SITE INFORMATION

Report Type: Closure Report

General Site Information:						
Site:	Southwest Central Tank Battery					
Company:	COG Operating LLC					
Section, Township and Range	Unit O	Sec 20	T17S	R30E		
Lease Number:	NMNM-0467932					
County:	Eddy County					
GPS:	32.8154			103.99518		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	From Loco Hills, New Mexico, intersection of Highway 82 and Hagerman Cutoff Road, go west on Highway 82 for 0.6 miles and turn south into lease road. Go 0.1 miles and lease road will vear to the east, turn south through a well location and go 0.1 miles to location					

Release Data:	Spill #1	Spill #2	Spill #3
Date Released:	8/2/2010	8/31/2010	12/31/2010
Type Release:	oil and produced water	produced water	produced water
Source of Contamination:	water tank	6" steel line	equalizer line
Fluid Released:	4 bbls oil and 60 water	100 bbls	150 bbls
Fluids Recovered:	2 bbls oil and 30 water	98 bbls	80 bbls

Official Communication:			
Name:	Pat Ellis		Ike Tavarez
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:	pellis@conchoresources.com		ike.tavarez@tetratech.com

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AUG 23 2013
NMOCD ARTESIA

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

TETRA TECH

June 20, 2013

Mr. Mike Bratcher
Environmental Engineer Specialist
Oil Conservation Division
District 2 1301 West Grand Avenue
Artesia, New Mexico 88210

Re: Closure Report for the COG Operating LLC., Southwest Central Tank Battery, Unit 0, Section 20, Township 17 South, Range 30 East, Eddy County, New Mexico.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess (3) three spills at the Southwest Central Tank Battery, Unit 0, Section 20, Township 17 South, Range 30 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.81557°, W 103.99519°. The site location is shown on Figures 1 and 2.

Background

COG Operating has reported three spills at the facility and submitted the initial C-141 forms for each spill to the NMOCD. For this work plan, the spills will be referenced as Spill #1, #2 and #3. The approximate spill footprint areas are shown on Figure 3.

Spill #1

According to the State of New Mexico C-141 Initial Report, the leak was discovered on August 2, 2010, and released approximately sixty (60) barrels of produced water and four (4) barrels of crude oil. The spill was caused by a failed water pump and overflowed the water tanks. COG personnel repaired the pump and returned the tank to operation. Thirty (30) barrels of produced water and two (2) barrels of crude oil were recovered. The spill initiated at the battery and impacted the north side of the facility pad measuring approximately 100' x 110' and migrated south off the pad in the pasture measuring approximately 100' x 110'. The initial C-141 form is enclosed in Appendix A.

Tetra Tech
1910 North Big Spring Midland,TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

Spill #2

According to the State of New Mexico C-141 Initial Report, the leak was discovered on August 31, 2010, and released approximately one hundred (100) barrels of produced water. The spill was caused by a corroding 6" steel line which developed a hole. A new poly line was installed to replace the steel line. Ninety eight (98) barrels of produced water were recovered by the use of a vacuum truck. The spill initiated from the steel line located south of tank battery and fluids migrated south into the pasture measuring approximately 35' x 35'. The spill area encompassed part of the 1st spill footprint. The initial C-141 form is enclosed in Appendix A.

Spill #3

According to the State of New Mexico C-141 Initial Report, the leak was discovered on December 31, 2010, and released approximately one hundred and fifty (150) barrels of produced water. The spill was caused by a PVC adaptor freezing and cracking. Eighty (80) barrels of produced water were recovered by the use of a vacuum truck. The spill initiated at the tank battery and migrated off the pad impacting an area of approximately 8' x 100' and 40' x 150' overlapping the two previous spills in the pasture south of the tank battery. The initial C-141 form is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 20. According to the NMOCD groundwater map, the average depth to groundwater in this area is approximately 250' below surface. The groundwater data is shown in Appendix B.

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 5,000 mg/kg.

Soil Assessment and Analytical Results Spill#1

Spill #1 and Spill #2

On August 10, 2010, Tetra Tech personnel inspected and sampled the spill area. A total of seven (7) auger holes (AH-1 through AH-7) were installed using a

stainless steel hand auger to assess the impacted soils. 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 B. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, all the submitted samples were below RRAL for TPH and BTEX. Auger holes (AH-1, AH-2, AH-3, AH-4 and AH-7) were not vertically defined and showed elevated chloride concentrations of 4,320 mg/kg (9-9.5'), 4,120 mg/kg (7-7.5'), 9,530 mg/kg (5-5.5'), 1,070 mg/kg (9-9.5'), and 2,040 mg/kg (2.5-3') respectively. Auger holes (AH-5 and AH-6) did detect elevated chloride concentrations at surface and significantly declined with depth. In order to define the impact of the chloride concentrations, Tech Tetra installed boreholes using an air rotary drilling rig.

Prior to drilling the soil borings, the second spill occurred at the site. The footprint of the second spill overlapped a portion of the first spill in the pasture. The footprint of the second spill is shown on Figure 3. On November 17, 2010, Tetra Tech supervised the installation of soil borings. The soil boring samples were collected to a maximum depth of 30' below ground surface. The soil boring locations are shown on Figure 3. The sampling results are summarized in Table 1. The soil boring locations are shown on Figure 3. Referring to Table 1, the chloride impact was defined and significantly declined with depth at approximately 10.0' below surface.

Spill #3

On December 31, 2010, the third spill occurred at the site overlapping the first and second spill area in the pasture. On February 15, 2011, Tetra Tech installed additional soil borings. Tech personnel supervised the installation of five soil borings (SB-1 through SB-5) utilizing an air rotary drilling rig. The soil boring locations are shown on Figure 3. The sampling results are summarized in Table 1. The soil boring locations are shown on Figure 3. Referring to Table 1, the chloride impact declined with depth with chloride concentrations declining to 634 mg/kg at SB-1 (10.0'), 240 mg/kg at SB-2 (15.0') and 269 mg/kg at SB-3 (20.0').

Closure Activities

Based on the approved work plan, Tetra Tech personnel supervised the excavation of the site. For safety concerns, COG had moved two of the water tanks located along the east edge of the pad. The tanks were installed on the east side of the pad, which encompassed a portion of the spill area.

The final excavation depths of the soil remediation were met as stated in the approved work plan. The excavation depths are highlighted in Table 1 and shown on Figure 4. Once excavated to the appropriate depths, Tetra Tech collected confirmation samples from the pad and in the pasture area.

TETRA TECH

Referring to Table 1, all of the bottom hole confirmation samples collected on the pad showed that the maximum extent of chloride contamination was removed. The confirmation samples collected in the pasture showed elevated chloride concentrations present in the excavation bottoms at 7.0' and 10.0' below surface. Based on the data, the areas of AH-1, AH-2 and AH-3 were capped with a 40 mil liner at a depth of approximately 4.0' below surface. The areas of AH-4 and AH-7 on the pad were also capped with clay material at approximately 3.0' below surface. All of the excavated areas were backfilled with clean soil to grade. Approximately 2,100 cubic yards of soil were excavated and hauled to R360 for proper disposal.

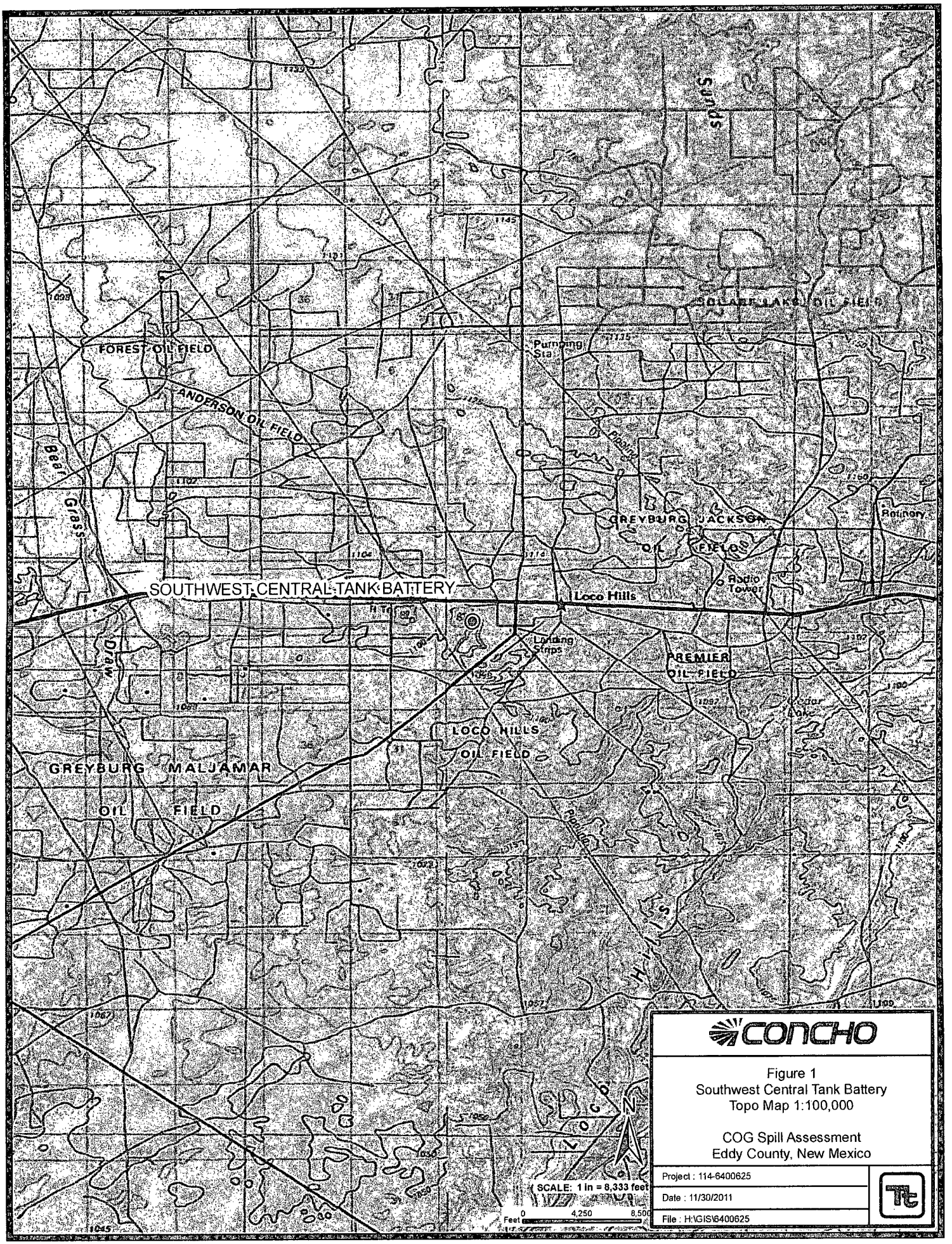
Based on the remedial activities performed, COG request closure of the site. Copies of the C-141's (Finals) are included in Appendix A. If you have any questions or comments concerning the remedial activities, please call at (432) 682-4559.

Respectfully submitted,
TETRA TECH

Ike Tavarez, PG
Project Manager

cc: Pat Ellis – COG
Mike Burton – BLM

FIGURES



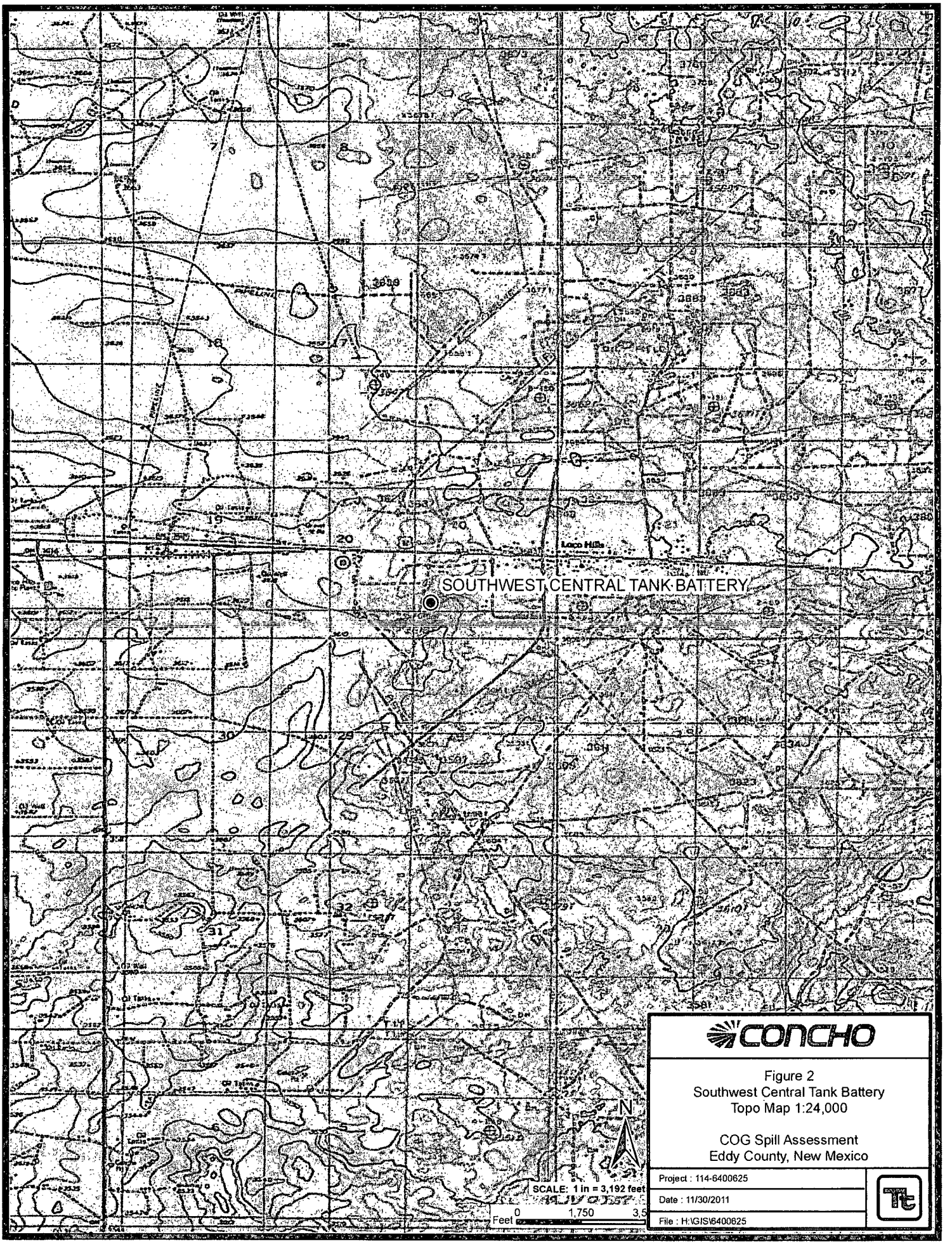
CONCHO

Figure 1
Southwest Central Tank Battery
Topo Map 1:100,000

COG Spill Assessment
Eddy County, New Mexico

Project : 114-6400625	
Date : 11/30/2011	
File : H:\GIS\6400625	

Drawn By: Isabel Marmolejo



CONCHO

Figure 2
Southwest Central Tank Battery
Topo Map 1:24,000

COG Spill Assessment
Eddy County, New Mexico

Project : 114-6400625	
Date : 11/30/2011	
File : H:\GIS\6400625	

Drawn By: Isabel Marmolejo

PASTURE

VEGETATION AREA

PUMP

SOUTHWEST
CENTRAL TANK
BATTERY

ELEV. TANK PAD

250 BBL OIL

OPEN TOP

HT

HT

HT

HT

HT

PAD

65'

30'

85'

110'

AH-5

SB-1 #1S

AH-1

AH-4

SB-2 #1S

ELEC PANEL

ELEC PANEL

FIRE PUMP

LEAK SOURCE

ELEV. TANK PAD

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

300 OIL

300 OIL

500 WATER

500 WATER

S

S

PASTURE

100'

105'

SB-3 #2S

AH-3

SB-5 #1S

SB-2 #2S

AH-2

SB-3 #1S

SB-1 #2S

AH-1

SB-4 #1S

EXPLANATION

- SPILL #1 AUGER HOLE SAMPLE LOCATIONS
- LEAK SOURCE
- SPILL #1 SOIL BORING SAMPLE LOCATIONS
- SPILL #2 SOIL BORING SAMPLE LOCATIONS
- SOUTHWEST CENTRAL TANK BATTERY

- FENCE
- HEADER
- STEEL LINE
- SPILL #1
- SPILL #2
- SPILL #3

N

SCALE: 1 IN = 59 FEET

Feet 0 30 60

CONCHO

Figure 3

Southwest Central Tank Battery

Spill Assessment Map

Eddy County, New Mexico

Project : 114-6400625

Date : 11/30/2011

File : H:\GIS\6400625

Drawn By: Isabel Marmolejo

VEGETATION AREA

PASTURE

ELEV. TANK PAD

250 BBL OIL

OPEN TOP

HT

HT

HT

HT

HT

PAD

4' DEEP
W/ CLAY CAP

SOUTHWEST
CENTRAL TANK
BATTERY

PUMP

1' DEEP

65'

AH-5

SB-1 #1S

CS-5

AH-7

30'

85'

AH-6

1' DEEP

ELEV. TANK PAD

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

500 OIL

300 OIL

300 OIL

S

S

4' DEEP
W/ CLAY CAP

CS-4

AH-4

SB-2 #1S

110'

500 WATER

CIRC PUMP

500 WATER

LEAK SOURCE

ELEC PANEL

ELEC PANEL

10' DEEP W/ LINER

100'

CS-3

AH-3

SB-3 #2S

SB-5 #1S

CS-2

AH-2

SB-2 #2S

SB-3 #1S

105'

CS-1

AH-1

SB-1 #2S

SB-4 #1S

7' DEEP W/ LINER

PASTURE

EXPLANATION

- SPILL #1 AUGER HOLE SAMPLE LOCATIONS
- LEAK SOURCE
- SPILL #1 SOIL BORING SAMPLE LOCATIONS
- SPILL #2 SOIL BORING SAMPLE LOCATIONS
- CONFIRMATION SAMPLE LOCATIONS
- FENCE
- HEADER
- STEEL LINE
- EXCAVATED AREAS
- CLAY CAP
- INSTALLED LINER

N

SCALE: 1 IN = 59 FEET

Feet 0 30 60

CONCHO

Figure 4

Southwest Central Tank Battery

Excavation Areas & Depths Map

Eddy County, New Mexico

Project : 114-6400625

Date : 6/20/2013

File : H:\GIS\6400625

Drawn By: Isabel Marmolejo

TABLES

Table 1
COG Operating LLC.
SOUTHWEST CENTRAL TANK BATTERY
EDDY COUNTY, NEW MEXICO

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
Pasture - Spill 3 - Spill Assessment (Overlapped Spills 1 and 2)													
SB-1	2/15/11	0-1'			X								8,780
Liner		3'			X								3,190
		5'			X								3,270
		7'			X								6,050
		10'		X									639
		15'		X									<200
		20'		X									<200
		25'		X									<200
		30'		X									<200
Pasture - Spill 1 and Spill 2 - Assessment Data													
AH-1	8/10/10	0-1'			X	<2.00	234	234	<0.0200	<0.0200	<0.0200	<0.0200	3,220
		1-1.5'			X	-	-	-	-	-	-	-	5,080
	"	2-2.5'			X	-	-	-	-	-	-	-	5,970
Liner	"	3-3.5'			X	-	-	-	-	-	-	-	12,100
	"	4-4.5'			X	-	-	-	-	-	-	-	12,800
	"	5-5.5'			X	-	-	-	-	-	-	-	13,700
	"	6-6.5'			X	-	-	-	-	-	-	-	13,000
	"	7-7.5'		X		-	-	-	-	-	-	-	10,000
	"	8-8.5'		X		-	-	-	-	-	-	-	7,010
	"	9-9.5'		X		-	-	-	-	-	-	-	4,320
SB-4	11/17/10	0-1'			X	-	-	-	-	-	-	-	3,710
Liner	"	3'			X	-	-	-	-	-	-	-	2,080
	"	5'			X	-	-	-	-	-	-	-	8,930
	"	7'			X	-	-	-	-	-	-	-	11,300
	"	10'		X		-	-	-	-	-	-	-	3,190
	"	15'		X		-	-	-	-	-	-	-	302
	"	20'		X		-	-	-	-	-	-	-	<200
	"	25'		X		-	-	-	-	-	-	-	<200
	"	30'		X		-	-	-	-	-	-	-	<200
CS-1 South Wall	2/28/13	-		X		-	-	-	-	-	-	-	<20.0
CS-1 East Wall	"	-		X		-	-	-	-	-	-	-	215
CS-1 West Wall	"	-		X		-	-	-	-	-	-	-	105
CS-1 Bottom Hole	"	7'		X		-	-	-	-	-	-	-	8,160

Table 1
COG Operating LLC.
SOUTHWEST CENTRAL TANK BATTERY
EDDY COUNTY, NEW MEXICO

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
Pasture - Spill 3 - Spill Assessment (Overlapped Spills 1 and 2)													
SB-2	2/15/11	0-1'			X								8,320
Liner		3'			X								5,590
		5'			X								5,700
		7'			X								5,520
		10'			X								3,450
		15'		X									240
		20'		X									<200
		25'		X									281
		30'		X									245
Pasture - Spill 1 and Spill 2 - Assessment Data													
AH-2	8/10/10	0-1'			X	<2.00	323	323	<0.0200	<0.0200	<0.0200	<0.0200	3,210
	"	1-1.5'			X	-	-	-	-	-	-	-	451
	"	2-2.5'			X	-	-	-	-	-	-	-	868
Liner	"	3-3.5'			X	-	-	-	-	-	-	-	963
	"	4-4.5'			X	-	-	-	-	-	-	-	2,790
	"	5-5.5'			X	-	-	-	-	-	-	-	3,460
	"	6-6.5'			X	-	-	-	-	-	-	-	2,940
	"	7-7.5'			X	-	-	-	-	-	-	-	4,120
SB-3	11/17/10	0-1'			X	-	-	-	-	-	-	-	3,340
Liner	"	3'			X	-	-	-	-	-	-	-	1,120
	"	5'			X	-	-	-	-	-	-	-	2,360
	"	7'			X	-	-	-	-	-	-	-	2,590
	"	10'			X	-	-	-	-	-	-	-	1,690
	"	15'		X		-	-	-	-	-	-	-	<200
	"	20'		X		-	-	-	-	-	-	-	<200
	"	25'		X		-	-	-	-	-	-	-	<200
CS-2 North Wall	3/1/13	-		X		-	-	-	-	-	-	-	215
CS-2 South Wall	"	-		X		-	-	-	-	-	-	-	210
CS-2 East Wall	"	-		X		-	-	-	-	-	-	-	653
CS-2 Bottom Hole	"	10'		X		-	-	-	-	-	-	-	4,300

Table 1
COG Operating LLC.
SOUTHWEST CENTRAL TANK BATTERY
EDDY COUNTY, NEW MEXICO

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
Pasture - Spill 3 - Spill Assessment		**(Overlapped Spill 1 and 2)**											
SB-3	2/15/11	0-1'			X								11,800
Liner		3'			X								4,910
		5'			X								3,240
		7'			X								9,690
		10'			X								4,090
		15'		X									2,090
		20'		X									269
		25'		X									<200
		30'		X									<200
		40'		X									<200
		50'		X									<200
Pasture - Spill 1 and Spill 2 - Assessment Data													
AH-3	8/10/10	0-1'			X	<10.0	3,020	3,020	<0.100	<0.100	<0.100	<0.100	1,220
	"	1-1.5'			X	-	-	-	-	-	-	-	1,590
	"	2-2.5'			X	-	-	-	-	-	-	-	4,980
Liner	"	3-3.5'			X	-	-	-	-	-	-	-	6,860
	"	4-4.5'			X	-	-	-	-	-	-	-	7,740
	"	5-5.5'			X	-	-	-	-	-	-	-	9,530
SB-5	11/17/10	0-1'			X	-	-	-	-	-	-	-	2,710
Liner	"	3'			X	-	-	-	-	-	-	-	7,480
	"	5'			X	-	-	-	-	-	-	-	7,320
	"	7'			X	-	-	-	-	-	-	-	11,000
	"	10'			X	-	-	-	-	-	-	-	4,740
	"	15'		X		-	-	-	-	-	-	-	3,880
	"	20'		X		-	-	-	-	-	-	-	266
	"	25'		X		-	-	-	-	-	-	-	<200
	"	30'		X		-	-	-	-	-	-	-	205
CS-3 Southeast Wall	3/1/13	-		X		-	-	-	-	-	-	-	352
CS-3 East Wall	"	-		X		-	-	-	-	-	-	-	78.3
CS-3 West Wall	"	-		X		-	-	-	-	-	-	-	308
CS-3 Bottom Hole	"	10'		X		-	-	-	-	-	-	-	6,130

Table 1
COG Operating LLC.
SOUTHWEST CENTRAL TANK BATTERY
EDDY COUNTY, NEW MEXICO

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
Pad Area - Spill 1 - Assessment Data													
AH-4	8/10/10	0-1'			X	<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	8,740
	"	1-1.5'			X								3,720
	"	2-2.5'			X								3,500
	"	3-3.5'			X								3,500
	"	4-4.5'		X		-	-	-	-	-	-	-	1,490
	"	5-5.5'		X		-	-	-	-	-	-	-	3,210
	"	6-6.5'		X		-	-	-	-	-	-	-	1,220
	"	7-7.5'		X		-	-	-	-	-	-	-	559
	"	8-8.5'		X		-	-	-	-	-	-	-	640
	"	9-9.5'		X		-	-	-	-	-	-	-	1,070
SB-2	11/17/10	0-1'			X								11,600
Clay	"	3'			X								13,400
	"	5'		X		-	-	-	-	-	-	-	2,270
	"	7'		X		-	-	-	-	-	-	-	2,770
	"	10'		X		-	-	-	-	-	-	-	1,320
	"	15'		X		-	-	-	-	-	-	-	<200
	"	20'		X		-	-	-	-	-	-	-	<200
	"	25'		X		-	-	-	-	-	-	-	<200
CS-4 North Wall	3/8/13	-		X		-	-	-	-	-	-	-	364
CS-4 South Wall	"	-		X		-	-	-	-	-	-	-	3,740
CS-4 East Wall	"	-		X		-	-	-	-	-	-	-	2,490
CS-3 Bottom Hole	"	-		X		-	-	-	-	-	-	-	519
CS-4 West Wall	3/11/13	-		X		-	-	-	-	-	-	-	4,850

Table 1
COG Operating LLC.
SOUTHWEST CENTRAL TANK BATTERY
EDDY COUNTY, NEW MEXICO

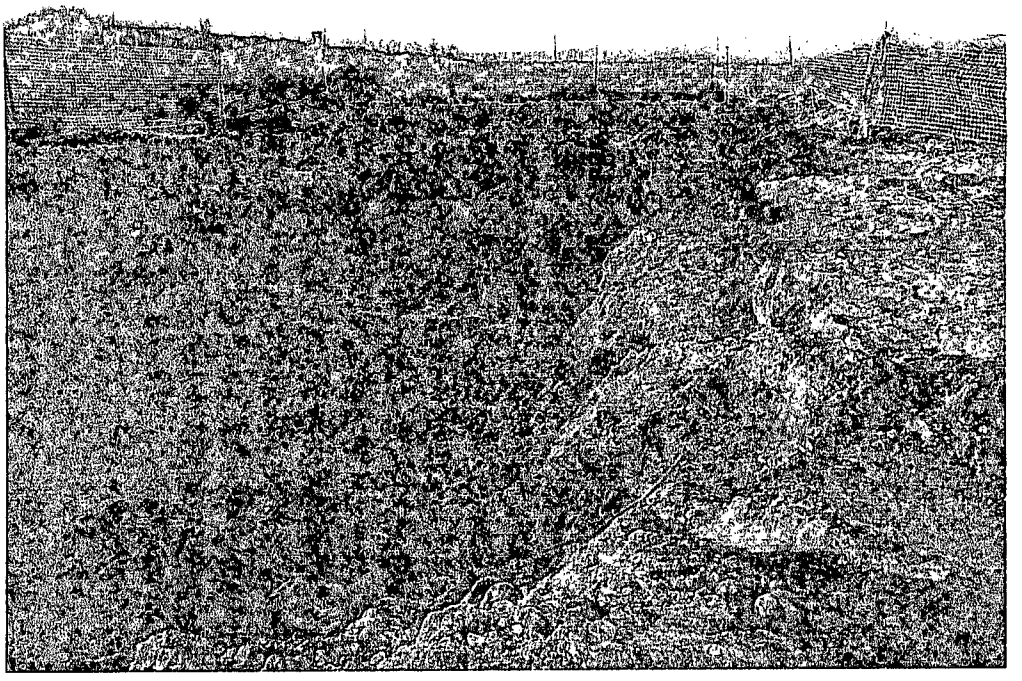
Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
Pad Area - Spill 1 - Assessment Data													
AH-5	8/10/10	0-1'			X	<2.00	<50.0	<50.0					7,900
	"	1-1.5'		X		-	-	-	-	-	-	-	1,090
	"	2-2.5'		X		-	-	-	-	-	-	-	255
	"	3-3.5'		X		-	-	-	-	-	-	-	<200
AH-6	8/10/10	0-1'		X		<2.00	<50.0	<50.0					1,640
	"	1-1.5'		X		-	-	-	-	-	-	-	208
	"	2-2.5'		X		-	-	-	-	-	-	-	223
AH-7	8/10/10	0-1'			X	<2.00	<50.0	<50.0					4,250
	"	1-1.5'			X								1,090
	"	2-2.5'			X								951
	"	2.5-3.0'			X								2,040
SB-1	11/17/10	0-1'			X								4,450
	"	3'			X								3,920
Clay	"	5'		X		-	-	-	-	-	-	-	3,160
	"	7'		X		-	-	-	-	-	-	-	2,930
	"	10'		X		-	-	-	-	-	-	-	570
	"	15'		X		-	-	-	-	-	-	-	293
	"	20'		X		-	-	-	-	-	-	-	370
CS-5 North Wall	3/8/13	-		X		-	-	-	-	-	-	-	349
CS-5 East Wall	"	-		X		-	-	-	-	-	-	-	1,140
CS-5 West Wall	"	-		X		-	-	-	-	-	-	-	162
CS-5 Bottom Hole	"	-		X		-	-	-	-	-	-	-	2,040
CS-5 South Wall	3/11/13	-		X		-	-	-	-	-	-	-	737

BEB — Below Excavation Bottom
(--) — Not Analyzed
[illegible] — Excavation Depths
Liner Installation

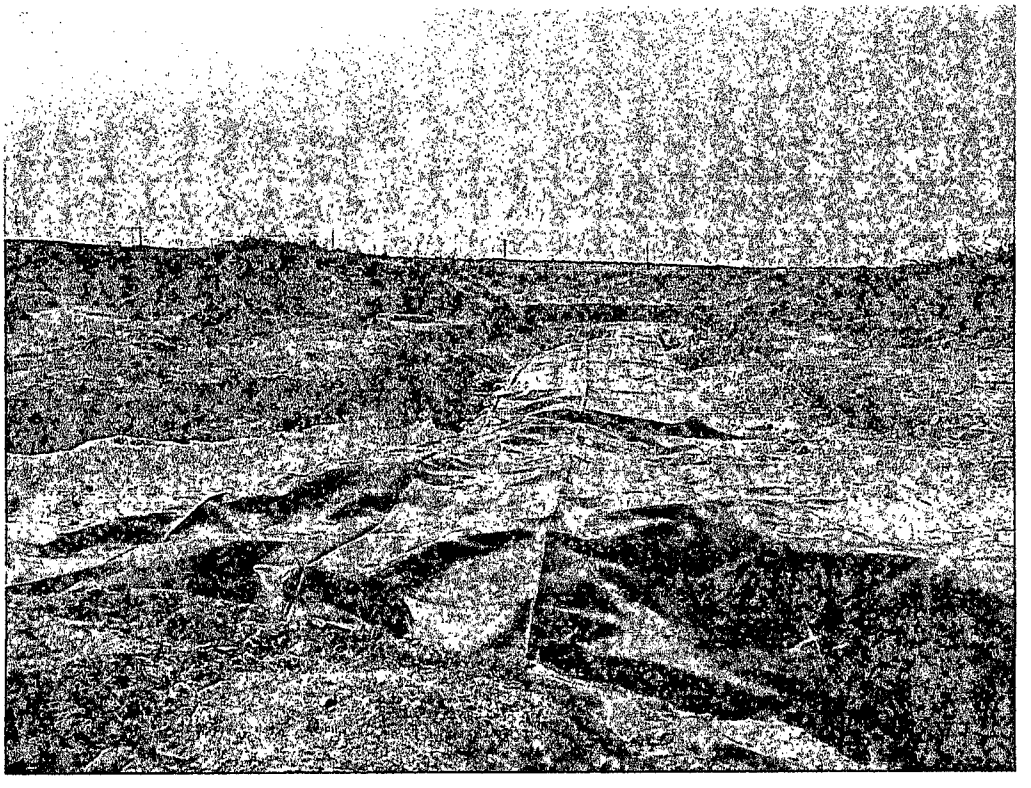
PHOTOGRAPHS

COG Operating LLC
Southwest Central Tank Battery
Eddy County, New Mexico

TETRA TECH



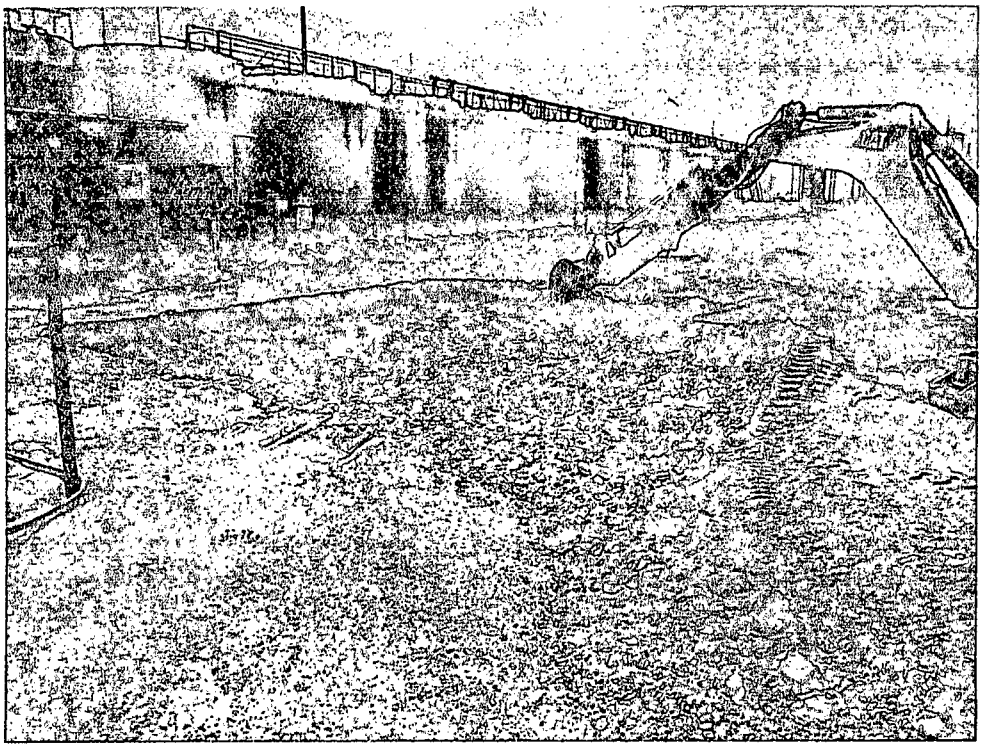
View East – Excavation of AH-2.



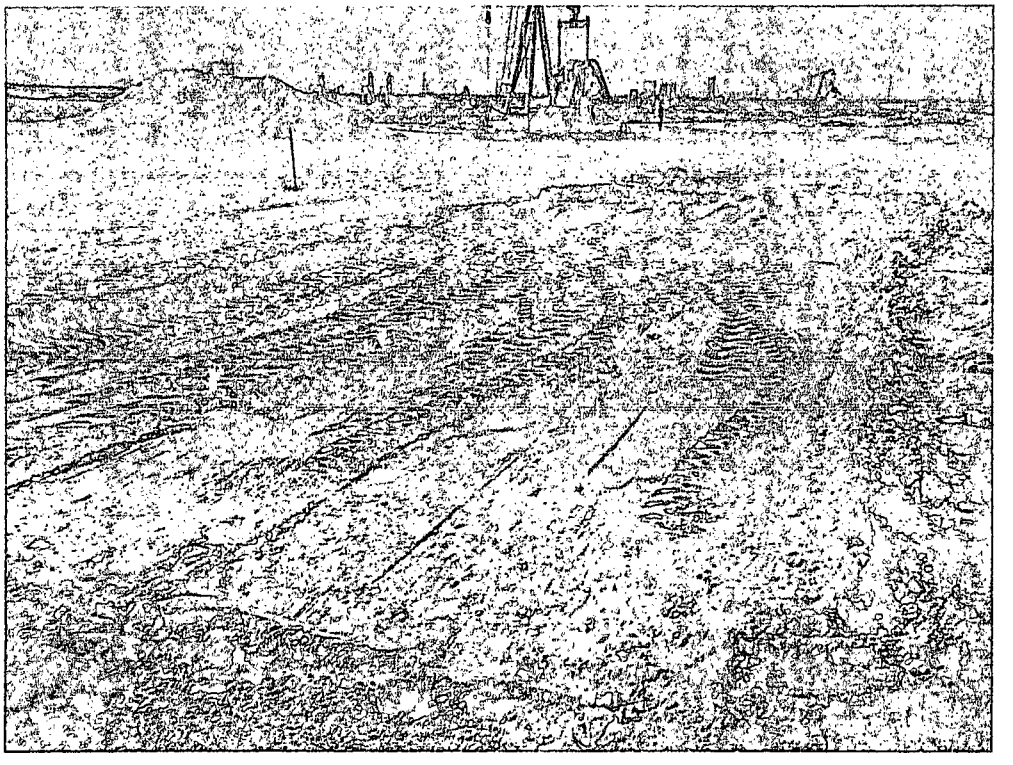
View South – Liner installation in area of AH-1 thru AH-3.

COG Operating LLC
Southwest Central Tank Battery
Eddy County, New Mexico

TETRA TECH

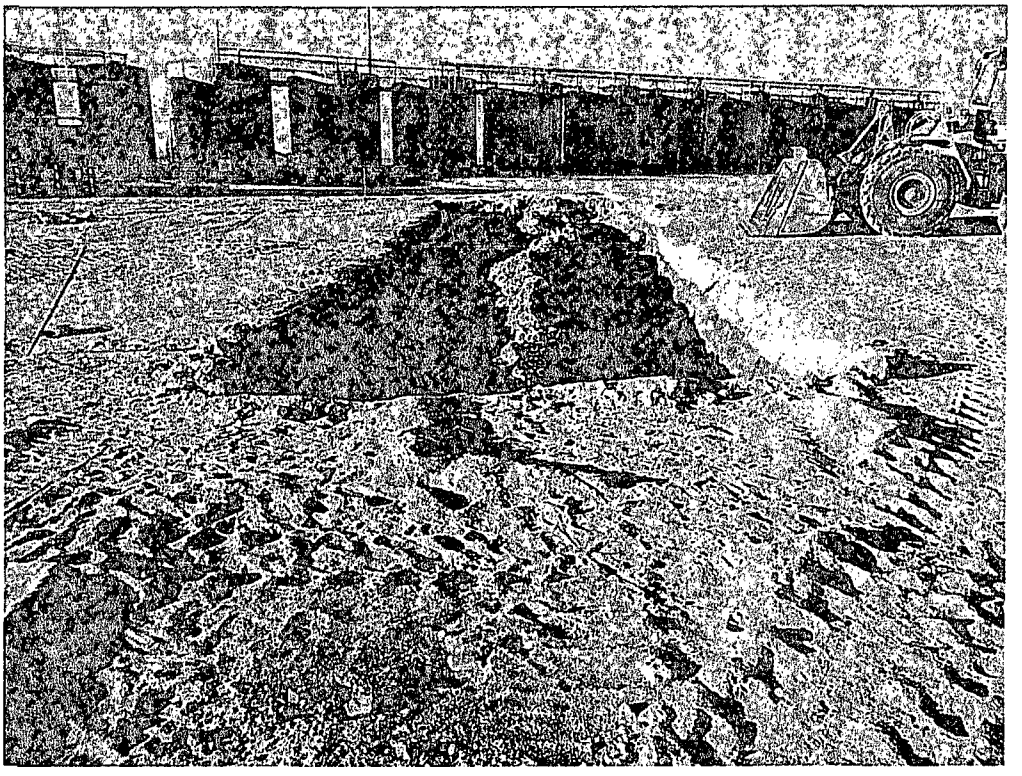


View Southwest – Excavation of AH-6.

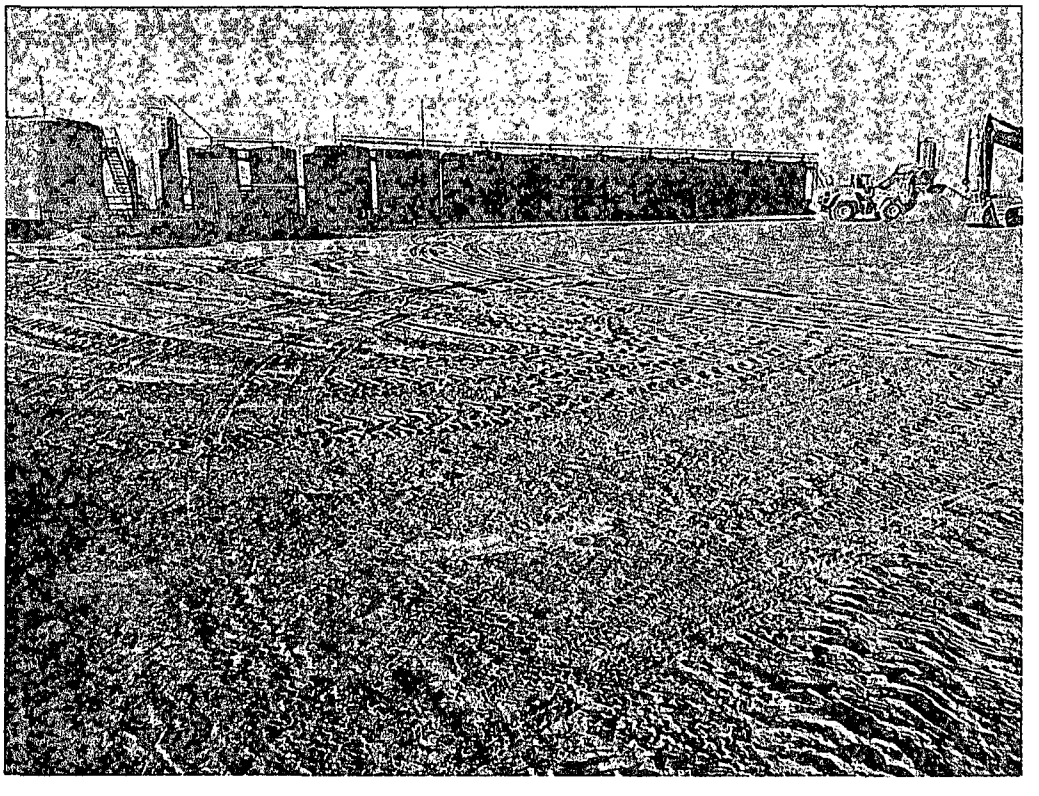


View Northeast – Excavation of AH-5.

COG Operating LLC
Southwest Central Tank Battery
Eddy County, New Mexico



View Southwest – Excavation and clay cap installation in area of AH-7.



View South – Backfill of areas on pad.

TETRA TECH

APPENDIX A

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) 685-4332**
Facility Name **Southwest Central Tank Battery**	Facility Type **Tank Battery**

Surface Owner: Federal	Mineral Owner	Lease No. NMNM-0467932

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
O	20	17S	30E					Eddy

Latitude N 32.81578° **Longitude** W 103.99519°

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release 150 bbls	Volume Recovered 80 bbls oil
Source of Release: PVC adaptor at equalizer line	Date and Hour of Occurrence 12/31/2010	Date and Hour of Discovery 12/31/2010 7:00 a.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour 01/30/2011 10:31 a.m.	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	

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AUG 23 2013
NMOCD ARTESIA

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

The PVC adaptor froze and cracked at the equalizer line behind the tanks. All the fittings have been replaced and the tank battery is in the process of upgrading from PVC to plastic coated steel.

Describe Area Affected and Cleanup Action Taken.*

Tetra Tech inspected and assessed the spill area for extents. A work plan was prepared and submitted to NMOCD for approval. Soils exceeding the RRAL were removed and transported to proper disposal. Once excavated to the appropriate depths, the excavation was backfilled with clean soil. Tetra Tech prepared closure report and submitted 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:	OIL CONSERVATION DIVISION
Printed Name: Ike Tavarez (agent for COG)	Approved by District Supervisor:
Title: Project Manager	Approval Date: / Expiration Date:
E-mail Address: ike.tavarez@tetratech.com	Conditions of Approval: / Attached ☐
Date: 6-20-13 Phone: (432) 682-4559	

* Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
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1301 W. Grand Avenue, Artesia, NM 88210
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State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
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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) 685-4332**
Facility Name **Southwest Central Tank Battery**	Facility Type **Tank Battery**

Surface Owner: Federal	Mineral Owner	Lease No. NMNM-0467932

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
O	20	17S	30E					Eddy

Latitude N 32.81578° **Longitude** W 103.99519°

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release 100 bbls	Volume Recovered 98 bbls oil
Source of Release: 6'' steel line	Date and Hour of Occurrence 08/31/2010	Date and Hour of Discovery 08/31/2010 5:00 a.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Terry Gregston –BLM, Jim Amos-BLM, Mike Bratcher-OCD	
By Whom?	Date and Hour 08/31/2010 5:24 p.m.	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

N/A

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NMOCD ARTESIA

Describe Cause of Problem and Remedial Action Taken.*

Due to corrosion, a 6'' steel water line developed a hole in it. A ½ inch plug was installed to repair the line and a new, plastic coasted line is being installed to replace the existing line.

Describe Area Affected and Cleanup Action Taken.*

Tetra Tech inspected and assessed the spill area for extents. A work plan was prepared and submitted to NMOCD for approval. Soils exceeding the RRAL were removed and transported to proper disposal. Once excavated to the appropriate depths, the excavation was backfilled with clean soil. Tetra Tech prepared closure report and submitted 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:	OIL CONSERVATION DIVISION	
Printed Name: Ike Tavarez (agent for COG)	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: ike.tavarez@tetratech.com	Conditions of Approval:	Attached ☐
Date: 6-20-13 Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
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1301 W. Grand Avenue, Artesia, NM 88210
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State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
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Santa Fe, NM 87505

Form C-141
Revised October 10, 2003

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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) 685-4332**
Facility Name **Southwest Central Tank Battery**	Facility Type **Tank Battery**

Surface Owner: Federal	Mineral Owner	Lease No. NMNM-0467932

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
O	20	17S	30E					Eddy

Latitude N 32.81578° **Longitude** W 103.99519°

NATURE OF RELEASE

Type of Release: Crude Oil and Produced Water	Volume of Release 4 bbls oil 60 bbls pw	Volume Recovered 2 bbls oil 30 bbls pw
Source of Release: Water Tank	Date and Hour of Occurrence 08/03/2010	Date and Hour of Discovery 08/03/2010 5:00 a.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher-OCD	
By Whom?	Date and Hour 08/03/2010 3:16 p.m.	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

N/A

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AUG 23 2013
NMOCD ARTESIA

Describe Cause of Problem and Remedial Action Taken.*

Produced water tanks ran over due to an inoperable water pump because of a blown fuse in the panel box. The electrical problem has been repaired.

Describe Area Affected and Cleanup Action Taken.*

Tetra Tech inspected and assessed the spill area for extents. A work plan was prepared and submitted to NMOCD for approval. Soils exceeding the RRAL were removed and transported to proper disposal. Once excavated to the appropriate depths, the excavation was backfilled with clean soil. Tetra Tech prepared closure report and submitted 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:	OIL CONSERVATION DIVISION	
Printed Name: Ike Tavarez (agent for COG)	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: ike.tavarez@tetratech.com	Conditions of Approval:	Attached ☐
Date: 6-20-13 Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary

1ST

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 Repor

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	Southwest Central Tank Battery	Facility Type	Tank Battery

Surface Owner Federal	Mineral Owner	Lease No. NMNM-0467932

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
O	20	17S	30E					Eddy

Latitude 32.815578 **Longitude** 103.99519

NATURE OF RELEASE

Type of Release Crude Oil and Produced Water	Volume of Release 4bbls of crude oil 60bbls of produced water	Volume Recovered 2bbls of crude oil 30bbls of produced water
Source of Release Water tank	Date and Hour of Occurrence 08/02/2010	Date and Hour of Discovery 08/02/2010 5:00 a.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher—OCD	
By Whom? Josh Russo	Date and Hour 08/03/2010 3:16 p.m.	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Produced water tanks ran over due to an inoperable water pump because of a blown fuse in the panel box. The electrical problem has been repaired.

Describe Area Affected and Cleanup Action Taken.*

Initially 4bbls of crude oil and 60bbls of produced water was released from the produced water tanks at the Southwest Central Tank Battery. The dimensions of the release was 15 yards x 65 yards on location, and 5 yards x 70 yards off of the location. The well pad has been returned to its original condition and the impacted material has been disposed of appropriately. (The closest well location to the release is the WD McIntyre "E" #4, Unit O, Sec.20-T17S-R30E, Eddy Co., NM, API # 30-015-29561). 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 BLM/NMOCD 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:	OIL CONSERVATION DIVISION
Printed Name: Josh Russo	Approved by District Supervisor:
Title: HSE Coordinator	Approval Date: / Expiration Date:
E-mail Address: jrusso@conchoresources.com	Conditions of Approval: / Attached ☐
Date: 08/13/2010 Phone: 432-212-2399	

* Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
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1301 W. Grand Avenue, Artesia, NM 88210
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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 100, Midland, TX 79701	Telephone No.	432-230-0077
Facility Name	Southwest Central Tank Battery	Facility Type	Tank Battery

Surface Owner Federal	Mineral Owner	Lease No. NMNM-0467932

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
O	20	17S	30E					Eddy

Latitude 32.815578 **Longitude** 103.99519

NATURE OF RELEASE

Type of Release Produced water	Volume of Release 100bbls	Volume Recovered 98bbls
Source of Release 6" steel water line	Date and Hour of Occurrence 08/31/2010	Date and Hour of Discovery 08/31/2010 8:00a.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Terry Gregston—BLM, Jim Amos—BLM, Mike Bratcher—OCD	
By Whom? Josh Russo	Date and Hour 08/31/2010 5:24 p.m.	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Due to corrosion, a 6" steel water line developed a hole in it. A ½ inch plug was installed to repair the line and a new, plastic coated line is being built to replace the existing line.

Describe Area Affected and Cleanup Action Taken.*

Initially 100bbls of produced water was released from the 6" steel line at the Southwest Central Tank Battery. We were able to recover 98bbls with a vacuum truck. The fluid flowed from the steel line, to behind the tank battery into the pasture with the dimensions of the spill area measuring 35' x 35'. (The closest well location to the release is the WD McIntyre E #4, 990' FSL 2310' FWL, Sec.20-T17S-R30E, API#30-015-29561, NMNM-0467932). 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 BLM/NMOCD 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:	OIL CONSERVATION DIVISION
Printed Name: Josh Russo	Approved by District Supervisor:
Title: HSE Coordinator	Approval Date: / Expiration Date:
E-mail Address: jrusso@conchoresources.com	Conditions of Approval: / Attached ☐
Date: 09/07/2010 Phone: 432-212-2399	

* Attach Additional Sheets If Necessary

Oral Spill

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

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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	Southwest Central	Facility Type	Tank Battery

Surface Owner Federal	Mineral Owner	Lease No. NMNM-0467932

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
N	20	17S	30E					Eddy

Latitude 32 48.908 **Longitude** 103 59.683

NATURE OF RELEASE

Type of Release Produced water	Volume of Release 150bbls	Volume Recovered 80bbls
Source of Release PVC adaptor at equalizer line	Date and Hour of Occurrence 12/31/2010	Date and Hour of Discovery 12/31/2010 7:00 a.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher—OCD Terry Gregston—BLM	
By Whom? Josh Russo	Date and Hour 01/03/2011 10:31 a.m.	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

The PVC adaptor froze and cracked at the equalizer line behind the tanks. All fittings have been replace and the tank battery is in the process of upgrading all PVC to plastic coated steel.

Describe Area Affected and Cleanup Action Taken.*

Initially 150bbls was released from the cracked fitting behind the tanks and we were able to recover 80bbls with a vacuum truck. From the source, the spill area measured 8' x 100' to the southeast and ended up 40' x 150' in the pasture. The closest well location to the release is the W.D. McIntyre E#4, API# 30-015-29561. 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 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:	OIL CONSERVATION DIVISION	
Printed Name: Josh Russo	Approved by District Supervisor:	
Title: HSE Coordinator	Approval Date:	Expiration Date:
E-mail Address: jrusso@conchoresources.com	Conditions of Approval:	Attached ☐
Date: 01/05/2011 Phone: 432-212-2399		

* Attach Additional Sheets If Necessary

APPENDIX B

Water Well Data
Average Depth to Groundwater (ft)
COG - Southwest Central Tank Battery
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	13
19 **110**	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	1
7	8	9	10	11	12 **288**
18	17	16	15	14	13 **113**
19	20	21	22	23	24
30	29	28	27	26	25
31 **290**	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 **80**	23	24
30	29 **210** **208'**	28	27	26	25
31	32	33	34	35 153	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 **SITE**	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 **271**	35	36

18 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	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	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 **400**
18	17	16	15	14 **317**	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35 **261**	36

- New Mexico State Engineers Well Reports
- USGS Well Reports
- Geology and Groundwater Conditions in Southern Eddy, County, NM
- NMOCD - Groundwater Data
- Site Location - Southwest Central Tank Battery

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

No records found.

PLSS Search:

Section(s): 1-36 **Township:** 17S **Range:** 30E

APPENDIX C

Summary Report

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

Report Date: March 15, 2013

Work Order: 13030828

Project Location: Eddy Co., NM
Project Name: COG/SW Central TB
Project Number: 114-6400625

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
322880	CS-1 (AH-1) South Wall	soil	2013-02-28	00:00	2013-03-08
322881	CS-1 (AH-1) East Wall	soil	2013-02-28	00:00	2013-03-08
322882	CS-1 (AH-1) West Wall	soil	2013-02-28	00:00	2013-03-08
322883	CS-1 (AH-1) Bottom Hole	soil	2013-02-28	00:00	2013-03-08

Sample: 322880 - CS-1 (AH-1) South Wall

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

Sample: 322881 - CS-1 (AH-1) East Wall

Param	Flag	Result	Units	RL
Chloride		**215**	mg/Kg	4

Sample: 322882 - CS-1 (AH-1) West Wall

Param	Flag	Result	Units	RL
Chloride		**105**	mg/Kg	4

Sample: 322883 - CS-1 (AH-1) Bottom Hole

Param	Flag	Result	Units	RL
Chloride		**8160**	mg/Kg	4

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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

Report Date: March 15, 2013

Work Order: 13030828

Project Location: Eddy Co., NM
Project Name: COG/SW Central TB
Project Number: 114-6400625

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
322880	CS-1 (AH-1) South Wall	soil	2013-02-28	00:00	2013-03-08
322881	CS-1 (AH-1) East Wall	soil	2013-02-28	00:00	2013-03-08
322882	CS-1 (AH-1) West Wall	soil	2013-02-28	00:00	2013-03-08
322883	CS-1 (AH-1) Bottom Hole	soil	2013-02-28	00:00	2013-03-08

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.

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

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- Sample 322881 (CS-1 (AH-1) East Wall) . . . 4
- Sample 322882 (CS-1 (AH-1) West Wall) . . . 4
- Sample 322883 (CS-1 (AH-1) Bottom Hole) . . . 4

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- QC Batch 99745 - LCS (1) . . . 7
- QC Batch 99745 - MS (1) . . . 7

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- QC Batch 99745 - CCV (1) . . . 8
- QC Batch 99745 - CCV (2) . . . 8

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- Standard Flags . . . 9
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Case Narrative

Samples for project COG/SW Central TB were received by TraceAnalysis, Inc. on 2013-03-08 and assigned to work order 13030828. Samples for work order 13030828 were received intact at a temperature of 5.8 C.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (Titration)	SM 4500-Cl B	84430	2013-03-13 at 10:25	99745	2013-03-15 at 14:12

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 13030828 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.

Analytical Report

Sample: 322880 - CS-1 (AH-1) South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99745	Date Analyzed:	2013-03-15	Analyzed By:	AR
Prep Batch:	84430	Sample Preparation:	2013-03-13	Prepared By:	AR

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

Sample: 322881 - CS-1 (AH-1) East Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99745	Date Analyzed:	2013-03-15	Analyzed By:	AR
Prep Batch:	84430	Sample Preparation:	2013-03-13	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**215**	mg/Kg	5	4.00

Sample: 322882 - CS-1 (AH-1) West Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99745	Date Analyzed:	2013-03-15	Analyzed By:	AR
Prep Batch:	84430	Sample Preparation:	2013-03-13	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**105**	mg/Kg	5	4.00

Sample: 322883 - CS-1 (AH-1) Bottom Hole

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99745	Date Analyzed:	2013-03-15	Analyzed By:	AR
Prep Batch:	84430	Sample Preparation:	2013-03-13	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**8160**	mg/Kg	10	4.00

Method Blanks

Method Blank (1) QC Batch: 99745

QC Batch:	99745	Date Analyzed:	2013-03-15	Analyzed By:	AR
Prep Batch:	84430	QC Preparation:	2013-03-13	Prepared By:	AR

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

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 99745 | Date Analyzed: 2013-03-15 | Analyzed By: AR
Prep Batch: 84430 | QC Preparation: 2013-03-13 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2790	mg/Kg	1	2500	<3.85	112	85 - 115

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
Chloride			2640	mg/Kg	1	2500	<3.85	106	85 - 115	6	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: 322885

QC Batch: 99745 | Date Analyzed: 2013-03-15 | Analyzed By: AR
Prep Batch: 84430 | QC Preparation: 2013-03-13 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2780	mg/Kg	5	2500	210	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			2640	mg/Kg	5	2500	210	97	78.9 - 121	5	20

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

Calibration Standards

Standard (CCV-1)

QC Batch: 99745 | Date Analyzed: 2013-03-15 | 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	100	100	85 - 115	2013-03-15

Standard (CCV-2)

QC Batch: 99745 | Date Analyzed: 2013-03-15 | 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	100	100	85 - 115	2013-03-15

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 then 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.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
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.

1303828

Analysis Request of Chain of Custody Record

PAGE: 1 OF: 1

TETRA TECH
1910 N. Big Spring St.
Midland, Texas 79705
(432) 682-4559 • Fax (432) 682-3946

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 114-640025

PROJECT NAME: COG - SW Central TB

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chlorides	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
882880	3/28		S		X	CS-1 (AH-1) South wall	1					✓													X				
881	3/28		S		X	CS-1 (AH-1) East wall	1					✓													X				
882	3/28		S		X	CS-1 (AH-1) West wall	1					✓													X				
883	3/28		S		X	CS-1 (AH-1) Bottom hole	1					✓													X				

RELINQUISHED BY: (Signature) Marcus Rivas	Date: 3/28/13 Time: 1445	RECEIVED BY: (Signature)	Date: 3/28/13 Time: 1445
SAMPLED BY: (Print & Initial) Marcus Rivas / MR	Date: Time:		
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS	AIRBILL #: OTHER:		
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
TETRA TECH CONTACT PERSON: Ike Tavarez	Results by:		
RECEIVING LABORATORY: Trace ADDRESS: CITY: Midland STATE: TX ZIP: CONTACT: PHONE:	RECEIVED BY: (Signature) DATE: TIME:		RUSH Charges Authorized: Yes No
SAMPLE CONDITION WHEN RECEIVED: 5.8°	REMARKS: Mail all		

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

Summary Report

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

Report Date: March 25, 2013

Work Order: 13031527

Project Location: Eddy Co., NM
Project Name: COG/SW Central TB
Project Number: 114-6400625

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
323555	CS-3 (AH-3) Southeast Wall	soil	2013-03-01	00:00	2013-03-15
323556	CS-3 (AH-3) East Wall	soil	2013-03-01	00:00	2013-03-15
323557	CS-3 (AH-3) West Wall	soil	2013-03-01	00:00	2013-03-15
323558	CS-3 (AH-3) Bottom Hole	soil	2013-03-01	00:00	2013-03-15

Sample: 323555 - CS-3 (AH-3) Southeast Wall

Param	Flag	Result	Units	RL
Chloride		**352**	mg/Kg	4

Sample: 323556 - CS-3 (AH-3) East Wall

Param	Flag	Result	Units	RL
Chloride		**78.3**	mg/Kg	4

Sample: 323557 - CS-3 (AH-3) West Wall

Param	Flag	Result	Units	RL
Chloride		**308**	mg/Kg	4

Sample: 323558 - CS-3 (AH-3) Bottom Hole

Param	Flag	Result	Units	RL
Chloride		**6130**	mg/Kg	4

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
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5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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

Report Date: March 25, 2013

Work Order: 13031527

Project Location: Eddy Co., NM
Project Name: COG/SW Central TB
Project Number: 114-6400625

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
323555	CS-3 (AH-3) Southeast Wall	soil	2013-03-01	00:00	2013-03-15
323556	CS-3 (AH-3) East Wall	soil	2013-03-01	00:00	2013-03-15
323557	CS-3 (AH-3) West Wall	soil	2013-03-01	00:00	2013-03-15
323558	CS-3 (AH-3) Bottom Hole	soil	2013-03-01	00:00	2013-03-15

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.

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

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Sample 323556 (CS-3 (AH-3) East Wall) 4
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Sample 323558 (CS-3 (AH-3) Bottom Hole) 4

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QC Batch 99926 - LCS (1) 7
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Case Narrative

Samples for project COG/SW Central TB were received by TraceAnalysis, Inc. on 2013-03-15 and assigned to work order 13031527. Samples for work order 13031527 were received intact at a temperature of 18.1 C. Samples were not on ice.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (Titration)	SM 4500-Cl B	84647	2013-03-21 at 09:58	99925	2013-03-22 at 13:45
Chloride (Titration)	SM 4500-Cl B	84647	2013-03-21 at 09:58	99926	2013-03-22 at 13:46

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 13031527.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.

Analytical Report

Sample: 323555 - CS-3 (AH-3) Southeast Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99925	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**352**	mg/Kg	5	4.00

Sample: 323556 - CS-3 (AH-3) East Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99925	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**78.3**	mg/Kg	5	4.00

Sample: 323557 - CS-3 (AH-3) West Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99925	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**308**	mg/Kg	5	4.00

Sample: 323558 - CS-3 (AH-3) Bottom Hole

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99926	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**6130**	mg/Kg	10	4.00

Method Blanks

Method Blank (1) QC Batch: 99925

QC Batch:	99925	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	QC Preparation:	2013-03-21	Prepared By:	AR

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

Method Blank (1) QC Batch: 99926

QC Batch:	99926	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	QC Preparation:	2013-03-21	Prepared By:	AR

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

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 99925 | Date Analyzed: 2013-03-22 | Analyzed By: AR
Prep Batch: 84647 | QC Preparation: 2013-03-21 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2750	mg/Kg	1	2500	<3.85	110	85 - 115

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
Chloride			2560	mg/Kg	1	2500	<3.85	102	85 - 115	7	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: 99926 | Date Analyzed: 2013-03-22 | Analyzed By: AR
Prep Batch: 84647 | QC Preparation: 2013-03-21 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2680	mg/Kg	1	2500	<3.85	107	85 - 115

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
Chloride			2610	mg/Kg	1	2500	<3.85	104	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: 323557

QC Batch: 99925 | Date Analyzed: 2013-03-22 | Analyzed By: AR
Prep Batch: 84647 | QC Preparation: 2013-03-21 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2830	mg/Kg	5	2500	308	101	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			2880	mg/Kg	5	2500	308	103	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: 323567

QC Batch: 99926 | Date Analyzed: 2013-03-22 | Analyzed By: AR
Prep Batch: 84647 | QC Preparation: 2013-03-21 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			7290	mg/Kg	10	2500	4850	98	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			7610	mg/Kg	10	2500	4850	110	78.9 - 121	4	20

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

Calibration Standards

Standard (CCV-1)

QC Batch: 99925 | Date Analyzed: 2013-03-22 | 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	99.8	100	85 - 115	2013-03-22

Standard (CCV-2)

QC Batch: 99925 | Date Analyzed: 2013-03-22 | 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	100	100	85 - 115	2013-03-22

Standard (CCV-1)

QC Batch: 99926 | Date Analyzed: 2013-03-22 | 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	99.3	99	85 - 115	2013-03-22

Standard (CCV-2)

QC Batch: 99926 | Date Analyzed: 2013-03-22 | 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	2013-03-22

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

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 then 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.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
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.

13031527

Analysis Request of Chain of Custody Record

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TETRA TECH
1910 N. Big Spring St.
Midland, Texas 79705
(432) 682-4559 • Fax (432) 682-3946

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 114-14006.25

PROJECT NAME: COG-SW Central TB

Craig Caplan

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
323555	3/1		S		X	CS-3 (AH-3) South East wall	1																		Y				
556	3/1		S		X	CS-3 (AH-3) East wall	1																		Y				
557	3/1		S		X	CS-3 (AH-3) West wall	1																		X				
558	3/1		S		X	CS-3 (AH-3) Bottom hole	1																		X				

RELINQUISHED BY: (Signature)	Date: 3-13-13 Time: 1145	RECEIVED BY: (Signature)	Date: 3/15/13 Time: 11:45
SAMPLED BY: (Print & Initial) Marcos Quintanilla	Date: Time:		
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS	AIRBILL #: OTHER:		
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
TETRA TECH CONTACT PERSON: Ike Tavarez	Results by:		
RECEIVING LABORATORY: Xenco ADDRESS: CITY: Midland STATE: TX ZIP: CONTACT: PHONE:	RECEIVED BY: (Signature) DATE: TIME:		RUSH Charges Authorized: Yes No
SAMPLE CONDITION WHEN RECEIVED: 18.1 C	REMARKS: Midland All		

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

Summary Report

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

Report Date: March 15, 2013

Work Order: 13030829

Project Location: Eddy Co., NM
Project Name: COG/SW Central TB
Project Number: 114-6400625

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
322884	CS-2 (AH-2) North Wall	soil	2013-03-01	00:00	2013-03-08
322885	CS-2 (AH-2) South Wall	soil	2013-03-01	00:00	2013-03-08
322886	CS-2 (AH-2) East Wall	soil	2013-03-01	00:00	2013-03-08
322887	CS-2 (AH-2) Bottom Hole	soil	2013-03-01	00:00	2013-03-08

Sample: 322884 - CS-2 (AH-2) North Wall

Param	Flag	Result	Units	RL
Chloride		**215**	mg/Kg	4

Sample: 322885 - CS-2 (AH-2) South Wall

Param	Flag	Result	Units	RL
Chloride		**210**	mg/Kg	4

Sample: 322886 - CS-2 (AH-2) East Wall

Param	Flag	Result	Units	RL
Chloride		**653**	mg/Kg	4

Sample: 322887 - CS-2 (AH-2) Bottom Hole

Param	Flag	Result	Units	RL
Chloride		**4300**	mg/Kg	4

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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

Report Date: March 15, 2013

Work Order: 13030829

Project Location: Eddy Co., NM
Project Name: COG/SW Central TB
Project Number: 114-6400625

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
322884	CS-2 (AH-2) North Wall	soil	2013-03-01	00:00	2013-03-08
322885	CS-2 (AH-2) South Wall	soil	2013-03-01	00:00	2013-03-08
322886	CS-2 (AH-2) East Wall	soil	2013-03-01	00:00	2013-03-08
322887	CS-2 (AH-2) Bottom Hole	soil	2013-03-01	00:00	2013-03-08

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.

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

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- Sample 322885 (CS-2 (AH-2) South Wall) . . . 4
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Case Narrative

Samples for project COG/SW Central TB were received by TraceAnalysis, Inc. on 2013-03-08 and assigned to work order 13030829. Samples for work order 13030829 were received intact at a temperature of 5.8 C.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (Titration)	SM 4500-Cl B	84430	2013-03-13 at 10:25	99745	2013-03-15 at 14:12
Chloride (Titration)	SM 4500-Cl B	84430	2013-03-13 at 10:25	99746	2013-03-15 at 14:13

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 13030829 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.

Analytical Report

Sample: 322884 - CS-2 (AH-2) North Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99745	Date Analyzed:	2013-03-15	Analyzed By:	AR
Prep Batch:	84430	Sample Preparation:	2013-03-13	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**215**	mg/Kg	5	4.00

Sample: 322885 - CS-2 (AH-2) South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99745	Date Analyzed:	2013-03-15	Analyzed By:	AR
Prep Batch:	84430	Sample Preparation:	2013-03-13	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**210**	mg/Kg	5	4.00

Sample: 322886 - CS-2 (AH-2) East Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99746	Date Analyzed:	2013-03-15	Analyzed By:	AR
Prep Batch:	84430	Sample Preparation:	2013-03-13	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**653**	mg/Kg	5	4.00

Sample: 322887 - CS-2 (AH-2) Bottom Hole

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99746	Date Analyzed:	2013-03-15	Analyzed By:	AR
Prep Batch:	84430	Sample Preparation:	2013-03-13	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**4300**	mg/Kg	10	4.00

Method Blanks

Method Blank (1) QC Batch: 99745

QC Batch:	99745	Date Analyzed:	2013-03-15	Analyzed By:	AR
Prep Batch:	84430	QC Preparation:	2013-03-13	Prepared By:	AR

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

Method Blank (1) QC Batch: 99746

QC Batch:	99746	Date Analyzed:	2013-03-15	Analyzed By:	AR
Prep Batch:	84430	QC Preparation:	2013-03-13	Prepared By:	AR

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

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 99745 | Date Analyzed: 2013-03-15 | Analyzed By: AR
Prep Batch: 84430 | QC Preparation: 2013-03-13 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2790	mg/Kg	1	2500	<3.85	112	85 - 115

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
Chloride			2640	mg/Kg	1	2500	<3.85	106	85 - 115	6	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: 99746 | Date Analyzed: 2013-03-15 | Analyzed By: AR
Prep Batch: 84430 | QC Preparation: 2013-03-13 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2650	mg/Kg	1	2500	<3.85	106	85 - 115

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
Chloride			2460	mg/Kg	1	2500	<3.85	98	85 - 115	7	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: 322885*

QC Batch: 99745 | Date Analyzed: 2013-03-15 | Analyzed By: AR
Prep Batch: 84430 | QC Preparation: 2013-03-13 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2780	mg/Kg	5	2500	210	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			2640	mg/Kg	5	2500	210	97	78.9 - 121	5	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: 322887

QC Batch: 99746 | Date Analyzed: 2013-03-15 | Analyzed By: AR
Prep Batch: 84430 | QC Preparation: 2013-03-13 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			6640	mg/Kg	10	2500	4300	94	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			7110	mg/Kg	10	2500	4300	112	78.9 - 121	7	20

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

Calibration Standards

Standard (CCV-1)

QC Batch: 99745 | Date Analyzed: 2013-03-15 | 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	100	100	85 - 115	2013-03-15

Standard (CCV-2)

QC Batch: 99745 | Date Analyzed: 2013-03-15 | 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	100	100	85 - 115	2013-03-15

Standard (CCV-1)

QC Batch: 99746 | Date Analyzed: 2013-03-15 | 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	99.8	100	85 - 115	2013-03-15

Standard (CCV-2)

QC Batch: 99746 | Date Analyzed: 2013-03-15 | 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	100	100	85 - 115	2013-03-15

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

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
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Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then 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.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
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.

1303 0829

Analysis Request of Chain of Custody Record

PAGE: OF: 1

TETRA TECH
1910 N. Big Spring St.
Midland, Texas 79705
(432) 682-4559 • Fax (432) 682-3946

CLIENT NAME: COG
SITE MANAGER: Ike Tavarez
PROJECT NO.: 114-6400625
PROJECT NAME: COG-SW Central TB, Eddy Co, NM

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
322884	3/1		S		X	CS-2 (AH-2) North wall	1																		Y				
885	3/1		S		X	CS-2 (AH-2) South wall	1																		Y				
886	3/1		S		X	CS-2 (AH-2) East wall	1																		Y				
887	3/1		S		X	CS-2 (AH-2) Bottom hole	1																		Y				

RELINQUISHED BY: (Signature) [signature] Date: 3/8/13 Time: 1445
RECEIVED BY: (Signature) [signature] Date: 3/8/13 Time: 14:45
SAMPLED BY: (Print & Initial) Marcus Kujawski / MK Date: Time:

RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS AIRBILL #: OTHER:

RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:
TETRA TECH CONTACT PERSON: Ike Tavarez
Results by:

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 5.8°
REMARKS: Midland all

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

Summary Report

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

Report Date: March 25, 2013

Work Order: 13031529

Project Location: Eddy Co., NM
Project Name: COG/SW Central TB
Project Number: 114-6400625

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
323563	CS-4 (AH-4) North Wall	soil	2013-03-08	00:00	2013-03-15
323564	CS-4 (AH-4) South Wall	soil	2013-03-08	00:00	2013-03-15
323565	CS-4 (AH-4) East Wall	soil	2013-03-08	00:00	2013-03-15
323566	CS-4 (AH-4) Bottom hole	soil	2013-03-08	00:00	2013-03-15
323567	CS-4 (AH-4) West Wall	soil	2013-03-11	00:00	2013-03-15
323568	CS-5 (AH-7) North Wall	soil	2013-03-08	00:00	2013-03-15
323569	CS-5 (AH-7) East Wall	soil	2013-03-08	00:00	2013-03-15
323570	CS-5 (AH-7) West Wall	soil	2013-03-08	00:00	2013-03-15
323571	CS-5 (AH-7) Bottom hole	soil	2013-03-08	00:00	2013-03-15
323572	CS-5 (AH-7) South Wall	soil	2013-03-11	00:00	2013-03-15

Sample: 323563 - CS-4 (AH-4) North Wall

Param	Flag	Result	Units	RL
Chloride		**364**	mg/Kg	4

Sample: 323564 - CS-4 (AH-4) South Wall

Param	Flag	Result	Units	RL
Chloride		**3740**	mg/Kg	4

Sample: 323565 - CS-4 (AH-4) East Wall

Param	Flag	Result	Units	RL
Chloride		**2490**	mg/Kg	4

Sample: 323566 - CS-4 (AH-4) Bottom hole

Param	Flag	Result	Units	RL
Chloride		**519**	mg/Kg	4

Sample: 323567 - CS-4 (AH-4) West Wall

Param	Flag	Result	Units	RL
Chloride		**4850**	mg/Kg	4

Sample: 323568 - CS-5 (AH-7) North Wall

Param	Flag	Result	Units	RL
Chloride		**349**	mg/Kg	4

Sample: 323569 - CS-5 (AH-7) East Wall

Param	Flag	Result	Units	RL
Chloride		**1140**	mg/Kg	4

Sample: 323570 - CS-5 (AH-7) West Wall

Param	Flag	Result	Units	RL
Chloride		**162**	mg/Kg	4

Sample: 323571 - CS-5 (AH-7) Bottom hole

Param	Flag	Result	Units	RL
Chloride		**2040**	mg/Kg	4

Sample: 323572 - CS-5 (AH-7) South Wall

Param	Flag	Result	Units	RL
Chloride		**737**	mg/Kg	4

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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

Report Date: March 25, 2013

Work Order: 13031529

Project Location: Eddy Co., NM
Project Name: COG/SW Central TB
Project Number: 114-6400625

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
323563	CS-4 (AH-4) North Wall	soil	2013-03-08	00:00	2013-03-15
323564	CS-4 (AH-4) South Wall	soil	2013-03-08	00:00	2013-03-15
323565	CS-4 (AH-4) East Wall	soil	2013-03-08	00:00	2013-03-15
323566	CS-4 (AH-4) Bottom hole	soil	2013-03-08	00:00	2013-03-15
323567	CS-4 (AH-4) West Wall	soil	2013-03-11	00:00	2013-03-15
323568	CS-5 (AH-7) North Wall	soil	2013-03-08	00:00	2013-03-15
323569	CS-5 (AH-7) East Wall	soil	2013-03-08	00:00	2013-03-15
323570	CS-5 (AH-7) West Wall	soil	2013-03-08	00:00	2013-03-15
323571	CS-5 (AH-7) Bottom hole	soil	2013-03-08	00:00	2013-03-15
323572	CS-5 (AH-7) South Wall	soil	2013-03-11	00:00	2013-03-15

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.

Michael Abel

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

Report Contents

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Case Narrative

Samples for project COG/SW Central TB were received by TraceAnalysis, Inc. on 2013-03-15 and assigned to work order 13031529. Samples for work order 13031529 were received intact at a temperature of 18.1 C. Samples were not on ice.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (Titration)	SM 4500-Cl B	84647	2013-03-21 at 09:58	99926	2013-03-22 at 13:46
Chloride (Titration)	SM 4500-Cl B	84647	2013-03-21 at 09:58	99927	2013-03-22 at 13:47

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 13031529 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.

Analytical Report

Sample: 323563 - CS-4 (AH-4) North Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99926	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**364**	mg/Kg	5	4.00

Sample: 323564 - CS-4 (AH-4) South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99926	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**3740**	mg/Kg	10	4.00

Sample: 323565 - CS-4 (AH-4) East Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99926	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**2490**	mg/Kg	10	4.00

Sample: 323566 - CS-4 (AH-4) Bottom hole

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99926	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**519**	mg/Kg	5	4.00

Sample: 323567 - CS-4 (AH-4) West Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99926	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**4850**	mg/Kg	10	4.00

Sample: 323568 - CS-5 (AH-7) North Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99927	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**349**	mg/Kg	5	4.00

Sample: 323569 - CS-5 (AH-7) East Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99927	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**1140**	mg/Kg	5	4.00

Sample: 323570 - CS-5 (AH-7) West Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99927	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**162**	mg/Kg	5	4.00

Sample: 323571 - CS-5 (AH-7) Bottom hole

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99927	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**2040**	mg/Kg	10	4.00

Sample: 323572 - CS-5 (AH-7) South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	99927	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	Sample Preparation:	2013-03-21	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**737**	mg/Kg	5	4.00

Method Blanks

Method Blank (1) QC Batch: 99926

QC Batch:	99926	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	QC Preparation:	2013-03-21	Prepared By:	AR

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

Method Blank (1) QC Batch: 99927

QC Batch:	99927	Date Analyzed:	2013-03-22	Analyzed By:	AR
Prep Batch:	84647	QC Preparation:	2013-03-21	Prepared By:	AR

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

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 99926 | Date Analyzed: 2013-03-22 | Analyzed By: AR
Prep Batch: 84647 | QC Preparation: 2013-03-21 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2680	mg/Kg	1	2500	<3.85	107	85 - 115

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
Chloride			2610	mg/Kg	1	2500	<3.85	104	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: 99927 | Date Analyzed: 2013-03-22 | Analyzed By: AR
Prep Batch: 84647 | QC Preparation: 2013-03-21 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2500	mg/Kg	1	2500	<3.85	100	85 - 115

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
Chloride			2700	mg/Kg	1	2500	<3.85	108	85 - 115	8	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: 323567

QC Batch: 99926 | Date Analyzed: 2013-03-22 | Analyzed By: AR
Prep Batch: 84647 | QC Preparation: 2013-03-21 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			7290	mg/Kg	10	2500	4850	98	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			7610	mg/Kg	10	2500	4850	110	78.9 - 121	4	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: 323572

QC Batch: 99927 | Date Analyzed: 2013-03-22 | Analyzed By: AR
Prep Batch: 84647 | QC Preparation: 2013-03-21 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			3200	mg/Kg	5	2500	737	98	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			3090	mg/Kg	5	2500	737	94	78.9 - 121	4	20

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

Calibration Standards

Standard (CCV-1)

QC Batch: 99926 | Date Analyzed: 2013-03-22 | 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	99.3	99	85 - 115	2013-03-22

Standard (CCV-2)

QC Batch: 99926 | Date Analyzed: 2013-03-22 | 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	2013-03-22

Standard (CCV-1)

QC Batch: 99927 | Date Analyzed: 2013-03-22 | 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	2013-03-22

Standard (CCV-2)

QC Batch: 99927 | Date Analyzed: 2013-03-22 | 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	98.8	99	85 - 115	2013-03-22

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

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 then 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.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
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.

13031529

Analysis Request of Chain of Custody Record

PAGE: 1 OF: 1

TETRA TECH
1910 N. Big Spring St.
Midland, Texas 79705
(432) 682-4559 • Fax (432) 682-3946

CLIENT NAME: COG
SITE MANAGER: Ike Tavarez
PROJECT NO.: 114-6400625
PROJECT NAME: COG-SU Central TB Eddy Co., NM

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	(Chloride)	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
323563	3/8		S		X	CS-4 (AH-4) North wall	1																		X				
564	3/8		S		X	CS-4 (AH-4) South wall	1																		X				
565	3/8		S		X	CS-4 (AH-4) East wall	1																		X				
566	3/8		S		X	CS-4 (AH-4) Bottom hole	1																		X				
567	3/"		S		X	CS-4 (AH-4) West wall	1																		X				
568	3/8		S		X	CS-5 (AH-7) North wall	1																		X				
569	3/8		S		X	CS-5 (AH-7) East wall	1																		X				
570	3/8		S		X	CS-5 (AH-7) West wall	1																		X				
571	3/8		S		X	CS-5 (AH-7) Bottom hole	1																		X				
572	3/"		S		X	CS-5 (AH-7) South wall	1																		X				

RELINQUISHED BY: (Signature) [signature] Date: 3-15-13 Time: 1145
RECEIVED BY: (Signature) [signature] Date: 3/15/13 Time: 1145
SAMPLED BY: (Print & Initial) Marcus Kinard / MK Date: Time:

RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS AIRBILL #: OTHER:

RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:

RECEIVING LABORATORY: Trace RECEIVED BY: (Signature)
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: PHONE: DATE: TIME:

TETRA TECH CONTACT PERSON: Ike Tavarez
Results by:
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 18.1°
REMARKS: Midland all

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.