98	0	90-110	20	

Analyst: ARM **Date Prepared:** 03/03/2018 **Date Analyzed:** 03/04/2018

Lab Batch ID: 3042788 **Sample:** 7640135-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	998	100	1000	963	96	4	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	1020	102	1000	976	98	4	70-135	35	

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

Form 3 - MS / MSD Recoveries

Project Name: Pan Head Fee #023H

Work Order # : 577777 **Project ID:**

Lab Batch ID: 3042724 **QC- Sample ID:** 577665-005 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 03/04/2018 **Date Prepared:** 03/03/2018 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00201	0.100	0.0765	77	0.101	0.0792	78	3	70-130	35	
Toluene	<0.00201	0.100	0.0798	80	0.101	0.0807	80	1	70-130	35	
Ethylbenzene	<0.00201	0.100	0.0922	92	0.101	0.0890	88	4	70-130	35	
m,p-Xylenes	<0.00402	0.201	0.183	91	0.202	0.183	91	0	70-130	35	
o-Xylene	<0.00201	0.100	0.0889	89	0.101	0.112	111	23	70-130	35	

Lab Batch ID: 3042728 **QC- Sample ID:** 577777-010 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 03/04/2018 **Date Prepared:** 03/04/2018 **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	0.0693	69	0.100	0.0693	69	0	70-130	35	X
Toluene	<0.00200	0.0998	0.0728	73	0.100	0.0739	74	1	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0825	83	0.100	0.0832	83	1	70-130	35	
m,p-Xylenes	<0.00399	0.200	0.162	81	0.200	0.165	83	2	70-130	35	
o-Xylene	<0.00200	0.0998	0.0806	81	0.100	0.0820	82	2	70-130	35	

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

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

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

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

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

Form 3 - MS / MSD Recoveries

Project Name: Pan Head Fee #023H

Work Order # : 577777 **Project ID:**

Lab Batch ID: 3043009 **QC- Sample ID:** 577774-008 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 03/06/2018 **Date Prepared:** 03/06/2018 **Analyst:** OJS

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	237	95	250	247	99	4	90-110	20	

Lab Batch ID: 3043009 **QC- Sample ID:** 577777-004 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 03/06/2018 **Date Prepared:** 03/06/2018 **Analyst:** OJS

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	<4.99	250	241	96	250	275	110	13	90-110	20	

Lab Batch ID: 3042788 **QC- Sample ID:** 577773-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 03/04/2018 **Date Prepared:** 03/03/2018 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	21.6	1000	1010	99	998	1020	100	1	70-135	35	
Diesel Range Organics (DRO)	562	1000	1610	105	998	1620	106	1	70-135	35	

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

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

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

CHAIN OF CUSTODY

Page 1 Of 1

XENCO LABORATORIES

Setting the Standard since 1990

Stafford,Texas (281-240-4200) | San Antonio, Texas (210-509-3334) | Phoenix, Arizona (480-355-0900)

Dallas Texas (214-902-0300) | Midland, Texas (432-704-5251)

www.xenco.com

Xenco Job # 577777

Client / Reporting Information

Company Name / Branch: TRC Environmental Corporation

Company Address: 2057 Commerce Drive, Midland, TX 79703

Email: jlowry@trcsolutions.com, zconder@trcsolutions.com

Phone No: 432-466-4450

Project Contact: Joel Lowry

Samplers's Name: Zach Conder

Project Information

Project Name/Number: Pan Head Fee #023H

Project Location: Lea Co, NM

Invoice To: COG Operating C/O Becky Haskell

Invoice:

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	Analytical Information: TPH 8015 M Ext	Chloride E 300	BTEX 8021B	Hold	Field Comments
1	SP-1 @ 6"	6"	2/23/2018	3:00	S	1									X	X	X		
2	SP-1 @ 1'	1'	2/23/2018	3:05	S	1									X	X			
3	SP-2 @ 6"	6"	2/23/2018	3:10	S	1									X	X	X		
4	SP-2 @ 1'	1'	2/23/2018	3:15	S	1									X	X			
5	SP-3 @ 6"	6"	2/23/2018	3:20	S	1									X	X	X		
6	SP-3 @ 1'	1'	2/23/2018	3:25	S	1									X	X			
7	N @ 6"	6"	2/23/2018	3:30	S	1									X	X	X		
8	E @ 6"	6"	2/23/2018	3:35	S	1									X	X	X		
9	S @ 6"	6"	2/23/2018	3:40	S	1									X	X	X		
10	W @ 6"	6"	2/23/2018	3:45	S	1									X	X	X		
11																			
12																			

Turnaround Time (Business days)

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

jlowry@trcsolutions.com zconder@trcsolutions.com

rhaskell@concho.com

kblackburn@trcsolutions.com

dneel2@concho.com

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		2/27 4:40	Brittany Cox	Brittany Cox	2/27 4:40	
2	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Receiv
3						14:30
4	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	
5						

Temp: 4.4 IR ID:R-8

CF:(0-6: -0.2°C)

(6-23: +0.2°C)

Corrected Temp: 4.2

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: TRC Solutions, Inc

Date/ Time Received: 02/28/2018 02:30:00 PM

Work Order #: 577777

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)?	4.2	
#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?	**No**	TPH received in bulk jars
#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: 02/28/2018

Checklist reviewed by: Kelsey Brooks Date: 03/02/2018

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 April 3, 2017

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.: **432-683-7443**
Facility Name**: PAN HEAD FEE #023H**	Facility Type**: Well**

Surface Owner: Private	Mineral Owner: Private	API No.: 30-025-42756

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	11	17S	32E	245	N	1910	W	Lea

Latitude: 32.855150 **Longitude**: -103.739437 NAD83

NATURE OF RELEASE

Type of Release: Oil & Produced Water	Volume of Release: 4 bbls PW; 1 bbls Oil	Volume Recovered: 3.5 bbls PW; 0.5 bbls Oil
Source of Release: Poly Flowline	Date and Hour of Occurrence: 1/28/2018	Date and Hour of Discovery: 1/28/2018 10:30 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.*

RECEIVED
By Olivia Yu at 7:42 am, Jan 31, 2018

Describe Cause of Problem and Remedial Action Taken.*
This release was caused by a ruptured flowline. The damaged portion of the flowline will be replaced.

Describe Area Affected and Cleanup Action Taken.*

This release occurred along the lease road and on the well pad location. A vacuum truck was dispatched to recover all freestanding fluids. 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

Printed Name: Dakota Neel

Title: HSE Coordinator

E-mail Address dneel2@concho.com

Date: 1/30/2018 Phone: 575-746-2010

OIL CONSERVATION DIVISION

Approved by Environmental Specialist:

Approval Date: 1/31/2018 Expiration Date:

Conditions of Approval:
see attached directive

Attached ☑

* Attach Additional Sheets If Necessary

1RP-4948

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pOY1803128149