

## SITE INFORMATION

**Report Type: Deferment Report      2RP-4284**

### General Site Information:

Site:	McIntyre B #10 Tank Battery					
Company:	COG Operating LLC					
Section, Township and Range	Unit M	Sec. 20	T 17S	R 30E		
Lease Number:	API No. 30-015-34775					
County:	Eddy County					
GPS:	32.815029° N			103.996007° W		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	From the intersection of US 82 and Hagerman Cutoff Rd in Loco Hills, NM, travel WEST on US 82 for approximately 0.30 mi, turn SOUTH onto lease road for 120 yards, turn WEST onto lease road for 0.15 mi, turn SOUTH onto lease road for 0.15 mi to location.					

### Release Data:

<b>Date Released:</b>	7/5/2017
<b>Type Release:</b>	Oil & Produced Water
<b>Source of Contamination:</b>	Header
<b>Fluid Released:</b>	1 bbls oil & 10 bbls water
<b>Fluids Recovered:</b>	0 bbls oil & 9 bbls water

### Official Communication:

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

### Ranking Criteria

<b>Depth to Groundwater:</b>	<b>Ranking Score</b>	<b>Site Data</b>
<50 ft	20	
50-99 ft	10	80'
>100 ft.	0	
<b>WellHead Protection:</b>	<b>Ranking Score</b>	<b>Site Data</b>
Water Source <1,000 ft., Private <200 ft.	20	
Water Source >1,000 ft., Private >200 ft.	0	0
<b>Surface Body of Water:</b>	<b>Ranking Score</b>	<b>Site Data</b>
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
<b>Total Ranking Score:</b>		10

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



February 13, 2017

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

**Re: Deferment Report for the COG Operating LLC., McIntyre B #10 Tank Battery, Unit M, Section 20, Township 17 South, Range 30 East, Eddy County, New Mexico. 2RP-4284.**

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to prepare a report for a release that occurred at the McIntyre B #10 Tank Battery, Unit M, Section 20, Township 17 South, Range 30 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.815029°, W 103.996007°. The site location is shown on Figures 1 and 2.

## **Background**

According to the State of New Mexico C-141 Initial Report, the release occurred on July 5, 2017, and released approximately one (1) barrel of oil and ten (10) barrels of produced water due to a failed victolic tee on the header. A vacuum truck was used to remove and standing fluids, recovering approximately nine (9) barrels of produced water and none of the oil. The release was contained inside the bermed facility and impacted an area measuring 15' x 33' and 16' x 25'. The release and spill foot print occurred in an area of numerous above ground steel and poly flowlines. The initial C-141 form is included in Appendix A.

## **Groundwater**

One water well is listed within Section 20 on the New Mexico Office of the State Engineer's database, which shows a depth to groundwater of 80' below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is between 225' and 250' below surface. The groundwater data is shown in Appendix B.

**Tetra Tech**

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

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

## **Regulatory**

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 1,000 mg/kg.

## **Soil Assessment and Analytical Results**

On August 23, 2017, Tetra Tech personnel were onsite to evaluate and inspect the release area. A total of three (3) auger holes (AH-1, AH-2, and AH-3) were installed in the release area to a total depth of 4.0'-4.5' below surface. Deeper samples could not be collected due to a dense formation in the area. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, all of the samples showed benzene concentrations below the laboratory reporting limits and total BTEX concentrations below the RRALs. The area of auger hole (AH-2) showed a TPH concentration below the RRAL of 470 mg/kg at 0'-1' below surface, which then declined with depth and showed a bottom sample concentration below the laboratory reporting limit at 4.0'-4.5' below surface. The area of auger holes (AH-1 and AH-3) showed TPH concentrations of 8,290 mg/kg and 3,340 mg/kg at 0'-1' below surface, respectively. The impact in the area of auger hole (AH-1) declined with depth to 239 mg/kg at 1.0'-1.5' and showed a bottom hole concentration of 41.5 mg/kg at 4.0'-4.5' below surface. However, the area of auger hole (AH-3) showed a bottom hole TPH concentration of 1,170 mg/kg at 4.0'-4.5' below surface.

The samples collected at auger holes (AH-1 and AH-2) showed increasing chloride concentration with depth and detected chloride highs of 4,980 mg/kg at 2.0'-2.5' and 5,840 mg/kg at 4.0'-4.5', respectively. The chloride concentrations in the area of auger hole (AH-1) then declined with depth to 536 mg/kg at 3.5'-4.0' and 507 mg/kg at 4.0'-4.5' below surface. The area of auger hole (AH-3) showed a chloride high of 2,030 mg/kg at 0'-1', which declined to 186 mg/kg at 1.0'-1.5' below surface. However, the chloride concentrations then increased with depth and showed a bottom hole concentration of 1,780 mg/kg at 4.0'-4.5' below surface.



## Conclusion

The release area does not show any benzene or BTEX concentrations above the RRALs. The area of auger hole (AH-1) showed elevated TPH and chloride concentrations in the shallow soils that were vertically defined. However the area of auger hole (AH-3) showed TPH concentrations that were not vertically defined to below the 1,000 mg/kg threshold. Additionally, the areas of auger holes (AH-2 and AH-3) showed elevated chloride concentrations in the subsurface soils that were not vertically defined. Deeper samples could not be collected due to a dense formation in the release area. Due to the header and numerous of above ground steel and poly flowlines in the area, the impacted soils are not accessible and cannot be removed or assessed safely using a backhoe or an air rotary rig.

Due to the safety issues and accessibility issues, COG proposes to defer the impacted areas until abandonment. To aid the degradation of the hydrocarbon soils, COG will apply a micro-blaze product to the area. In addition, COG will perform some shallow remediation and removal (general housekeeping) of impacted soil in areas that are accessible by hand digging. If you have any questions or comments concerning the assessment activities for this site, please call me at (432) 682-4559.

Respectfully submitted,  
TETRA TECH

Clair Gonzales,  
Geologist I

Ike Tavaréz,  
Senior Project Manager, P.G.

cc: Robert McNeill – COG  
Dakota Neel – COG  
Rebecca Haskell – COG  
Shelly Tucker - BLM

## Figures

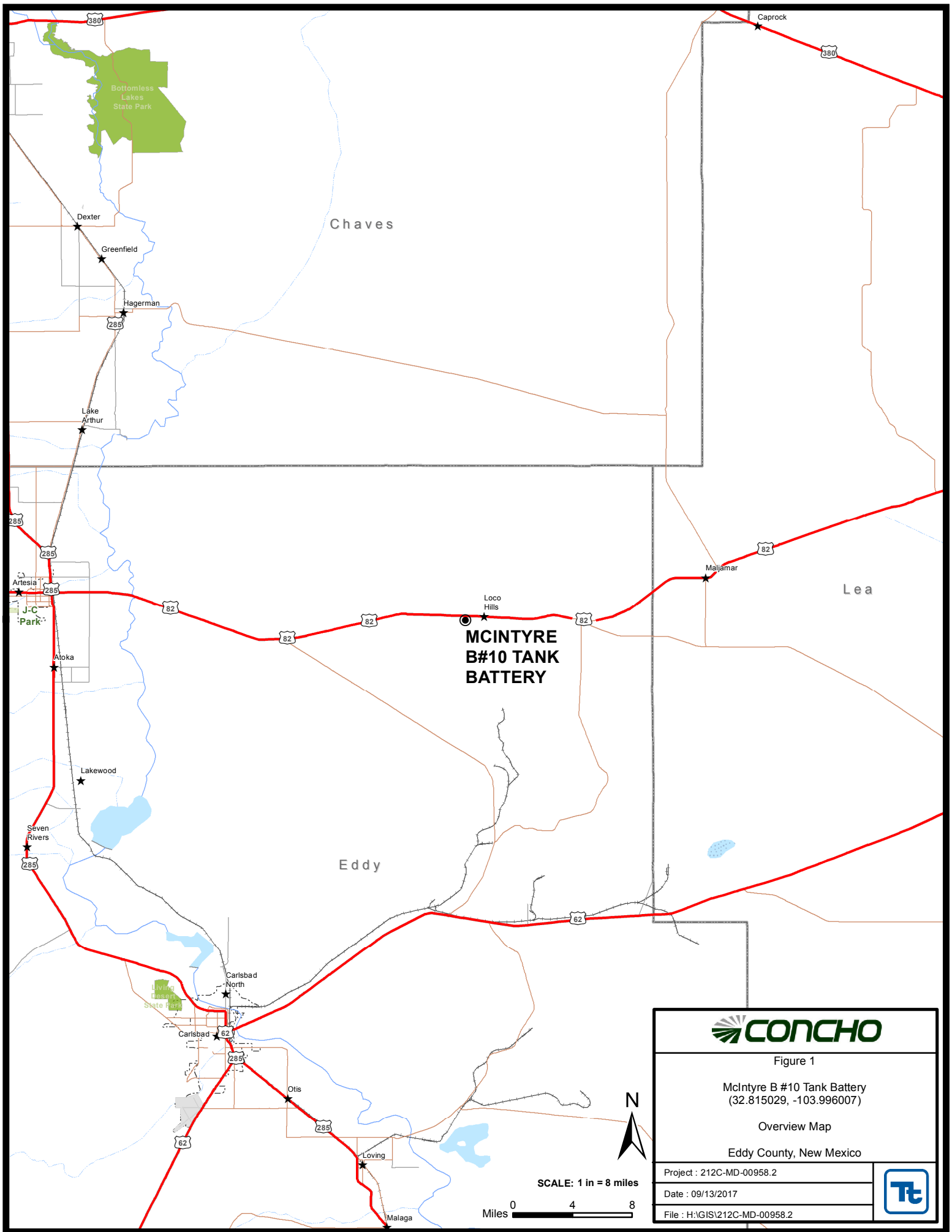


Figure 1

McIntyre B #10 Tank Battery  
(32.815029, -103.996007)

Overview Map

Eddy County, New Mexico

Project : 212C-MD-00958.2

Date : 09/13/2017

File : H:\GIS\212C-MD-00958.2





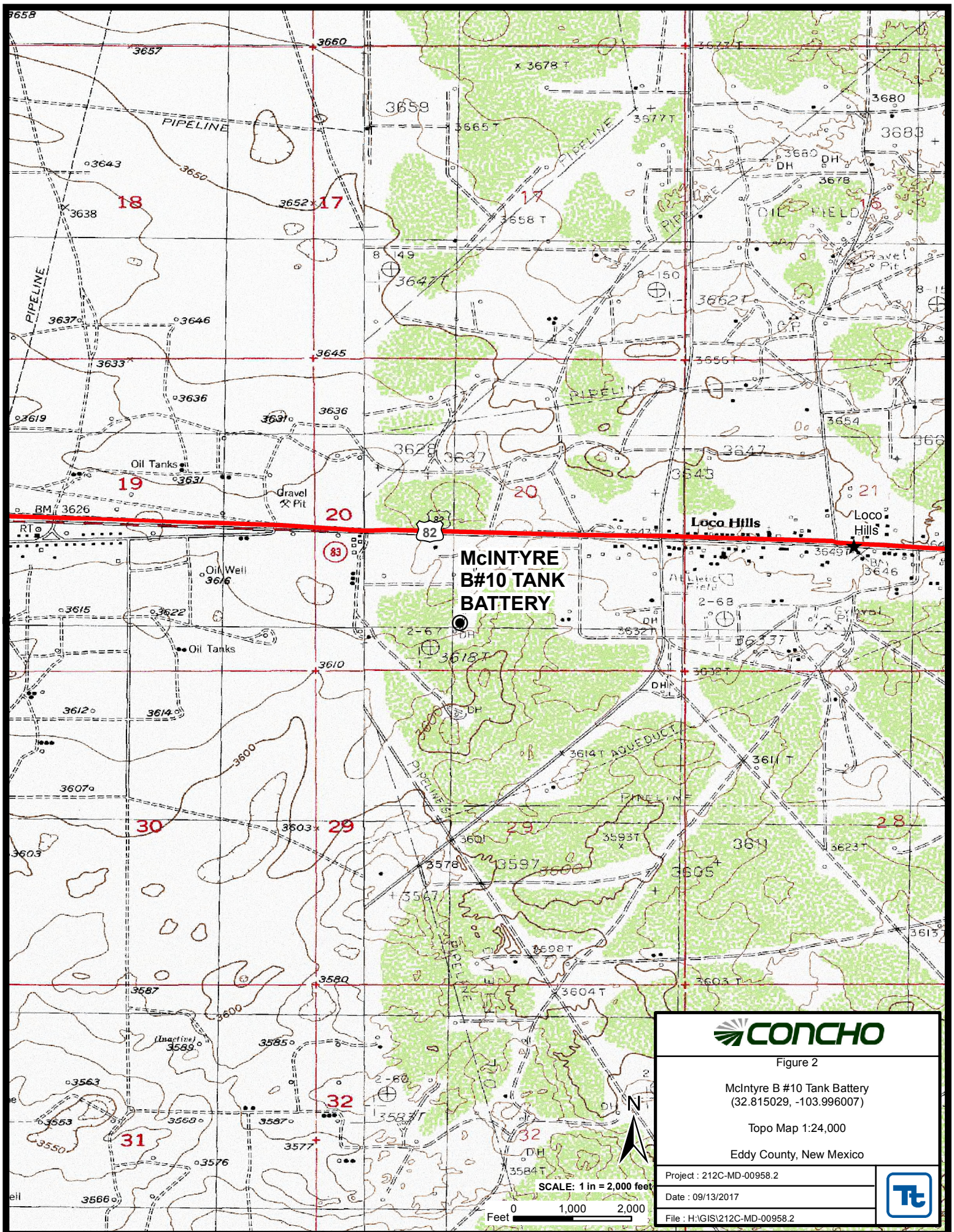


Figure 2

McIntyre B #10 Tank Battery  
(32.815029, -103.996007)

Topo Map 1:24,000

Eddy County, New Mexico

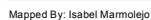
Project : 212C-MD-00958.2

Date : 09/13/2017

File : H:\GIS\212C-MD-00958.2









## Tables

**Table 1**  
**COG Operating LLC.**  
**McIntyre B #10**  
**Eddy County, New Mexico**

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)				Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	C6-C10	C10-C28	C28-C35	Total						
AH-1	8/23/2017	0 - 1	X		23.3	6,970	1,300	8,290	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	528
	"	1.0 - 1.5	X		<15.0	221	18.1	239	-	-	-	-	-	4,240
	"	1.5 - 2.0	X		-	-	-	-	-	-	-	-	-	4,160
	"	2.0 - 2.5	X		-	-	-	-	-	-	-	-	-	4,980
	"	2.5 - 3.0	X		-	-	-	-	-	-	-	-	-	2,830
	"	3.0 - 3.5	X		-	-	-	-	-	-	-	-	-	1,290
	"	3.5 - 4.0	X		-	-	-	-	-	-	-	-	-	536
	"	4.0 - 4.5	X		<15.0	41.5	<15.0	41.5	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	507
AH-2	8/23/2017	0 - 1	X		<14.9	408	62.2	470	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	150
	"	1.0 - 1.5	X		-	-	-	-	-	-	-	-	-	1,430
	"	1.5 - 2.0	X		-	-	-	-	-	-	-	-	-	2,460
	"	2.0 - 2.5	X		-	-	-	-	-	-	-	-	-	1,080
	"	2.5 - 3.0	X		-	-	-	-	-	-	-	-	-	696
	"	3.0 - 3.5	X		-	-	-	-	-	-	-	-	-	1,540
	"	3.5 - 4.0	X		-	-	-	-	-	-	-	-	-	3,620
	"	4.0 - 4.5	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	5,840
AH-3	8/23/2017	0 - 1	X		95.2	2,800	441	3,340	<0.00200	0.00244	0.0233	0.0688	0.0945	2,030
	"	1.0 - 1.5	X		-	-	-	-	-	-	-	-	-	186
	"	1.5 - 2.0	X		-	-	-	-	-	-	-	-	-	670
	"	2.0 - 2.5	X		-	-	-	-	-	-	-	-	-	1,320
	"	2.5 - 3.0	X		-	-	-	-	-	-	-	-	-	1,290
	"	3.0 - 3.5	X		-	-	-	-	-	-	-	-	-	1,330
	"	3.5 - 4.0	X		-	-	-	-	-	-	-	-	-	1,500
	"	4.0 - 4.5	X		66.5	927	178	1,170	<0.00201	<0.00201	0.0285	0.174	0.203	1,780

Photos



COG Operating LLC  
McIntyre B#10 Tank Battery  
Eddy County, New Mexico



TETRA TECH



View East – Release Area



View West – Area of AH-1



COG Operating LLC  
McIntyre B#10 Tank Battery  
Eddy County, New Mexico



TETRA TECH



View East – Area of AH-2



View North – Area of AH-3

## Appendix A



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

State of New Mexico  
Energy Minerals and Natural Resources

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. 432-683-7443	
Facility Name: McIntyre B #10	Facility Type: Tank Battery	
Surface Owner: Federal	Mineral Owner: Federal	API No. 30-015-34775

**LOCATION OF RELEASE**

Unit Letter M	Section 20	Township 17S	Range 30E	Feet from the 330	North/South Line South	Feet from the 990	East/West Line West	County Eddy
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Latitude 32.815029 Longitude -103.996007

**NATURE OF RELEASE**

Type of Release: Oil and Produced Water	Volume of Release: 1 bbl. Oil & 10 bbl. PW	Volume Recovered: 9 bbl. PW
Source of Release: Header	Date and Hour of Occurrence: July 5, 2017 9:30 am	Date and Hour of Discovery: July 5, 2017 9:30 am
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour:	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	
If a Watercourse was Impacted, Describe Fully.*		
Describe Cause of Problem and Remedial Action Taken.*		
The Victolic tee on the header blew out resulting in the release. The Victolic tee and gaskets were replaced.		
Describe Area Affected and Cleanup Action Taken.*		
The release was on location. A vacuum truck was dispatched to remove all freestanding fluids. Concho will have the spill area sampled to delineate any possible impact from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation activities.		
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.		
Signature: <i>Rebecca Haskell</i>	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Rebecca Haskell	Approved by Environmental Specialist:	
Title: Senior HSE Coordinator	Approval Date:	Expiration Date:
E-mail Address: <a href="mailto:rhaskell@concho.com">rhaskell@concho.com</a>	Conditions of Approval:	Attached <input type="checkbox"/>
Date: July 7, 2017 Phone: 432-683-7443		

\* Attach Additional Sheets If Necessary

## Appendix B

**Water Well Data**  
**Average Depth to Groundwater (ft)**  
**COG - McIntyre B #10**  
**Eddy County, New Mexico**

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

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

16 South			31 East		
6	5	4	3	2 290	1
7	8	9	10	11	12
18	17	16	15	14 113	13 288
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

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

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

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

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

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

18 South			31 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15 98	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

**88** New Mexico State Engineers Well Reports

**105** USGS Well Reports

**90** Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)

Geology and Groundwater Resources of Eddy County, NM (Report 3)

**34** NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

**143** NMOCD Groundwater map well location





## New Mexico Office of the State Engineer

# Water Column/Average Depth to Water

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

(R=POD has been replaced,

O=orphaned,

C=the file is closed)

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	Code	Sub-basin	County	Q Q Q	Sec	Tws	Rng	X	Y	DepthWell	DepthWater	Water Column		
<a href="#">RA 11914 POD1</a>			ED	2	4	2	20	17S	30E	594801	3632002	85	80	5

Average Depth to Water: **80 feet**

Minimum Depth: **80 feet**

Maximum Depth: **80 feet**

**Record Count:** 1

**PLSS Search:**

**Township:** 17S

**Range:** 30E

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

9/13/17 8:44 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

## Appendix C

# **Analytical Report 561383**

**for  
Tetra Tech- Midland**

**Project Manager: Ike Tavaréz**

**COG- McIntyre B #10**

**212C-MD-00958**

**06-SEP-17**

Collected By: Client



**1211 W. Florida Ave, Midland TX 79701**

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

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)  
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)  
Xenco-San Antonio: Texas (T104704534)  
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)  
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)





06-SEP-17

Project Manager: **Ike Tavaréz**  
**Tetra Tech- Midland**  
4000 N. Big Spring Suite 401  
Midland, TX 79705

Reference: XENCO Report No(s): **561383**  
**COG- Mcintyre B #10**  
Project Address: Eddy County, New Mexico

**Ike Tavaréz:**

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 561383. 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. 561383 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

**Kelsey Brooks**

Project Manager

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

*Certified and approved by numerous States and Agencies.*

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

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

## Tetra Tech- Midland, Midland, TX

COG- McIntyre B #10

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH#1 (0-1')	S	08-23-17 00:00		561383-001
AH#1 (1-1.5')	S	08-23-17 00:00		561383-002
AH#1 (1.5-2')	S	08-23-17 00:00		561383-003
AH#1 (2-2.5')	S	08-23-17 00:00		561383-004
AH#1 (2.5-3')	S	08-23-17 00:00		561383-005
AH#1 (3-3.5')	S	08-23-17 00:00		561383-006
AH#1 (3.5-4')	S	08-23-17 00:00		561383-007
AH#1 (4-4.5')	S	08-23-17 00:00		561383-008
AH#2 (0-1')	S	08-23-17 00:00		561383-009
AH#2 (1-1.5')	S	08-23-17 00:00		561383-010
AH#2 (1.52-2')	S	08-23-17 00:00		561383-011
AH#2 (2-2.5')	S	08-23-17 00:00		561383-012
AH#2 (2.5-3')	S	08-23-17 00:00		561383-013
AH#2 (3-3.5')	S	08-23-17 00:00		561383-014
AH#2 (3.5-4')	S	08-23-17 00:00		561383-015
AH#2 (4-4.5')	S	08-23-17 00:00		561383-016
AH#3 (0-1')	S	08-23-17 00:00		561383-017
AH#3 (1-1.5')	S	08-23-17 00:00		561383-018
AH#3 (1.5-2')	S	08-23-17 00:00		561383-019
AH#3 (2-2.5')	S	08-23-17 00:00		561383-020
AH#3 (2.5-3')	S	08-23-17 00:00		561383-021
AH#3 (3-3.5')	S	08-23-17 00:00		561383-022
AH#3 (3.5-4')	S	08-23-17 00:00		561383-023
AH#3 (4-4.5')	S	08-23-17 00:00		561383-024



## CASE NARRATIVE

*Client Name: Tetra Tech- Midland*

*Project Name: COG- Mcintrye B #10*

Project ID: 212C-MD-00958  
Work Order Number(s): 561383

Report Date: 06-SEP-17  
Date Received: 08/25/2017

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**Sample receipt non conformance and comments:**

Samples 8, 16, and 24 released from hold for TPH and BTEX per Clair Gonzales e-mail 09/01/17--KB

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

None

**Analytical non conformance and comments:**

Batch: LBA-3026156 BTEX by EPA 8021B

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

Batch: LBA-3026250 BTEX by EPA 8021B

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

Batch: LBA-3026700 BTEX by EPA 8021B

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





# Certificate of Analysis Summary 561383

Tetra Tech- Midland, Midland, TX

Project Name: COG- Mcintyre B #10



**Project Id:** 212C-MD-00958  
**Contact:** Ike Tavarez  
**Project Location:** Eddy County, New Mexico

Draft

**Date Received in Lab:** Fri Aug-25-17 12:30 pm  
**Report Date:** 06-SEP-17  
**Project Manager:** Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	561383-001	561383-002	561383-003	561383-004	561383-005	561383-006
	<i>Field Id:</i>	AH#1 (0-1')	AH#1(1-1.5')	AH#1 (1.5-2')	AH#1 (2-2.5')	AH#1 (2.5-3')	AH#1 (3-3.5')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>	Aug-30-17 08:00					
	<i>Analyzed:</i>	Aug-30-17 16:13					
	<i>Units/RL:</i>	mg/kg RL					
Benzene		<0.00202 0.00202					
Toluene		<0.00202 0.00202					
Ethylbenzene		<0.00202 0.00202					
m,p-Xylenes		<0.00404 0.00404					
o-Xylene		<0.00202 0.00202					
Total Xylenes		<0.00202 0.00202					
Total BTEX		<0.00202 0.00202					
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35
	<i>Analyzed:</i>	Aug-29-17 14:59	Aug-29-17 15:30	Aug-29-17 15:40	Aug-29-17 15:50	Aug-29-17 16:01	Aug-29-17 16:32
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		528 4.96	4240 25.0	4160 25.0	4980 24.8	2830 E 4.98	1290 4.92
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>	Aug-28-17 16:00	Aug-28-17 16:00				
	<i>Analyzed:</i>	Aug-29-17 08:02	Aug-29-17 09:57				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Gasoline Range Hydrocarbons (GRO)		23.3 15.0	<15.0 15.0				
Diesel Range Organics (DRO)		6970 15.0	221 15.0				
Oil Range Hydrocarbons (ORO)		1300 15.0	18.1 15.0				
Total TPH		8290 15.0	239 15.0				

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Kelsey Brooks  
Project Manager



# Certificate of Analysis Summary 561383

Tetra Tech- Midland, Midland, TX

Project Name: COG- Mcintyre B #10



**Project Id:** 212C-MD-00958  
**Contact:** Ike Tavarez  
**Project Location:** Eddy County, New Mexico

Draft

**Date Received in Lab:** Fri Aug-25-17 12:30 pm  
**Report Date:** 06-SEP-17  
**Project Manager:** Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	561383-007	561383-008	561383-009	561383-010	561383-011	561383-012
	<i>Field Id:</i>	AH#1 (3.5-4')	AH#1 (4-4.5')	AH#2 (0-1')	AH#2 (1-1.5')	AH#2 (1.52-2')	AH#2 (2-2.5')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>		Sep-05-17 08:30	Aug-30-17 08:00			
	<i>Analyzed:</i>		Sep-05-17 16:23	Aug-30-17 16:30			
	<i>Units/RL:</i>		mg/kg RL	mg/kg RL			
Benzene			<0.00199 0.00199	<0.00201 0.00201			
Toluene			<0.00199 0.00199	<0.00201 0.00201			
Ethylbenzene			<0.00199 0.00199	<0.00201 0.00201			
m,p-Xylenes			<0.00398 0.00398	<0.00402 0.00402			
o-Xylene			<0.00199 0.00199	<0.00201 0.00201			
Total Xylenes			<0.00199 0.00199	<0.00201 0.00201			
Total BTEX			<0.00199 0.00199	<0.00201 0.00201			
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35
	<i>Analyzed:</i>	Aug-29-17 16:42	Aug-29-17 16:52	Aug-29-17 17:03	Aug-29-17 17:23	Aug-29-17 17:13	Aug-29-17 17:55
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		536 4.98	507 4.92	150 4.90	1430 4.99	2460 24.7	1080 4.93
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>		Sep-02-17 14:00	Aug-28-17 16:00			
	<i>Analyzed:</i>		Sep-03-17 02:58	Aug-29-17 05:21			
	<i>Units/RL:</i>		mg/kg RL	mg/kg RL			
Gasoline Range Hydrocarbons (GRO)			<15.0 15.0	<14.9 14.9			
Diesel Range Organics (DRO)			41.5 15.0	408 14.9			
Oil Range Hydrocarbons (ORO)			<15.0 15.0	62.2 14.9			
Total TPH			41.5 15.0	470 14.9			

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Kelsey Brooks  
Project Manager



# Certificate of Analysis Summary 561383

Tetra Tech- Midland, Midland, TX

Project Name: COG- Mcintyre B #10



**Project Id:** 212C-MD-00958  
**Contact:** Ike Tavaréz  
**Project Location:** Eddy County, New Mexico

**Draft**

**Date Received in Lab:** Fri Aug-25-17 12:30 pm  
**Report Date:** 06-SEP-17  
**Project Manager:** Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	561383-013	561383-014	561383-015	561383-016	561383-017	561383-018
	<i>Field Id:</i>	AH#2 (2.5-3')	AH#2 (3-3.5')	AH#2 (3.5-4')	AH#2 (4-4.5')	AH#3 (0-1')	AH#3 (1-1.5')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>				Sep-05-17 08:30	Aug-28-17 16:00	
	<i>Analyzed:</i>				Sep-05-17 16:59	Aug-29-17 07:46	
	<i>Units/RL:</i>				mg/kg RL	mg/kg RL	
Benzene					<0.00200 0.00200	<0.00200 0.00200	
Toluene					<0.00200 0.00200	0.00244 0.00200	
Ethylbenzene					<0.00200 0.00200	0.0233 0.00200	
m,p-Xylenes					<0.00401 0.00401	0.0309 0.00401	
o-Xylene					<0.00200 0.00200	0.0379 0.00200	
Total Xylenes					<0.00200 0.00200	0.0688 0.00200	
Total BTEX					<0.00200 0.00200	0.0945 0.00200	
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 11:35
	<i>Analyzed:</i>	Aug-29-17 18:05	Aug-29-17 18:36	Aug-29-17 18:46	Aug-29-17 18:57	Aug-29-17 19:07	Aug-29-17 19:17
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		696 4.91	1540 24.7	3620 24.6	5840 49.6	2030 24.7	186 4.97
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>				Sep-02-17 14:00	Aug-28-17 16:00	
	<i>Analyzed:</i>				Sep-03-17 04:01	Aug-29-17 08:22	
	<i>Units/RL:</i>				mg/kg RL	mg/kg RL	
Gasoline Range Hydrocarbons (GRO)					<15.0 15.0	95.2 14.9	
Diesel Range Organics (DRO)					<15.0 15.0	2800 14.9	
Oil Range Hydrocarbons (ORO)					<15.0 15.0	441 14.9	
Total TPH					<15.0 15.0	3340 14.9	

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Kelsey Brooks  
Project Manager





# Certificate of Analysis Summary 561383

Tetra Tech- Midland, Midland, TX

Project Name: COG- Mcintyre B #10



**Project Id:** 212C-MD-00958  
**Contact:** Ike Tavarez  
**Project Location:** Eddy County, New Mexico

**Draft**

**Date Received in Lab:** Fri Aug-25-17 12:30 pm  
**Report Date:** 06-SEP-17  
**Project Manager:** Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	561383-019	561383-020	561383-021	561383-022	561383-023	561383-024
	<i>Field Id:</i>	AH#3 (1.5-2')	AH#3 (2-2.5')	AH#3 (2.5-3')	AH#3 (3-3.5')	AH#3 (3.5-4')	AH#3 (4-4.5)
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00	Aug-23-17 00:00
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>						Sep-05-17 08:30
	<i>Analyzed:</i>						Sep-05-17 17:17
	<i>Units/RL:</i>						mg/kg RL
Benzene							<0.00201 0.00201
Toluene							<0.00201 0.00201
Ethylbenzene							0.0285 0.00201
m,p-Xylenes							0.0966 0.00402
o-Xylene							0.0778 0.00201
Total Xylenes							0.174 0.00201
Total BTEX							0.203 0.00201
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Aug-29-17 11:35	Aug-29-17 11:35	Aug-29-17 16:15	Aug-29-17 16:15	Aug-29-17 16:15	Aug-29-17 16:15
	<i>Analyzed:</i>	Aug-29-17 19:28	Aug-29-17 19:38	Aug-29-17 20:40	Aug-29-17 21:11	Aug-29-17 21:21	Aug-29-17 21:32
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		670 4.94	1320 4.90	1290 4.90	1330 4.90	1500 24.6	1780 4.99
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>						Sep-02-17 14:00
	<i>Analyzed:</i>						Sep-03-17 04:21
	<i>Units/RL:</i>						mg/kg RL
Gasoline Range Hydrocarbons (GRO)							66.5 15.0
Diesel Range Organics (DRO)							927 15.0
Oil Range Hydrocarbons (ORO)							178 15.0
Total TPH							1170 15.0

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Kelsey Brooks  
Project Manager

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

\*\* Surrogate recovered outside laboratory control limit.

**BRL** Below Reporting Limit.

**RL** Reporting Limit

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

**PQL** Practical Quantitation Limit      **SQL** 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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(602) 437-0330	



## Form 2 - Surrogate Recoveries

Project Name: COG- Mcintyre B #10

Work Orders : 561383,

Project ID: 212C-MD-00958

Lab Batch #: 3026146

Sample: 561383-001 / DL

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 05:00

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	101	99.7	101	70-135	
o-Terphenyl	41.4	49.9	83	70-135	

Lab Batch #: 3026146

Sample: 561383-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 05:21

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	99.6	106	70-135	
o-Terphenyl	54.4	49.8	109	70-135	

Lab Batch #: 3026156

Sample: 561383-017 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 07:46

### 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	0.0351	0.0300	117	80-120	

Lab Batch #: 3026146

Sample: 561383-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 08:02

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	104	99.7	104	70-135	
o-Terphenyl	49.5	49.9	99	70-135	

Lab Batch #: 3026146

Sample: 561383-017 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 08:22

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	101	99.6	101	70-135	
o-Terphenyl	63.7	49.8	128	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: COG- McIntyre B #10

Work Orders : 561383,

Lab Batch #: 3026146

Sample: 561383-002 / SMP

Project ID: 212C-MD-00958

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 09:57

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	99.9	105	70-135	
o-Terphenyl	53.7	50.0	107	70-135	

Lab Batch #: 3026250

Sample: 561383-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/30/17 16:13

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0274	0.0300	91	80-120	
4-Bromofluorobenzene	0.0266	0.0300	89	80-120	

Lab Batch #: 3026250

Sample: 561383-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/30/17 16:30

### 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	0.0256	0.0300	85	80-120	

Lab Batch #: 3026616

Sample: 561383-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/03/17 02:58

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.6	99.9	94	70-135	
o-Terphenyl	45.9	50.0	92	70-135	

Lab Batch #: 3026616

Sample: 561383-016 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/03/17 04:01

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.7	99.7	92	70-135	
o-Terphenyl	45.0	49.9	90	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: COG- Mcintyre B #10

Work Orders : 561383,

Lab Batch #: 3026616

Sample: 561383-024 / SMP

Project ID: 212C-MD-00958

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/03/17 04:21

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod  Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	110	99.7	110	70-135	
o-Terphenyl	50.2	49.9	101	70-135	

Lab Batch #: 3026700

Sample: 561383-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/05/17 16:23

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B  Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0280	0.0300	93	80-120	
4-Bromofluorobenzene	0.0315	0.0300	105	80-120	

Lab Batch #: 3026700

Sample: 561383-016 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/05/17 16:59

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B  Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0293	0.0300	98	80-120	

Lab Batch #: 3026700

Sample: 561383-024 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/05/17 17:17

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B  Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0269	0.0300	90	80-120	
4-Bromofluorobenzene	0.0301	0.0300	100	80-120	

Lab Batch #: 3026156

Sample: 730048-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/28/17 22:01

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B  Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	80-120	
4-Bromofluorobenzene	0.0241	0.0300	80	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: COG- McIntyre B #10

Work Orders : 561383,

Lab Batch #: 3026146

Sample: 730045-1-BLK / BLK

Project ID: 212C-MD-00958

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/29/17 01:51

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.4	100	93	70-135	
o-Terphenyl	47.5	50.0	95	70-135	

Lab Batch #: 3026250

Sample: 730108-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/30/17 11:35

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0253	0.0300	84	80-120	

Lab Batch #: 3026616

Sample: 730330-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 09/03/17 01:56

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	100	105	70-135	
o-Terphenyl	52.0	50.0	104	70-135	

Lab Batch #: 3026700

Sample: 730377-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 09/05/17 09:13

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0298	0.0300	99	80-120	

Lab Batch #: 3026156

Sample: 730048-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/28/17 20:28

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	80-120	
4-Bromofluorobenzene	0.0274	0.0300	91	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: COG- Mcintyre B #10

Work Orders : 561383,

Lab Batch #: 3026146

Sample: 730045-1-BKS / BKS

Project ID: 212C-MD-00958

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/29/17 02:12

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.6	100	92	70-135	
o-Terphenyl	44.5	50.0	89	70-135	

Lab Batch #: 3026250

Sample: 730108-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/30/17 10:00

### SURROGATE RECOVERY STUDY

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

Lab Batch #: 3026616

Sample: 730330-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 09/03/17 02:16

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	104	100	104	70-135	
o-Terphenyl	52.8	50.0	106	70-135	

Lab Batch #: 3026700

Sample: 730377-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 09/05/17 07:57

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	80-120	
4-Bromofluorobenzene	0.0315	0.0300	105	80-120	

Lab Batch #: 3026156

Sample: 730048-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/28/17 20:47

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	80-120	
4-Bromofluorobenzene	0.0260	0.0300	87	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: COG- Mcintyre B #10

Work Orders : 561383,

Lab Batch #: 3026146

Sample: 730045-1-BSD / BSD

Project ID: 212C-MD-00958

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/29/17 02:33

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.6	100	100	70-135	
o-Terphenyl	50.1	50.0	100	70-135	

Lab Batch #: 3026250

Sample: 730108-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 08/30/17 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	0.0252	0.0300	84	80-120	
4-Bromofluorobenzene	0.0241	0.0300	80	80-120	

Lab Batch #: 3026616

Sample: 730330-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 09/03/17 02:37

### 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	51.1	50.0	102	70-135	

Lab Batch #: 3026700

Sample: 730377-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 09/05/17 08:16

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0310	0.0300	103	80-120	

Lab Batch #: 3026156

Sample: 561227-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/28/17 21:06

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0295	0.0300	98	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: COG- McIntyre B #10

Work Orders : 561383,

Lab Batch #: 3026146

Sample: 561389-001 S / MS

Project ID: 212C-MD-00958

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 03:14

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	111	99.8	111	70-135	
o-Terphenyl	49.3	49.9	99	70-135	

Lab Batch #: 3026250

Sample: 561411-004 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/30/17 10:38

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0308	0.0300	103	80-120	
4-Bromofluorobenzene	0.0295	0.0300	98	80-120	

Lab Batch #: 3026616

Sample: 561383-008 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/03/17 03:18

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.4	99.9	99	70-135	
o-Terphenyl	48.1	50.0	96	70-135	

Lab Batch #: 3026700

Sample: 561383-008 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/05/17 16:23

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0319	0.0300	106	80-120	
4-Bromofluorobenzene	0.0342	0.0300	114	80-120	

Lab Batch #: 3026156

Sample: 561227-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/28/17 21:23

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0251	0.0300	84	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: COG- Mcintyre B #10

Work Orders : 561383,

Lab Batch #: 3026146

Sample: 561389-001 SD / MSD

Project ID: 212C-MD-00958

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/29/17 03:35

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.4	99.8	89	70-135	
o-Terphenyl	41.0	49.9	82	70-135	

Lab Batch #: 3026250

Sample: 561411-004 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 08/30/17 10:57

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0309	0.0300	103	80-120	
4-Bromofluorobenzene	0.0289	0.0300	96	80-120	

Lab Batch #: 3026616

Sample: 561383-008 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/03/17 03:39

### SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.7	99.8	94	70-135	
o-Terphenyl	45.1	49.9	90	70-135	

Lab Batch #: 3026700

Sample: 561383-008 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 09/05/17 16:23

### SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0319	0.0300	106	80-120	
4-Bromofluorobenzene	0.0349	0.0300	116	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: COG- Mcintyre B #10

Work Order #: 561383

Project ID: 212C-MD-00958

Analyst: ALJ

Date Prepared: 08/28/2017

Date Analyzed: 08/28/2017

Lab Batch ID: 3026156

Sample: 730048-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

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

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00199	0.0994	0.116	117	0.100	0.119	119	3	70-130	35	
Toluene	<0.00199	0.0994	0.113	114	0.100	0.115	115	2	70-130	35	
Ethylbenzene	<0.00199	0.0994	0.112	113	0.100	0.114	114	2	71-129	35	
m,p-Xylenes	<0.00398	0.199	0.220	111	0.200	0.225	113	2	70-135	35	
o-Xylene	<0.00199	0.0994	0.106	107	0.100	0.109	109	3	71-133	35	

Analyst: ALJ

Date Prepared: 08/30/2017

Date Analyzed: 08/30/2017

Lab Batch ID: 3026250

Sample: 730108-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

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

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00200	0.0998	0.116	116	0.100	0.114	114	2	70-130	35	
Toluene	<0.00200	0.0998	0.114	114	0.100	0.112	112	2	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.115	115	0.100	0.113	113	2	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.225	113	0.201	0.221	110	2	70-135	35	
o-Xylene	<0.00200	0.0998	0.109	109	0.100	0.107	107	2	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: COG- Mcintyre B #10

Work Order #: 561383

Project ID: 212C-MD-00958

Analyst: ALJ

Date Prepared: 09/05/2017

Date Analyzed: 09/05/2017

Lab Batch ID: 3026700

Sample: 730377-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

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

<b>BTEX by EPA 8021B</b>	<b>Blank Sample Result [A]</b>	<b>Spike Added [B]</b>	<b>Blank Spike Result [C]</b>	<b>Blank Spike %R [D]</b>	<b>Spike Added [E]</b>	<b>Blank Spike Duplicate Result [F]</b>	<b>Blk. Spk Dup. %R [G]</b>	<b>RPD %</b>	<b>Control Limits %R</b>	<b>Control Limits %RPD</b>	<b>Flag</b>
<b>Analytes</b>											
Benzene	<0.00200	0.100	0.104	104	0.0996	0.103	103	1	70-130	35	
Toluene	<0.00200	0.100	0.102	102	0.0996	0.101	101	1	70-130	35	
Ethylbenzene	<0.00200	0.100	0.101	101	0.0996	0.100	100	1	71-129	35	
m,p-Xylenes	<0.00401	0.200	0.198	99	0.199	0.196	98	1	70-135	35	
o-Xylene	<0.00200	0.100	0.0952	95	0.0996	0.0945	95	1	71-133	35	

Analyst: MNV

Date Prepared: 08/29/2017

Date Analyzed: 08/29/2017

Lab Batch ID: 3026244

Sample: 730074-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

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

<b>Inorganic Anions by EPA 300/300.1</b>	<b>Blank Sample Result [A]</b>	<b>Spike Added [B]</b>	<b>Blank Spike Result [C]</b>	<b>Blank Spike %R [D]</b>	<b>Spike Added [E]</b>	<b>Blank Spike Duplicate Result [F]</b>	<b>Blk. Spk Dup. %R [G]</b>	<b>RPD %</b>	<b>Control Limits %R</b>	<b>Control Limits %RPD</b>	<b>Flag</b>
<b>Analytes</b>											
Chloride	<5.00	250	250	100	250	250	100	0	90-110	20	

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

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

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

All results are based on MDL and Validated for QC Purposes





## BS / BSD Recoveries



Project Name: COG- Mcintyre B #10

Work Order #: 561383

Project ID: 212C-MD-00958

Analyst: MNV

Date Prepared: 08/29/2017

Date Analyzed: 08/29/2017

Lab Batch ID: 3026248

Sample: 730075-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

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

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	247	99	250	247	99	0	90-110	20	

Analyst: ARM

Date Prepared: 08/28/2017

Date Analyzed: 08/29/2017

Lab Batch ID: 3026146

Sample: 730045-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

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

TPH By SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	898	90	1000	952	95	6	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	967	97	1000	1020	102	5	70-135	35	

Analyst: ARM

Date Prepared: 09/02/2017

Date Analyzed: 09/03/2017

Lab Batch ID: 3026616

Sample: 730330-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

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

TPH By SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	891	89	1000	911	91	2	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	1020	102	1000	1030	103	1	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: COG- Mcintyre B #10

Work Order #: 561383

Project ID: 212C-MD-00958

Lab Batch ID: 3026156

QC- Sample ID: 561227-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 08/28/2017

Date Prepared: 08/28/2017

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	0.100	99	0.101	0.0962	95	4	70-130	35	
Toluene	<0.00202	0.101	0.0908	90	0.101	0.0865	86	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0785	78	0.101	0.0805	80	3	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.151	75	0.202	0.154	76	2	70-135	35	
o-Xylene	<0.00202	0.101	0.0750	74	0.101	0.0786	78	5	71-133	35	

Lab Batch ID: 3026250

QC- Sample ID: 561411-004 S

Batch #: 1 Matrix: Soil

Date Analyzed: 08/30/2017

Date Prepared: 08/30/2017

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	0.0803	80	0.101	0.0761	75	5	70-130	35	
Toluene	<0.00202	0.101	0.0760	75	0.101	0.0710	70	7	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0732	72	0.101	0.0662	66	10	71-129	35	X
m,p-Xylenes	<0.00403	0.202	0.143	71	0.202	0.128	63	11	70-135	35	X
o-Xylene	<0.00202	0.101	0.0724	72	0.101	0.0685	68	6	71-133	35	X

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

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

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: COG- Mcintyre B #10

Work Order #: 561383

Project ID: 212C-MD-00958

Lab Batch ID: 3026700

QC- Sample ID: 561383-008 S

Batch #: 1 Matrix: Soil

Date Analyzed: 09/05/2017

Date Prepared: 09/05/2017

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	0.103	103	0.100	0.104	104	1	70-130	35	
Toluene	<0.00200	0.0998	0.100	100	0.100	0.101	101	1	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0969	97	0.100	0.0982	98	1	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.189	95	0.200	0.191	96	1	70-135	35	
o-Xylene	<0.00200	0.0998	0.0918	92	0.100	0.0932	93	2	71-133	35	

Lab Batch ID: 3026244

QC- Sample ID: 561383-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 08/29/2017

Date Prepared: 08/29/2017

Analyst: MNV

Reporting Units: mg/kg

## MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	528	248	786	104	248	787	104	0	90-110	20	

Lab Batch ID: 3026248

QC- Sample ID: 560863-007 S

Batch #: 1 Matrix: Soil

Date Analyzed: 08/29/2017

Date Prepared: 08/29/2017

Analyst: MNV

Reporting Units: mg/kg

## MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	998	247	1220	90	247	1200	82	2	90-110	20	X

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

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

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: COG- Mcintyre B #10

Work Order #: 561383

Project ID: 212C-MD-00958

Lab Batch ID: 3026248

QC- Sample ID: 561383-021 S

Batch #: 1 Matrix: Soil

Date Analyzed: 08/29/2017

Date Prepared: 08/29/2017

Analyst: MNV

Reporting Units: mg/kg

## MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	1290	245	1560	110	245	1560	110	0	90-110	20	

Lab Batch ID: 3026146

QC- Sample ID: 561389-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 08/29/2017

Date Prepared: 08/28/2017

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)	<15.0	998	1050	105	998	893	89	16	70-135	35	
Diesel Range Organics (DRO)	99.9	998	1120	102	998	988	89	13	70-135	35	

Lab Batch ID: 3026616

QC- Sample ID: 561383-008 S

Batch #: 1 Matrix: Soil

Date Analyzed: 09/03/2017

Date Prepared: 09/02/2017

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)	<15.0	999	886	89	998	940	94	6	70-135	35	
Diesel Range Organics (DRO)	41.5	999	1020	98	998	1020	98	0	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.

## Page 1 of 3



5601383

ORIGINAL COPY

(Circle) ~~HAND DELIVER~~

Temp: 3.8  
IR ID: R-8  
CF: (0.6: -0.2°C)  
(6-23: +0.2°C)  
Corrected Temp: 3.1

IR ID: B-8

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~~Draft 1.000~~



# Analysis Request of Custody Record



## Tetra Tech, Inc.

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

Client Name: COG		Site Manager: Ike Tavaraz	
Project Name: McIntyre B#10			
Project Location: (county, state) Eddy County, New Mexico		Project #: 212C-MD-00958	
Invoice to: COG			
Receiving Laboratory: Xenco Midland Tx		Sampler Signature:	
Comments: If TPH exceeds 5,000mg/kg run deeper samples. If Benzene exceeds 10 mg/kg or Total BTEX exceeds 50 mg/kg run deeper samples			

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		MATRIX		PRESERVATIVE METHOD				# CONTAINERS	FILTERED (Y/N)	
		YEAR: 2017		WATER	SOIL	HCL	HNO <sub>3</sub>	ICE	None			
		DATE	TIME									
	AH#2 (1.5-2)	8/23/2017		X			X				1 N	
	AH#2 (2-2.5)	8/23/2017		X			X				1 N	
	AH#2 (2.5-3)	8/23/2017		X			X				1 N	
	AH#2 (3-3.5)	8/23/2017		X			X				1 N	
	AH#2 (3.5-4)	8/23/2017		X			X				1 N	
	AH#2 (4-4.5)	8/23/2017		X			X				1 N	
	AH#3 (0-1)	8/23/2017		X			X				1 N	
	AH#3 (1-1.5)	8/23/2017		X			X				1 N	
	AH#3 (1.5-2)	8/23/2017		X			X				1 N	
	AH#3 (2-2.5)	8/23/2017		X			X				1 N	

Relinquished by:  8-25-17 12:50		Received by:  8/25/17 12:30	
Date: Time:	Date: Time:	Date: Time:	Date: Time:
Relinquished by: _____		Received by: _____	
Date: Time:	Date: Time:	Date: Time:	Date: Time:

<b>LAB USE ONLY</b> Sample Temperature  REMARKS: <b>STANDARD</b> <input type="checkbox"/> RUSH: Same Day 24 hr 48 hr 72 hr <input type="checkbox"/> Rush Charges Authorized <input type="checkbox"/> Special Report Limits or TRRP Report	ANALYSIS REQUEST (Circle or Specify Method No.) BTEX 8021B BTEX 8260B TPH TX1005 (Ext to C35) TPH 8015M ( GRO - DRO - ORO - MRO) PAH 8270C Total Metals Ag As Ba Cd Cr Pb Se Hg TCLP Metals Ag As Ba Cd Cr Pb Se Hg TCLP Volatiles TCLP Semi Volatiles RCI GC/MS Vol. 8260B / 624 GC/MS Semi. Vol. 8270C/625 PCB's 8082 / 608 NORM PLM (Asbestos) Chloride Chloride Sulfate TDS General Water Chemistry (see attached list) Anion/Cation Balance														
	(Circle) HAND DELIVERED F														

ORIGINAL COPY

Temp: 38 IR ID:R-8  
 CF: (0-6: -0.2°C)  
 Corrected Temp: 3.40

ω



561383

IR ID: R-8

5





# XENCO Laboratories

## Prelogin/Nonconformance Report- Sample Log-In



**Client:** Tetra Tech- Midland

**Date/ Time Received:** 08/25/2017 12:30:00 PM

**Work Order #:** 561383

**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)?	3.6
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	N/A
#5 *Custody Seals intact on shipping container/ cooler?	N/A
#6 Custody Seals intact on sample bottles?	N/A
#7 *Custody Seals Signed and dated?	N/A
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	No
#21 VOC samples have zero headspace?	N/A

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

Analyst:

PH Device/Lot#:

**Checklist completed by:**

Shawnee Smith

Date: 08/28/2017

**Checklist reviewed by:**

Kelsey Brooks

Date: 08/29/2017