SITE INFORMATION

Report Type: Closure Report

General Site Information:						
Site:	Burch Keely Unit #100 - Injection Line					
Company:	COG Operating LLC					
Section, Township and Range	Unit P	Sec. 18	T-17-S	R-30-E		
Lease Number:	API-30-015-04213					
County:	Eddy County					
GPS:	32.81382° N			104.00933° W		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	Intersection of 529 and Hagerman Cutoff, travel west on 82 1.6 mi, turn left at COG BKU Yard 300', left 0.2 mi, turn right 0.2 mi, turn left 0.2 mi to location					

Release Data:	
Date Released:	6/15/2012
Type Release:	Produced Fluids
Source of Contamination:	Steel line ruptured
Fluid Released:	30 bbls
Fluids Recovered:	15 bbls

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NOV 01 2012
NMOCD ARTESIA

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

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

October 17, 2012

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NMOCD ARTESIA

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

Re: Closure Report for the COG Operating LLC., Burch Keely Unit #100, Injection Line, Unit P, Section 18, 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 a spill from the Burch Keely Unit #100, Injection Line, Unit P, Section 18, Township 17 South, Range 30 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.81382°, W 104.00933°. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the leak was discovered on June 15, 2012, and released approximately thirty (30) barrels of produced water from a rupture steel line (injection line) with fifteen (15) barrels of standing fluids recovered. The spill is located in the pasture south of the lease road and measured approximately 10' x 30'. The initial C-141 form is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 18. According to the NMOCD groundwater map, the average depth to groundwater in this area is approximately 325' below surface. The average depth to groundwater map 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

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

(RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Soil Assessment and Analytical Results

On July 3, 2012, Tetra Tech personnel inspected and sampled the spill area. One (1) auger hole (AH-1) was 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 C. The sampling results are summarized in Table 1. The auger hole location is shown on Figure 3.

Referring to Table 1, the samples were below the RRAL for TPH and BTEX. Elevated chloride concentrations were detected in the auger hole, with concentrations of 11,700 mg/kg at 0-1' and 10,000 mg/kg at 1-1.5' below surface. The chloride impact was not vertically defined at the site. Deeper samples could not be collected due to a dense caliche formation.

According to BLM, additional impact from the spill was not assessed or addressed as shown on Figure 4. The spill area near the release point measured approximately 10' x 30' and the additional impact reported by the BLM had migrated approximately 750 feet down a two track road, with an approximate width of 2.0' to 3.0'. Tetra Tech recommended excavation of this additional impacted area.

Remediation and Conclusion

Based on the revised work plan, Tetra Tech personnel supervised the excavation of the site. The excavated areas and depths are highlighted in Table 1 and shown on Figure 4. The final excavation depths of the soil remediation were met as stated in the approved work plan. Approximately 640 cubic yards of soil were excavated and transported to the R360 facility for proper disposal.

In the area of AH-1, a trench was installed to vertically delineate the chloride impact in the area. According to the results shown on Table 1, the impact significantly declined with depth and showed a concentration of 922 mg/kg at 5.0' below surface. The excavation measured approximately 30' x 45' at a depth of 4.0' below surface. Once completed, a clay material was placed in the excavation bottom and backfilled with clean soil to grade.

TETRA TECH

In order to address the additional impact on the two track road, the area was excavated to a depth of 2.0' to 4.0' below surface. Tetra Tech field screened the samples for chloride to determine depth of the excavation.

Once excavated, Tetra Tech collected confirmation samples from the excavated areas. The confirmation samples are shown in Table 1. According to the results, the BLM approved the backfilling of the site. In addition, the two track road was reclaimed with clean material and windrows were installed to prevent erosion. The entire area was seeded with a BLM approved seed mix in order to establish regrowth in the pasture.

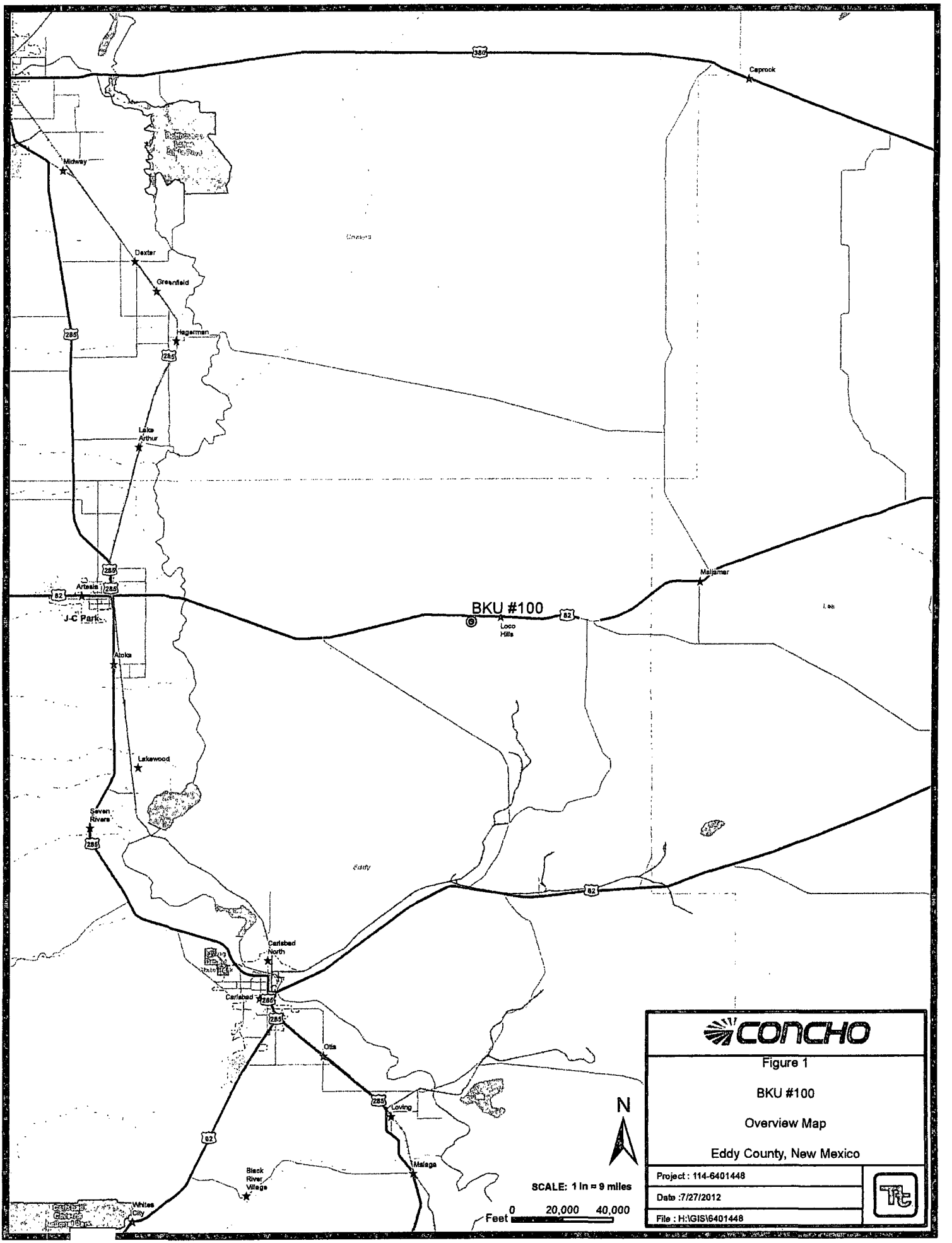
Based on the remediation activities performed at this location, COG requests closure for this site. The C-141 (Final) is included in Appendix A. If you have any questions or comments concerning the assessment or the remediation activities performed at the site, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH

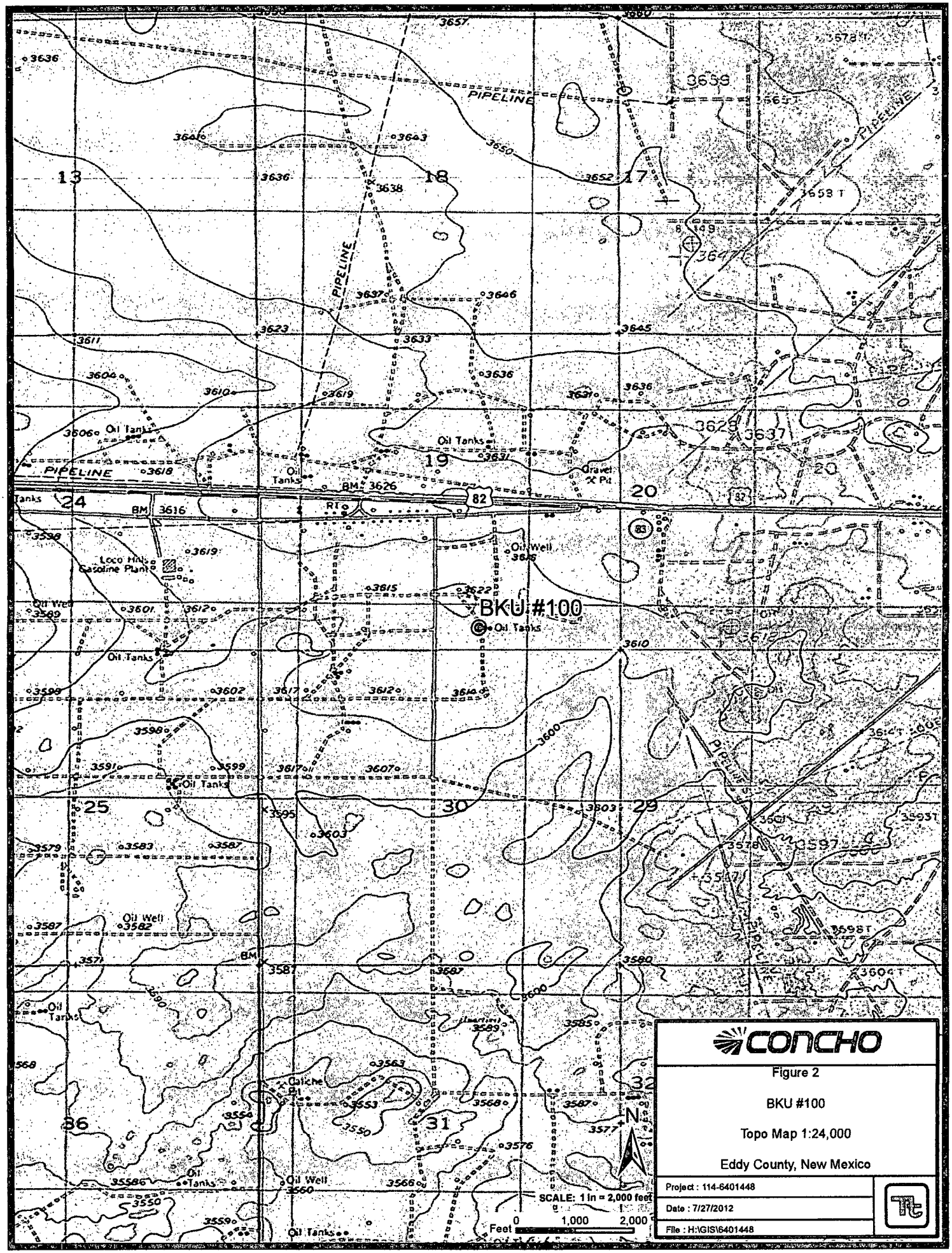
Ike Tavarez, PG
Senior Project Manager

cc: Pat Ellis – COG
cc: Terry Gregston - BLM

Figures



Drawn By: Isabel Marmolejo



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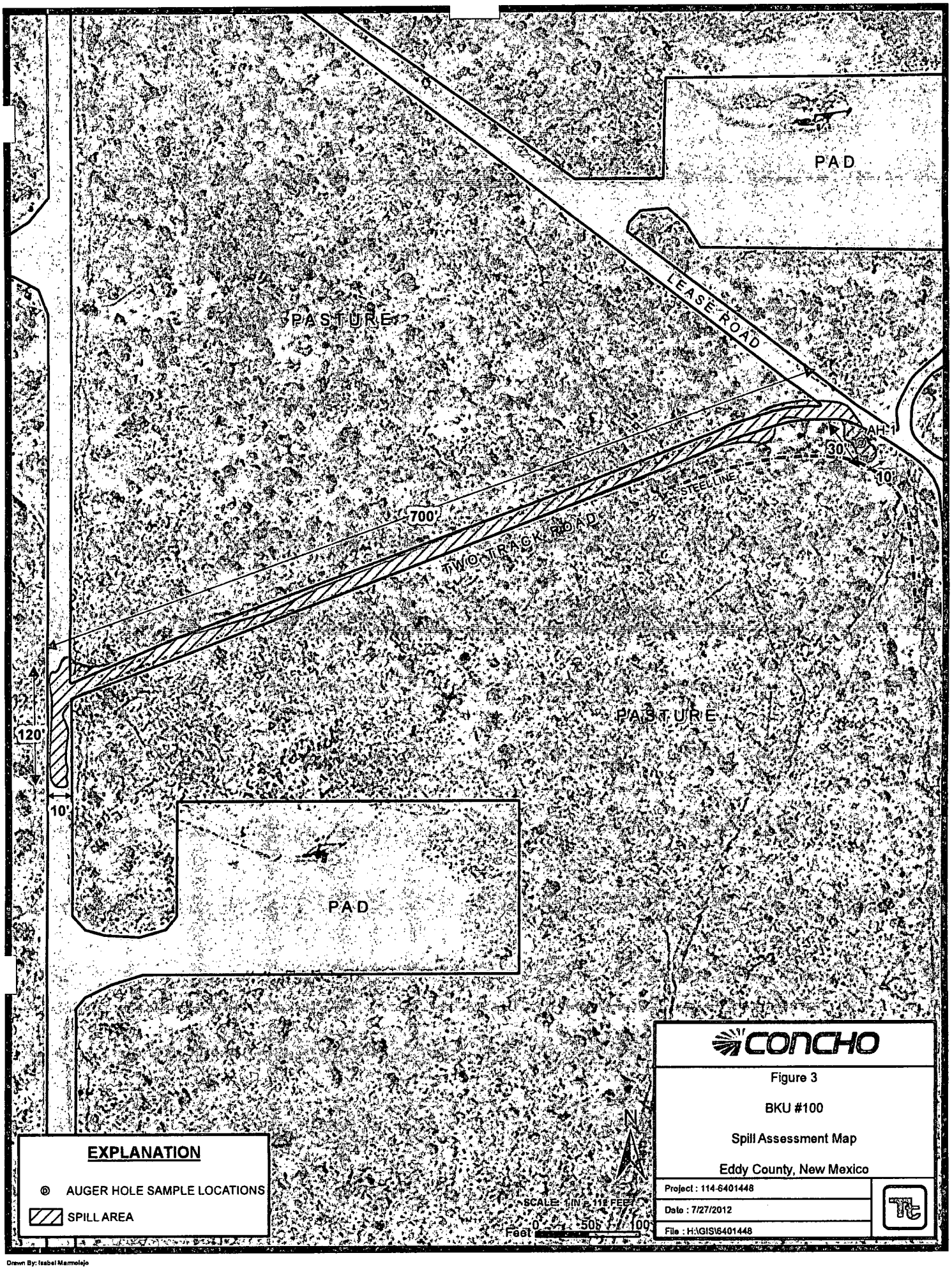

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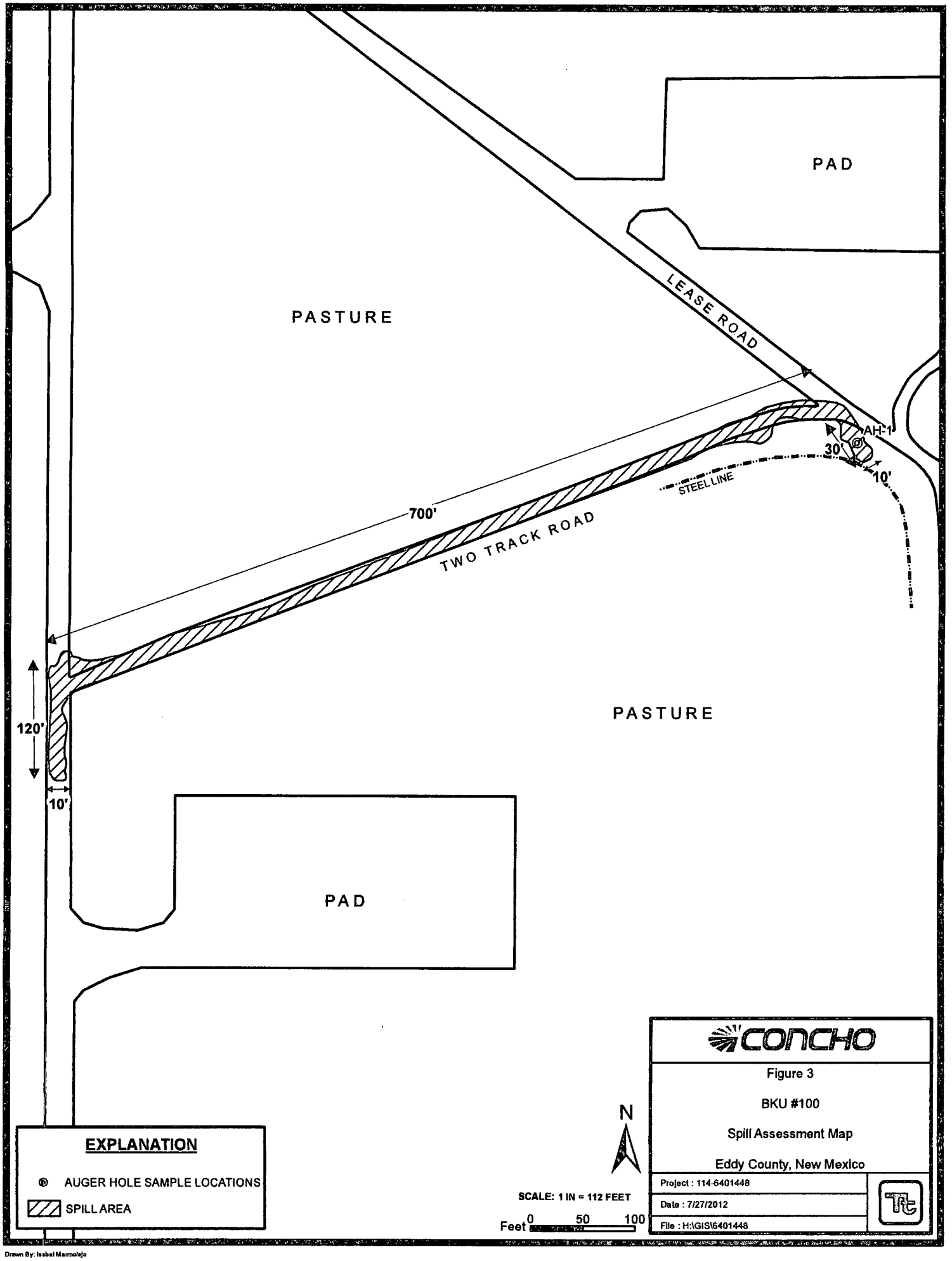

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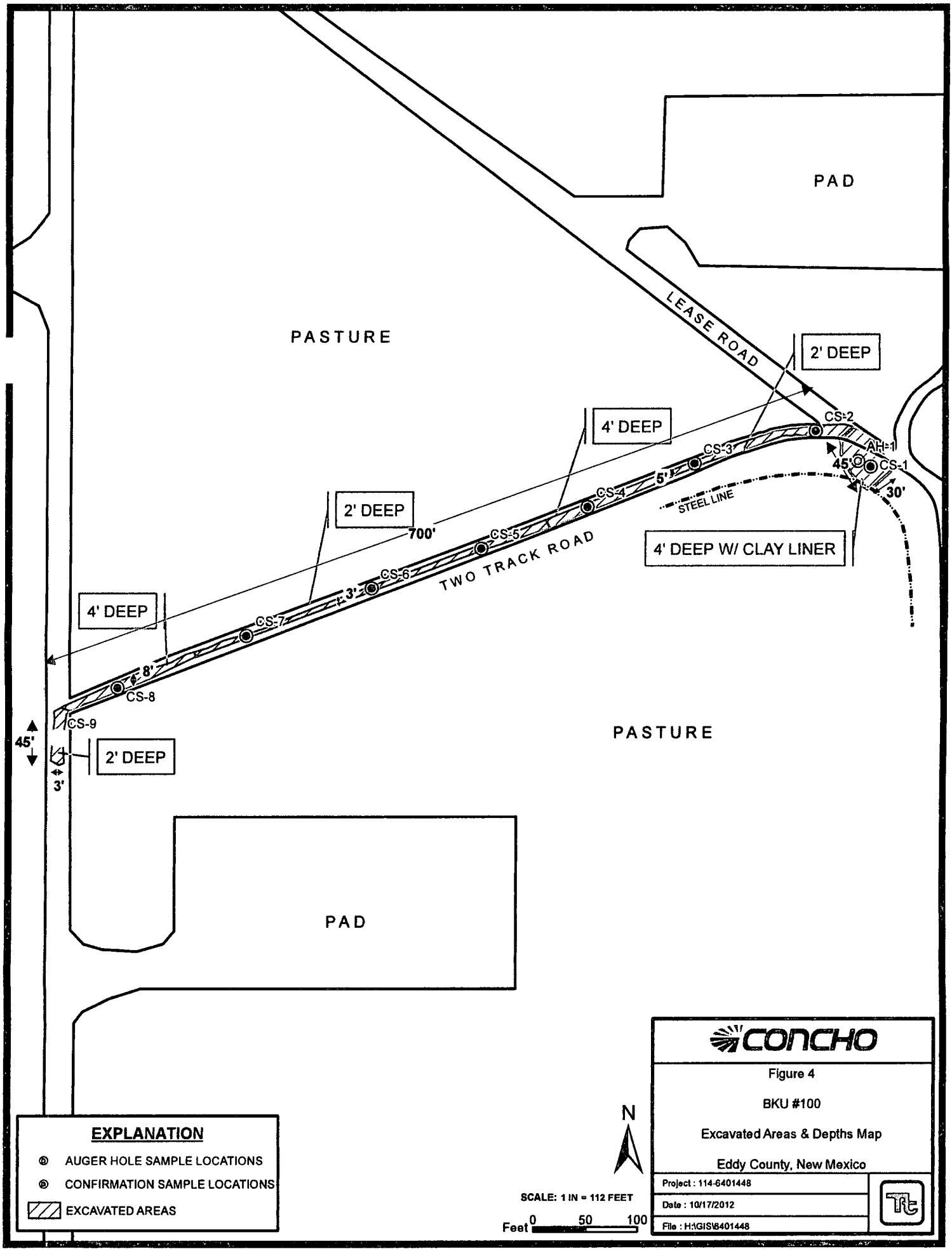


Drawn By: Isabel Mamolejo

Tables

Table 1
COG Operating LLC.
BKU #100
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
AH-1	7/3/2012	0-1		X	66.2	<250	66.2	0.223	0.259	0.410	0.944	1.84	11,700
	"	1-1.5		X	-	-	-	-	-	-	-	-	10,000
T-1 clay cap @ 4.0'	10/1/2012	5	X		-	-	-	-	-	-	-	-	922
	"	7	X		-	-	-	-	-	-	-	-	922
	"	9	X		-	-	-	-	-	-	-	-	884
	"	11	X		-	-	-	-	-	-	-	-	732
	"	13	X		-	-	-	-	-	-	-	-	471
CS-1 South Wall	10/1/2012	-	X		-	-	-	-	-	-	-	-	138
CS-1 East Wall	10/1/2012	-	X		-	-	-	-	-	-	-	-	238
CS-1 West Wall	10/1/2012	-	X		-	-	-	-	-	-	-	-	<20.0
CS-1 Bottom Hole	10/1/2012	4	X		-	-	-	-	-	-	-	-	984

Table 1
COG Operating LLC.
BKU #100
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
CS-2 North Wall	10/2/2012	-	X		-	-	-	-	-	-	-	-	271
CS-2 South Wall	10/2/2012	-	X		-	-	-	-	-	-	-	-	162
CS-2 Bottom Hole	10/2/2012	2	X		-	-	-	-	-	-	-	-	253
CS-3 North Wall	10/3/2012	-	X		-	-	-	-	-	-	-	-	210
CS-3 South Wall	10/3/2012	-	X		-	-	-	-	-	-	-	-	124
CS-3 Bottom Hole	10/3/2012	2	X		-	-	-	-	-	-	-	-	95.4
CS-4 North Wall	10/4/2012	-	X		-	-	-	-	-	-	-	-	124
CS-4 South Wall	10/4/2012	-	X		-	-	-	-	-	-	-	-	210
CS-4 Bottom Hole	10/4/2012	2	X		-	-	-	-	-	-	-	-	219
CS-5 North Wall	10/4/2012	-	X		-	-	-	-	-	-	-	-	243
CS-5 South Wall	10/4/2012	-	X		-	-	-	-	-	-	-	-	281
CS-5 Bottom Hole	10/4/2012	2	X		-	-	-	-	-	-	-	-	299
CS-6 North Wall	10/5/2012	-	X		-	-	-	-	-	-	-	-	309
CS-6 South Wall	10/5/2012	-	X		-	-	-	-	-	-	-	-	394
CS-6 Bottom Hole	10/5/2012	2	X		-	-	-	-	-	-	-	-	266

Table 1
COG Operating LLC.
BKU #100
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
CS-7 North Wall	10/5/2012	-	X		-	-	-	-	-	-	-	-	329
CS-7 South Wall	10/5/2012	-	X		-	-	-	-	-	-	-	-	361
CS-7 Bottom Hole	10/5/2012	2	X		-	-	-	-	-	-	-	-	285
CS-8 North Wall	10/5/2012	-	X		-	-	-	-	-	-	-	-	242
CS-8 South Wall	10/5/2012	-	X		-	-	-	-	-	-	-	-	223
CS-8 Bottom Hole	10/5/2012	4	X		-	-	-	-	-	-	-	-	309
CS-9 North Wall	10/9/2012	-	X		-	-	-	-	-	-	-	-	359
CS-9 South Wall	10/9/2012	-	X		-	-	-	-	-	-	-	-	272
CS-9 East Wall	10/9/2012	-	X		-	-	-	-	-	-	-	-	233
CS-9 West Wall	10/9/2012	-	X		-	-	-	-	-	-	-	-	209
CS-9 Bottom Hole	10/9/2012	2	X		-	-	-	-	-	-	-	-	359

(-) Not Analyzed

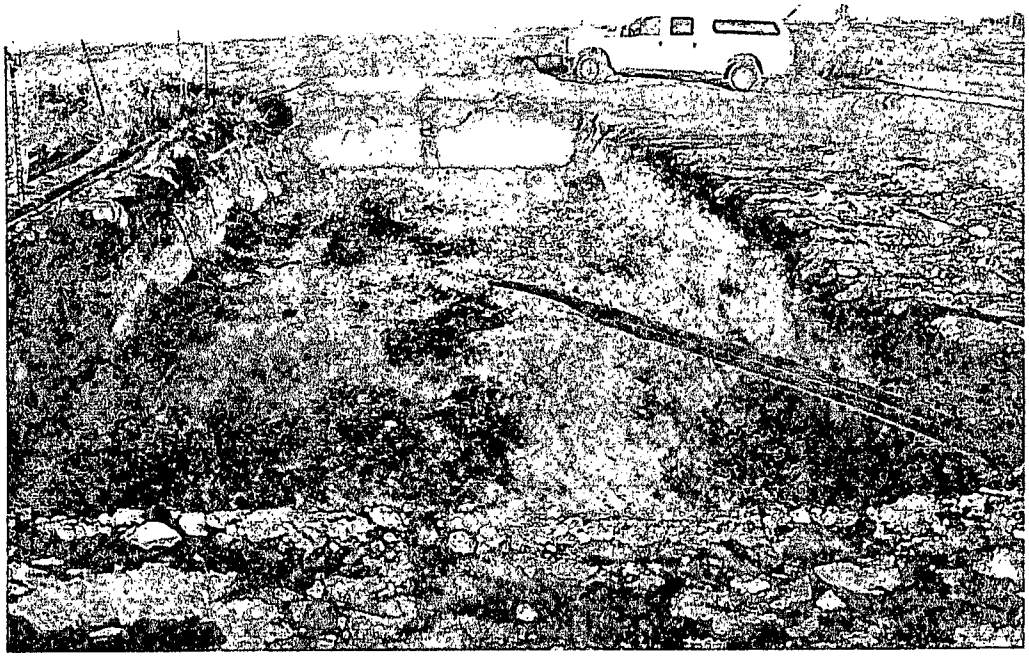
Excavated Depths

Clay Material

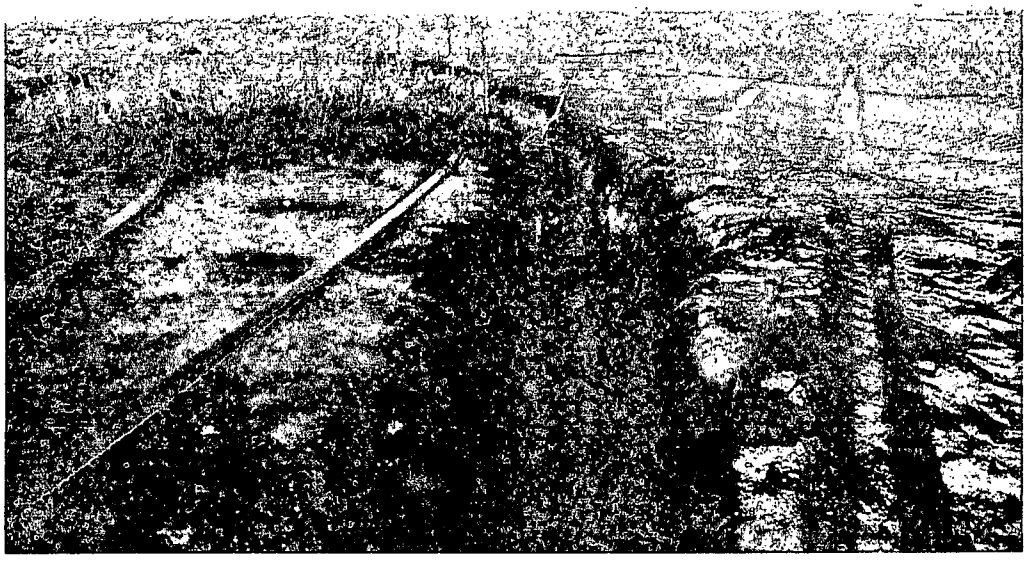
Photos

COG Operating LLC
Burch Keely Unit #100 Flowline
Eddy County, New Mexico

TETRA TECH



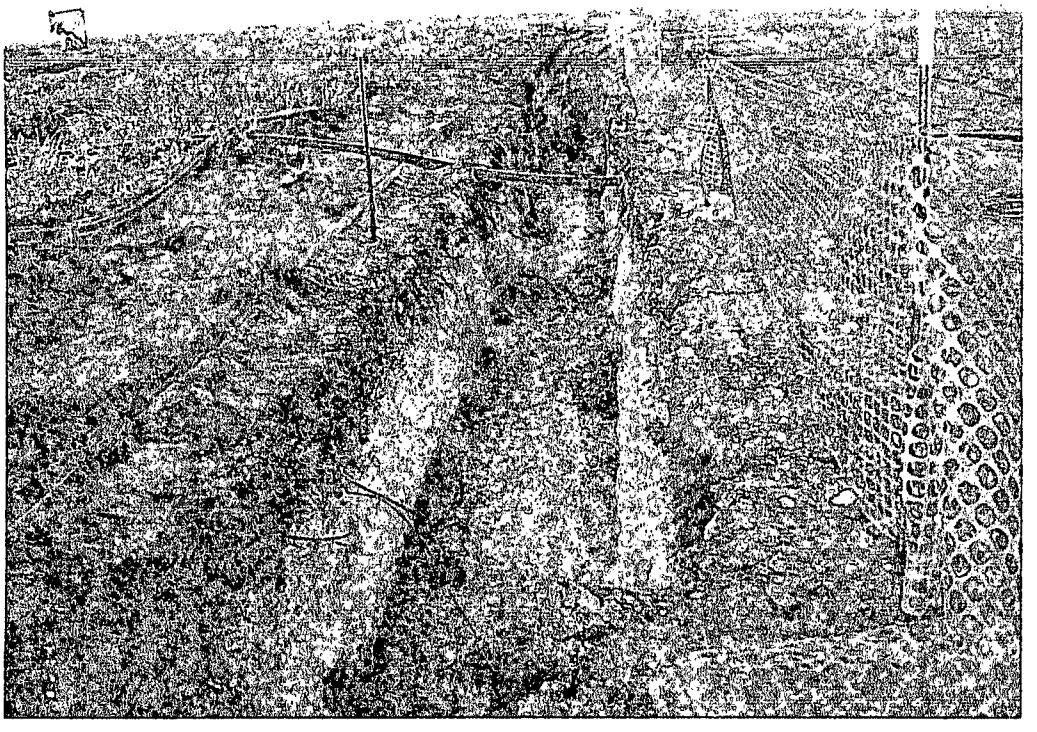
View North – Area of AH-1



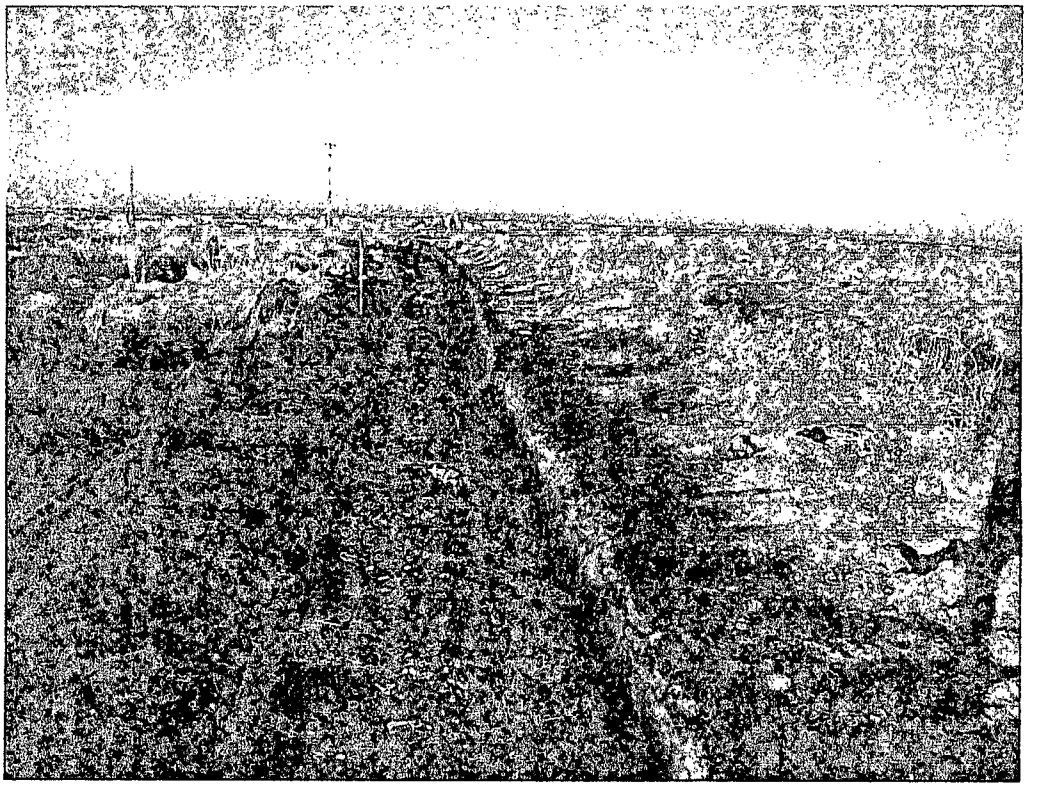
View West – Area of CS-2 and CS-3

COG Operating LLC
Burch Keely Unit #100 Flowline
Eddy County, New Mexico

TETRA TECH



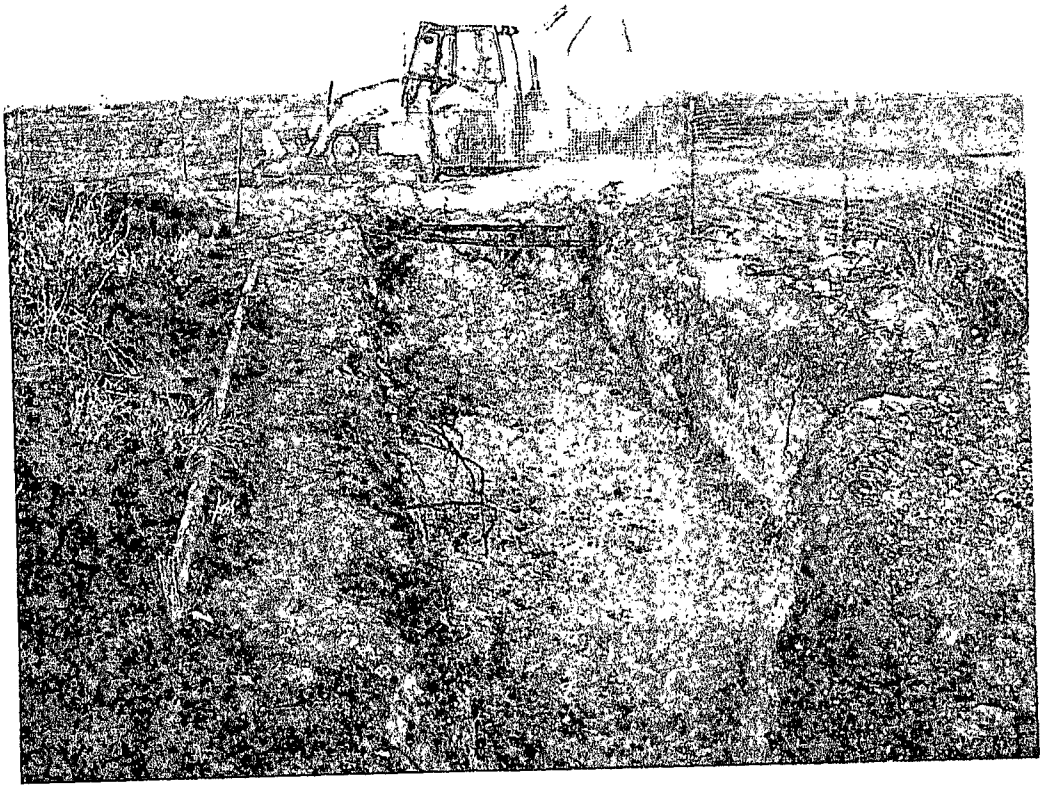
View West – Area of CS-4 and CS-5



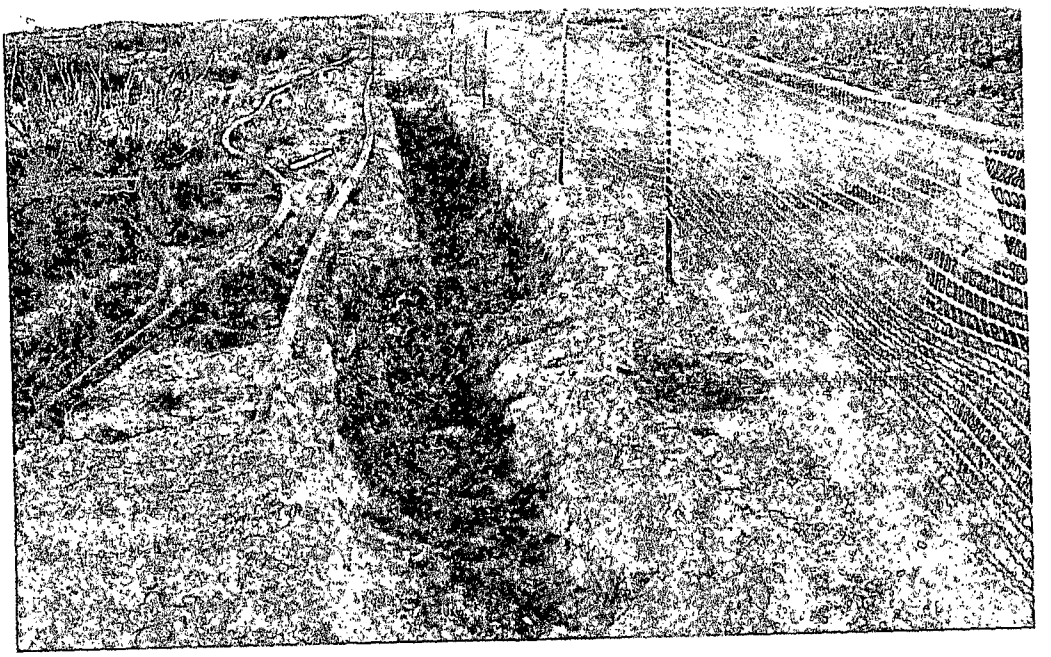
View West – Area of CS-6 and CS-7

COG Operating LLC
Burch Keely Unit #100 Flowline
Eddy County, New Mexico

TETRA TECH



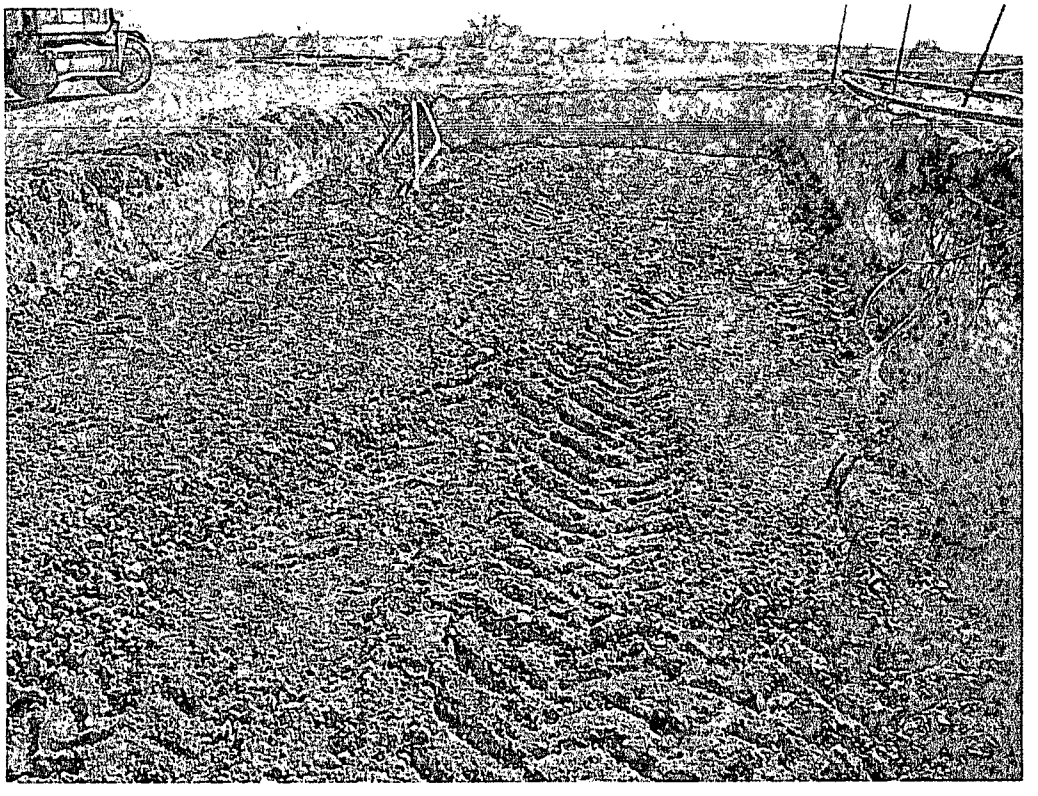
View West – Area of CS-8



View South – Area of CS-9

COG Operating LLC
Burch Keely Unit #100 Flowline
Eddy County, New Mexico

TETRA TECH

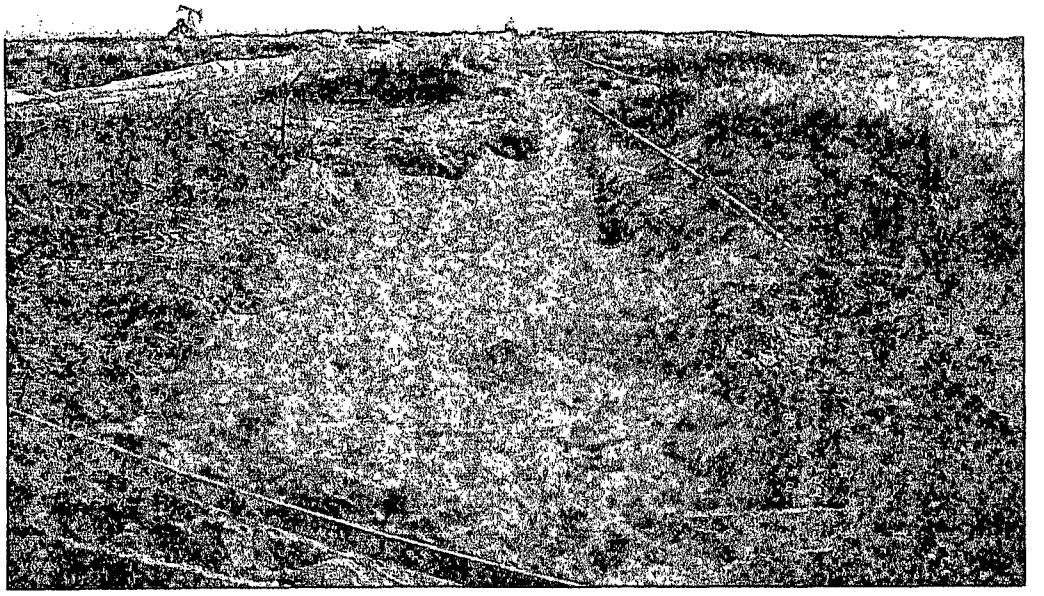


Clay liner installed in area of AH-1

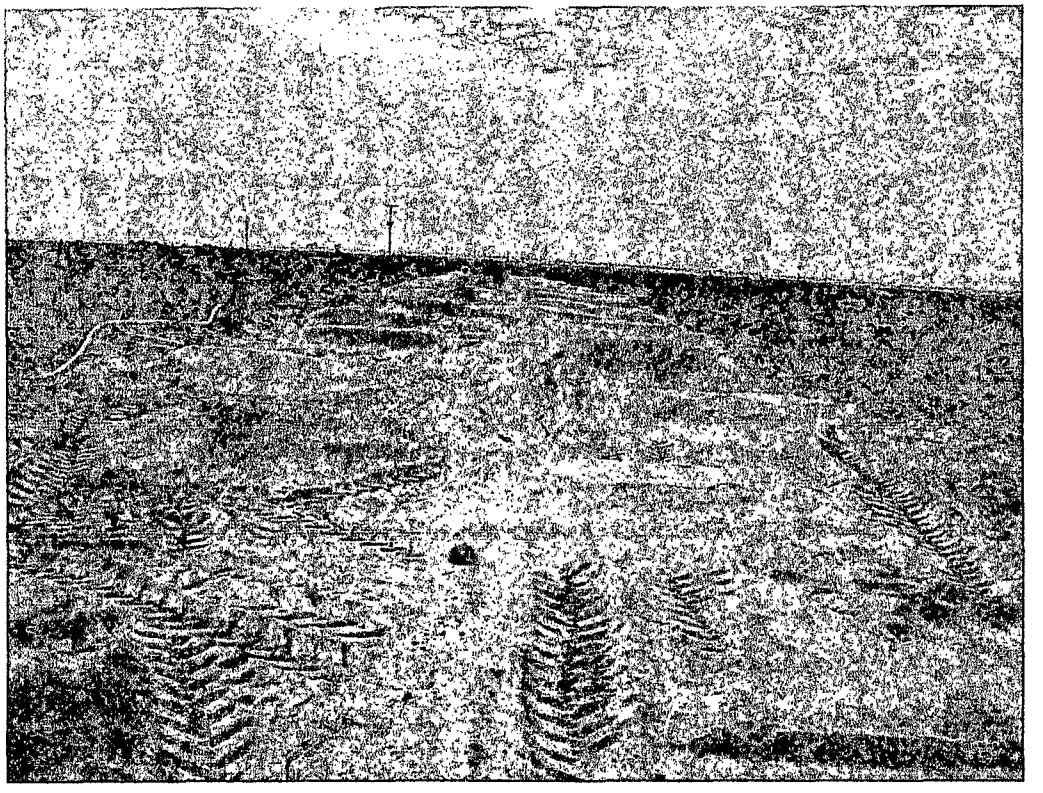
Backfill

COG Operating LLC
Burch Keely Unit #100 Flowline
Eddy County, New Mexico

TETRA TECH



Backfill



Two track road was reclaimed and windrows installed

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

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NOV 01 2012
NMOCD ARTESIA

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company	COG Operating LLC	Contact	Pat Ellis
Address	550 W. Texas, Suite 1300 Midland, Texas 79701	Telephone No.	(432) 230-0077
Facility Name	Burch Keely Unit #100	Facility Type	Injection Line

Surface Owner: Federal	Mineral Owner	Lease No. (API#) 30-015-04213

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
P	18	17S	30E					Eddy

Latitude N 32.81382° **Longitude** W 104.00933°

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release 30 bbls	Volume Recovered 15 bbls
Source of Release: Steel Line	Date and Hour of Occurrence 06/15/2012	Date and Hour of Discovery 06/15/2012 10:00 a.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher-OCD	
By Whom? Michelle Mullins	Date and Hour 06/16/2012 6:15 p.m.	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

The Burch Keely Unit #100 steel line ruptured roughly 50 yards from the Burch Keely Unit #279 well. We have replaced the faulty joint of pipe with a new joint.

Describe Area Affected and Cleanup Action Taken.*

Tetra Tech personnel inspected the site and collected samples to define the spills extent. Soil that exceeded RRAL was removed and hauled away for proper disposal. The site was then brought up to surface grade with clean backfill material. Tetra Tech prepared a closure report and submitted it to NMOCD for review.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION	
Printed Name: Ike Tavarez	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:	Attached ☐
Date: 10-17-12 Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary

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 100, Midland, TX 79701	Telephone No.	432-230-0077
Facility Name	Burch Keely Unit #100	Facility Type	Injection line

Surface Owner Federal	Mineral Owner	Lease No. (API#) 30-015-04213

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
P	18	17S	30E					Eddy

Latitude 32 48.877 **Longitude** 104 00.563

NATURE OF RELEASE

Type of Release Produced water	Volume of Release 30bbls	Volume Recovered 15bbls
Source of Release Steel line	Date and Hour of Occurrence 06/15/2012	Date and Hour of Discovery 06/15/2012 10:00 a.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher-OCD	
By Whom? Michelle Mullins	Date and Hour 06/16/2012 6:15 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.*

The Burch Keely Unit #100 steel line ruptured roughly 50 yards from the Burch Keely Unit #279 well. We have replaced the faulty joint of pipe with a new joint.

Describe Area Affected and Cleanup Action Taken.*

Initially 30bbls of produced water was released from the steel line and we were able to recover 15bbls with a vacuum truck. The release was contained by the roadway and measured and area of 31' x 11' in the pasture. Tetra Tech will sample the spill site area to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD/BLM for approval prior to any significant remediation work.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	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: 06/22/2012 Phone: 432-212-2399		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - BKU #100 Steel line
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 **SITE**	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

17 South 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

Appendix C

Summary Report

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

Report Date: October 19, 2012

Work Order: 12101518

Project Location: Eddy Co., NM
Project Name: COG/BKU #100
Project Number: 114-6401448

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
311790	CS-9 North Wall	soil	2012-10-09	00:00	2012-10-15
311791	CS-9 South Wall	soil	2012-10-09	00:00	2012-10-15
311792	CS-9 East Wall	soil	2012-10-09	00:00	2012-10-15
311793	CS-9 West Wall	soil	2012-10-09	00:00	2012-10-15
311794	CS-9 Bottom Hole 2'	soil	2012-10-09	00:00	2012-10-15

Sample: 311790 - CS-9 North Wall

Param	Flag	Result	Units	RL
Chloride		**359**	mg/Kg	4

Sample: 311791 - CS-9 South Wall

Param	Flag	Result	Units	RL
Chloride		**272**	mg/Kg	4

Sample: 311792 - CS-9 East Wall

Param	Flag	Result	Units	RL
Chloride		**233**	mg/Kg	4

Sample: 311793 - CS-9 West Wall

Param	Flag	Result	Units	RL
Chloride		**209**	mg/Kg	4

Sample: 311794 - CS-9 Bottom Hole 2'

Param	Flag	Result	Units	RL
Chloride		**359**	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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(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: October 19, 2012

Work Order: 12101518

Project Location: Eddy Co., NM
Project Name: COG/BKU #100
Project Number: 114-6401448

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
311790	CS-9 North Wall	soil	2012-10-09	00:00	2012-10-15
311791	CS-9 South Wall	soil	2012-10-09	00:00	2012-10-15
311792	CS-9 East Wall	soil	2012-10-09	00:00	2012-10-15
311793	CS-9 West Wall	soil	2012-10-09	00:00	2012-10-15
311794	CS-9 Bottom Hole 2'	soil	2012-10-09	00:00	2012-10-15

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.

This report consists of a total of 10 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

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

Report Contents

Case Narrative

Samples for project COG/BKU #100 were received by TraceAnalysis, Inc. on 2012-10-15 and assigned to work order 12101518. Samples for work order 12101518 were received intact at a temperature of 4.8 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	81204	2012-10-18 at 10:08	95875	2012-10-18 at 16:23
Chloride (Titration)	SM 4500-Cl B	81204	2012-10-18 at 10:08	95876	2012-10-18 at 16:24

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 12101518 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: 311790 - CS-9 North Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95875	Date Analyzed:	2012-10-18	Analyzed By:	AR
Prep Batch:	81204	Sample Preparation:	2012-10-18	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**359**	mg/Kg	5	4.00

Sample: 311791 - CS-9 South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95875	Date Analyzed:	2012-10-18	Analyzed By:	AR
Prep Batch:	81204	Sample Preparation:	2012-10-18	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**272**	mg/Kg	5	4.00

Sample: 311792 - CS-9 East Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95875	Date Analyzed:	2012-10-18	Analyzed By:	AR
Prep Batch:	81204	Sample Preparation:	2012-10-18	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**233**	mg/Kg	5	4.00

Sample: 311793 - CS-9 West Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95876	Date Analyzed:	2012-10-18	Analyzed By:	AR
Prep Batch:	81204	Sample Preparation:	2012-10-18	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**209**	mg/Kg	5	4.00

Sample: 311794 - CS-9 Bottom Hole 2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95876	Date Analyzed:	2012-10-18	Analyzed By:	AR
Prep Batch:	81204	Sample Preparation:	2012-10-18	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**359**	mg/Kg	5	4.00

Method Blanks

Method Blank (1) QC Batch: 95875

QC Batch:	95875	Date Analyzed:	2012-10-18	Analyzed By:	AR
Prep Batch:	81204	QC Preparation:	2012-10-18	Prepared By:	AR

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

Method Blank (1) QC Batch: 95876

QC Batch:	95876	Date Analyzed:	2012-10-18	Analyzed By:	AR
Prep Batch:	81204	QC Preparation:	2012-10-18	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: 95875 | Date Analyzed: 2012-10-18 | Analyzed By: AR
Prep Batch: 81204 | QC Preparation: 2012-10-18 | 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			2560	mg/Kg	1	2500	<3.85	102	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: 95876 | Date Analyzed: 2012-10-18 | Analyzed By: AR
Prep Batch: 81204 | QC Preparation: 2012-10-18 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2580	mg/Kg	1	2500	<3.85	103	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			2710	mg/Kg	1	2500	<3.85	108	85 - 115	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: 311792

QC Batch: 95875 | Date Analyzed: 2012-10-18 | Analyzed By: AR
Prep Batch: 81204 | QC Preparation: 2012-10-18 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2740	mg/Kg	5	2500	233	100	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			2860	mg/Kg	5	2500	233	105	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: 311794

QC Batch: 95876 | Date Analyzed: 2012-10-18 | Analyzed By: AR
Prep Batch: 81204 | QC Preparation: 2012-10-18 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2880	mg/Kg	5	2500	359	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			2770	mg/Kg	5	2500	359	96	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: 95875 | Date Analyzed: 2012-10-18 | 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	99.5	100	85 - 115	2012-10-18

Standard (CCV-2)

QC Batch: 95875 | Date Analyzed: 2012-10-18 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2012-10-18

Standard (CCV-1)

QC Batch: 95876 | Date Analyzed: 2012-10-18 | 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	2012-10-18

Standard (CCV-2)

QC Batch: 95876 | Date Analyzed: 2012-10-18 | 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	99.6	100	85 - 115	2012-10-18

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.
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.

10/10/12

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.: 114-6401448

PROJECT NAME: COG / BKU 100 Eddy Co, NM

LAB I.D. NUMBER	DATE 2012	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE
311790	10-9		S		X	CS-9 North wall	1				Y	
791						CS-9 South wall						
792						CS-9 East wall						
793						CS-9 West wall						
794	↓		↓		↓	CS-9 Bottom Hole 2'	↓				↓	

ANALYSIS REQUEST (Circle or Specify Method No.)

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
												↓				

RELINQUISHED BY: (Signature) Robert Hobbs Jr. Date: 10-11-12 Time: 1700
RECEIVED BY: (Signature) Date: 10/15/12 Time: 1700

RELINQUISHED BY: (Signature) Date: 10.15.12 Time: 1553
RECEIVED BY: (Signature) Date: 10/15/12 Time: 15:50

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

SAMPLED BY: (Print & Initial) Robert Hobbs, Jr. Date: 10-11-12 Time: 1700

SAMPLE SHIPPED BY: (Circle)
FEDEX BUS
HAND DELIVERED UPS

AIRBILL #:

OTHER:

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: Acosta PHONE:

RECEIVED BY: (Signature)
DATE: TIME:

TETRA TECH CONTACT PERSON: Ike Tavarez

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 4.8°

REMARKS: Midland lab

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: October 15, 2012

Work Order: 12100815

Project Location: Eddy Co., NM
Project Name: COG/BKU #100
Project Number: 114-6401448

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
311225	Trench-1 5' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311226	Trench-1 7' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311227	Trench-1 9' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311228	Trench-1 11' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311229	Trench-1 13' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311230	CS-1 South Wall (AH-1)	soil	2012-10-01	00:00	2012-10-08
311231	CS-1 East Wall (AH-1)	soil	2012-10-01	00:00	2012-10-08
311232	CS-1 West Wall (AH-1)	soil	2012-10-01	00:00	2012-10-08
311233	CS-1 Bottom Hole 4' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311234	CS-2 North Wall	soil	2012-10-02	00:00	2012-10-08
311235	CS-2 South Wall	soil	2012-10-02	00:00	2012-10-08
311236	CS-2 Bottom Hole 2'	soil	2012-10-02	00:00	2012-10-08
311237	CS-3 North Wall	soil	2012-10-03	00:00	2012-10-08
311238	CS-3 South Wall	soil	2012-10-03	00:00	2012-10-08
311239	CS-3 Bottom Hole 2'	soil	2012-10-03	00:00	2012-10-08
311240	CS-4 North Wall	soil	2012-10-04	00:00	2012-10-08
311241	CS-4 South Wall	soil	2012-10-04	00:00	2012-10-08
311242	CS-4 Bottom Hole 2'	soil	2012-10-04	00:00	2012-10-08
311243	CS-5 North Wall	soil	2012-10-04	00:00	2012-10-08
311244	CS-5 South Wall	soil	2012-10-04	00:00	2012-10-08
311245	CS-5 Bottom Hole 2'	soil	2012-10-04	00:00	2012-10-08
311246	CS-6 North Wall	soil	2012-10-05	00:00	2012-10-08
311247	CS-6 South Wall	soil	2012-10-05	00:00	2012-10-08
311248	CS-6 Bottom Hole 2'	soil	2012-10-05	00:00	2012-10-08
311249	CS-7 North Wall	soil	2012-10-05	00:00	2012-10-08
311250	CS-7 South Wall	soil	2012-10-05	00:00	2012-10-08
311251	CS-7 Bottom Hole 2'	soil	2012-10-05	00:00	2012-10-08
311252	CS-8 North Wall	soil	2012-10-05	00:00	2012-10-08
311253	CS-8 South Wall	soil	2012-10-05	00:00	2012-10-08
311254	CS-8 Bottom Hole 4'	soil	2012-10-05	00:00	2012-10-08

Sample: 311225 - Trench-1 5' (AH-1)

Param	Flag	Result	Units	RL
Chloride		**922**	mg/Kg	4

Sample: 311226 - Trench-1 7' (AH-1)

Param	Flag	Result	Units	RL
Chloride		**922**	mg/Kg	4

Sample: 311227 - Trench-1 9' (AH-1)

Param	Flag	Result	Units	RL
Chloride		**884**	mg/Kg	4

Sample: 311228 - Trench-1 11' (AH-1)

Param	Flag	Result	Units	RL
Chloride		**732**	mg/Kg	4

Sample: 311229 - Trench-1 13' (AH-1)

Param	Flag	Result	Units	RL
Chloride		**471**	mg/Kg	4

Sample: 311230 - CS-1 South Wall (AH-1)

Param	Flag	Result	Units	RL
Chloride		**138**	mg/Kg	4

Sample: 311231 - CS-1 East Wall (AH-1)

Param	Flag	Result	Units	RL
Chloride		**238**	mg/Kg	4

Sample: 311232 - CS-1 West Wall (AH-1)

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

Sample: 311233 - CS-1 Bottom Hole 4' (AH-1)

Param	Flag	Result	Units	RL
Chloride		**984**	mg/Kg	4

Sample: 311234 - CS-2 North Wall

Param	Flag	Result	Units	RL
Chloride		**271**	mg/Kg	4

Sample: 311235 - CS-2 South Wall

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

Sample: 311236 - CS-2 Bottom Hole 2'

Param	Flag	Result	Units	RL
Chloride		**253**	mg/Kg	4

Sample: 311237 - CS-3 North Wall

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

Sample: 311238 - CS-3 South Wall

Param	Flag	Result	Units	RL
Chloride		**124**	mg/Kg	4

Sample: 311239 - CS-3 Bottom Hole 2'

Param	Flag	Result	Units	RL
Chloride		**95.4**	mg/Kg	4

Sample: 311240 - CS-4 North Wall

Param	Flag	Result	Units	RL
Chloride		**124**	mg/Kg	4

Sample: 311241 - CS-4 South Wall

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

Sample: 311242 - CS-4 Bottom Hole 2'

Param	Flag	Result	Units	RL
Chloride		**219**	mg/Kg	4

Sample: 311243 - CS-5 North Wall

Param	Flag	Result	Units	RL
Chloride		**243**	mg/Kg	4

Sample: 311244 - CS-5 South Wall

Param	Flag	Result	Units	RL
Chloride		**281**	mg/Kg	4

Sample: 311245 - CS-5 Bottom Hole 2'

Param	Flag	Result	Units	RL
Chloride		**299**	mg/Kg	4

Sample: 311246 - CS-6 North Wall

Param	Flag	Result	Units	RL
Chloride		**309**	mg/Kg	4

Sample: 311247 - CS-6 South Wall

Param	Flag	Result	Units	RL
Chloride		**394**	mg/Kg	4

Sample: 311248 - CS-6 Bottom Hole 2'

Param	Flag	Result	Units	RL
Chloride		**266**	mg/Kg	4

Sample: 311249 - CS-7 North Wall

Param	Flag	Result	Units	RL
Chloride		**329**	mg/Kg	4

Sample: 311250 - CS-7 South Wall

Param	Flag	Result	Units	RL
Chloride		**361**	mg/Kg	4

Sample: 311251 - CS-7 Bottom Hole 2'

Param	Flag	Result	Units	RL
Chloride		**285**	mg/Kg	4

Sample: 311252 - CS-8 North Wall

Param	Flag	Result	Units	RL
Chloride		**242**	mg/Kg	4

Sample: 311253 - CS-8 South Wall

Param	Flag	Result	Units	RL
Chloride		**223**	mg/Kg	4

Sample: 311254 - CS-8 Bottom Hole 4'

Param	Flag	Result	Units	RL
Chloride		**309**	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: October 15, 2012

Work Order: 12100815

Project Location: Eddy Co., NM
Project Name: COG/BKU #100
Project Number: 114-6401448

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
311225	Trench-1 5' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311226	Trench-1 7' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311227	Trench-1 9' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311228	Trench-1 11' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311229	Trench-1 13' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311230	CS-1 South Wall (AH-1)	soil	2012-10-01	00:00	2012-10-08
311231	CS-1 East Wall (AH-1)	soil	2012-10-01	00:00	2012-10-08
311232	CS-1 West Wall (AH-1)	soil	2012-10-01	00:00	2012-10-08
311233	CS-1 Bottom Hole 4' (AH-1)	soil	2012-10-01	00:00	2012-10-08
311234	CS-2 North Wall	soil	2012-10-02	00:00	2012-10-08
311235	CS-2 South Wall	soil	2012-10-02	00:00	2012-10-08
311236	CS-2 Bottom Hole 2'	soil	2012-10-02	00:00	2012-10-08
311237	CS-3 North Wall	soil	2012-10-03	00:00	2012-10-08
311238	CS-3 South Wall	soil	2012-10-03	00:00	2012-10-08
311239	CS-3 Bottom Hole 2'	soil	2012-10-03	00:00	2012-10-08
311240	CS-4 North Wall	soil	2012-10-04	00:00	2012-10-08
311241	CS-4 South Wall	soil	2012-10-04	00:00	2012-10-08
311242	CS-4 Bottom Hole 2'	soil	2012-10-04	00:00	2012-10-08

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
311243	CS-5 North Wall	soil	2012-10-04	00:00	2012-10-08
311244	CS-5 South Wall	soil	2012-10-04	00:00	2012-10-08
311245	CS-5 Bottom Hole 2'	soil	2012-10-04	00:00	2012-10-08
311246	CS-6 North Wall	soil	2012-10-05	00:00	2012-10-08
311247	CS-6 South Wall	soil	2012-10-05	00:00	2012-10-08
311248	CS-6 Bottom Hole 2'	soil	2012-10-05	00:00	2012-10-08
311249	CS-7 North Wall	soil	2012-10-05	00:00	2012-10-08
311250	CS-7 South Wall	soil	2012-10-05	00:00	2012-10-08
311251	CS-7 Bottom Hole 2'	soil	2012-10-05	00:00	2012-10-08
311252	CS-8 North Wall	soil	2012-10-05	00:00	2012-10-08
311253	CS-8 South Wall	soil	2012-10-05	00:00	2012-10-08
311254	CS-8 Bottom Hole 4'	soil	2012-10-05	00:00	2012-10-08

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.

This report consists of a total of 21 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

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

Report Contents

Case Narrative

Samples for project COG/BKU #100 were received by TraceAnalysis, Inc. on 2012-10-08 and assigned to work order 12100815. Samples for work order 12100815 were received intact at a temperature of 3.7 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	81080	2012-10-14 at 12:23	95699	2012-10-15 at 12:32
Chloride (Titration)	SM 4500-Cl B	81080	2012-10-14 at 12:23	95700	2012-10-15 at 12:34
Chloride (Titration)	SM 4500-Cl B	81080	2012-10-14 at 12:23	95701	2012-10-15 at 12:34

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 12100815 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: 311225 - Trench-1 5' (AH-1)

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95699	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**922**	mg/Kg	5	4.00

Sample: 311226 - Trench-1 7' (AH-1)

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95699	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**922**	mg/Kg	5	4.00

Sample: 311227 - Trench-1 9' (AH-1)

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95699	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**884**	mg/Kg	5	4.00

Sample: 311228 - Trench-1 11' (AH-1)

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95699	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**732**	mg/Kg	5	4.00

Sample: 311229 - Trench-1 13' (AH-1)

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95699	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**471**	mg/Kg	5	4.00

Sample: 311230 - CS-1 South Wall (AH-1)

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95699	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**138**	mg/Kg	5	4.00

Sample: 311231 - CS-1 East Wall (AH-1)

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95699	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**238**	mg/Kg	5	4.00

Sample: 311232 - CS-1 West Wall (AH-1)

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95699	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

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

Sample: 311233 - CS-1 Bottom Hole 4' (AH-1)

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95699	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**984**	mg/Kg	5	4.00

Sample: 311234 - CS-2 North Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95699	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**271**	mg/Kg	5	4.00

Sample: 311235 - CS-2 South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95700	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

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

Sample: 311236 - CS-2 Bottom Hole 2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95700	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**253**	mg/Kg	5	4.00

Sample: 311237 - CS-3 North Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95700	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

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

Sample: 311238 - CS-3 South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95700	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**124**	mg/Kg	5	4.00

Sample: 311239 - CS-3 Bottom Hole 2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95700	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**95.4**	mg/Kg	5	4.00

Sample: 311240 - CS-4 North Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95700	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**124**	mg/Kg	5	4.00

Sample: 311241 - CS-4 South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95700	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

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

Sample: 311242 - CS-4 Bottom Hole 2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95700	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	Result	RL	Units	Dilution	RL
Chloride			**219**		mg/Kg	5	4.00

Sample: 311243 - CS-5 North Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95700	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	Result	RL	Units	Dilution	RL
Chloride			**243**		mg/Kg	5	4.00

Sample: 311244 - CS-5 South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95700	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	Result	RL	Units	Dilution	RL
Chloride			**281**		mg/Kg	5	4.00

Sample: 311245 - CS-5 Bottom Hole 2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95701	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**299**	mg/Kg	5	4.00

Sample: 311246 - CS-6 North Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95701	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**309**	mg/Kg	5	4.00

Sample: 311247 - CS-6 South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95701	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**394**	mg/Kg	5	4.00

Sample: 311248 - CS-6 Bottom Hole 2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95701	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**266**	mg/Kg	5	4.00

Sample: 311249 - CS-7 North Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95701	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**329**	mg/Kg	5	4.00

Sample: 311250 - CS-7 South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95701	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**361**	mg/Kg	5	4.00

Sample: 311251 - CS-7 Bottom Hole 2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95701	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**285**	mg/Kg	5	4.00

Sample: 311252 - CS-8 North Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95701	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**242**	mg/Kg	5	4.00

Sample: 311253 - CS-8 South Wall

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95701	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**223**	mg/Kg	5	4.00

Sample: 311254 - CS-8 Bottom Hole 4'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95701	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	Sample Preparation:	2012-10-14	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**309**	mg/Kg	5	4.00

Method Blanks

Method Blank (1) QC Batch: 95699

QC Batch:	95699	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	QC Preparation:	2012-10-14	Prepared By:	AR

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

Method Blank (1) QC Batch: 95700

QC Batch:	95700	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	QC Preparation:	2012-10-14	Prepared By:	AR

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

Method Blank (1) QC Batch: 95701

QC Batch:	95701	Date Analyzed:	2012-10-15	Analyzed By:	AR
Prep Batch:	81080	QC Preparation:	2012-10-14	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: 95699 | Date Analyzed: 2012-10-15 | Analyzed By: AR
Prep Batch: 81080 | QC Preparation: 2012-10-14 | 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			2640	mg/Kg	1	2500	<3.85	106	85 - 115	2	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: 95700 | Date Analyzed: 2012-10-15 | Analyzed By: AR
Prep Batch: 81080 | QC Preparation: 2012-10-14 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2590	mg/Kg	1	2500	<3.85	104	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	4	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: 95701 | Date Analyzed: 2012-10-15 | Analyzed By: AR
Prep Batch: 81080 | QC Preparation: 2012-10-14 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2690	mg/Kg	1	2500	<3.85	108	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			2550	mg/Kg	1	2500	<3.85	102	85 - 115	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: 311234

QC Batch: 95699 | Date Analyzed: 2012-10-15 | Analyzed By: AR
Prep Batch: 81080 | QC Preparation: 2012-10-14 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2750	mg/Kg	5	2500	271	99	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			2820	mg/Kg	5	2500	271	102	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: 311244

QC Batch: 95700 | Date Analyzed: 2012-10-15 | Analyzed By: AR
Prep Batch: 81080 | QC Preparation: 2012-10-14 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2790	mg/Kg	5	2500	281	100	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			2730	mg/Kg	5	2500	281	98	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: 311254

QC Batch: 95701 | Date Analyzed: 2012-10-15 | Analyzed By: AR
Prep Batch: 81080 | QC Preparation: 2012-10-14 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2600	mg/Kg	5	2500	309	92	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			2690	mg/Kg	5	2500	309	95	78.9 - 121	3	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: 95699 | Date Analyzed: 2012-10-15 | 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	101	101	85 - 115	2012-10-15

Standard (CCV-2)

QC Batch: 95699 | Date Analyzed: 2012-10-15 | 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	99.4	99	85 - 115	2012-10-15

Standard (CCV-1)

QC Batch: 95700 | Date Analyzed: 2012-10-15 | 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	2012-10-15

Standard (CCV-2)

QC Batch: 95700 | Date Analyzed: 2012-10-15 | 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	2012-10-15

Standard (CCV-1)

QC Batch: 95701 | Date Analyzed: 2012-10-15 | 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	99.5	100	85 - 115	2012-10-15

Standard (CCV-2)

QC Batch: 95701 | Date Analyzed: 2012-10-15 | 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	101	101	85 - 115	2012-10-15

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
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.
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.

12100815

Analysis Request of Chain of Custody Record

PAGE: 1 of 3

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

CLIENT NAME: COG

SITE MANAGER: Jake Tavarez

PROJECT NO.: 114-6401448

PROJECT NAME: COG / BKU #100 Eddy Co, NM

LAB I.D. NUMBER	DATE 2012	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE
311224	10-1		S		X	Trench-1 3' (AH-1)	1				X	
225						Trench-1 5' (AH-1)						
226						Trench-1 7' (AH-1)						
227						Trench-1 9' (AH-1)						
228						Trench-1 11' (AH-1)						
229						Trench-1 13' (AH-1)						
230						CS-1 Southwall (AH-1)						
231						CS-1 East wall (AH-1)						
232						CS-1 West wall (AH-1)						
233	↓		↓		↓	CS-1 Bottom Hole 4' (AH-1)	↓				↓	

ANALYSIS REQUEST (Circle or Specify Method No.)

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

RELINQUISHED BY: (Signature)	Date: 10-5-12 Time: 1700	RECEIVED BY: (Signature)	Date: 10-8-12 Time: 2:30 P.M.
RELINQUISHED BY: (Signature)	Date: 10-8-12 Time: 2:30 PM	RECEIVED BY: (Signature)	Date: 10/8/12 Time: 14:30
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:

SAMPLED BY: (Print & Initial) Robert Gabbs Jr. Date: 10-5-12 Time: 1000

SAMPLE SHIPPED BY: (Circle) FEDEX HAND DELIVERED BUS UPS AIRBILL #: OTHER:

RECEIVING LABORATORY: Trace

ADDRESS: CITY: Midland STATE: TX ZIP:

CONTACT: Trace PHONE: DATE: TIME:

RECEIVED BY: (Signature)

TETRA TECH CONTACT PERSON: Jake Tavarez

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 2.7° Intact

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.

10W0812

Analysis Request of Chain of Custody Record

PAGE: 2 of 3

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

CLIENT NAME: COG
SITE MANAGER: Tike Tavarez
PROJECT NO.: 114-6401448
PROJECT NAME: COG / BKU # 100 Eddy Co, NM

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
234	10-2-2013		S		X	CS-2 North wall	1				X														X				
235						CS-2 South wall																							
236						CS-2 Bottom Hole 2'																							
237	10-3					CS-3 North wall																							
238						CS-3 South wall																							
239						CS-3 Bottom Hole 2'																							
240	10-4					CS-4 North wall																							
241						CS-4 South wall																							
242						CS-4 Bottom Hole 2'																							
243	10-4		Y		Y	CS-5 North wall	Y				Y														Y				

RELINQUISHED BY: (Signature) Robert Grubbs Jr. Date: 10-5-12 Time: 1240
RECEIVED BY: (Signature) Date: 10-8-12 Time: 2:30 PM
SAMPLED BY: (Print & Initial) Robert Grubbs Jr. Date: 10-5-12 Time: 1005

RELINQUISHED BY: (Signature) Date: 10-8-12 Time: 2:30 PM
RECEIVED BY: (Signature) Date: 10/8/12 Time: 14:50
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS
AIRBILL #:

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

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

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

SAMPLE CONDITION WHEN RECEIVED: 3.7° intact
REMARKS:

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

10/10/12

Analysis Request of Chain of Custody Record

PAGE: 3 of 3

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.: 114-6401448

PROJECT NAME: COG / BKU #100 Eddy Co, NM

LAB I.D. NUMBER	DATE 2012	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
244	10-4		S		✓	CS-5 South wall	1				X													X				
245	10-4					CS-5 Bottom Hole 2'																						
246	10-5					CS-6 North wall																						
247						CS-6 South wall																						
248						CS-6 Bottom Hole 2'																						
249						CS-7 North wall																						
250						CS-7 South wall																						
251						CS-7 Bottom Hole 2'																						
252						CS-8 North wall																						
253			↓		↓	CS-8 South wall	↓				↓													↓				

RELINQUISHED BY: (Signature)	Date: 10-9-12 Time: 1700	RECEIVED BY: (Signature)	Date: 10-8-12 Time: 2:30 pm
RELINQUISHED BY: (Signature)	Date: 10-8-12 Time: 2:30 pm	RECEIVED BY: (Signature)	Date: 10/8/12 Time:
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:

SAMPLED BY: (Print & Initial) Robert Lubbs TX — Date: 10-5-12 Time: 1010

SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: — OTHER:

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

TETRA TECH CONTACT PERSON: Ike Tavarez

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 37° intact

REMARKS:

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

LAB Order ID # 12100815

Page _____ of _____

TraceAnalysis, Inc.

email: lab@traceanalysis.com

6701 Aberdeen Avenue, Suite 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

5002 Basin Street, Suite A1
Midland, Texas 79703
Tel (432) 689-6301
Fax (432) 689-6313

200 East Sunset Rd., Suite E
El Paso, Texas 79922
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

BioAquatic Testing
2501 Mayes Rd., Ste 100
Carrollton, Texas 75006
Tel (972) 242-7750

Company Name: TETRA TECH — **Phone #:**

Address: (Street, City, Zip) — **Fax #:**

Contact Person: IKE TAVAREZ — **E-mail:**

Invoice to: (If different from above) COG

Project #: 114-640148 — **Project Name:** COG/BKU #100

Project Location (including state): EDDY CO NM — **Sampler Signature:**

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME
31254	CS-8 Bottom Hole 4'	1	4oz		X							X		10/5	

MTBE 8021 / 602 / 8260 / 624	BTEX 8021 / 602 / 8260 / 624	TPH 418.1 / TX1005 / TX1005 Ext(C35)	TPH 8015 GRO / DRO / TVHC	PAH 8270 / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260 / 624	GC/MS Semi. Vol. 8270 / 625	PCB's 8082 / 608	Pesticides 8081 / 608	BOD, TSS, pH	Moisture Content	Cl, F, SO_4, NO_3-N, NO_2-N, PO_4-P, Alkalinity	Na, Ca, Mg, K, TDS, EC						Turn Around Time if different from standard	Hold
																		X	X							

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:
	Tetra Tech	10-8-12	2:30		TA	10/8/12	4:30
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:

INST 1.2 °C
OBS 3.7 °C
COR 3.7 °C

INST ____ °C
OBS ____ °C
COR ____ °C

INST ____ °C
OBS ____ °C
COR ____ °C

LAB USE ONLY
Intact Y / N
Headspace Y / N / NA
Log-In-Review

REMARKS:

- ☐ Dry Weight Basis Required
- ☐ TRRP Report Required
- ☐ Check If Special Reporting Limits Are Needed

Carrier #

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

ORIGINAL COPY

Summary Report

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

Report Date: July 20, 2012

Work Order: 12070517

Project Location: Eddy Co., NM
Project Name: COG/BKU #100
Project Number: 114-6401448

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
302733	AH-1 0-1'	soil	2012-07-03	00:00	2012-07-05
302734	AH-1 1-1.5"	soil	2012-07-03	00:00	2012-07-05

	BTEX				TPH DRO - NEW	TPH GRO
Sample - Field Code	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
302733 - AH-1 0-1'	**0.223**	**0.259**	**0.410**	**0.944**	<250 Qs	**66.2** Qs

Sample: 302733 - AH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		**11700**	mg/Kg	4

Sample: 302734 - AH-1 1-1.5"

Param	Flag	Result	Units	RL
Chloride		**10000**	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
(Corrected Report)

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

Report Date: July 20, 2012

Work Order: 12070517

Project Location: Eddy Co., NM
Project Name: COG/BKU #100
Project Number: 114-6401448

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
302733	AH-1 0-1'	soil	2012-07-03	00:00	2012-07-05
302734	AH-1 1-1.5"	soil	2012-07-03	00:00	2012-07-05

Report Corrections (Work Order 12070517)

- 7/18/12: Removed 48-hour flag from BTEX.

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

This report consists of a total of 18 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

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

Report Contents

Case Narrative

Samples for project COG/BKU #100 were received by TraceAnalysis, Inc. on 2012-07-05 and assigned to work order 12070517. Samples for work order 12070517 were received intact at a temperature of 4.0 C.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
BTEX	S 8021B	78843	2012-07-11 at 15:36	92978	2012-07-11 at 15:36
Chloride (Titration)	SM 4500-Cl B	78690	2012-07-06 at 08:44	92800	2012-07-06 at 14:52
TPH DRO - NEW	S 8015 D	78748	2012-07-09 at 09:00	92862	2012-07-09 at 11:00
TPH GRO	S 8015 D	78843	2012-07-11 at 15:36	92979	2012-07-11 at 15:36

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 12070517 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: 302733 - AH-1 0-1'

Laboratory:	Lubbock				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	92978	Date Analyzed:	2012-07-11	Analyzed By:	ZLM
Prep Batch:	78843	Sample Preparation:	2012-07-11	Prepared By:	ZLM

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Benzene		1	**0.223**	mg/Kg	1	0.0200
Toluene		1	**0.259**	mg/Kg	1	0.0200
Ethylbenzene		1	**0.410**	mg/Kg	1	0.0200
Xylene		1	**0.944**	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.89	mg/Kg	1	2.00	94	70 - 130
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr	2.90	mg/Kg	1	2.00	145	70 - 130

Sample: 302733 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	92800	Date Analyzed:	2012-07-06	Analyzed By:	AR
Prep Batch:	78690	Sample Preparation:	2012-07-06	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**11700**	mg/Kg	10	4.00

Sample: 302733 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	92862	Date Analyzed:	2012-07-09	Analyzed By:	CW
Prep Batch:	78748	Sample Preparation:	2012-07-09	Prepared By:	CW

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
DRO	Qs	2	<250	mg/Kg	5	50.0

Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr		260	mg/Kg	5	100	260	49.3 - 157.5

Sample: 302733 - AH-1 0-1'

Laboratory:	Lubbock				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	92979	Date Analyzed:	2012-07-11	Analyzed By:	ZLM
Prep Batch:	78843	Sample Preparation:	2012-07-11	Prepared By:	ZLM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Qs	1	**66.2**	mg/Kg	1	2.00

Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)				1.57	mg/Kg	1	2.00	78	70 - 130
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr		2.84	mg/Kg	1	2.00	142	70 - 130

Sample: 302734 - AH-1 1-1.5"

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	92800	Date Analyzed:	2012-07-06	Analyzed By:	AR
Prep Batch:	78690	Sample Preparation:	2012-07-06	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**10000**	mg/Kg	10	4.00

Method Blanks

Method Blank (1) QC Batch: 92800

QC Batch: 92800 | Date Analyzed: 2012-07-06 | Analyzed By: AR
Prep Batch: 78690 | QC Preparation: 2012-07-06 | Prepared By: AR

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

Method Blank (1) QC Batch: 92862

QC Batch: 92862 | Date Analyzed: 2012-07-09 | Analyzed By: CW
Prep Batch: 78748 | QC Preparation: 2012-07-09 | Prepared By: CW

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		2	<14.5	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			130	mg/Kg	1	100	130	52 - 160.8

Method Blank (1) QC Batch: 92978

QC Batch: 92978 | Date Analyzed: 2012-07-11 | Analyzed By: ZLM
Prep Batch: 78843 | QC Preparation: 2012-07-11 | Prepared By: ZLM

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1	<0.00365	mg/Kg	0.02
Toluene		1	<0.00816	mg/Kg	0.02
Ethylbenzene		1	<0.00560	mg/Kg	0.02
Xylene		1	0.0126	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.96	mg/Kg	1	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)			1.98	mg/Kg	1	2.00	99	70 - 130

Method Blank (1) QC Batch: 92979

QC Batch:	92979	Date Analyzed:	2012-07-11	Analyzed By:	ZLM
Prep Batch:	78843	QC Preparation:	2012-07-11	Prepared By:	ZLM

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		1	0.540	mg/Kg	2

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.65	mg/Kg	1	2.00	82	70 - 130
4-Bromofluorobenzene (4-BFB)			1.94	mg/Kg	1	2.00	97	70 - 130

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 92800 | Date Analyzed: 2012-07-06 | Analyzed By: AR
Prep Batch: 78690 | QC Preparation: 2012-07-06 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2630	mg/Kg	1	2500	<3.85	105	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2720	mg/Kg	1	2500	<3.85	109	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: 92862 | Date Analyzed: 2012-07-09 | Analyzed By: CW
Prep Batch: 78748 | QC Preparation: 2012-07-09 | Prepared By: CW

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		2	263	mg/Kg	1	250	<14.5	105	62 - 128.3

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
DRO		2	263	mg/Kg	1	250	<14.5	105	62 - 128.3	0	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane	129	129	mg/Kg	1	100	129	129	58.6 - 149.6

Laboratory Control Spike (LCS-1)

QC Batch: 92978 | Date Analyzed: 2012-07-11 | Analyzed By: ZLM
Prep Batch: 78843 | QC Preparation: 2012-07-11 | Prepared By: ZLM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	2.06	mg/Kg	1	2.00	<0.00365	103	75.4 - 120
Toluene		1	2.04	mg/Kg	1	2.00	<0.00816	102	74.9 - 120
Ethylbenzene		1	2.06	mg/Kg	1	2.00	<0.00560	103	78.1 - 120
Xylene		1	6.19	mg/Kg	1	6.00	0.0126	103	77.3 - 120

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	2.07	mg/Kg	1	2.00	<0.00365	104	75.4 - 120	0	20
Toluene		1	2.07	mg/Kg	1	2.00	<0.00816	104	74.9 - 120	1	20
Ethylbenzene		1	2.09	mg/Kg	1	2.00	<0.00560	104	78.1 - 120	1	20
Xylene		1	6.27	mg/Kg	1	6.00	0.0126	104	77.3 - 120	1	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.01	2.04	mg/Kg	1	2.00	100	102	70 - 130
4-Bromofluorobenzene (4-BFB)	2.06	2.09	mg/Kg	1	2.00	103	104	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 92979 | Date Analyzed: 2012-07-11 | Analyzed By: ZLM
Prep Batch: 78843 | QC Preparation: 2012-07-11 | Prepared By: ZLM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	16.7	mg/Kg	1	20.0	0.54	84	68.9 - 120

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
GRO		1	17.9	mg/Kg	1	20.0	0.54	90	68.9 - 120	7	20

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

continued ...

control spikes continued ...

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.68	1.80	mg/Kg	1	2.00	84	90	70 - 130
4-Bromofluorobenzene (4-BFB)	1.95	2.02	mg/Kg	1	2.00	98	101	70 - 130

Matrix Spike (MS-1) Spiked Sample: 302742

QC Batch: 92800 | Date Analyzed: 2012-07-06 | Analyzed By: AR
Prep Batch: 78690 | QC Preparation: 2012-07-06 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2880	mg/Kg	5	2500	235	106	79.4 - 120.6

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			3010	mg/Kg	5	2500	235	111	79.4 - 120.6	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: 302733

QC Batch: 92862 | Date Analyzed: 2012-07-09 | Analyzed By: CW
Prep Batch: 78748 | QC Preparation: 2012-07-09 | Prepared By: CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	Qs Qs	2	372	mg/Kg	1	250	221	60	45.5 - 127

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO	Qs Qs	2	375	mg/Kg	1	250	221	62	45.5 - 127	1	20

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

continued ...

matrix spikes continued ...

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane	137	135	mg/Kg	1	100	137	135	45.4 - 145.8

Matrix Spike (MS-1) Spiked Sample: 302733

QC Batch: 92978 | Date Analyzed: 2012-07-11 | Analyzed By: ZLM
Prep Batch: 78843 | QC Preparation: 2012-07-11 | Prepared By: ZLM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.96	mg/Kg	1	2.00	0.223	87	37.6 - 142
Toluene		1	2.11	mg/Kg	1	2.00	0.259	92	38.6 - 153
Ethylbenzene		1	2.64	mg/Kg	1	2.00	0.41	112	36.7 - 172
Xylene		1	7.81	mg/Kg	1	6.00	0.944	114	36.7 - 173

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	2.04	mg/Kg	1	2.00	0.223	91	37.6 - 142	4	20
Toluene		1	2.18	mg/Kg	1	2.00	0.259	96	38.6 - 153	3	20
Ethylbenzene		1	2.42	mg/Kg	1	2.00	0.41	100	36.7 - 172	9	20
Xylene		1	7.26	mg/Kg	1	6.00	0.944	105	36.7 - 173	7	20

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

Surrogate			MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)			2.15	2.29	mg/Kg	1	2	108	114	70 - 130
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr	3.14	2.52	mg/Kg	1	2	157	126	70 - 130

Matrix Spike (MS-1) Spiked Sample: 302733

QC Batch: 92979 | Date Analyzed: 2012-07-11 | Analyzed By: ZLM
Prep Batch: 78843 | QC Preparation: 2012-07-11 | Prepared By: ZLM

continued ...

matrix spikes continued ...

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO [Qs]	Qs	1	117	mg/Kg	1	20.0	66.2	254	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO [Qs]	Qs	1	107	mg/Kg	1	20.0	66.2	204	70 - 130	9	20

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

Surrogate			MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)			1.61	1.23	mg/Kg	1	2	80	62	70 - 130
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr	3.35	2.06	mg/Kg	1	2	168	103	70 - 130

Calibration Standards

Standard (CCV-1)

QC Batch: 92800 | Date Analyzed: 2012-07-06 | 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	2012-07-06

Standard (CCV-2)

QC Batch: 92800 | Date Analyzed: 2012-07-06 | 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	2012-07-06

Standard (CCV-1)

QC Batch: 92862 | Date Analyzed: 2012-07-09 | Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		2	mg/Kg	250	251	100	80 - 120	2012-07-09

Standard (CCV-2)

QC Batch: 92862 | Date Analyzed: 2012-07-09 | Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		2	mg/Kg	250	257	103	80 - 120	2012-07-09

Standard (CCV-3)

QC Batch: 92862 | Date Analyzed: 2012-07-09 | Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		2	mg/Kg	250	243	97	80 - 120	2012-07-09

Standard (CCV-4)

QC Batch: 92862 | Date Analyzed: 2012-07-09 | Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		2	mg/Kg	250	248	99	80 - 120	2012-07-09

Standard (CCV-1)

QC Batch: 92978 | Date Analyzed: 2012-07-11 | Analyzed By: ZLM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.106	106	80 - 120	2012-07-11
Toluene		1	mg/kg	0.100	0.104	104	80 - 120	2012-07-11
Ethylbenzene		1	mg/kg	0.100	0.106	106	80 - 120	2012-07-11
Xylene		1	mg/kg	0.300	0.316	105	80 - 120	2012-07-11

Standard (CCV-2)

QC Batch: 92978 | Date Analyzed: 2012-07-11 | Analyzed By: ZLM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0979	98	80 - 120	2012-07-11
Toluene		1	mg/kg	0.100	0.0957	96	80 - 120	2012-07-11
Ethylbenzene		1	mg/kg	0.100	0.0965	96	80 - 120	2012-07-11
Xylene		1	mg/kg	0.300	0.292	97	80 - 120	2012-07-11

Standard (CCV-3)

QC Batch: 92978 Date Analyzed: 2012-07-11 Analyzed By: ZLM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0963	96	80 - 120	2012-07-11
Toluene		1	mg/kg	0.100	0.0974	97	80 - 120	2012-07-11
Ethylbenzene		1	mg/kg	0.100	0.0968	97	80 - 120	2012-07-11
Xylene		1	mg/kg	0.300	0.287	96	80 - 120	2012-07-11

Standard (CCV-1)

QC Batch: 92979 Date Analyzed: 2012-07-11 Analyzed By: ZLM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.889	89	80 - 120	2012-07-11

Standard (CCV-2)

QC Batch: 92979 Date Analyzed: 2012-07-11 Analyzed By: ZLM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.09	109	80 - 120	2012-07-11

Standard (CCV-3)

QC Batch: 92979 Date Analyzed: 2012-07-11 Analyzed By: ZLM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO	1	1	mg/Kg	2.00	1.61	80	80 - 120	2012-07-11

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	T104704219-12-8	Lubbock
2	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.
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

Result Comments

1 CCV was double-spiked.

Attachments

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

1207517

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.: 114-6401448

PROJECT NAME: BKU # 100 Eddy Co. NM

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
102733	5/3/12				1	AH-1 '0-1'	1				X		X	X											X				
734					1	AH-1 '1-1.5'	1				X														X				

RELINQUISHED BY: (Signature) — Date: — Time: —
RECEIVED BY: (Signature) Maria Finch — Date: 7/5/12 — Time: 1115
SAMPLED BY: (Print & Initial) Kim Dorf — Date: 6/5/12 — Time: —

RELINQUISHED BY: (Signature) Ike Tavarez — Date: 7-5-12 — Time: 1310
RECEIVED BY: (Signature) Dixon — Date: 7-5-12 — Time: 1310
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: — OTHER: —

RELINQUISHED BY: (Signature) Dixon — Date: 7-5-12 — Time: 1310
RECEIVED BY: (Signature) — Date: — Time: —
TETRA TECH CONTACT PERSON: IMF Ike Tavarez — Results by: —

RECEIVING LABORATORY: Trace Analysis
ADDRESS: — CITY: — STATE: — ZIP: — CONTACT: — PHONE: —
RECEIVED BY: (Signature) Sandy McCoy — DATE: 07/09/12 — TIME: 0800
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 4°C

REMARKS: If TPH > 5000 mg/kg Run deeper sample
If Total BTEX > 50 mg/kg Run deeper sample
Midland - DRO/GRO
Kilgore - GRO/BTEX

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