SITE INFORMATION

Report Type: Closure Report

General Site Information:						
Site:	Loco Hills SWD 33 #4 Tank Battery					
Company:	COG Operating LLC					
Section, Township and Range	Unit P	Sec 33	T 17S	R 30E		
Lease Number:	API-30-015-37269					
County:	Eddy County					
GPS:	32.78607° N			103.97054° W		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	In Loco Hills, from the intersection of Haggerman Cutoff and 82, travel South on Haggerman Cutoff for 0.42 miles, turn left and travel Southeast 2.00 miles. Turn right onto least road and travel Southwest 0.46 miles to location.					

Release Data:	
Date Released:	12/5/2013
Type Release:	Produced Water
Source of Contamination:	Steel Flowline Failure
Fluid Released:	10 bbls
Fluids Recovered:	9 bbls

NM OIL CONSERVATION
ARTESIA DISTRICT
AUG 29 2014
RECEIVED

Official Communication:			
Name:	Robert McNeill		Ike Tavarez
Company:	COG Operating, LLC		Tetra Tech
Address:	One Concho Center		4000 N. Big Spring
	600 W. Illinois Ave.		Suite 401
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 682-4559
Fax:	(432) 684-7137		
Email:	rmcneill@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	
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

August 18, 2014

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

Re: Closure Report for the COG Operating LLC., Loco Hills SWD 33 #4 Flow Line Leak, Unit P, Section 33, 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 Loco Hills SWD 33 #4 Flow line Leak located in Unit P, Section 33, Township 17 South, Range 30 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.78607°, W 103.97054°. 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 December 05, 2013, and released approximately ten (10) barrels of produced fluid from a steel flow line. To alleviate the problem, COG personnel repaired the flow line. Nine (9) barrels of standing fluids were recovered. The spill initiated on the pad affecting an area approximately 20' X 15' and 20' X 10'. The initial C-141 form is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 33. According to the NMOCD groundwater map, the average depth to groundwater in this area is greater than 250' below surface. The groundwater data is shown in Appendix B.

Tetra Tech
4000 North Big Spring, Suite 401, Midland, TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Soil Assessment and Analytical Results

On January 06, 2014, Tetra Tech personnel inspected and sampled the spill area. Four (4) auger holes (AH-1 through AH-4) were installed using a stainless steel hand auger to assess the impacted soils. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, neither AH-1 nor AH-2 exceeded the TPH and BTEX RRAL, however, elevated chloride concentrations were detected in both of the auger holes. Auger hole (AH-1) showed chloride concentrations of 4,830 mg/kg at 1.0' below surface, but the concentrations declined with depth at 2.0' to 2.5' of 526 mg/kg. The area of AH-2 was not vertically defined due to a dense formation, but showed a chloride concentration of 9,240 mg/kg at 0-1' below surface.

Remedial Activities

On March 31, 2014, Tetra Tech supervised the removal of impacted material as highlighted (green) in Table 1 and shown on Figure 4. The area of AH-1 was excavated 1.5' below surface to remove the elevated chloride concentrations. The area of AH-2 was trenched with a backhoe to vertically define the chloride concentrations. Based on the results, the area was excavated to approximately 1.5' below surface, with a bottom hole chloride concentration of 752 mg/kg.

Once the areas were excavated to the appropriate depths, the excavation was backfilled with clean soil to grade. Approximately 276 cubic yards of material was transported to the proper disposal.

Conclusion

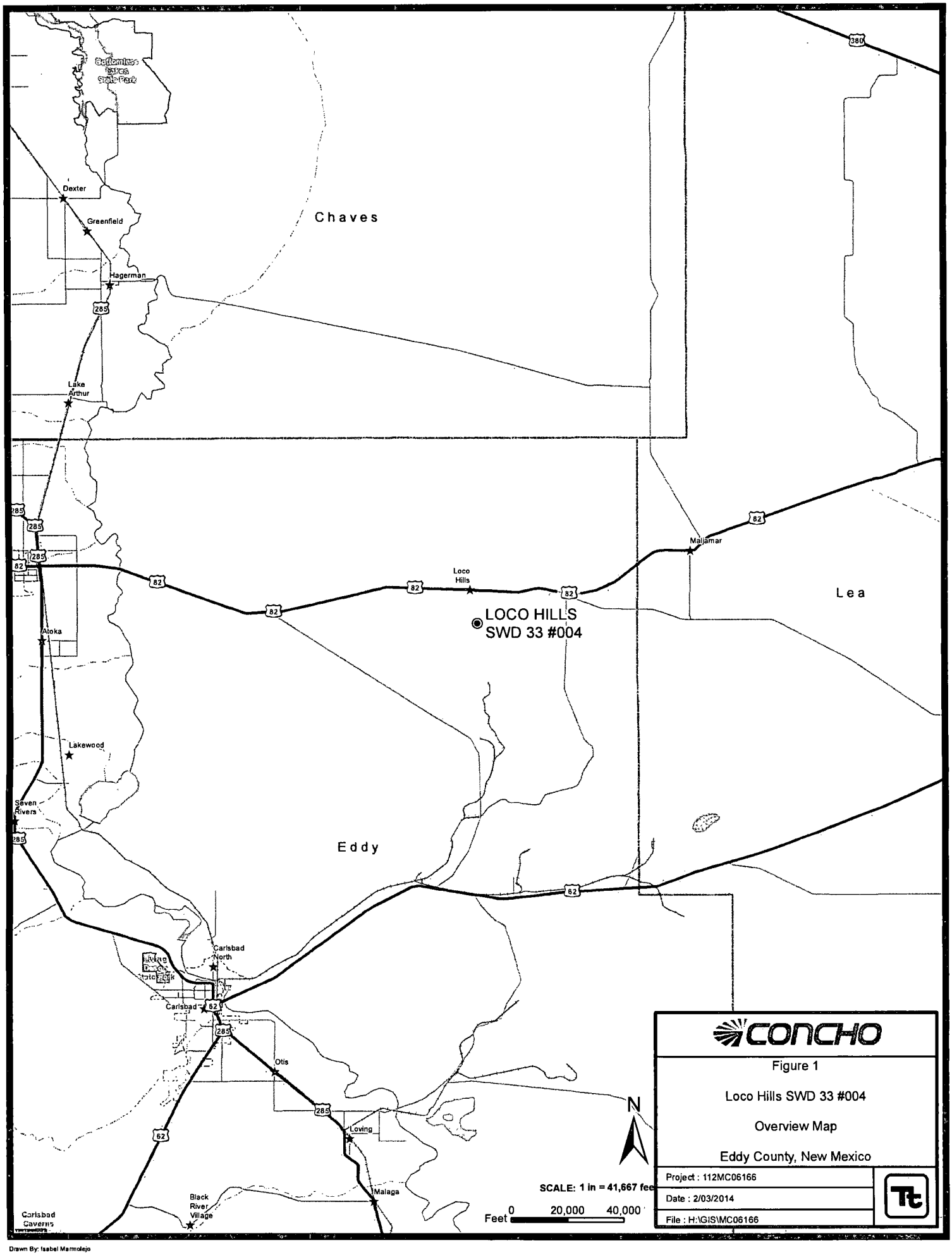
Based on the assessment and work performed at the site, COG requests closure of this spill issue. A Final C-141 is enclosed in Appendix A. If you have any questions or comments concerning the assessment or the remediation activities for this site, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH

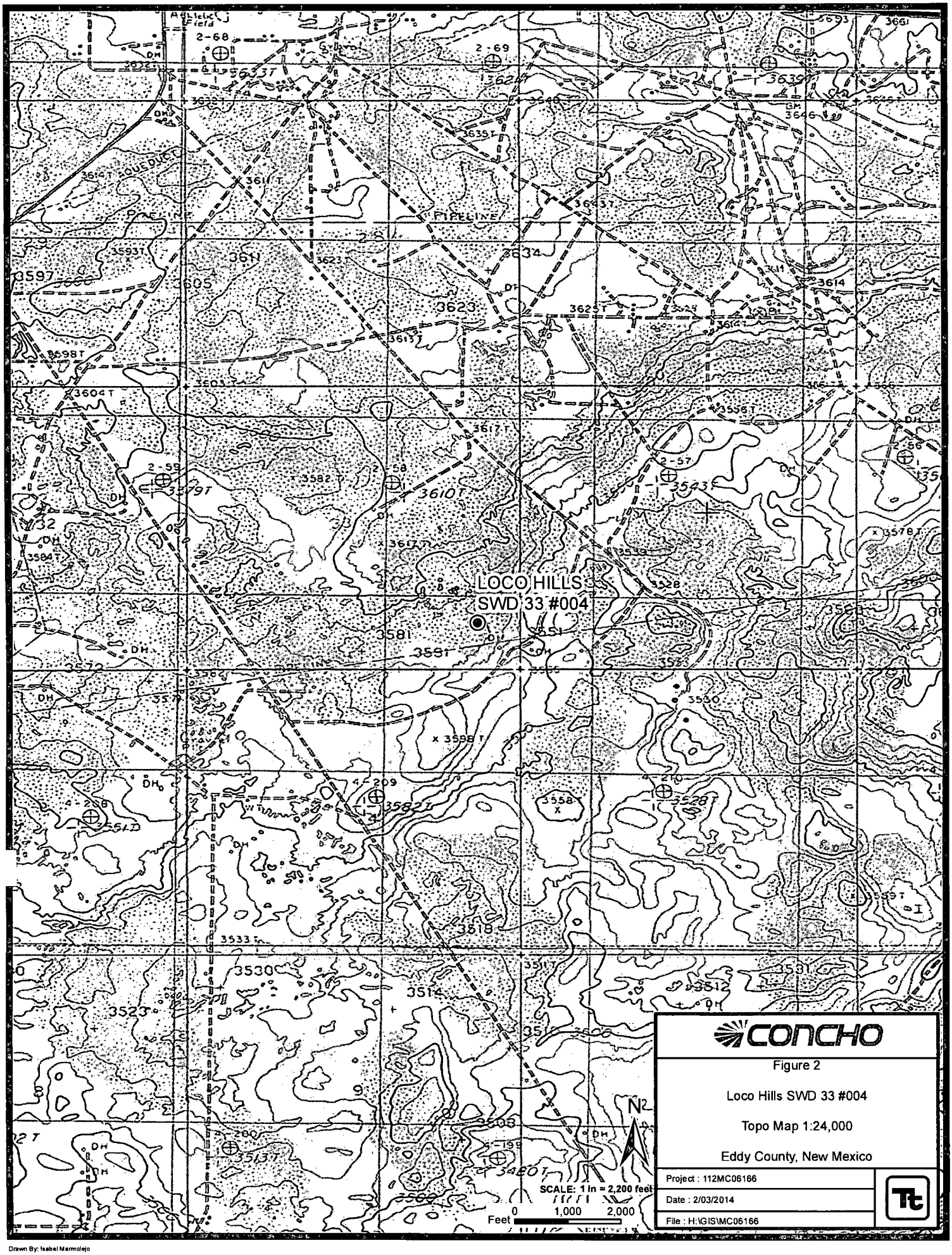
Ike Tavarez, PG
Senior Project Manager

cc: Robert McNeill – COG
cc: James Amos – BLM

Figures



Drawn By: Isabel Marmolejo



CONCHO

Figure 2

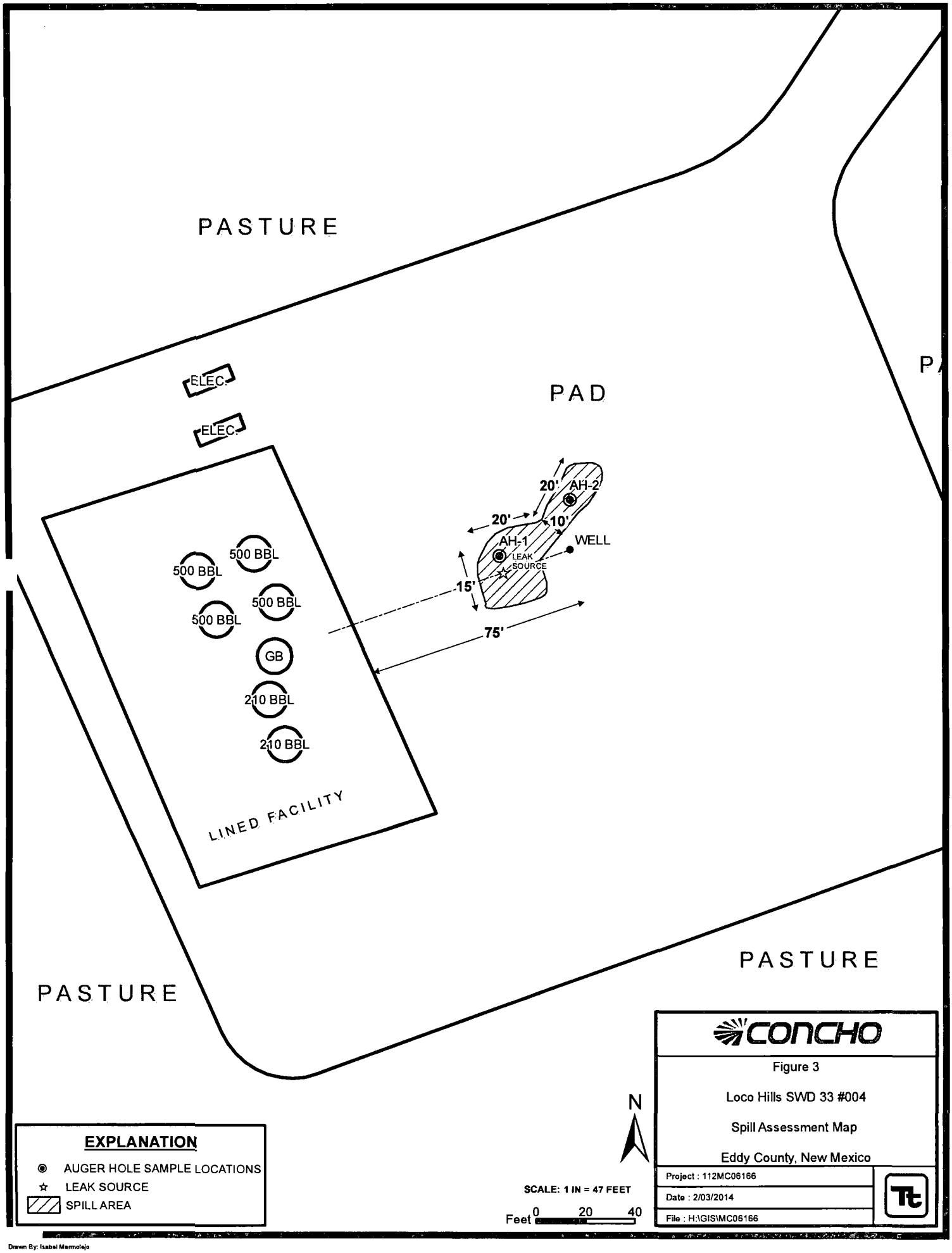
Loco Hills SWD 33 #004

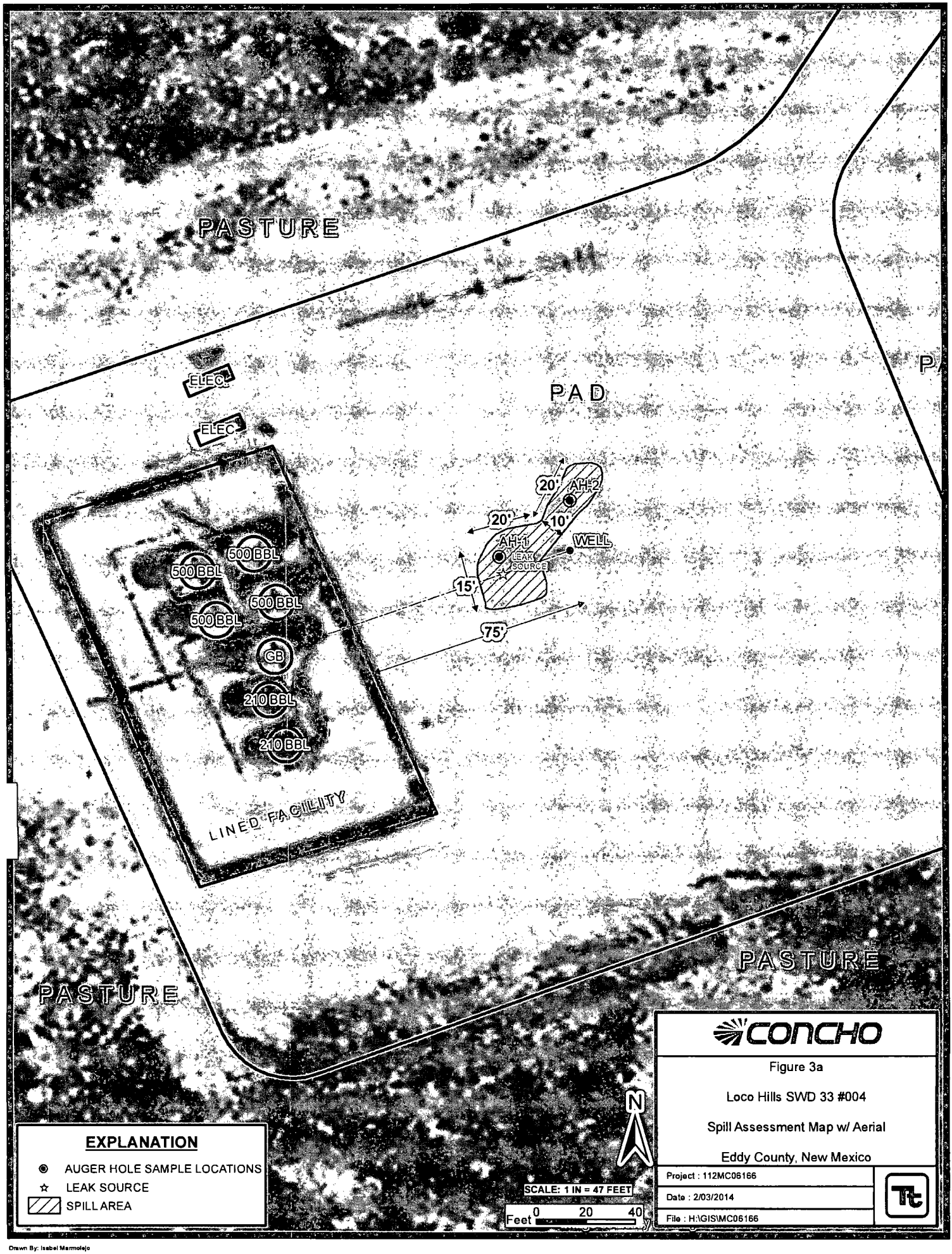
Topo Map 1:24,000

Eddy County, New Mexico

Project : 112MC06166	
Date : 2/03/2014	
File : H:\GIS\MC06166	

Drawn By: Isabel Marmolejo


PASTURE
PAD
ELEC.
ELEC.
500 BBL
500 BBL
500 BBL
500 BBL
GB
210 BBL
210 BBL
LINED FACILITY
20'
AH-2
20'
10'
AH-1
LEAK SOURCE
WELL
15'
75'
PASTURE
PASTURE
EXPLANATION
AUGER HOLE SAMPLE LOCATIONS
LEAK SOURCE
SPILL AREA
N
SCALE: 1 IN = 47 FEET
Feet 0 20 40
CONCHO
Figure 3
Loco Hills SWD 33 #004
Spill Assessment Map
Eddy County, New Mexico
Project : 112MC06166
Date : 2/03/2014
File : H:\GIS\MC06166
Drawn By: Isabel Marmolejo



CONCHO

Figure 3a

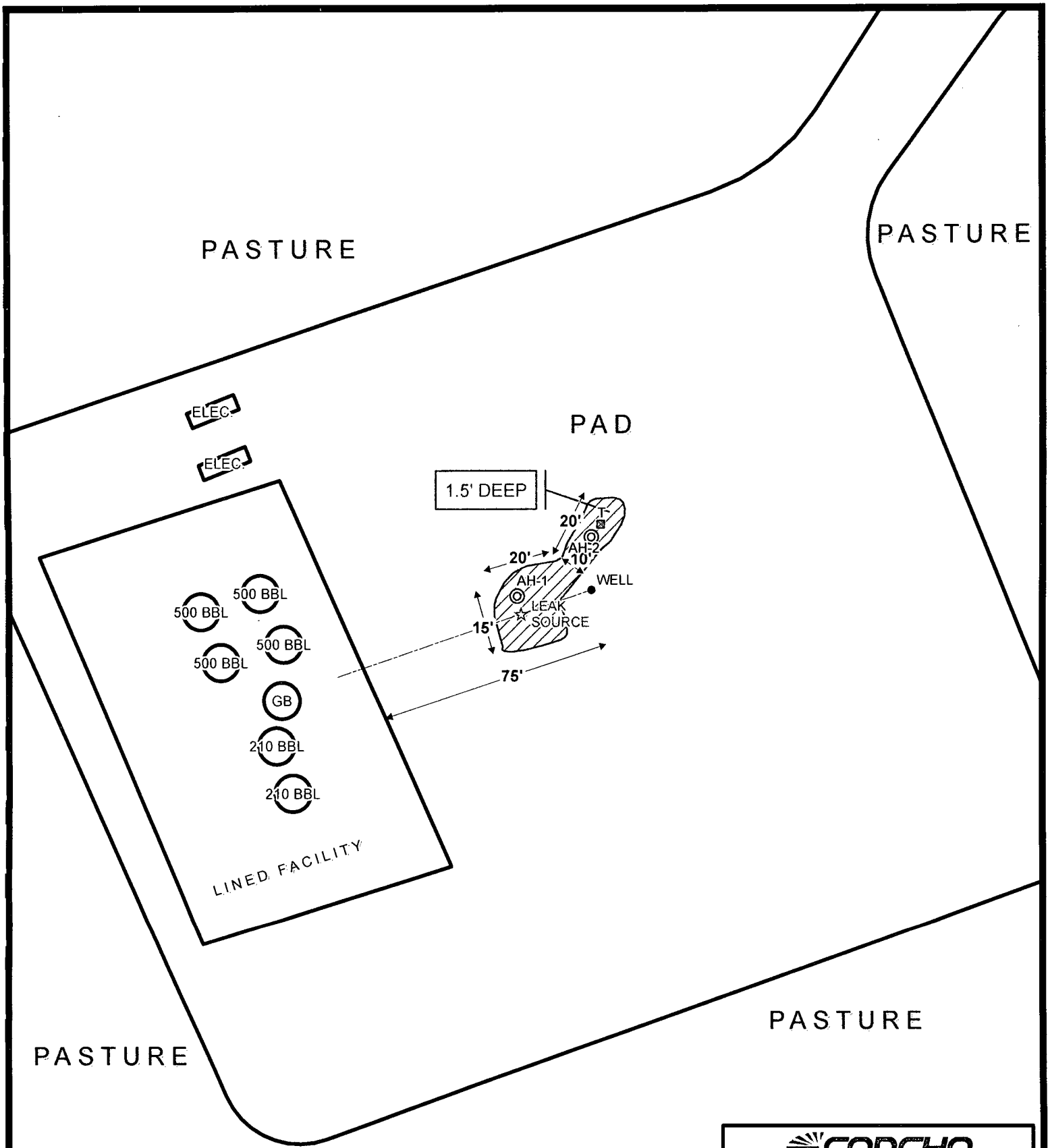
Loco Hills SWD 33 #004

Spill Assessment Map w/ Aerial

Eddy County, New Mexico

Project : 112MC06166	
Date : 2/03/2014	
File : H:\GIS\MC06166	

Drawn By: Isabel Marmolejo



EXPLANATION

- ◎ AUGER HOLE SAMPLE LOCATIONS
- ⊠ TRENCH LOCATIONS
- ☆ LEAK SOURCE
- EXCAVATED AREA

N

SCALE: 1 IN = 50 FEET

Feet 0 20 40

CONCHO

Figure 4

Loco Hills SWD 33 #004

Excavation Area & Depth Map

Eddy County, New Mexico

Project : 112MC06166	
Date : 05/05/2014	
File : H:\GIS\MC06166	

Drawn By: Isabel Marmolejo

Tables

Table 1
COG Operating LLC.
Loco Hills SWD 33 #4
Eddy County, New Mexico

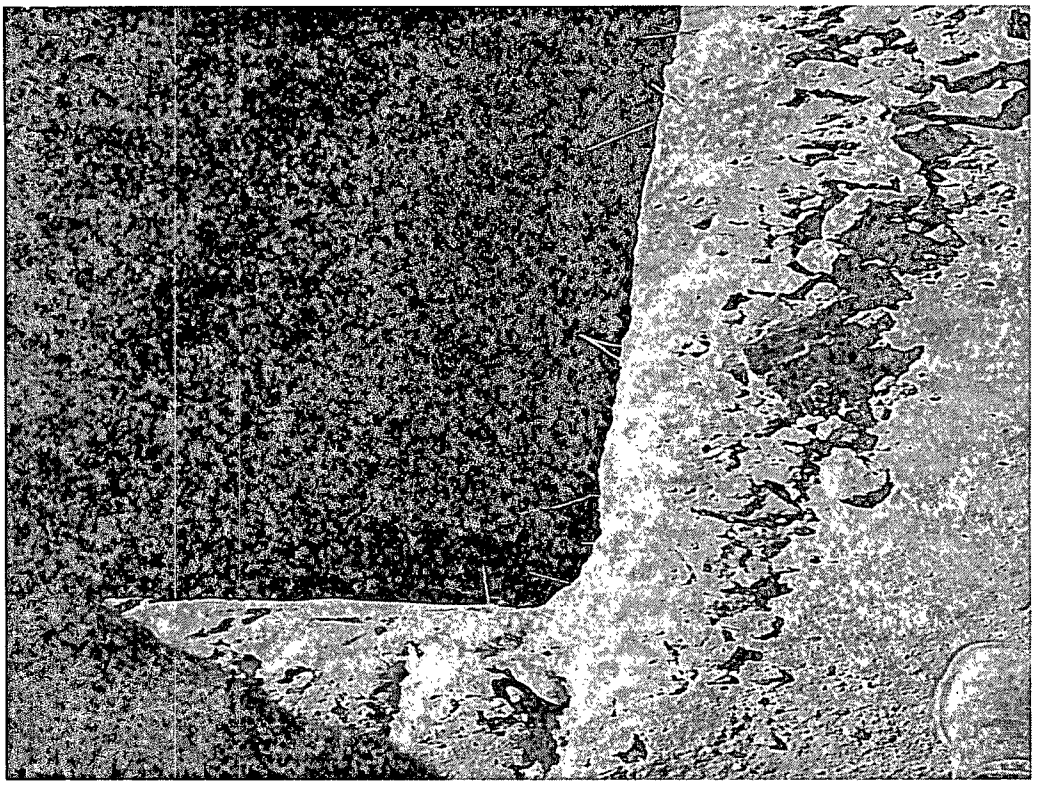
Sample ID	Sample Date	Sample Depth (ft)	BEB Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total						
AH-1	1/6/2014	0-1	-		X	<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	**3,860**
	"	1-1.5	-		X	-	-	-	-	-	-	-	-	**4,830**
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	526
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	735
	"	4-4.5	-	X		-	-	-	-	-	-	-	-	616
	"	5-5.5	-	X		-	-	-	-	-	-	-	-	487
	"	6-6.5	-	X		-	-	-	-	-	-	-	-	382
	"	7-7.5	-	X		-	-	-	-	-	-	-	-	134
	"	8-8.5	-	X		-	-	-	-	-	-	-	-	86.0
	"	9-9.5	-	X		-	-	-	-	-	-	-	-	52.5
AH-1 Bottom Hole	3/31/2014	1.5	-	X		-	-	-	-	-	-	-	-	256
AH-2	1/6/2014	0-1	-		X	5.42	56.4	61.8	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	9,240
AH-2 Bottom Hole	3/31/2014	1.5	-		X	-	-	-	-	-	-	-	-	<16.0
T-1	3/31/2014	1	-		X	-	-	-	-	-	-	-	-	752
	"	2	-	X		-	-	-	-	-	-	-	-	288
	"	4	-	X		-	-	-	-	-	-	-	-	32.0
	"	6	-	X		-	-	-	-	-	-	-	-	48.0
	"	8	-	X		-	-	-	-	-	-	-	-	32.0
	"	10	-	X		-	-	-	-	-	-	-	-	96.0

	Excavated Depths
(-)	Not Analyzed
(BEB)	Below Excavation Bottom

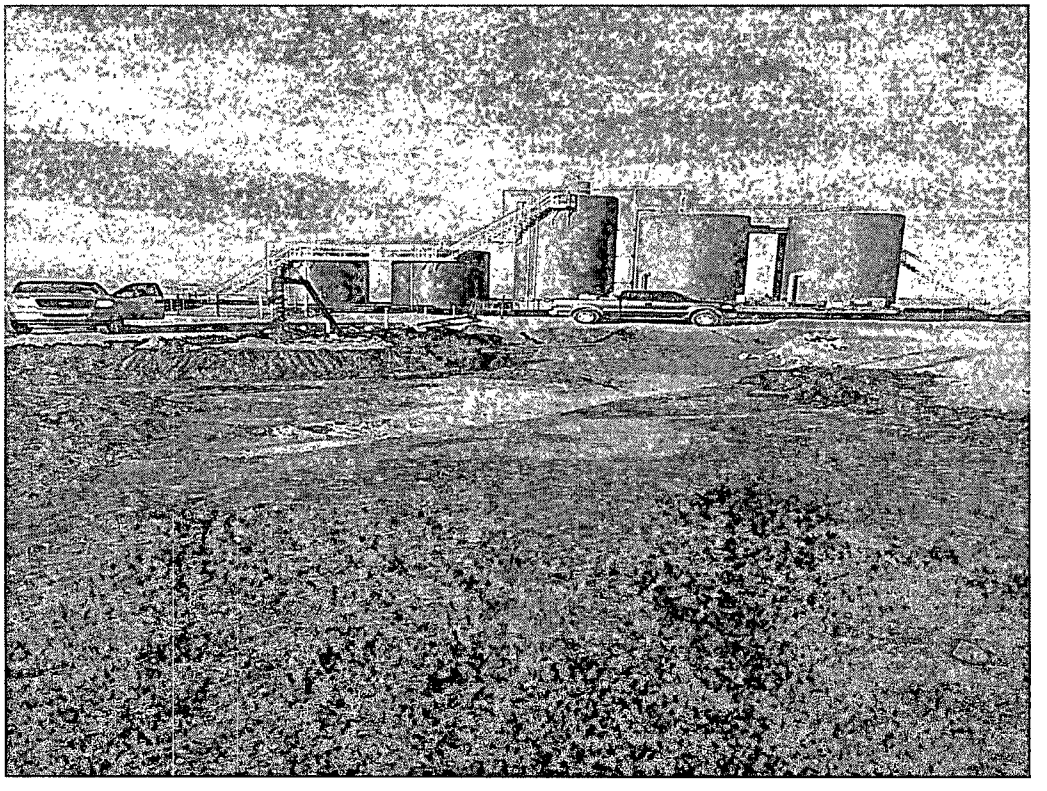
Photos

COG Operating LLC
Loco Hills SWD 33 #4
Eddy County, New Mexico

TETRA TECH



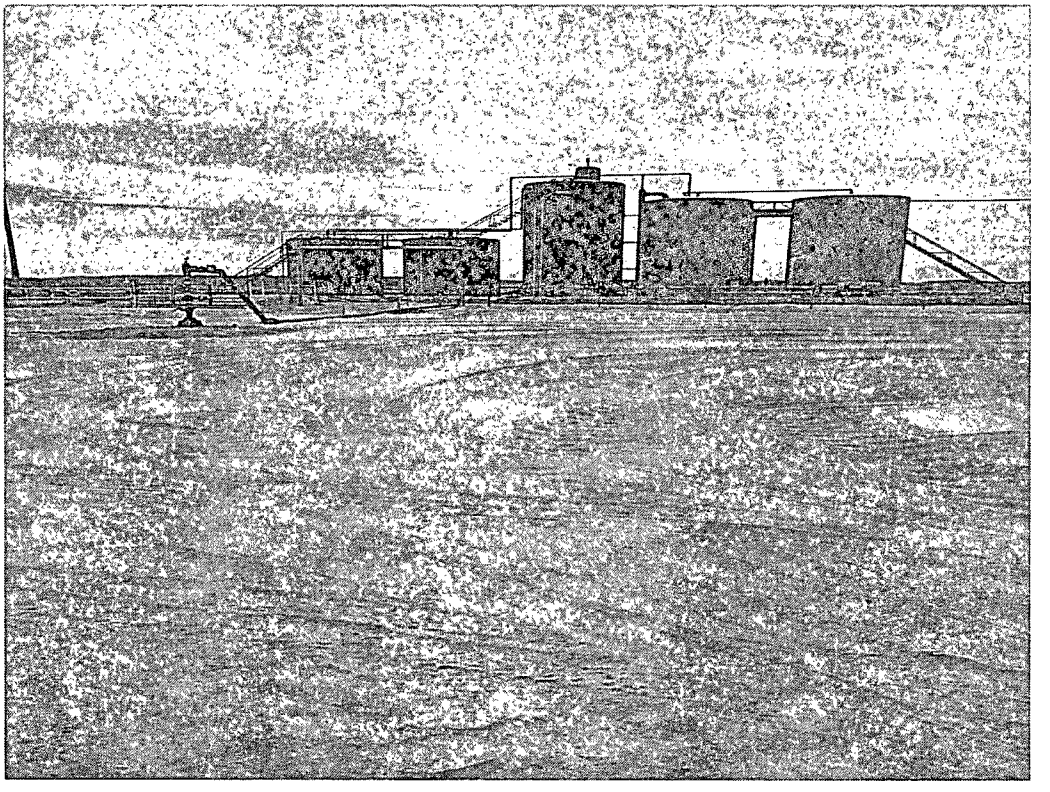
View West – T-1 in area of AH-2



View West – Areas of AH-1 and AH-2 at 1.5'

COG Operating LLC
Loco Hills SWD 33 #4
Eddy County, New Mexico

TETRA TECH



View West – Excavation Backfilled

Appendix A

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company	COG OPERATING LLC	Contact	Robert McNeill
Address	600 West Illinois Avenue, Midland, TX 79701	Telephone No.	432-230-0077
Facility Name	Loco Hills SWD 33 #004	Facility Type	Tank Battery

Surface Owner Federal	Mineral Owner	Lease No. (API#) 30-015-37269

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
P	33	17S	30E					Eddy

Latitude 32.78607 **Longitude** 103.97054

NATURE OF RELEASE

Type of Release Produced water	Volume of Release 10bbls	Volume Recovered 9bbls
Source of Release Steel flowline	Date and Hour of Occurrence 12-05-2013	Date and Hour of Discovery 12-05-2013 08:00am
Was Immediate Notice Given? ☐ Yes ☒ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

A steel flowline developed a hole due to corrosion. Replaced the steel line.

Describe Area Affected and Cleanup Action Taken.*

Initially 10bbls of produced water were released A hole developed in a steel flowline. We were able to recover 9bbls with a vacuum truck. All free fluids have been recovered. Concho will have the spill site sampled 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: Robert Grubbs Jr.	Approved by District Supervisor:	
Title: Senior Environmental Coordinator	Approval Date:	Expiration Date:
E-mail Address: rgrubbs@concho.com	Conditions of Approval:	Attached ☐
Date: 12-11-2013 Phone: 432-661-6601		

* 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
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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 **Robert McNeill**
Address **600 W. Illinois Ave, Midland, Texas 79701**	Telephone No. **(432) 685-4332**
Facility Name **Loco Hills SWD 33 #4**	Facility Type **Tank Battery**

Surface Owner: Federal	Mineral Owner	Lease No. (API#)30-015-37269

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
P	33	17S	30E					Eddy

Latitude 32.78607° N **Longitude** 103.97054° W

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release 10 bbls	Volume Recovered 9 bbls
Source of Release: Steel Flowline	Date and Hour of Occurrence 12/05/2013	Date and Hour of Discovery 12/05/2013 8:00am
Was Immediate Notice Given? ☐ Yes ☒ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

N/A

NM OIL CONSERVATION
ARTESIA DISTRICT
AUG 29 2014
RECEIVED

Describe Cause of Problem and Remedial Action Taken.*

A steel flowline developed a hole due to corrosion. Replaced the steel line.

Describe Area Affected and Cleanup Action Taken.*

Initially 10bbls of produced water were released from a hole that developed in a steel flowline. COG was able to recover 9bbls with a vacuum truck and all free fluids were recovered. Tetra Tech inspected site and collected samples to define spills extent. Soil that exceeded RRAL was removed and hauled away for proper disposal. Site was then brought up to surface grade with clean backfill material. Tetra Tech prepared closure report and submitted to NMOCD for review.

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

Signature:	OIL CONSERVATION DIVISION	
Printed Name: Ike Tavarez	Approved by District Supervisor:	
Title: Project Manager (agent for COG)	Approval Date:	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:	Attached ☐
Date: 8-18-14 Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Loco Hills SWD 33 #4
Eddy County, New Mexico

16 South 29 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14 220 dry	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 **290**	1
7	8	9	10	11	12 **288**
18	17	16	15	14 **113** **314**	13 **299**
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 **76** **80**	23	24
30	29 **210** **208**	28	27	26	25
31	32	33	34	35 153	36

17 South 30 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20 **80**	21	22	23	24
30	29	28	27	26	25
31	32	33 Site	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 **95**	11	12
18	17	16	15	14	13
19	20	21	22	23	24 **158**
30	29	28	27	26	25
31	32	33	34	35	36

18 South 30 East

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

18 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12 **400**
18	17	16	15 **98**	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
- Field water level
- New Mexico Water and Infrastructure Data System

Appendix C

Summary Report

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

Report Date: January 17, 2014

Work Order: 14011002

Project Location: Eddy Co, NM
Project Name: COG/Loco Hills SWD 33 #4
Project Number: TBD

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
351100	AH-1 0-1'	soil	2014-01-06	00:00	2014-01-09
351101	AH-1 1-1.5'	soil	2014-01-06	00:00	2014-01-09
351102	AH-1 2-2.5'	soil	2014-01-06	00:00	2014-01-09
351103	AH-1 3-3.5'	soil	2014-01-06	00:00	2014-01-09
351104	AH-1 4-4.5'	soil	2014-01-06	00:00	2014-01-09
351105	AH-1 5-5.5'	soil	2014-01-06	00:00	2014-01-09
351106	AH-1 6-6.5'	soil	2014-01-06	00:00	2014-01-09
351107	AH-1 7-7.5'	soil	2014-01-06	00:00	2014-01-09
351108	AH-1 8-8.5'	soil	2014-01-06	00:00	2014-01-09
351109	AH-1 9-9.5'	soil	2014-01-06	00:00	2014-01-09
351110	AH-2 0-1'	soil	2014-01-06	00:00	2014-01-09

	BTEX				TPH DRO - NEW	TPH GRO
	Benzene	Toluene	Ethylbenzene	Xylene	DRO	GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
351100 - AH-1 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<4.00
351110 - AH-2 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	**56.4**	**5.42**

Sample: 351100 - AH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		**3860**	mg/Kg	4

Sample: 351101 - AH-1 1-1.5'

continued ...

sample 351101 continued ...

Param	Flag	Result	Units	RL

Param	Flag	Result	Units	RL
Chloride		**4830**	mg/Kg	4

Sample: 351102 - AH-1 2-2.5'

Param	Flag	Result	Units	RL
Chloride		**526**	mg/Kg	4

Sample: 351103 - AH-1 3-3.5'

Param	Flag	Result	Units	RL
Chloride		**735**	mg/Kg	4

Sample: 351104 - AH-1 4-4.5'

Param	Flag	Result	Units	RL
Chloride		**616**	mg/Kg	4

Sample: 351105 - AH-1 5-5.5'

Param	Flag	Result	Units	RL
Chloride		**487**	mg/Kg	4

Sample: 351106 - AH-1 6-6.5'

Param	Flag	Result	Units	RL
Chloride		**382**	mg/Kg	4

Sample: 351107 - AH-1 7-7.5'

Param	Flag	Result	Units	RL
Chloride		**134**	mg/Kg	4

Sample: 351108 - AH-1 8-8.5'

Param	Flag	Result	Units	RL
Chloride		**86.0**	mg/Kg	4

Sample: 351109 - AH-1 9-9.5'

Param	Flag	Result	Units	RL
Chloride		**52.5**	mg/Kg	4

Sample: 351110 - AH-2 0-1'

Param	Flag	Result	Units	RL
Chloride		**9240**	mg/Kg	4

TRACEANALYSIS, INC.

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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: January 28, 2014

Work Order: 14011002

Project Location: Eddy Co, NM
Project Name: COG/Loco Hills SWD 33 #4
Project Number: 112MC06166

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
351100	AH-1 0-1'	soil	2014-01-06	00:00	2014-01-09
351101	AH-1 1-1.5'	soil	2014-01-06	00:00	2014-01-09
351102	AH-1 2-2.5'	soil	2014-01-06	00:00	2014-01-09
351103	AH-1 3-3.5'	soil	2014-01-06	00:00	2014-01-09
351104	AH-1 4-4.5'	soil	2014-01-06	00:00	2014-01-09
351105	AH-1 5-5.5'	soil	2014-01-06	00:00	2014-01-09
351106	AH-1 6-6.5'	soil	2014-01-06	00:00	2014-01-09
351107	AH-1 7-7.5'	soil	2014-01-06	00:00	2014-01-09
351108	AH-1 8-8.5'	soil	2014-01-06	00:00	2014-01-09
351109	AH-1 9-9.5'	soil	2014-01-06	00:00	2014-01-09
351110	AH-2 0-1'	soil	2014-01-06	00:00	2014-01-09

Report Corrections (Work Order 14011002)

- 1/28/14: Corrected Project Number and added second page of Chain of Custody.

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 23 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/Loco Hills SWD 33 #4 were received by TraceAnalysis, Inc. on 2014-01-09 and assigned to work order 14011002. Samples for work order 14011002 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	91601	2014-01-14 at 09:45	108308	2014-01-15 at 09:21
Chloride (Titration)	SM 4500-Cl B	91532	2014-01-10 at 10:14	108256	2014-01-13 at 14:49
Chloride (Titration)	SM 4500-Cl B	91532	2014-01-10 at 10:14	108257	2014-01-13 at 14:56
TPH DRO - NEW	S 8015 D	91617	2014-01-14 at 14:00	108314	2014-01-15 at 09:55
TPH GRO	S 8015 D	91548	2014-01-10 at 14:30	108273	2014-01-13 at 16:35

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 14011002 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: 351100 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	108308	Date Analyzed:	2014-01-15	Analyzed By:	AK
Prep Batch:	91601	Sample Preparation:	2014-01-14	Prepared By:	AK

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.19	mg/Kg	1	2.00	110	70 - 130
4-Bromofluorobenzene (4-BFB)			2.07	mg/Kg	1	2.00	104	70 - 130

Sample: 351100 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	108256	Date Analyzed:	2014-01-13	Analyzed By:	AR
Prep Batch:	91532	Sample Preparation:	2014-01-10	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**3860**	mg/Kg	10	4.00

Sample: 351100 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	108314	Date Analyzed:	2014-01-15	Analyzed By:	KC
Prep Batch:	91617	Sample Preparation:	2014-01-14	Prepared By:	KC

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			111	mg/Kg	1	100	111	70 - 130

Sample: 351100 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	108273	Date Analyzed:	2014-01-13	Analyzed By:	AK
Prep Batch:	91548	Sample Preparation:	2014-01-10	Prepared By:	AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.92	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			1.98	mg/Kg	1	2.00	99	70 - 130

Sample: 351101 - AH-1 1-1.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	108256	Date Analyzed:	2014-01-13	Analyzed By:	AR
Prep Batch:	91532	Sample Preparation:	2014-01-10	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**4830**	mg/Kg	10	4.00

Sample: 351102 - AH-1 2-2.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	108256	Date Analyzed:	2014-01-13	Analyzed By:	AR
Prep Batch:	91532	Sample Preparation:	2014-01-10	Prepared By:	AR

continued ...

sample 351102 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**526**	mg/Kg	5	4.00

Sample: 351103 - AH-1 3-3.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	108256	Date Analyzed:	2014-01-13	Analyzed By:	AR
Prep Batch:	91532	Sample Preparation:	2014-01-10	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**735**	mg/Kg	10	4.00

Sample: 351104 - AH-1 4-4.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	108256	Date Analyzed:	2014-01-13	Analyzed By:	AR
Prep Batch:	91532	Sample Preparation:	2014-01-10	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**616**	mg/Kg	5	4.00

Sample: 351105 - AH-1 5-5.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	108256	Date Analyzed:	2014-01-13	Analyzed By:	AR
Prep Batch:	91532	Sample Preparation:	2014-01-10	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**487**	mg/Kg	5	4.00

Sample: 351106 - AH-1 6-6.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	108256	Date Analyzed:	2014-01-13	Analyzed By:	AR
Prep Batch:	91532	Sample Preparation:	2014-01-10	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**382**	mg/Kg	5	4.00

Sample: 351107 - AH-1 7-7.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	108256	Date Analyzed:	2014-01-13	Analyzed By:	AR
Prep Batch:	91532	Sample Preparation:	2014-01-10	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**134**	mg/Kg	5	4.00

Sample: 351108 - AH-1 8-8.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	108256	Date Analyzed:	2014-01-13	Analyzed By:	AR
Prep Batch:	91532	Sample Preparation:	2014-01-10	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**86.0**	mg/Kg	5	4.00

Sample: 351109 - AH-1 9-9.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	108256	Date Analyzed:	2014-01-13	Analyzed By:	AR
Prep Batch:	91532	Sample Preparation:	2014-01-10	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**52.5**	mg/Kg	5	4.00

Sample: 351110 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	108308	Date Analyzed:	2014-01-15	Analyzed By:	AK
Prep Batch:	91601	Sample Preparation:	2014-01-14	Prepared By:	AK

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.18	mg/Kg	1	2.00	109	70 - 130
4-Bromofluorobenzene (4-BFB)			2.14	mg/Kg	1	2.00	107	70 - 130

Sample: 351110 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	108257	Date Analyzed:	2014-01-13	Analyzed By:	AR
Prep Batch:	91532	Sample Preparation:	2014-01-10	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**9240**	mg/Kg	10	4.00

Sample: 351110 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	108314	Date Analyzed:	2014-01-15	Analyzed By:	KC
Prep Batch:	91617	Sample Preparation:	2014-01-14	Prepared By:	KC

Parameter	Flag	Cert	Result	RL Result	Units	Dilution	RL
DRO	B	1	**56.4**		mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			104	mg/Kg	1	100	104	70 - 130

Sample: 351110 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	108273	Date Analyzed:	2014-01-13	Analyzed By:	AK
Prep Batch:	91548	Sample Preparation:	2014-01-10	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Result	Units	Dilution	RL
GRO		1	**5.42**		mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.22	mg/Kg	1	2.00	111	70 - 130
4-Bromofluorobenzene (4-BFB)			2.52	mg/Kg	1	2.00	126	70 - 130

Method Blanks

Method Blank (1) QC Batch: 108256

QC Batch: 108256 | Date Analyzed: 2014-01-13 | Analyzed By: AR
Prep Batch: 91532 | QC Preparation: 2014-01-10 | Prepared By: AR

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

Method Blank (1) QC Batch: 108257

QC Batch: 108257 | Date Analyzed: 2014-01-13 | Analyzed By: AR
Prep Batch: 91532 | QC Preparation: 2014-01-10 | Prepared By: AR

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

Method Blank (1) QC Batch: 108273

QC Batch: 108273 | Date Analyzed: 2014-01-13 | Analyzed By: AK
Prep Batch: 91548 | QC Preparation: 2014-01-10 | Prepared By: AK

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		1	<2.32	mg/Kg	4

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.01	mg/Kg	1	2.00	100	70 - 130
4-Bromofluorobenzene (4-BFB)			2.06	mg/Kg	1	2.00	103	70 - 130

Method Blank (1) QC Batch: 108308

QC Batch: 108308 | Date Analyzed: 2014-01-15 | Analyzed By: AK
Prep Batch: 91601 | QC Preparation: 2014-01-14 | Prepared By: AK

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1	<0.00354	mg/Kg	0.02
Toluene		1	<0.00966	mg/Kg	0.02
Ethylbenzene		1	<0.00790	mg/Kg	0.02
Xylene		1	<0.00667	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.19	mg/Kg	1	2.00	110	70 - 130
4-Bromofluorobenzene (4-BFB)			1.70	mg/Kg	1	2.00	85	70 - 130

Method Blank (1) QC Batch: 108314

QC Batch: 108314 | Date Analyzed: 2014-01-15 | Analyzed By: KC
Prep Batch: 91617 | QC Preparation: 2014-01-14 | Prepared By: KC

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1	<6.88	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			102	mg/Kg	1	100	102	70 - 130

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 108256 | Date Analyzed: 2014-01-13 | Analyzed By: AR
Prep Batch: 91532 | QC Preparation: 2014-01-10 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2520	mg/Kg	1	2500	<3.85	101	89.7 - 115.9

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			2400	mg/Kg	1	2500	<3.85	96	89.7 - 115.9	5	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: 108257 | Date Analyzed: 2014-01-13 | Analyzed By: AR
Prep Batch: 91532 | QC Preparation: 2014-01-10 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2370	mg/Kg	1	2500	<3.85	95	89.7 - 115.9

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			2420	mg/Kg	1	2500	<3.85	97	89.7 - 115.9	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: 108273 | Date Analyzed: 2014-01-13 | Analyzed By: AK
Prep Batch: 91548 | QC Preparation: 2014-01-10 | Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	16.5	mg/Kg	1	20.0	<2.32	82	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	17.3	mg/Kg	1	20.0	<2.32	86	70 - 130	5	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.83	1.96	mg/Kg	1	2.00	92	98	70 - 130
4-Bromofluorobenzene (4-BFB)	2.17	2.23	mg/Kg	1	2.00	108	112	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 108308 | Date Analyzed: 2014-01-15 | Analyzed By: AK
Prep Batch: 91601 | QC Preparation: 2014-01-14 | Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	2.13	mg/Kg	1	2.00	<0.00354	106	70 - 130
Toluene		1	2.19	mg/Kg	1	2.00	<0.00966	110	70 - 130
Ethylbenzene		1	2.18	mg/Kg	1	2.00	<0.00790	109	70 - 130
Xylene		1	6.75	mg/Kg	1	6.00	<0.00667	112	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	2.07	mg/Kg	1	2.00	<0.00354	104	70 - 130	3	20
Toluene		1	2.11	mg/Kg	1	2.00	<0.00966	106	70 - 130	4	20
Ethylbenzene		1	2.14	mg/Kg	1	2.00	<0.00790	107	70 - 130	2	20
Xylene		1	6.57	mg/Kg	1	6.00	<0.00667	110	70 - 130	3	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)	2.35	2.28	mg/Kg	1	2.00	118	114	70 - 130
4-Bromofluorobenzene (4-BFB)	2.30	2.20	mg/Kg	1	2.00	115	110	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 108314 | Date Analyzed: 2014-01-15 | Analyzed By: KC
Prep Batch: 91617 | QC Preparation: 2014-01-14 | Prepared By: KC

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	266	mg/Kg	1	250	9.43	103	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		1	271	mg/Kg	1	250	9.43	105	70 - 130	2	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	113	113	mg/Kg	1	100	113	113	70 - 130

Matrix Spike (MS-1) Spiked Sample: 351109

QC Batch: 108256 | Date Analyzed: 2014-01-13 | Analyzed By: AR
Prep Batch: 91532 | QC Preparation: 2014-01-10 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2560	mg/Kg	5	2500	52.5	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			2440	mg/Kg	5	2500	52.5	96	78.9 - 121	5	20

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

Matrix Spike (MS-1) Spiked Sample: 351118

QC Batch: 108257 | Date Analyzed: 2014-01-13 | Analyzed By: AR
Prep Batch: 91532 | QC Preparation: 2014-01-10 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			3790	mg/Kg	10	2500	1160	105	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			3490	mg/Kg	10	2500	1160	93	78.9 - 121	8	20

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

Matrix Spike (MS-1) Spiked Sample: 351100

QC Batch: 108273 | Date Analyzed: 2014-01-13 | Analyzed By: AK
Prep Batch: 91548 | QC Preparation: 2014-01-10 | Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	15.3	mg/Kg	1	20.0	<2.32	76	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	16.2	mg/Kg	1	20.0	<2.32	81	70 - 130	6	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)	1.73	1.86	mg/Kg	1	2	86	93	70 - 130
4-Bromofluorobenzene (4-BFB)	2.03	2.12	mg/Kg	1	2	102	106	70 - 130

Matrix Spike (MS-1) Spiked Sample: 351100

QC Batch: 108308 | Date Analyzed: 2014-01-15 | Analyzed By: AK
Prep Batch: 91601 | QC Preparation: 2014-01-14 | Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.41	mg/Kg	1	2.00	<0.00354	70	70 - 130
Toluene		1	1.47	mg/Kg	1	2.00	<0.00966	74	70 - 130
Ethylbenzene		1	1.55	mg/Kg	1	2.00	<0.00790	78	70 - 130
Xylene		1	4.71	mg/Kg	1	6.00	<0.00667	78	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	1.49	mg/Kg	1	2.00	<0.00354	74	70 - 130	6	20
Toluene		1	1.57	mg/Kg	1	2.00	<0.00966	78	70 - 130	7	20
Ethylbenzene		1	1.66	mg/Kg	1	2.00	<0.00790	83	70 - 130	7	20
Xylene		1	5.08	mg/Kg	1	6.00	<0.00667	85	70 - 130	8	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)	2.18	2.18	mg/Kg	1	2	109	109	70 - 130
4-Bromofluorobenzene (4-BFB)	2.20	2.21	mg/Kg	1	2	110	110	70 - 130

Matrix Spike (MS-1) Spiked Sample: 351100

QC Batch: 108314 | Date Analyzed: 2014-01-15 | Analyzed By: KC
Prep Batch: 91617 | QC Preparation: 2014-01-14 | Prepared By: KC

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	243	mg/Kg	1	250	<6.88	97	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		1	227	mg/Kg	1	250	<6.88	91	70 - 130	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
n-Tricosane	103	98.8	mg/Kg	1	100	103	99	70 - 130

Calibration Standards

Standard (CCV-1)

QC Batch: 108256 | Date Analyzed: 2014-01-13 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	98.3	98	85 - 115	2014-01-13

Standard (CCV-2)

QC Batch: 108256 | Date Analyzed: 2014-01-13 | 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	102	102	85 - 115	2014-01-13

Standard (CCV-1)

QC Batch: 108257 | Date Analyzed: 2014-01-13 | 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	103	103	85 - 115	2014-01-13

Standard (CCV-2)

QC Batch: 108257 | Date Analyzed: 2014-01-13 | 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	96.9	97	85 - 115	2014-01-13

Standard (CCV-1)

QC Batch: 108273 | Date Analyzed: 2014-01-13 | Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.03	103	80 - 120	2014-01-13

Standard (CCV-2)

QC Batch: 108273 | Date Analyzed: 2014-01-13 | Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.08	108	80 - 120	2014-01-13

Standard (CCV-1)

QC Batch: 108308 | Date Analyzed: 2014-01-15 | Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.108	108	80 - 120	2014-01-15
Toluene		1	mg/kg	0.100	0.111	111	80 - 120	2014-01-15
Ethylbenzene		1	mg/kg	0.100	0.110	110	80 - 120	2014-01-15
Xylene		1	mg/kg	0.300	0.341	114	80 - 120	2014-01-15

Standard (CCV-2)

QC Batch: 108308 | Date Analyzed: 2014-01-15 | Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0982	98	80 - 120	2014-01-15
Toluene		1	mg/kg	0.100	0.0989	99	80 - 120	2014-01-15
Ethylbenzene		1	mg/kg	0.100	0.0999	100	80 - 120	2014-01-15
Xylene		1	mg/kg	0.300	0.306	102	80 - 120	2014-01-15

Standard (CCV-1)

QC Batch: 108314 | Date Analyzed: 2014-01-15 | Analyzed By: KC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	256	102	80 - 120	2014-01-15

Standard (CCV-2)

QC Batch: 108314 | Date Analyzed: 2014-01-15 | Analyzed By: KC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	251	100	80 - 120	2014-01-15

Appendix

Report Definitions

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

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704392-13-7	Midland

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

Attachments

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

1401002

Analysis Request of Chain of Custody Record

PAGE: OF: 2

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.: T1

PROJECT NAME: Loco Hills SWD 33 #4

LAB I.D. NUMBER	DATE 2014	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION Eddy Co., NM	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
351100	1/6		S		X	AH-1 0-1					X		X	X											X				
101			S		X	" 1-1.5					X														X				
102			S		X	" 2-2.5					X														X				
103			S		X	" 3-3.5					X														X				
104			S		X	" 4-4.5					X														X				
105			S		X	" 5-5.5					X														X				
106			S		X	" 6-6.5					X														X				
107			S		X	" 7-7.5					X														X				
108			S		X	" 8-8.5					X														X				
109			S		X	" 9-9.5					X														X				

RELINQUISHED BY: (Signature) Alan Gonzales	Date: 1/9/14 Time: 16:34	RECEIVED BY: (Signature) [illegible]	Date: 1/9/14 Time: 16:34
SAMPLED BY: (Print & Initial) CG3 RR	Date: 1/6/14 Time:		
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS	AIRBILL #: OTHER:		
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
TETRA TECH CONTACT PERSON:	Results by:		
RECEIVING LABORATORY: ADDRESS: CITY: STATE: ZIP: CONTACT: PHONE:	RECEIVED BY: (Signature) DATE: TIME:		RUSH Charges Authorized: Yes No
SAMPLE CONDITION WHEN RECEIVED: 4.0	REMARKS: Run deeper samples if Benzene exceeds 10, total BTEX exceeds 50 or TPH exceeds 5,000 mg/kg		

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

Midland - ALL

1401100 2

Analysis Request of Chain of Custody Record

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.:

PROJECT NAME: Loco Hills SWD 33 #4

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
110	1/6	~~201~~	S		X	AH-2 0-1					X		X	X										X				

RELINQUISHED BY: (Signature) Chris Camargos	Date: 1/9/14 Time: 16:34	RECEIVED BY: (Signature)	Date: 1/9/14 Time: 16:34
SAMPLED BY: (Print & Initial) CG & RR	Date: 1/6/14 Time:		
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS	AIRBILL #: OTHER:		
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
TETRA TECH CONTACT PERSON:	Results by:		
RECEIVING LABORATORY: ADDRESS: CITY: STATE: ZIP: CONTACT: PHONE:	RECEIVED BY: (Signature) DATE: TIME:		RUSH Charges Authorized: Yes No
SAMPLE CONDITION WHEN RECEIVED: 4.0	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.

NX