SITE INFORMATION

Report Type: Closure Report

General Site Information:	
Site:	**Geronimo Tank Battery**
Company:	**SM Energy Company**
Section, Township and Range	**Section 24, T18S, R31E** **Unit Letter - G**
Lease Number:	**API 30-01-5524927**
County:	**Eddy County**
GPS:	**32.73376º N, 103.82129º W**
Surface Owner:	Federal
Mineral Owner:	
Directions:	From the intersection of Hwy 82 and Shugart Rd (Loco Hills), go south on Shugart Rd exactly 4 miles. Turn to the Southeast on a caliche road and travel southeast for another 4 miles until the road ends. Turn onto the road to the northeast and travel approximatly 1.1 miles to the location.

Release Data:	
Date Released:	2/5/2015
Type Release:	Produced Water and Oil
Source of Contamination:	Heater Treater
Fluid Released:	265 water/16 oil
Fluids Recovered:	232 water/13.5oil

Official Communication:			
Name:	Tejay Simpson		Ike Tavarez
Company:	SM Energy Company		Tetra Tech
Address:	6301 Holiday Hill Rd. Bldg 1		4000 N Big Spring
P.O. Box			
City:	Midland, Texas		Midland, Texas
Phone number:	(432) 212-3408		(432) 682-4559
Fax:			
Email:	tsimpson@sm-energy.com		ike.tavarez@tetratech.com

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

Acceptable Soil RRAL (mg/kg)		
Benzene	***Total BTEX***	***TPH***
10	50	5,000

TETRA TECH

February 26, 2016

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

Re: Closure Report for SM Energy Company
Geronimo Tank Battery
Unit G, Section 24, Township 18 South, Range 31 East
Eddy County, New Mexico

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by SM Energy Company (SM Energy) to assess a spill that occurred the Geronimo Tank Battery located in Unit G, Section 24, Township 18 South, Range 31 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.73376º, W 103.82129º. 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 February 5, 2015. Approximately 256 barrels of produced water and 16 barrels of oil were released from the heater treater. Approximately 232 barrels of produced water and 13.5 barrels of oil were recovered. The heater treater fire tube flange was repaired with new connections. The spill area impacted an area measuring approximately 90' x 115' on the facility pad. The initial C-141 is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 24. According to the NMOCD groundwater map, the average depth to groundwater in this area is greater than 280' below surface. The groundwater data 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 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.

Initial Soil Assessment and Results

On March 31, 2015, Tetra Tech personnel installed a total of six (6) auger holes and collected soil samples utilizing a hand auger to assess the spill area. Soil samples were submitted for laboratory analysis of TPH by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, the soil samples did not show any BTEX or TPH concentrations above the RRAL's. The areas of auger holes (AH-1 and AH-6) showed elevated chlorides in the shallow soils (0-1') of 3,360 mg/kg and 5,930 mg/kg, respectively. The deeper samples showed chloride concentrations significantly declining with depth at 1-1.5' below surface. Moderate chloride concentrations were detected in the areas of auger holes (AH-2 and AH-3) with concentrations of 1,440 mg/kg and 1,240 mg/kg, respectively. Additionally, a moderate chloride concentration of 1,060 mg/kg was detected at auger hole (AH-2) at 3.0'-3.5' below surface, possibly due to cross contamination from the soils above. The remaining areas of auger holes (AH-4 and AH-5) did not show any impact to the soils.

Additional Soil Assessment and Resampling

Based on the initial sampling results, Tetra Tech submitted a Work Plan to the NMOCD and BLM dated June 1, 2015, for approval. Referring to the Work Plan, SM Energy proposed to excavate the areas of auger holes (AH-1 and AH-6) to a depth of approximately 1.0' below surface and to perform a surficial scrape in the areas of auger holes (AH-2 and AH-3). The Work Plan was approved by the NMOCD on June 4, 2015, and by the BLM on September 9, 2015.

Due to recent heavy rain events in the area, Tetra Tech proposed via electronic correspondence to return to the facility to resample the pad area for further evaluation. The NMOCD approved this request on December 30, 2015.

Based on the correspondence with the NMOCD, Tetra Tech personnel returned to the site on February 2, 2016, to resample the areas of auger holes (AH-1, AH-2, AH-3 and AH-6) to a depth of 0'-1' below surface. Soil samples were submitted for laboratory analysis of chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1.

Referring to Table 1, all samples collected showed a decrease in chloride concentrations. The chloride concentrations in the area of auger holes (AH-1, AH-2, AH-3, and AH-6) declined to 2,090 mg/kg, 988 mg/kg, 63.4 mg/kg and 174 mg/kg, respectively.

Conclusion

All of the fluids from the release remained on the facility pad and did not migrate into the pasture or any surrounding areas. Based on the laboratory results from the resampling event, the shallow chloride concentrations do not appear to be an environmental concern. SM Energy requests closure of the site. The Final C-141 is enclosed in Appendix A. If you have any questions or comments concerning the assessment activities for this site, please call me at (432) 682-4559.

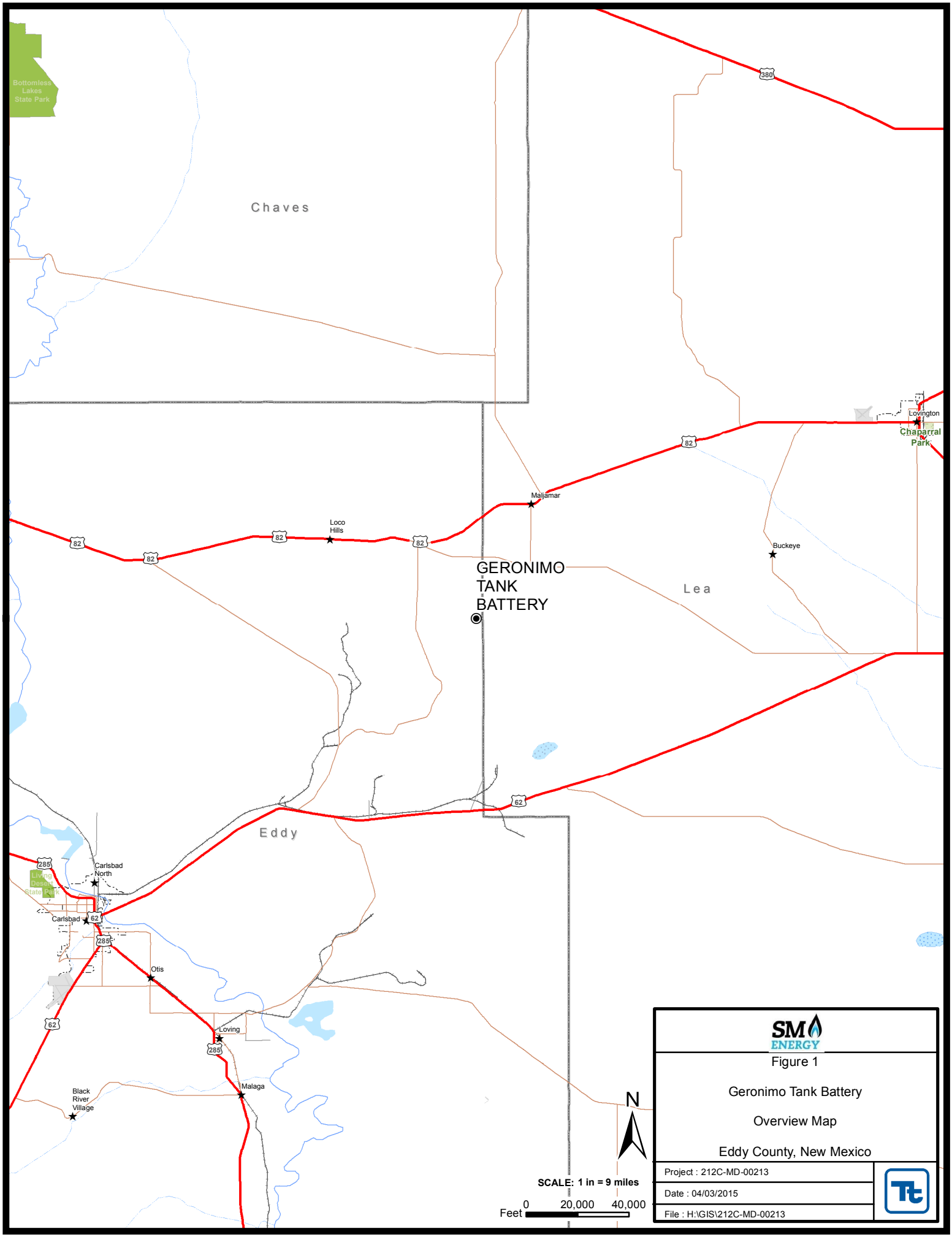
Respectfully submitted,
TETRA TECH

Clair Gonzales,
Geologist

Ike Tavarez,
Senior Project Manager, P.G.

cc: Zachary Luikens – SM Energy Company
Bob Geries – SM Energy Company
BLM – Shelly Tucker

Figures



SM ENERGY

Figure 1

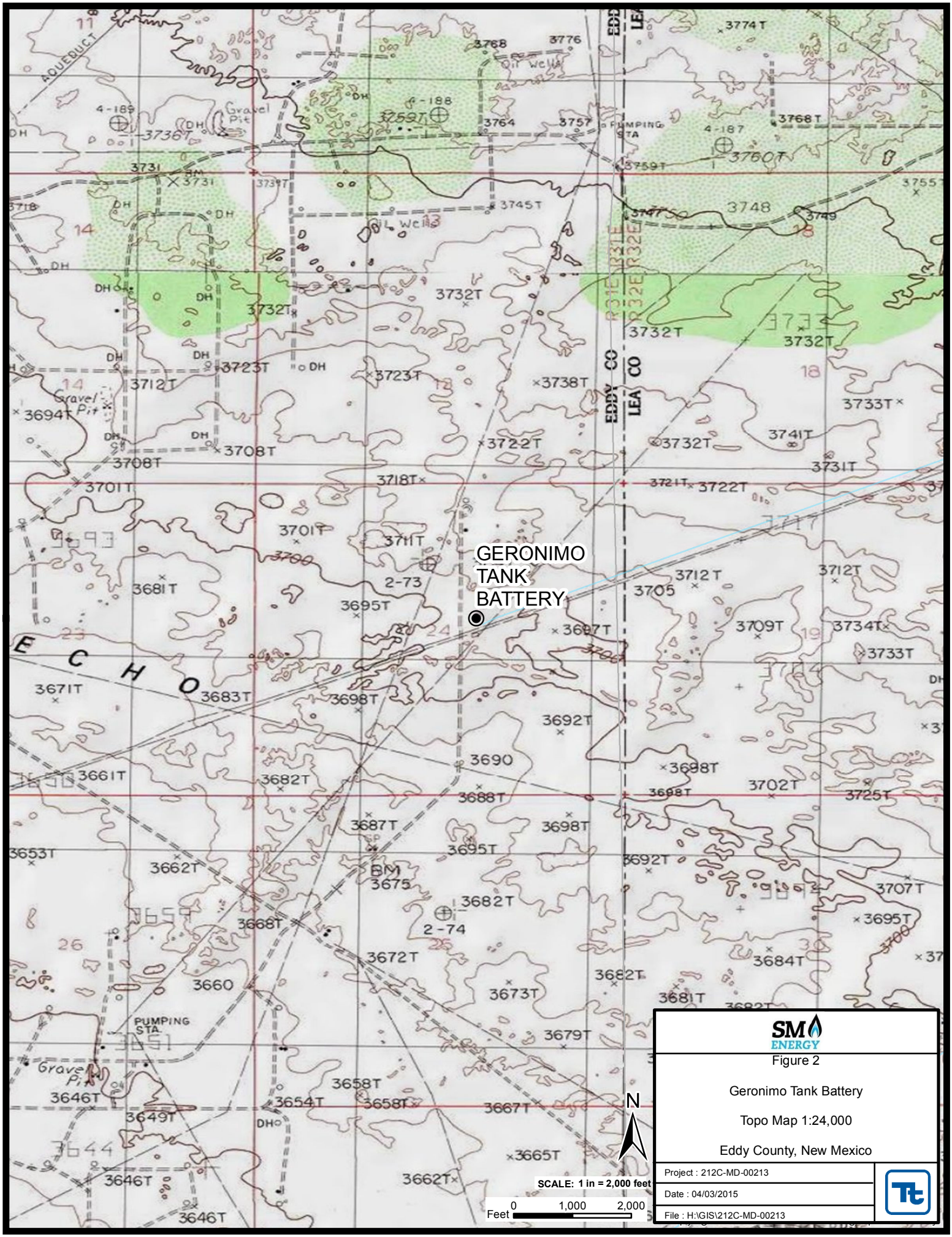
Geronimo Tank Battery

Overview Map

Eddy County, New Mexico

Project : 212C-MD-00213	
Date : 04/03/2015	
File : H:\GIS\212C-MD-00213	

Mapped By: Isabel Marmolejo



SM ENERGY

Figure 2

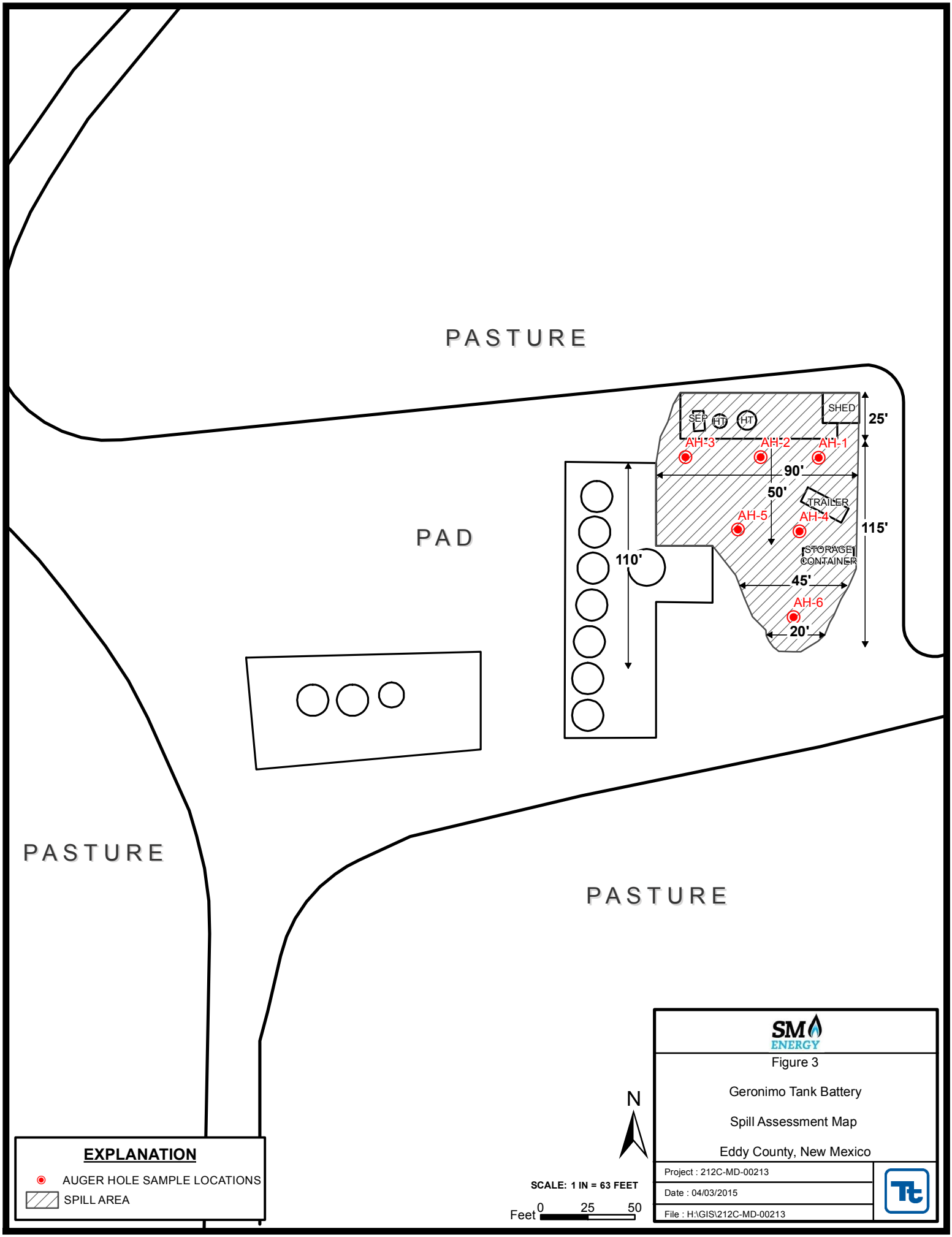
Geronimo Tank Battery

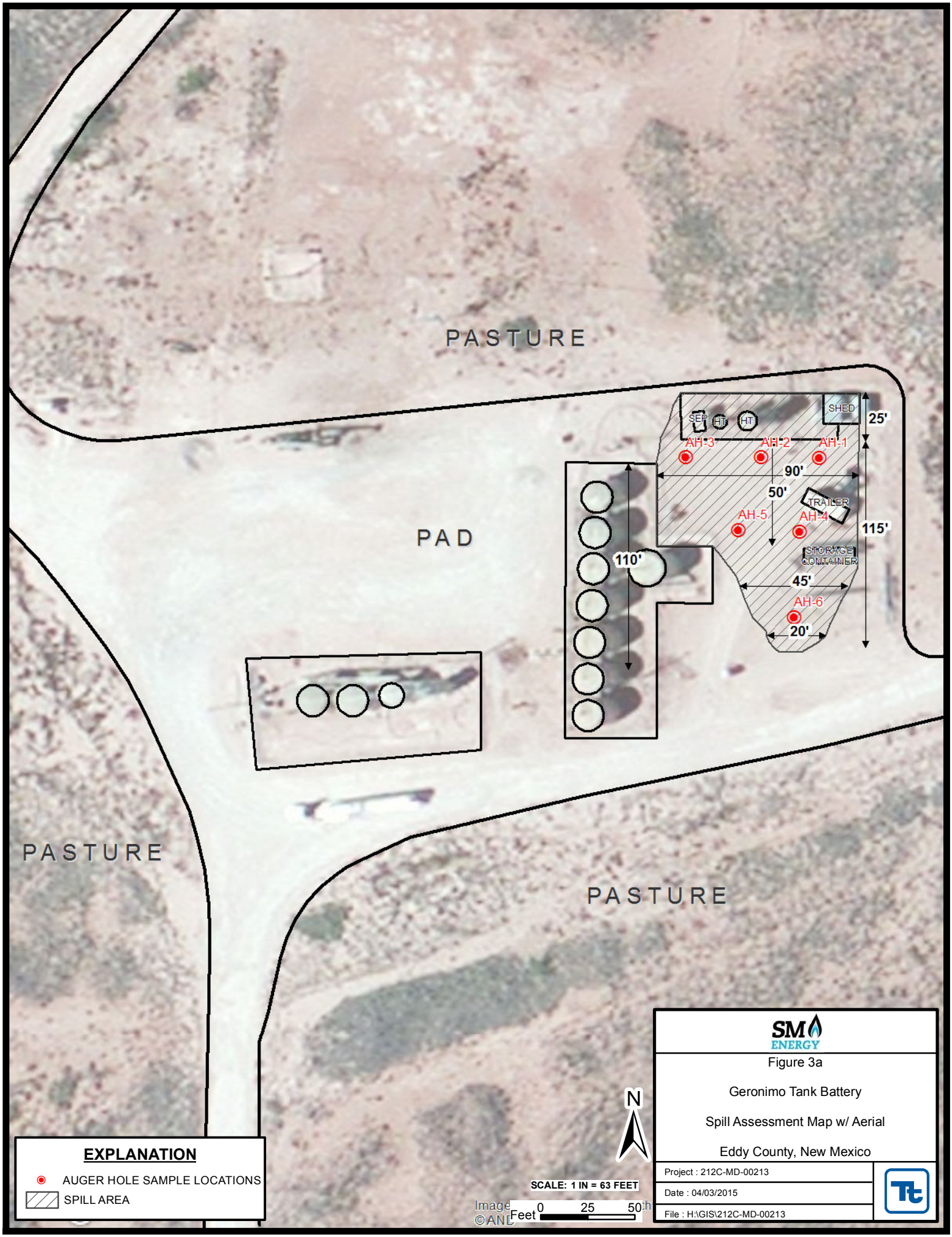
Topo Map 1:24,000

Eddy County, New Mexico

Project : 212C-MD-00213	
Date : 04/03/2015	
File : H:\GIS\212C-MD-00213	

Mapped By: Isabel Marmolejo


PASTURE
PAD
PASTURE
PASTURE
SEP
HT
HT
SHED
AH-3
AH-2
AH-1
90'
25'
50'
TRAILER
AH-5
AH-4
115'
STORAGE CONTAINER
110'
45'
AH-6
20'
N
SCALE: 1 IN = 63 FEET
Feet 0 25 50
EXPLANATION
AUGER HOLE SAMPLE LOCATIONS
SPILL AREA
SM ENERGY
Figure 3
Geronimo Tank Battery
Spill Assessment Map
Eddy County, New Mexico
Project : 212C-MD-00213
Date : 04/03/2015
File : H:\GIS\212C-MD-00213
Mapped By: Isabel Marmolejo



EXPLANATION

- AUGER HOLE SAMPLE LOCATIONS
- SPILL AREA

SM ENERGY

Figure 3a

Geronimo Tank Battery

Spill Assessment Map w/ Aerial

Eddy County, New Mexico

Project : 212C-MD-00213

Date : 04/03/2015

File : H:\GIS\212C-MD-00213

Mapped By: Isabel Marmolejo

Tables

Table 1
SM Energy
Geronimo Tank Battery
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	3/31/2015	0-1	X		<4.00	1,160	1,160	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	**3,360**
	"	1-1.5	X		-	-	-	-	-	-	-	-	192
	"	2-2.5	X		-	-	-	-	-	-	-	-	192
	"	3-3.5	X		-	-	-	-	-	-	-	-	385
	"	4-4.5	X		-	-	-	-	-	-	-	-	192
AH-1	2/3/2016	0-1	X		-	-	-	-	-	-	-	-	**2,090**
AH-2	3/31/2015	0-1	X		<4.00	2,200	2,200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	**1,440**
	"	1-1.5	X		-	-	-	-	-	-	-	-	385
	"	2-2.5	X		-	-	-	-	-	-	-	-	192
	"	3-3.5	X		-	-	-	-	-	-	-	-	**1,060**
	"	4-4.5	X		-	-	-	-	-	-	-	-	762
	"	5-5.5	X		-	-	-	-	-	-	-	-	381
	"	6-6.5	X		-	-	-	-	-	-	-	-	476
	"	7-7.5	X		-	-	-	-	-	-	-	-	190
AH-2	2/3/2016	0-1	X		-	-	-	-	-	-	-	-	988
AH-3	3/31/2015	0-1	X		16.1	521	537	<0.0400	0.0501	0.0492	0.498	0.5973	**1,240**
	"	1-1.5	X		-	-	-	-	-	-	-	-	190
	"	1.5-2.0	X		-	-	-	-	-	-	-	-	190
AH-3	2/3/2016	0-1	X		-	-	-	-	-	-	-	-	63.4
AH-4	3/31/2015	0-1	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<20.0
	"	1-1.5	X		-	-	-	-	-	-	-	-	<20.0
	"	2-2.5	X		-	-	-	-	-	-	-	-	190

Table 1
SM Energy
Geronimo Tank Battery
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-5	3/31/2015	0-1	X		100	1,580	1,680	<0.0400	0.226	0.510	2.63	3.37	670
	"	1-1.5	X		-	-	-	-	-	-	-	-	<20.0
	"	2-2.5	X		-	-	-	-	-	-	-	-	<20.0
AH-6	3/31/2015	0-1	X		247	483	730	<0.0400	0.351	1.36	4.89	6.60	**5,930**
	"	1-1.5	X		-	-	-	-	-	-	-	-	96.0
	"	2-2.5	X		-	-	-	-	-	-	-	-	96.0
AH-6	2/3/2016	0-1	X		-	-	-	-	-	-	-	-	174

(-) Not Analyzed

Confirmation Samples

Photos

SM Energy Company
Geronimo Tank Battery
Eddy County, New Mexico

View West – Area of AH-1, AH-2 and AH-3

View southwest – Area of AH-5, and AH-6

SM Energy Company
Geronimo Tank Battery
Eddy County, New Mexico

View North – Area of AH-1, AH-2, AH-3, AH-4 and AH-5

View east – Area of AH-1

Appendix A

NM OIL CONSERVATION
ARTESIA DISTRICT
MAR 13 2015
RECEIVED

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., 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 August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

nAB1507551864 154903

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company SM ENERGY COMPANY	Contact LISA HUNT
Address 6301 Holiday Hill Rd, Bldg 1 Midland, TX 79707	Telephone No. (432)848-4833
Facility Name Geronimo Battery	Facility Type Production Battery

Surface Owner BLM	Mineral Owner	API No. 3001524927 (closest well)

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
G	24	18S	31E	2310	N	2310	E	Eddy

Latitude 32.734 Longitude 103.8219

NATURE OF RELEASE

Type of Release Produced water & oil	Volume of Release 256wtr/16 oil Volume Recovered 232 wtr/13.5 oil
Source of Release Heater treater	Date and Hour of Occurrence 2/5/15 Date and Hour of Discovery 2/5/15 7:40am
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Jim Amos - BLM and NMOCD
By Whom? Tejay Simpson	Date and Hour 2/5/15 11:22 am
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

A leak was coming out of the top of the fire tube flange & spraying towards the top of the heater. Lease operator switched the production of the heater into secondary heater.The depressurized heater stopping the release of fluid. Vacuum trucks, gang & backhoe operators were called. Heater treater was emptied into a vacuum truck & transferred to a spare storage tank.
Estimate spill volume: 256 water / 16 oil
Recovered: 232 water / 13.5 oil

Describe Area Affected and Cleanup Action Taken.*

Battery pad. 128' x 31'. Vacuum trucks picked up free standing fluid while gang assisted. Recovered fluid was placed in 500 bbls storage tank. Backhoe back drug location recovering contaminated soil & loaded into dump truck for transport to disposal.

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: Lisa Hunt

Printed Name: LISA HUNT

Title: REGULATORY TECHNICIAN

E-mail Address: LHUNT@SM-ENERGY.COM

Date: 03/09/2015 Phone: (432)848-4833

OIL CONSERVATION DIVISION

Approved by Environmental Specialist:

Approval Date: 3/16/15 Expiration Date:

Conditions of Approval: Attached ☐

Remediation per O.C.D. Rules & Guidelines
SUBMIT REMEDIATION PROPOSAL NO
LATER THAN: 4/16/15

2RP-2889

* Attach Additional Sheets If Necessary

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company **SM Energy Company**	Contact **Lisa Hunt**
Address **6301 Holiday Hill Rd., Bldg 1 Midland, TX 79707**	Telephone No. **(432) 848-4833**
Facility Name **Geronimo Battery**	Facility Type **Production Battery**

Surface Owner: BLM	Mineral Owner	API No. 30-015-24927 (closest well)

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
G	24	18S	31E	2310	N	2310	E	Eddy

Latitude N 32.73396° **Longitude** W 103.82129°

NATURE OF RELEASE

Type of Release: Produced water & Oil	Volume of Release: 256 bbls water 16 bbls oil	Volume Recovered 232 bbls water 13.5 bbls oil
Source of Release: Heater Treater	Date and Hour of Occurrence 02/5/15	Date and Hour of Discovery 02/5/15 @ 07:40 am
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Jim Amos – BLM and NMOCD	
By Whom? Tejay Simpson	Date and Hour 02/5/15 @ 11:22 am	
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.*

A leak developed at the top of the fire tube flange & sprayed towards the top of the heater treater. The heater treater was emptied into a vacuum truck & transferred to a spare storage tank. The release was contained on the facility pad. Vacuum trucks were used to remove all free standing fluids. Additionally, the spill area was scraped using a backhoe and the soil was transferred for proper disposal.

Describe Area Affected and Cleanup Action Taken.*

Tetra Tech inspected site and collected samples to define spills extent. 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 Approved by District Supervisor:	
Printed Name: Ike Tavarez (Agent for SM Energy)		
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:	Attached ☐
Date: Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
SM Energy - Geronimo Battery
Eddy County, New Mexico

17 South 30 East

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

17 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34 271	35	36

17 South 32 East

6	5	4 82 Maljamar	3 175	2 60	1 225
7	8	9	10 132	11 70 88	12 120
18	17	16	15	14	13
19	20	21	22	23	24
30 180 dry	29	28	27	26	25
31	32	33	34	35	36

18 South 30 East

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

18 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12 400
18	17	16	15 98	14 317	13
19	20	21	22	23	24 SITE
30	29	28	27	26	25
31	32	33	34	35 261	36

18 South 32 East

6	5	4 65	3	2	1
7 460 82	8	9	10	11	12
18	17	16 84	15	14	13
19	20 164	21	22 429	23	24
30	29	28	27	26	25
31	32	33	34 117	35	36

19 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 90	29	28	27	26	25
31 115	32	33	34	35	36

19 South 31 East

6	5 SITE	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28 180	27	26	25
31	32	33 101	34	35	36 130

19 South 32 East

6	5	4	3	2	1
7	8 365	9	10	11	12
18	17	16	15	14	13 135 dry
19 102	20 345	21	22	23	24
30	29	28	27	26	25
31	32	33	34 250	35	36

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

90 Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)

Geology and Groundwater Resources of Eddy County, NM (Report 3)

34 NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

143 NMOCD Groundwater map well location

Appendix C

Summary Report

Ike Tavarez
Tetra Tech
1901 N. Big Spring St.
Midland, TX 79705

Report Date: April 13, 2015

Work Order: 15040201

Project Location: Eddy Co, NM
Project Name: SM Energy Geronimo TB
Project Number: 212C-MD-00213

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
390223	AH-1 0-1	soil	2015-03-31	00:00	2015-04-02
390224	AH-1 1-1.5	soil	2015-03-31	00:00	2015-04-02
390225	AH-1 2-2.5	soil	2015-03-31	00:00	2015-04-02
390226	AH-1 3-3.5	soil	2015-03-31	00:00	2015-04-02
390227	AH-1 4-4.5	soil	2015-03-31	00:00	2015-04-02
390228	AH-2 0-1	soil	2015-03-31	00:00	2015-04-02
390229	AH-2 1-1.5	soil	2015-03-31	00:00	2015-04-02
390230	AH-2 2-2.5	soil	2015-03-31	00:00	2015-04-02
390231	AH-2 3-3.5	soil	2015-03-31	00:00	2015-04-02
390232	AH-2 4-4.5	soil	2015-03-31	00:00	2015-04-02
390233	AH-2 5-5.5	soil	2015-03-31	00:00	2015-04-02
390234	AH-2 6-6.5	soil	2015-03-31	00:00	2015-04-02
390235	AH-2 7-7.5	soil	2015-03-31	00:00	2015-04-02
390236	AH-3 0-1	soil	2015-03-31	00:00	2015-04-02
390237	AH-3 1-1.5	soil	2015-03-31	00:00	2015-04-02
390238	AH-3 1.5-2.0	soil	2015-03-31	00:00	2015-04-02
390239	AH-4 0-1	soil	2015-03-31	00:00	2015-04-02
390240	AH-4 1-1.5	soil	2015-03-31	00:00	2015-04-02
390241	AH-4 2-2.5	soil	2015-03-31	00:00	2015-04-02
390242	AH-5 0-1	soil	2015-03-31	00:00	2015-04-02
390243	AH-5 1-1.5	soil	2015-03-31	00:00	2015-04-02
390244	AH-5 2-2.5	soil	2015-03-31	00:00	2015-04-02
390246	AH-6 0-1	soil	2015-03-31	00:00	2015-04-02
390247	AH-6 1-1.5	soil	2015-03-31	00:00	2015-04-02
390248	AH-6 2-2.5	soil	2015-03-31	00:00	2015-04-02

Sample - Field Code	BTEX Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	TPH DRO - NEW DRO (mg/Kg)	TPH GRO GRO (mg/Kg)
390223 - AH-1 0-1	<0.0200	<0.0200	<0.0200	<0.0200	**1160** Je,Qs	<4.00 Qs
390228 - AH-2 0-1	<0.0200	<0.0200	<0.0200	<0.0200	**2200** Qs	<4.00 Qs
390236 - AH-3 0-1	<0.0400 [1]	**0.0501**	**0.0492**	**0.498**	**521** Qs	**16.1** Qs
390239 - AH-4 0-1	<0.0200	<0.0200	<0.0200	<0.0200	<50.0 Qs	<4.00 Qs
390242 - AH-5 0-1	<0.0400 [2]	**0.226**	**0.510**	**2.63**	**1580** Qs	**100** Qs
390246 - AH-6 0-1	<0.0400 [3]	**0.351**	**1.36**	**4.89**	**483** Qs	**247** Qs

Sample: 390223 - AH-1 0-1

Param	Flag	Result	Units	RL
Chloride		**3360**	mg/Kg	4

Sample: 390224 - AH-1 1-1.5

Param	Flag	Result	Units	RL
Chloride		**192**	mg/Kg	4

Sample: 390225 - AH-1 2-2.5

Param	Flag	Result	Units	RL
Chloride		**192**	mg/Kg	4

Sample: 390226 - AH-1 3-3.5

Param	Flag	Result	Units	RL
Chloride		**385**	mg/Kg	4

Sample: 390227 - AH-1 4-4.5

Param	Flag	Result	Units	RL
Chloride		**192**	mg/Kg	4

Sample: 390228 - AH-2 0-1

Param	Flag	Result	Units	RL
Chloride		**1440**	mg/Kg	4

[1]Dilution due to hydrocarbons.
[2]Dilution due to hydrocarbons.
[3]Dilution due to hydrocarbons.

Sample: 390229 - AH-2 1-1.5

Param	Flag	Result	Units	RL
Chloride		**385**	mg/Kg	4

Sample: 390230 - AH-2 2-2.5

Param	Flag	Result	Units	RL
Chloride		**192**	mg/Kg	4

Sample: 390231 - AH-2 3-3.5

Param	Flag	Result	Units	RL
Chloride		**1060**	mg/Kg	4

Sample: 390232 - AH-2 4-4.5

Param	Flag	Result	Units	RL
Chloride		**762**	mg/Kg	4

Sample: 390233 - AH-2 5-5.5

Param	Flag	Result	Units	RL
Chloride		**381**	mg/Kg	4

Sample: 390234 - AH-2 6-6.5

Param	Flag	Result	Units	RL
Chloride		**476**	mg/Kg	4

Sample: 390235 - AH-2 7-7.5

Param	Flag	Result	Units	RL
Chloride		**190**	mg/Kg	4

Sample: 390236 - AH-3 0-1

Param	Flag	Result	Units	RL
Chloride		**1240**	mg/Kg	4

Sample: 390237 - AH-3 1-1.5

Param	Flag	Result	Units	RL
Chloride		**190**	mg/Kg	4

Sample: 390238 - AH-3 1.5-2.0

Param	Flag	Result	Units	RL
Chloride		**190**	mg/Kg	4

Sample: 390239 - AH-4 0-1

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

Sample: 390240 - AH-4 1-1.5

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

Sample: 390241 - AH-4 2-2.5

Param	Flag	Result	Units	RL
Chloride		**190**	mg/Kg	4

Sample: 390242 - AH-5 0-1

Param	Flag	Result	Units	RL
Chloride		**670**	mg/Kg	4

Sample: 390243 - AH-5 1-1.5

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

Sample: 390244 - AH-5 2-2.5

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

Sample: 390246 - AH-6 0-1

Param	Flag	Result	Units	RL
Chloride		**5930**	mg/Kg	4

Sample: 390247 - AH-6 1-1.5

Param	Flag	Result	Units	RL
Chloride		**96.0**	mg/Kg	4

Sample: 390248 - AH-6 2-2.5

Param	Flag	Result	Units	RL
Chloride		**96.0**	mg/Kg	4

TRACEANALYSIS, INC.

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Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Ike Tavarez
Tetra Tech
1901 N. Big Spring St.
Midland, TX, 79705

Report Date: April 13, 2015

Work Order: 15040201

Project Location: Eddy Co, NM
Project Name: SM Energy Geronimo TB
Project Number: 212C-MD-00213

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
390223	AH-1 0-1	soil	2015-03-31	00:00	2015-04-02
390224	AH-1 1-1.5	soil	2015-03-31	00:00	2015-04-02
390225	AH-1 2-2.5	soil	2015-03-31	00:00	2015-04-02
390226	AH-1 3-3.5	soil	2015-03-31	00:00	2015-04-02
390227	AH-1 4-4.5	soil	2015-03-31	00:00	2015-04-02
390228	AH-2 0-1	soil	2015-03-31	00:00	2015-04-02
390229	AH-2 1-1.5	soil	2015-03-31	00:00	2015-04-02
390230	AH-2 2-2.5	soil	2015-03-31	00:00	2015-04-02
390231	AH-2 3-3.5	soil	2015-03-31	00:00	2015-04-02
390232	AH-2 4-4.5	soil	2015-03-31	00:00	2015-04-02
390233	AH-2 5-5.5	soil	2015-03-31	00:00	2015-04-02
390234	AH-2 6-6.5	soil	2015-03-31	00:00	2015-04-02
390235	AH-2 7-7.5	soil	2015-03-31	00:00	2015-04-02
390236	AH-3 0-1	soil	2015-03-31	00:00	2015-04-02
390237	AH-3 1-1.5	soil	2015-03-31	00:00	2015-04-02
390238	AH-3 1.5-2.0	soil	2015-03-31	00:00	2015-04-02
390239	AH-4 0-1	soil	2015-03-31	00:00	2015-04-02
390240	AH-4 1-1.5	soil	2015-03-31	00:00	2015-04-02

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
390241	AH-4 2-2.5	soil	2015-03-31	00:00	2015-04-02
390242	AH-5 0-1	soil	2015-03-31	00:00	2015-04-02
390243	AH-5 1-1.5	soil	2015-03-31	00:00	2015-04-02
390244	AH-5 2-2.5	soil	2015-03-31	00:00	2015-04-02
390246	AH-6 0-1	soil	2015-03-31	00:00	2015-04-02
390247	AH-6 1-1.5	soil	2015-03-31	00:00	2015-04-02
390248	AH-6 2-2.5	soil	2015-03-31	00:00	2015-04-02

Notes

- **Work Order 15040201:** Run deeper sample if TPH exceeds 5,000 mg/kg, if Benzene exceeds 10mg/kg, or if total BTEX exceeds 50mg/kg. Run all Chlorides

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.

Dr. Blair Leftwich, Director
James Taylor, Assistant Director
Brian Pellam, Operations Manager

Report Contents

Case Narrative

Samples for project SM Energy Geronimo TB were received by TraceAnalysis, Inc. on 2015-04-02 and assigned to work order 15040201. Samples for work order 15040201 were received intact at a temperature of 7.1 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	102019	2015-04-06 at 14:57	120584	2015-04-08 at 09:10
Chloride (Titration)	SM 4500-Cl B	101955	2015-04-02 at 14:12	120485	2015-04-02 at 14:13
Chloride (Titration)	SM 4500-Cl B	101957	2015-04-02 at 14:19	120487	2015-04-02 at 14:20
Chloride (Titration)	SM 4500-Cl B	101974	2015-04-03 at 13:21	120515	2015-04-03 at 13:24
TPH DRO - NEW	S 8015 D	102134	2015-04-10 at 15:00	120689	2015-04-13 at 12:43
TPH GRO	S 8015 D	102019	2015-04-06 at 14:57	120585	2015-04-08 at 09:34

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 15040201 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: 390223 - AH-1 0-1

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	120584	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Benzene	U	5	<0.0200	mg/Kg	1	0.0200
Toluene	U	5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	5	<0.0200	mg/Kg	1	0.0200
Xylene	U	5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.58	mg/Kg	1	2.00	79	70 - 130
4-Bromofluorobenzene (4-BFB)			2.04	mg/Kg	1	2.00	102	70 - 130

Sample: 390223 - AH-1 0-1

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120485	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101955	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**3360**	mg/Kg	5	4.00

Sample: 390223 - AH-1 0-1

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	120689	Date Analyzed:	2015-04-13	Analyzed By:	SC
Prep Batch:	102134	Sample Preparation:	2015-04-10	Prepared By:	SC

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
DRO	Je,Qs	5	**1160**	mg/Kg	1	50.0

Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr		155	mg/Kg	1	100	155	70 - 130

Sample: 390223 - AH-1 0-1

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	120585	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Qs,U	5	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.66	mg/Kg	1	2.00	83	70 - 130
4-Bromofluorobenzene (4-BFB)			1.99	mg/Kg	1	2.00	100	70 - 130

Sample: 390224 - AH-1 1-1.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120485	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101955	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**192**	mg/Kg	5	4.00

Sample: 390225 - AH-1 2-2.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120485	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101955	Sample Preparation:	2015-04-02	Prepared By:	EM

continued ...

sample 390225 continued . . .

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**192**	mg/Kg	5	4.00

Sample: 390226 - AH-1 3-3.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120485	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101955	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**385**	mg/Kg	5	4.00

Sample: 390227 - AH-1 4-4.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120485	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101955	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**192**	mg/Kg	5	4.00

Sample: 390228 - AH-2 0-1

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	120584	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	Result	Units	Dilution	RL
Benzene	U	5	<0.0200	mg/Kg	1	0.0200
Toluene	U	5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	5	<0.0200	mg/Kg	1	0.0200
Xylene	U	5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.42	mg/Kg	1	2.00	71	70 - 130
4-Bromofluorobenzene (4-BFB)			1.79	mg/Kg	1	2.00	90	70 - 130

Sample: 390228 - AH-2 0-1

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120485	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101955	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			**1440**	mg/Kg	5	4.00

Sample: 390228 - AH-2 0-1

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	120689	Date Analyzed:	2015-04-13	Analyzed By:	SC
Prep Batch:	102134	Sample Preparation:	2015-04-10	Prepared By:	SC

Parameter	Flag	Cert	Result	Units	Dilution	RL
DRO	Qs	5	**2200**	mg/Kg	5	50.0

Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr		200	mg/Kg	5	100	200	70 - 130

Sample: 390228 - AH-2 0-1

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	120585	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Qs,U	5	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.58	mg/Kg	1	2.00	79	70 - 130
4-Bromofluorobenzene (4-BFB)			1.85	mg/Kg	1	2.00	92	70 - 130

Sample: 390229 - AH-2 1-1.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120485	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101955	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**385**	mg/Kg	5	4.00

Sample: 390230 - AH-2 2-2.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120485	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101955	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**192**	mg/Kg	5	4.00

Sample: 390231 - AH-2 3-3.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120485	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101955	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**1060**	mg/Kg	5	4.00

Sample: 390232 - AH-2 4-4.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120487	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101957	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**762**	mg/Kg	5	4.00

Sample: 390233 - AH-2 5-5.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120487	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101957	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**381**	mg/Kg	5	4.00

Sample: 390234 - AH-2 6-6.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120487	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101957	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**476**	mg/Kg	5	4.00

Sample: 390235 - AH-2 7-7.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120487	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101957	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**190**	mg/Kg	5	4.00

Sample: 390236 - AH-3 0-1

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	120584	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Benzene [1]	U	5	<0.0400	mg/Kg	2	0.0200
Toluene		5	**0.0501**	mg/Kg	2	0.0200
Ethylbenzene		5	**0.0492**	mg/Kg	2	0.0200
Xylene		5	**0.498**	mg/Kg	2	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.97	mg/Kg	2	4.00	74	70 - 130
4-Bromofluorobenzene (4-BFB)			3.82	mg/Kg	2	4.00	96	70 - 130

Sample: 390236 - AH-3 0-1

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120487	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101957	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**1240**	mg/Kg	5	4.00

Sample: 390236 - AH-3 0-1

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	120689	Date Analyzed:	2015-04-13	Analyzed By:	SC
Prep Batch:	102134	Sample Preparation:	2015-04-10	Prepared By:	SC

Parameter	Flag	Cert	Result	RL Result	Units	Dilution	RL
DRO	Qs	5	**521**		mg/Kg	5	50.0

Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr		151	mg/Kg	5	100	151	70 - 130

Sample: 390236 - AH-3 0-1

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	120585	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Result	Units	Dilution	RL
GRO	Qs	5	**16.1**		mg/Kg	2	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			3.45	mg/Kg	2	4.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)			4.55	mg/Kg	2	4.00	114	70 - 130

Sample: 390237 - AH-3 1-1.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120487	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101957	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	Result	RL Result	Units	Dilution	RL
Chloride			**190**		mg/Kg	5	4.00

Sample: 390238 - AH-3 1.5-2.0

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120487	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101957	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**190**	mg/Kg	5	4.00

Sample: 390239 - AH-4 0-1

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	120584	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	5	<0.0200	mg/Kg	1	0.0200
Toluene	U	5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	5	<0.0200	mg/Kg	1	0.0200
Xylene	U	5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.45	mg/Kg	1	2.00	72	70 - 130
4-Bromofluorobenzene (4-BFB)			1.88	mg/Kg	1	2.00	94	70 - 130

Sample: 390239 - AH-4 0-1

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120487	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101957	Sample Preparation:	2015-04-02	Prepared By:	EM

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

Sample: 390239 - AH-4 0-1

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	120689	Date Analyzed:	2015-04-13	Analyzed By:	SC
Prep Batch:	102134	Sample Preparation:	2015-04-10	Prepared By:	SC

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
DRO	Qs,U	5	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			92.2	mg/Kg	1	100	92	70 - 130

Sample: 390239 - AH-4 0-1

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	120585	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
GRO	Qs,U	5	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.68	mg/Kg	1	2.00	84	70 - 130
4-Bromofluorobenzene (4-BFB)			1.91	mg/Kg	1	2.00	96	70 - 130

Sample: 390240 - AH-4 1-1.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120487	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101957	Sample Preparation:	2015-04-02	Prepared By:	EM

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

Sample: 390241 - AH-4 2-2.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120487	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101957	Sample Preparation:	2015-04-02	Prepared By:	EM

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**190**	mg/Kg	5	4.00

Sample: 390242 - AH-5 0-1

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	120584	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Benzene [2]	U	5	<0.0400	mg/Kg	2	0.0200
Toluene		5	**0.226**	mg/Kg	2	0.0200
Ethylbenzene		5	**0.510**	mg/Kg	2	0.0200
Xylene		5	**2.63**	mg/Kg	2	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.99	mg/Kg	2	4.00	75	70 - 130
4-Bromofluorobenzene (4-BFB)			4.98	mg/Kg	2	4.00	124	70 - 130

Sample: 390242 - AH-5 0-1

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120515	Date Analyzed:	2015-04-03	Analyzed By:	EM
Prep Batch:	101974	Sample Preparation:	2015-04-03	Prepared By:	EM

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**670**	mg/Kg	5	4.00

Sample: 390242 - AH-5 0-1

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	120689	Date Analyzed:	2015-04-13	Analyzed By:	SC
Prep Batch:	102134	Sample Preparation:	2015-04-10	Prepared By:	SC

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
DRO	Qs	5	**1580**	mg/Kg	5	50.0

Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr		191	mg/Kg	5	100	191	70 - 130

Sample: 390242 - AH-5 0-1

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	120585	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
GRO	Qs	5	**100**	mg/Kg	2	4.00

Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)				3.31	mg/Kg	2	4.00	83	70 - 130
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr		7.59	mg/Kg	2	4.00	190	70 - 130

Sample: 390243 - AH-5 1-1.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120515	Date Analyzed:	2015-04-03	Analyzed By:	EM
Prep Batch:	101974	Sample Preparation:	2015-04-03	Prepared By:	EM

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

Sample: 390244 - AH-5 2-2.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120515	Date Analyzed:	2015-04-03	Analyzed By:	EM
Prep Batch:	101974	Sample Preparation:	2015-04-03	Prepared By:	EM

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

Sample: 390246 - AH-6 0-1

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	120584	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Benzene [3]	U	5	<0.0400	mg/Kg	2	0.0200
Toluene		5	**0.351**	mg/Kg	2	0.0200
Ethylbenzene		5	**1.36**	mg/Kg	2	0.0200
Xylene		5	**4.89**	mg/Kg	2	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			3.34	mg/Kg	2	4.00	84	70 - 130
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr	6.75	mg/Kg	2	4.00	169	70 - 130

Sample: 390246 - AH-6 0-1

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120515	Date Analyzed:	2015-04-03	Analyzed By:	EM
Prep Batch:	101974	Sample Preparation:	2015-04-03	Prepared By:	EM

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**5930**	mg/Kg	5	4.00

Sample: 390246 - AH-6 0-1

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	120689	Date Analyzed:	2015-04-13	Analyzed By:	SC
Prep Batch:	102134	Sample Preparation:	2015-04-10	Prepared By:	SC

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
DRO	Qs	5	**483**	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			98.7	mg/Kg	1	100	99	70 - 130

Sample: 390246 - AH-6 0-1

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	120585	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	Sample Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
GRO	Qs	5	**247**	mg/Kg	2	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			3.33	mg/Kg	2	4.00	83	70 - 130
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr	13.5	mg/Kg	2	4.00	338	70 - 130

Sample: 390247 - AH-6 1-1.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120515	Date Analyzed:	2015-04-03	Analyzed By:	EM
Prep Batch:	101974	Sample Preparation:	2015-04-03	Prepared By:	EM

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**96.0**	mg/Kg	5	4.00

Sample: 390248 - AH-6 2-2.5

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	120515	Date Analyzed:	2015-04-03	Analyzed By:	EM
Prep Batch:	101974	Sample Preparation:	2015-04-03	Prepared By:	EM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**96.0**	mg/Kg	5	4.00

Method Blanks

Method Blank (1) QC Batch: 120485

QC Batch:	120485	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101955	QC Preparation:	2015-04-02	Prepared By:	EM

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

Method Blank (1) QC Batch: 120487

QC Batch:	120487	Date Analyzed:	2015-04-02	Analyzed By:	EM
Prep Batch:	101957	QC Preparation:	2015-04-02	Prepared By:	EM

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

Method Blank (1) QC Batch: 120515

QC Batch:	120515	Date Analyzed:	2015-04-03	Analyzed By:	EM
Prep Batch:	101974	QC Preparation:	2015-04-03	Prepared By:	EM

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

Method Blank (1) QC Batch: 120584

QC Batch:	120584	Date Analyzed:	2015-04-08	Analyzed By:	AK
Prep Batch:	102019	QC Preparation:	2015-04-06	Prepared By:	AK

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		5	<0.00533	mg/Kg	0.02
Toluene		5	<0.00645	mg/Kg	0.02
Ethylbenzene		5	<0.0116	mg/Kg	0.02
Xylene		5	<0.00874	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.58	mg/Kg	1	2.00	79	70 - 130
4-Bromofluorobenzene (4-BFB)			1.84	mg/Kg	1	2.00	92	70 - 130

Method Blank (1) QC Batch: 120585

QC Batch: 120585 Date Analyzed: 2015-04-08 Analyzed By: AK
Prep Batch: 102019 QC Preparation: 2015-04-06 Prepared By: AK

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		5	<2.32	mg/Kg	4

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.73	mg/Kg	1	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)			1.84	mg/Kg	1	2.00	92	70 - 130

Method Blank (1) QC Batch: 120689

QC Batch: 120689 Date Analyzed: 2015-04-13 Analyzed By: SC
Prep Batch: 102134 QC Preparation: 2015-04-10 Prepared By: SC

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		5	<7.41	mg/Kg	50

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

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 120485 | Date Analyzed: 2015-04-02 | Analyzed By: EM
Prep Batch: 101955 | QC Preparation: 2015-04-02 | Prepared By: EM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2500	mg/Kg	5	2500	<19.2	100	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			2600	mg/Kg	5	2500	<19.2	104	85 - 115	4	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 120487 | Date Analyzed: 2015-04-02 | Analyzed By: EM
Prep Batch: 101957 | QC Preparation: 2015-04-02 | Prepared By: EM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2480	mg/Kg	5	2500	<19.2	99	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			2570	mg/Kg	5	2500	<19.2	103	85 - 115	4	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 120515 | Date Analyzed: 2015-04-03 | Analyzed By: EM
Prep Batch: 101974 | QC Preparation: 2015-04-03 | Prepared By: EM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2390	mg/Kg	5	2500	<19.2	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			2490	mg/Kg	5	2500	<19.2	100	85 - 115	4	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 120584 | Date Analyzed: 2015-04-08 | Analyzed By: AK
Prep Batch: 102019 | QC Preparation: 2015-04-06 | Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		5	1.49	mg/Kg	1	2.00	<0.00533	74	70 - 130
Toluene		5	1.50	mg/Kg	1	2.00	<0.00645	75	70 - 130
Ethylbenzene		5	1.62	mg/Kg	1	2.00	<0.0116	81	70 - 130
Xylene		5	4.87	mg/Kg	1	6.00	<0.00874	81	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		5	1.55	mg/Kg	1	2.00	<0.00533	78	70 - 130	4	20
Toluene		5	1.58	mg/Kg	1	2.00	<0.00645	79	70 - 130	5	20
Ethylbenzene		5	1.65	mg/Kg	1	2.00	<0.0116	82	70 - 130	2	20
Xylene		5	5.04	mg/Kg	1	6.00	<0.00874	84	70 - 130	3	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.43	1.52	mg/Kg	1	2.00	72	76	70 - 130
4-Bromofluorobenzene (4-BFB)	1.89	1.91	mg/Kg	1	2.00	94	96	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 120585 | Date Analyzed: 2015-04-08 | Analyzed By: AK
Prep Batch: 102019 | QC Preparation: 2015-04-06 | Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		[5]	15.3	mg/Kg	1	20.0	<2.32	76	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		[5]	15.0	mg/Kg	1	20.0	<2.32	75	70 - 130	2	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.73	1.68	mg/Kg	1	2.00	86	84	70 - 130
4-Bromofluorobenzene (4-BFB)	2.04	1.99	mg/Kg	1	2.00	102	100	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 120689 | Date Analyzed: 2015-04-13 | Analyzed By: SC
Prep Batch: 102134 | QC Preparation: 2015-04-10 | Prepared By: SC

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		[5]	215	mg/Kg	1	250	<7.41	86	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		[5]	212	mg/Kg	1	250	<7.41	85	70 - 130	1	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane	90.0	92.4	mg/Kg	1	100	90	92	70 - 130

Matrix Spikes

Matrix Spike (MS-1) Spiked Sample: 390231

QC Batch: 120485 | Date Analyzed: 2015-04-02 | Analyzed By: EM
Prep Batch: 101955 | QC Preparation: 2015-04-02 | Prepared By: EM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			3460	mg/Kg	5	2500	1058	96	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			3460	mg/Kg	5	2500	1058	96	78.9 - 121	0	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: 390241

QC Batch: 120487 | Date Analyzed: 2015-04-02 | Analyzed By: EM
Prep Batch: 101957 | QC Preparation: 2015-04-02 | Prepared By: EM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2480	mg/Kg	5	2500	<19.2	99	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2570	mg/Kg	5	2500	<19.2	103	78.9 - 121	4	20

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

Matrix Spike (MS-1) Spiked Sample: 390242

QC Batch: 120515 | Date Analyzed: 2015-04-03 | Analyzed By: EM
Prep Batch: 101974 | QC Preparation: 2015-04-03 | Prepared By: EM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			3060	mg/Kg	5	2500	670	96	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			3160	mg/Kg	5	2500	670	100	78.9 - 121	3	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: 390223

QC Batch: 120584 | Date Analyzed: 2015-04-08 | Analyzed By: AK
Prep Batch: 102019 | QC Preparation: 2015-04-06 | Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		5	1.46	mg/Kg	1	2.00	<0.00533	73	70 - 130
Toluene		5	1.48	mg/Kg	1	2.00	<0.00645	74	70 - 130
Ethylbenzene		5	1.51	mg/Kg	1	2.00	<0.0116	76	70 - 130
Xylene		5	4.48	mg/Kg	1	6.00	<0.00874	75	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		5	1.54	mg/Kg	1	2.00	<0.00533	77	70 - 130	5	20
Toluene		5	1.54	mg/Kg	1	2.00	<0.00645	77	70 - 130	4	20
Ethylbenzene		5	1.60	mg/Kg	1	2.00	<0.0116	80	70 - 130	6	20
Xylene		5	4.78	mg/Kg	1	6.00	<0.00874	80	70 - 130	6	20

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

Surrogate			MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	Qsr	Qsr	1.36	1.45	mg/Kg	1	2	68	72	70 - 130
4-Bromofluorobenzene (4-BFB)			1.89	1.90	mg/Kg	1	2	94	95	70 - 130

Matrix Spike (xMS-1) Spiked Sample: 390223

QC Batch: 120585 | Date Analyzed: 2015-04-08 | Analyzed By: AK
Prep Batch: 102019 | QC Preparation: 2015-04-06 | Prepared By: AK

Param		F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	Qs	Qs	5	33.1	mg/Kg	5	20.0	23.6	48	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO Qs	Qs	5	31.9	mg/Kg	5	20.0	23.6	42	70 - 130	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)	8.72	8.65	mg/Kg	5	10	87	86	70 - 130
4-Bromofluorobenzene (4-BFB)	9.91	9.72	mg/Kg	5	10	99	97	70 - 130

Matrix Spike (xMS-1) Spiked Sample: 390070

QC Batch: 120689 | Date Analyzed: 2015-04-13 | Analyzed By: SC
Prep Batch: 102134 | QC Preparation: 2015-04-10 | Prepared By: SC

Param		F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	Qs	Qs	5	535	mg/Kg	2	250	410	50	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO Qs	Qs	5	573	mg/Kg	2	250	410	65	70 - 130	7	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane	106	122	mg/Kg	2	100	106	122	70 - 130

Calibration Standards

Standard (ICV-1)

QC Batch: 120485 Date Analyzed: 2015-04-02 Analyzed By: EM

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.0	99	85 - 115	2015-04-02

Standard (CCV-1)

QC Batch: 120485 Date Analyzed: 2015-04-02 Analyzed By: EM

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	2015-04-02

Standard (ICV-1)

QC Batch: 120487 Date Analyzed: 2015-04-02 Analyzed By: EM

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.0	99	85 - 115	2015-04-02

Standard (CCV-1)

QC Batch: 120487 Date Analyzed: 2015-04-02 Analyzed By: EM

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	2015-04-02

Standard (ICV-1)

QC Batch: 120515 | Date Analyzed: 2015-04-03 | Analyzed By: EM

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2015-04-03

Standard (CCV-1)

QC Batch: 120515 | Date Analyzed: 2015-04-03 | Analyzed By: EM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2015-04-03

Standard (CCV-1)

QC Batch: 120584 | Date Analyzed: 2015-04-08 | Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		5	mg/kg	0.100	0.0921	92	80 - 120	2015-04-08
Toluene		5	mg/kg	0.100	0.0887	89	80 - 120	2015-04-08
Ethylbenzene		5	mg/kg	0.100	0.0884	88	80 - 120	2015-04-08
Xylene		5	mg/kg	0.300	0.265	88	80 - 120	2015-04-08

Standard (CCV-2)

QC Batch: 120584 | Date Analyzed: 2015-04-08 | Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		5	mg/kg	0.100	0.0903	90	80 - 120	2015-04-08
Toluene		5	mg/kg	0.100	0.0847	85	80 - 120	2015-04-08
Ethylbenzene		5	mg/kg	0.100	0.0814	81	80 - 120	2015-04-08
Xylene		5	mg/kg	0.300	0.247	82	80 - 120	2015-04-08

Standard (CCV-3)

QC Batch: 120584 Date Analyzed: 2015-04-08 Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		5	mg/kg	0.100	0.0903	90	80 - 120	2015-04-08
Toluene		5	mg/kg	0.100	0.0856	86	80 - 120	2015-04-08
Ethylbenzene		5	mg/kg	0.100	0.0821	82	80 - 120	2015-04-08
Xylene		5	mg/kg	0.300	0.248	83	80 - 120	2015-04-08

Standard (CCV-1)

QC Batch: 120585 Date Analyzed: 2015-04-08 Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		5	mg/Kg	1.00	1.13	113	80 - 120	2015-04-08

Standard (CCV-2)

QC Batch: 120585 Date Analyzed: 2015-04-08 Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		5	mg/Kg	1.00	1.00	100	80 - 120	2015-04-08

Standard (CCV-3)

QC Batch: 120585 Date Analyzed: 2015-04-08 Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		5	mg/Kg	1.00	0.866	87	80 - 120	2015-04-08

Standard (CCV-2)

QC Batch: 120689 | Date Analyzed: 2015-04-13 | Analyzed By: SC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		5	mg/Kg	250	225	90	80 - 120	2015-04-13

Standard (CCV-3)

QC Batch: 120689 | Date Analyzed: 2015-04-13 | Analyzed By: SC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		5	mg/Kg	250	205	82	80 - 120	2015-04-13

Appendix

Report Definitions

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

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	PJLA	L14-93	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-15-11	Lubbock
5	NELAP	T104704392-14-8	Midland
6		2014-018	Lubbock

Standard Flags

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

F	Description
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

Result Comments

1 Dilution due to hydrocarbons.
2 Dilution due to hydrocarbons.
3 Dilution due to hydrocarbons.

Attachments

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

WO#: 15040201

Analysis Request of Chain of Custody Record

PAGE: | OF: 3

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

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: SM Energy | SITE MANAGER: Ike Tavarez

PROJECT NO.: TBD | PROJECT NAME: Geronimo TB

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH TX1005 (Ext. to C35) / 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
	2015					Eddy Co. NM																						
390223	3.31		S		X	AH-1 0-1	1				X		X	X											X				
390224						1-1.5	1				X														X				
390225						2-2.5	1				X														X				
390226						3-3.5	1				X														X				
390227						4-4.5	1				X														X				
390228						AH-2 0-1	1				X		X	X											X				
390229						1-1.5	1				X														X				
390230						2-2.5	1				X														X				
390231						3-3.5	1				X														X				
390232						4-4.5	1				X														X				

RELINQUISHED BY: (Signature) Carlos Gonzales — Date: 3-2-15 Time: 3804
RECEIVED BY: (Signature) Nadia — Date: 3-2-15 Time: 8:04
SAMPLED BY: (Print & Initial) CG & AG — Date: 3-21-15 Time:

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: OTHER:

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:
TETRA TECH CONTACT PERSON: Ike Tavarez — Results by:

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

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 7.1

REMARKS: Run deeper samples if TPH exceeds 5,000 mg/kg, if Benzene exceeds 10 mg/kg OR if total BTEX exceeds 50 mg/kg

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

Run all Chlorides

WO#: 15040201

Analysis Request of Chain of Custody Record

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

CLIENT NAME: SM Energy
SITE MANAGER: Ike Tavarez
PROJECT NO.: TBD
PROJECT NAME: Geronimo TB

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB I.D. NUMBER	DATE 2015	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION Eddy NM	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH TX1005 (Ext. to C35)	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
390233	3.31		S		X	AH-2 5-5.5	1				X															X				
390234						6-6.5	1				X															X				
390235						7-7.5	1				X															X				
390236						AH-3 0-1	1				X		X	X												X				
390237						1-1.5	1				X															X				
390238						1.5-2.0	1				X															X				
390239						AH-4 0-1	1				X		X	X												X				
390240						1-1.5	1				X															X				
390241						2-2.5	1				X															X				
390242						AH-5 0-1	1				X		X	X												X				

RELINQUISHED BY: (Signature) Clair Gonzales — Date: 4.2.15 Time: 0804
RECEIVED BY: (Signature) — Date: 4-2-15 Time: 1:04
SAMPLED BY: (Print & Initial) CG, AG — Date: 3.31.15 Time:

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

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

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

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

TETRA TECH CONTACT PERSON: Ike Tavarez

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 7.1

REMARKS:

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

AT

WO#: 15040201

Analysis Request of Chain of Custody Record

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

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: SM Energy
SITE MANAGER: Ike Tavarez
PROJECT NO.: TBD
PROJECT NAME: Geronimo TB

LAB I.D. NUMBER	DATE 2015	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION Eddy Co. NM	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
390243	3-31		S		X	AH-5 1-1.5	1				X													X				
390244						2-2.5	1				X													X				
~~390245~~						3-3.5	1				X													X				
390246						AH-6 0-1	1				X		X	X										X				
390247						1-1.5	1				X													X				
390248	↓		↓		↓	2-2.5	1				X													X				

RELINQUISHED BY: (Signature) Oliver Gonzales — Date: 4-2-15 Time: 0804
RECEIVED BY: (Signature) Nalda — Date: 4-2-15 Time: 8:04
SAMPLED BY: (Print & Initial) CG3 AG — Date: 3-31-15 Time:

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS
AIRBILL #:

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

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

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

SAMPLE CONDITION WHEN RECEIVED: 7.1
REMARKS: AH5 3-3.5 missing. 4-2-15 AT AT

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

WO#: 1504020I

Analysis Request of Chain of Custody Record

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

CLIENT NAME: SM Energy
SITE MANAGER: Ike Tavarez
PROJECT NO.: TBD
PROJECT NAME: Geronimo TB

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB I.D. NUMBER	DATE 2015	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE
390243	3-31		S		X	AH-5 1-1.5	1				X	
390244						2-2.5	1				X	
390245						3-3.5	1				X	
390246						AH-6 0-1	1				X	
390247						1-1.5	1				X	
390248	↓		↓		↓	2-2.5	1				X	

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
X	X											X				
												X				
												X				
												X				
												X				
												X				
												X				

RELINQUISHED BY: (Signature) Date: 4-2-15 Time: 8:00
RECEIVED BY: (Signature) Date: 4-2-15 Time: 8:00
SAMPLED BY: (Print & Initial) CG3 AG Date: 3-31-15 Time:
RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS AIRBILL #: OTHER:
RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:
TETRA TECH CONTACT PERSON: Ike Tavarez
Results by:
RECEIVING LABORATORY:
ADDRESS:
CITY: STATE: ZIP:
CONTACT: PHONE: DATE: TIME:
RECEIVED BY: (Signature)
RUSH Charges Authorized: Yes No
SAMPLE CONDITION WHEN RECEIVED: 7.1
REMARKS: AH5 3-3.5 missing. 4-2-15 AT AT

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

Analytical Report 524229

for

Tetra Tech- Midland

Project Manager: Ike Tavarez

Geronimo TB

212C-MD-00213

12-FEB-16

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-15-19), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534-15-1)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Texas (T104704477), Louisiana (04176), USDA (P330-07-00105)

Xenco-Lakeland: Florida (E84098)

12-FEB-16

Project Manager: **Ike Tavarez**
Tetra Tech- Midland
4000 N. Big Spring Suite 401
Midland, TX 79705

Reference: XENCO Report No(s): **524229**
Geronimo TB
Project Address: Lea Co. NM

Ike Tavarez:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 524229. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 524229 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 524229

Tetra Tech- Midland, Midland, TX

Geronimo TB

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH 1 (0-1)	S	02-03-16 00:00	0 - 1 N/A	524229-001
AH 2 (0-1)	S	02-03-16 00:00	0 - 1 N/A	524229-002
AH 3 (0-1)	S	02-03-16 00:00	0 - 1 N/A	524229-003
AH 6 (0-1)	S	02-03-16 00:00	0 - 1 N/A	524229-004

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 524229

Tetra Tech- Midland, Midland, TX

Project Name: Geronimo TB

Project Id: 212C-MD-00213
Contact: Ike Tavarez
Project Location: Lea Co. NM

Date Received in Lab: Thu Feb-04-16 10:03 am
Report Date: 12-FEB-16
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	524229-001		524229-002		524229-003		524229-004					
	Field Id:	AH 1 (0-1)		AH 2 (0-1)		AH 3 (0-1)		AH 6 (0-1)					
	Depth:	0-1 N/A		0-1 N/A		0-1 N/A		0-1 N/A					
	Matrix:	SOLID		SOLID		SOLID		SOLID					
	Sampled:	Feb-03-16 00:00		Feb-03-16 00:00		Feb-03-16 00:00		Feb-03-16 00:00					
Inorganic Anions by EPA 300/300.1	***Extracted:***	Feb-10-16 16:00		Feb-10-16 16:00		Feb-10-16 16:00		Feb-10-16 16:00					
	Analyzed:	Feb-11-16 01:04		Feb-11-16 01:22		Feb-11-16 01:40		Feb-12-16 02:38					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride		2090	200	988	100	63.4	10.0	174	10.0				

Kelsey Brooks
Project Manager

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

	Phone	Fax
4147 Greenbriar Dr, Stafford, TX 77477	(281) 240-4200	(281) 240-4280
9701 Harry Hines Blvd , Dallas, TX 75220	(214) 902 0300	(214) 351-9139
5332 Blackberry Drive, San Antonio TX 78238	(210) 509-3334	(210) 509-3335
1211 W Florida Ave, Midland, TX 79701	(432) 563-1800	(432) 563-1713
2525 W. Huntington Dr. - Suite 102, Tempe AZ 85282	(602) 437-0330	

BS / BSD Recoveries

Project Name: Geronimo TB

Work Order #: 524229 **Project ID:** 212C-MD-00213

Analyst: MNR **Date Prepared:** 02/10/2016 **Date Analyzed:** 02/10/2016

Lab Batch ID: 987792 **Sample:** 704722-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<2.00	50.0	48.9	98	50.0	48.0	96	2	90-110	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS Recoveries

Project Name: Geronimo TB

Work Order #: 524229

Lab Batch #: 987792 **Project ID:** 212C-MD-00213

Date Analyzed: 02/12/2016 **Date Prepared:** 02/10/2016 **Analyst:** MNR

QC- Sample ID: 524410-001 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

Inorganic Anions by EPA 300	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	34.6	250	285	100	80-120	

Lab Batch #: 987792

Date Analyzed: 02/11/2016 **Date Prepared:** 02/10/2016 **Analyst:** MNR

QC- Sample ID: 524540-001 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

Inorganic Anions by EPA 300	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	1080	2500	3970	116	80-120	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Analysis Request of Chain of Custody Record

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

524229

PAGE: 1 OF: 1

CLIENT NAME: SM Energy

SITE MANAGER: Ike Tavarez

PROJECT NO.: 212C-MD-00013

PROJECT NAME: Geronimo TB (Lea Co., NM)

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE
	2-3-16		S		X	AH 1 (0-1)	1				X	
	2-3-16		S		X	AH 2 (0-1)	1				X	
	2-3-16		S		X	AH 3 (0-1)	1				X	
	2-3-16		S		X	AH 6 (0-1)	1				X	

ANALYSIS REQUEST (Circle or Specify Method No.)

BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
												X				
												X				
												X				
												X				

RELINQUISHED BY: (Signature) — Date: 2-4-16 Time: 0900
RECEIVED BY: (Signature) — Date: 2-4-16 Time: 0900
SAMPLED BY: (Print & Initial) Mathew M. Cole — Date: 2-3-16 Time:

RELINQUISHED BY: (Signature) — Date: 2-4-16 Time: 1003
RECEIVED BY: (Signature) — Date: 2/4/16 Time: 10:03
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: — OTHER:

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:
TETRA TECH CONTACT PERSON: Ike Tavarez — Results by:

RECEIVING LABORATORY: Xenco
ADDRESS:
CITY: STATE: ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 2°C

REMARKS:

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

XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 02/04/2016 10:03:00 AM

Work Order #: 524229

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : r8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	2
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6 *Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**No**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**N/A**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	**N/A**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: PH Device/Lot#:

Checklist completed by: Carley Owens Date: 02/04/2016

Carley Owens

Checklist reviewed by: Kelsey Brooks Date: 02/04/2016

Kelsey Brooks