

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, 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 October 10, 2003

Submit 2 Copies to appropriate  
District Office in accordance  
with Rule 116 on back  
side of form

### Release Notification and Corrective Action

#### OPERATOR

☐ Initial Report ☒ Final Report

Name of Company	COG Operating LLC	Contact	Pat Ellis
Address	550 W. Texas, Suite 1300 Midland, Texas 79701	Telephone No.	(432) 230-0077
Facility Name	LPC 31 Federal #2 Tank Battery	Facility Type	Tank Battery

Surface Owner: Federal	Mineral Owner	Lease No. (API#) 30-025-38157 Closest well location
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#### LOCATION OF RELEASE

Unit Letter G	Section 31	Township 18S	Range 32E	Feet from the	North/South Line	Feet from the	East/West Line	County Lea
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Latitude 32 42.376 Longitude 103 48.245

#### NATURE OF RELEASE

Type of Release: Oil	Volume of Release 12 bbls oil	Volume Recovered 10 bbls
Source of Release: Heater Treater	Date and Hour of Occurrence 09/06/2012	Date and Hour of Discovery 09/06/2012 4:00 p.m.
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. N/A	
If a Watercourse was Impacted, Describe Fully.*		

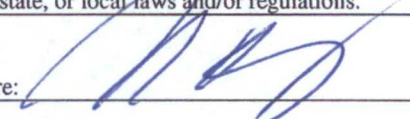
#### Describe Cause of Problem and Remedial Action Taken.\*

The heater was not emptied completely prior to unbolting the fire tube for maintenance. When the fire tube was unbolted fluid was released. The drain line was clogged which did not allow for the emptying of all the fluids inside the heater. The drain line has been unclogged and the fire tube has been replaced.

#### Describe Area Affected and Cleanup Action Taken.\*

Tetra Tech personnel inspected the site and collected samples to define the spills extent. No soils exceeded the RRAL for BTEX or TPH. Tetra Tech prepared a closure report and submitted it to NMOCD for review.

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: 		<u>OIL CONSERVATION DIVISION</u>	
Printed Name: Ike Tavarez (agent for COG)		Approved by District Supervisor: Jocelyn Harimon	
Title: Project Manager		Approval Date: 06/27/2023	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com		Conditions of Approval: None	Attached <input type="checkbox"/>
Date: 10-23-12 Phone: (432) 682-4559			

\* Attach Additional Sheets If Necessary



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Oil Conservation Division  
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PJXK1601132001

4098

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Revised October 10, 2003

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with Rule 116 on back  
side of form

**Release Notification and Corrective Action****OPERATOR**☒ Initial Report ☐ Final Report

Name of Company	COG OPERATING LLC	Contact	Pat Ellis
Address	550 W. Texas, Suite 100, Midland, TX 79701	Telephone No.	432-230-0077
Facility Name	LPC 31 Federal #2 Tank Battery	Facility Type	Tank Battery

Surface Owner	Federal	Mineral Owner		Lease No. (API#)	30-025-38157
				Closest well location	

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
G	31	18S	32E					Lea

Latitude 32 42.376 Longitude 103 48.245

**NATURE OF RELEASE**

Type of Release	Oil	Volume of Release	12bbbls	Volume Recovered	10bbbls
Source of Release	Heater Treater	Date and Hour of Occurrence	09/06/2012	Date and Hour of Discovery	09/06/2012 4:00 p.m.
Was Immediate Notice Given?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required				
By Whom?	If YES, To Whom?				
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.\*

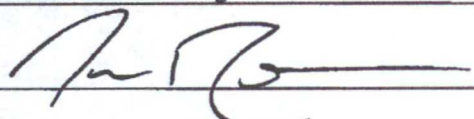
Describe Cause of Problem and Remedial Action Taken.\*

The heater was not emptied completely prior to unbolting the fire tube for maintenance. When the fire tube was unbolted fluid was released. The drain line was clogged which did not allow for the emptying of all fluids inside the heater. The drain line has been unclogged and the fire tube has been replaced.

Describe Area Affected and Cleanup Action Taken.\*

Initially 12bbbls of oil were released around the heater treater at the LPC 31 Federal #2 Tank Battery and we were able to recover 10bbbls of fluid with a vacuum truck. The spill area measures approximately a 7' x 15' area around the heater. All free fluids have been recovered contaminated soil at the surface has been removed. Tetra Tech will sample the spill site area to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD/BLM for approval prior to any significant remediation work.

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: 		<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Josh Russo		Approved by District Supervisor:	
Title: HSE Coordinator		Approval Date:	Expiration Date:
E-mail Address: jrusso@conchoresources.com		Conditions of Approval:	
Date: 09/17/2012 Phone: 432-212-2399		Attached <input type="checkbox"/>	

Attach Additional Sheets If Necessary



## SITE INFORMATION

## Report Type: Closure Report

HOBBS OGD

NOV 02 2012

## General Site Information:

Site:	LPC 31 Federal #2 Tank Battery				
Company:	COG Operating LLC				
Section, Township and Range	Unit G	Sec 31	T18S	R32E	
Lease Number:	API-30-015-31366				
County:	Lea County				
GPS:	32.70670° N			103.80429° W	
Surface Owner:	Federal				
Mineral Owner:					
Directions:	From the intersection of Hwy 529 and CR 126A, travel south on CR 126A approximatly 5.8 miles. Turn right (west) and travel for 0.7 miles on a cliché road. Follow the road turning to the left (south) and travel for 0.3 miles. Turn left (east) and travel for 0.1 miles to site.				

## Release Data:

Date Released:	9/6/2012
Type Release:	Oil
Source of Contamination:	Heater Treater
Fluid Released:	12 bbls oil
Fluids Recovered:	10 bbls oil

## Official Communication:

Name:	Pat Ellis	Ike Tavaréz
Company:	COG Operating, LLC	Tetra Tech
Address:	550 W. Texas Ave. Ste. 1300	1910 N. Big Spring
P.O. Box		
City:	Midland Texas, 79701	Midland, Texas
Phone number:	(432) 686-3023	(432) 682-4559
Fax:	(432) 684-7137	
Email:	<a href="mailto:pellis@conchoresources.com">pellis@conchoresources.com</a>	<a href="mailto:ike.tavarez@tetrattech.com">ike.tavarez@tetrattech.com</a>

## Ranking Criteria

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

## Acceptable Soil RRAL (mg/kg)

Benzene	Total BTEX	TPH
10	50	5,000





October 23, 2012

Mr. Geoffrey Leking  
Environmental Engineer Specialist  
Oil Conservation Division, District 1  
1625 North French Drive  
Hobbs, New Mexico 88240

**Re: Closure Report for the COG Operating LLC., LPC 31 Federal #2 Tank Battery, Located Unit G, Section 31, Township 18 South, Range 32 East, Lea County, New Mexico.**

Mr. Leking:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from LPC 31 Federal #2 Tank Battery, Located Unit G, Section 31, Township 18 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are N 31.70670°, W 103.80429°. The site location is shown on Figures 1 and 2.

### **Background**

According to the State of New Mexico Oil Conservation Division (NMOCD) Form C-141 Initial Report, the leak was discovered on September 6, 2012. COG was performing maintenance on a heater treater and the release occurred during the disassembly of the fire tube, due to a clogged drain line inside the heater the heater. Approximately twelve (12) barrels of oil were released and recovered approximately (10) barrels of fluid using a vacuum truck. COG repaired the clogged drain line prior to reassembly of the heater treater. The spill impacted an area on the pad around the heater treater, which measured approximately 20' x 55'. The spill areas are shown on Figures 3. The initial Form C-141 is enclosed in Appendix A.

### **Groundwater**

No water wells records were found in Section 31. According to the NMOCD groundwater map, the average depth to groundwater is approximately 200' below surface. The average depth to groundwater map is shown in Appendix B.

**Tetra Tech**

1910 North Big Spring, Midland, TX 79705

Tel 432.682.4559

Fax 432.682.3946

www.tetrattech.com





## Regulatory

A risk-based evaluation was performed for the Site in accordance with the 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 5,000 mg/kg.

## Soil Assessment and Analytical Results

On October 4, 2012, Tetra Tech personnel inspected and sampled the spill area. A total of two (2) auger holes (AH-1 and AH-2) were installed using a stainless steel hand auger to assess the impacted areas. 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 sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, all of the auger hole samples were below the RRAL for TPH and BTEX. The chloride concentrations detected did not show an impact to the soils, with concentrations ranging from <20 mg/kg to 94.5 mg/kg.

## Conclusion

Based on the results, no corrective action is required for the spill area and COG requests closure for this site. The C-141 (Final) is included in Appendix A. If you have any questions or comments concerning the assessment or the remediation activities performed at the site, please call me at (432) 682-4559.

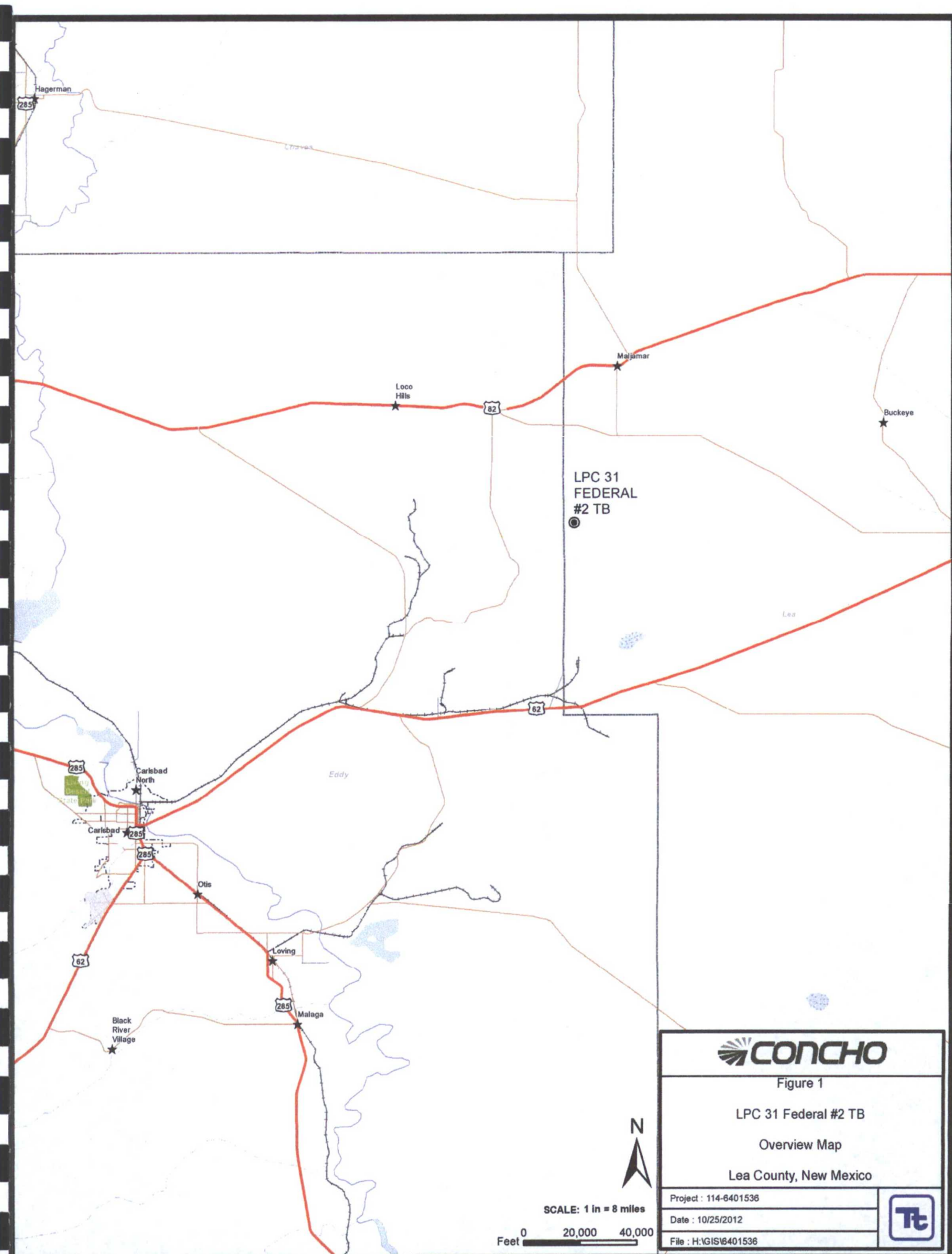
Respectfully submitted,  
TETRA TECH



Ike Tavarez  
Senior Project Manager

cc: Pat Ellis - COG  
cc: Jim Amos - BLM





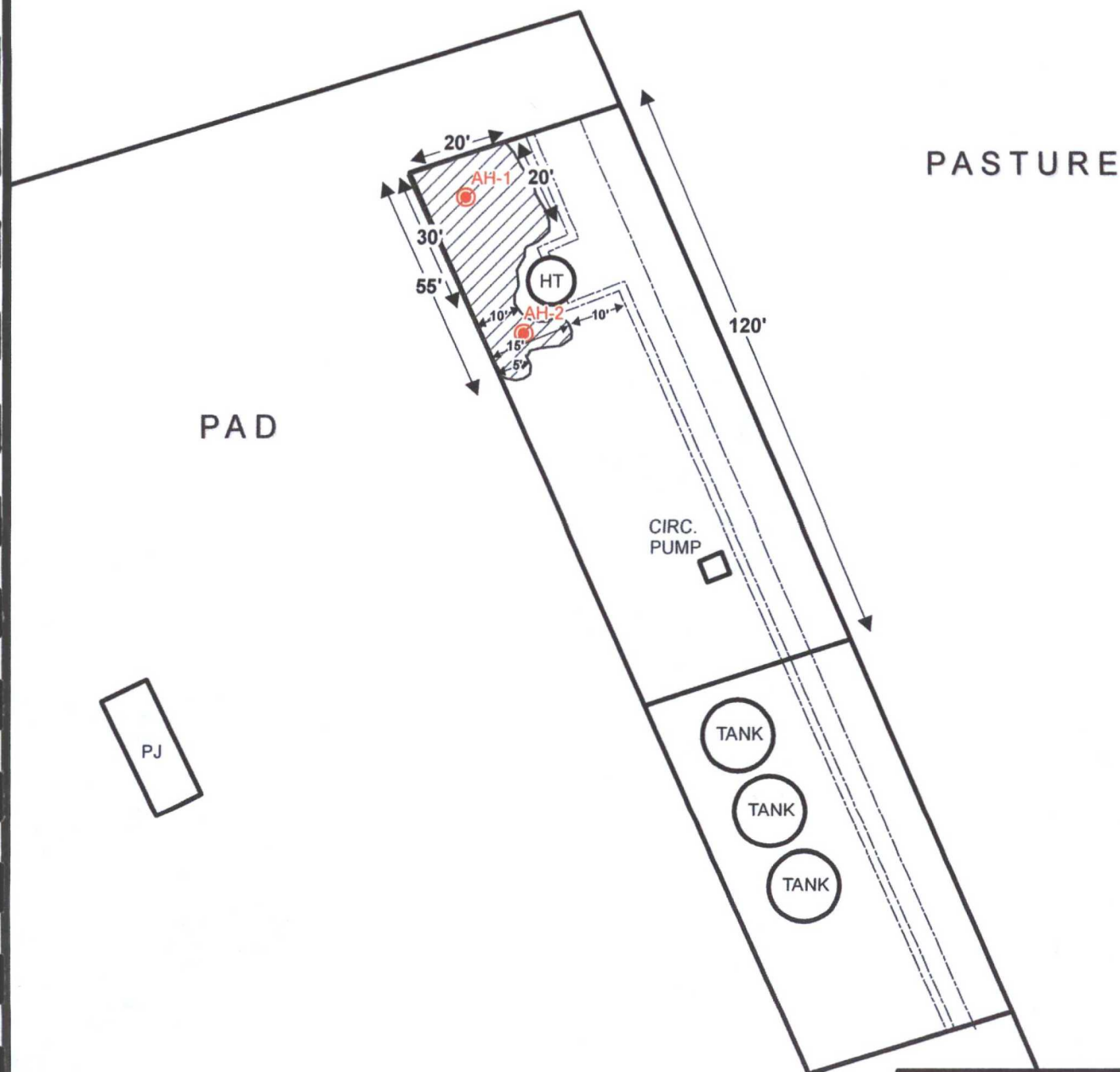












**EXPLANATION**

● AUGER HOLE SAMPLE LOCATIONS

▨ SPILL AREA

N

SCALE: 1 IN = 39 FEET

Feet 0 20 40

**CONCHO**

Figure 3

LPC 31 Federal #2 TB

Spill Assessment Map

Lea County, New Mexico

Project : 114-6401536

Date : 10/25/2012

File : H:\GIS\6401536

**Tt**



Table 1  
COG Operating LLC.  
LPC 31 Federal #2 Tank Battery  
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
AH-1	10/4/2012	0-1	X		<1.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<20.0
	"	1-1.5	X		-	-	-	-	-	-	-	-	<20.0
	"	2-2.5	X		-	-	-	-	-	-	-	-	<20.0
	"	3-3.5	X		-	-	-	-	-	-	-	-	<20.0
	"	4-4.5	X		-	-	-	-	-	-	-	-	<20.0
	"	5-5.5	X		-	-	-	-	-	-	-	-	<20.0
	"	6-6.5	X		-	-	-	-	-	-	-	-	<20.0
	"	7-7.5	X		-	-	-	-	-	-	-	-	<20.0
AH-2	10/4/2012	0-1	X		<1.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<20.0
	"	1-1.5	X		-	-	-	-	-	-	-	-	<20.0
	"	2-2.5	X		-	-	-	-	-	-	-	-	<20.0
	"	3-3.5	X		-	-	-	-	-	-	-	-	94.5
	"	4-4.5	X		-	-	-	-	-	-	-	-	<20.0
	"	5-5.5	X		-	-	-	-	-	-	-	-	<20.0
	"	6-6.5	X		-	-	-	-	-	-	-	-	<20.0
	"	7-7.5	X		-	-	-	-	-	-	-	-	<20.0
	"	7.5-8	X		-	-	-	-	-	-	-	-	<20.0

( - ) Not Analyzed



COG Operating LLC  
LPC 31 Federal #2 Tank Battery  
Lea County, New Mexico



TETRA TECH



View East – Area of AH-1



View West – Area of AH-2



**Water Well Data**  
**Average Depth to Groundwater (ft)**  
**COG - LPC 31 Federal #2 Tank Battery**  
**Lea County, New Mexico**

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			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

19 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

17 South			32 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			32 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

19 South			32 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

17 South			33 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			33 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

19 South			33 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

- New Mexico State Engineers Well Reports
- USGS Well Reports
- Geology and Groundwater Conditions in Southern Eddy, County, NM
- NMOCD - Groundwater Data
- Field water level
- New Mexico Water and Infrastructure Data System



Report Date: October 10, 2012

Work Order: 12100516

Page Number: 1 of 4

## Summary Report

Ike Tavarez  
Tetra Tech  
1910 N. Big Spring Street  
Midland, TX 79705

Report Date: October 10, 2012

Work Order: 12100516

Project Location: Lea Co., NM  
Project Name: COG/LPC 31 Fed. #2 TB  
Project Number: 114-6401536

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
310952	AH-1 0-1'	soil	2012-10-04	00:00	2012-10-05
310953	AH-1 1-1.5'	soil	2012-10-04	00:00	2012-10-05
310954	AH-1 2-2.5'	soil	2012-10-04	00:00	2012-10-05
310955	AH-1 3-3.5'	soil	2012-10-04	00:00	2012-10-05
310956	AH-1 4-4.5'	soil	2012-10-04	00:00	2012-10-05
310957	AH-1 5-5.5'	soil	2012-10-04	00:00	2012-10-05
310958	AH-1 6-6.5'	soil	2012-10-04	00:00	2012-10-05
310959	AH-1 7-7.5'	soil	2012-10-04	00:00	2012-10-05
310960	AH-1 8-8.5'	soil	2012-10-04	00:00	2012-10-05
310961	AH-2 0-1'	soil	2012-10-04	00:00	2012-10-05
310962	AH-2 1-1.5'	soil	2012-10-04	00:00	2012-10-05
310963	AH-2 2-2.5'	soil	2012-10-04	00:00	2012-10-05
310964	AH-2 3-3.5'	soil	2012-10-04	00:00	2012-10-05
310965	AH-2 4-4.5'	soil	2012-10-04	00:00	2012-10-05
310966	AH-2 5-5.5'	soil	2012-10-04	00:00	2012-10-05
310967	AH-2 6-6.5'	soil	2012-10-04	00:00	2012-10-05
310968	AH-2 7-7.5'	soil	2012-10-04	00:00	2012-10-05
310969	AH-2 7.5-8'	soil	2012-10-04	00:00	2012-10-05

Sample - Field Code	BTEX				TPH DRO - NEW	TPH GRO
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
310952 - AH-1 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<1.00
310961 - AH-2 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<1.00

Sample: 310952 - AH-1 0-1'



Report Date: October 10, 2012

Work Order: 12100516

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Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 310953 - AH-1 1-1.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 310954 - AH-1 2-2.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 310955 - AH-1 3-3.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 310956 - AH-1 4-4.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 310957 - AH-1 5-5.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 310958 - AH-1 6-6.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 310959 - AH-1 7-7.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4



Report Date: October 10, 2012

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**Sample: 310960 - AH-1 8-8.5'**

Param	Flag	Result	Units	RL
Chloride		74.6	mg/Kg	4

**Sample: 310961 - AH-2 0-1'**

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

**Sample: 310962 - AH-2 1-1.5'**

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

**Sample: 310963 - AH-2 2-2.5'**

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

**Sample: 310964 - AH-2 3-3.5'**

Param	Flag	Result	Units	RL
Chloride		94.5	mg/Kg	4

**Sample: 310965 - AH-2 4-4.5'**

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

**Sample: 310966 - AH-2 5-5.5'**

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

**Sample: 310967 - AH-2 6-6.5'**

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4



Report Date: October 10, 2012

Work Order: 12100516

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Sample: 310968 - AH-2 7-7.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

---

## Sample: 310969 - AH-2 7.5-8'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

---







These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 25 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.



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Dr. Blair Leftwich, Director  
Dr. Michael Abel, Project Manager



# Report Contents

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Sample 310955 (AH-1 3-3.5')	8
Sample 310956 (AH-1 4-4.5')	8
Sample 310957 (AH-1 5-5.5')	8
Sample 310958 (AH-1 6-6.5')	9
Sample 310959 (AH-1 7-7.5')	9
Sample 310960 (AH-1 8-8.5')	9
Sample 310961 (AH-2 0-1')	9
Sample 310962 (AH-2 1-1.5')	11
Sample 310963 (AH-2 2-2.5')	11
Sample 310964 (AH-2 3-3.5')	11
Sample 310965 (AH-2 4-4.5')	12
Sample 310966 (AH-2 5-5.5')	12
Sample 310967 (AH-2 6-6.5')	12
Sample 310968 (AH-2 7-7.5')	13
Sample 310969 (AH-2 7.5-8')	13
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## Case Narrative

Samples for project COG/LPC 31 Fed. #2 TB were received by TraceAnalysis, Inc. on 2012-10-05 and assigned to work order 12100516. Samples for work order 12100516 were received intact at a temperature of 3.8 C.

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
BTEX	S 8021B	80935	2012-10-06 at 09:45	95513	2012-10-06 at 09:45
Chloride (Titration)	SM 4500-Cl B	80964	2012-10-08 at 18:14	95569	2012-10-09 at 22:22
Chloride (Titration)	SM 4500-Cl B	80964	2012-10-08 at 18:14	95570	2012-10-09 at 22:23
TPH DRO - NEW	S 8015 D	80944	2012-10-05 at 10:00	95522	2012-10-08 at 10:56
TPH GRO	S 8015 D	80935	2012-10-06 at 09:45	95521	2012-10-06 at 09:45

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 12100516 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

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## Analytical Report

Sample: 310952 - AH-1 0-1'

Laboratory: Midland  
Analysis: BTEX  
QC Batch: 95513  
Prep Batch: 80935

Analytical Method: S 8021B  
Date Analyzed: 2012-10-06  
Sample Preparation: 2012-10-06

Prep Method: S 5035  
Analyzed By: YG  
Prepared By: YG

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1	<0.0200	mg/Kg	1	0.0200
Toluene	u	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	1	<0.0200	mg/Kg	1	0.0200
Xylene	u	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.74	mg/Kg	1	2.00	87	70 - 130
4-Bromofluorobenzene (4-BFB)			1.72	mg/Kg	1	2.00	86	70 - 130

Sample: 310952 - AH-1 0-1'

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 95569  
Prep Batch: 80964

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2012-10-09  
Sample Preparation: 2012-10-08

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 310952 - AH-1 0-1'

Laboratory: Midland  
Analysis: TPH DRO - NEW  
QC Batch: 95522  
Prep Batch: 80944

Analytical Method: S 8015 D  
Date Analyzed: 2012-10-08  
Sample Preparation: 2012-10-05

Prep Method: N/A  
Analyzed By: CW  
Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1	<50.0	mg/Kg	1	50.0



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Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			114	mg/Kg	1	100	114	70 - 130

**Sample: 310952 - AH-1 0-1'**

Laboratory: Midland  
Analysis: TPH GRO  
QC Batch: 95521  
Prep Batch: 80935

Analytical Method: S 8015 D  
Date Analyzed: 2012-10-06  
Sample Preparation: 2012-10-06

Prep Method: S 5035  
Analyzed By: YG  
Prepared By: YG

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<1.00	mg/Kg	1	1.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.11	mg/Kg	1	2.00	106	70 - 130
4-Bromofluorobenzene (4-BFB)			1.78	mg/Kg	1	2.00	89	70 - 130

**Sample: 310953 - AH-1 1-1.5'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 95569  
Prep Batch: 80964

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2012-10-09  
Sample Preparation: 2012-10-08

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

**Sample: 310954 - AH-1 2-2.5'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 95569  
Prep Batch: 80964

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2012-10-09  
Sample Preparation: 2012-10-08

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

*continued ...*

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sample 310954 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

**Sample: 310955 - AH-1 3-3.5'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 95569  
Prep Batch: 80964

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2012-10-09  
Sample Preparation: 2012-10-08

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

**Sample: 310956 - AH-1 4-4.5'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 95569  
Prep Batch: 80964

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2012-10-09  
Sample Preparation: 2012-10-08

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

**Sample: 310957 - AH-1 5-5.5'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 95569  
Prep Batch: 80964

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2012-10-09  
Sample Preparation: 2012-10-08

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR



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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

**Sample: 310958 - AH-1 6-6.5'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2012-10-09	Analyzed By:	AR
QC Batch:	95569	Sample Preparation:	2012-10-08	Prepared By:	AR
Prep Batch:	80964				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

**Sample: 310959 - AH-1 7-7.5'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2012-10-09	Analyzed By:	AR
QC Batch:	95569	Sample Preparation:	2012-10-08	Prepared By:	AR
Prep Batch:	80964				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

**Sample: 310960 - AH-1 8-8.5'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2012-10-09	Analyzed By:	AR
QC Batch:	95570	Sample Preparation:	2012-10-08	Prepared By:	AR
Prep Batch:	80964				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			74.6	mg/Kg	5	4.00

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**Sample: 310961 - AH-2 0-1'**

Laboratory: Midland  
Analysis: BTEX  
QC Batch: 95513  
Prep Batch: 80935

Analytical Method: S 8021B  
Date Analyzed: 2012-10-06  
Sample Preparation: 2012-10-06

Prep Method: S 5035  
Analyzed By: YG  
Prepared By: YG

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.73	mg/Kg	1	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)			1.62	mg/Kg	1	2.00	81	70 - 130

**Sample: 310961 - AH-2 0-1'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 95570  
Prep Batch: 80964

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2012-10-09  
Sample Preparation: 2012-10-08

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

**Sample: 310961 - AH-2 0-1'**

Laboratory: Midland  
Analysis: TPH DRO - NEW  
QC Batch: 95522  
Prep Batch: 80944

Analytical Method: S 8015 D  
Date Analyzed: 2012-10-08  
Sample Preparation: 2012-10-05

Prep Method: N/A  
Analyzed By: CW  
Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			106	mg/Kg	1	100	106	70 - 130



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**Sample: 310961 - AH-2 0-1'**

Laboratory: Midland  
Analysis: TPH GRO  
QC Batch: 95521  
Prep Batch: 80935

Analytical Method: S 8015 D  
Date Analyzed: 2012-10-06  
Sample Preparation: 2012-10-06

Prep Method: S 5035  
Analyzed By: YG  
Prepared By: YG

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	u	1	<1.00	mg/Kg	1	1.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.14	mg/Kg	1	2.00	107	70 - 130
4-Bromofluorobenzene (4-BFB)			1.68	mg/Kg	1	2.00	84	70 - 130

**Sample: 310962 - AH-2 1-1.5'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 95570  
Prep Batch: 80964

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2012-10-09  
Sample Preparation: 2012-10-08

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

**Sample: 310963 - AH-2 2-2.5'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 95570  
Prep Batch: 80964

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2012-10-09  
Sample Preparation: 2012-10-08

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

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**Sample: 310964 - AH-2 3-3.5'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2012-10-09	Analyzed By:	AR
QC Batch:	95570	Sample Preparation:	2012-10-08	Prepared By:	AR
Prep Batch:	80964				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			94.5	mg/Kg	5	4.00

**Sample: 310965 - AH-2 4-4.5'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2012-10-09	Analyzed By:	AR
QC Batch:	95570	Sample Preparation:	2012-10-08	Prepared By:	AR
Prep Batch:	80964				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

**Sample: 310966 - AH-2 5-5.5'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2012-10-09	Analyzed By:	AR
QC Batch:	95570	Sample Preparation:	2012-10-08	Prepared By:	AR
Prep Batch:	80964				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

**Sample: 310967 - AH-2 6-6.5'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2012-10-09	Analyzed By:	AR
QC Batch:	95570	Sample Preparation:	2012-10-08	Prepared By:	AR
Prep Batch:	80964				



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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<20.0	mg/Kg	5	4.00

**Sample: 310968 - AH-2 7-7.5'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 95570  
Prep Batch: 80964

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2012-10-09  
Sample Preparation: 2012-10-08

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

**Sample: 310969 - AH-2 7.5-8'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 95570  
Prep Batch: 80964

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2012-10-09  
Sample Preparation: 2012-10-08

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

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Method Blanks

Method Blank (1)      QC Batch: 95513

QC Batch: 95513  
Prep Batch: 80935

Date Analyzed: 2012-10-06  
QC Preparation: 2012-10-06

Analyzed By: YG  
Prepared By: YG

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1	<0.00100	mg/Kg	0.02
Toluene		1	<0.00100	mg/Kg	0.02
Ethylbenzene		1	<0.00110	mg/Kg	0.02
Xylene		1	<0.00360	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.70	mg/Kg	1	2.00	85	70 - 130
4-Bromofluorobenzene (4-BFB)			1.64	mg/Kg	1	2.00	82	70 - 130

Method Blank (1)      QC Batch: 95521

QC Batch: 95521  
Prep Batch: 80935

Date Analyzed: 2012-10-06  
QC Preparation: 2012-10-06

Analyzed By: YG  
Prepared By: YG

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		1	<0.482	mg/Kg	1

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.82	mg/Kg	1	2.00	91	70 - 130
4-Bromofluorobenzene (4-BFB)			1.70	mg/Kg	1	2.00	85	70 - 130

Method Blank (1)      QC Batch: 95522

QC Batch: 95522  
Prep Batch: 80944

Date Analyzed: 2012-10-08  
QC Preparation: 2012-10-05

Analyzed By: CW  
Prepared By: CW



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Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1	<9.09	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			110	mg/Kg	1	100	110	70 - 130

**Method Blank (1)**      QC Batch: 95569

QC Batch: 95569  
Prep Batch: 80964

Date Analyzed: 2012-10-09  
QC Preparation: 2012-10-08

Analyzed By: AR  
Prepared By: AR

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.85	mg/Kg	4

**Method Blank (1)**      QC Batch: 95570

QC Batch: 95570  
Prep Batch: 80964

Date Analyzed: 2012-10-09  
QC Preparation: 2012-10-08

Analyzed By: AR  
Prepared By: AR

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.85	mg/Kg	4

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## Laboratory Control Spikes

### Laboratory Control Spike (LCS-1)

QC Batch: 95513  
Prep Batch: 80935

Date Analyzed: 2012-10-06  
QC Preparation: 2012-10-06

Analyzed By: YG  
Prepared By: YG

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.97	mg/Kg	1	2.00	<0.00100	98	70 - 130
Toluene		1	1.80	mg/Kg	1	2.00	<0.00100	90	70 - 130
Ethylbenzene		1	1.75	mg/Kg	1	2.00	<0.00110	88	70 - 130
Xylene		1	5.32	mg/Kg	1	6.00	<0.00360	89	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	1.82	mg/Kg	1	2.00	<0.00100	91	70 - 130	8	20
Toluene		1	1.67	mg/Kg	1	2.00	<0.00100	84	70 - 130	8	20
Ethylbenzene		1	1.64	mg/Kg	1	2.00	<0.00110	82	70 - 130	6	20
Xylene		1	4.97	mg/Kg	1	6.00	<0.00360	83	70 - 130	7	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.74	1.72	mg/Kg	1	2.00	87	86	70 - 130
4-Bromofluorobenzene (4-BFB)	1.72	1.67	mg/Kg	1	2.00	86	84	70 - 130

### Laboratory Control Spike (LCS-1)

QC Batch: 95521  
Prep Batch: 80935

Date Analyzed: 2012-10-06  
QC Preparation: 2012-10-06

Analyzed By: YG  
Prepared By: YG

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	17.8	mg/Kg	1	20.0	3.63	71	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

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Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	16.4	mg/Kg	1	20.0	3.63	82	70 - 130	8	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.08	2.07	mg/Kg	1	2.00	104	104	70 - 130
4-Bromofluorobenzene (4-BFB)	1.82	1.82	mg/Kg	1	2.00	91	91	70 - 130

#### Laboratory Control Spike (LCS-1)

QC Batch: 95522  
Prep Batch: 80944

Date Analyzed: 2012-10-08  
QC Preparation: 2012-10-05

Analyzed By: CW  
Prepared By: CW

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	241	mg/Kg	1	250	<9.09	96	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		1	290	mg/Kg	1	250	<9.09	116	70 - 130	18	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
n-Tricosane	125	113	mg/Kg	1	100	125	113	70 - 130

#### Laboratory Control Spike (LCS-1)

QC Batch: 95569  
Prep Batch: 80964

Date Analyzed: 2012-10-09  
QC Preparation: 2012-10-08

Analyzed By: AR  
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2600	mg/Kg	1	2500	<3.85	104	85 - 115

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Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2530	mg/Kg	1	2500	<3.85	101	85 - 115	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

#### Laboratory Control Spike (LCS-1)

QC Batch: 95570  
Prep Batch: 80964

Date Analyzed: 2012-10-09  
QC Preparation: 2012-10-08

Analyzed By: AR  
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2620	mg/Kg	1	2500	<3.85	105	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2710	mg/Kg	1	2500	<3.85	108	85 - 115	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

#### Matrix Spike (MS-1) Spiked Sample: 310961

QC Batch: 95513  
Prep Batch: 80935

Date Analyzed: 2012-10-06  
QC Preparation: 2012-10-06

Analyzed By: YG  
Prepared By: YG

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.55	mg/Kg	1	2.00	<0.00100	78	70 - 130
Toluene		1	1.67	mg/Kg	1	2.00	<0.00100	84	70 - 130
Ethylbenzene		1	1.74	mg/Kg	1	2.00	<0.00110	87	70 - 130
Xylene		1	5.31	mg/Kg	1	6.00	<0.00360	88	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	1.60	mg/Kg	1	2.00	<0.00100	80	70 - 130	3	20
Toluene		1	1.72	mg/Kg	1	2.00	<0.00100	86	70 - 130	3	20
Ethylbenzene		1	1.77	mg/Kg	1	2.00	<0.00110	88	70 - 130	2	20
Xylene		1	5.40	mg/Kg	1	6.00	<0.00360	90	70 - 130	2	20



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Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.72	1.73	mg/Kg	1	2	86	86	70 - 130
4-Bromofluorobenzene (4-BFB)	1.70	1.70	mg/Kg	1	2	85	85	70 - 130

**Matrix Spike (MS-1)** Spiked Sample: 310961

QC Batch: 95521  
Prep Batch: 80935

Date Analyzed: 2012-10-06  
QC Preparation: 2012-10-06

Analyzed By: YG  
Prepared By: YG

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	19.7	mg/Kg	1	20.0	<0.482	98	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	17.0	mg/Kg	1	20.0	<0.482	85	70 - 130	15	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.53	2.11	mg/Kg	1	2	126	106	70 - 130
4-Bromofluorobenzene (4-BFB)	1.80	1.84	mg/Kg	1	2	90	92	70 - 130

**Matrix Spike (MS-1)** Spiked Sample: 311080

QC Batch: 95522  
Prep Batch: 80944

Date Analyzed: 2012-10-08  
QC Preparation: 2012-10-05

Analyzed By: CW  
Prepared By: CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	266	mg/Kg	1	250	<9.09	106	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		1	251	mg/Kg	1	250	<9.09	100	70 - 130	6	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

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Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane	109	108	mg/Kg	1	100	109	108	70 - 130

**Matrix Spike (MS-1)** Spiked Sample: 310959

QC Batch: 95569  
Prep Batch: 80964

Date Analyzed: 2012-10-09  
QC Preparation: 2012-10-08

Analyzed By: AR  
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2670	mg/Kg	5	2500	<19.2	107	78.9 - 121

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2610	mg/Kg	5	2500	<19.2	104	78.9 - 121	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Matrix Spike (MS-1)** Spiked Sample: 310969

QC Batch: 95570  
Prep Batch: 80964

Date Analyzed: 2012-10-09  
QC Preparation: 2012-10-08

Analyzed By: AR  
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2580	mg/Kg	5	2500	<19.2	103	78.9 - 121

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2700	mg/Kg	5	2500	<19.2	108	78.9 - 121	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.



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## Calibration Standards

### Standard (CCV-1)

QC Batch: 95513

Date Analyzed: 2012-10-06

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.101	101	80 - 120	2012-10-06
Toluene		1	mg/kg	0.100	0.0902	90	80 - 120	2012-10-06
Ethylbenzene		1	mg/kg	0.100	0.0859	86	80 - 120	2012-10-06
Xylene		1	mg/kg	0.300	0.260	87	80 - 120	2012-10-06

### Standard (CCV-2)

QC Batch: 95513

Date Analyzed: 2012-10-06

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0825	82	80 - 120	2012-10-06
Toluene		1	mg/kg	0.100	0.0867	87	80 - 120	2012-10-06
Ethylbenzene		1	mg/kg	0.100	0.0868	87	80 - 120	2012-10-06
Xylene		1	mg/kg	0.300	0.263	88	80 - 120	2012-10-06

### Standard (CCV-3)

QC Batch: 95513

Date Analyzed: 2012-10-06

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0824	82	80 - 120	2012-10-06
Toluene		1	mg/kg	0.100	0.0871	87	80 - 120	2012-10-06
Ethylbenzene		1	mg/kg	0.100	0.0857	86	80 - 120	2012-10-06
Xylene		1	mg/kg	0.300	0.260	87	80 - 120	2012-10-06

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#### Standard (CCV-1)

QC Batch: 95521

Date Analyzed: 2012-10-06

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.16	116	80 - 120	2012-10-06

#### Standard (CCV-2)

QC Batch: 95521

Date Analyzed: 2012-10-06

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.872	87	80 - 120	2012-10-06

#### Standard (CCV-3)

QC Batch: 95521

Date Analyzed: 2012-10-06

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.14	114	80 - 120	2012-10-06

#### Standard (CCV-1)

QC Batch: 95522

Date Analyzed: 2012-10-08

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	290	116	80 - 120	2012-10-08

#### Standard (CCV-2)

QC Batch: 95522

Date Analyzed: 2012-10-08

Analyzed By: CW



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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	284	114	80 - 120	2012-10-08

#### Standard (CCV-3)

QC Batch: 95522

Date Analyzed: 2012-10-08

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	220	88	80 - 120	2012-10-08

#### Standard (CCV-4)

QC Batch: 95522

Date Analyzed: 2012-10-08

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	226	90	80 - 120	2012-10-08

#### Standard (CCV-1)

QC Batch: 95569

Date Analyzed: 2012-10-09

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.2	99	85 - 115	2012-10-09

#### Standard (CCV-2)

QC Batch: 95569

Date Analyzed: 2012-10-09

Analyzed By: AR

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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2012-10-09

**Standard (CCV-1)**

QC Batch: 95570

Date Analyzed: 2012-10-09

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2012-10-09

**Standard (CCV-2)**

QC Batch: 95570

Date Analyzed: 2012-10-09

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.2	99	85 - 115	2012-10-09



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## Appendix

### Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

### Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704392-12-4	Midland

### Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less than ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

### Attachments

The scanned attachments will follow this page.  
Please note, each attachment may consist of more than one page.







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1625 N. French Dr., Hobbs, NM 88240  
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**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

CONDITIONS  
  
Action 233571

CONDITIONS

Operator: COG OPERATING LLC 600 W Illinois Ave Midland, TX 79701	OGRID: 229137
	Action Number: 233571
	Action Type: [IM-SD] Incident File Support Doc (ENV) (IM-BNF)

CONDITIONS

Created By	Condition	Condition Date
jharimon	None	6/27/2023