

SITE INFORMATION

Report Type: Closure Report

General Site Information:

Site:	Parkway 36 State #001	
Company:	SM Energy Company	
Section, Township and Range	Section 36, T19S, R29E	Unit Letter - F
Lease Number:		
County:	Eddy County	
GPS:	32.61872° N, 104.03101° W	
Surface Owner:	State	
Mineral Owner:		
Directions:	From the intersection of Hwy 360 and Co Rd 235, follow Co Rd 235 approximately 4.75 miles to the NW. Turn south on caliche road and go approximately 1.1 miles. Site is on the west side of the road.	

Release Data:

Date Released:	8/9/2011
Type Release:	Produced Water
Source of Contamination:	Unknow and unauthorized transport truck
Fluid Released:	125 bbls
Fluids Recovered:	0 bbls

Official Communication:

Name:	Chad McNeely	Aaron Hale
Company:	SM Energy Company	Tetra Tech
Address:	3300 N A St # 7-200	1910 N. Big Spring
P.O. Box		
City:	Midland, Texas	Midland, Texas
Phone number:	(432) 688-3124	(432) 682-4559
Fax:		
Email:	cmcneely@sm-energy.com	aaron.hale@tetrattech.com

Ranking Criteria

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	0
Wellhead Protection:	Ranking Score	Site Data
Water Source <1,000 ft., Private <200 ft.	20	
Water Source >1,000 ft., Private >200 ft.	0	0
Surface Body of Water:	Ranking Score	Site Data
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
Total Ranking Score:		0

Acceptable Soil RRAL (mg/kg)

Benzene	Total BTEX	TPH
10	50	5,000



TETRA TECH

RECEIVED

MAR 20 2012

NMOCD ARTESIA

February 16, 2012

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

**Re: Closure for the SM Energy Company
Parkway Delaware Unit 36 State #001
Unit F, Section 36, Township 19 South, Range 29 East
Eddy County, New Mexico**

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by SM Energy Company (SM Energy) to assess an unauthorized produced water release at the Parkway Delaware Unit 36 State #001 located in Unit F, Section 36, Township 19 South, Range 29 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.61872°, W 104.03101°. 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 August 9, 2011. Approximately 125 barrels of produced water were released into the pasture from an unknown and unauthorized transport truck. No barrels of produced water were recovered. The initial C-141 is enclosed in Appendix A.

Hydrology

The New Mexico Office of the State Engineers (OSE) Website listed two water wells within a half mile of the site. These wells (identified by the OSE as CP 00742 and CP 00703) had reported depths to water at 115 feet below ground surface (bgs).

The New Mexico Oil Conservation Division (OCD) regional groundwater gradient map for Eddy County shows the depth to groundwater in this section at approximately 100 feet.

Tetra Tech

1910 North Big Spring, Midland, TX 79705

Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com



According to the Geology and Ground-Water Resources of Eddy County, New Mexico (Report 3), the Rustler Formation is present in most of the area east of the Pecos River. The Rustler Formation consists of anhydrite, gypsum, interbedded sandy clays and shales, and irregular beds of dolomite.

Regulatory

A risk-based evaluation was performed for the Site in accordance with the OCD 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 Results

On August 17, 2011, Tetra Tech personnel collected soils samples up to 2.5 feet bgs (Figure 3), utilizing a hand auger at five locations within the spill area (identified as AH-1, AH-2, AH-3, AH-4 and AH-5). The spill area was estimated to cover approximately 7,938 square feet. Soil sampling stopped in each location when auger refusal occurred. Soil samples were submitted for laboratory analysis of TPH by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by SM method 4500. The results of the sampling are summarized in Table 1. The laboratory analytical data indicated that chloride impact was limited to the upper 1.0 foot to 1.5 foot of soil. BTEX and TPH concentrations were not detected at the surface level.

All sample locations had chloride concentrations that decreased with depth. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix B.

Remediation and Closure Activities

On October 19, 2011, Tetra Tech personnel supervised the removal of impacted material as discussed in the work plan. The areas of AH-1 through AH-5 were excavated to a depth of 0-1.5' bgs (Figure 4). Approximately 300 cubic yards of impacted soil were transported offsite for disposal at Lea Land, Inc. of Hobbs, New Mexico. Based on the results, the excavation has been backfilled with clean material to surface grade and seeded with a BLM #3 mix.



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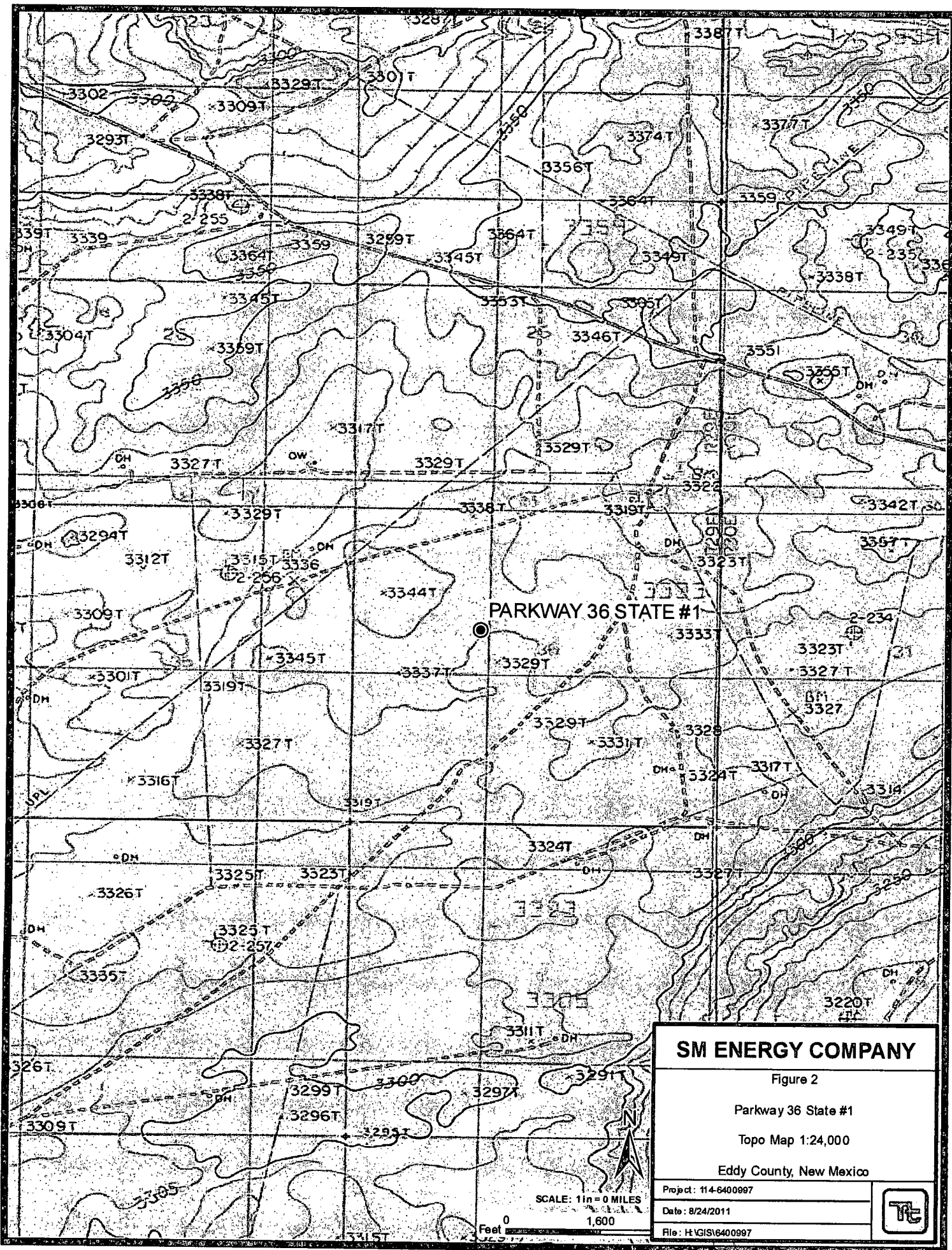
Based on the results, SM Energy requests closure of the site. The C-141 (Final) is included in Appendix C. If you have any questions or comments concerning the assessment or the remediation activities performed at the site, please call me at (432) 682-4559.

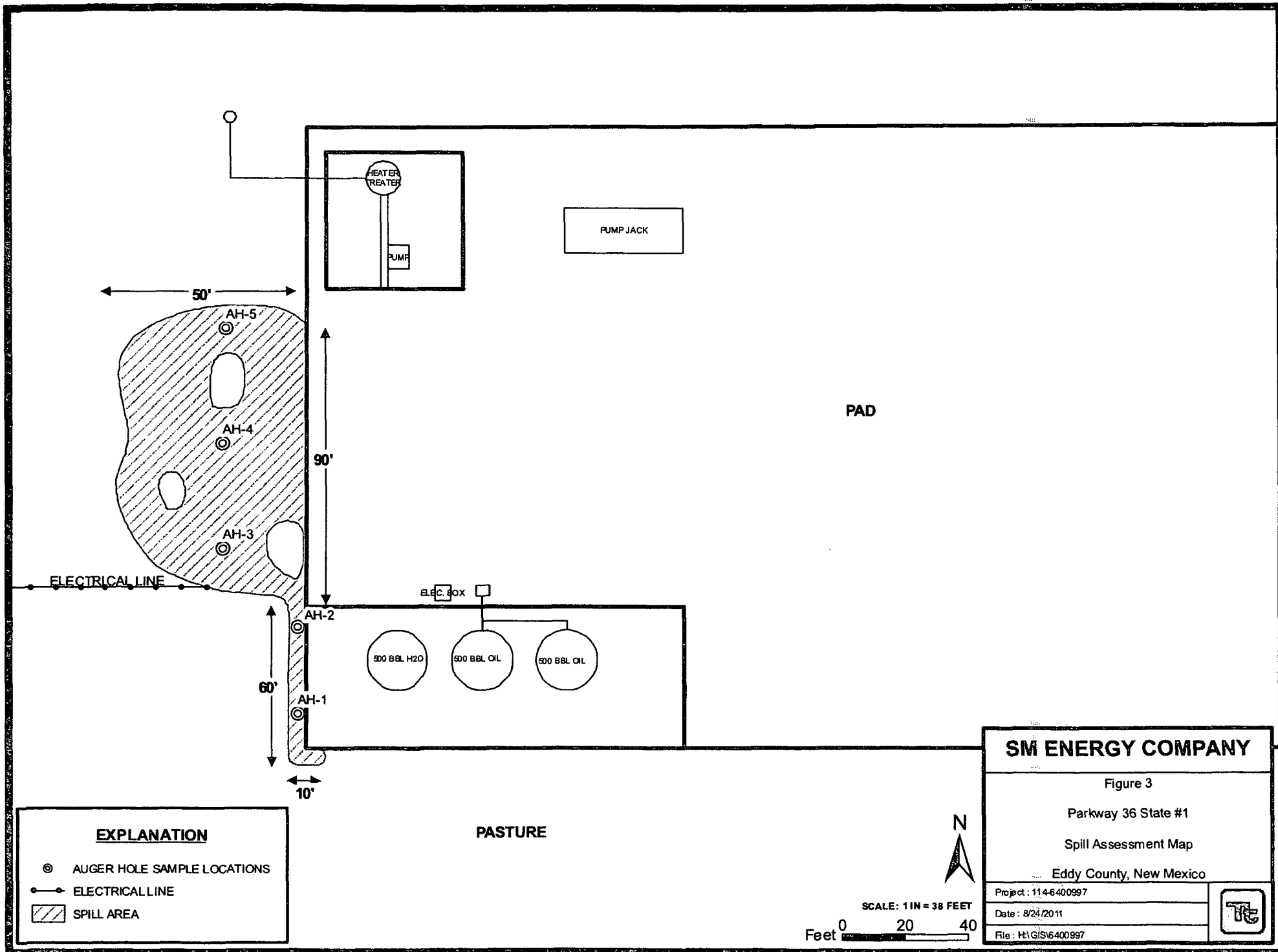
Respectfully submitted,
TETRA TECH, INC.

Aaron Hale
Senior Project Manager

cc: Chad McNeely – SM Energy Company
Don Riggs – SM Energy Company
Mark Bondy – SM Energy Company

FIGURES





TABLES

Table 1
SM Energy
PDU 36 State #001
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
AH-1	8/17/2011	0-1'		X	<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	4,870
	"	1-1.5'		X	-	-	-	-	-	-	-	-	217
	"	2-2.5'	X		-	-	-	-	-	-	-	-	<200
AH-2	8/17/2011	0-1'		X	<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	4,020
	"	1-1.5'		X	-	-	-	-	-	-	-	-	<200
	"	1.5-2'	X		-	-	-	-	-	-	-	-	216
AH-3	8/17/2011	0-1'		X	<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	10,200
	"	1-1.5'		X	-	-	-	-	-	-	-	-	<200
	"	2-2.5'	X		-	-	-	-	-	-	-	-	<200
AH-4	8/17/2011	0-1'		X	<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	4,360
	"	1-1.5'		X	-	-	-	-	-	-	-	-	8,980
	"	2-2.5'	X		-	-	-	-	-	-	-	-	<200
AH-5	8/17/2011	0-1'		X	<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	5,850
	"	1-1.5'		X	-	-	-	-	-	-	-	-	<200
	"	2-2.5'	X		-	-	-	-	-	-	-	-	<200

(--) Not Analyzed

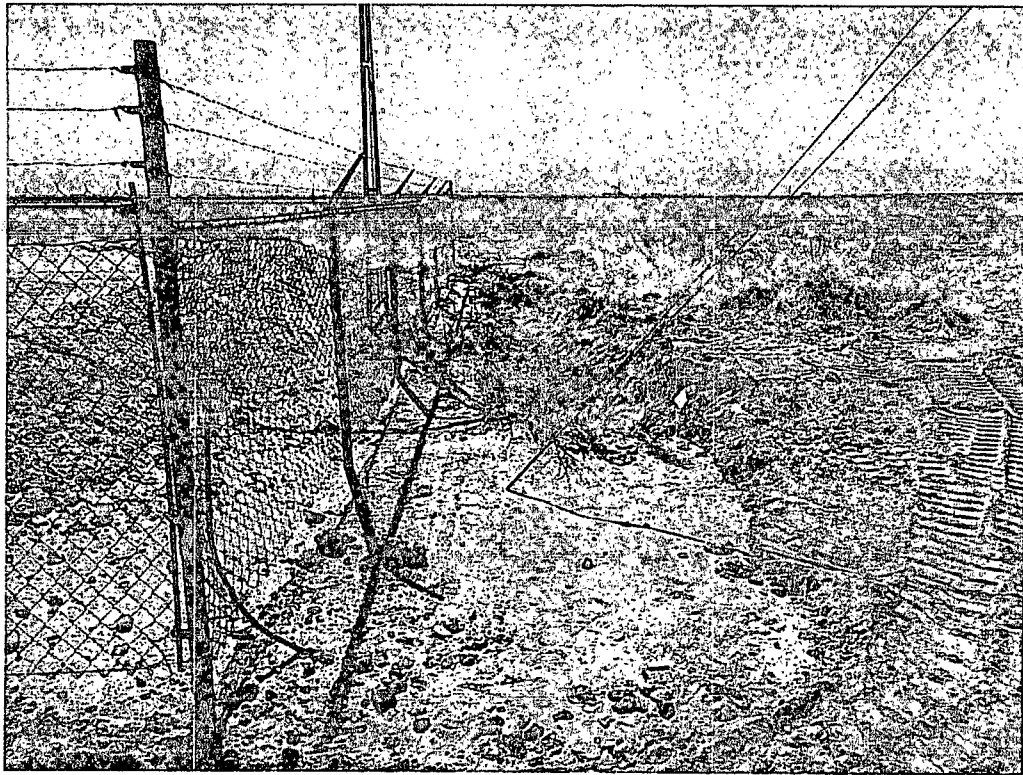
☐ Excavated Depths

PHOTOGRAPHS

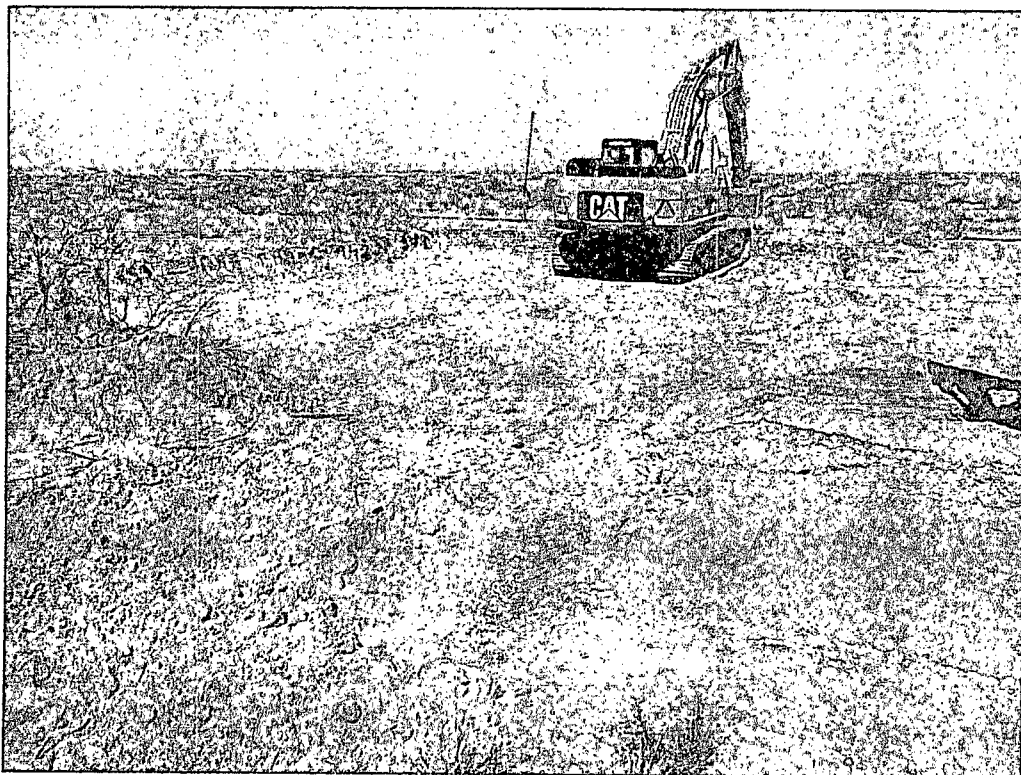
SM Energy Company
Parkway 36 State #001
Eddy County, New Mexico



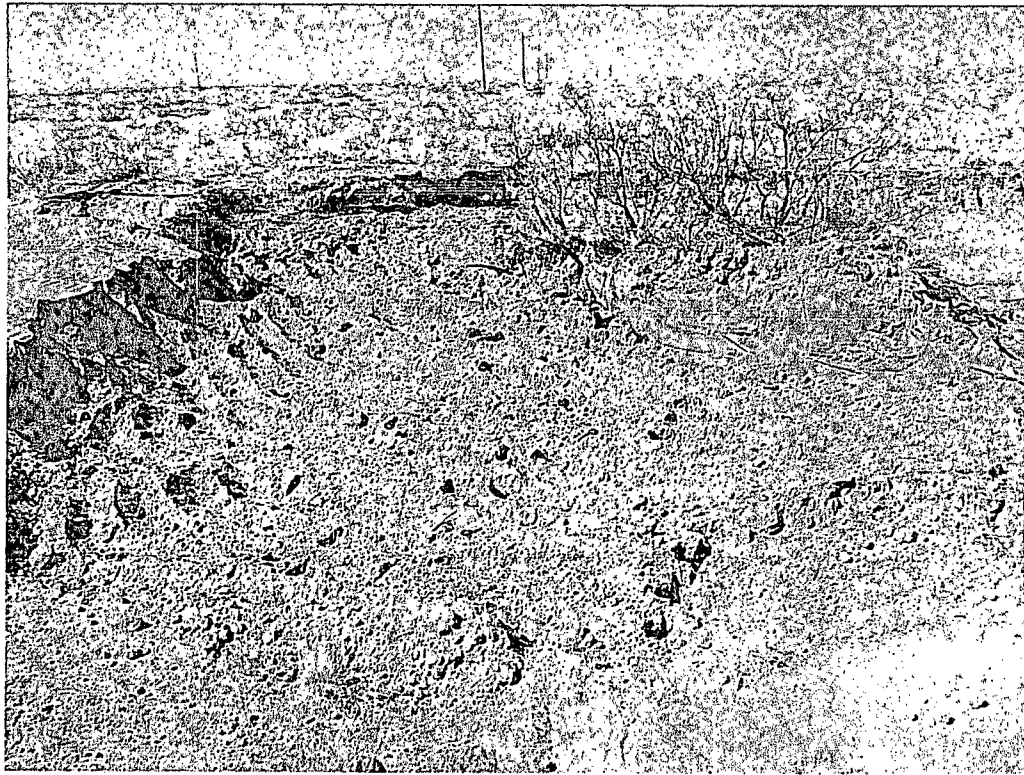
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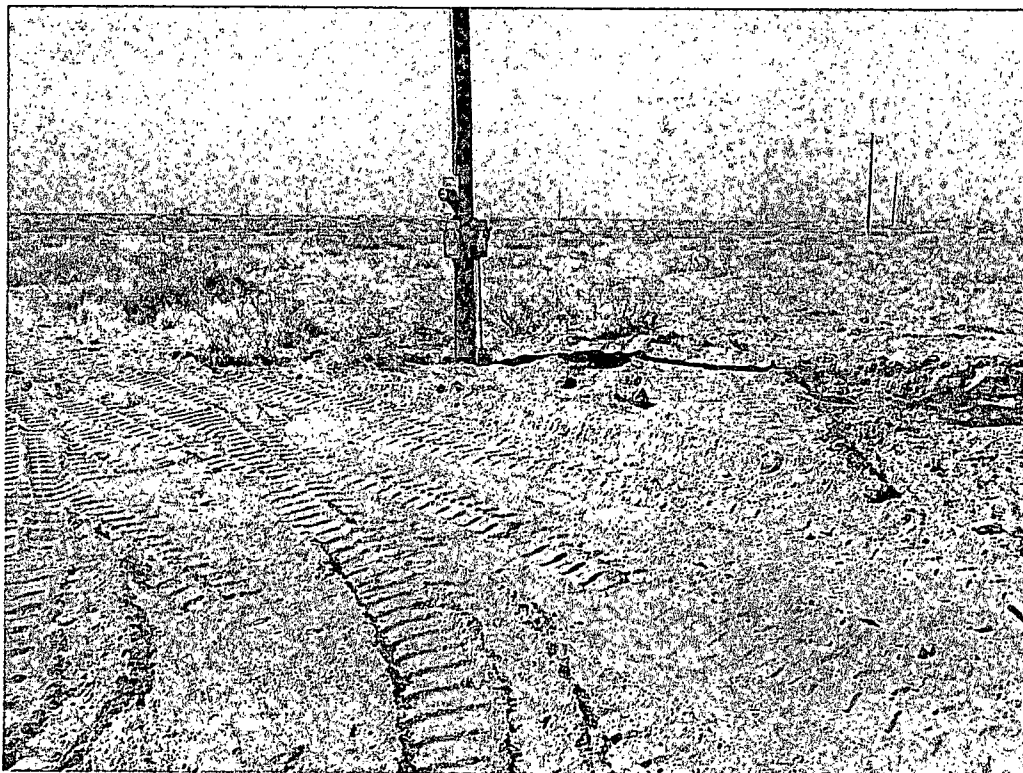
View South – AH-1 and AH-2



View North West – AH-4 and AH-5



View West – AH-3



View West - Electrical

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 SM Energy Company	Contact Vickie Martinez
Address 3300 N "A" St Bldg. 7-200 Midland, Tx 79705	Telephone No. (432) 688-1709
Facility Name Parkway 36 State #001	Facility Type Tank Battery

Surface Owner: Commissioner of Public Lands	Mineral Owner: Commissioner of Public Lands	Lease No. 30-015-26112
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LOCATION OF RELEASE

Unit Letter F	Section 36	Township 19S	Range 29E	Feet from the	North/South Line	Feet from the	East/West Line	County Eddy
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Latitude N 32.61872° Longitude W 104.03101°

NATURE OF RELEASE


Type of Release: Produced Water	Volume of Release 125 bbls	Volume Recovered 0 bbls
Source of Release: Unknown	Date and Hour of Occurrence 08/09/2011	Date and Hour of Discovery 08/09/2011
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Mike Bratcher	
By Whom? Bill Hearne	Date and Hour 08/09/2011 1:58 p.m.	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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.*
Sometime between 08/08/2011 and 08/09/2011 an unknown water transport truck backed up to location and dumped a load in the pasture near SM Energy's Parkway 36 State #001

Describe Area Affected and Cleanup Action Taken.*
Tetra Tech inspected site and collected samples to define spills extent. Soil that exceeded RRAL was removed and hauled away for proper disposal. Site was then brought up to surface grade with clean backfill material. Tetra Tech prepared closure report and submitted to NMOCD for review.

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

Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Aaron Hale (Agent for SM Energy)	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: aaron.hale@tetrattech.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date:	Phone: (432) 682-4559	

* Attach Additional Sheets If Necessary

APPENDIX B

Summary Report

Aaron Hale
Tetra Tech
1910 N. Big Spring Street
Midland, TX 79705

Report Date: August 24, 2011

Work Order: 11081826



Project Location: Eddy Co., NM
Project Name: SM Energy/PDU 36 State #001
Project Number: 114-6400997

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
274908	AH-1 0-1'	soil	2011-08-17	00:00	2011-08-18
274909	AH-1 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274910	AH-1 2-2.5'	soil	2011-08-17	00:00	2011-08-18
274911	AH-2 0-1'	soil	2011-08-17	00:00	2011-08-18
274912	AH-2 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274913	AH-2 1.5-2'	soil	2011-08-17	00:00	2011-08-18
274914	AH-3 0-1'	soil	2011-08-17	00:00	2011-08-18
274915	AH-3 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274916	AH-3 2-2.5'	soil	2011-08-17	00:00	2011-08-18
274917	AH-4 0-1'	soil	2011-08-17	00:00	2011-08-18
274918	AH-4 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274919	AH-4 2-2.5'	soil	2011-08-17	00:00	2011-08-18
274920	AH-5 0-1'	soil	2011-08-17	00:00	2011-08-18
274921	AH-5 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274922	AH-5 2-2.5'	soil	2011-08-17	00:00	2011-08-18

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)
274908 - AH-1 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00
274911 - AH-2 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00
274914 - AH-3 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00
274917 - AH-4 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00
274920 - AH-5 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00

Sample: 274908 - AH-1 0-1'

continued ...

sample 274908 continued ...

Param	Flag	Result	Units	RL
Param	Flag	Result	Units	RL
Chloride		4870	mg/Kg	4

Sample: 274909 - AH-1 1-1.5'

Param	Flag	Result	Units	RL
Chloride		217	mg/Kg	4

Sample: 274910 - AH-1 2-2.5'

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

Sample: 274911 - AH-2 0-1'

Param	Flag	Result	Units	RL
Chloride		4020	mg/Kg	4

Sample: 274912 - AH-2 1-1.5'

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

Sample: 274913 - AH-2 1.5-2'

Param	Flag	Result	Units	RL
Chloride		216	mg/Kg	4

Sample: 274914 - AH-3 0-1'

Param	Flag	Result	Units	RL
Chloride		10200	mg/Kg	4

Sample: 274915 - AH-3 1-1.5'

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

Sample: 274916 - AH-3 2-2.5'

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

Sample: 274917 - AH-4 0-1'

Param	Flag	Result	Units	RL
Chloride		4360	mg/Kg	4

Sample: 274918 - AH-4 1-1.5'

Param	Flag	Result	Units	RL
Chloride		8980	mg/Kg	4

Sample: 274919 - AH-4 2-2.5'

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

Sample: 274920 - AH-5 0-1'

Param	Flag	Result	Units	RL
Chloride		5850	mg/Kg	4

Sample: 274921 - AH-5 1-1.5'

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

Sample: 274922 - AH-5 2-2.5'

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



6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1296
200 East Sunset Road, Suite E El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432•689•6301 FAX 432•689•6313
6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132 817•201•5260
E-Mail: lab@traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Aaron Hale
Tetra Tech
1910 N. Big Spring Street
Midland, TX, 79705

Report Date: August 24, 2011

Work Order: 11081826



Project Location: Eddy Co., NM
Project Name: SM Energy/PDU 36 State #001
Project Number: 114-6400997

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
274908	AH-1 0-1'	soil	2011-08-17	00:00	2011-08-18
274909	AH-1 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274910	AH-1 2-2.5'	soil	2011-08-17	00:00	2011-08-18
274911	AH-2 0-1'	soil	2011-08-17	00:00	2011-08-18
274912	AH-2 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274913	AH-2 1.5-2'	soil	2011-08-17	00:00	2011-08-18
274914	AH-3 0-1'	soil	2011-08-17	00:00	2011-08-18
274915	AH-3 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274916	AH-3 2-2.5'	soil	2011-08-17	00:00	2011-08-18
274917	AH-4 0-1'	soil	2011-08-17	00:00	2011-08-18
274918	AH-4 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274919	AH-4 2-2.5'	soil	2011-08-17	00:00	2011-08-18
274920	AH-5 0-1'	soil	2011-08-17	00:00	2011-08-18
274921	AH-5 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274922	AH-5 2-2.5'	soil	2011-08-17	00:00	2011-08-18

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 27 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

A handwritten signature in black ink, appearing to read "Michael Abel". The signature is written in a cursive, slightly slanted style.

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

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Sample 274912 (AH-2 1-1.5')	9
Sample 274913 (AH-2 1.5-2')	9
Sample 274914 (AH-3 0-1')	10
Sample 274915 (AH-3 1-1.5')	11
Sample 274916 (AH-3 2-2.5')	11
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Case Narrative

Samples for project SM Energy/PDU 36 State #001 were received by TraceAnalysis, Inc. on 2011-08-18 and assigned to work order 11081826. Samples for work order 11081826 were received intact at a temperature of 3.4 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	71411	2011-08-19 at 10:58	84101	2011-08-19 at 10:58
Chloride (Titration)	SM 4500-Cl B	71416	2011-08-19 at 15:42	84136	2011-08-22 at 16:26
Chloride (Titration)	SM 4500-Cl B	71416	2011-08-19 at 15:42	84205	2011-08-24 at 12:20
TPH DRO - NEW	S 8015 D	71417	2011-08-19 at 09:19	84108	2011-08-19 at 09:19
TPH GRO	S 8015 D	71411	2011-08-19 at 10:58	84102	2011-08-19 at 10:58

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 11081826 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.

Report Date: August 24, 2011
114-6400997

Work Order: 11081826
SM Energy/PDU 36 State #001

Page Number: 6 of 27
Eddy Co., NM

Analytical Report

Sample: 274908 - AH-1 0-1'

Laboratory: Midland

Analysis: BTEX

QC Batch: 84101

Prep Batch: 71411

Analytical Method: S 8021B

Date Analyzed: 2011-08-19

Sample Preparation: 2011-08-19

Prep Method: S 5035

Analyzed By: ME

Prepared By: ME

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)			2.79	mg/Kg	1	2.00	140	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			2.53	mg/Kg	1	2.00	126	70.6 - 179

Sample: 274908 - AH-1 0-1'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 84136

Prep Batch: 71416

Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-08-22

Sample Preparation: 2011-08-19

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			4870	mg/Kg	100	4.00

Sample: 274908 - AH-1 0-1'

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 84108

Prep Batch: 71417

Analytical Method: S 8015 D

Date Analyzed: 2011-08-19

Sample Preparation: 2011-08-19

Prep Method: N/A

Analyzed By: kg

Prepared By: kg

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

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Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			86.1	mg/Kg	1	100	86	67.5 - 147.1

Sample: 274908 - AH-1 0-1'

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 84102
Prep Batch: 71411

Analytical Method: S 8015 D
Date Analyzed: 2011-08-19
Sample Preparation: 2011-08-19

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.47	mg/Kg	1	2.00	124	30 - 134.6
4-Bromofluorobenzene (4-BFB)			2.14	mg/Kg	1	2.00	107	22.4 - 149

Sample: 274909 - AH-1 1-1.5'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 84136
Prep Batch: 71416

Analytical Method: SM 4500-Cl B
Date Analyzed: 2011-08-22
Sample Preparation: 2011-08-19

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			217	mg/Kg	50	4.00

Sample: 274910 - AH-1 2-2.5'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 84136
Prep Batch: 71416

Analytical Method: SM 4500-Cl B
Date Analyzed: 2011-08-22
Sample Preparation: 2011-08-19

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

continued ...

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sample 274910 continued ...

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

Sample: 274911 - AH-2 0-1'

Laboratory: Midland

Analysis: BTEX

QC Batch: 84101

Prep Batch: 71411

Analytical Method: S 8021B

Date Analyzed: 2011-08-19

Sample Preparation: 2011-08-19

Prep Method: S 5035

Analyzed By: ME

Prepared By: ME

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)			2.74	mg/Kg	1	2.00	137	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			2.50	mg/Kg	1	2.00	125	70.6 - 179

Sample: 274911 - AH-2 0-1'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 84136

Prep Batch: 71416

Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-08-22

Sample Preparation: 2011-08-19

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			4020	mg/Kg	100	4.00

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Sample: 274911 - AH-2 0-1'

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 84108 Date Analyzed: 2011-08-19 Analyzed By: kg
Prep Batch: 71417 Sample Preparation: 2011-08-19 Prepared By: kg

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			91.4	mg/Kg	1	100	91	67.5 - 147.1

Sample: 274911 - AH-2 0-1'

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 84102 Date Analyzed: 2011-08-19 Analyzed By: ME
Prep Batch: 71411 Sample Preparation: 2011-08-19 Prepared By: ME

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.40	mg/Kg	1	2.00	120	30 - 134.6
4-Bromofluorobenzene (4-BFB)			2.10	mg/Kg	1	2.00	105	22.4 - 149

Sample: 274912 - AH-2 1-1.5'

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 84136 Date Analyzed: 2011-08-22 Analyzed By: AR
Prep Batch: 71416 Sample Preparation: 2011-08-19 Prepared By: AR

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

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Sample: 274913 - AH-2 1.5-2'

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 84205 Date Analyzed: 2011-08-24 Analyzed By: AR
Prep Batch: 71416 Sample Preparation: 2011-08-19 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			216	mg/Kg	50	4.00

Sample: 274914 - AH-3 0-1'

Laboratory: Midland
Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
QC Batch: 84101 Date Analyzed: 2011-08-19 Analyzed By: ME
Prep Batch: 71411 Sample Preparation: 2011-08-19 Prepared By: ME

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)			2.74	mg/Kg	1	2.00	137	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			2.51	mg/Kg	1	2.00	126	70.6 - 179

Sample: 274914 - AH-3 0-1'

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 84205 Date Analyzed: 2011-08-24 Analyzed By: AR
Prep Batch: 71416 Sample Preparation: 2011-08-19 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			10200	mg/Kg	100	4.00

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Sample: 274914 - AH-3 0-1'

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 84108

Prep Batch: 71417

Analytical Method: S 8015 D

Date Analyzed: 2011-08-19

Sample Preparation: 2011-08-19

Prep Method: N/A

Analyzed By: kg

Prepared By: kg

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			87.2	mg/Kg	1	100	87	67.5 - 147.1

Sample: 274914 - AH-3 0-1'

Laboratory: Midland

Analysis: TPH GRO

QC Batch: 84102

Prep Batch: 71411

Analytical Method: S 8015 D

Date Analyzed: 2011-08-19

Sample Preparation: 2011-08-19

Prep Method: S 5035

Analyzed By: ME

Prepared By: ME

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.42	mg/Kg	1	2.00	121	30 - 134.6
4-Bromofluorobenzene (4-BFB)			2.10	mg/Kg	1	2.00	105	22.4 - 149

Sample: 274915 - AH-3 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 84205

Prep Batch: 71416

Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-08-24

Sample Preparation: 2011-08-19

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

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

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Sample: 274916 - AH-3 2-2.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 84205

Prep Batch: 71416

Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-08-24

Sample Preparation: 2011-08-19

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

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

Sample: 274917 - AH-4 0-1'

Laboratory: Midland

Analysis: BTEX

QC Batch: 84101

Prep Batch: 71411

Analytical Method: S 8021B

Date Analyzed: 2011-08-19

Sample Preparation: 2011-08-19

Prep Method: S 5035

Analyzed By: ME

Prepared By: ME

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)			2.39	mg/Kg	1	2.00	120	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			2.21	mg/Kg	1	2.00	110	70.6 - 179

Sample: 274917 - AH-4 0-1'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 84205

Prep Batch: 71416

Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-08-24

Sample Preparation: 2011-08-19

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			4360	mg/Kg	100	4.00

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Sample: 274917 - AH-4 0-1'

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 84108

Prep Batch: 71417

Analytical Method: S 8015 D

Date Analyzed: 2011-08-19

Sample Preparation: 2011-08-19

Prep Method: N/A

Analyzed By: kg

Prepared By: kg

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			87.1	mg/Kg	1	100	87	67.5 - 147.1

Sample: 274917 - AH-4 0-1'

Laboratory: Midland

Analysis: TPH GRO

QC Batch: 84102

Prep Batch: 71411

Analytical Method: S 8015 D

Date Analyzed: 2011-08-19

Sample Preparation: 2011-08-19

Prep Method: S 5035

Analyzed By: ME

Prepared By: ME

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.09	mg/Kg	1	2.00	104	30 - 134.6
4-Bromofluorobenzene (4-BFB)	j		1.86	mg/Kg	1	2.00	93	22.4 - 149

Sample: 274918 - AH-4 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 84205

Prep Batch: 71416

Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-08-24

Sample Preparation: 2011-08-19

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			8980	mg/Kg	100	4.00

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Sample: 274919 - AH-4 2-2.5'

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 84205 Date Analyzed: 2011-08-24 Analyzed By: AR
Prep Batch: 71416 Sample Preparation: 2011-08-19 Prepared By: AR

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

Sample: 274920 - AH-5 0-1'

Laboratory: Midland
Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
QC Batch: 84101 Date Analyzed: 2011-08-19 Analyzed By: ME
Prep Batch: 71411 Sample Preparation: 2011-08-19 Prepared By: ME

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)			2.71	mg/Kg	1	2.00	136	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			2.48	mg/Kg	1	2.00	124	70.6 - 179

Sample: 274920 - AH-5 0-1'

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 84205 Date Analyzed: 2011-08-24 Analyzed By: AR
Prep Batch: 71416 Sample Preparation: 2011-08-19 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			5850	mg/Kg	100	4.00

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Sample: 274920 - AH-5 0-1'

Laboratory:	Midland		
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D
QC Batch:	84108	Date Analyzed:	2011-08-19
Prep Batch:	71417	Sample Preparation:	2011-08-19
		Prep Method:	N/A
		Analyzed By:	kg
		Prepared By:	kg

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			89.5	mg/Kg	1	100	90	67.5 - 147.1

Sample: 274920 - AH-5 0-1'

Laboratory:	Midland		
Analysis:	TPH GRO	Analytical Method:	S 8015 D
QC Batch:	84102	Date Analyzed:	2011-08-19
Prep Batch:	71411	Sample Preparation:	2011-08-19
		Prep Method:	S 5035
		Analyzed By:	ME
		Prepared By:	ME

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.38	mg/Kg	1	2.00	119	30 - 134.6
4-Bromofluorobenzene (4-BFB)			2.09	mg/Kg	1	2.00	104	22.4 - 149

Sample: 274921 - AH-5 1-1.5'

Laboratory:	Midland		
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B
QC Batch:	84205	Date Analyzed:	2011-08-24
Prep Batch:	71416	Sample Preparation:	2011-08-19
		Prep Method:	N/A
		Analyzed By:	AR
		Prepared By:	AR

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

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Sample: 274922 - AH-5 2-2.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 84205

Prep Batch: 71416

Analytical Method: SM 4500-Cl B

Date Analyzed: 2011-08-24

Sample Preparation: 2011-08-19

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

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

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Method Blanks

Method Blank (1) QC Batch: 84101

QC Batch: 84101
Prep Batch: 71411

Date Analyzed: 2011-08-19
QC Preparation: 2011-08-19

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)			2.10	mg/Kg	1	2.00	105	65.9 - 111.8
4-Bromofluorobenzene (4-BFB)			2.07	mg/Kg	1	2.00	104	48.4 - 123.1

Method Blank (1) QC Batch: 84102

QC Batch: 84102
Prep Batch: 71411

Date Analyzed: 2011-08-19
QC Preparation: 2011-08-19

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)			1.88	mg/Kg	1	2.00	94	67.6 - 150
4-Bromofluorobenzene (4-BFB)			1.77	mg/Kg	1	2.00	88	52.4 - 130

Method Blank (1) QC Batch: 84108

QC Batch: 84108
Prep Batch: 71417

Date Analyzed: 2011-08-19
QC Preparation: 2011-08-19

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			83.7	mg/Kg	1	100	84	52.7 - 133.8

Method Blank (1) QC Batch: 84136

QC Batch: 84136
Prep Batch: 71416

Date Analyzed: 2011-08-22
QC Preparation: 2011-08-19

Analyzed By: AR
Prepared By: AR

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

Method Blank (1) QC Batch: 84205

QC Batch: 84205
Prep Batch: 71416

Date Analyzed: 2011-08-24
QC Preparation: 2011-08-19

Analyzed By: AR
Prepared By: AR

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

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Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 84101
Prep Batch: 71411

Date Analyzed: 2011-08-19
QC Preparation: 2011-08-19

Analyzed By: ME
Prepared By: ME

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.99	mg/Kg	1	2.00	<0.0118	100	77.4 - 121.7
Toluene		1	2.16	mg/Kg	1	2.00	<0.00600	108	88.6 - 121.6
Ethylbenzene		1	2.23	mg/Kg	1	2.00	<0.00850	112	74.3 - 117.9
Xylene		1	6.71	mg/Kg	1	6.00	<0.00613	112	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	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	2.06	mg/Kg	1	2.00	<0.0118	103	77.4 - 121.7	3	20
Toluene		1	2.23	mg/Kg	1	2.00	<0.00600	112	88.6 - 121.6	3	20
Ethylbenzene		1	2.28	mg/Kg	1	2.00	<0.00850	114	74.3 - 117.9	2	20
Xylene		1	6.90	mg/Kg	1	6.00	<0.00613	115	73.4 - 118.8	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)	2.22	2.17	mg/Kg	1	2.00	111	108	65.5 - 116.7
4-Bromofluorobenzene (4-BFB)	2.38	2.36	mg/Kg	1	2.00	119	118	56.2 - 132.1

Laboratory Control Spike (LCS-1)

QC Batch: 84102
Prep Batch: 71411

Date Analyzed: 2011-08-19
QC Preparation: 2011-08-19

Analyzed By: ME
Prepared By: ME

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	17.4	mg/Kg	1	20.0	<0.753	87	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	17.8	mg/Kg	1	20.0	<0.753	89	60.9 - 95.4	2	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.05	2.07	mg/Kg	1	2.00	102	104	61.9 - 142
4-Bromofluorobenzene (4-BFB)	2.09	1.84	mg/Kg	1	2.00	104	92	68.2 - 132

Laboratory Control Spike (LCS-1)

QC Batch: 84108
Prep Batch: 71417

Date Analyzed: 2011-08-19
QC Preparation: 2011-08-19

Analyzed By: kg
Prepared By: kg

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	228	mg/Kg	1	250	<14.5	91	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	238	mg/Kg	1	250	<14.5	95	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	89.1	91.4	mg/Kg	1	100	89	91	65.3 - 135.8

Laboratory Control Spike (LCS-1)

QC Batch: 84136
Prep Batch: 71416

Date Analyzed: 2011-08-22
QC Preparation: 2011-08-19

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			92.2	mg/Kg	1	100	<3.85	92	85 - 115

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114-6400997

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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			103	mg/Kg	1	100	<3.85	103	85 - 115	11	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: 84205
Prep Batch: 71416

Date Analyzed: 2011-08-24
QC Preparation: 2011-08-19

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			95.9	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	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			108	mg/Kg	1	100	<3.85	108	85 - 115	12	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: 274943

QC Batch: 84101
Prep Batch: 71411

Date Analyzed: 2011-08-19
QC Preparation: 2011-08-19

Analyzed By: ME
Prepared By: ME

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.88	mg/Kg	1	2.00	<0.0118	94	69.4 - 123.6
Toluene		1	2.14	mg/Kg	1	2.00	<0.00600	107	75.4 - 134.3
Ethylbenzene		1	2.34	mg/Kg	1	2.00	<0.00850	117	58.8 - 133.7
Xylene		1	7.15	mg/Kg	1	6.00	<0.00613	119	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	1.83	mg/Kg	1	2.00	<0.0118	92	69.4 - 123.6	3	20
Toluene		1	2.08	mg/Kg	1	2.00	<0.00600	104	75.4 - 134.3	3	20
Ethylbenzene		1	2.28	mg/Kg	1	2.00	<0.00850	114	58.8 - 133.7	3	20
Xylene		1	6.92	mg/Kg	1	6.00	<0.00613	115	57 - 134.2	3	20

Report Date: August 24, 2011
114-6400997

Work Order: 11081826
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Eddy Co., NM

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.68	2.44	mg/Kg	1	2	134	122	79.4 - 141.1
4-Bromofluorobenzene (4-BFB)	2.55	2.29	mg/Kg	1	2	128	114	71 - 167

Matrix Spike (MS-1) Spiked Sample: 274920

QC Batch: 84102
Prep Batch: 71411

Date Analyzed: 2011-08-19
QC Preparation: 2011-08-19

Analyzed By: ME
Prepared By: ME

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	17.4	mg/Kg	1	20.0	<0.753	87	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	16.6	mg/Kg	1	20.0	<0.753	83	61.8 - 114	5	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.39	2.27	mg/Kg	1	2	120	114	29.4 - 161.7
4-Bromofluorobenzene (4-BFB)	2.25	2.13	mg/Kg	1	2	112	106	37.3 - 162

Matrix Spike (MS-1) Spiked Sample: 274920

QC Batch: 84108
Prep Batch: 71417

Date Analyzed: 2011-08-19
QC Preparation: 2011-08-19

Analyzed By: kg
Prepared By: kg

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	217	mg/Kg	1	250	<14.5	87	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	218	mg/Kg	1	250	<14.5	87	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	83.9	85.2	mg/Kg	1	100	84	85	54.6 - 149.8

Matrix Spike (MS-1) Spiked Sample: 274912

QC Batch: 84136
Prep Batch: 71416

Date Analyzed: 2011-08-22
QC Preparation: 2011-08-19

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			10100	mg/Kg	100	10000	<385	101	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			10700	mg/Kg	100	10000	<385	107	79.4 - 120.6	6	20

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

Matrix Spike (MS-1) Spiked Sample: 274922

QC Batch: 84205
Prep Batch: 71416

Date Analyzed: 2011-08-24
QC Preparation: 2011-08-19

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			8670	mg/Kg	100	10000	<385	87	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			9470	mg/Kg	100	10000	<385	95	79.4 - 120.6	9	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: 84101

Date Analyzed: 2011-08-19

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	0.0954	95	80 - 120	2011-08-19
Toluene		1	mg/Kg	0.100	0.102	102	80 - 120	2011-08-19
Ethylbenzene		1	mg/Kg	0.100	0.106	106	80 - 120	2011-08-19
Xylene		1	mg/Kg	0.300	0.320	107	80 - 120	2011-08-19

Standard (CCV-2)

QC Batch: 84101

Date Analyzed: 2011-08-19

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	0.0984	98	80 - 120	2011-08-19
Toluene		1	mg/Kg	0.100	0.108	108	80 - 120	2011-08-19
Ethylbenzene		1	mg/Kg	0.100	0.107	107	80 - 120	2011-08-19
Xylene		1	mg/Kg	0.300	0.325	108	80 - 120	2011-08-19

Standard (CCV-1)

QC Batch: 84102

Date Analyzed: 2011-08-19

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	1.04	104	80 - 120	2011-08-19

Standard (CCV-2)

QC Batch: 84102

Date Analyzed: 2011-08-19

Analyzed By: ME

Report Date: August 24, 2011
114-6400997

Work Order: 11081826
SM Energy/PDU 36 State #001

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Eddy Co., NM

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	2011-08-19

Standard (CCV-2)

QC Batch: 84108

Date Analyzed: 2011-08-19

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	254	102	80 - 120	2011-08-19

Standard (CCV-3)

QC Batch: 84108

Date Analyzed: 2011-08-19

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	2011-08-19

Standard (ICV-1)

QC Batch: 84136

Date Analyzed: 2011-08-22

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	101	101	85 - 115	2011-08-22

Standard (CCV-1)

QC Batch: 84136

Date Analyzed: 2011-08-22

Analyzed By: AR

Report Date: August 24, 2011
114-6400997

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Eddy Co., NM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	98.9	99	85 - 115	2011-08-22

Standard (ICV-1)

QC Batch: 84205

Date Analyzed: 2011-08-24

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	2011-08-24

Standard (CCV-1)

QC Batch: 84205

Date Analyzed: 2011-08-24

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	97.8	98	85 - 115	2011-08-24

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.

XWO #: 11081826

Analysis Request of Chain of Custody Record

PAGE: 1 OF: 2

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

 ANALYSIS REQUEST
 (Circle or Specify Method No.)

CLIENT NAME:

SM Energy

SITE MANAGER:

Aaron Hale

PROJECT NO.:

114-4406997

PROJECT NAME:

 SM Energy / PDU 3L State #001
 Eddy Co. NM
 SAMPLE IDENTIFICATION

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB		NUMBER OF CONTAINERS	FILTERED (Y/N)	HCL	HNO3	ICE	NONE	BTEX 80215	TPH 8015 MOD	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
274908	8/17		S		X	AH-1 0-1'					X		X	X											X				
909						AH-1 1-1.5'																							
910						AH-1 2-2.5'																							
911						AH-2 0-1'							X	X															
912						AH-2 1-1.5'																							
913						AH-2 1.5'-2'																							
914						AH-3 0-1'							X	X															
915						AH-3 1-1.5'																							
916						AH-3 2-2.5'																							
917						AH-4 0-1'							X	X															

RELINQUISHED BY: (Signature)

Date: 8/18/11

Time: 1445

RECEIVED BY: (Signature)

Date: 8/18/11

Time: 1445

SAMPLED BY: (Print & Initial)

JT/TF

Date: 8/17/11

Time:

RELINQUISHED BY: (Signature)

Date:

Time:

RECEIVED BY: (Signature)

Date:

Time:

SAMPLE SHIPPED BY: (Circle)

FEDEX BUS

AIRBILL #: _____

HAND DELIVERED UPS

OTHER: _____

RELINQUISHED BY: (Signature)

Date:

Time:

RECEIVED BY: (Signature)

Date:

Time:

TETRA TECH CONTACT PERSON:

Results by:

RECEIVING LABORATORY:

Tetra

RECEIVED BY: (Signature)

ADDRESS:

CITY: Midland

STATE: TX

ZIP:

CONTACT:

PHONE:

DATE:

TIME:

Aaron Hale

RUSH Charges

Authorized:

Yes No

SAMPLE CONDITION WHEN RECEIVED:

3.4°C intact

REMARKS:

If total TPH exceeds 1,000 mg/kg run deeper samples / If total BTEX exceeds 50 mg/kg or Benzene exceeds 10 mg/kg run deeper samples

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

XWO #: 11081826

Analysis Request of Chain of Custody Record

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

 ANALYSIS REQUEST
 (Circle or Specify Method No.)

 CLIENT NAME:
 SM Enersy

 SITE MANAGER:
 Aaron Hale

 PROJECT NO.:
 114-L400997

 PROJECT NAME:
 SM Enersy / PDU 3L State #001

 Eddy Co. NM
 SAMPLE IDENTIFICATION

LAB I.D. NUMBER	DATE 2011	TIME	MATRIX	COMP.	GRAB	Eddy C. NM SAMPLE IDENTIFICATION	NUMBER OF	FILTERED (Y/N)	HCL	HNO3	ICE	NONE	BTEX 8021B	CPH 8015	PAH 8270	RCRA Metals	TCLP Metals	TCLP Volatile	TCLP Semi V	RCI	GC/MS Vol. 8	GC/MS Semi	PCB's 8080/80	Pest. 808/80	Chloride	Gamma Spec	Alpha Beta (/	PLM (Asbest	Major Anions	
274918	8/17		S	X		AH-4 1'-1.5'	1				X														X					
919						AH-4 2'-2.5'																								
920						AH-5 0-1'							X	X																
921						AH-5 1'-1.5'																								
922						AH-5 2'-2.5'																								
																													</	

 RELINQUISHED BY: (Signature) *[Signature]* Date: 8/18/11 Time: 14:45

 RECEIVED BY: (Signature) *[Signature]* Date: 8/18/11 Time: 14:45

SAMPLED BY: (Print & Initial) JTF Date: 8/11/11

RELINQUISHED BY: (Signature) Date: Time:

RECEIVED BY: (Signature) Date: Time:

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

RELINQUISHED BY: (Signature) Date: Time:

RECEIVED BY: (Signature) Date: Time:

HAND DELIVERED UPS OTHER:

RECEIVING LABORATORY: Tetra Tech ADDRESS: Midland STATE: TX ZIP: PHONE: DATE: TIME:

RECEIVED BY: (Signature) DATE: TIME:

TETRA TECH CONTACT PERSON: Aaron Hale Results by: RUSH Charges Authorized: Yes No

 SAMPLE CONDITION WHEN RECEIVED:
 3.4°C intact

 REMARKS:
 If total TPH exceeds 1,000 mg/kg run deeper samples / If total BTEX exceeds 50 mg/kg or Benzene exceeds 10 mg/kg run deeper samples

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