

SITE INFORMATION

Report Type: Work Plan 2-RP 1138

General Site Information:

Site:	Artesia State Unit #901				
Company:	Alamo Permian Resources, LLC.				
Section, Township and Range	Sec 23	T18S	R27E		
Lease Number:	API-30-015-21448				
County:	Eddy County				
GPS:	32.74012° N			104.24484° W	
Surface Owner:	State				
Mineral Owner:					
Directions:	In Artesia, travel east on US 82 for 10.2 miles, turn right on Illinois Camp Rd (CR 206) and travel 3.8 miles, turn right and travel 2.1 miles to "T", continue straight and travel 0.2 miles, turn right to site.				

Release Data:

Date Released:	4/27/2012	RECEIVED
Type Release:	Produced Water	
Source of Contamination:	Hole in injection line	JUN 24 2013
Fluid Released:	20 bbls water	
Fluids Recovered:	0 bbls	NMOCD ARTESIA

Official Communication:

Name:	Steven Mastin	James F. Kennedy
Company:	Alamo Permian Resources, LLC.	Tetra Tech
Address:	415 W. Wall St. Suite 500	1910 N. Big Spring
P.O. Box		
City:	Midland Texas	Midland, Texas
Phone number:	(432) 557-5847	(432) 682-4559
Fax:		
Email:	smastin@alamoresources.com	james.kennedy@tetratech.com

Ranking Criteria

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	50'-75'
>100 ft.	0	
Wellhead Protection:	Ranking Score	Site Data
Water Source <1,000 ft., Private <200 ft.	20	
Water Source >1,000 ft., Private >200 ft.	0	0
Surface Body of Water:	Ranking Score	Site Data
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
Total Ranking Score:	20	

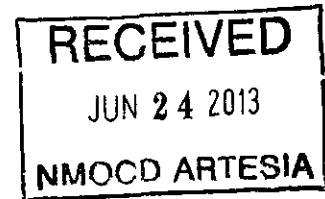
Acceptable Soil RRAL (mg/kg)

Benzene	Total BTEX	TPH
10	50	1,000



TETRA TECH

May 30, 2013



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

Re: Work Plan for the Alamo Permian Resources, LLC., Artesia State Unit #901 Well Site, Unit A, Section 23, Township 18 South, Range 27 East, Eddy County, New Mexico.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by Alamo Permian Resources, LLC (Alamo) to assess and remediate a spill from the Artesia State Unit #901 Well Site located Unit A, Section 23, Township 18 South, Range 27 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.74012°, W 104.24484°. The site location is shown on Figures 1 and 2.

Background

According to the C-141, a leak occurred as a result of a hole in the injection line and released approximately 20 barrels of produced water on April 27, 2012. None of the fluids were recovered from the release. The spill covered the part of the pad north of the well, and split into two paths as it ran off the well pad into the pasture to the north. The initial C-141 form is enclosed in Appendix A.

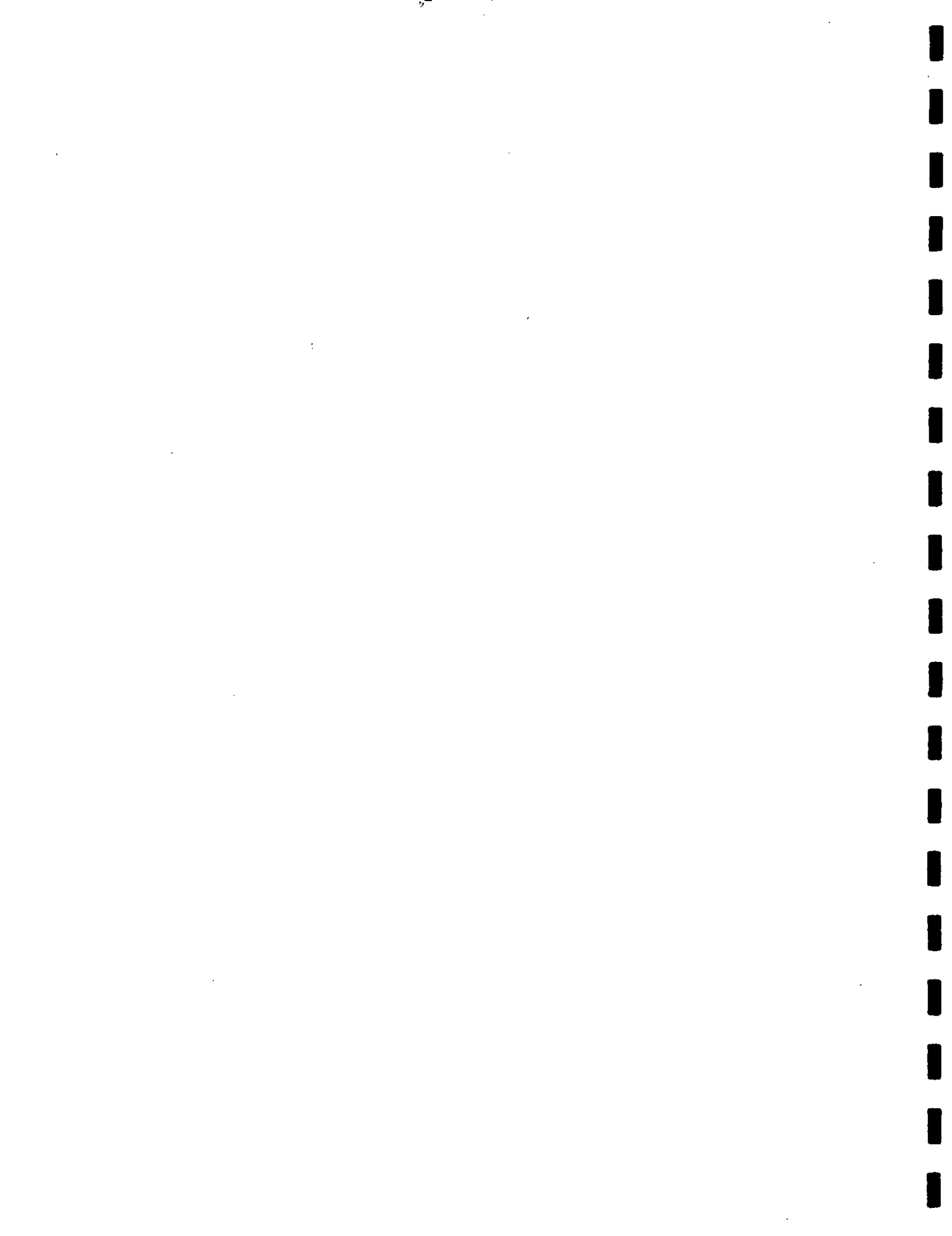
Tetra Tech

1910 North Big Spring, Midland, TX 79705

Tel 432.682.4559

Fax 432.682.3946

www.tetrattech.com





Groundwater

No water wells were listed within Section 23. The New Mexico Office of the State Engineer reports showed a well in Section 28, with a depth to groundwater of approximately 100.0' below surface. In addition, the NMOCD groundwater map also shows an average depth to groundwater of 50.0' to 75.0' in this area. The average depth to ground water data is shown in Appendix B.

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 1,000 mg/kg.

Soil Assessment

On October 1, 2012, Tetra Tech personnel inspected and sampled the spill area. Four (4) backhoe trenches (T-1 through T-4) were installed using a backhoe to assess the impacted soils. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. The sampling results are summarized in Table 1. The trench locations are shown on Figure 3. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C.

Referring to Table 1, all of the sample trench locations were below the RRAL for TPH and BTEX. Elevated chloride concentrations were detected in T-1, T-2 and T-4 from surface to a depth of 7.0', 10.0' and 4.0', respectively. Deeper samples were not collected due to the dense caliche formation. The chloride impact was not vertically defined. The area of T-3 did not show a significant chloride impact to the soils.

On February 20, 2013, Tetra Tech personnel supervised the installation of boreholes (BH-1, BH-2 and BH-3) utilizing an air rotary drilling rig to collect deeper samples in the areas of T-1, T-2 and T-4. The soil



TETRA TECH

borings were installed to a total depth of 40.0' for BH-1 (T-1), 25.0' for BH-2 (T-2), and 15.0' for BH-3 (T-4).

Referring to Table 1, chloride concentrations decreased with depth and the areas were vertically defined. Borehole (BH-1) showed a shallow impact to the soils, with a chloride high detected of 6,150 mg/Kg at a depth of 1.0', then declined to 567 mg/Kg at 5.0'. The areas of BH-2 and BH-3 did show a deeper impact to the soils declining significantly at depths from 6.0' to 9.0' below surface.

Proposed Work Plan

Alamo proposes to excavate the elevated chloride impacted soil. The proposed areas are highlighted (green) in Table 1 and shown on Figure 4. The area of T-1 will be excavated to a depth of approximately 1.0' below surface and approximately 3.0'-4.0' in the area of T-2 and T-4 to remove majority of impacted soils. Once excavated to the appropriate depths, the excavation will be backfilled with clean soil.

Based on site formation, the excavation depths may not be reached due to dense formations, wall cave ins and safety concerns for onsite personnel. In addition, impacted soil around oil and gas equipment, structures or lines may not be feasible or practicable to be removed due to safety concerns. As such, Tetra Tech will excavate the soils to the maximum extent practicable, if the depths are not reached, a 40 mil liner will be installed at depth of 3.0 below surface to cap the impacted area.

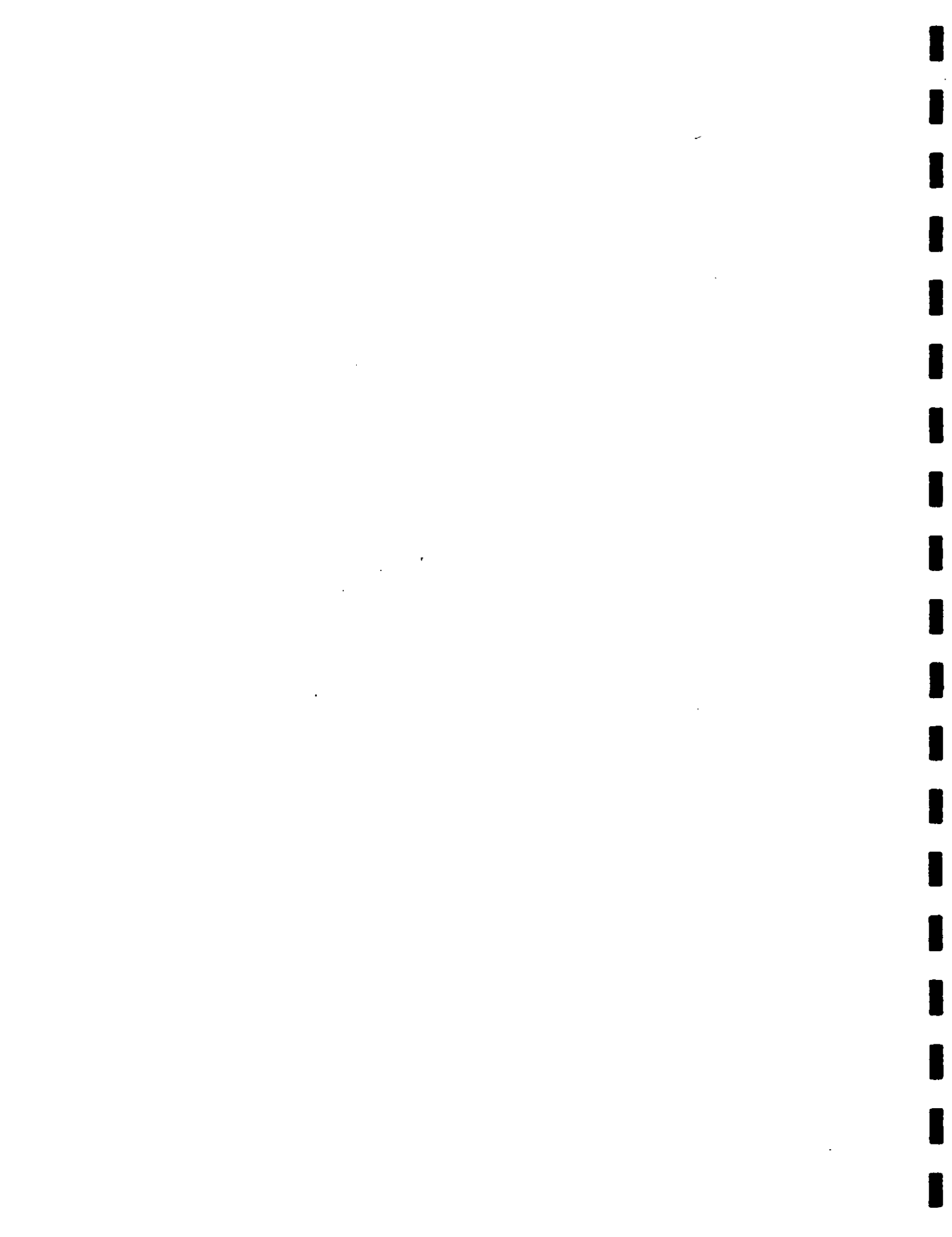
Final Reporting

Upon completion, a final report will be submitted to the NMOCD. If you have any questions or comments concerning the proposed remediation activities for this site, please call me at (432) 682-4559.

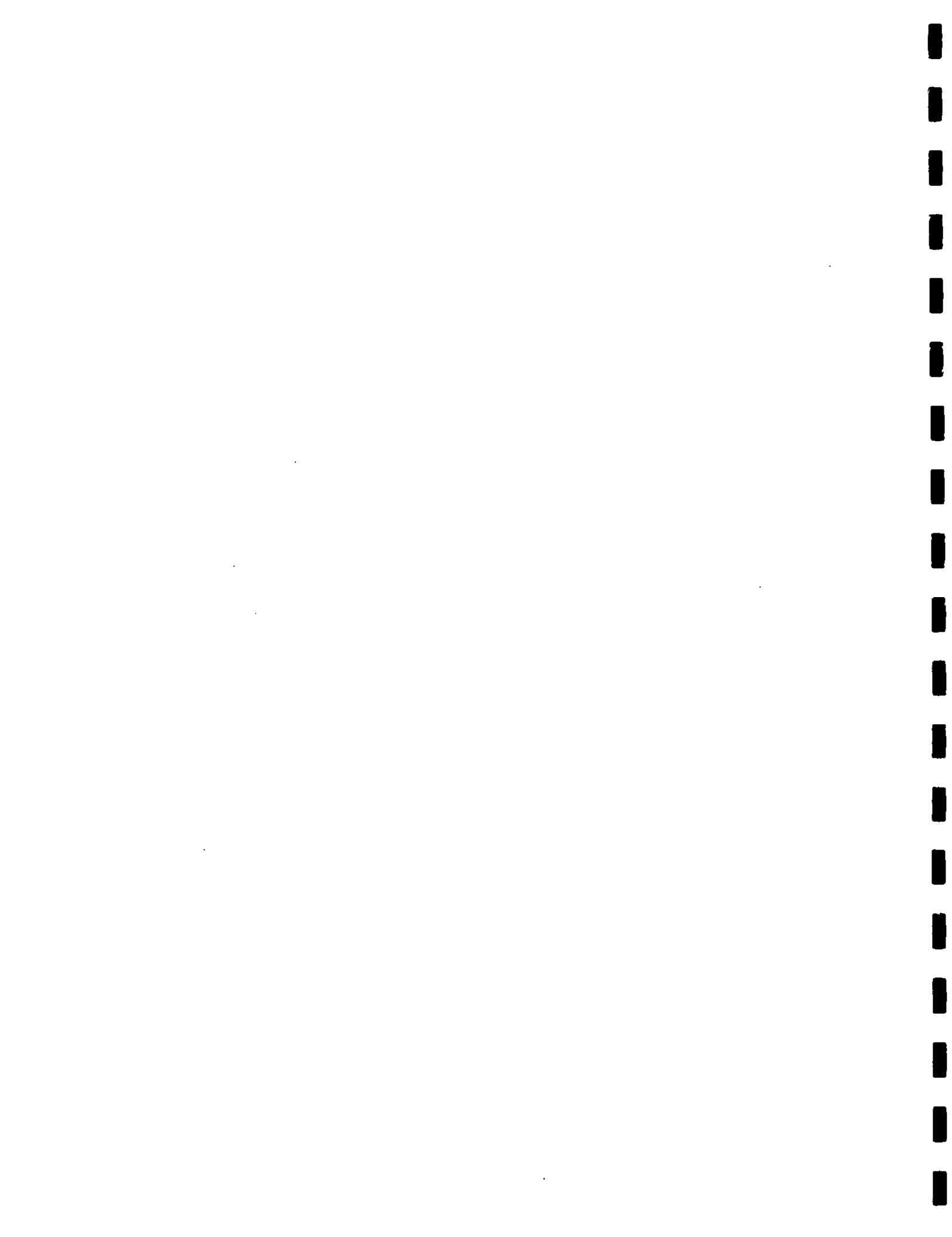
Respectfully submitted,
TETRA TECH

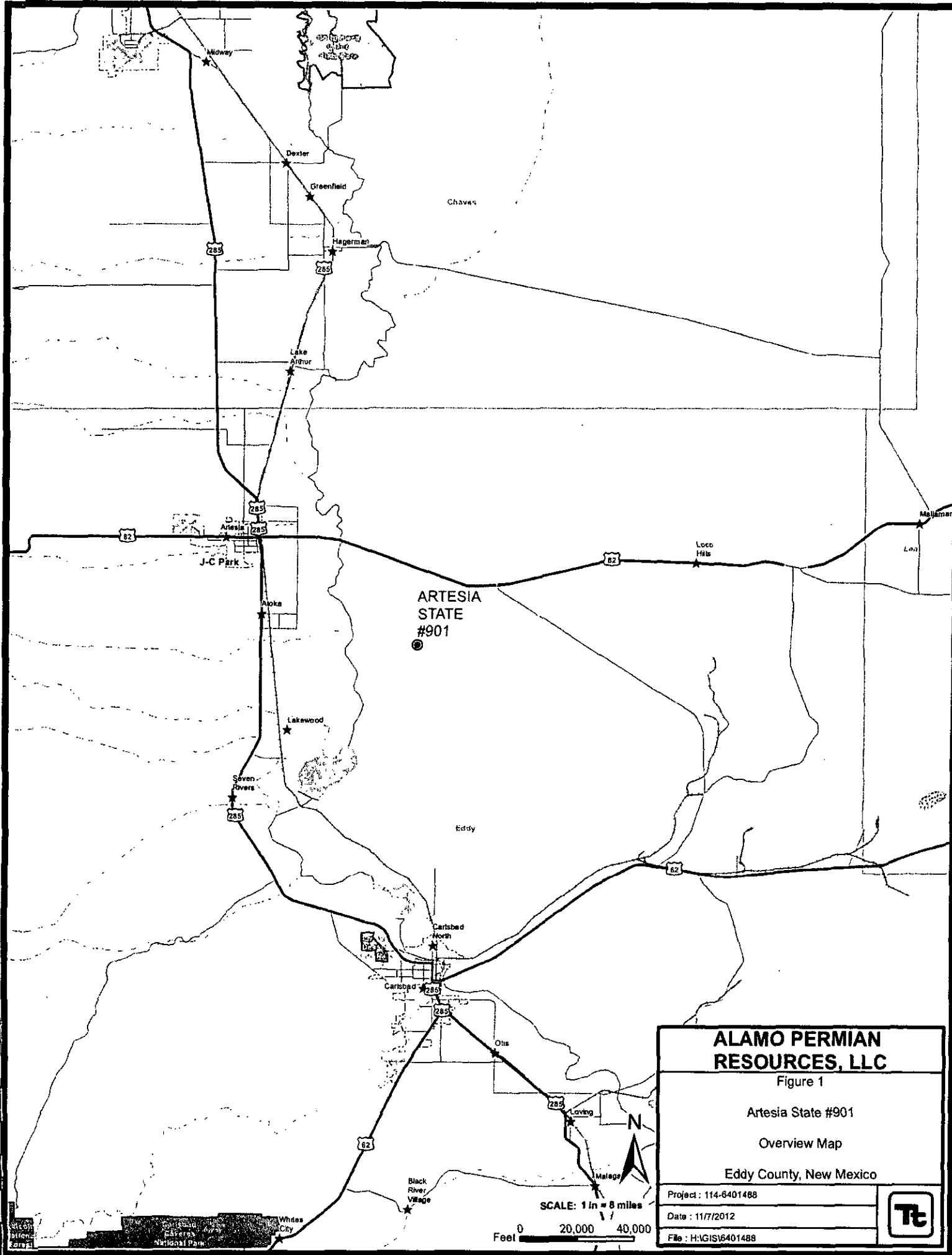
James F. Kennedy
Sr. Staff Professional

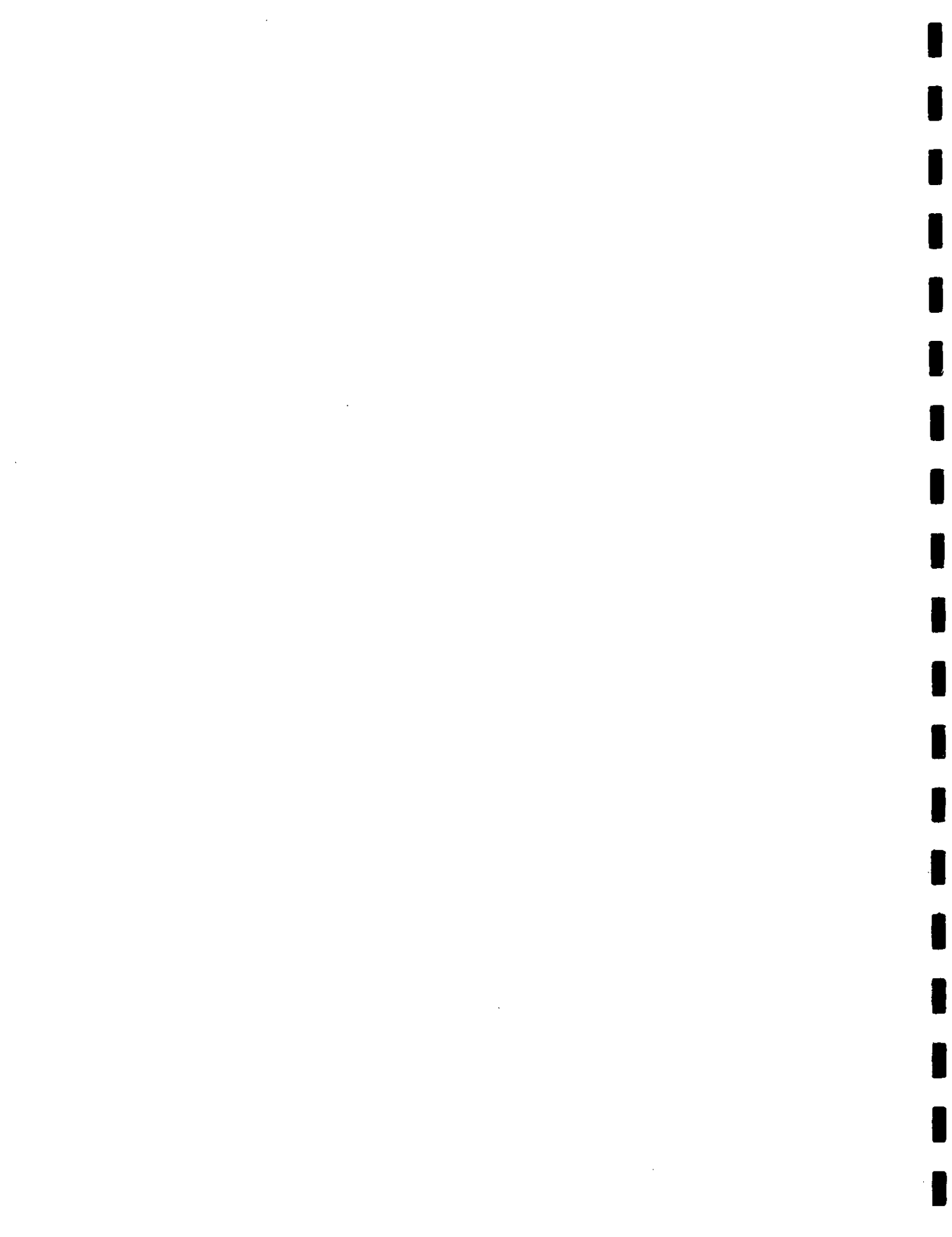
cc: Helm Oil – Michael Stewart
Helm Oil – Hollie Lamb

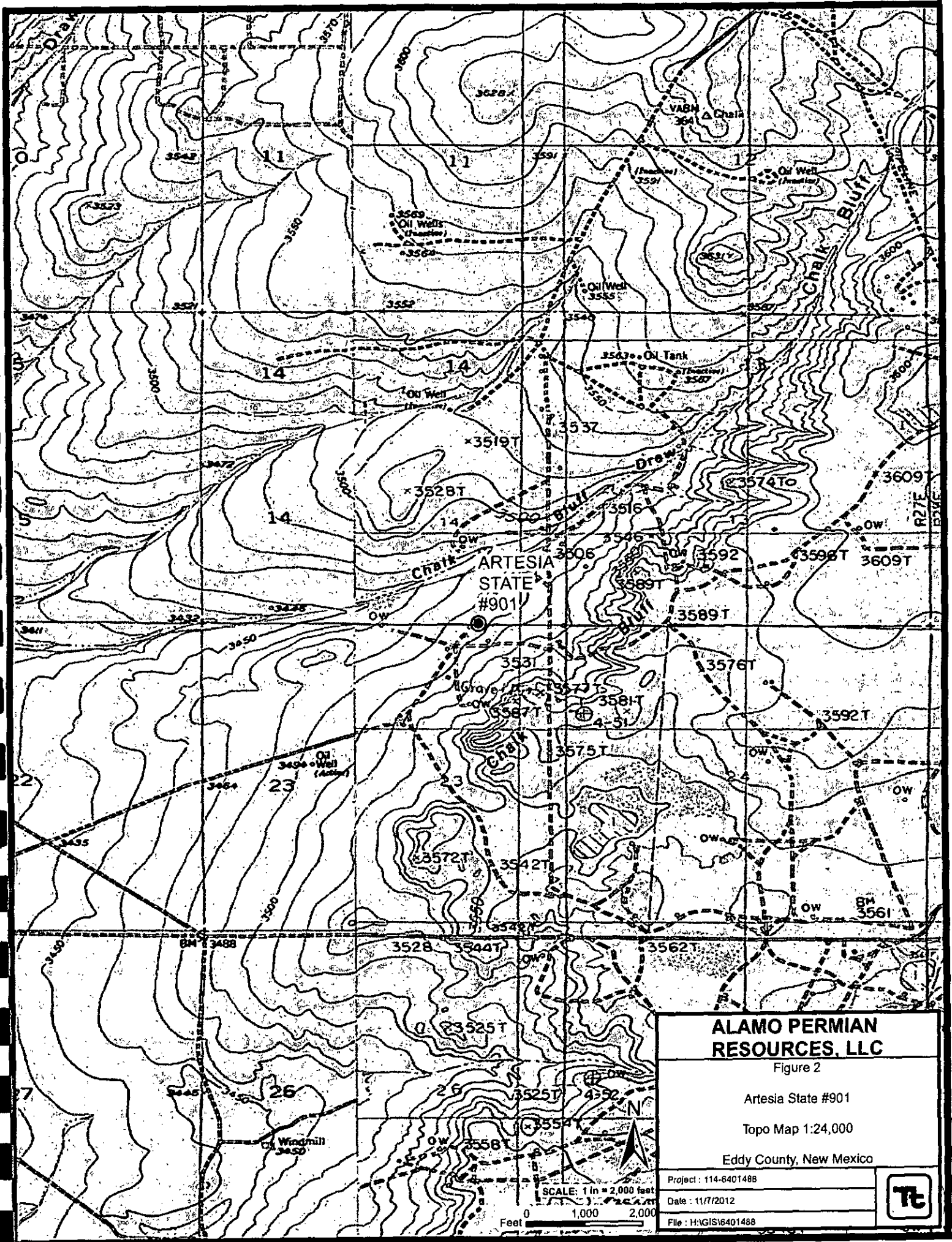


Figures









**ALAMO PERMIAN
RESOURCES, LLC**

Figure 2

Artesia State #901

Topo Map 1:24,000

Eddy County, New Mexico

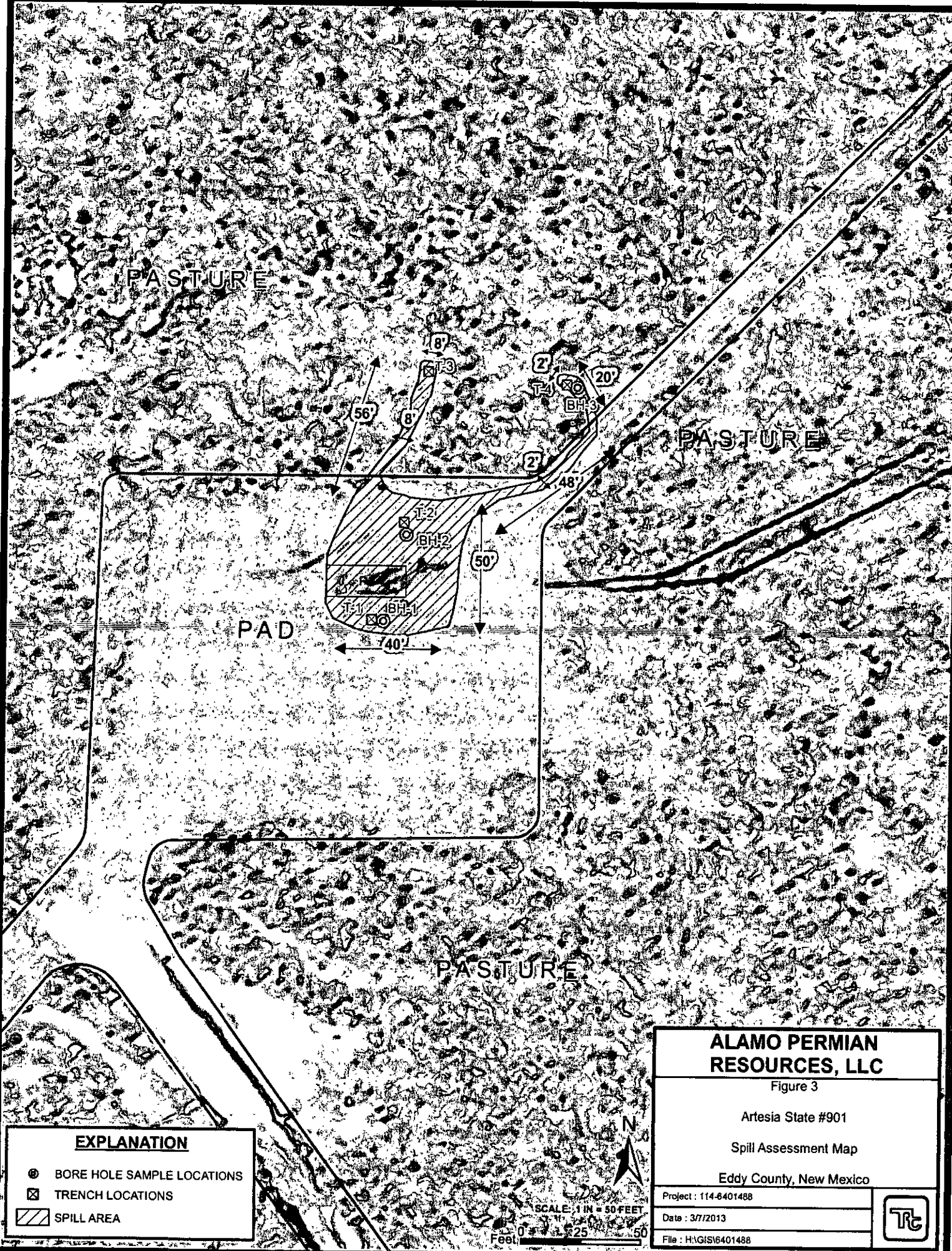
Project: 114-6401488

Date: 11/7/2012

File: H:\GIS\6401488







EXPLANATION

- ⊙ BORE HOLE SAMPLE LOCATIONS
- ⊠ TRENCH LOCATIONS
- ▨ SPILL AREA

**ALAMO PERMIAN
RESOURCES, LLC**

Figure 3

Artesia State #901

Spill Assessment Map

Eddy County, New Mexico

Project : 114-6401488

Date : 3/7/2013

File : H:\GIS\16401488



PASTURE

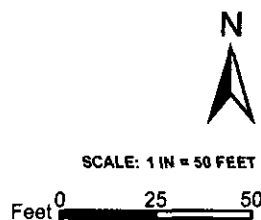
PASTURE

PAD

PASTURE

EXPLANATION

- BORE HOLE SAMPLE LOCATIONS
- ⊠ TRENCH LOCATIONS
- ▨ SPILL AREA



ALAMO PERMIAN RESOURCES, LLC	
Figure 3	
Artesia State #901	
Spill Assessment Map	
Eddy County, New Mexico	
Project : 114-6401488	
Date : 3/7/2013	
File : H:\GIS\6401488	

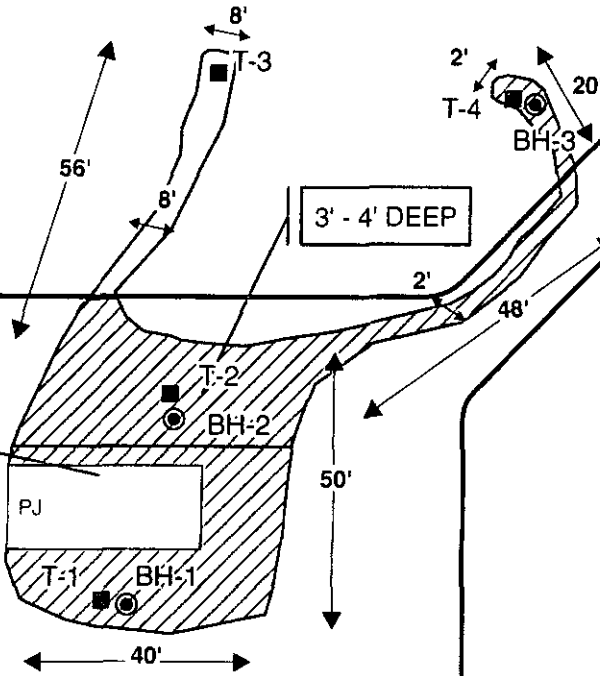


PASTURE

PASTURE

PASTURE

PAD



EXPLANATION

- BORE HOLE SAMPLE LOCATIONS
- TRENCH LOCATIONS
- ▨ PROPOSED EXCAVATION AREAS



SCALE: 1 IN = 38 FEET

Feet 0 20 40

**ALAMO PERMIAN
RESOURCES, LLC**

Figure 4

Artesia State #901

Proposed Excavation Areas & Depths Map

Eddy County, New Mexico

Project : 114-6401488

Date : 3/7/2013

File : H:\GIS\6401488





Tables

Table 1
Alamo Permian
Artesia State #901
Eddy County, New Mexico

[illegible]

Table 1
Alamo Permian
Artesia State #901
Eddy County, New Mexico

[illegible]



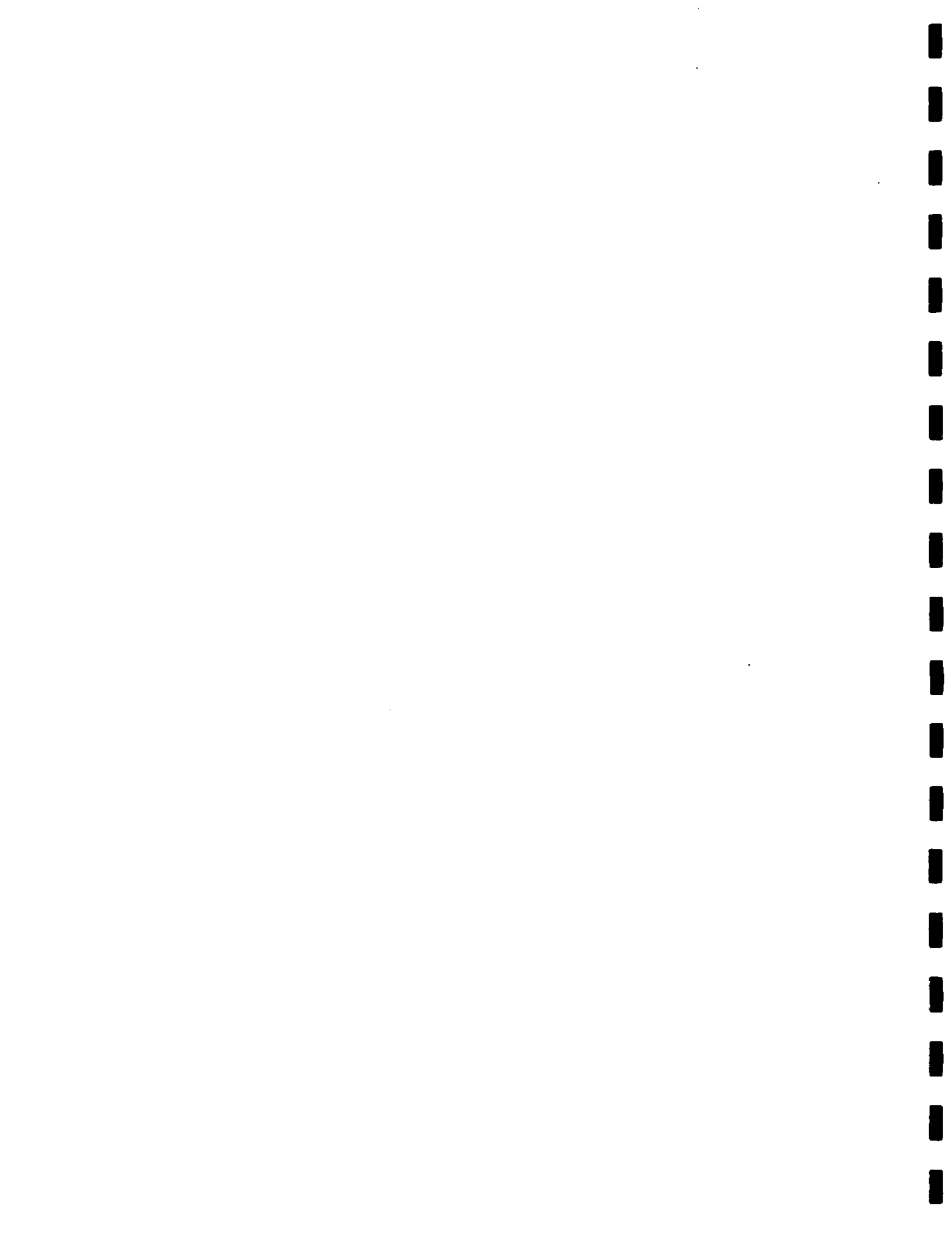
Table 1
Alamo Permian
Artesia State #901
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
T-3	10/1/2012	0-1	X		<1.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	794
	"	2	X		-	-	-	-	-	-	-	-	561
	"	4	X		-	-	-	-	-	-	-	-	794
	"	6	X		-	-	-	-	-	-	-	-	374
T-4	10/1/2012	0-1	X		<5.00	<50.0	<50.0	<0.100	<0.100	<0.100	<0.100	<0.100	1,260
	"	2	X		-	-	-	-	-	-	-	-	1,360
	"	4	X		-	-	-	-	-	-	-	-	1,500
	"	"											
BH-3	2/20/2013	0-1	X		-	-	-	-	-	-	-	-	6,210
	"	4-5	X		-	-	-	-	-	-	-	-	1,120
	"	9-10	X		-	-	-	-	-	-	-	-	<20.0
	"	14-15	X		-	-	-	-	-	-	-	-	147

(-) Not Analyzed
T-1 Backhoe Trenches
Proposed Excavation Depths



Photos



PHOTOGRAPHIC DOCUMENTATION

Alamo Permian Resources, LLC

Artesia State #901

Eddy County, New Mexico

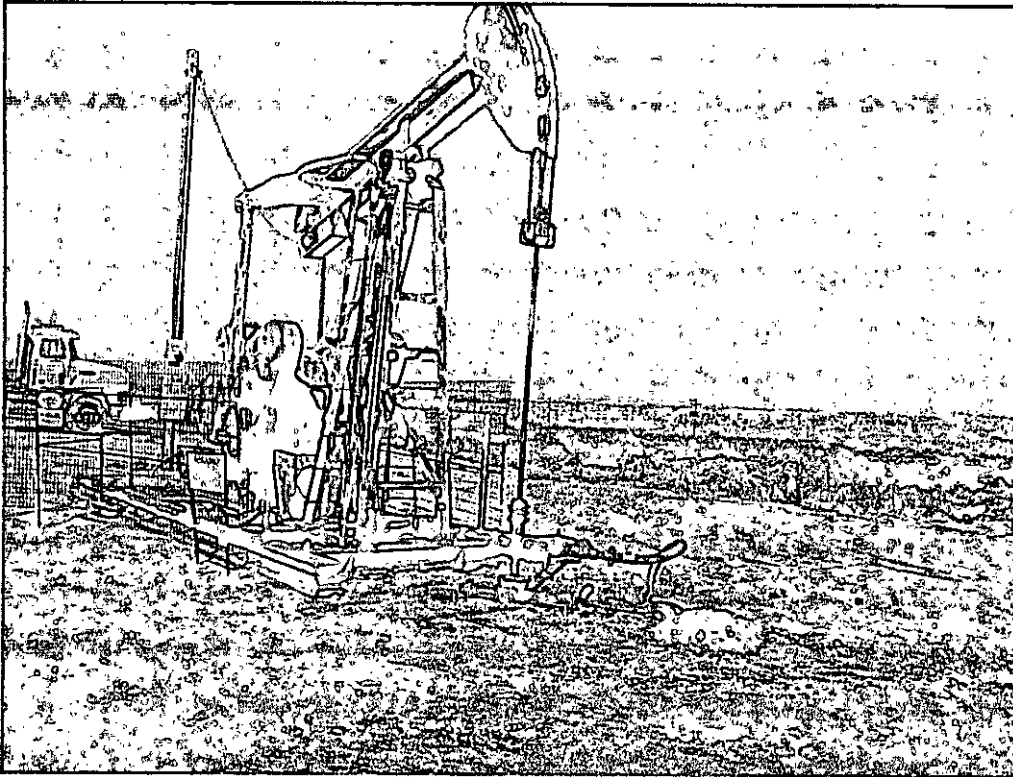


Photo 1. View of the release area on the well pad.



Photo 2. View of the backhoe trench #3 being installed.

PHOTOGRAPHIC DOCUMENTATION

Alamo Permian Resources, LLC

Artesia State #901

Eddy County, New Mexico

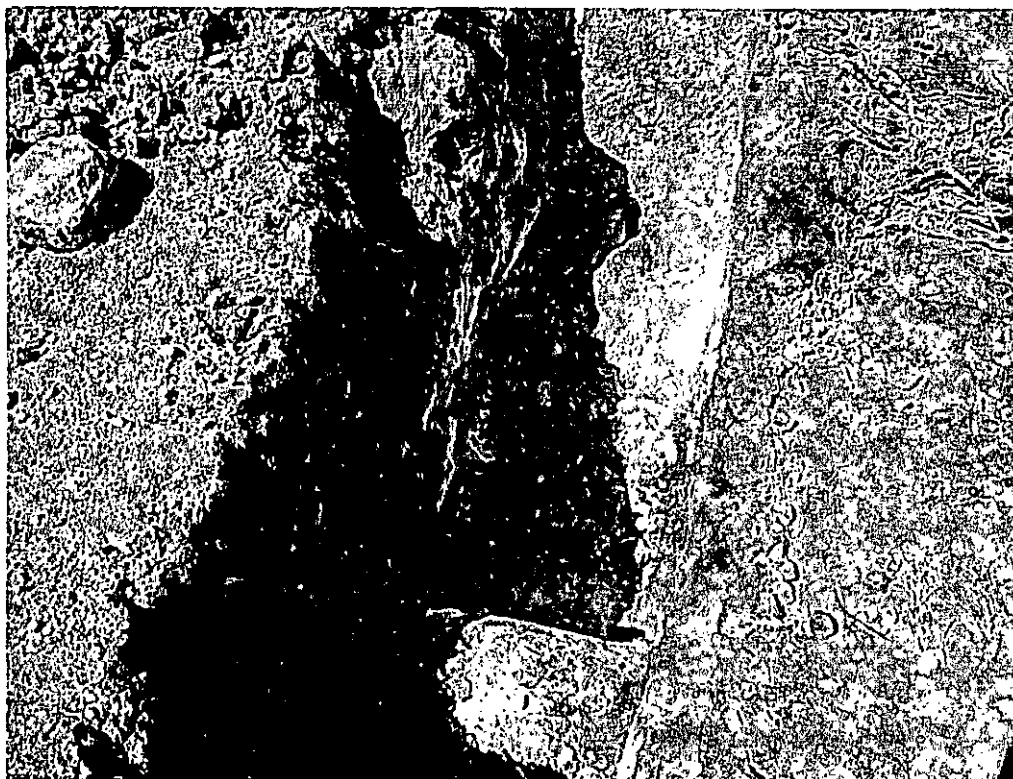


Photo 3. View of the backhoe trench #4.

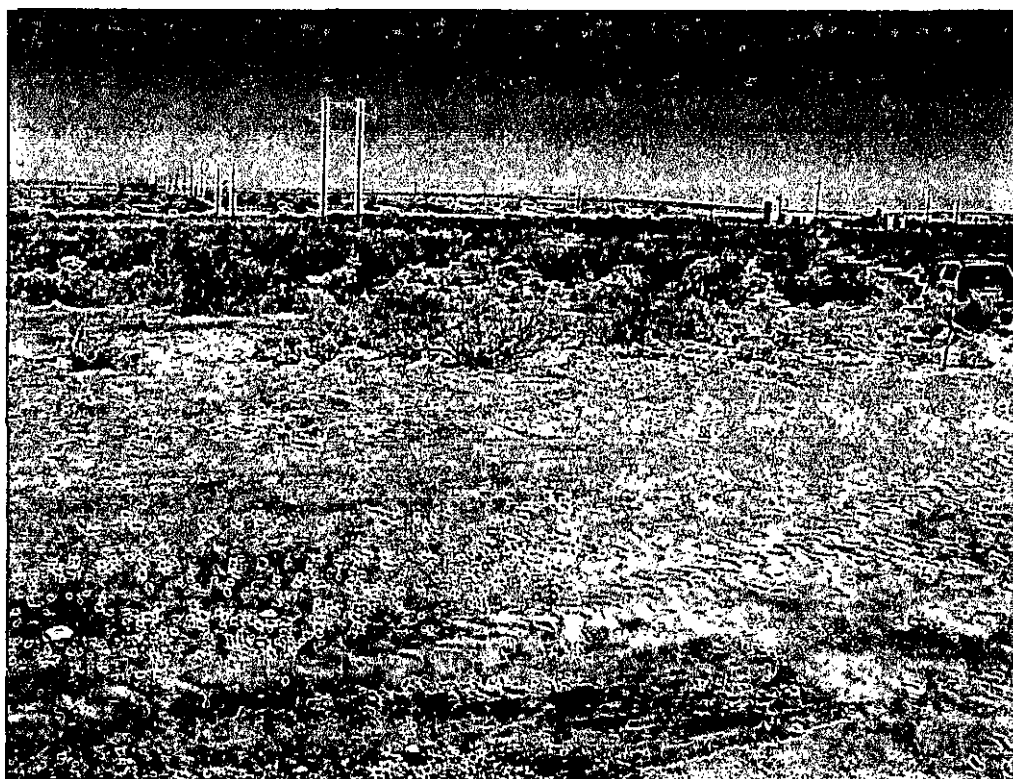


Photo 4. View of the backhoe trench #2 with trench #3 and #4 in the background.



Appendix A



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

nmlb/215057156		274841	OPERATOR	☒ Initial Report	☐ Final Report
Name of Company ALAMO PERMIAN RESOURCES, LLC		Contact STEVEN MASTIN			
Address 415 W. WALL ST. SUITE 500		Telephone No. 432 557 5847			
Facility Name ARTESIA STATE UNIT 901		Facility Type WELL			
Surface Owner STATE		Mineral Owner STATE		API No. 30-015-21448	

LOCATION OF RELEASE

Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
23	18S	27E	10	N	1310	E	EDDY

Latitude 32.7401051
Longitude -104.244912

NATURE OF RELEASE

Type of Release: WATER	Volume of Release: 20 BBLS	Volume Recovered: 0
Source of Release: INJECTION LINE	Date and Hour of Occurrence: APRIL 27, 2012	Date and Hour of Discovery: APRIL 27, 2012
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? STEVEN MASTIN To OCS: 4/30/12 2:53 PM	
By Whom? RICKY RODRIGUEZ, FIELD SUPERVISOR	Date and Hour APR 27, 2012	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Cause of problem: Hole in injection line; no standing fluid left to suck up

Describe Area Affected and Cleanup Action Taken.*

Clean up action: Backhoe scheduled to pick up contaminated soil and haul 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: <u>Tan Fulvi</u>		OIL CONSERVATION DIVISION	
Printed Name: TOM FULVI		Signed By <u>Mike Brumley</u>	
Title: REGULATORY/ PRODUCTION TECH		Approved by Environmental Specialist:	
E-mail Address: tfulvi@alamoresources.com		Approval Date: MAY 29 2012	Expiration Date:
Date: 04/30/2012 Phone: 432 897 0673		Conditions of Approval: Remediation per OCD Rules & Guidelines. SUBMIT REMEDIATION PROPOSAL NOT LATER THAN: <u>6/29/2012</u>	
		Attached ☐	

* Attach Additional Sheets If Necessary

6/29/2012

2RP-1138



Appendix B

Water Well Data
Average Depth to Groundwater (ft)
Alamo - Artesia State #901
Eddy County, New Mexico

17 South 27 East

6	5	4	3	2	1
	30				
7	8	9	10	11 54	12
14				50	
18	17	16	15	14	13
111	90	175			
19	20	21	22	23	24
				40	
30	29	28	27	26	25
31	32	33	34	35	36
	140				

17 South 28 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
			79		
30	29	28	27	26	25
31	32	33	34	35 258	36

17 South 29 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
			80		
30	29 210	28	27	26	25
	208'				
31	32	33	34	35	36
				153	

18 South 27 East

6	5	4	3	2	1
7	8	9	10	11	12
			50		
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
		100			
31 65	32	33	34	35	36

18 South 28 East

6	5	4	3	2	1
		108			
7	8	9	10	11	12
49	69				
18	17	16	15	14	13
19	20	21	22	23	24
		226			
49	29	28	27	26	25
31	32	33	34	35	36
				65	

18 South 29 East

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

19 South 27 East

6	5	20	4	3	2	1
	8	50	9	10	11	12
18	17	16	15	14 82	13	
		18		107	60	
19	20	21	22	23	24	
30	29	28	27	26	25	
31	32	33	34	35	36	

19 South 28 East

6	5	4	3	2	1
	8	9 246	10	11	12
		265			
18	17	16	15	14	13
91					
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

19 South 29 East

6	5	4	3	2	1
	8	9	10	11	12
18	17	16	15	14	13 123
					101
19	20	21	22	23	24
	62				
30	29	28	27	26	25
31	32	33	34 62	35 121	36
			60	110	115

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

Report Date: October 12, 2012

Work Order: 12100530

Project Location: Eddy Co., NM
Project Name: Alamo Permian/Artesia State #901
Project Number: 114-6401488

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
311127	T-1 (0-1')	soil	2012-10-01	00:00	2012-10-05
311128	T-1 (2')	soil	2012-10-01	00:00	2012-10-05
311129	T-1 (4')	soil	2012-10-01	00:00	2012-10-05
311130	T-1 (6')	soil	2012-10-01	00:00	2012-10-05
311131	T-1 (7')	soil	2012-10-01	00:00	2012-10-05
311132	T-2 (0-1')	soil	2012-10-01	00:00	2012-10-05
311133	T-2 (2')	soil	2012-10-01	00:00	2012-10-05
311134	T-2 (4')	soil	2012-10-01	00:00	2012-10-05
311135	T-2 (6')	soil	2012-10-01	00:00	2012-10-05
311136	T-2 (8')	soil	2012-10-01	00:00	2012-10-05
311137	T-2 (10')	soil	2012-10-01	00:00	2012-10-05
311138	T-3 (0-1')	soil	2012-10-01	00:00	2012-10-05
311139	T-3 (2')	soil	2012-10-01	00:00	2012-10-05
311140	T-3 (4')	soil	2012-10-01	00:00	2012-10-05
311141	T-3 (6')	soil	2012-10-01	00:00	2012-10-05
311142	T-4 (0-1')	soil	2012-10-01	00:00	2012-10-05
311143	T-4 (2')	soil	2012-10-01	00:00	2012-10-05
311144	T-4 (4')	soil	2012-10-01	00:00	2012-10-05

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)
311127 - T-1 (0-1')	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<1.00
311132 - T-2 (0-1')	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<1.00
311138 - T-3 (0-1')	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<1.00
311142 - T-4 (0-1')	<0.100 ¹	<0.100	<0.100	<0.100	<50.0	<5.00 ²

¹ Dilution due to surfactants.² Dilution due to surfactants.



Sample: 311127 - T-1 (0-1')

Param	Flag	Result	Units	RL
Chloride		1930	mg/Kg	5

Sample: 311128 - T-1 (2')

Param	Flag	Result	Units	RL
Chloride		1300	mg/Kg	5

Sample: 311129 - T-1 (4')

Param	Flag	Result	Units	RL
Chloride		918	mg/Kg	5

Sample: 311130 - T-1 (6')

Param	Flag	Result	Units	RL
Chloride		483	mg/Kg	5

Sample: 311131 - T-1 (7')

Param	Flag	Result	Units	RL
Chloride		1010	mg/Kg	5

Sample: 311132 - T-2 (0-1')

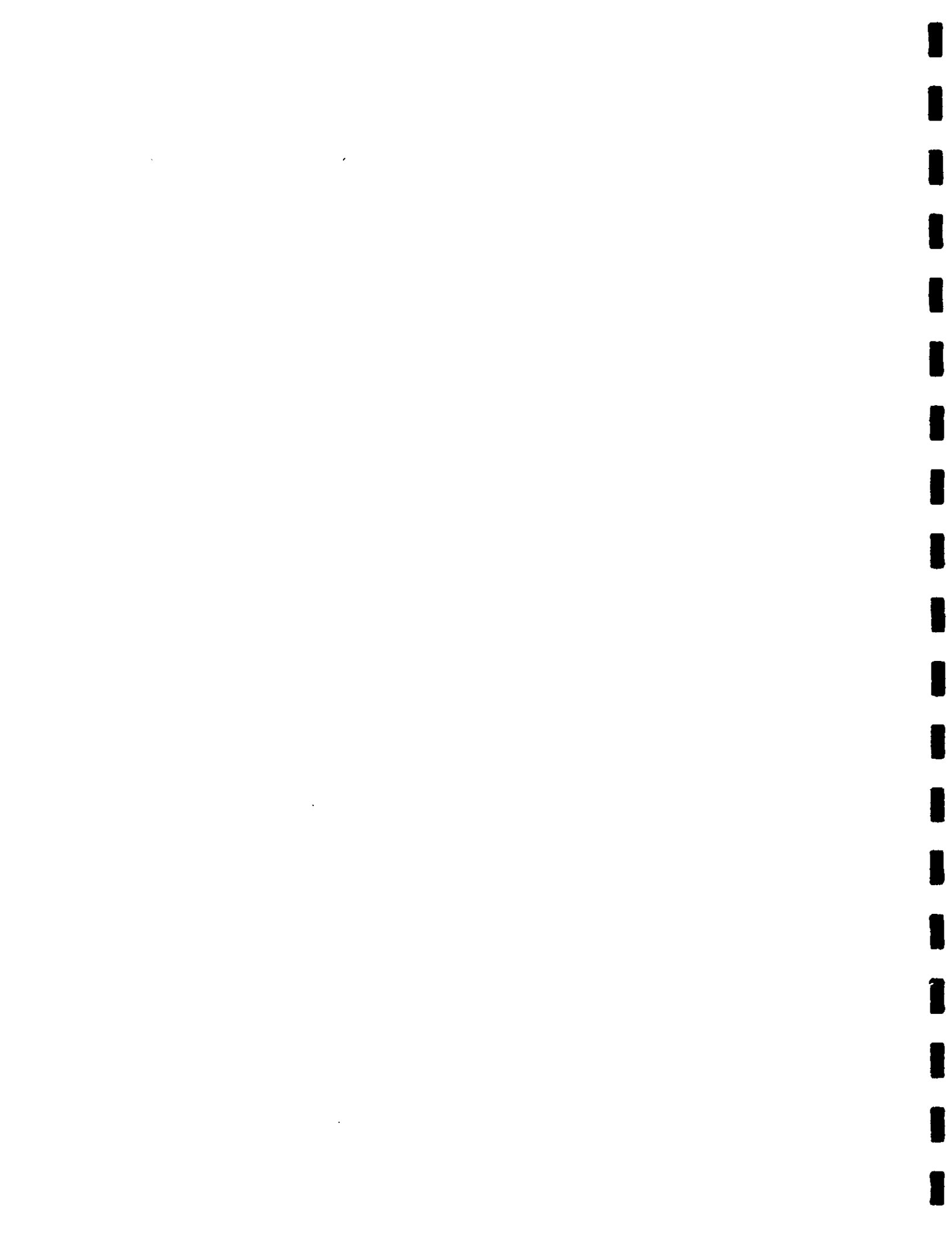
Param	Flag	Result	Units	RL
Chloride		1210	mg/Kg	5

Sample: 311133 - T-2 (2')

Param	Flag	Result	Units	RL
Chloride		1500	mg/Kg	5

Sample: 311134 - T-2 (4')

Param	Flag	Result	Units	RL
Chloride		1840	mg/Kg	5



Sample: 311135 - T-2 (6')

Param	Flag	Result	Units	RL
Chloride		725	mg/Kg	5

Sample: 311136 - T-2 (8')

Param	Flag	Result	Units	RL
Chloride		918	mg/Kg	5

Sample: 311137 - T-2 (10')

Param	Flag	Result	Units	RL
Chloride		981	mg/Kg	5

Sample: 311138 - T-3 (0-1')

Param	Flag	Result	Units	RL
Chloride		794	mg/Kg	5

Sample: 311139 - T-3 (2')

Param	Flag	Result	Units	RL
Chloride		561	mg/Kg	5

Sample: 311140 - T-3 (4')

Param	Flag	Result	Units	RL
Chloride		794	mg/Kg	5

Sample: 311141 - T-3 (6')

Param	Flag	Result	Units	RL
Chloride		374	mg/Kg	5

Sample: 311142 - T-4 (0-1')

Param	Flag	Result	Units	RL
Chloride		1260	mg/Kg	5



Report Date: October 12, 2012

Work Order: 12100530

Page Number: 4 of 4

Sample: 311143 - T-4 (2')

Param	Flag	Result	Units	RL
Chloride		1360	mg/Kg	5

Sample: 311144 - T-4 (4')

Param	Flag	Result	Units	RL
Chloride		1500	mg/Kg	5





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Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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

Report Date: October 12, 2012

Work Order: 12100530

Project Location: Eddy Co., NM
Project Name: Alamo Permian/Artesia State #901
Project Number: 114-6401488

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
311127	T-1 (0-1')	soil	2012-10-01	00:00	2012-10-05
311128	T-1 (2')	soil	2012-10-01	00:00	2012-10-05
311129	T-1 (4')	soil	2012-10-01	00:00	2012-10-05
311130	T-1 (6')	soil	2012-10-01	00:00	2012-10-05
311131	T-1 (7')	soil	2012-10-01	00:00	2012-10-05
311132	T-2 (0-1')	soil	2012-10-01	00:00	2012-10-05
311133	T-2 (2')	soil	2012-10-01	00:00	2012-10-05
311134	T-2 (4')	soil	2012-10-01	00:00	2012-10-05
311135	T-2 (6')	soil	2012-10-01	00:00	2012-10-05
311136	T-2 (8')	soil	2012-10-01	00:00	2012-10-05
311137	T-2 (10')	soil	2012-10-01	00:00	2012-10-05
311138	T-3 (0-1')	soil	2012-10-01	00:00	2012-10-05
311139	T-3 (2')	soil	2012-10-01	00:00	2012-10-05
311140	T-3 (4')	soil	2012-10-01	00:00	2012-10-05
311141	T-3 (6')	soil	2012-10-01	00:00	2012-10-05
311142	T-4 (0-1')	soil	2012-10-01	00:00	2012-10-05
311143	T-4 (2')	soil	2012-10-01	00:00	2012-10-05
311144	T-4 (4')	soil	2012-10-01	00:00	2012-10-05



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

A handwritten signature in black ink, reading "Michael Abel". The signature is written in a cursive style with a large, stylized "M" and "A".

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



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Case Narrative

Samples for project Alamo Permian/Artesia State #901 were received by TraceAnalysis, Inc. on 2012-10-05 and assigned to work order 12100530. Samples for work order 12100530 were received intact at a temperature of 3.8 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	80969	2012-10-06 at 09:45	95546	2012-10-06 at 09:45
Chloride (Titration)	SM 4500-Cl B	81070	2012-10-12 at 13:37	95676	2012-10-12 at 13:39
Chloride (Titration)	SM 4500-Cl B	81072	2012-10-12 at 13:59	95678	2012-10-12 at 14:01
TPH DRO - NEW	S 8015 D	80944	2012-10-05 at 10:00	95522	2012-10-08 at 10:56
TPH GRO	S 8015 D	80969	2012-10-06 at 09:45	95547	2012-10-06 at 09:45

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 12100530 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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



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Analytical Report

Sample: 311127 - T-1 (0-1')

Laboratory: Midland
Analysis: BTEX
QC Batch: 95546
Prep Batch: 80969

Analytical Method: S 8021B
Date Analyzed: 2012-10-06
Sample Preparation: 2012-10-06

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	2	<0.0200	mg/Kg	1	0.0200
Toluene	U	2	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	2	<0.0200	mg/Kg	1	0.0200
Xylene	U	2	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.69	mg/Kg	1	2.00	84	70 - 130
4-Bromofluorobenzene (4-BFB)			1.66	mg/Kg	1	2.00	83	70 - 130

Sample: 311127 - T-1 (0-1')

Laboratory: Lubbock
Analysis: Chloride (Titration)
QC Batch: 95676
Prep Batch: 81070

Analytical Method: SM 4500-Cl B
Date Analyzed: 2012-10-12
Sample Preparation:

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1930	mg/Kg	1	5.00

Sample: 311127 - T-1 (0-1')

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 95522
Prep Batch: 80944

Analytical Method: S 8015 D
Date Analyzed: 2012-10-08
Sample Preparation: 2012-10-05

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	2	<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			107	mg/Kg	1	100	107	70 - 130

Sample: 311127 - T-1 (0-1')

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 95547
Prep Batch: 80969

Analytical Method: S 8015 D
Date Analyzed: 2012-10-06
Sample Preparation: 2012-10-06

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	0	2	<1.00	mg/Kg	1	1.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.17	mg/Kg	1	2.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)			1.72	mg/Kg	1	2.00	86	70 - 130

Sample: 311128 - T-1 (2')

Laboratory: Lubbock
Analysis: Chloride (Titration)
QC Batch: 95676
Prep Batch: 81070

Analytical Method: SM 4500-Cl B
Date Analyzed: 2012-10-12
Sample Preparation:

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1300	mg/Kg	1	5.00

Sample: 311129 - T-1 (4')

Laboratory: Lubbock
Analysis: Chloride (Titration)
QC Batch: 95676
Prep Batch: 81070

Analytical Method: SM 4500-Cl B
Date Analyzed: 2012-10-12
Sample Preparation:

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

continued ...



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sample 311129 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			918	mg/Kg	1	5.00

Sample: 311130 - T-1 (6')

Laboratory:	Lubbock				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95676	Date Analyzed:	2012-10-12	Analyzed By:	DM
Prep Batch:	81070	Sample Preparation:		Prepared By:	DM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			483	mg/Kg	1	5.00

Sample: 311131 - T-1 (7')

Laboratory:	Lubbock				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95676	Date Analyzed:	2012-10-12	Analyzed By:	DM
Prep Batch:	81070	Sample Preparation:		Prepared By:	DM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1010	mg/Kg	1	5.00

Sample: 311132 - T-2 (0-1')

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	95546	Date Analyzed:	2012-10-06	Analyzed By:	YG
Prep Batch:	80969	Sample Preparation:	2012-10-06	Prepared By:	YG



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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	2	<0.0200	mg/Kg	1	0.0200
Toluene	u	2	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	2	<0.0200	mg/Kg	1	0.0200
Xylene	u	2	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.70	mg/Kg	1	2.00	85	70 - 130
4-Bromofluorobenzene (4-BFB)			1.68	mg/Kg	1	2.00	84	70 - 130

Sample: 311132 - T-2 (0-1')

Laboratory: Lubbock
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 95676 Date Analyzed: 2012-10-12 Analyzed By: DM
Prep Batch: 81070 Sample Preparation: Prepared By: DM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1210	mg/Kg	1	5.00

Sample: 311132 - T-2 (0-1')

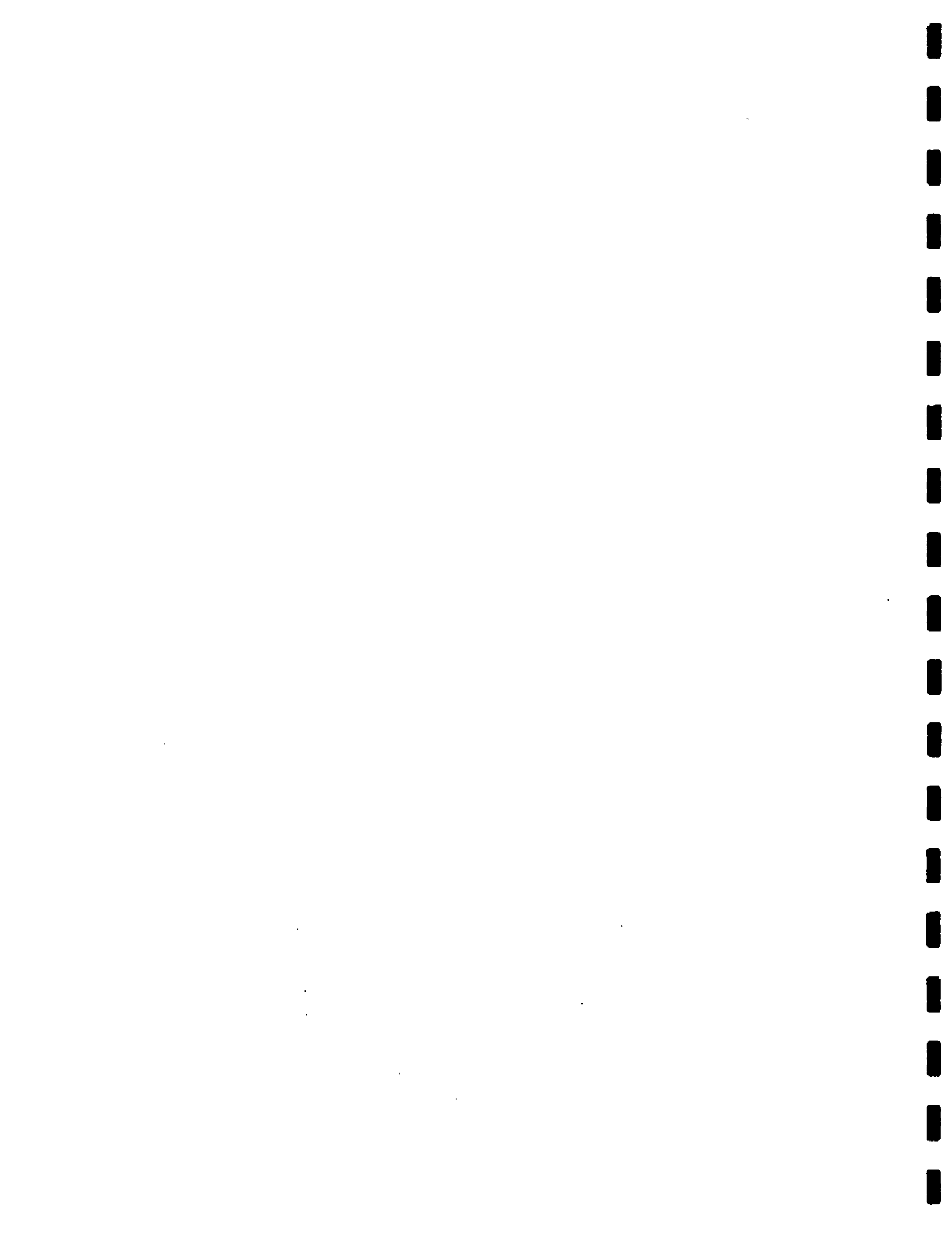
Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 95522 Date Analyzed: 2012-10-08 Analyzed By: CW
Prep Batch: 80944 Sample Preparation: 2012-10-05 Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	2	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			103	mg/Kg	1	100	103	70 - 130

Sample: 311132 - T-2 (0-1')

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 95547 Date Analyzed: 2012-10-06 Analyzed By: YG
Prep Batch: 80969 Sample Preparation: 2012-10-06 Prepared By: YG



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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	u	2	<1.00	mg/Kg	1	1.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.17	mg/Kg	1	2.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)			1.75	mg/Kg	1	2.00	88	70 - 130

Sample: 311133 - T-2 (2')

Laboratory: Lubbock
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 95676 Date Analyzed: 2012-10-12 Analyzed By: DM
Prep Batch: 81070 Sample Preparation: Prepared By: DM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1500	mg/Kg	1	5.00

Sample: 311134 - T-2 (4')

Laboratory: Lubbock
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 95676 Date Analyzed: 2012-10-12 Analyzed By: DM
Prep Batch: 81070 Sample Preparation: Prepared By: DM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1840	mg/Kg	1	5.00

Sample: 311135 - T-2 (6')

Laboratory: Lubbock
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 95676 Date Analyzed: 2012-10-12 Analyzed By: DM
Prep Batch: 81070 Sample Preparation: Prepared By: DM

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			725	mg/Kg	1	5.00

Sample: 311136 - T-2 (8')

Laboratory: Lubbock
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 95676 Date Analyzed: 2012-10-12 Analyzed By: DM
Prep Batch: 81070 Sample Preparation: Prepared By: DM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			918	mg/Kg	1	5.00

Sample: 311137 - T-2 (10')

Laboratory: Lubbock
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 95678 Date Analyzed: 2012-10-12 Analyzed By: DM
Prep Batch: 81072 Sample Preparation: 2012-10-12 Prepared By: DM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			981	mg/Kg	1	5.00

Sample: 311138 - T-3 (0-1')

Laboratory: Midland
Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
QC Batch: 95546 Date Analyzed: 2012-10-06 Analyzed By: YG
Prep Batch: 80969 Sample Preparation: 2012-10-06 Prepared By: YG

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	2	<0.0200	mg/Kg	1	0.0200
Toluene	u	2	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	2	<0.0200	mg/Kg	1	0.0200

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sample 311138 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Xylene	0	2	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.69	mg/Kg	1	2.00	84	70 - 130
4-Bromofluorobenzene (4-BFB)			1.67	mg/Kg	1	2.00	84	70 - 130

Sample: 311138 - T-3 (0-1')

Laboratory:	Lubbock				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95678	Date Analyzed:	2012-10-12	Analyzed By:	DM
Prep Batch:	81072	Sample Preparation:	2012-10-12	Prepared By:	DM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			794	mg/Kg	1	5.00

Sample: 311138 - T-3 (0-1')

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	95522	Date Analyzed:	2012-10-08	Analyzed By:	CW
Prep Batch:	80944	Sample Preparation:	2012-10-05	Prepared By:	CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		2	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			106	mg/Kg	1	100	106	70 - 130

Sample: 311138 - T-3 (0-1')

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	95547	Date Analyzed:	2012-10-06	Analyzed By:	YG
Prep Batch:	80969	Sample Preparation:	2012-10-06	Prepared By:	YG

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	u	2	<1.00	mg/Kg	1	1.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.18	mg/Kg	1	2.00	109	70 - 130
4-Bromofluorobenzene (4-BFB)			1.74	mg/Kg	1	2.00	87	70 - 130

Sample: 311139 - T-3 (2')

Laboratory: Lubbock
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 95678 Date Analyzed: 2012-10-12 Analyzed By: DM
Prep Batch: 81072 Sample Preparation: 2012-10-12 Prepared By: DM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			561	mg/Kg	1	5.00

Sample: 311140 - T-3 (4')

Laboratory: Lubbock
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 95678 Date Analyzed: 2012-10-12 Analyzed By: DM
Prep Batch: 81072 Sample Preparation: 2012-10-12 Prepared By: DM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			794	mg/Kg	1	5.00

Sample: 311141 - T-3 (6')

Laboratory: Lubbock
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 95678 Date Analyzed: 2012-10-12 Analyzed By: DM
Prep Batch: 81072 Sample Preparation: 2012-10-12 Prepared By: DM

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			374	mg/Kg	1	5.00

Sample: 311142 - T-4 (0-1')

Laboratory: Midland
Analysis: BTEX
QC Batch: 95546
Prep Batch: 80969

Analytical Method: S 8021B
Date Analyzed: 2012-10-06
Sample Preparation: 2012-10-06

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

Parameter	Flag	Cert	RL				
			Result	Units	Dilution	RL	
Benzene	1	u	2	<0.100	mg/Kg	5	0.0200
Toluene		u	2	<0.100	mg/Kg	5	0.0200
Ethylbenzene		u	2	<0.100	mg/Kg	5	0.0200
Xylene		u	2	<0.100	mg/Kg	5	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			8.41	mg/Kg	5	10.0	84	70 - 130
4-Bromofluorobenzene (4-BFB)			8.21	mg/Kg	5	10.0	82	70 - 130

Sample: 311142 - T-4 (0-1')

Laboratory: Lubbock
Analysis: Chloride (Titration)
QC Batch: 95678
Prep Batch: 81072

Analytical Method: SM 4500-Cl B
Date Analyzed: 2012-10-12
Sample Preparation: 2012-10-12

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1260	mg/Kg	1	5.00

Sample: 311142 - T-4 (0-1')

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 95522
Prep Batch: 80944

Analytical Method: S 8015 D
Date Analyzed: 2012-10-08
Sample Preparation: 2012-10-05

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



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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	2	<50.0	mg/Kg	1	50.0

Sample: 311142 - T-4 (0-1')

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 95547
Prep Batch: 80969

Analytical Method: S 8015 D
Date Analyzed: 2012-10-06
Sample Preparation: 2012-10-06

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	u	2	<5.00	mg/Kg	5	1.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			9.04	mg/Kg	5	10.0	90	70 - 130
4-Bromofluorobenzene (4-BFB)			8.61	mg/Kg	5	10.0	86	70 - 130

Sample: 311143 - T-4 (2')

Laboratory: Lubbock
Analysis: Chloride (Titration)
QC Batch: 95678
Prep Batch: 81072

Analytical Method: SM 4500-Cl B
Date Analyzed: 2012-10-12
Sample Preparation: 2012-10-12

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1360	mg/Kg	1	5.00

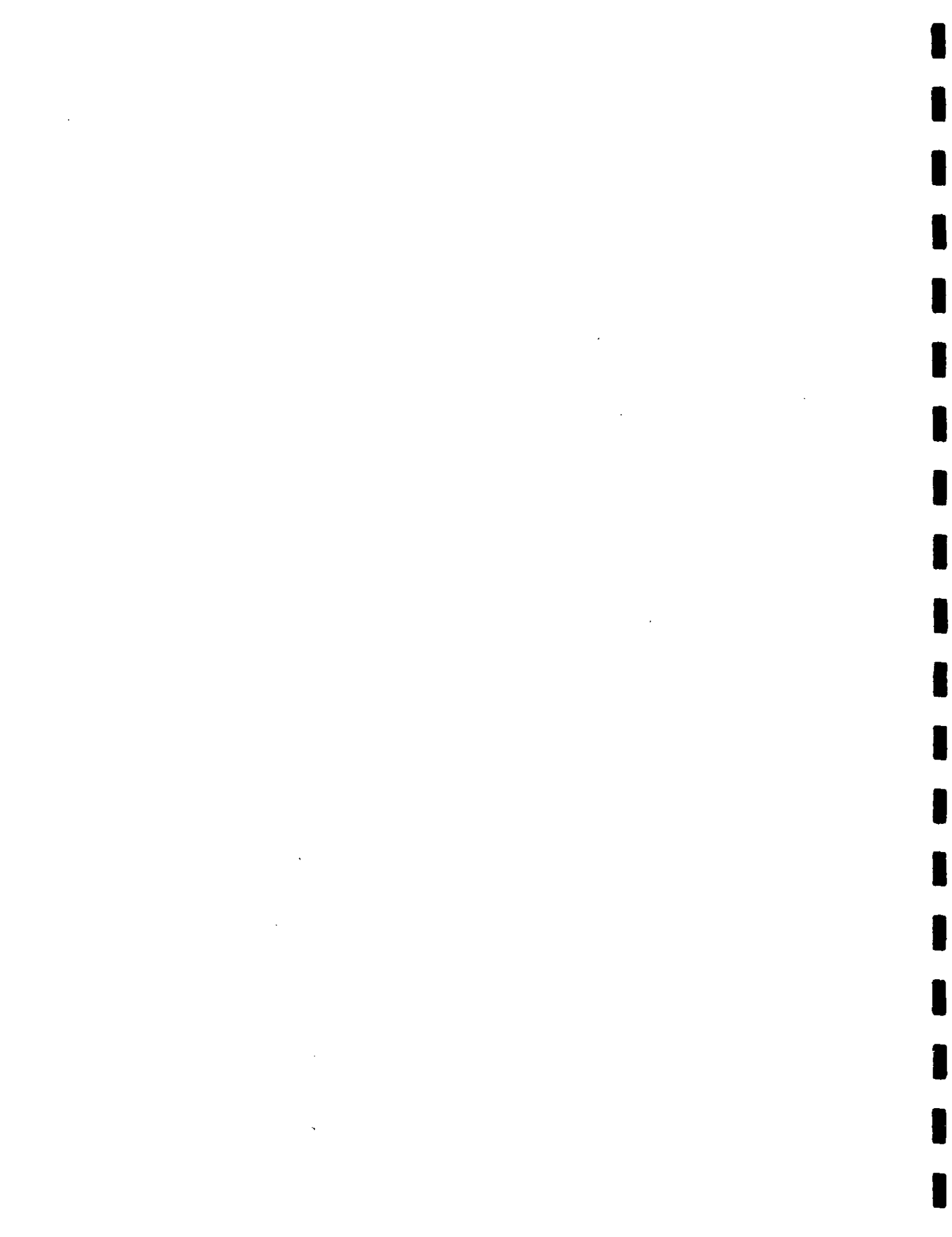
Sample: 311144 - T-4 (4')

Laboratory: Lubbock
Analysis: Chloride (Titration)
QC Batch: 95678
Prep Batch: 81072

Analytical Method: SM 4500-Cl B
Date Analyzed: 2012-10-12
Sample Preparation: 2012-10-12

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

continued ...



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sample 311144 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1500	mg/Kg	1	5.00



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Method Blanks

Method Blank (1) QC Batch: 95522

QC Batch: 95522
Prep Batch: 80944

Date Analyzed: 2012-10-08
QC Preparation: 2012-10-05

Analyzed By: CW
Prepared By: CW

Parameter	Flag	Cert.	MDL Result	Units	RL
DRO		2	<9.09	mg/Kg	50

Surrogate	Flag	Cert.	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			110	mg/Kg	1	100	110	70 - 130

Method Blank (1) QC Batch: 95546

QC Batch: 95546
Prep Batch: 80969

Date Analyzed: 2012-10-06
QC Preparation: 2012-10-06

Analyzed By: YG
Prepared By: YG

Parameter	Flag	Cert.	MDL Result	Units	RL
Benzene		2	<0.00100	mg/Kg	0.02
Toluene		2	<0.00100	mg/Kg	0.02
Ethylbenzene		2	<0.00110	mg/Kg	0.02
Xylene		2	<0.00360	mg/Kg	0.02

Surrogate	Flag	Cert.	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.67	mg/Kg	1	2.00	84	70 - 130
4-Bromofluorobenzene (4-BFB)			1.61	mg/Kg	1	2.00	80	70 - 130

Method Blank (1) QC Batch: 95547

QC Batch: 95547
Prep Batch: 80969

Date Analyzed: 2012-10-06
QC Preparation: 2012-10-06

Analyzed By: YG
Prepared By: YG



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Parameter	Flag	Cert	MDL Result	Units	RL
GRO		2	<0.482	mg/Kg	1

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.80	mg/Kg	1	2.00	90	70 - 130
4-Bromofluorobenzene (4-BFB)			1.70	mg/Kg	1	2.00	85	70 - 130

Method Blank (1) QC Batch: 95676

QC Batch: 95676
Prep Batch: 81070

Date Analyzed: 2012-10-12
QC Preparation: 2012-10-12

Analyzed By: DM
Prepared By: DM

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.05	mg/Kg	5

Method Blank (1) QC Batch: 95678

QC Batch: 95678
Prep Batch: 81072

Date Analyzed: 2012-10-12
QC Preparation: 2012-10-12

Analyzed By: DM
Prepared By: DM

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.05	mg/Kg	5



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Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 95522
Prep Batch: 80944

Date Analyzed: 2012-10-08
QC Preparation: 2012-10-05

Analyzed By: CW
Prepared By: CW

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		2	241	mg/Kg	1	250	<9.09	96	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		2	290	mg/Kg	1	250	<9.09	116	70 - 130	18	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	125	113	mg/Kg	1	100	125	113	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 95546
Prep Batch: 80969

Date Analyzed: 2012-10-06
QC Preparation: 2012-10-06

Analyzed By: YG
Prepared By: YG

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		2	2.11	mg/Kg	1	2.00	<0.00100	106	70 - 130
Toluene		2	1.92	mg/Kg	1	2.00	<0.00100	96	70 - 130
Ethylbenzene		2	1.88	mg/Kg	1	2.00	<0.00110	94	70 - 130
Xylene		2	5.68	mg/Kg	1	6.00	<0.00360	95	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		2	2.01	mg/Kg	1	2.00	<0.00100	100	70 - 130	5	20
Toluene		2	1.83	mg/Kg	1	2.00	<0.00100	92	70 - 130	5	20
Ethylbenzene		2	1.78	mg/Kg	1	2.00	<0.00110	89	70 - 130	6	20
Xylene		2	5.39	mg/Kg	1	6.00	<0.00360	90	70 - 130	5	20

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



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Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.69	1.71	mg/Kg	1	2.00	84	86	70 - 130
4-Bromofluorobenzene (4-BFB)	1.67	1.72	mg/Kg	1	2.00	84	86	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 95547
Prep Batch: 80969

Date Analyzed: 2012-10-06
QC Preparation: 2012-10-06

Analyzed By: YG
Prepared By: YG

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		2	19.9	mg/Kg	1	20.0	3.61	100	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		2	18.6	mg/Kg	1	20.0	3.61	93	70 - 130	7	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)	1.79	1.81	mg/Kg	1	2.00	90	90	70 - 130
4-Bromofluorobenzene (4-BFB)	1.81	1.84	mg/Kg	1	2.00	90	92	70 - 130

Matrix Spike (MS-1) Spiked Sample: 311080

QC Batch: 95522
Prep Batch: 80944

Date Analyzed: 2012-10-08
QC Preparation: 2012-10-05

Analyzed By: CW
Prepared By: CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		2	266	mg/Kg	1	250	<9.09	106	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		2	251	mg/Kg	1	250	<9.09	100	70 - 130	6	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	109	108	mg/Kg	1	100	109	108	70 - 130

Matrix Spike (MS-1) Spiked Sample: 311039

QC Batch: 95546
Prep Batch: 80969

Date Analyzed: 2012-10-06
QC Preparation: 2012-10-06

Analyzed By: YG
Prepared By: YG

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		2	1.93	mg/Kg	1	2.00	<0.00100	96	70 - 130
Toluene		2	1.75	mg/Kg	1	2.00	<0.00100	88	70 - 130
Ethylbenzene		2	1.69	mg/Kg	1	2.00	<0.00110	84	70 - 130
Xylene		2	5.11	mg/Kg	1	6.00	<0.00360	85	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		2	2.07	mg/Kg	1	2.00	<0.00100	104	70 - 130	7	20
Toluene		2	1.88	mg/Kg	1	2.00	<0.00100	94	70 - 130	7	20
Ethylbenzene		2	1.83	mg/Kg	1	2.00	<0.00110	92	70 - 130	8	20
Xylene		2	5.55	mg/Kg	1	6.00	<0.00360	92	70 - 130	8	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.69	1.68	mg/Kg	1	2	84	84	70 - 130
4-Bromofluorobenzene (4-BFB)	1.72	1.70	mg/Kg	1	2	86	85	70 - 130

Matrix Spike (MS-1) Spiked Sample: 311039

QC Batch: 95547
Prep Batch: 80969

Date Analyzed: 2012-10-06
QC Preparation: 2012-10-06

Analyzed By: YG
Prepared By: YG

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		2	15.7	mg/Kg	1	20.0	<0.482	78	70 - 130

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



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Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		2	16.5	mg/Kg	1	20.0	<0.482	82	70 - 130	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)	2.10	2.12	mg/Kg	1	2	105	106	70 - 130
4-Bromofluorobenzene (4-BFB)	1.85	1.86	mg/Kg	1	2	92	93	70 - 130

Matrix Spike (MS-1) Spiked Sample: 311136

QC Batch: 95676
Prep Batch: 81070

Date Analyzed: 2012-10-12
QC Preparation: 2012-10-12

Analyzed By: DM
Prepared By: DM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			1010	mg/Kg	1	500	<3.05	203	80 - 120

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			1110	mg/Kg	1	500	<3.05	222	80 - 120	9	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: 311144

QC Batch: 95678
Prep Batch: 81072

Date Analyzed: 2012-10-12
QC Preparation: 2012-10-12

Analyzed By: DM
Prepared By: DM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			1590	mg/Kg	1	500	<3.05	318	80 - 120

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			1500	mg/Kg	1	500	<3.05	299	80 - 120	6	20

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



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Calibration Standards

Standard (CCV-1)

QC Batch: 95522

Date Analyzed: 2012-10-08

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		2	mg/Kg	250	290	116	80 - 120	2012-10-08

Standard (CCV-2)

QC Batch: 95522

Date Analyzed: 2012-10-08

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		2	mg/Kg	250	284	114	80 - 120	2012-10-08

Standard (CCV-3)

QC Batch: 95522

Date Analyzed: 2012-10-08

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		2	mg/Kg	250	220	88	80 - 120	2012-10-08

Standard (CCV-4)

QC Batch: 95522

Date Analyzed: 2012-10-08

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		2	mg/Kg	250	226	90	80 - 120	2012-10-08

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Standard (CCV-1)

QC Batch: 95546

Date Analyzed: 2012-10-06

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		2	mg/kg	0.100	0.101	101	80 - 120	2012-10-06
Toluene		2	mg/kg	0.100	0.0899	90	80 - 120	2012-10-06
Ethylbenzene		2	mg/kg	0.100	0.0854	85	80 - 120	2012-10-06
Xylene		2	mg/kg	0.300	0.259	86	80 - 120	2012-10-06

Standard (CCV-2)

QC Batch: 95546

Date Analyzed: 2012-10-06

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		2	mg/kg	0.100	0.100	100	80 - 120	2012-10-06
Toluene		2	mg/kg	0.100	0.0886	89	80 - 120	2012-10-06
Ethylbenzene		2	mg/kg	0.100	0.0823	82	80 - 120	2012-10-06
Xylene		2	mg/kg	0.300	0.247	82	80 - 120	2012-10-06

Standard (CCV-3)

QC Batch: 95546

Date Analyzed: 2012-10-06

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		2	mg/kg	0.100	0.100	100	80 - 120	2012-10-06
Toluene		2	mg/kg	0.100	0.0895	90	80 - 120	2012-10-06
Ethylbenzene		2	mg/kg	0.100	0.0827	83	80 - 120	2012-10-06
Xylene		2	mg/kg	0.300	0.250	83	80 - 120	2012-10-06

Standard (CCV-1)

QC Batch: 95547

Date Analyzed: 2012-10-06

Analyzed By: YG



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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		2	mg/Kg	1.00	1.18	118	80 - 120	2012-10-06

Standard (CCV-2)

QC Batch: 95547

Date Analyzed: 2012-10-06

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		2	mg/Kg	1.00	1.18	118	80 - 120	2012-10-06

Standard (CCV-3)

QC Batch: 95547

Date Analyzed: 2012-10-06

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		2	mg/Kg	1.00	0.916	92	80 - 120	2012-10-06

Standard (ICV-1)

QC Batch: 95676

Date Analyzed: 2012-10-12

Analyzed By: DM

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	2012-10-12

Standard (CCV-1)

QC Batch: 95676

Date Analyzed: 2012-10-12

Analyzed By: DM



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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2012-10-12

Standard (ICV-1)

QC Batch: 95678

Date Analyzed: 2012-10-12

Analyzed By: DM

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	2012-10-12

Standard (CCV-1)

QC Batch: 95678

Date Analyzed: 2012-10-12

Analyzed By: DM

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	2012-10-12



Appendix

Report Definitions

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

Laboratory Certifications

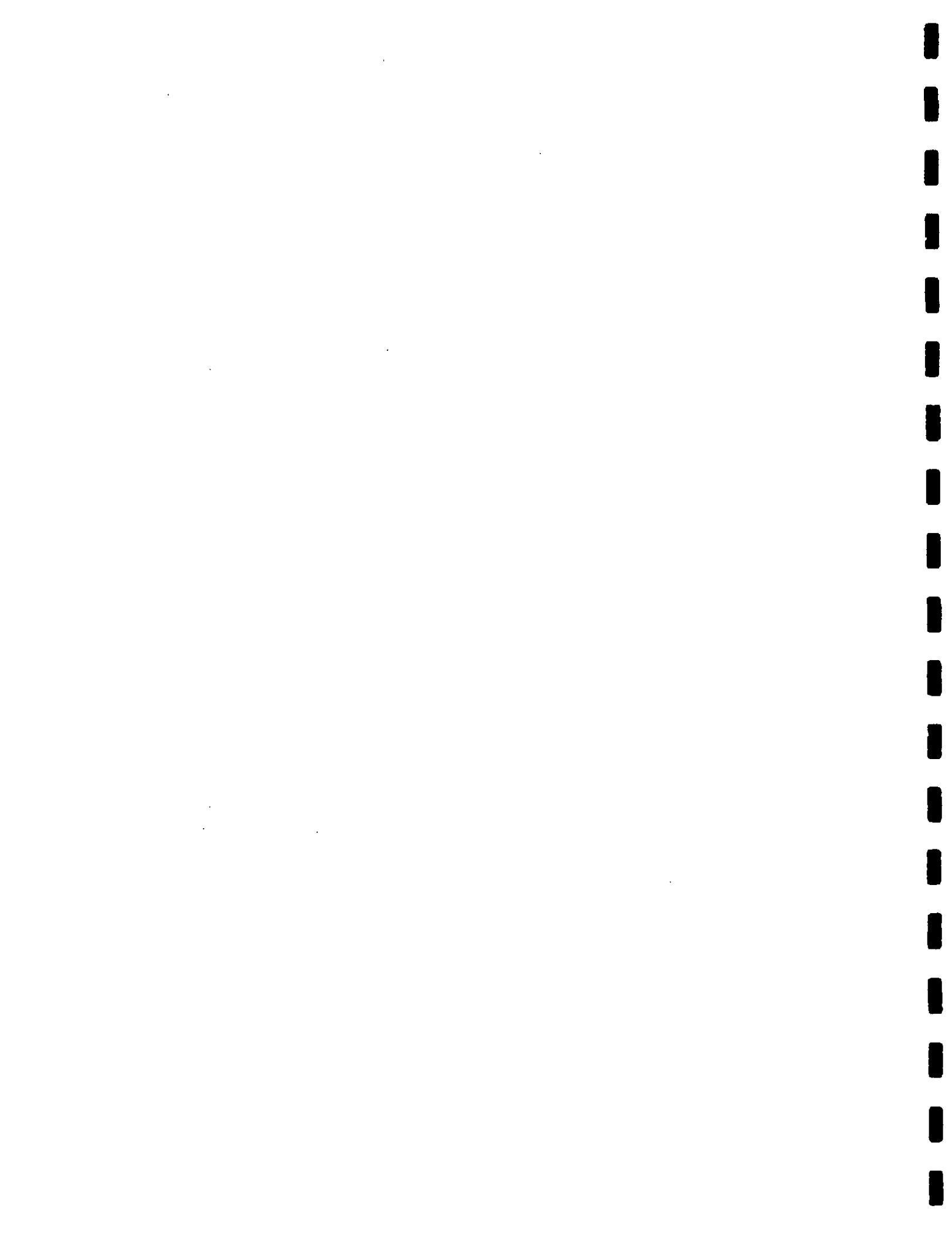
C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704219-12-8	Lubbock
2	NELAP	T104704392-12-4	Midland

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

Result Comments

- 1 Dilution due to surfactants.
- 2 Dilution due to surfactants.



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Attachments

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



ANALYSIS REQUEST
(Circle or Specify Method No.)

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

SAMPLE CONDITION WHEN RECEIVED: 28	REMARKS: If Benzene > 10 mg/l or If BTEX > 50 mg/kg Run deeper Sample. If TPH > 1,000 mg/kg
---------------------------------------	--

Accounting receives Gold copy.

Run deer for Sample

五



Summary Report

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

Report Date: March 1, 2013

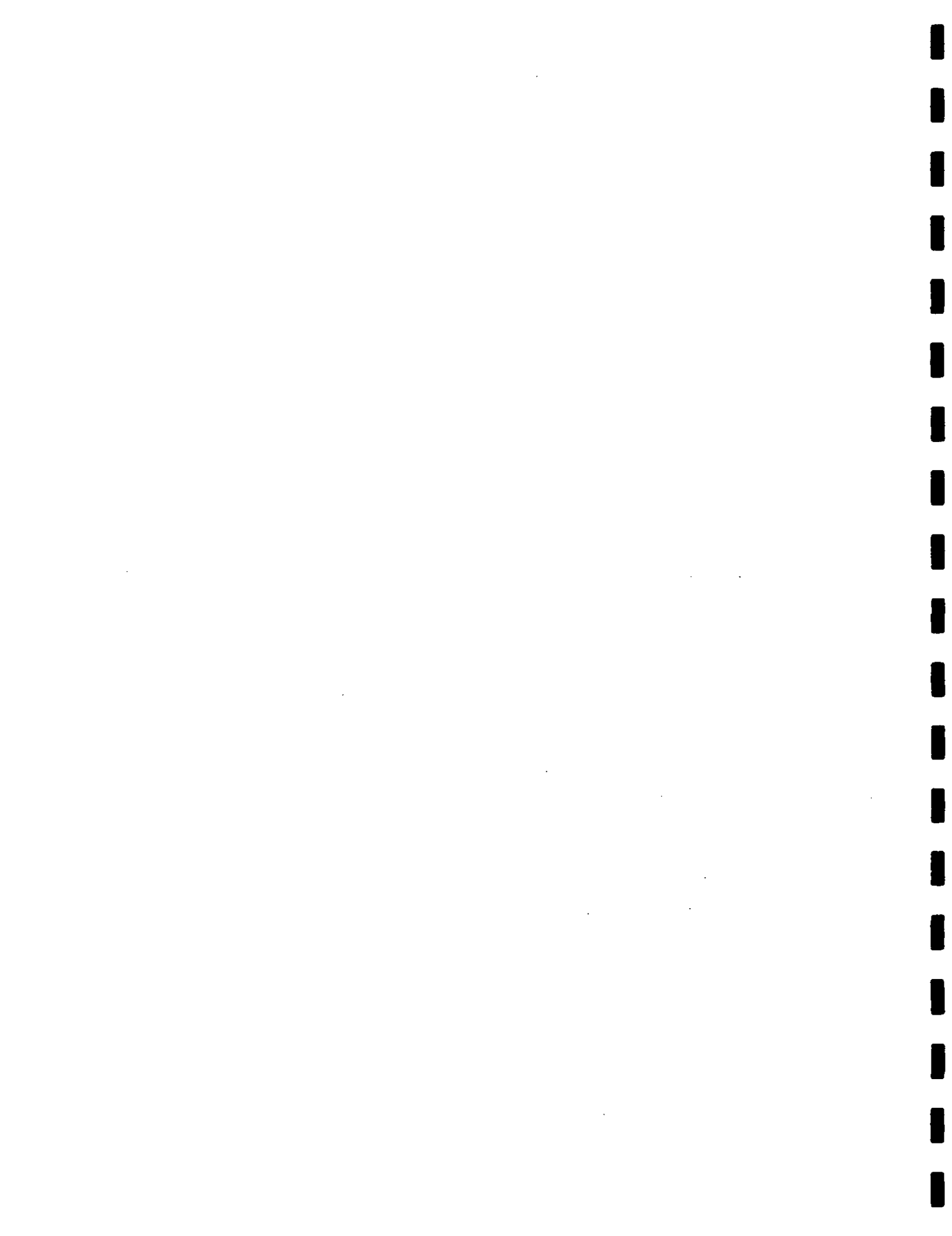
Work Order: 13022211

Project Location: Eddy Co., NM
Project Name: Alamo Permian/Artesia State #901
Project Number: 114-6401488

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
321910	BH-1 (0-1')	soil	2013-02-20	00:00	2013-02-22
321911	BH-1 (4-5')	soil	2013-02-20	00:00	2013-02-22
321912	BH-1 (9-10')	soil	2013-02-20	00:00	2013-02-22
321913	BH-1 (14-15')	soil	2013-02-20	00:00	2013-02-22
321914	BH-1 (19-20')	soil	2013-02-20	00:00	2013-02-22
321915	BH-1 (24-25')	soil	2013-02-20	00:00	2013-02-22
321916	BH-1 (29-30')	soil	2013-02-20	00:00	2013-02-22
321917	BH-1 (34-35')	soil	2013-02-20	00:00	2013-02-22
321918	BH-1 (39-40')	soil	2013-02-20	00:00	2013-02-22
321919	BH-2 (0-1')	soil	2013-02-20	00:00	2013-02-22
321920	BH-2 (4-5')	soil	2013-02-20	00:00	2013-02-22
321921	BH-2 (9-10')	soil	2013-02-20	00:00	2013-02-22
321922	BH-2 (14-15')	soil	2013-02-20	00:00	2013-02-22
321923	BH-2 (19-20')	soil	2013-02-20	00:00	2013-02-22
321924	BH-2 (24-25')	soil	2013-02-20	00:00	2013-02-22
321925	BH-3 (0-1')	soil	2013-02-20	00:00	2013-02-22
321926	BH-3 (4-5')	soil	2013-02-20	00:00	2013-02-22
321927	BH-3 (9-10')	soil	2013-02-20	00:00	2013-02-22
321928	BH-3 (14-15')	soil	2013-02-20	00:00	2013-02-22

Sample: 321910 - BH-1 (0-1')

Param	Flag	Result	Units	RL
Chloride		6150	mg/Kg	4



Sample: 321911 - BH-1 (4-5')

Param	Flag	Result	Units	RL
Chloride		567	mg/Kg	4

Sample: 321912 - BH-1 (9-10')

Param	Flag	Result	Units	RL
Chloride		345	mg/Kg	4

Sample: 321913 - BH-1 (14-15')

Param	Flag	Result	Units	RL
Chloride		222	mg/Kg	4

Sample: 321914 - BH-1 (19-20')

Param	Flag	Result	Units	RL
Chloride		123	mg/Kg	4

Sample: 321915 - BH-1 (24-25')

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

Sample: 321916 - BH-1 (29-30')

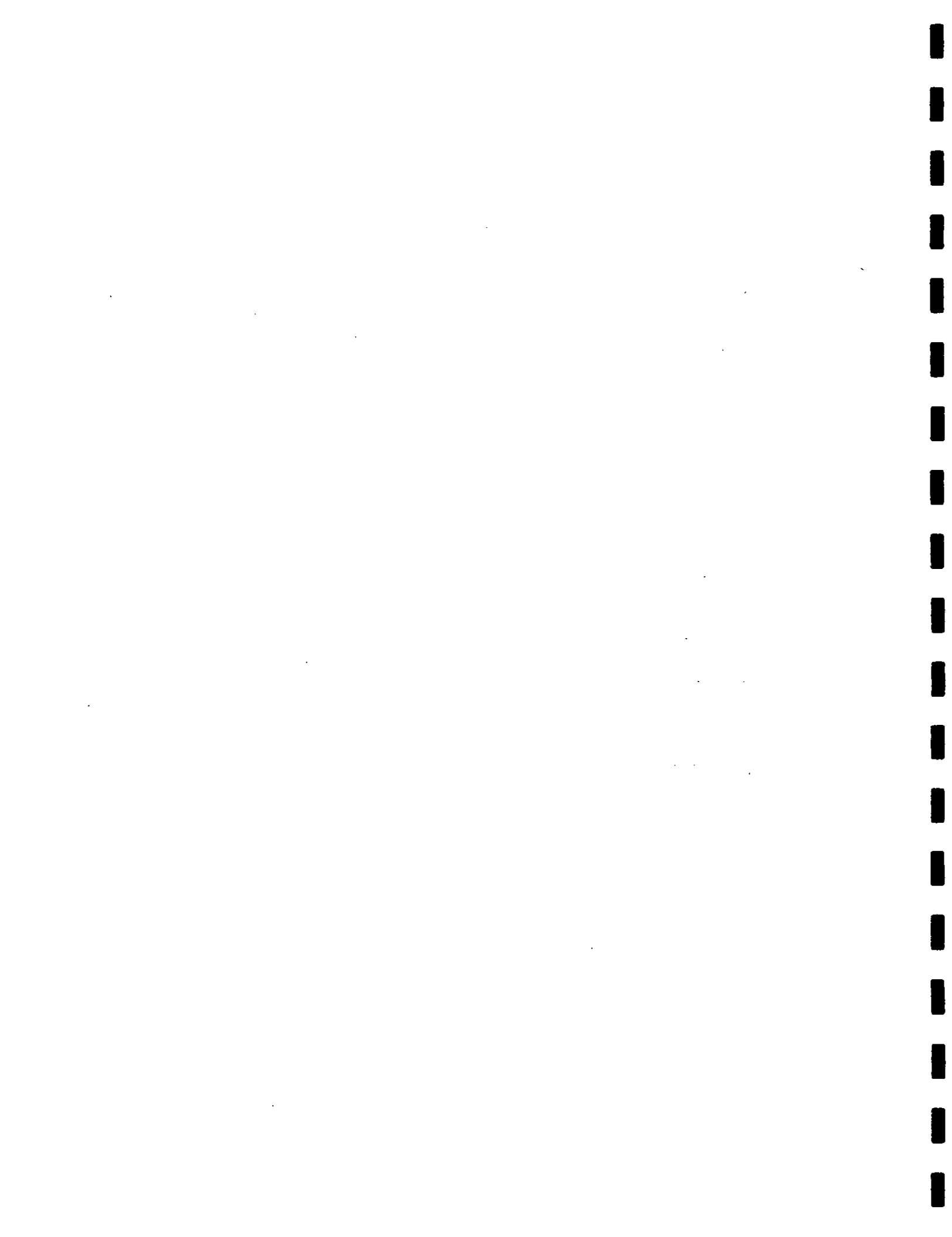
Param	Flag	Result	Units	RL
Chloride		199	mg/Kg	4

Sample: 321917 - BH-1 (34-35')

Param	Flag	Result	Units	RL
Chloride		79.5	mg/Kg	4

Sample: 321918 - BH-1 (39-40')

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



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Sample: 321919 - BH-2 (0-1')

Param	Flag	Result	Units	RL
Chloride		1020	mg/Kg	4

Sample: 321920 - BH-2 (4-5')

Param	Flag	Result	Units	RL
Chloride		1850	mg/Kg	4

Sample: 321921 - BH-2 (9-10')

Param	Flag	Result	Units	RL
Chloride		1310	mg/Kg	4

Sample: 321922 - BH-2 (14-15')

Param	Flag	Result	Units	RL
Chloride		378	mg/Kg	4

Sample: 321923 - BH-2 (19-20')

Param	Flag	Result	Units	RL
Chloride		353	mg/Kg	4

Sample: 321924 - BH-2 (24-25')

Param	Flag	Result	Units	RL
Chloride		99.4	mg/Kg	4

Sample: 321925 - BH-3 (0-1')

Param	Flag	Result	Units	RL
Chloride		6210	mg/Kg	4

Sample: 321926 - BH-3 (4-5')

Param	Flag	Result	Units	RL
Chloride		1120	mg/Kg	4

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Sample: 321927 - BH-3 (9-10')

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

Sample: 321928 - BH-3 (14-15')

Param	Flag	Result	Units	RL
Chloride		147	mg/Kg	4





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Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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

Report Date: March 1, 2013

Work Order: 13022211

Project Location: Eddy Co., NM
Project Name: Alamo Permian/Artesia State #901
Project Number: 114-6401488

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
321910	BH-1 (0-1')	soil	2013-02-20	00:00	2013-02-22
321911	BH-1 (4-5')	soil	2013-02-20	00:00	2013-02-22
321912	BH-1 (9-10')	soil	2013-02-20	00:00	2013-02-22
321913	BH-1 (14-15')	soil	2013-02-20	00:00	2013-02-22
321914	BH-1 (19-20')	soil	2013-02-20	00:00	2013-02-22
321915	BH-1 (24-25')	soil	2013-02-20	00:00	2013-02-22
321916	BH-1 (29-30')	soil	2013-02-20	00:00	2013-02-22
321917	BH-1 (34-35')	soil	2013-02-20	00:00	2013-02-22
321918	BH-1 (39-40')	soil	2013-02-20	00:00	2013-02-22
321919	BH-2 (0-1')	soil	2013-02-20	00:00	2013-02-22
321920	BH-2 (4-5')	soil	2013-02-20	00:00	2013-02-22
321921	BH-2 (9-10')	soil	2013-02-20	00:00	2013-02-22
321922	BH-2 (14-15')	soil	2013-02-20	00:00	2013-02-22
321923	BH-2 (19-20')	soil	2013-02-20	00:00	2013-02-22
321924	BH-2 (24-25')	soil	2013-02-20	00:00	2013-02-22
321925	BH-3 (0-1')	soil	2013-02-20	00:00	2013-02-22
321926	BH-3 (4-5')	soil	2013-02-20	00:00	2013-02-22
321927	BH-3 (9-10')	soil	2013-02-20	00:00	2013-02-22



Sample	Description	Matrix	Date Taken	Time Taken	Date Received
321928	BH-3 (14-15')	soil	2013-02-20	00:00	2013-02-22

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



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



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Sample 321925 (BH-3 (0-1'))	10
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Case Narrative

Samples for project Alamo Permian/Artesia State #901 were received by TraceAnalysis, Inc. on 2013-02-22 and assigned to work order 13022211. Samples for work order 13022211 were received intact at a temperature of 3.8 C.

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (Titration)	SM 4500-Cl B	84163	2013-02-27 at 12:54	99352	2013-02-28 at 19:06
Chloride (Titration)	SM 4500-Cl B	84163	2013-02-27 at 12:54	99353	2013-02-28 at 19:07
Chloride (Titration)	SM 4500-Cl B	84163	2013-02-27 at 12:54	99354	2013-02-28 at 19:09

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 13022211 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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



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Analytical Report

Sample: 321910 - BH-1 (0-1')

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-02-28	Analyzed By:	AR
QC Batch:	99352	Sample Preparation:	2013-02-27	Prepared By:	AR
Prep Batch:	84163				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			6150	mg/Kg	10	4.00

Sample: 321911 - BH-1 (4-5')

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-02-28	Analyzed By:	AR
QC Batch:	99352	Sample Preparation:	2013-02-27	Prepared By:	AR
Prep Batch:	84163				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			567	mg/Kg	5	4.00

Sample: 321912 - BH-1 (9-10')

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-02-28	Analyzed By:	AR
QC Batch:	99352	Sample Preparation:	2013-02-27	Prepared By:	AR
Prep Batch:	84163				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			345	mg/Kg	5	4.00

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Sample: 321913 - BH-1 (14-15')

Laboratory:	Midland		
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B
QC Batch:	99352	Date Analyzed:	2013-02-28
Prep Batch:	84163	Sample Preparation:	2013-02-27
		Prep Method:	N/A
		Analyzed By:	AR
		Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			222	mg/Kg	5	4.00

Sample: 321914 - BH-1 (19-20')

Laboratory:	Midland		
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B
QC Batch:	99352	Date Analyzed:	2013-02-28
Prep Batch:	84163	Sample Preparation:	2013-02-27
		Prep Method:	N/A
		Analyzed By:	AR
		Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			123	mg/Kg	5	4.00

Sample: 321915 - BH-1 (24-25')

Laboratory:	Midland		
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B
QC Batch:	99352	Date Analyzed:	2013-02-28
Prep Batch:	84163	Sample Preparation:	2013-02-27
		Prep Method:	N/A
		Analyzed By:	AR
		Prepared By:	AR

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

Sample: 321916 - BH-1 (29-30')

Laboratory:	Midland		
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B
QC Batch:	99353	Date Analyzed:	2013-02-28
Prep Batch:	84163	Sample Preparation:	2013-02-27
		Prep Method:	N/A
		Analyzed By:	AR
		Prepared By:	AR

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			199	mg/Kg	5	4.00

Sample: 321917 - BH-1 (34-35')

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 99353 Date Analyzed: 2013-02-28 Analyzed By: AR
Prep Batch: 84163 Sample Preparation: 2013-02-27 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			79.5	mg/Kg	5	4.00

Sample: 321918 - BH-1 (39-40')

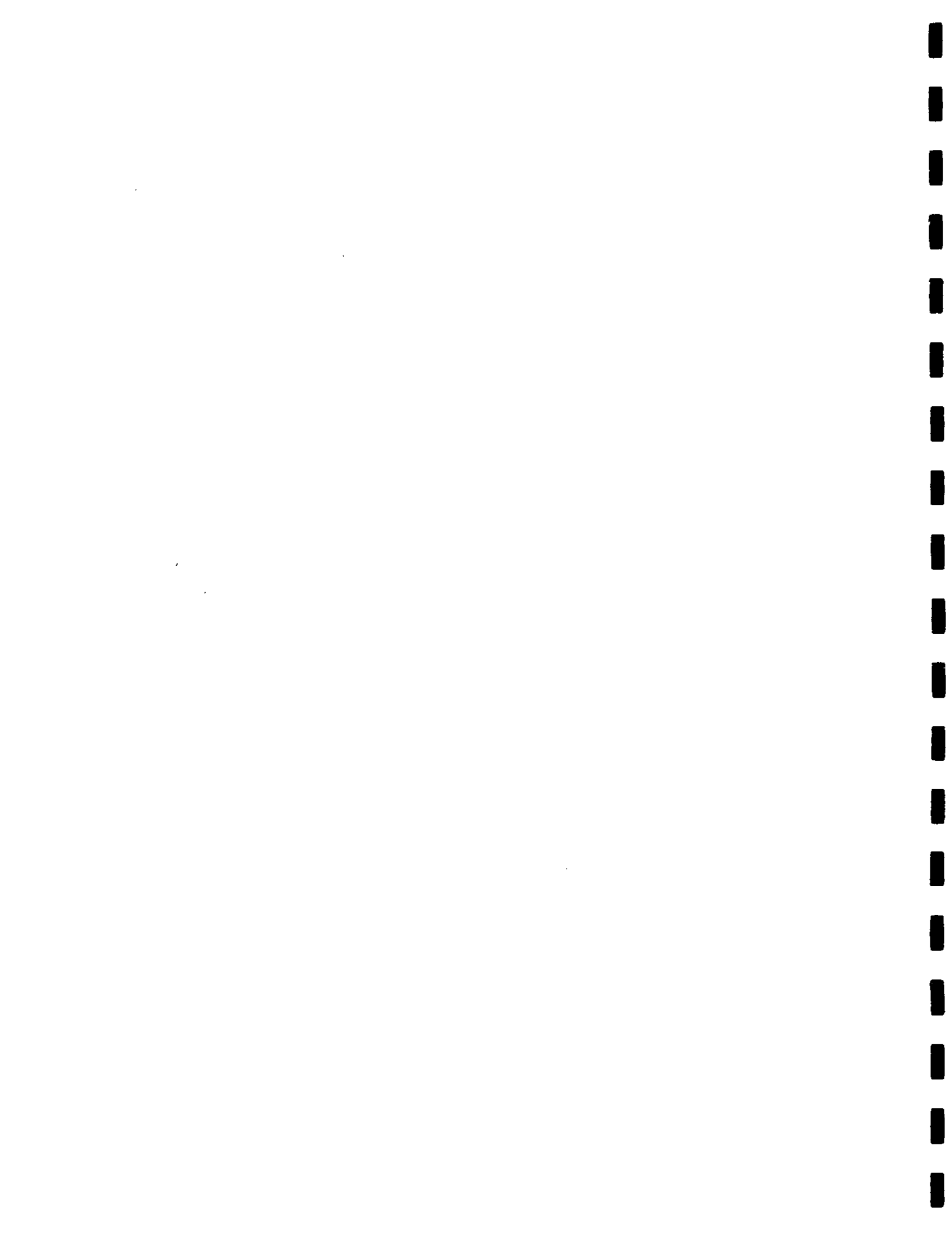
Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 99353 Date Analyzed: 2013-02-28 Analyzed By: AR
Prep Batch: 84163 Sample Preparation: 2013-02-27 Prepared By: AR

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

Sample: 321919 - BH-2 (0-1')

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 99353 Date Analyzed: 2013-02-28 Analyzed By: AR
Prep Batch: 84163 Sample Preparation: 2013-02-27 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1020	mg/Kg	10	4.00



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Sample: 321920 - BH-2 (4-5')

Laboratory:	Midland		
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B
QC Batch:	99353	Date Analyzed:	2013-02-28
Prep Batch:	84163	Sample Preparation:	2013-02-27
		Prep Method:	N/A
		Analyzed By:	AR
		Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1850	mg/Kg	10	4.00

Sample: 321921 - BH-2 (9-10')

Laboratory:	Midland		
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B
QC Batch:	99353	Date Analyzed:	2013-02-28
Prep Batch:	84163	Sample Preparation:	2013-02-27
		Prep Method:	N/A
		Analyzed By:	AR
		Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1310	mg/Kg	10	4.00

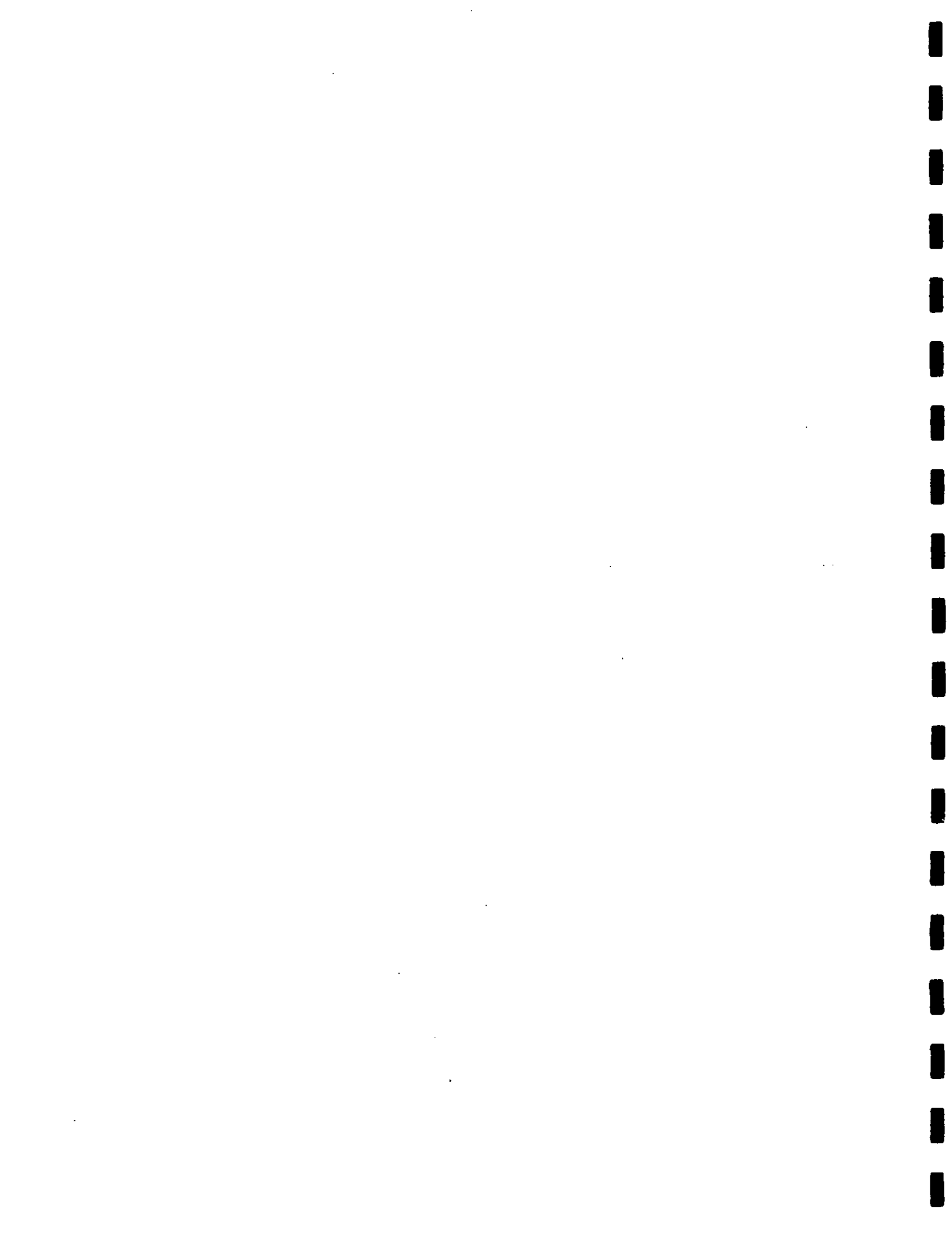
Sample: 321922 - BH-2 (14-15')

Laboratory:	Midland		
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B
QC Batch:	99353	Date Analyzed:	2013-02-28
Prep Batch:	84163	Sample Preparation:	2013-02-27
		Prep Method:	N/A
		Analyzed By:	AR
		Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			378	mg/Kg	5	4.00

Sample: 321923 - BH-2 (19-20')

Laboratory:	Midland		
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B
QC Batch:	99353	Date Analyzed:	2013-02-28
Prep Batch:	84163	Sample Preparation:	2013-02-27
		Prep Method:	N/A
		Analyzed By:	AR
		Prepared By:	AR



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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			353	mg/Kg	5	4.00

Sample: 321924 - BH-2 (24-25')

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 99353 Date Analyzed: 2013-02-28 Analyzed By: AR
Prep Batch: 84163 Sample Preparation: 2013-02-27 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			99.4	mg/Kg	5	4.00

Sample: 321925 - BH-3 (0-1')

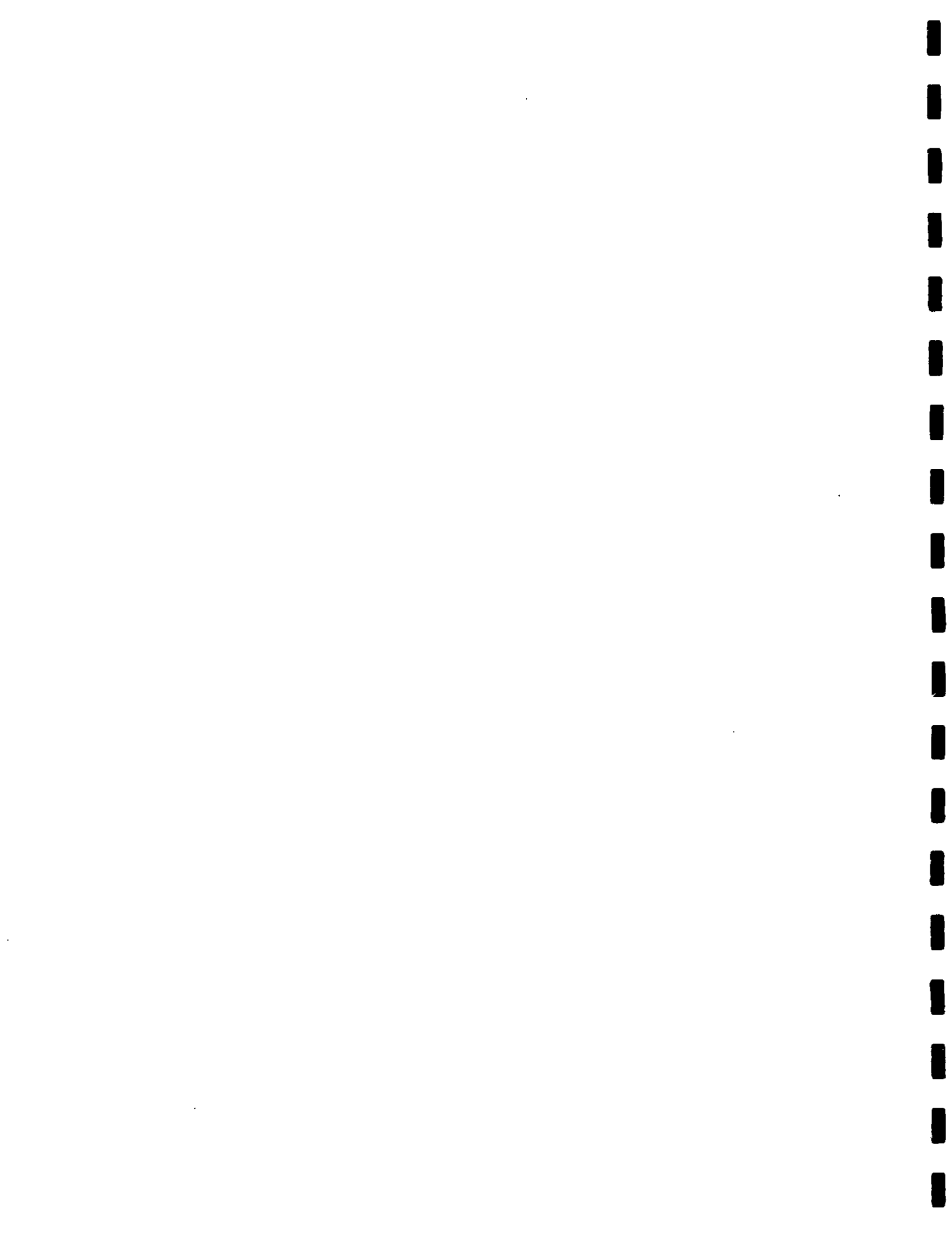
Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 99353 Date Analyzed: 2013-02-28 Analyzed By: AR
Prep Batch: 84163 Sample Preparation: 2013-02-27 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			6210	mg/Kg	10	4.00

Sample: 321926 - BH-3 (4-5')

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 99354 Date Analyzed: 2013-02-28 Analyzed By: AR
Prep Batch: 84163 Sample Preparation: 2013-02-27 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1120	mg/Kg	10	4.00



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Sample: 321927 - BH-3 (9-10')

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-02-28	Analyzed By:	AR
QC Batch:	99354	Sample Preparation:	2013-02-27	Prepared By:	AR
Prep Batch:	84163				

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

Sample: 321928 - BH-3 (14-15')

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-02-28	Analyzed By:	AR
QC Batch:	99354	Sample Preparation:	2013-02-27	Prepared By:	AR
Prep Batch:	84163				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			147	mg/Kg	5	4.00



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Method Blanks

Method Blank (1) QC Batch: 99352

QC Batch: 99352 Date Analyzed: 2013-02-28 Analyzed By: AR
Prep Batch: 84163 QC Preparation: 2013-02-27 Prepared By: AR

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

Method Blank (1) QC Batch: 99353

QC Batch: 99353 Date Analyzed: 2013-02-28 Analyzed By: AR
Prep Batch: 84163 QC Preparation: 2013-02-27 Prepared By: AR

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

Method Blank (1) QC Batch: 99354

QC Batch: 99354 Date Analyzed: 2013-02-28 Analyzed By: AR
Prep Batch: 84163 QC Preparation: 2013-02-27 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: 99352
Prep Batch: 84163

Date Analyzed: 2013-02-28
QC Preparation: 2013-02-27

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2540	mg/Kg	1	2500	<3.85	102	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			2350	mg/Kg	1	2500	<3.85	94	85 - 115	8	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: 99353
Prep Batch: 84163

Date Analyzed: 2013-02-28
QC Preparation: 2013-02-27

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2390	mg/Kg	1	2500	<3.85	96	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2560	mg/Kg	1	2500	<3.85	102	85 - 115	7	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 99354
Prep Batch: 84163

Date Analyzed: 2013-02-28
QC Preparation: 2013-02-27

Analyzed By: AR
Prepared By: AR



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Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2300	mg/Kg	1	2500	<3.85	92	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			2520	mg/Kg	1	2500	<3.85	101	85 - 115	9	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: 321915

QC Batch: 99352
Prep Batch: 84163

Date Analyzed: 2013-02-28
QC Preparation: 2013-02-27

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2210	mg/Kg	5	2500	<19.2	88	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			2380	mg/Kg	5	2500	<19.2	95	78.9 - 121	7	20

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

Matrix Spike (MS-1) Spiked Sample: 321925

QC Batch: 99353
Prep Batch: 84163

Date Analyzed: 2013-02-28
QC Preparation: 2013-02-27

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			8450	mg/Kg	10	2500	6210	90	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			8900	mg/Kg	10	2500	6210	108	78.9 - 121	5	20

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



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Matrix Spike (MS-1) Spiked Sample: 321935

QC Batch: 99354
Prep Batch: 84163

Date Analyzed: 2013-02-28
QC Preparation: 2013-02-27

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2570	mg/Kg	5	2500	<19.2	103	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			2350	mg/Kg	5	2500	<19.2	94	78.9 - 121	9	20

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



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Calibration Standards

Standard (CCV-1)

QC Batch: 99352

Date Analyzed: 2013-02-28

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	99.5	100	85 - 115	2013-02-28

Standard (CCV-2)

QC Batch: 99352

Date Analyzed: 2013-02-28

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-02-28

Standard (CCV-1)

QC Batch: 99353

Date Analyzed: 2013-02-28

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-02-28

Standard (CCV-2)

QC Batch: 99353

Date Analyzed: 2013-02-28

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	98.6	99	85 - 115	2013-02-28

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Standard (CCV-1)

QC Batch: 99354

Date Analyzed: 2013-02-28

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	99.8	100	85 - 115	2013-02-28

Standard (CCV-2)

QC Batch: 99354

Date Analyzed: 2013-02-28

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	100	100	85 - 115	2013-02-28



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

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.
Jc	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

Attachments

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





