

SITE INFORMATION

Report Type: Work Plan

General Site Information:

Site:	Willow "A" State Tank Battery				
Company:	COG Operating LLC				
Section, Township and Range	Unit J	Sec 3	T25S	R28E	
Lease Number:	API-30-015-33012				
County:	Eddy County				
GPS:	32.15751° N			104.07456° W	
Surface Owner:	State				
Mineral Owner:					
Directions:	Starting in Malaga on Hwy 285, travel south on Hwy 285 for 4.6 miles site is on west side of the highway.				

Release Data:

Date Released:	1/31/2011
Type Release:	Oil
Source of Contamination:	Circulating Pump
Fluid Released:	24 bbls
Fluids Recovered:	23 bbls

Official Communication:

Name:	Pat Ellis	Ike Tavaréz
Company:	COG Operating, LLC	Tetra Tech
Address:	550 W. Texas Ave. Ste. 1300	1910 N. Big Spring
P.O. Box		
City:	Midland Texas, 79701	Midland, Texas
Phone number:	(432) 686-3023	(432) 425-3878
Fax:	(432) 684-7137	
Email:	pellis@conchoresources.com	ike.tavaréz@tetrattech.com

Ranking Criteria:

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	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:	20	

Acceptable Soil RRAL (mg/kg)		
Benzene	Total BTEX	TPH
10	50	100

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June 1, 2011

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

Re: Work Plan for the COG Operating LLC., Willow "A" State Tank Battery, Unit J, Section 3, Township 25 South, Range 28 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 Willow "A" State Tank Battery located in Unit J, Section 3, Township 25 South, Range 28 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.15751°, W 104.07456°. 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 January 31, 2011, and released approximately twenty four (24) barrels of oil from the circulating pump. To alleviate the problem, COG personnel repaired the pump. Twenty three (23) barrels of standing fluids were recovered. The spill was contained inside of the tank battery affecting an area of approximately 45' x 140'. The initial C-141 form is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 3. The New Mexico State Engineer Well Reports showed one well in Section 4, with a groundwater depth of 35' below surface. According to the NMOCD groundwater map, the average depth to groundwater in this area is less than 50' below surface. The average depth to water map is shown in Appendix B.

Tetra Tech

1910 North Big Spring, 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 100 mg/kg.

Soil Assessment and Analytical Results

On February 15, 2011, Tetra Tech personnel inspected and sampled the spill area. A total of five (5) auger holes (AH-1 through AH-4 and a background auger hole) were installed using a stainless steel hand auger to assess the impacted soils. Select 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, auger holes (AH-1, AH-2 and AH-3) were below the RRAL for TPH and BTEX. Auger hole (AH-4) had a total TPH concentration of 131 mg/kg (0-1') and declined below the RRAL at (1-1.5').

Auger holes (AH-1, AH-2 and AH-3) showed chloride concentrations ranging from 425 mg/kg to 1,650 mg/kg. The chloride concentrations declined with depth and showed bottom samples (auger holes) of AH-1 (<200 mg/kg at 5-5.5'), AH-2 (465 mg/kg at 4-4.5') and AH-3 (878 mg/kg at 2.5'-3.0'). The background auger hole showed a chloride high of 352 mg/kg at 3-3.5' below surface. The remaining auger hole (AH-4) did not show a chloride impact to the area.



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Work Plan

COG proposes to remove impacted material as highlighted (green) in Table 1. The proposed areas are shown on Figure 4. In the area of auger hole (AH-3), a backhoe trench will be installed to define the vertical extent of the chloride impact. The impacted soil around oil and gas equipment, structures or lines may not be feasible or practicable to be removed due to safety concerns. As such, Tetra Tech will excavate the soils to the maximum extent practicable. Once the areas are excavated to the appropriate depths, the excavation will be backfilled with clean soil.

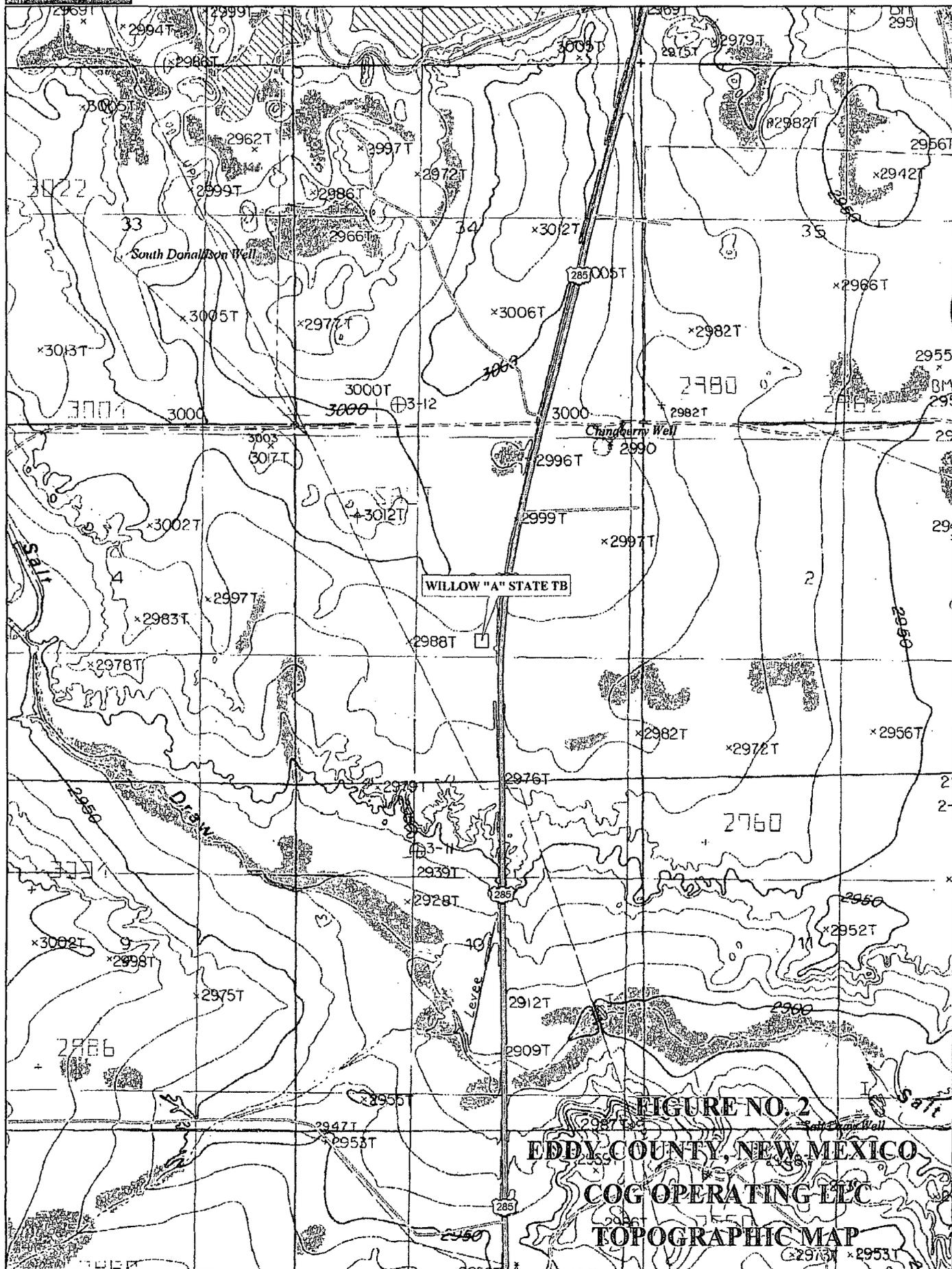
Once completed, a final report will be submitted to the NMOCD for review. If you have any questions or comments concerning the assessment, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH

Ike Tavaréz
Project Manager

cc: Pat Ellis – COG

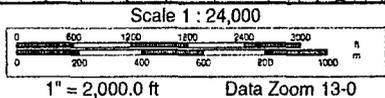
Figures

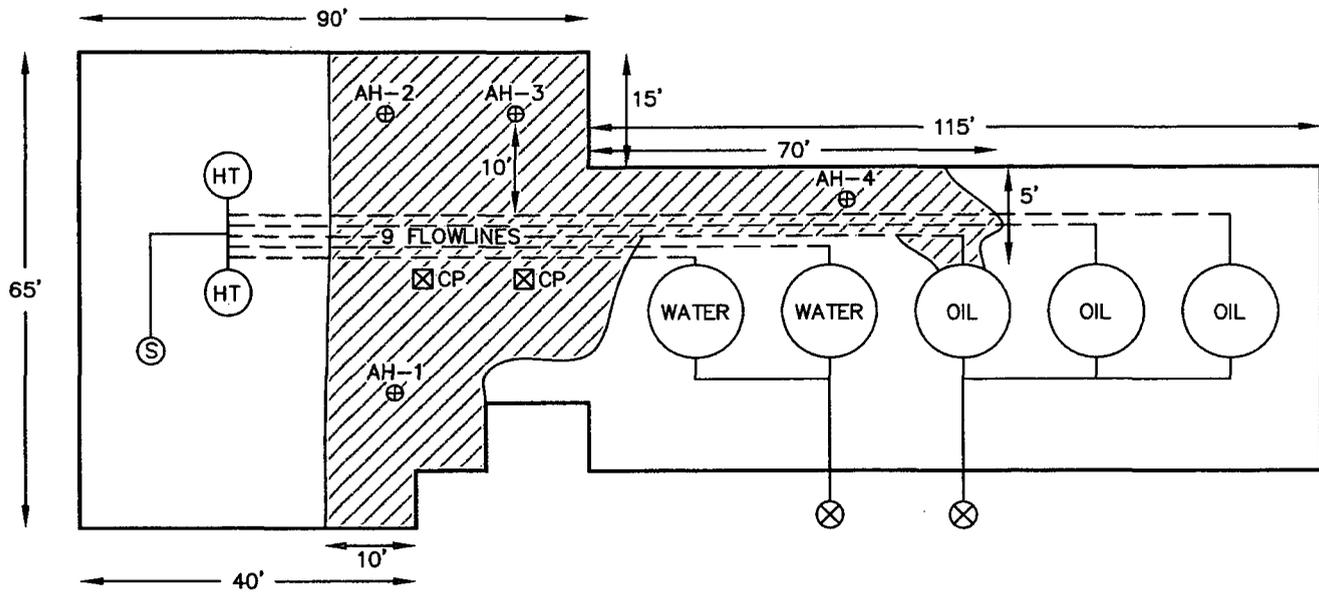


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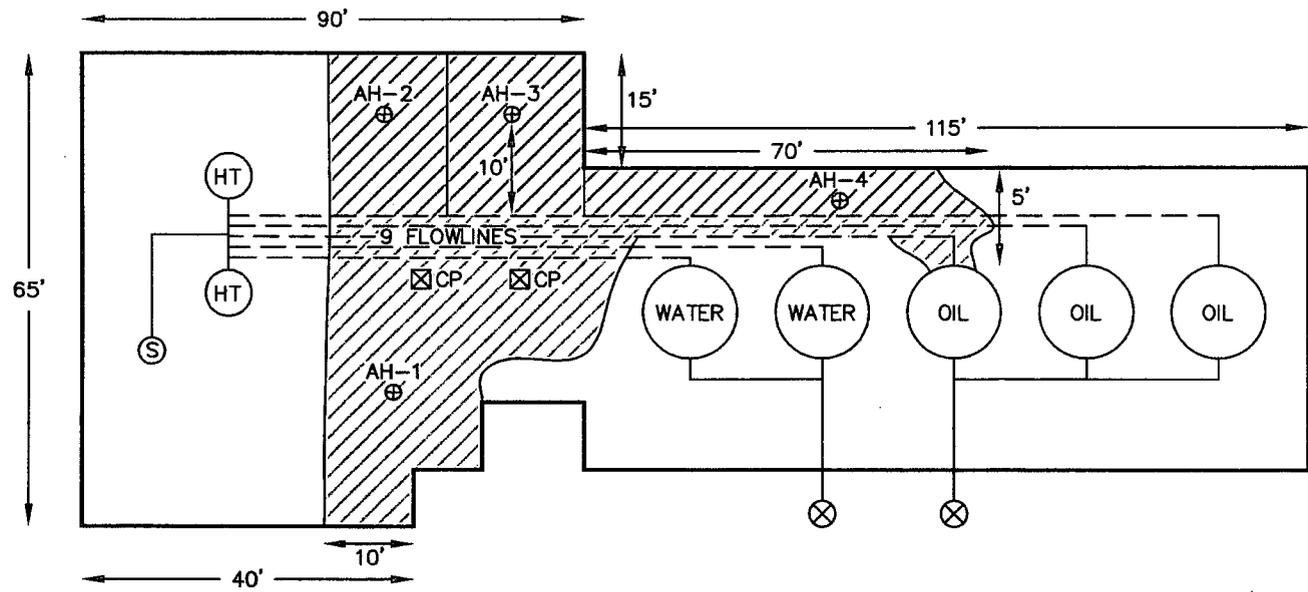


▨ SPILL AREA
⊕ SAMPLE LOCATIONS

NOT TO SCALE

DATE:
2/15/11
DWN BY:
JJ
FILE:
15\COG\0400817
WILLOW A STATE TB

FIGURE NO. 3
EDDY COUNTY, NEW MEXICO
COG OPERATING LLC
WILLOW "A" STATE TB
TETRA TECH, INC. MIDLAND, TEXAS



- SPILL AREA
- EXCAVATION AREA (1.0' DEEP)
- EXCAVATION AREA (2.5' TO 3.0' DEEP)
- EXCAVATION AREA (3.0' DEEP)
- SAMPLE LOCATIONS

NOT TO SCALE

DATE:	2/15/11
DWN. BY:	JJ
FILE:	H:\COO\8400817 WILLOW A STATE TB

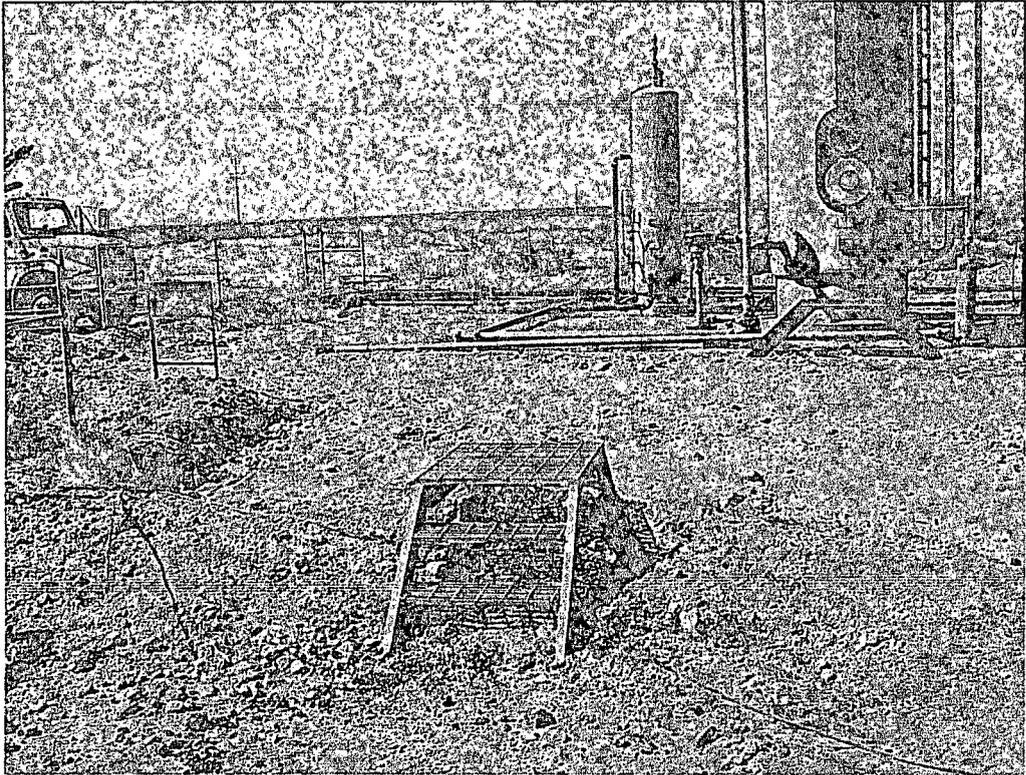
FIGURE NO. 4
EDDY COUNTY, NEW MEXICO
COG OPERATING LLC
WILLOW "A" STATE TB PROPOSED EXCAVATION MAP
TETRA TECH, INC. MIDLAND, TEXAS

Photos

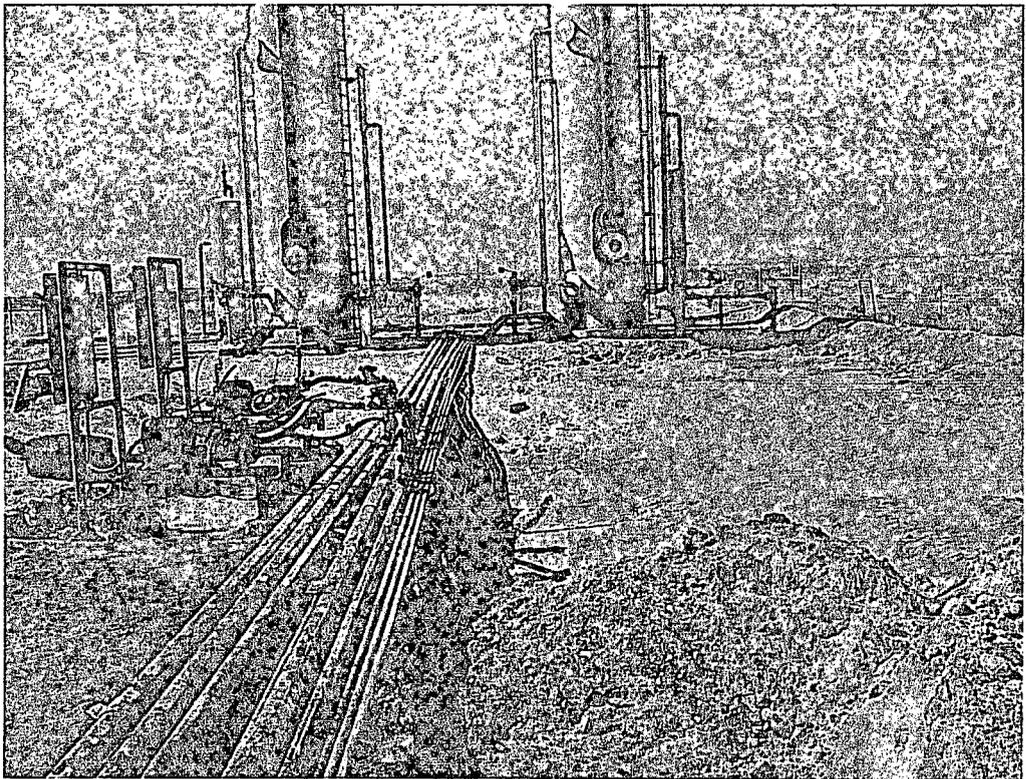
COG Operating LLC
Willow "A" State TB
Eddy County, New Mexico



TETRA TECH

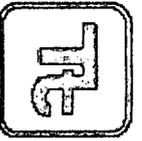


View West – AH-1

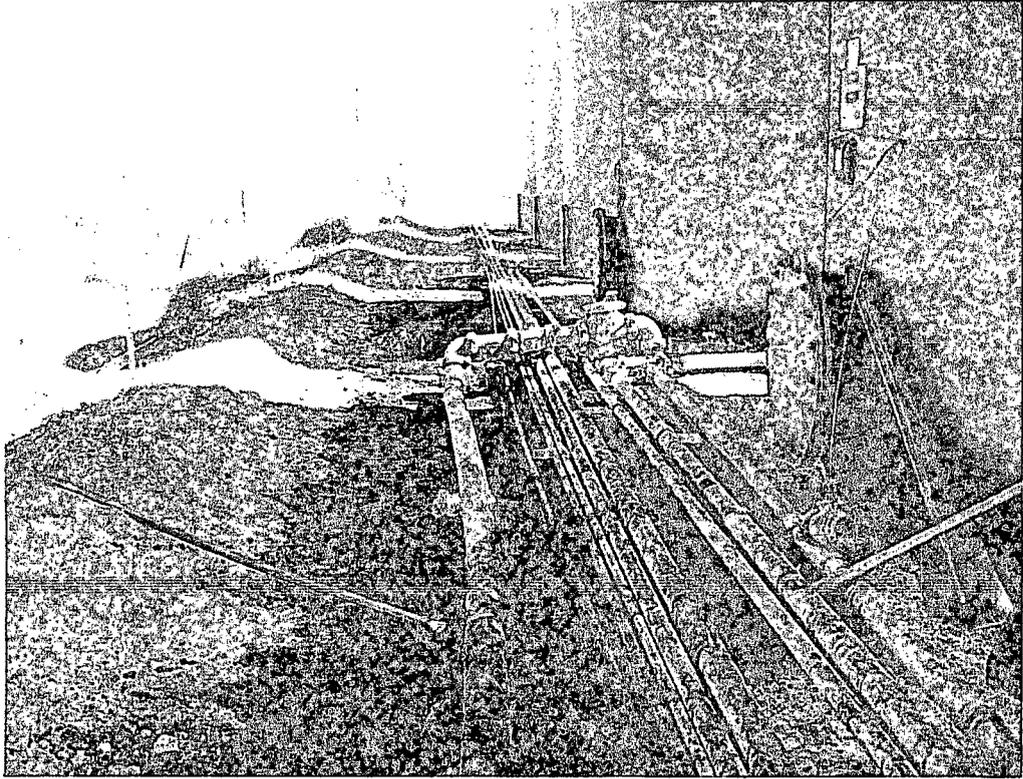


View West – AH-2 and 3

COG Operating LLC
Willow "A" State TB
Eddy County, New Mexico



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View East – AH-4

Site info and picture details

Tables

Table 1
COG Operating LLC.
WILLOW "A" TANK BATTERY
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
AH-3	2/15/2011	0-1'	1'	X		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	981
	"	1-1.5'	1'	X		-	-	-	-	-	-	-	1,630
	"	2-2.5'	1'	X		-	-	-	-	-	-	-	1,570
	"	2.5-3'	1'	X		-	-	-	-	-	-	-	878
AH-4	2/15/2011	0-1'	1'	X		131	<50.0	131	<0.0200	0.236	0.346	1.22	<200
	"	1-1.5'	1'	X		<2.00	<50.0	<50.0	-	-	-	-	<200
	"	2-2.5'	1'	X		-	-	-	-	-	-	-	<200
	"	3-3.5'	1'	X		-	-	-	-	-	-	-	<200
BG	4/14/2011	0-1'		X		-	-	-	-	-	-	-	<200
	"	1-1.5'		X		-	-	-	-	-	-	-	<200
	"	2-2.5'		X		-	-	-	-	-	-	-	<200
	"	3-3.5'		X		-	-	-	-	-	-	-	352

BEB Below Excavation Bottom

(--) Not Analyzed

Proposed excavation depths

Appendix A

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

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

Initial Report Final Report

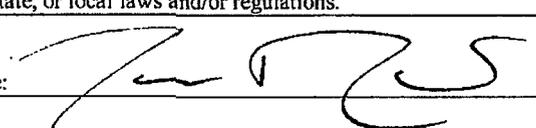
Name of Company	COG OPERATING LLC	Contact	Pat Ellis
Address	550 W. Texas, Suite 100, Midland, TX 79701	Telephone No.	432-230-0077
Facility Name	Willow "A" State	Facility Type	Tank Battery
Surface Owner	State	Mineral Owner	Lease No. (API#) 30-015-33012

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
J	3	25S	28E					Eddy

Latitude 32 09.454 Longitude 104 04.456

NATURE OF RELEASE

Type of Release	Oil	Volume of Release	24bbls	Volume Recovered	23bbls
Source of Release	Circulating pump	Date and Hour of Occurrence	01/31/2011	Date and Hour of Discovery	01/31/2011 5:00a.m.
Was Immediate Notice Given?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?			
By Whom?		Date and Hour			
Was a Watercourse Reached?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse			
If a Watercourse was Impacted, Describe Fully.*					
Describe Cause of Problem and Remedial Action Taken.*					
1/4" nipple on circulating pump started leaking when the pump was turned on, due to worn out threads. The nipple and valves have been replaced and the circulating pump has been put back into service.					
Describe Area Affected and Cleanup Action Taken.*					
Initially 24bbls was released from the circulating pump and we were able to recover 23bbls with a vacuum truck. All released oil was completely contained inside the dike walls of the facility. The facility will be scraped and the contaminated soil will be disposed of appropriately. 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 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 <input type="checkbox"/>
Date: 02/04/2011 Phone: 432-212-2399					

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* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Willow "A" State
Eddy County, New Mexico

24 South 27 East

6	5	4	3	2	1
7	8	26	9	10	11
18	17	43	16	15	14
34			22	23	31
19	20	21	70	24	
30	29	28	27	26	25
31	32	33	34	35	36

24 South 28 East

6	70	5	30	4	30
7	8	50	9	10	11
18	17	16	15	14	13
19	42	29	18	52	34
30	48	21	22	23	24
31	32	33	34	35	36

24 South 29 East

6	5	4	3	2
7	8	9	10	11
160	17	16	15	14
19	20	21	22	23
30	29	28	27	26
31	32	33	34	35

25 South 27 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

25 South 28 East

6	5	4	35	3	2	1
7	8	9	SITE	10	11	12
18	17	16	15	14	13	
19	20	21	22	23	24	
30	96	28	27	26	25	
31	32	90	34	35	36	

25 South 29 East

6	5	4	3	2
40	8	9	10	11
18	17	16	15	14
19	20	21	60	23
30	29	28	27	26
30	32	33	34	35

26 South 27 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

26 South 28 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

26 South 29 East

6	5	4	3	2
7	8	9	10	11
18	17	16	15	14
19	20	21	22	23
30	29	28	27	26
31	32	33	34	35

-  New Mexico State Engineers Well Reports
-  USGS Well Reports
-  Geology and Groundwater Conditions in Southern Eddy, County, NM
-  NMOCD - Groundwater Data

Appendix C

Summary Report

Tom Franklin
Tetra Tech
1910 N. Big Spring Street
Midland, TX 79705

Report Date: February 28, 2011

Work Order: 11021807



Project Location: Eddy Co., NM
Project Name: COG/Willow A TB
Project Number: 114-6400817

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
257838	AH-1 0-1' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257839	AH-1 1-1.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257840	AH-1 2-2.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257841	AH-1 3-3.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257842	AH-1 4-4.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257843	AH-1 5-5.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257844	AH-2 0-1' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257845	AH-2 1-1.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257846	AH-2 2-2.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257847	AH-2 3-3.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257848	AH-2 4-4.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257849	AH-3 0-1' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257850	AH-3 1-1.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257851	AH-3 2-2.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257852	AH-3 2.5-3' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257853	AH-4 0-1' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257854	AH-4 1-1.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257855	AH-4 2-2.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17
257856	AH-4 3-3.5' 1' BEB	soil	2011-02-15	00:00	2011-02-17

Sample - Field Code	BTEX				TPH DRO - NEW DRO (mg/Kg)	TPH GRO GRO (mg/Kg)
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)		
257838 - AH-1 0-1' 1' BEB	<0.0200	<0.0200	<0.0200	0.477	<50.0	22.7
257844 - AH-2 0-1' 1' BEB	<0.0200	<0.0200	<0.0200	0.379	<50.0	3.03
257849 - AH-3 0-1' 1' BEB	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00
257853 - AH-4 0-1' 1' BEB	<0.0200	0.236	0.346	1.22	<50.0	131
257854 - AH-4 1-1.5' 1' BEB	<0.0200				<50.0	<2.00

Sample: 257838 - AH-1 0-1' 1' BEB

Param	Flag	Result	Units	RL
Chloride		518	mg/Kg	4.00

Sample: 257839 - AH-1 1-1.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		735	mg/Kg	4.00

Sample: 257840 - AH-1 2-2.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		953	mg/Kg	4.00

Sample: 257841 - AH-1 3-3.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		1020	mg/Kg	4.00

Sample: 257842 - AH-1 4-4.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		425	mg/Kg	4.00

Sample: 257843 - AH-1 5-5.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00

Sample: 257844 - AH-2 0-1' 1' BEB

Param	Flag	Result	Units	RL
Chloride		1130	mg/Kg	4.00

Sample: 257845 - AH-2 1-1.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		1350	mg/Kg	4.00

Sample: 257846 - AH-2 2-2.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		1650	mg/Kg	4.00

Sample: 257847 - AH-2 3-3.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		1120	mg/Kg	4.00

Sample: 257848 - AH-2 4-4.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		465	mg/Kg	4.00

Sample: 257849 - AH-3 0-1' 1' BEB

Param	Flag	Result	Units	RL
Chloride		981	mg/Kg	4.00

Sample: 257850 - AH-3 1-1.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		1630	mg/Kg	4.00

Sample: 257851 - AH-3 2-2.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		1570	mg/Kg	4.00

Sample: 257852 - AH-3 2.5-3' 1' BEB

Param	Flag	Result	Units	RL
Chloride		878	mg/Kg	4.00

Sample: 257853 - AH-4 0-1' 1' BEB

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00

Sample: 257854 - AH-4 1-1.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00

Sample: 257855 - AH-4 2-2.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00

Sample: 257856 - AH-4 3-3.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00

Summary Report

Tom Franklin
Tetra Tech
1910 N. Big Spring Street
Midland, TX 79705

Report Date: April 27, 2011

Work Order: 11041532

Project Location: Eddy Co, NM
Project Name: COG/Willow A State Tank Battery

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
263933	BG 0-1'	soil	2011-04-14	00:00	2011-04-15
263934	BG 1-1.5'	soil	2011-04-14	00:00	2011-04-15
263935	BG 2-2.5'	soil	2011-04-14	00:00	2011-04-15
263936	BG 3-3.5'	soil	2011-04-14	00:00	2011-04-15

Sample: 263933 - BG 0-1'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00

Sample: 263934 - BG 1-1.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00

Sample: 263935 - BG 2-2.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00

Sample: 263936 - BG 3-3.5'

Param	Flag	Result	Units	RL
Chloride		352	mg/Kg	4.00
