

SITE INFORMATION

Report Type: Closure Report

General Site Information:

Site:	Polaris B	
Company:	COG Operating LLC	
Section, Township and Range	Sec 17 - T-17S - R-30E	
Lease Number:	NMLC-029342-B	
County:	Eddy County	
GPS:	32.83518° N	103.99529° W
Surface Owner:	Federal	
Mineral Owner:		
Directions:	From Hwy 82 and CR-217 in Loco Hills, travel north on 217 0.9 mi, turn left 0.5 mi, right 0.1 mi, left 0.1 mi to location	

Release Data:

Date Released:	5/27/2011
Type Release:	Oil
Source of Contamination:	Oil tank overflow - equalizer valve failed
Fluid Released:	20 bbls
Fluids Recovered:	18 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	432-682-4559
Fax:	(432) 684-7137	
Email:	pellis@conchoresources.com	ike.tavarez@tetrattech.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

RECEIVED

DEC 14 2011

NMLC029342-B



TETRA TECH

November 10, 2011

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

Re: Closure Report for the COG Operating LLC., Polaris B Federal Tank Battery, Section 17, 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 Polaris B Federal Tank Battery located in Section 17, Township 17 South, Range 30 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.83518°, W 103.99529°. 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 May 27, 2011, and released approximately twenty (20) barrels of oil due a tank overflow caused by an equalizer valve failure. To alleviate the problem, COG personnel replaced the damaged valve. Eighteen (18) barrels of standing fluids were recovered. The spill initiated from the tank and impacted an area approximately 50' x 85'. The entire spill remained within the facility berms. The initial C-141 form is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 17. According to the NMOCD Eddy County groundwater map, the average depth to groundwater in this area is greater than 300' below surface. The groundwater information 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 5,000 mg/kg.

Soil Assessment and Analytical Results

On July 14, 2011, Tetra Tech personnel inspected and sampled the spill area. A total of five (5) auger holes (AH-1 through AH-5) 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, the samples from AH-1, AH-2, and AH-3 were all below the RRAL for TPH and BTEX. However, auger holes (AH-4 and AH-5) were not vertically defined and either exceeded the RRAL for TPH, Benzene or Total BTEX at depths of 0-1' and 1-1.5' below surface.

Auger holes (AH-1 and AH-5) did show chloride concentrations declining with depth, with bottom auger hole samples of 1,580 mg/kg at 3-3.5' and 1,520 mg/kg at 1-1.5', respectively.

Closure Activities

Based on the approved work plan, Tetra Tech personnel supervised the excavation of the site. The final excavation depths of the soil remediation were met or exceeded as stated in the approved work plan. A total of 20 cubic yards of soil were excavated and hauled to proper disposal. The excavation depths are highlighted in Table 1 and shown on Figure 4. The excavations were backfilled with clean soil to grade.



TETRA TECH

As recommended in the work plan, the area of AH-1 was excavated to a depth of approximately 2.0' below surface. Once completed, a backhoe trench (T-1) was installed to define the vertical extent of the chloride impact. Referring to Table 1, the chloride declined with depth to 248 mg/kg at 5.0' below surface. In addition, the areas of AH-4 and AH-5 were excavated approximately 2.0' below surface to remove the hydrocarbon impacted soil above the RRAL and collected confirmation samples for TPH and BTEX analysis. Referring to Table 1, the results were below the RRAL. The sampling results are summarized in Table 1.

As requested by the BLM, confirmation samples were collected from the excavation sidewalls. The confirmation samples results are shown in Table 1. Referring to Table 1, a chloride concentration of 1,250 mg/kg was detected in the area of CS-6 (north-northeast sidewall). However, this area was not excavated due to the facility tank and lines near the sidewall. The BLM inspected area and approved the chloride concentration.

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

Respectfully submitted,
TETRA TECH



Ike Tavaréz, PG
Senior Project Manager

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

Figures

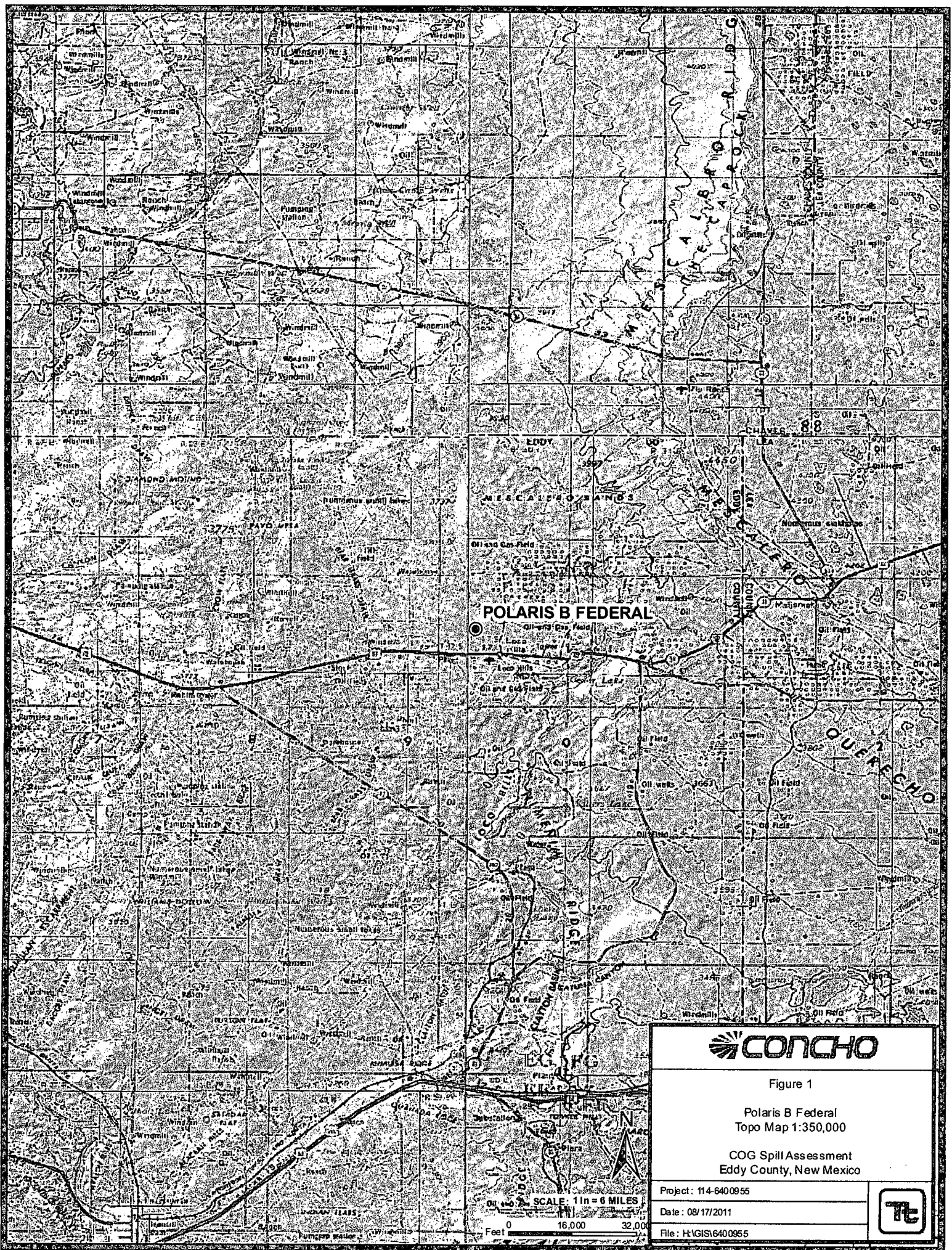


Figure 1

Polaris B Federal
Topo Map 1:350,000

COG Spill Assessment
Eddy County, New Mexico

Project: 114-6400955

Date: 08/17/2011

File: H:GIS\6400955



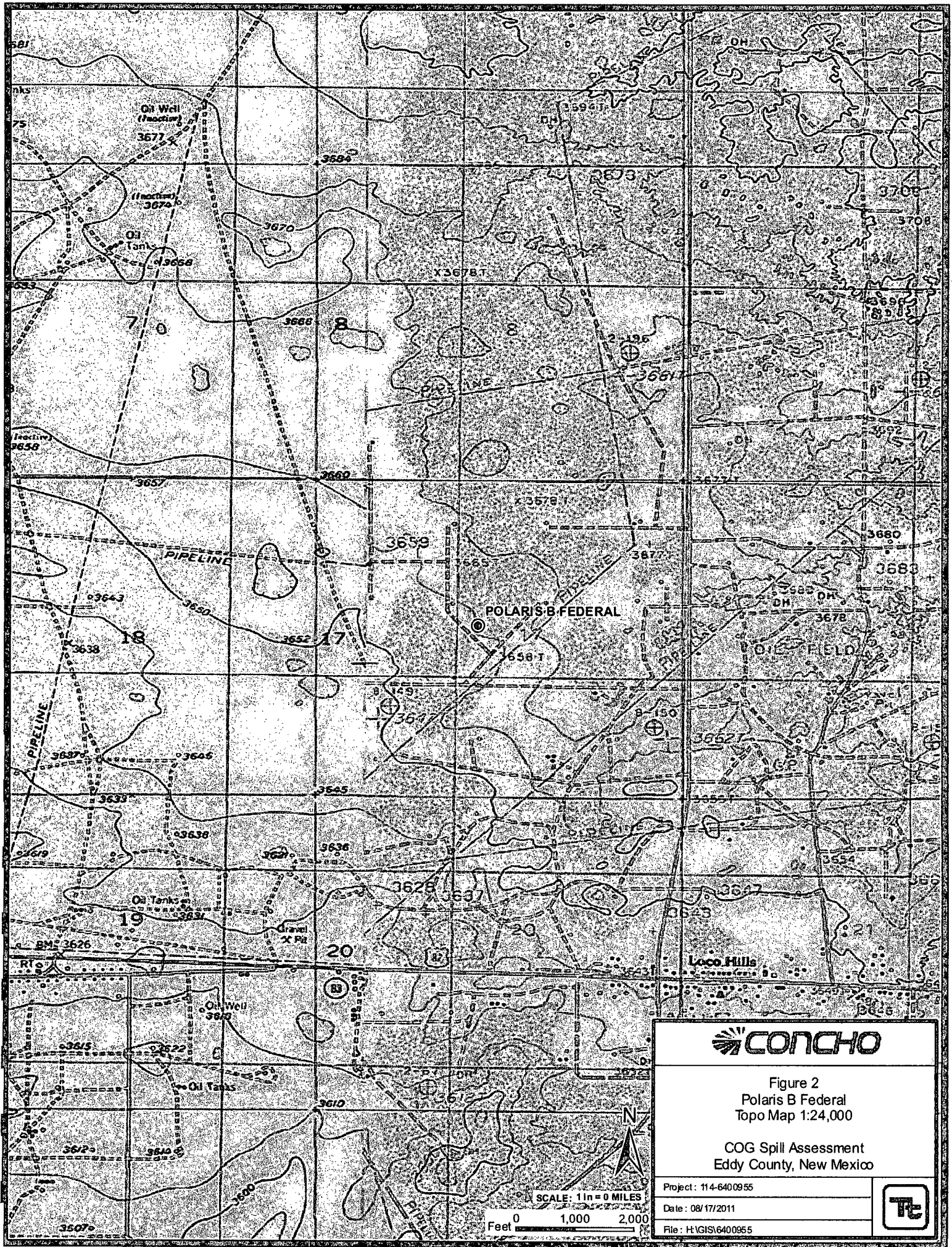


Figure 2
Polaris B Federal
Topo Map 1:24,000

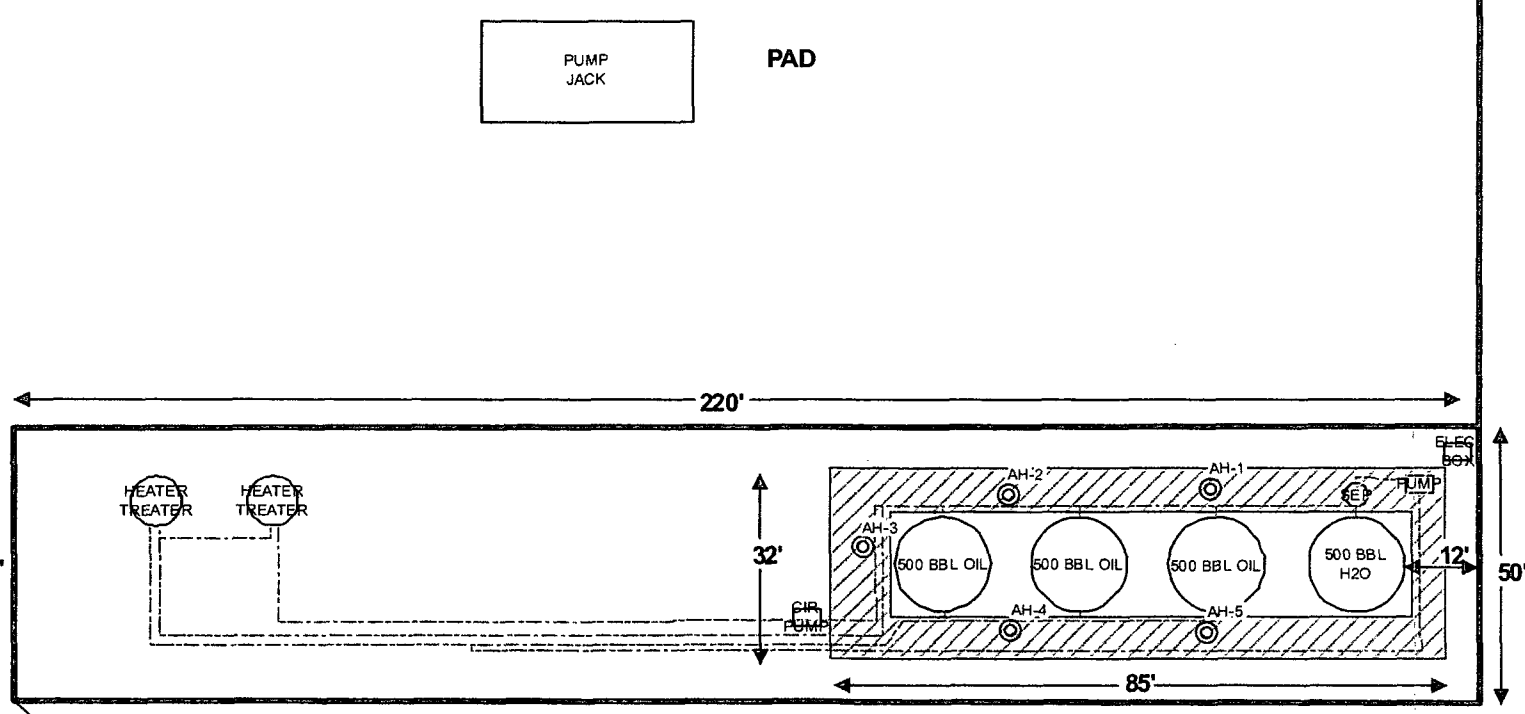
COG Spill Assessment
Eddy County, New Mexico

Project: 114-6400955

Date: 08/17/2011

File: H:\GIS\6400955





EXPLANATION

⊙ AUGER HOLE LOCATIONS

▨ SPILL AREA



SCALE: 1IN = 34 FT

Feet 0 10 20

Figure 3

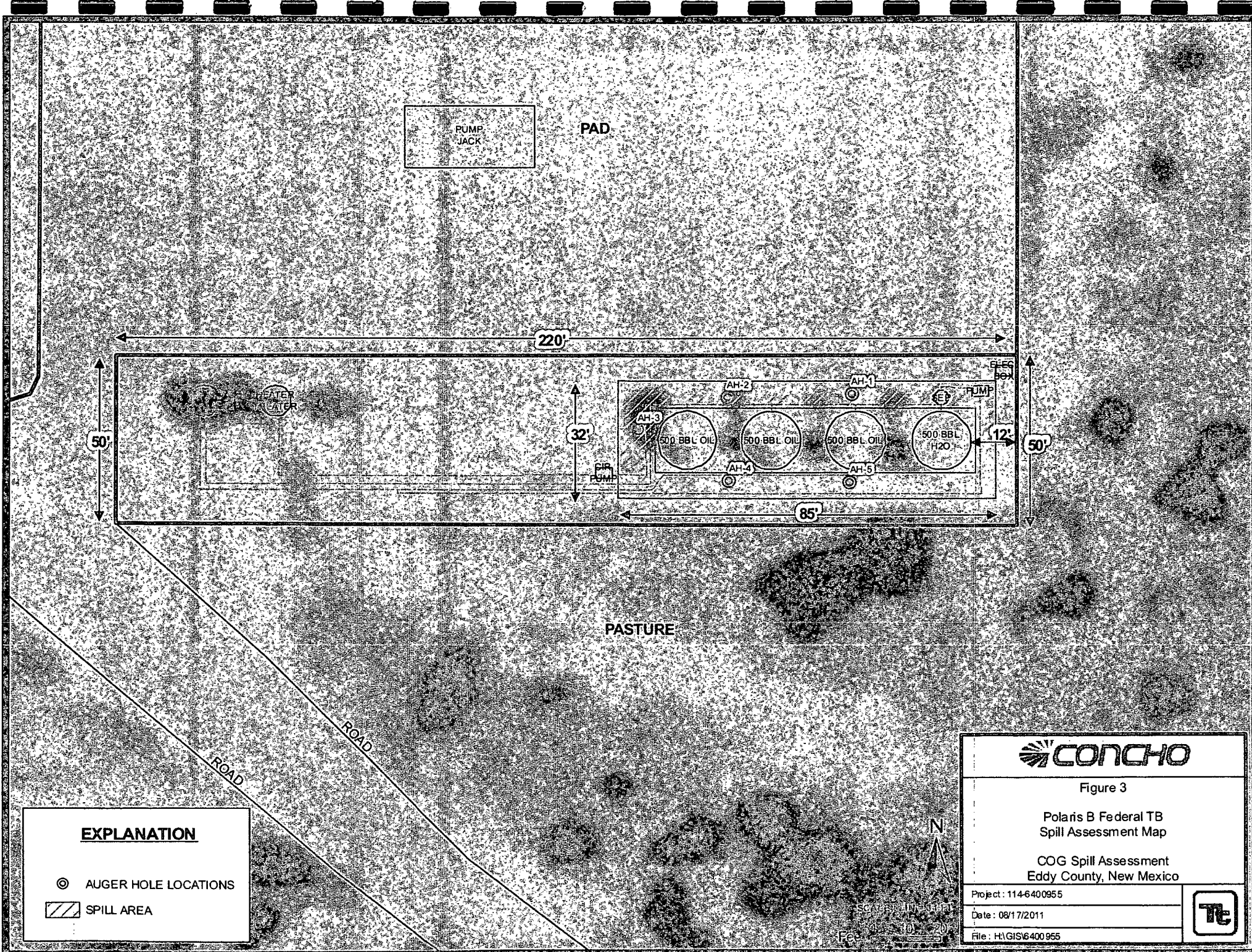
Polaris B Federal TB
Spill Assessment Map

COG Spill Assessment
Eddy County, New Mexico

Project : 1146400955

Date : 08/17/2011

File : H:\GIS\6400955



EXPLANATION

⊙ AUGER HOLE LOCATIONS

▨ SPILL AREA

Figure 3

Polaris B Federal TB
Spill Assessment Map

COG Spill Assessment
Eddy County, New Mexico

Project : 114-6400955	
Date : 08/17/2011	
File : H:\GIS\6400955	

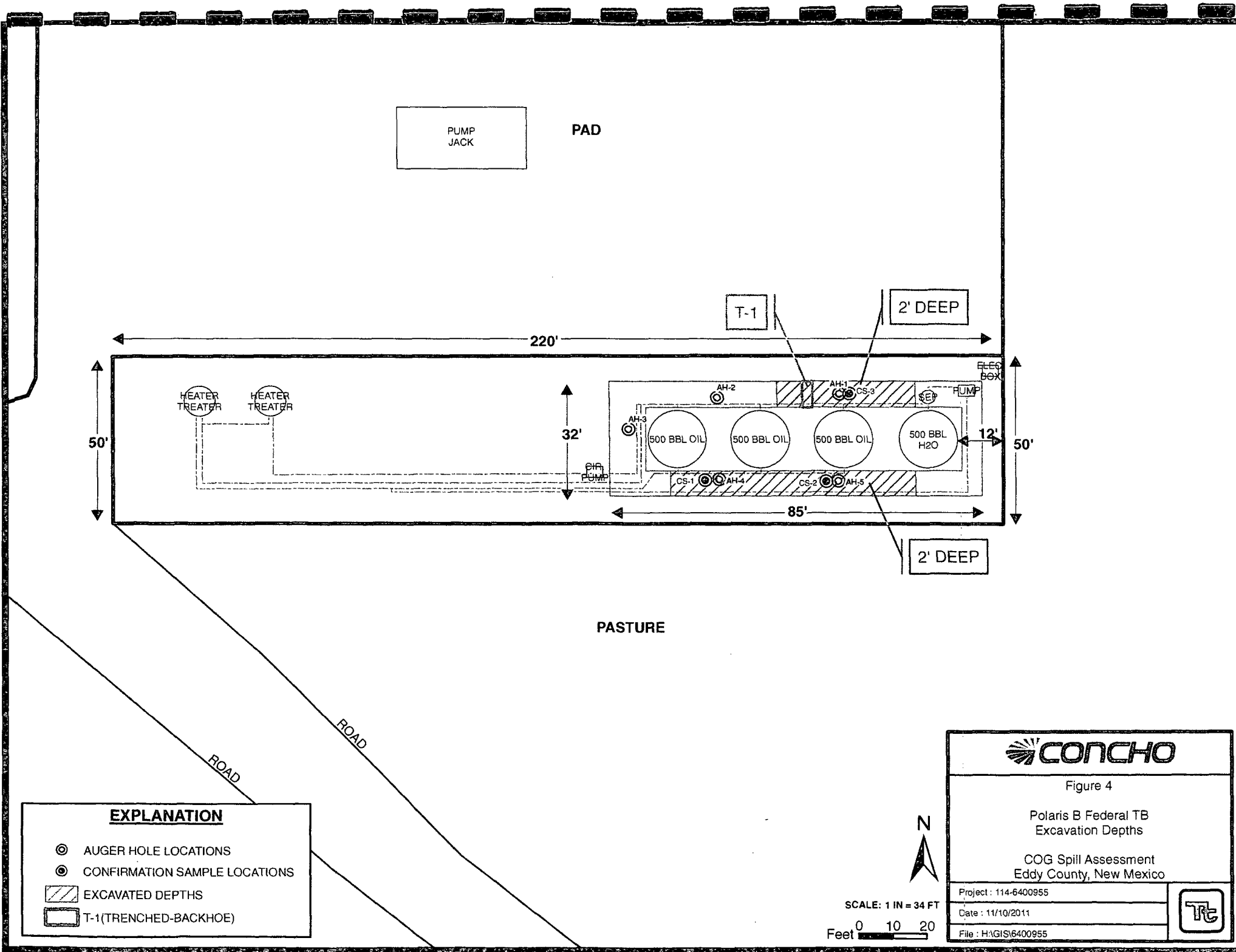


Figure 4

Polaris B Federal TB
Excavation Depths

COG Spill Assessment
Eddy County, New Mexico

Project : 114-6400955

Date : 11/10/2011

File : H:\GIS\6400955



Tables

Table 1
COG Operating LLC.
Polaris B Federal
Eddy County, New Mexico

[illegible]

Table 1
COG Operating LLC.
Polaris B Federal
Eddy County, New Mexico

[illegible]

Table 1
COG Operating LLC.
Polaris B Federal
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-4	7/14/2011	0-1'		X	530	7,700	8,230	3.25	22.4	1.63	33	60.28	549
		1-1.5'		X	7,310	10,400	17,710	95.6	342	193	220	850.6	311
CS-1	9/29/2011	Bottom 4'	X		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	-
AH-5	7/14/2011	0-1'		X	2,020	6,930	8,950	12.9	133	110	123	378.9	1,750
		1-1.5'		X	4,360	4,990	9,350	27.7	184	121	138	470.7	1,520
CS-2	9/28/2011	Bottom 3'	X		7.82	<50.0	7.82	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	522
Area of AH-5 and AH-6													
CS-4	9/28/2011	North-NW	X		-	-	-	-	-	-	-	-	<200
CS-5	9/28/2011	North-SW	X		-	-	-	-	-	-	-	-	269
CS-6	9/28/2011	North-NE	X		-	-	-	-	-	-	-	-	1,250
CS-7	9/29/2011	South-SE	X		-	-	-	-	-	-	-	-	<200
CS-10	9/30/2011	East wall	X		-	-	-	-	-	-	-	-	278
CS-11	9/30/2011	Westwall	X		-	-	-	-	-	-	-	-	

(--) Not Analyzed

 Excavated material and depth

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

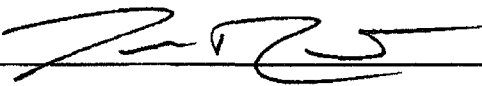
Name of Company	COG OPERATING LLC	Contact	Pat Ellis
Address	550 W. Texas, Suite 100, Midland, TX 79701	Telephone No.	432-230-0077
Facility Name	Polaris B	Facility Type	Tank Battery
Surface Owner	Federal	Mineral Owner	
		Lease No.	NMLC-029342-B

LOCATION OF RELEASE

Unit Letter	Section 17	Township 17S	Range 30E	Feet from the	North/South Line	Feet from the	East/West Line	County Eddy
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Latitude 32 50.111 Longitude 103 59.722

NATURE OF RELEASE

Type of Release	Oil	Volume of Release	20bbls	Volume Recovered	18bbls
Source of Release	Oil tank	Date and Hour of Occurrence	05/27/2011	Date and Hour of Discovery	05/27/2011 4:00 a.m.
Was Immediate Notice Given?	☐ Yes ☒ No ☒ Not Required				
By Whom?	If YES, To Whom?				
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 equalizer valve between tanks failed causing the oil tank to overflow. The valve has been replaced.					
Describe Area Affected and Cleanup Action Taken.* Initially 20bbls of oil was released from the oil tanks and we were able to recover 18bbls with a vacuum truck. The tanks have been steamed and all free fluid has been recovered. The entire release was contained inside the dike walls of the facility. Noticeable contaminated gravel and soil has been removed. The closest well location to the release site is the Polaris B #1, (API#) 30-015-31565. 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: 06/01/2011		Phone: 432-212-2399			

* Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
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1000 Rio Brazos Road, Aztec, NM 87410
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State of New Mexico
Energy Minerals and Natural Resources

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1220 South St. Francis Dr.
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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 Pat Ellis
Address 550 W. Texas, Suite 1300 Midland, Texas 79701	Telephone No. (432) 230-0077
Facility Name Polaris B	Facility Type Tank Battery

Surface Owner: Federal	Mineral Owner	Lease No. NMLC-029342-B
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LOCATION OF RELEASE

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

Latitude N 32.83518 Longitude W 103.99529

NATURE OF RELEASE

Type of Release: Oil	Volume of Release 20 bbls	Volume Recovered 18 bbls
Source of Release: Oil Tank	Date and Hour of Occurrence 5/27/11	Date and Hour of Discovery 5/27/11 4:00 a.m.
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

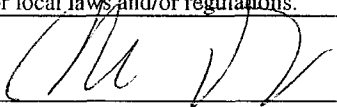
Describe Cause of Problem and Remedial Action Taken.*

The equalizer valve between tanks failed causing the oil tank to overflow. The valve has been replaced.

Describe Area Affected and Cleanup Action Taken.*

Tetra Tech inspected and assessed the spill area for extents. A work plan was prepared and submitted to NMOCD for approval. Soils exceeding the RRAL were removed and transported to proper disposal. Once excavated to the appropriate depths, the excavation was backfilled with clean soil. Tetra Tech prepared closure report and submitted to NMOCD for review.

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

Signature: 	<u>OIL CONSERVATION DIVISION</u>		
Printed Name: Ike Tavarez (agent for COG)	Approved by District Supervisor:		
Title: Project Manager	Approval Date:	Expiration Date:	
E-mail Address: ike.tavarez@tetrattech.com	Conditions of Approval:		Attached ☐
Date: 11-10-11	Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Polaris B Federal
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	20	21	22	23	24
110	29	28	27	26	25
30	32	33	34	35	36
31					

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
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
290					

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	23	24
30	29	210	28	27	26
31	32	33	34	35	36
				153	

17 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

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

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

-  New Mexico State Engineers Well Reports
-  USGS Well Reports
-  Geology and Groundwater Conditions in Southern Eddy, County, NM
-  NMOCD - Groundwater Data
-  Site Location - Electra Federal #5 Site

Appendix C

Summary Report

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

Report Date: July 22, 2011

Work Order: 11071511

Project Location: Eddy Co., NM
Project Name: COG/Polaris B Federal
Project Number: 114-6400955

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
272027	AH-1 0-1	soil	2011-07-14	00:00	2011-07-15
272028	AH-1 1-1.5	soil	2011-07-14	00:00	2011-07-15
272029	AH-1 2-2.5	soil	2011-07-14	00:00	2011-07-15
272030	AH-1 3-3.5	soil	2011-07-14	00:00	2011-07-15
272031	AH-2 0-1	soil	2011-07-14	00:00	2011-07-15
272032	AH-2 1-1.5	soil	2011-07-14	00:00	2011-07-15
272033	AH-2 2-2.5	soil	2011-07-14	00:00	2011-07-15
272034	AH-2 3-3.5	soil	2011-07-14	00:00	2011-07-15
272035	AH-2 4-4.5	soil	2011-07-14	00:00	2011-07-15
272036	AH-3 0-1	soil	2011-07-14	00:00	2011-07-15
272037	AH-3 1-1.5	soil	2011-07-14	00:00	2011-07-15
272038	AH-3 2-2.5	soil	2011-07-14	00:00	2011-07-15
272039	AH-3 3-3.5	soil	2011-07-14	00:00	2011-07-15
272040	AH-3 4-4.5	soil	2011-07-14	00:00	2011-07-15
272041	AH-3 5-5.5	soil	2011-07-14	00:00	2011-07-15
272042	AH-4 0-1	soil	2011-07-14	00:00	2011-07-15
272043	AH-4 1-1.5	soil	2011-07-14	00:00	2011-07-15
272044	AH-5 0-1	soil	2011-07-14	00:00	2011-07-15
272045	AH-5 1-1.5	soil	2011-07-14	00:00	2011-07-15

Sample - Field Code	BTEX				TPH DRO - NEW	TPH GRO
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
272027 - AH-1 0-1	<0.400	<0.400	1.66	4.49	213	197
272031 - AH-2 0-1	<0.0200	<0.0200	<0.0200	0.654	115	150
272036 - AH-3 0-1	<0.400	2.40	4.21	8.58	320	281
272042 - AH-4 0-1	3.25	22.4	1.63	33.0	7700	530
272043 - AH-4 1-1.5	95.6	342	193	220	10400	7310
272044 - AH-5 0-1	12.9	133	110	123	6930	2020

continued ...

... continued

Sample - Field Code	BTEX				TPH DRO - NEW	TPH GRO
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
272045 - AH-5 1-1.5	27.7	184	121	138	4990	4360

Sample: 272027 - AH-1 0-1

Param	Flag	Result	Units	RL
Chloride		4190	mg/Kg	4

Sample: 272028 - AH-1 1-1.5

Param	Flag	Result	Units	RL
Chloride		3890	mg/Kg	4

Sample: 272029 - AH-1 2-2.5

Param	Flag	Result	Units	RL
Chloride		2030	mg/Kg	4

Sample: 272030 - AH-1 3-3.5

Param	Flag	Result	Units	RL
Chloride		1580	mg/Kg	4

Sample: 272031 - AH-2 0-1

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 272032 - AH-2 1-1.5

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 272033 - AH-2 2-2.5

continued ...

sample 272033 continued ...

Param	Flag	Result	Units	RL
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 272034 - AH-2 3-3.5

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 272035 - AH-2 4-4.5

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 272036 - AH-3 0-1

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 272037 - AH-3 1-1.5

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 272038 - AH-3 2-2.5

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 272039 - AH-3 3-3.5

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 272040 - AH-3 4-4.5

Param	Flag	Result	Units	RL
Chloride		257	mg/Kg	4

Sample: 272041 - AH-3 5-5.5

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 272042 - AH-4 0-1

Param	Flag	Result	Units	RL
Chloride		549	mg/Kg	4

Sample: 272043 - AH-4 1-1.5

Param	Flag	Result	Units	RL
Chloride		311	mg/Kg	4

Sample: 272044 - AH-5 0-1

Param	Flag	Result	Units	RL
Chloride		1750	mg/Kg	4

Sample: 272045 - AH-5 1-1.5

Param	Flag	Result	Units	RL
Chloride		1520	mg/Kg	4



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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: July 22, 2011

Work Order: 11071511



Project Location: Eddy Co., NM
Project Name: COG/Polaris B Federal
Project Number: 114-6400955

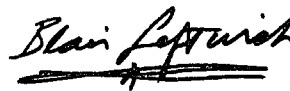
Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
272027	AH-1 0-1	soil	2011-07-14	00:00	2011-07-15
272028	AH-1 1-1.5	soil	2011-07-14	00:00	2011-07-15
272029	AH-1 2-2.5	soil	2011-07-14	00:00	2011-07-15
272030	AH-1 3-3.5	soil	2011-07-14	00:00	2011-07-15
272031	AH-2 0-1	soil	2011-07-14	00:00	2011-07-15
272032	AH-2 1-1.5	soil	2011-07-14	00:00	2011-07-15
272033	AH-2 2-2.5	soil	2011-07-14	00:00	2011-07-15
272034	AH-2 3-3.5	soil	2011-07-14	00:00	2011-07-15
272035	AH-2 4-4.5	soil	2011-07-14	00:00	2011-07-15
272036	AH-3 0-1	soil	2011-07-14	00:00	2011-07-15
272037	AH-3 1-1.5	soil	2011-07-14	00:00	2011-07-15
272038	AH-3 2-2.5	soil	2011-07-14	00:00	2011-07-15
272039	AH-3 3-3.5	soil	2011-07-14	00:00	2011-07-15
272040	AH-3 4-4.5	soil	2011-07-14	00:00	2011-07-15
272041	AH-3 5-5.5	soil	2011-07-14	00:00	2011-07-15
272042	AH-4 0-1	soil	2011-07-14	00:00	2011-07-15
272043	AH-4 1-1.5	soil	2011-07-14	00:00	2011-07-15
272044	AH-5 0-1	soil	2011-07-14	00:00	2011-07-15

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
272045	AH-5 1-1.5	soil	2011-07-14	00:00	2011-07-15

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 36 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

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Case Narrative

Samples for project COG/Polaris B Federal were received by TraceAnalysis, Inc. on 2011-07-15 and assigned to work order 11071511. Samples for work order 11071511 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
BTEX	S 8021B	70614	2011-07-18 at 11:39	83139	2011-07-18 at 11:39
BTEX	S 8021B	70654	2011-07-20 at 09:10	83181	2011-07-20 at 15:55
Chloride (Titration)	SM 4500-Cl B	70615	2011-07-19 at 11:15	83217	2011-07-22 at 10:34
Chloride (Titration)	SM 4500-Cl B	70615	2011-07-19 at 11:15	83219	2011-07-22 at 10:36
TPH DRO - NEW	S 8015 D	70586	2011-07-15 at 14:37	83103	2011-07-15 at 14:37
TPH DRO - NEW	S 8015 D	70684	2011-07-21 at 10:00	83218	2011-07-21 at 11:23
TPH GRO	S 8015 D	70614	2011-07-18 at 11:39	83140	2011-07-18 at 11:39
TPH GRO	S 8015 D	70654	2011-07-20 at 09:10	83182	2011-07-20 at 15:55

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 11071511 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

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Analytical Report

Sample: 272027 - AH-1 0-1

Laboratory: Midland
Analysis: BTEX
QC Batch: 83139
Prep Batch: 70614

Analytical Method: S 8021B
Date Analyzed: 2011-07-18
Sample Preparation: 2011-07-18

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene		1	<0.400	mg/Kg	20	0.0200
Toluene		1	<0.400	mg/Kg	20	0.0200
Ethylbenzene		1	1.66	mg/Kg	20	0.0200
Xylene		1	4.49	mg/Kg	20	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			22.1	mg/Kg	20	20.0	110	52.8 - 137
4-Bromofluorobenzene (4-BFB)			24.2	mg/Kg	20	20.0	121	38.4 - 157

Sample: 272027 - AH-1 0-1

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 83217
Prep Batch: 70615

Analytical Method: SM 4500-Cl B
Date Analyzed: 2011-07-22
Sample Preparation: 2011-07-19

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			4190	mg/Kg	100	4.00

Sample: 272027 - AH-1 0-1

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 83103
Prep Batch: 70586

Analytical Method: S 8015 D
Date Analyzed: 2011-07-15
Sample Preparation: 2011-07-15

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1	213	mg/Kg	1	50.0

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Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			97.1	mg/Kg	1	100	97	70 - 130

Sample: 272027 - AH-1 0-1

Laboratory: Midland			
Analysis: TPH GRO	Analytical Method: S 8015 D	Prep Method: S 5035	
QC Batch: 83140	Date Analyzed: 2011-07-18	Analyzed By: ME	
Prep Batch: 70614	Sample Preparation: 2011-07-18	Prepared By: ME	

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO			197	mg/Kg	20	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			21.6	mg/Kg	20	20.0	108	48.5 - 152
4-Bromofluorobenzene (4-BFB)			23.4	mg/Kg	20	20.0	117	42 - 159

Sample: 272028 - AH-1 1-1.5

Laboratory: Midland			
Analysis: Chloride (Titration)	Analytical Method: SM 4500-Cl B	Prep Method: N/A	
QC Batch: 83217	Date Analyzed: 2011-07-22	Analyzed By: AR	
Prep Batch: 70615	Sample Preparation: 2011-07-19	Prepared By: AR	

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			3890	mg/Kg	100	4.00

Sample: 272029 - AH-1 2-2.5

Laboratory: Midland			
Analysis: Chloride (Titration)	Analytical Method: SM 4500-Cl B	Prep Method: N/A	
QC Batch: 83217	Date Analyzed: 2011-07-22	Analyzed By: AR	
Prep Batch: 70615	Sample Preparation: 2011-07-19	Prepared By: AR	

continued ...

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sample 272029 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			2030	mg/Kg	100	4.00

Sample: 272030 - AH-1 3-3.5

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 83217 Date Analyzed: 2011-07-22 Analyzed By: AR
Prep Batch: 70615 Sample Preparation: 2011-07-19 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1580	mg/Kg	100	4.00

Sample: 272031 - AH-2 0-1

Laboratory: Midland
Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
QC Batch: 83181 Date Analyzed: 2011-07-20 Analyzed By: ME
Prep Batch: 70654 Sample Preparation: 2011-07-20 Prepared By: ME

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene		1	<0.0200	mg/Kg	1	0.0200
Toluene		1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene		1	<0.0200	mg/Kg	1	0.0200
Xylene		1	0.654	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.51	mg/Kg	1	2.00	126	52.8 - 137
4-Bromofluorobenzene (4-BFB)			2.78	mg/Kg	1	2.00	139	38.4 - 157

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Sample: 272031 - AH-2 0-1

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-07-22	Analyzed By:	AR
QC Batch:	83217	Sample Preparation:	2011-07-19	Prepared By:	AR
Prep Batch:	70615				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 272031 - AH-2 0-1

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	N/A
Analysis:	TPH DRO - NEW	Date Analyzed:	2011-07-15	Analyzed By:	kg
QC Batch:	83103	Sample Preparation:	2011-07-15	Prepared By:	kg
Prep Batch:	70586				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1	115	mg/Kg	1	50.0

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

Sample: 272031 - AH-2 0-1

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	S 5035
Analysis:	TPH GRO	Date Analyzed:	2011-07-18	Analyzed By:	ME
QC Batch:	83140	Sample Preparation:	2011-07-18	Prepared By:	ME
Prep Batch:	70614				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	150	mg/Kg	20	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			22.0	mg/Kg	20	20.0	110	48.5 - 152
4-Bromofluorobenzene (4-BFB)			21.8	mg/Kg	20	20.0	109	42 - 159

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Sample: 272032 - AH-2 1-1.5

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-07-22	Analyzed By:	AR
QC Batch:	83217	Sample Preparation:	2011-07-19	Prepared By:	AR
Prep Batch:	70615				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 272033 - AH-2 2-2.5

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-07-22	Analyzed By:	AR
QC Batch:	83217	Sample Preparation:	2011-07-19	Prepared By:	AR
Prep Batch:	70615				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 272034 - AH-2 3-3.5

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-07-22	Analyzed By:	AR
QC Batch:	83217	Sample Preparation:	2011-07-19	Prepared By:	AR
Prep Batch:	70615				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 272035 - AH-2 4-4.5

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-07-22	Analyzed By:	AR
QC Batch:	83217	Sample Preparation:	2011-07-19	Prepared By:	AR
Prep Batch:	70615				

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 272036 - AH-3 0-1

Laboratory: Midland

Analysis: BTEX

QC Batch: 83139

Prep Batch: 70614

Analytical Method: S 8021B

Date Analyzed: 2011-07-18

Sample Preparation: 2011-07-18

Prep Method: S 5035

Analyzed By: ME

Prepared By: ME

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene		1	<0.400	mg/Kg	20	0.0200
Toluene		1	2.40	mg/Kg	20	0.0200
Ethylbenzene		1	4.21	mg/Kg	20	0.0200
Xylene		1	8.58	mg/Kg	20	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			24.5	mg/Kg	20	20.0	122	52.8 - 137
4-Bromofluorobenzene (4-BFB)			28.4	mg/Kg	20	20.0	142	38.4 - 157

Sample: 272036 - AH-3 0-1

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 83217

Prep Batch: 70615

Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-07-22

Sample Preparation: 2011-07-19

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 272036 - AH-3 0-1

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 83103

Prep Batch: 70586

Analytical Method: S 8015 D

Date Analyzed: 2011-07-15

Sample Preparation: 2011-07-15

Prep Method: N/A

Analyzed By: kg

Prepared By: kg

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1	320	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			117	mg/Kg	1	100	117	70 - 130

Sample: 272036 - AH-3 0-1

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 83140
Prep Batch: 70614

Analytical Method: S 8015 D
Date Analyzed: 2011-07-18
Sample Preparation: 2011-07-18

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	281	mg/Kg	20	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			23.5	mg/Kg	20	20.0	118	48.5 - 152
4-Bromofluorobenzene (4-BFB)			30.5	mg/Kg	20	20.0	152	42 - 159

Sample: 272037 - AH-3 1-1.5

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 83219
Prep Batch: 70615

Analytical Method: SM 4500-Cl B
Date Analyzed: 2011-07-22
Sample Preparation: 2011-07-19

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 272038 - AH-3 2-2.5

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 83219
Prep Batch: 70615

Analytical Method: SM 4500-Cl B
Date Analyzed: 2011-07-22
Sample Preparation: 2011-07-19

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

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 272039 - AH-3 3-3.5

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-07-22	Analyzed By:	AR
QC Batch:	83219	Sample Preparation:	2011-07-19	Prepared By:	AR
Prep Batch:	70615				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 272040 - AH-3 4-4.5

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-07-22	Analyzed By:	AR
QC Batch:	83219	Sample Preparation:	2011-07-19	Prepared By:	AR
Prep Batch:	70615				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			257	mg/Kg	50	4.00

Sample: 272041 - AH-3 5-5.5

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-07-22	Analyzed By:	AR
QC Batch:	83219	Sample Preparation:	2011-07-19	Prepared By:	AR
Prep Batch:	70615				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

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Sample: 272042 - AH-4 0-1

Laboratory: Midland
Analysis: BTEX
QC Batch: 83139
Prep Batch: 70614

Analytical Method: S 8021B
Date Analyzed: 2011-07-18
Sample Preparation: 2011-07-18

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene		1	3.25	mg/Kg	20	0.0200
Toluene		1	22.4	mg/Kg	20	0.0200
Ethylbenzene		1	1.63	mg/Kg	20	0.0200
Xylene		1	33.0	mg/Kg	20	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			23.6	mg/Kg	20	20.0	118	52.8 - 137
4-Bromofluorobenzene (4-BFB)			29.0	mg/Kg	20	20.0	145	38.4 - 157

Sample: 272042 - AH-4 0-1

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 83219
Prep Batch: 70615

Analytical Method: SM 4500-Cl B
Date Analyzed: 2011-07-22
Sample Preparation: 2011-07-19

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			549	mg/Kg	50	4.00

Sample: 272042 - AH-4 0-1

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 83103
Prep Batch: 70586

Analytical Method: S 8015 D
Date Analyzed: 2011-07-15
Sample Preparation: 2011-07-15

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1	7700	mg/Kg	5	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			539	mg/Kg	5	100	539	70 - 130

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Sample: 272042 - AH-4 0-1

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 83140
Prep Batch: 70614

Analytical Method: S 8015 D
Date Analyzed: 2011-07-18
Sample Preparation: 2011-07-18

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	530	mg/Kg	20	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			22.6	mg/Kg	20	20.0	113	48.5 - 152
4-Bromofluorobenzene (4-BFB)			33.9	mg/Kg	20	20.0	170	42 - 159

Sample: 272043 - AH-4 1-1.5

Laboratory: Midland
Analysis: BTEX
QC Batch: 83181
Prep Batch: 70654

Analytical Method: S 8021B
Date Analyzed: 2011-07-20
Sample Preparation: 2011-07-20

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene		1	95.6	mg/Kg	20	0.0200
Toluene		1	342	mg/Kg	20	0.0200
Ethylbenzene		1	193	mg/Kg	20	0.0200
Xylene		1	220	mg/Kg	20	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			24.4	mg/Kg	20	20.0	122	52.8 - 137
4-Bromofluorobenzene (4-BFB)			57.8	mg/Kg	20	20.0	289	38.4 - 157

Sample: 272043 - AH-4 1-1.5

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 83219
Prep Batch: 70615

Analytical Method: SM 4500-Cl B
Date Analyzed: 2011-07-22
Sample Preparation: 2011-07-19

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

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sample 272043 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			311	mg/Kg	50	4.00

Sample: 272043 - AH-4 1-1.5

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 83218

Prep Batch: 70684

Analytical Method: S 8015 D

Date Analyzed: 2011-07-21

Sample Preparation: 2011-07-21

Prep Method: N/A

Analyzed By: AG

Prepared By: AG

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1	10400	mg/Kg	5	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			736	mg/Kg	5	100	736	70 - 130

Sample: 272043 - AH-4 1-1.5

Laboratory: Midland

Analysis: TPH GRO

QC Batch: 83182

Prep Batch: 70654

Analytical Method: S 8015 D

Date Analyzed: 2011-07-20

Sample Preparation: 2011-07-20

Prep Method: S 5035

Analyzed By: ME

Prepared By: ME

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	7310	mg/Kg	20	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			22.1	mg/Kg	20	20.0	110	48.5 - 152
4-Bromofluorobenzene (4-BFB)			80.4	mg/Kg	20	20.0	402	42 - 159

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Sample: 272044 - AH-5 0-1

Laboratory: Midland

Analysis: BTEX

QC Batch: 83139

Prep Batch: 70614

Analytical Method: S 8021B

Date Analyzed: 2011-07-18

Sample Preparation: 2011-07-18

Prep Method: S 5035

Analyzed By: ME

Prepared By: ME

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene		1	12.9	mg/Kg	20	0.0200
Toluene		1	133	mg/Kg	20	0.0200
Ethylbenzene		1	110	mg/Kg	20	0.0200
Xylene		1	123	mg/Kg	20	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			22.6	mg/Kg	20	20.0	113	52.8 - 137
4-Bromofluorobenzene (4-BFB)			43.0	mg/Kg	20	20.0	215	38.4 - 157

Sample: 272044 - AH-5 0-1

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 83219

Prep Batch: 70615

Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-07-22

Sample Preparation: 2011-07-19

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1750	mg/Kg	100	4.00

Sample: 272044 - AH-5 0-1

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 83103

Prep Batch: 70586

Analytical Method: S 8015 D

Date Analyzed: 2011-07-15

Sample Preparation: 2011-07-15

Prep Method: N/A

Analyzed By: kg

Prepared By: kg

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1	6930	mg/Kg	5	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			478	mg/Kg	5	100	478	70 - 130

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Sample: 272044 - AH-5 0-1

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 83140
Prep Batch: 70614

Analytical Method: S 8015 D
Date Analyzed: 2011-07-18
Sample Preparation: 2011-07-18

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	2020	mg/Kg	20	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			21.9	mg/Kg	20	20.0	110	48.5 - 152
4-Bromofluorobenzene (4-BFB)			57.2	mg/Kg	20	20.0	286	42 - 159

Sample: 272045 - AH-5 1-1.5

Laboratory: Midland
Analysis: BTEX
QC Batch: 83181
Prep Batch: 70654

Analytical Method: S 8021B
Date Analyzed: 2011-07-20
Sample Preparation: 2011-07-20

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene		1	27.7	mg/Kg	20	0.0200
Toluene		1	184	mg/Kg	20	0.0200
Ethylbenzene		1	121	mg/Kg	20	0.0200
Xylene		1	138	mg/Kg	20	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			23.3	mg/Kg	20	20.0	116	52.8 - 137
4-Bromofluorobenzene (4-BFB)			45.0	mg/Kg	20	20.0	225	38.4 - 157

Sample: 272045 - AH-5 1-1.5

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 83219
Prep Batch: 70615

Analytical Method: SM 4500-Cl B
Date Analyzed: 2011-07-22
Sample Preparation: 2011-07-19

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

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1520	mg/Kg	100	4.00

Sample: 272045 - AH-5 1-1.5

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 83218

Prep Batch: 70684

Analytical Method: S 8015 D

Date Analyzed: 2011-07-21

Sample Preparation: 2011-07-21

Prep Method: N/A

Analyzed By: AG

Prepared By: AG

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1	4990	mg/Kg	5	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			372	mg/Kg	5	100	372	70 - 130

Sample: 272045 - AH-5 1-1.5

Laboratory: Midland

Analysis: TPH GRO

QC Batch: 83182

Prep Batch: 70654

Analytical Method: S 8015 D

Date Analyzed: 2011-07-20

Sample Preparation: 2011-07-20

Prep Method: S 5035

Analyzed By: ME

Prepared By: ME

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	4360	mg/Kg	20	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			21.9	mg/Kg	20	20.0	110	48.5 - 152
4-Bromofluorobenzene (4-BFB)			63.7	mg/Kg	20	20.0	318	42 - 159

Method Blanks

Method Blank (1) QC Batch: 83103

QC Batch: 83103
Prep Batch: 70586

Date Analyzed: 2011-07-15
QC Preparation: 2011-07-15

Analyzed By: kg
Prepared By: kg

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1	<14.5	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			105	mg/Kg	1	100	105	70 - 130

Method Blank (1) QC Batch: 83139

QC Batch: 83139
Prep Batch: 70614

Date Analyzed: 2011-07-18
QC Preparation: 2011-07-18

Analyzed By: ME
Prepared By: ME

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1	<0.0118	mg/Kg	0.02
Toluene		1	<0.00600	mg/Kg	0.02
Ethylbenzene		1	<0.00850	mg/Kg	0.02
Xylene		1	<0.00613	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.05	mg/Kg	1	2.00	102	66.6 - 122
4-Bromofluorobenzene (4-BFB)			2.21	mg/Kg	1	2.00	110	55.4 - 124

Method Blank (1) QC Batch: 83140

QC Batch: 83140
Prep Batch: 70614

Date Analyzed: 2011-07-18
QC Preparation: 2011-07-18

Analyzed By: ME
Prepared By: ME

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Parameter	Flag	Cert	MDL Result	Units	RL
GRO		1	<0.753	mg/Kg	2

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.23	mg/Kg	1	2.00	112	67.6 - 150
4-Bromofluorobenzene (4-BFB)			2.15	mg/Kg	1	2.00	108	52.4 - 130

Method Blank (1) QC Batch: 83181

QC Batch: 83181
Prep Batch: 70654

Date Analyzed: 2011-07-20
QC Preparation: 2011-07-20

Analyzed By: ME
Prepared By: ME

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1	<0.0118	mg/Kg	0.02
Toluene		1	<0.00600	mg/Kg	0.02
Ethylbenzene		1	<0.00850	mg/Kg	0.02
Xylene		1	<0.00613	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.99	mg/Kg	1	2.00	100	66.6 - 122
4-Bromofluorobenzene (4-BFB)			2.10	mg/Kg	1	2.00	105	55.4 - 124

Method Blank (1) QC Batch: 83182

QC Batch: 83182
Prep Batch: 70654

Date Analyzed: 2011-07-20
QC Preparation: 2011-07-20

Analyzed By: ME
Prepared By: ME

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		1	<0.753	mg/Kg	2

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.90	mg/Kg	1	2.00	95	67.6 - 150
4-Bromofluorobenzene (4-BFB)			1.84	mg/Kg	1	2.00	92	52.4 - 130

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Method Blank (1) QC Batch: 83217

QC Batch: 83217
Prep Batch: 70615

Date Analyzed: 2011-07-22
QC Preparation: 2011-07-19

Analyzed By: AR
Prepared By: AR

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

Method Blank (1) QC Batch: 83218

QC Batch: 83218
Prep Batch: 70684

Date Analyzed: 2011-07-21
QC Preparation: 2011-07-21

Analyzed By: AG
Prepared By: kg

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1	<14.5	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			112	mg/Kg	1	100	112	70 - 130

Method Blank (1) QC Batch: 83219

QC Batch: 83219
Prep Batch: 70615

Date Analyzed: 2011-07-22
QC Preparation: 2011-07-19

Analyzed By: AR
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: 83103
Prep Batch: 70586

Date Analyzed: 2011-07-15
QC Preparation: 2011-07-15

Analyzed By: kg
Prepared By: kg

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	296	mg/Kg	1	250	<14.5	118	57.4 - 133.4

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	296	mg/Kg	1	250	<14.5	118	57.4 - 133.4	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	102	88.8	mg/Kg	1	100	102	89	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 83139
Prep Batch: 70614

Date Analyzed: 2011-07-18
QC Preparation: 2011-07-18

Analyzed By: ME
Prepared By: ME

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	2.15	mg/Kg	1	2.00	<0.0118	108	81.9 - 108
Toluene		1	2.27	mg/Kg	1	2.00	<0.00600	114	81.9 - 118
Ethylbenzene		1	2.21	mg/Kg	1	2.00	<0.00850	110	78.4 - 115
Xylene		1	6.67	mg/Kg	1	6.00	<0.00613	111	79.1 - 116

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	<0.0118	104	81.9 - 108	4	20
Toluene		1	2.19	mg/Kg	1	2.00	<0.00600	110	81.9 - 118	4	20
Ethylbenzene		1	2.15	mg/Kg	1	2.00	<0.00850	108	78.4 - 115	3	20
Xylene		1	6.47	mg/Kg	1	6.00	<0.00613	108	79.1 - 116	3	20

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

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Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.09	1.91	mg/Kg	1	2.00	104	96	70.2 - 114
4-Bromofluorobenzene (4-BFB)	2.39	2.10	mg/Kg	1	2.00	120	105	69.8 - 121

Laboratory Control Spike (LCS-1)

QC Batch: 83140
Prep Batch: 70614

Date Analyzed: 2011-07-18
QC Preparation: 2011-07-18

Analyzed By: ME
Prepared By: ME

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	18.4	mg/Kg	1	20.0	<0.753	92	60.9 - 95.4

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	17.8	mg/Kg	1	20.0	<0.753	89	60.9 - 95.4	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)	2.21	2.02	mg/Kg	1	2.00	110	101	61.9 - 142
4-Bromofluorobenzene (4-BFB)	2.28	2.09	mg/Kg	1	2.00	114	104	68.2 - 132

Laboratory Control Spike (LCS-1)

QC Batch: 83181
Prep Batch: 70654

Date Analyzed: 2011-07-20
QC Preparation: 2011-07-20

Analyzed By: ME
Prepared By: ME

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	2.15	mg/Kg	1	2.00	<0.0118	108	81.9 - 108
Toluene		1	2.20	mg/Kg	1	2.00	<0.00600	110	81.9 - 118
Ethylbenzene		1	2.16	mg/Kg	1	2.00	<0.00850	108	78.4 - 115
Xylene		1	6.54	mg/Kg	1	6.00	<0.00613	109	79.1 - 116

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	2.17	mg/Kg	1	2.00	<0.0118	108	81.9 - 108	1	20

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control spikes continued ...

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Toluene		1	2.26	mg/Kg	1	2.00	<0.00600	113	81.9 - 118	3	20
Ethylbenzene		1	2.22	mg/Kg	1	2.00	<0.00850	111	78.4 - 115	3	20
Xylene		1	6.72	mg/Kg	1	6.00	<0.00613	112	79.1 - 116	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)	2.10	2.11	mg/Kg	1	2.00	105	106	70.2 - 114
4-Bromofluorobenzene (4-BFB)	2.30	2.29	mg/Kg	1	2.00	115	114	69.8 - 121

Laboratory Control Spike (LCS-1)

QC Batch: 83182
Prep Batch: 70654

Date Analyzed: 2011-07-20
QC Preparation: 2011-07-20

Analyzed By: ME
Prepared By: ME

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	15.8	mg/Kg	1	20.0	<0.753	79	60.9 - 95.4

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	16.3	mg/Kg	1	20.0	<0.753	82	60.9 - 95.4	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)	2.05	2.06	mg/Kg	1	2.00	102	103	61.9 - 142
4-Bromofluorobenzene (4-BFB)	2.06	2.08	mg/Kg	1	2.00	103	104	68.2 - 132

Laboratory Control Spike (LCS-1)

QC Batch: 83217
Prep Batch: 70615

Date Analyzed: 2011-07-22
QC Preparation: 2011-07-19

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			94.2	mg/Kg	1	100	<3.85	94	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			103	mg/Kg	1	100	<3.85	103	85 - 115	9	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: 83218
Prep Batch: 70684

Date Analyzed: 2011-07-21
QC Preparation: 2011-07-21

Analyzed By: AG
Prepared By: kg

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	280	mg/Kg	1	250	<14.5	112	57.4 - 133.4

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	243	mg/Kg	1	250	<14.5	97	57.4 - 133.4	14	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	114	97.9	mg/Kg	1	100	114	98	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 83219
Prep Batch: 70615

Date Analyzed: 2011-07-22
QC Preparation: 2011-07-19

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			96.4	mg/Kg	1	100	<3.85	96	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			105	mg/Kg	1	100	<3.85	105	85 - 115	8	20

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

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Matrix Spike (MS-1) Spiked Sample: 272031

QC Batch: 83103
Prep Batch: 70586

Date Analyzed: 2011-07-15
QC Preparation: 2011-07-15

Analyzed By: kg
Prepared By: kg

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	441	mg/Kg	1	250	115	130	35.2 - 167.1

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	445	mg/Kg	1	250	115	132	35.2 - 167.1	1	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	91.6	97.3	mg/Kg	1	100	92	97	70 - 130

Matrix Spike (MS-1) Spiked Sample: 272036

QC Batch: 83139
Prep Batch: 70614

Date Analyzed: 2011-07-18
QC Preparation: 2011-07-18

Analyzed By: ME
Prepared By: ME

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	22.5	mg/Kg	20	20.0	<0.236	112	80.5 - 112
Toluene		1	23.9	mg/Kg	20	20.0	2.4056	107	82.4 - 113
Ethylbenzene		1	24.9	mg/Kg	20	20.0	4.2119	103	83.9 - 114
Xylene		1	72.3	mg/Kg	20	60.0	8.5803	106	84 - 114

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	23.0	mg/Kg	20	20.0	<0.236	115	80.5 - 112	2	20
Toluene		1	24.3	mg/Kg	20	20.0	2.4056	109	82.4 - 113	2	20
Ethylbenzene		1	25.5	mg/Kg	20	20.0	4.2119	106	83.9 - 114	2	20
Xylene		1	73.7	mg/Kg	20	60.0	8.5803	108	84 - 114	2	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)	24.2	25.0	mg/Kg	20	20	121	125	41.3 - 117

continued ...

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matrix spikes continued ...

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
4-Bromofluorobenzene (4-BFB)	28.6	29.3	mg/Kg	20	20	143	146	35.5 - 129

Matrix Spike (MS-1) Spiked Sample: 272031

QC Batch: 83140
Prep Batch: 70614

Date Analyzed: 2011-07-18
QC Preparation: 2011-07-18

Analyzed By: ME
Prepared By: ME

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	304	mg/Kg	20	200	149.709	77	61.8 - 114

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	285	mg/Kg	20	200	149.709	68	61.8 - 114	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)	24.3	23.8	mg/Kg	20	20	122	119	50 - 162
4-Bromofluorobenzene (4-BFB)	21.9	25.9	mg/Kg	20	20	110	130	50 - 162

Matrix Spike (MS-1) Spiked Sample: 272131

QC Batch: 83181
Prep Batch: 70654

Date Analyzed: 2011-07-20
QC Preparation: 2011-07-20

Analyzed By: ME
Prepared By: ME

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	21.8	mg/Kg	20	20.0	<0.236	109	80.5 - 112
Toluene		1	21.6	mg/Kg	20	20.0	<0.120	108	82.4 - 113
Ethylbenzene		1	20.6	mg/Kg	20	20.0	1.5688	95	83.9 - 114
Xylene		1	61.8	mg/Kg	20	60.0	1.6486	100	84 - 114

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	22.4	mg/Kg	20	20.0	<0.236	112	80.5 - 112	3	20

continued ...

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matrix spikes continued . . .

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Toluene		1	21.7	mg/Kg	20	20.0	<0.120	101	82.4 - 113	0	20
Ethylbenzene		1	20.8	mg/Kg	20	20.0	1.5688	96	83.9 - 114	1	20
Xylene		1	62.5	mg/Kg	20	60.0	1.6486	96	84 - 114	1	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)	23.6	23.3	mg/Kg	20	20	94	116	41.3 - 117
4-Bromofluorobenzene (4-BFB)	26.0	25.9	mg/Kg	20	20	130	130	35.5 - 129

Matrix Spike (MS-1) Spiked Sample: 272045

QC Batch: 83182
Prep Batch: 70654

Date Analyzed: 2011-07-20
QC Preparation: 2011-07-20

Analyzed By: ME
Prepared By: ME

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	4730	mg/Kg	20	200	4365.72	182	61.8 - 114

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	4870	mg/Kg	20	200	4365.72	252	61.8 - 114	3	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)	21.4	22.5	mg/Kg	20	20	107	112	50 - 162
4-Bromofluorobenzene (4-BFB)	67.8	65.0	mg/Kg	20	20	339	325	50 - 162

Matrix Spike (MS-1) Spiked Sample: 272036

QC Batch: 83217
Prep Batch: 70615

Date Analyzed: 2011-07-22
QC Preparation: 2011-07-19

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			9520	mg/Kg	100	10000	<385	95	80 - 120

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			9910	mg/Kg	100	10000	<385	99	80 - 120	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: 272312

QC Batch: 83218
Prep Batch: 70684

Date Analyzed: 2011-07-21
QC Preparation: 2011-07-21

Analyzed By: AG
Prepared By: kg

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	437	mg/Kg	1	250	437	0	35.2 - 167.1

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	538	mg/Kg	1	250	437	34	35.2 - 167.1	21	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	117	146	mg/Kg	1	100	117	146	70 - 130

Matrix Spike (MS-1) Spiked Sample: 272045

QC Batch: 83219
Prep Batch: 70615

Date Analyzed: 2011-07-22
QC Preparation: 2011-07-19

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			11200	mg/Kg	100	10000	1520	97	80 - 120

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			11800	mg/Kg	100	10000	1520	103	80 - 120	5	20

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

Calibration Standards

Standard (CCV-1)

QC Batch: 83103

Date Analyzed: 2011-07-15

Analyzed By: kg

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	258	103	80 - 120	2011-07-15

Standard (CCV-2)

QC Batch: 83103

Date Analyzed: 2011-07-15

Analyzed By: kg

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	228	91	80 - 120	2011-07-15

Standard (CCV-3)

QC Batch: 83103

Date Analyzed: 2011-07-15

Analyzed By: kg

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	273	109	80 - 120	2011-07-15

Standard (CCV-1)

QC Batch: 83139

Date Analyzed: 2011-07-18

Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/Kg	0.100	0.110	110	80 - 120	2011-07-18
Toluene		1	mg/Kg	0.100	0.107	107	80 - 120	2011-07-18

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standard continued ...

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Ethylbenzene		1	mg/Kg	0.100	0.105	105	80 - 120	2011-07-18
Xylene		1	mg/Kg	0.300	0.319	106	80 - 120	2011-07-18

Standard (CCV-2)

QC Batch: 83139

Date Analyzed: 2011-07-18

Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/Kg	0.100	0.114	114	80 - 120	2011-07-18
Toluene		1	mg/Kg	0.100	0.111	111	80 - 120	2011-07-18
Ethylbenzene		1	mg/Kg	0.100	0.106	106	80 - 120	2011-07-18
Xylene		1	mg/Kg	0.300	0.322	107	80 - 120	2011-07-18

Standard (CCV-1)

QC Batch: 83140

Date Analyzed: 2011-07-18

Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.10	110	80 - 120	2011-07-18

Standard (CCV-2)

QC Batch: 83140

Date Analyzed: 2011-07-18

Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.05	105	80 - 120	2011-07-18

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Standard (CCV-1)

QC Batch: 83181

Date Analyzed: 2011-07-20

Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/Kg	0.100	0.110	110	80 - 120	2011-07-20
Toluene		1	mg/Kg	0.100	0.109	109	80 - 120	2011-07-20
Ethylbenzene		1	mg/Kg	0.100	0.109	109	80 - 120	2011-07-20
Xylene		1	mg/Kg	0.300	0.330	110	80 - 120	2011-07-20

Standard (CCV-2)

QC Batch: 83181

Date Analyzed: 2011-07-20

Analyzed By: ME

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	2011-07-20
Toluene		1	mg/Kg	0.100	0.104	104	80 - 120	2011-07-20
Ethylbenzene		1	mg/Kg	0.100	0.0985	98	80 - 120	2011-07-20
Xylene		1	mg/Kg	0.300	0.297	99	80 - 120	2011-07-20

Standard (CCV-1)

QC Batch: 83182

Date Analyzed: 2011-07-20

Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.02	102	80 - 120	2011-07-20

Standard (CCV-2)

QC Batch: 83182

Date Analyzed: 2011-07-20

Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.10	110	80 - 120	2011-07-20

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Standard (ICV-1)

QC Batch: 83217

Date Analyzed: 2011-07-22

Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	107	107	85 - 115	2011-07-22

Standard (CCV-1)

QC Batch: 83217

Date Analyzed: 2011-07-22

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	92.7	93	85 - 115	2011-07-22

Standard (CCV-1)

QC Batch: 83218

Date Analyzed: 2011-07-21

Analyzed By: AG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO			mg/Kg	250	249	100	80 - 120	2011-07-21

Standard (CCV-2)

QC Batch: 83218

Date Analyzed: 2011-07-21

Analyzed By: AG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO			mg/Kg	250	283	113	80 - 120	2011-07-21

Standard (ICV-1)

QC Batch: 83219

Date Analyzed: 2011-07-22

Analyzed By: AR

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Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	97.7	98	85 - 115	2011-07-22

Standard (CCV-1)

QC Batch: 83219

Date Analyzed: 2011-07-22

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	102	102	85 - 115	2011-07-22

Appendix

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	T104704392-10-TX	Midland

Standard Flags

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

Attachments

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

XUJ0 #: 11071511

Analysis Request of Chain of Custody Record

ANALYSIS REQUEST
(Circle or Specify Method No.)



TETRA TECH

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

CLIENT NAME: COC		SITE MANAGER: Ile Tovariz							
PROJECT NO: 114-6400955		PROJECT NAME: Polaris Federal Eddy & DM							
LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION			
030023	7/14		S	X					
028						AA-1	0-1	1-1.5	
029						AA-1	2-2.5	3-3.5	
030						AA-1	0-1	1-1.5	
031						AA-2	0-1	1-1.5	
032						AA-2	2-2.5	3-3.5	
033						AA-2	0-1	1-1.5	
034						AA-2	2-2.5	3-3.5	
035						AA-2	0-1	1-1.5	
036						AA-3	0-1	1-1.5	
RELINQUISHED BY (Signature)		Date: 7/18/11		Time: 11:18		RECEIVED BY (Signature)		Date: 7/18/11	Time: 11:18
RELINQUISHED BY (Signature)		Date: 7/18/11		Time: 11:18		RECEIVED BY (Signature)		Date: 7/18/11	Time: 11:18
RELINQUISHED BY (Signature)		Date: 7/18/11		Time: 11:18		RECEIVED BY (Signature)		Date: 7/18/11	Time: 11:18
RECEIVING LABORATORY: Tetra		ADDRESS: Midland		STATE: TX		ZIP: 		DATE: 	
CONTACT: 3.1.1 contact		PHONE: 		TIME: 		REMARKS: 			

NUMBER OF CONTAINERS		PRESERVATIVE METHOD	
1		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			

Please fill out all copies - Laboratory retains Yellow copy - Return Original 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 13, 2011

Work Order: 11100305



Project Location: Eddy Co., NM
Project Name: COG/Polaris B Federal
Project Number: 114-6400955

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
278847	CS-1 Bottom Hole 4' (AH-4)	soil	2011-09-29	13:00	2011-09-30
278848	CS-2 Bottom Hole 3' (AH-5)	soil	2011-09-28	08:00	2011-09-30
278849	CS-3 Bottom Hole 2' (AH-1)	soil	2011-09-28	08:10	2011-09-30
278850	CS-4 Sidewall	soil	2011-09-28	08:20	2011-09-30
278851	CS-5 Sidewall	soil	2011-09-28	08:30	2011-09-30
278852	CS-6 Sidewall	soil	2011-09-28	08:40	2011-09-30
278853	CS-7 Sidewall	soil	2011-09-29	13:50	2011-09-30
278854	CS-8 Sidewall	soil	2011-09-28	09:00	2011-09-30
278855	CS-9 Sidewall	soil	2011-09-28	09:10	2011-09-30
278856	CS-10 Sidewall	soil	2011-09-30	08:00	2011-09-30
278858	CS-12 Sidewall	soil	2011-09-28	08:48	2011-09-30
278859	CS-13 Sidewall	soil	2011-09-28	10:30	2011-09-30
278860	Trench-1 @ 3' (AH-1)	soil	2011-09-28	13:45	2011-09-30
278861	Trench-1 @ 4' (AH-1)	soil	2011-09-28	14:45	2011-09-30
278862	Trench-1 @ 5' (AH-1)	soil	2011-09-29	14:00	2011-09-30

Sample - Field Code	BTEX				TPH DRO - NEW	TPH GRO
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
278847 - CS-1 Bottom Hole 4' (AH-4)	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00 Qs
278848 - CS-2 Bottom Hole 3' (AH-5)	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	7.82 Qs

Sample: 278848 - CS-2 Bottom Hole 3' (AH-5)

Param	Flag	Result	Units	RL
Chloride		522	mg/Kg	4

Sample: 278849 - CS-3 Bottom Hole 2' (AH-1)

Param	Flag	Result	Units	RL
Chloride		393	mg/Kg	4

Sample: 278850 - CS-4 Sidewall

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 278851 - CS-5 Sidewall

Param	Flag	Result	Units	RL
Chloride		269	mg/Kg	4

Sample: 278852 - CS-6 Sidewall

Param	Flag	Result	Units	RL
Chloride		1250	mg/Kg	4

Sample: 278853 - CS-7 Sidewall

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 278854 - CS-8 Sidewall

Param	Flag	Result	Units	RL
Chloride		781	mg/Kg	4

Sample: 278855 - CS-9 Sidewall

Param	Flag	Result	Units	RL
Chloride		467	mg/Kg	4

Sample: 278856 - CS-10 Sidewall

Param	Flag	Result	Units	RL
Chloride		278	mg/Kg	4

Sample: 278858 - CS-12 Sidewall

Param	Flag	Result	Units	RL
Chloride		985	mg/Kg	4

Sample: 278859 - CS-13 Sidewall

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 278860 - Trench-1 @ 3' (AH-1)

Param	Flag	Result	Units	RL
Chloride		1710	mg/Kg	4

Sample: 278861 - Trench-1 @ 4' (AH-1)

Param	Flag	Result	Units	RL
Chloride		1350	mg/Kg	4

Sample: 278862 - Trench-1 @ 5' (AH-1)

Param	Flag	Result	Units	RL
Chloride		248	mg/Kg	4



6701 Alverdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
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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 13, 2011

Work Order: 11100305



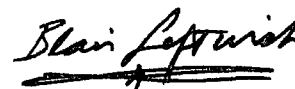
Project Location: Eddy Co., NM
Project Name: COG/Polaris B Federal
Project Number: 114-6400955

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
278847	CS-1 Bottom Hole 4' (AH-4)	soil	2011-09-29	13:00	2011-09-30
278848	CS-2 Bottom Hole 3' (AH-5)	soil	2011-09-28	08:00	2011-09-30
278849	CS-3 Bottom Hole 2' (AH-1)	soil	2011-09-28	08:10	2011-09-30
278850	CS-4 Sidewall	soil	2011-09-28	08:20	2011-09-30
278851	CS-5 Sidewall	soil	2011-09-28	08:30	2011-09-30
278852	CS-6 Sidewall	soil	2011-09-28	08:40	2011-09-30
278853	CS-7 Sidewall	soil	2011-09-29	13:50	2011-09-30
278854	CS-8 Sidewall	soil	2011-09-28	09:00	2011-09-30
278855	CS-9 Sidewall	soil	2011-09-28	09:10	2011-09-30
278856	CS-10 Sidewall	soil	2011-09-30	08:00	2011-09-30
278858	CS-12 Sidewall	soil	2011-09-28	08:48	2011-09-30
278859	CS-13 Sidewall	soil	2011-09-28	10:30	2011-09-30
278860	Trench-1 @ 3' (AH-1)	soil	2011-09-28	13:45	2011-09-30
278861	Trench-1 @ 4' (AH-1)	soil	2011-09-28	14:45	2011-09-30
278862	Trench-1 @ 5' (AH-1)	soil	2011-09-29	14:00	2011-09-30

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.

A handwritten signature in black ink, reading "Blair Leftwich". The signature is written in a cursive style with a horizontal line underneath.

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

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Case Narrative

Samples for project COG/Polaris B Federal were received by TraceAnalysis, Inc. on 2011-09-30 and assigned to work order 11100305. Samples for work order 11100305 were received intact at a temperature of 11.3 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	72438	2011-10-04 at 11:00	85322	2011-10-04 at 21:44
Chloride (Titration)	SM 4500-Cl B	72450	2011-10-06 at 10:23	85495	2011-10-11 at 15:44
Chloride (Titration)	SM 4500-Cl B	72450	2011-10-06 at 10:23	85496	2011-10-11 at 15:47
TPH DRO - NEW	S 8015 D	72444	2011-10-05 at 13:28	85330	2011-10-05 at 13:28
TPH GRO	S 8015 D	72438	2011-10-04 at 11:00	85323	2011-10-04 at 22:10

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 11100305 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: 278847 - CS-1 Bottom Hole 4' (AH-4)

Laboratory: Midland
Analysis: BTEX
QC Batch: 85322
Prep Batch: 72438

Analytical Method: S 8021B
Date Analyzed: 2011-10-04
Sample Preparation: 2011-10-04

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.03	mg/Kg	1	2.00	102	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			1.93	mg/Kg	1	2.00	96	70.6 - 179

Sample: 278847 - CS-1 Bottom Hole 4' (AH-4)

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 85330
Prep Batch: 72444

Analytical Method: S 8015 D
Date Analyzed: 2011-10-05
Sample Preparation: 2011-10-05

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			79.9	mg/Kg	1	100	80	67.5 - 147.1

Sample: 278847 - CS-1 Bottom Hole 4' (AH-4)

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 85323
Prep Batch: 72438

Analytical Method: S 8015 D
Date Analyzed: 2011-10-04
Sample Preparation: 2011-10-04

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.90	mg/Kg	1	2.00	95	30 - 134.6
4-Bromofluorobenzene (4-BFB)			1.82	mg/Kg	1	2.00	91	22.4 - 149

Sample: 278848 - CS-2 Bottom Hole 3' (AH-5)

Laboratory: Midland

Analysis: BTEX

QC Batch: 85322

Prep Batch: 72438

Analytical Method: S 8021B

Date Analyzed: 2011-10-04

Sample Preparation: 2011-10-04

Prep Method: S 5035

Analyzed By: AG

Prepared By: AG

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.04	mg/Kg	1	2.00	102	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			2.02	mg/Kg	1	2.00	101	70.6 - 179

Sample: 278848 - CS-2 Bottom Hole 3' (AH-5)

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 85495

Prep Batch: 72450

Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-10-11

Sample Preparation: 2011-10-06

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			522	mg/Kg	50	4.00

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Sample: 278848 - CS-2 Bottom Hole 3' (AH-5)

Laboratory:	Midland		
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D
QC Batch:	85330	Date Analyzed:	2011-10-05
Prep Batch:	72444	Sample Preparation:	2011-10-05
		Prep Method:	N/A
		Analyzed By:	kg
		Prepared By:	kg

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			80.7	mg/Kg	1	100	81	67.5 - 147.1

Sample: 278848 - CS-2 Bottom Hole 3' (AH-5)

Laboratory:	Midland		
Analysis:	TPH GRO	Analytical Method:	S 8015 D
QC Batch:	85323	Date Analyzed:	2011-10-04
Prep Batch:	72438	Sample Preparation:	2011-10-04
		Prep Method:	S 5035
		Analyzed By:	AG
		Prepared By:	AG

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Qs	1	7.82	mg/Kg	1	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.87	mg/Kg	1	2.00	94	30 - 134.6
4-Bromofluorobenzene (4-BFB)			1.98	mg/Kg	1	2.00	99	22.4 - 149

Sample: 278849 - CS-3 Bottom Hole 2' (AH-1)

Laboratory:	Midland		
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B
QC Batch:	85495	Date Analyzed:	2011-10-11
Prep Batch:	72450	Sample Preparation:	2011-10-06
		Prep Method:	N/A
		Analyzed By:	AR
		Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			393	mg/Kg	50	4.00

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Sample: 278850 - CS-4 Sidewall

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-10-11	Analyzed By:	AR
QC Batch:	85495	Sample Preparation:	2011-10-06	Prepared By:	AR
Prep Batch:	72450				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<200	mg/Kg	50	4.00

Sample: 278851 - CS-5 Sidewall

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-10-11	Analyzed By:	AR
QC Batch:	85495	Sample Preparation:	2011-10-06	Prepared By:	AR
Prep Batch:	72450				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			269	mg/Kg	50	4.00

Sample: 278852 - CS-6 Sidewall

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-10-11	Analyzed By:	AR
QC Batch:	85495	Sample Preparation:	2011-10-06	Prepared By:	AR
Prep Batch:	72450				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1250	mg/Kg	100	4.00

Sample: 278853 - CS-7 Sidewall

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2011-10-11	Analyzed By:	AR
QC Batch:	85495	Sample Preparation:	2011-10-06	Prepared By:	AR
Prep Batch:	72450				

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<200	mg/Kg	50	4.00

Sample: 278854 - CS-8 Sidewall

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 85495 Date Analyzed: 2011-10-11 Analyzed By: AR
Prep Batch: 72450 Sample Preparation: 2011-10-06 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			781	mg/Kg	50	4.00

Sample: 278855 - CS-9 Sidewall

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 85495 Date Analyzed: 2011-10-11 Analyzed By: AR
Prep Batch: 72450 Sample Preparation: 2011-10-06 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			467	mg/Kg	50	4.00

Sample: 278856 - CS-10 Sidewall

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 85495 Date Analyzed: 2011-10-11 Analyzed By: AR
Prep Batch: 72450 Sample Preparation: 2011-10-06 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			278	mg/Kg	50	4.00

Report Date: October 13, 2011
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Sample: 278858 - CS-12 Sidewall

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 85495 Date Analyzed: 2011-10-11 Analyzed By: AR
Prep Batch: 72450 Sample Preparation: 2011-10-06 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			985	mg/Kg	100	4.00

Sample: 278859 - CS-13 Sidewall

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 85496 Date Analyzed: 2011-10-11 Analyzed By: AR
Prep Batch: 72450 Sample Preparation: 2011-10-06 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<200	mg/Kg	50	4.00

Sample: 278860 - Trench-1 @ 3' (AH-1)

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 85496 Date Analyzed: 2011-10-11 Analyzed By: AR
Prep Batch: 72450 Sample Preparation: 2011-10-06 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1710	mg/Kg	100	4.00

Sample: 278861 - Trench-1 @ 4' (AH-1)

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 85496 Date Analyzed: 2011-10-11 Analyzed By: AR
Prep Batch: 72450 Sample Preparation: 2011-10-06 Prepared By: AR

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1350	mg/Kg	100	4.00

Sample: 278862 - Trench-1 @ 5' (AH-1)

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 85496

Prep Batch: 72450

Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-10-11

Sample Preparation: 2011-10-06

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			248	mg/Kg	50	4.00

Method Blanks

Method Blank (1) QC Batch: 85322

QC Batch: 85322
Prep Batch: 72438

Date Analyzed: 2011-10-04
QC Preparation: 2011-10-04

Analyzed By: AG
Prepared By: AG

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1	<0.0118	mg/Kg	0.02
Toluene		1	<0.00600	mg/Kg	0.02
Ethylbenzene		1	<0.00850	mg/Kg	0.02
Xylene		1	<0.00613	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.97	mg/Kg	1	2.00	98	65.9 - 111.8
4-Bromofluorobenzene (4-BFB)			1.60	mg/Kg	1	2.00	80	48.4 - 123.1

Method Blank (1) QC Batch: 85323

QC Batch: 85323
Prep Batch: 72438

Date Analyzed: 2011-10-04
QC Preparation: 2011-10-04

Analyzed By: AG
Prepared By: AG

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		1	0.881	mg/Kg	2

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.82	mg/Kg	1	2.00	91	67.6 - 150
4-Bromofluorobenzene (4-BFB)			1.53	mg/Kg	1	2.00	76	52.4 - 130

Method Blank (1) QC Batch: 85330

QC Batch: 85330
Prep Batch: 72444

Date Analyzed: 2011-10-05
QC Preparation: 2011-10-05

Analyzed By: kg
Prepared By: kg

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Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1	<14.5	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			82.2	mg/Kg	1	100	82	52.7 - 133.8

Method Blank (1) QC Batch: 85495

QC Batch: 85495
Prep Batch: 72450

Date Analyzed: 2011-10-11
QC Preparation: 2011-10-06

Analyzed By: AR
Prepared By: AR

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

Method Blank (1) QC Batch: 85496

QC Batch: 85496
Prep Batch: 72450

Date Analyzed: 2011-10-11
QC Preparation: 2011-10-06

Analyzed By: AR
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: 85322
Prep Batch: 72438

Date Analyzed: 2011-10-04
QC Preparation: 2011-10-04

Analyzed By: AG
Prepared By: AG

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.58	mg/Kg	1	2.00	<0.0118	79	77.4 - 121.7
Toluene		1	1.90	mg/Kg	1	2.00	<0.00600	95	88.6 - 121.6
Ethylbenzene		1	2.03	mg/Kg	1	2.00	<0.00850	102	74.3 - 117.9
Xylene		1	6.14	mg/Kg	1	6.00	<0.00613	102	73.4 - 118.8

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

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	1.61	mg/Kg	1	2.00	<0.0118	80	77.4 - 121.7	2	20
Toluene		1	1.94	mg/Kg	1	2.00	<0.00600	97	88.6 - 121.6	2	20
Ethylbenzene		1	2.10	mg/Kg	1	2.00	<0.00850	105	74.3 - 117.9	3	20
Xylene		1	6.28	mg/Kg	1	6.00	<0.00613	105	73.4 - 118.8	2	20

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

Surrogate	LCS Result	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.94	2.01	mg/Kg	1	2.00	97	100	65.5 - 116.7
4-Bromofluorobenzene (4-BFB)	1.84	1.84	mg/Kg	1	2.00	92	92	56.2 - 132.1

Laboratory Control Spike (LCS-1)

QC Batch: 85323
Prep Batch: 72438

Date Analyzed: 2011-10-04
QC Preparation: 2011-10-04

Analyzed By: AG
Prepared By: AG

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	16.6	mg/Kg	1	20.0	<0.753	83	60.9 - 95.4

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

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control spikes continued ...

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	17.2	mg/Kg	1	20.0	<0.753	86	60.9 - 95.4	4	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)	1.88	1.88	mg/Kg	1	2.00	94	94	61.9 - 142
4-Bromofluorobenzene (4-BFB)	1.73	1.73	mg/Kg	1	2.00	86	86	56.2 - 132

Laboratory Control Spike (LCS-1)

QC Batch: 85330
Prep Batch: 72444

Date Analyzed: 2011-10-05
QC Preparation: 2011-10-05

Analyzed By: kg
Prepared By: kg

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	252	mg/Kg	1	250	<14.5	101	64.5 - 146.9

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
DRO		1	242	mg/Kg	1	250	<14.5	97	64.5 - 146.9	4	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	100	99.5	mg/Kg	1	100	100	100	65.3 - 135.8

Laboratory Control Spike (LCS-1)

QC Batch: 85495
Prep Batch: 72450

Date Analyzed: 2011-10-11
QC Preparation: 2011-10-06

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			94.4	mg/Kg	1	100	<3.85	94	85 - 115

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

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			104	mg/Kg	1	100	<3.85	104	85 - 115	10	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: 85496
Prep Batch: 72450

Date Analyzed: 2011-10-11
QC Preparation: 2011-10-06

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			95.0	mg/Kg	1	100	<3.85	95	85 - 115

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

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			102	mg/Kg	1	100	<3.85	102	85 - 115	7	20

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

Matrix Spike (MS-1) Spiked Sample: 278972

QC Batch: 85322
Prep Batch: 72438

Date Analyzed: 2011-10-04
QC Preparation: 2011-10-04

Analyzed By: AG
Prepared By: AG

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.62	mg/Kg	1	2.00	<0.0118	81	69.4 - 123.6
Toluene		1	2.16	mg/Kg	1	2.00	<0.00600	108	75.4 - 134.3
Ethylbenzene		1	2.42	mg/Kg	1	2.00	<0.00850	121	58.8 - 133.7
Xylene		1	7.29	mg/Kg	1	6.00	<0.00613	122	57 - 134.2

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	1.68	mg/Kg	1	2.00	<0.0118	84	69.4 - 123.6	4	20
Toluene		1	2.09	mg/Kg	1	2.00	<0.00600	104	75.4 - 134.3	3	20
Ethylbenzene		1	2.41	mg/Kg	1	2.00	<0.00850	120	58.8 - 133.7	0	20
Xylene		1	7.23	mg/Kg	1	6.00	<0.00613	120	57 - 134.2	1	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.99	2.02	mg/Kg	1	2	100	101	79.4 - 141.1
4-Bromofluorobenzene (4-BFB)	1.99	2.01	mg/Kg	1	2	100	100	71 - 167

Matrix Spike (MS-1) Spiked Sample: 278847

QC Batch: 85323
Prep Batch: 72438

Date Analyzed: 2011-10-04
QC Preparation: 2011-10-04

Analyzed By: AG
Prepared By: AG

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	Qs	1	25.1	mg/Kg	1	20.0	1.6123	117	61.8 - 114

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	24.2	mg/Kg	1	20.0	1.6123	113	61.8 - 114	4	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)	1.85	1.86	mg/Kg	1	2	92	93	29.4 - 161.7
4-Bromofluorobenzene (4-BFB)	1.95	1.98	mg/Kg	1	2	98	99	37.3 - 162

Matrix Spike (MS-1) Spiked Sample: 278971

QC Batch: 85330
Prep Batch: 72444

Date Analyzed: 2011-10-05
QC Preparation: 2011-10-05

Analyzed By: kg
Prepared By: kg

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	195	mg/Kg	1	250	<14.5	78	38.8 - 153.3

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	195	mg/Kg	1	250	<14.5	78	38.8 - 153.3	0	20

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

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Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane	80.9	79.3	mg/Kg	1	100	81	79	54.6 - 149.8

Matrix Spike (MS-1) Spiked Sample: 278858

QC Batch: 85495
Prep Batch: 72450

Date Analyzed: 2011-10-11
QC Preparation: 2011-10-06

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			10600	mg/Kg	100	10000	985	96	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			11000	mg/Kg	100	10000	985	100	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: 279035

QC Batch: 85496
Prep Batch: 72450

Date Analyzed: 2011-10-11
QC Preparation: 2011-10-06

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			11400	mg/Kg	100	10000	1460	99	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			12000	mg/Kg	100	10000	1460	105	79.4 - 120.6	5	20

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

Calibration Standards

Standard (CCV-1)

QC Batch: 85322

Date Analyzed: 2011-10-04

Analyzed By: AG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/Kg	0.100	0.0803	80	80 - 120	2011-10-04
Toluene		1	mg/Kg	0.100	0.0963	96	80 - 120	2011-10-04
Ethylbenzene		1	mg/Kg	0.100	0.103	103	80 - 120	2011-10-04
Xylene		1	mg/Kg	0.300	0.307	102	80 - 120	2011-10-04

Standard (CCV-2)

QC Batch: 85322

Date Analyzed: 2011-10-04

Analyzed By: AG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/Kg	0.100	0.0829	83	80 - 120	2011-10-04
Toluene		1	mg/Kg	0.100	0.101	101	80 - 120	2011-10-04
Ethylbenzene		1	mg/Kg	0.100	0.108	108	80 - 120	2011-10-04
Xylene		1	mg/Kg	0.300	0.321	107	80 - 120	2011-10-04

Standard (CCV-1)

QC Batch: 85323

Date Analyzed: 2011-10-04

Analyzed By: AG

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	2011-10-04

Standard (CCV-2)

QC Batch: 85323

Date Analyzed: 2011-10-04

Analyzed By: AG

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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.02	102	80 - 120	2011-10-04

Standard (CCV-2)

QC Batch: 85330 Date Analyzed: 2011-10-05 Analyzed By: kg

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	237	95	80 - 120	2011-10-05

Standard (CCV-3)

QC Batch: 85330 Date Analyzed: 2011-10-05 Analyzed By: kg

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	218	87	80 - 120	2011-10-05

Standard (ICV-1)

QC Batch: 85495 Date Analyzed: 2011-10-11 Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	102	102	85 - 115	2011-10-11

Standard (CCV-1)

QC Batch: 85495 Date Analyzed: 2011-10-11 Analyzed By: AR

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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	97.7	98	85 - 115	2011-10-11

Standard (ICV-1)

QC Batch: 85496

Date Analyzed: 2011-10-11

Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.3	99	85 - 115	2011-10-11

Standard (CCV-1)

QC Batch: 85496

Date Analyzed: 2011-10-11

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	2011-10-11

Appendix

Laboratory Certifications

	Certifying C Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704392-10-TX	Midland

Standard Flags

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

Attachments

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

