AE Order Number Banner

Report Description

This report shows an AE Order Number in Barcode format for purposes of scanning. The Barcode format is Code 39.

App Number: pGRL1311953585

1RP - 2912

SIANA OPERATING LLC

7/27/2016

SPORT ENVIRONMENTAL SERVICES, PLLC
502 N. Big Spring Street, Midland, Texas 79701
Business: 432.683.1100 Fax: 888.500.0622

HOBBS OCD

MAR 05 2014

RECEIVED

March 4, 2014

Mr. Geoffrey R. Leking, Environmental Engineer State of New Mexico
Oil Conservation Division, District 1
1625 N. French Drive
Hobbs, New Mexico 88240 *sent via email GeoffreyR.Leking@state.nm.us*

Mr. Legion Brumley, Realty Compliance
U.S. Department of the Interior
Bureau of Land Management
620 East Greene
Carlsbad, NM 88220 *sent via email rpair@blm.gov*

RE: **Site Remediation Action Plan and Encapsulation Proposal**
Siana Operating, LLC - Curry Federal #2 SWD
Section 22, T-23-S, R-34-E, Lea County, New Mexico

Dear Mr. Leking and Mr. Brumley,

On behalf of Siana Operating, LLC, this Remediation Action Plan (RAP) is to describe the work that includes the remediation and encapsulation of chloride contaminated soil located at the aforementioned site per Bureau of Land Management (BLM) and NM Oil Conservation Division (NMOCD) requirements.

Current Status and Findings

Prior excavation and delineation to attain chloride concentrations (Cl) <1000 mg/kg had narrowed the areas of concern to the excavation floors of the vicinity encompassing sample points SP-1 and PP-4. Please refer to **Attachment 1** for the Sample Plan denoting final sample points. As outlined in the previous RAP dated March 12, 2013, SP-1 and PP-4 were vertically delineated to attain <250 mg/kg Cl with the following results recorded in **Attachment 2**:

- SP-1 showed 5010 mg/kg Cl at 10' and 2180 mg/kg Cl at 15'. Remaining samples taken at 5' depth increments were slightly above 2000 mg/kg Cl all the way down to 55' where the level

dropped to 1410 mg/kg Cl. The final sample showed 356 mg/kg Cl at 65', the depth limit of the air drilling rig.

- PP-4 showed 74 mg/kg Cl at 5', 80.8 mg/kg Cl at 10' and all samples taken at depths below 10' were non-detectable. Low Cl levels were expected at a shallow depth for this sample point as the excavation floor of the vicinity encompassing PP-4 is a layer of rock.

Work Plan

- The excavation area encompassing SP-1 is approximately 26'X32' and has been excavated to a depth of 3'. This area is composed of very sandy soil. Consequently, when the produced water spilled over the edge of the caliche pad much of it was rapidly absorbed by the sandy ground and continued to leach to an estimated depth of <100' based on results of the vertical delineation. Since the highest Cl concentrations are shown to be in the upper 10', the area encompassing SP-1 will be further excavated a minimum of 4' to remove approximately 16 more cubic yards of contaminated soil for disposal at Sundance Services in Eunice, New Mexico. Due to the proximity (less than 15 feet) of the excavation area South wall to the Curry Fed #2 location pad further excavation cannot be completed without encroaching onto the pad. The final excavation on the South wall of this area will follow the pitch of the Curry Fed #2 location pad drop off to avert slope stability problems and safety concerns.

  Three hundred – sixty (360) cubic yards of clean soil matching the natural geology of this location will be utilized for backfill. The excavation will be filled so that it is shaped in a crown fashion (see **Attachment 3**). A 55'X60' 20-mil poly-liner will be placed on top of the soil mound and extended with an overhang to prevent any further leaching of the Cl contained in the ground below. The liner shall be of sufficient length to avert sloughing and allow proper benching of the liner edges. The remaining clean soil will be backfilled on top of the liner to its previous level. The area will be feathered to blend with the natural contour of the land and the affected areas will be reseeded per BLM guidance and seed mixture specification. (see **Attachment 3**).

- The excavation area encompassing SP-2 is approximately 21'X36' and has been excavated to a depth of 3.5'. At the time of liner installation, the East wall, South wall and West wall will require additional excavation of 5 feet. We prefer not to encroach on the North wall as the edge of an existing liner was uncovered in this area during the previous excavation. The history and purpose of this liner is unknown to the current operator, the OCD, and the BLM.

  Ninety-eight (98) cubic yards of clean soil matching the natural geology of this location will be utilized to backfill the excavation to its previous level. The area will be feathered to blend with the natural contour of the land and the affected areas will be reseeded per BLM guidance and seed mixture specification.

- The excavation area encompassing PP-2 is approximately 29'X42' and has been excavated to a depth of 4'. Previous delineation results show that this area has chloride concentrations less than 1,000 ppm and does not require additional excavation.

One hundred-eighty (180) cubic yards of clean soil matching the natural geology of this location will be utilized to backfill the excavation to its previous level. The area will be feathered to blend with the natural contour of the land and the affected areas will be reseeded per BLM guidance and seed mixture specification.

- The excavation area encompassing PP-4 is approximately 50'X50' and has been excavated to bedrock at a depth of 3.5'. Vertical delineation below the excavation floor shows that Cl contamination has not permeated the rock.

  Twenty-seven (27) cubic yards of clean soil matching the natural geology of this location will be utilized to backfill the excavation to its previous level. The area will be feathered to blend with the natural contour of the land and the affected areas will be reseeded per BLM guidance and seed mixture specification.

If you have any questions or comments, please don't hesitate to contact me anytime at either my office (432-683-1100) or on my mobile (432-553-8555).

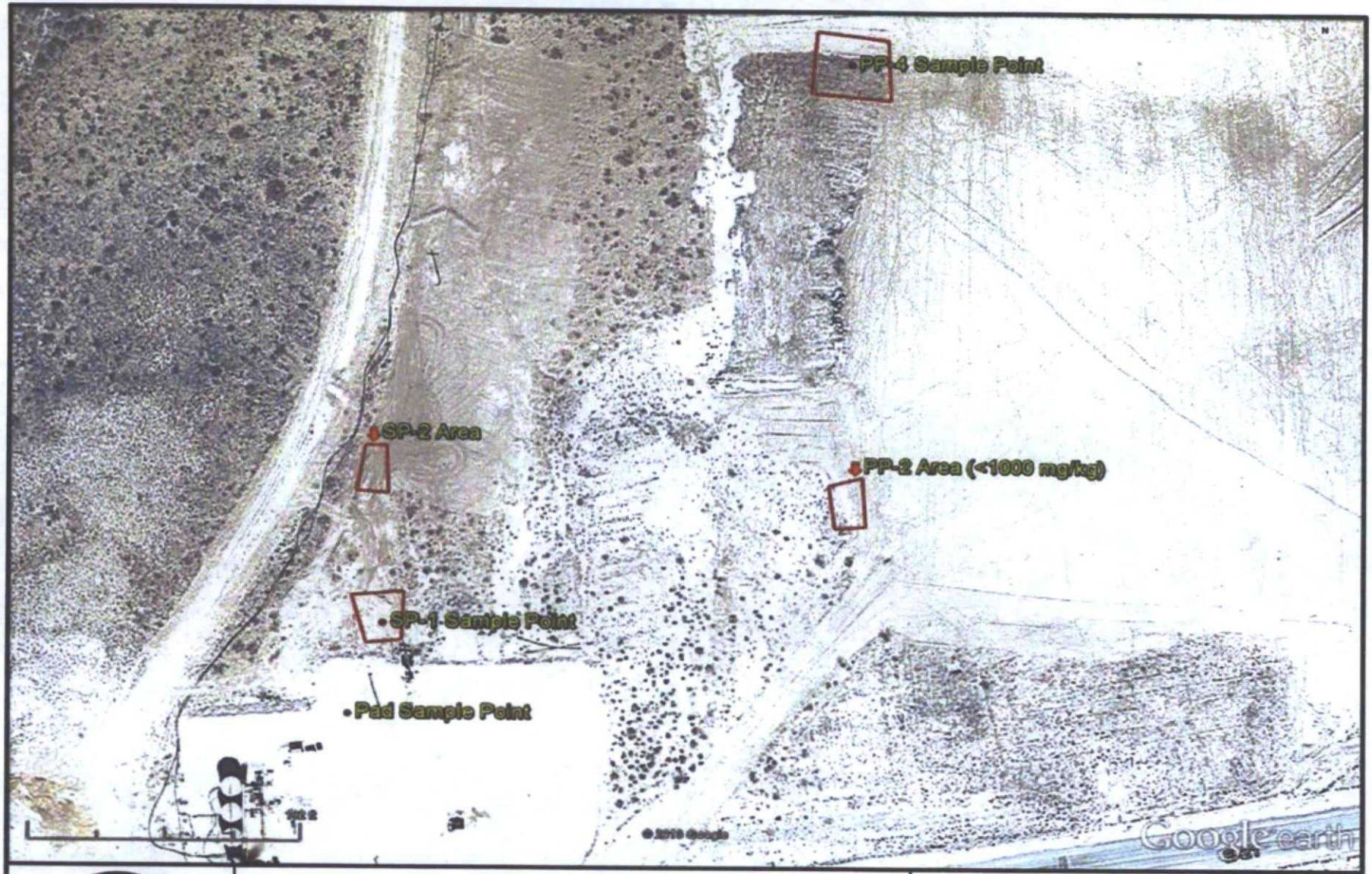
Sincerely,

Debi S. Moore.

Debi Sport Moore, M.E., R.E.P.A.
President

Attatchments:
1. Sample Location Site Plan
2. Trace Analysis' Analytical Reports
3. Work Plan Drawing

Cc: Mr. Matt Doffer *sent via email mdoffer@sianaoil.com*
Siana Oil and Gas Co., LLC
601 N. Marienfeld, Suite 300
Midland, TX 79701



SPORT ENVIRONMENTAL SERVICES

Siana Operating, LLC
Curry Federal #2 SWD
Section 22, T-23-S, R-34-e
Lee County, New Mexico

Sample Plan Denoting Final Sample Points

Author	Drawing Date	Site Visit Date
mlb	3/5/2014	3/4/2014

Attachment 1

Attachment 2

TraceAnalysis Analytical Reports

W.O. Nos. 13120616 and 13120617

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Debi Sport Moore
Sport Environmental Services
502 N. Big Spring Street
Midland, TX, 79701

Report Date: December 17, 2013

Work Order: 13120616

Project Location: Jal, NM
Project Name: Siana Curry Fed. #2 (SWD Release)

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
348219	SP1-5'	soil	2013-12-04	10:14	2013-12-06
348220	SP1-10'	soil	2013-12-04	10:15	2013-12-06
348221	SP1-15'	soil	2013-12-04	10:16	2013-12-06
348222	SP1-20'	soil	2013-12-04	10:17	2013-12-06
348223	SP1-25'	soil	2013-12-04	10:19	2013-12-06
348224	SP1-30'	soil	2013-12-04	13:23	2013-12-06
348225	SP1-35'	soil	2013-12-04	13:25	2013-12-06
348226	SP1-45'	soil	2013-12-04	13:32	2013-12-06
348227	SP1-55'	soil	2013-12-04	13:46	2013-12-06
348228	SP1-60'	soil	2013-12-04	13:48	2013-12-06
348229	SP1-65'	soil	2013-12-04	13:51	2013-12-06

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.

Notes:
All sample results are reported on a dry weight basis.

For inorganic analyses, the term MQL should actually read PQL.

Michael Abel

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

Report Contents

Case Narrative

Samples for project Siana Curry Fed. #2 (SWD Release) were received by TraceAnalysis, Inc. on 2013-12-06 and assigned to work order 13120616. Samples for work order 13120616 were received intact at a temperature of 3.3 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	91073	2013-12-12 at 09:19	107599	2013-12-13 at 14:31
Chloride (Titration)	SM 4500-Cl B	91073	2013-12-12 at 09:19	107600	2013-12-13 at 15:05
Moisture Content	ASTM D 2216-05	91022	2013-12-11 at 13:26	107505	2013-12-12 at 13:26

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 13120616 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

Note: *All sample results are reported on a dry weight basis.*

Sample: 348219 - SP1-5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107599	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**9780**	**9780**	<43.0	mg/Kg	10	43.0	4	3.85

Sample: 348219 - SP1-5'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107505	Date Analyzed:	2013-12-12	Analyzed By:	AR
Prep Batch:	91022	Sample Preparation:	2013-12-11	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture			10.5	%	1	0

Sample: 348220 - SP1-10'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107599	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**5010**	**5010**	<40.2	mg/Kg	10	40.2	4	3.85

Sample: 348220 - SP1-10'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A

QC Batch: 107505 | Date Analyzed: 2013-12-12 | Analyzed By: AR
Prep Batch: 91022 | Sample Preparation: 2013-12-11 | Prepared By: AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture		1	4.21	%	1	0

Sample: 348221 - SP1-15'

Laboratory: Midland
Analysis: Chloride (Titration) | Analytical Method: SM 4500-Cl B | Prep Method: N/A
QC Batch: 107599 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | Sample Preparation: 2013-12-12 | Prepared By: AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**2180**	**2180**	<39.3	mg/Kg	10	39.3	4	3.85

Sample: 348221 - SP1-15'

Laboratory: Midland
Analysis: Moisture Content | Analytical Method: ASTM D 2216-05 | Prep Method: N/A
QC Batch: 107505 | Date Analyzed: 2013-12-12 | Analyzed By: AR
Prep Batch: 91022 | Sample Preparation: 2013-12-11 | Prepared By: AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture		1	2.04	%	1	0

Sample: 348222 - SP1-20'

Laboratory: Midland
Analysis: Chloride (Titration) | Analytical Method: SM 4500-Cl B | Prep Method: N/A
QC Batch: 107600 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | Sample Preparation: 2013-12-12 | Prepared By: AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**3980**	**3980**	<40.3	mg/Kg	10	40.3	4	3.85

Sample: 348222 - SP1-20'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107505	Date Analyzed:	2013-12-12	Analyzed By:	AR
Prep Batch:	91022	Sample Preparation:	2013-12-11	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture		1	4.50	%	1	0

Sample: 348223 - SP1-25'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107600	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**2040**	**2040**	<49.2	mg/Kg	10	49.2	4	3.85

Sample: 348223 - SP1-25'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107505	Date Analyzed:	2013-12-12	Analyzed By:	AR
Prep Batch:	91022	Sample Preparation:	2013-12-11	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture		1	21.7	%	1	0

Sample: 348224 - SP1-30'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107600	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**2060**	**2060**	<39.3	mg/Kg	10	39.3	4	3.85

Sample: 348224 - SP1-30'

Laboratory:	Midland			Prep Method:	N/A
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Analyzed By:	AR
QC Batch:	107505	Date Analyzed:	2013-12-12	Prepared By:	AR
Prep Batch:	91022	Sample Preparation:	2013-12-11		

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture			2.10	%	1	0

Sample: 348225 - SP1-35'

Laboratory:	Midland			Prep Method:	N/A
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Analyzed By:	AR
QC Batch:	107600	Date Analyzed:	2013-12-13	Prepared By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12		

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**2210**	**2210**	<39.5	mg/Kg	10	39.5	4	3.85

Sample: 348225 - SP1-35'

Laboratory:	Midland			Prep Method:	N/A
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Analyzed By:	AR
QC Batch:	107505	Date Analyzed:	2013-12-12	Prepared By:	AR
Prep Batch:	91022	Sample Preparation:	2013-12-11		

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture			2.56	%	1	0

Sample: 348226 - SP1-45'

Laboratory: Midland

Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107600	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**2240**	**2240**	<39.5	mg/Kg	10	39.5	4	3.85

Sample: 348226 - SP1-45'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107505	Date Analyzed:	2013-12-12	Analyzed By:	AR
Prep Batch:	91022	Sample Preparation:	2013-12-11	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture			2.64	%	1	0

Sample: 348227 - SP1-55'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107600	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**1410**	**1410**	<39.6	mg/Kg	10	39.6	4	3.85

Sample: 348227 - SP1-55'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107505	Date Analyzed:	2013-12-12	Analyzed By:	AR
Prep Batch:	91022	Sample Preparation:	2013-12-11	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture			2.77	%	1	0

Sample: 348228 - SP1-60'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107600	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**1320**	**1320**	<39.5	mg/Kg	10	39.5	4	3.85

Sample: 348228 - SP1-60'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107505	Date Analyzed:	2013-12-12	Analyzed By:	AR
Prep Batch:	91022	Sample Preparation:	2013-12-11	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture			2.54	%	1	0

Sample: 348229 - SP1-65'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107600	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**356**	**356**	<19.8	mg/Kg	5	19.8	4	3.85

Sample: 348229 - SP1-65'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107505	Date Analyzed:	2013-12-12	Analyzed By:	AR
Prep Batch:	91022	Sample Preparation:	2013-12-11	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture			3.06	%	1	0

Method Blanks

Method Blank (1)

QC Batch: 107599 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | QC Preparation: 2013-12-12 | Prepared By: AR

Parameter	F	C	Result	Units	Reporting Limits
Chloride			<3.85	mg/Kg	3.85

Method Blank (1)

QC Batch: 107600 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | QC Preparation: 2013-12-12 | Prepared By: AR

Parameter	F	C	Result	Units	Reporting Limits
Chloride			<3.85	mg/Kg	3.85

Duplicate (2) Duplicated Sample: 348231

QC Batch: 107505 | Date Analyzed: 2013-12-12 | Analyzed By: AR
Prep Batch: 91022 | QC Preparation: 2013-12-11 | Prepared By: AR

Param	F	C	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Moisture		1	9.11	9.85	%	1	8	20

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 107599 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | QC Preparation: 2013-12-12 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2360	mg/Kg	1	2500	<3.85	94	89.7 - 115.9

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2490	mg/Kg	1	2500	<3.85	100	89.7 - 115.9	5	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: 107600 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | QC Preparation: 2013-12-12 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2670	mg/Kg	1	2500	<3.85	107	89.7 - 115.9

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2520	mg/Kg	1	2500	<3.85	101	89.7 - 115.9	6	20

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

Matrix Spike (MS-1) Spiked Sample: 348221

QC Batch: 107599 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | QC Preparation: 2013-12-12 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			4660	mg/Kg	10	2500	2140	101	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			4760	mg/Kg	10	2500	2140	105	78.9 - 121	2	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: 348231

QC Batch: 107600 Date Analyzed: 2013-12-13 Analyzed By: AR
Prep Batch: 91073 QC Preparation: 2013-12-12 Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2530	mg/Kg	5	2500	72.8	98	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			2630	mg/Kg	5	2500	72.8	102	78.9 - 121	4	20

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

Calibration Standards

Standard (CCV-1)

QC Batch: 107599 | Date Analyzed: 2013-12-13 | Analyzed By: AR

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.3	99	85 - 115	2013-12-13

Standard (CCV-2)

QC Batch: 107599 | Date Analyzed: 2013-12-13 | Analyzed By: AR

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-12-13

Standard (CCV-1)

QC Batch: 107600 | Date Analyzed: 2013-12-13 | Analyzed By: AR

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	103	103	85 - 115	2013-12-13

Standard (CCV-2)

QC Batch: 107600 | Date Analyzed: 2013-12-13 | Analyzed By: AR

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	96.7	97	85 - 115	2013-12-13

Limits of Detection (LOD)

Test	Method	Matrix	Instrument	Analyte	Spike Amount	Pass
Chloride (Titration)	SM 4500-Cl B	soil	N/A	Chloride	10.0	Pass

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	T104704392-13-7	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 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.
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

Attachments

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

LAB Order ID # 13120616

Page 1 of 1

TraceAnalysis, Inc.

email: lab@traceanalysis.com

6701 Aberdeen Ave, Ste 9, Lubbock, Texas 79424, Tel (806) 794-1296, Fax (806) 794-1298, 1 (800) 378-1296

5002 Basin Street, Suite A1, Midland, Texas 79703, Tel (432) 689-6301, Fax (432) 689-6313

200 East Sunset Rd., Suite E, El Paso, Texas 79922, Tel (915) 585-3443, Fax (915) 585-4944

BioAquatic Testing, 2501 Mayes Rd., Ste 100, Carrollton, Texas 75006, Tel (972) 242-7750

Company Name: Sport Environmental Services, PLLC	Phone #: (432) 683-1100
Address: 502 N. Big Spring Street, Midland, Texas 79701	Fax #: (888) 500-0622
Contact Person: Debi S. Moore, M.E., R.E.P.A.	E-mail: debi@sportenvironmental.com
Invoice to: same as above	
Project #: N/A	Project Name: Siana O & G - Curry Fed #2 SWD Release
Project Location: (include state) Jal, New Mexico	Sampler Signature:

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME	MTBE 8021B / 602 / 8260B / 624	BTEX 8021B / 602 / 8260B / 624	TPH 418.1 / TX1005 / DRO / TVHC	PAH 8270C / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B / 200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	Pesticides 8081A / 608	BOD, TSS, pH	Moisture Content	Cl, F, SO_4, NO_3-N, NO_2-N, PO_4-P, Alkalinity	Na, Ca, Mg, K, TDS, EC	Volatiles by Method 8260		Turn Around Time if different from standard	Hold
548219	SP1-5'	1			X								X	12/4/13	1014															X	X					
220	SP1-10'	1			X								X	12/4/13	1015															X	X					
221	SP1-15'	1			X								X	12/4/13	1016															X	X					
222	SP1-20'	1			X								X	12/4/13	1017															X	X					
223	SP1-25'	1			X								X	12/4/13	1019															X	X					
224	SP1-30'	1			X								X	12/4/13	1323															X	X					
225	SP1-35'	1			X								X	12/4/13	1325															X	X					
226	SP1-45'	1			X								X	12/4/13	1332															X	X					
227	SP1-55'	1			X								X	12/4/13	1346															X	X					
228	SP1-60'	1			X								X	12/4/13	1348															X	X					
229	SP1-65'	1			X								X	12/4/13	1357															X	X					

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	
[signature]	SPORTEN.	12/6/13	0856	TRPORT	SES	12-6-13	0857	INST ____ OBS ____ °C COR ____ °C
TRPORT	SES 12-6-13	12-6-13	1200	[signature]	SES	12-6-13	1206	INST ____ OBS ____ °C COR ____ °C
[signature]	SES	12-6-13	1302	[signature]	TA	12/6/13	1302	INST 18.7 OBS 24.1 °C COR 23.5 °C

Submittal of samples constitutes agreement to Terms and Conditions

ORIGINAL COPY

LAB USE ONLY

Intact Y / N

Headspace Y / N / NA

Log-in Review

Carrier # [signature]

REMARKS: Midland -all

- ☐ Dry Weight Basis Required
- ☐ TRRP Report Required
- ☐ Check If Special Reporting Limits Are Needed

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915•585•3443 FAX 915•585•4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432•689•6301 FAX 432•689•6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972•242•7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Debi Sport Moore
Sport Environmental Services
502 N. Big Spring Street
Midland, TX, 79701

Report Date: December 17, 2013

Work Order: 13120617

Project Location: Jal, NM
Project Name: Siana Curry Fed. #2 (SWD Release)

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
348230	PP4-5'	soil	2013-12-04	09:25	2013-12-06
348231	PP4-10'	soil	2013-12-04	09:26	2013-12-06
348232	PP4-15'	soil	2013-12-04	09:28	2013-12-06
348233	PP4-20'	soil	2013-12-04	09:30	2013-12-06
348234	PP4-25'	soil	2013-12-04	09:31	2013-12-06
348235	PAD-5'	soil	2013-12-04	10:55	2013-12-06
348236	PAD-10'	soil	2013-12-04	10:57	2013-12-06
348237	PAD-15'	soil	2013-12-04	11:00	2013-12-06
348238	PAD-20'	soil	2013-12-04	11:02	2013-12-06
348239	PAD-25'	soil	2013-12-04	11:05	2013-12-06

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.

Notes:
All sample results are reported on a dry weight basis.

For inorganic analyses, the term MQL should actually read PQL.

Michael Abel

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

Report Contents

Case Narrative

Samples for project Siana Curry Fed. #2 (SWD Release) were received by TraceAnalysis, Inc. on 2013-12-06 and assigned to work order 13120617. Samples for work order 13120617 were received intact at a temperature of 3.3 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	91073	2013-12-12 at 09:19	107600	2013-12-13 at 15:05
Chloride (Titration)	SM 4500-Cl B	91073	2013-12-12 at 09:19	107601	2013-12-13 at 15:13
Moisture Content	ASTM D 2216-05	91022	2013-12-11 at 13:26	107505	2013-12-12 at 13:26
Moisture Content	ASTM D 2216-05	91075	2013-12-12 at 09:20	107590	2013-12-13 at 16:08

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 13120617 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

Note: *All sample results are reported on a dry weight basis.*

Sample: 348230 - PP4-5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107600	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**74.0**	**74.0**	<24.4	mg/Kg	5	24.4	4	3.85

Sample: 348230 - PP4-5'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107505	Date Analyzed:	2013-12-12	Analyzed By:	AR
Prep Batch:	91022	Sample Preparation:	2013-12-11	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture		1	21.2	%	1	0

Sample: 348231 - PP4-10'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107600	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**80.8**	**80.8**	<21.4	mg/Kg	5	21.4	4	3.85

Sample: 348231 - PP4-10'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A

QC Batch: 107505 | Date Analyzed: 2013-12-12 | Analyzed By: AR
Prep Batch: 91022 | Sample Preparation: 2013-12-11 | Prepared By: AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture		1	9.85	%	1	0

Sample: 348232 - PP4-15'

Laboratory: Midland
Analysis: Chloride (Titration) | Analytical Method: SM 4500-Cl B | Prep Method: N/A
QC Batch: 107601 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | Sample Preparation: 2013-12-12 | Prepared By: AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	U		<21.9	<22.8	<21.9	mg/Kg	5	21.9	4	3.85

Sample: 348232 - PP4-15'

Laboratory: Midland
Analysis: Moisture Content | Analytical Method: ASTM D 2216-05 | Prep Method: N/A
QC Batch: 107590 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91075 | Sample Preparation: 2013-12-12 | Prepared By: AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture		1	12.2	%	1	0

Sample: 348233 - PP4-20'

Laboratory: Midland
Analysis: Chloride (Titration) | Analytical Method: SM 4500-Cl B | Prep Method: N/A
QC Batch: 107601 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | Sample Preparation: 2013-12-12 | Prepared By: AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	U		<20.3	<21.0	<20.3	mg/Kg	5	20.3	4	3.85

Sample: 348233 - PP4-20'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107590	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91075	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture		1	5.09	%	1	0

Sample: 348234 - PP4-25'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107601	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride	U		<24.6	<25.6	<24.6	mg/Kg	5	24.6	4	3.85

Sample: 348234 - PP4-25'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107590	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91075	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture		1	21.8	%	1	0

Sample: 348235 - PAD-5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107601	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**19800**	**19800**	<44.9	mg/Kg	10	44.9	4	3.85

Sample: 348235 - PAD-5'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107590	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91075	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture			14.3	%	1	0

Sample: 348236 - PAD-10'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107601	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**7670**	**7670**	<43.0	mg/Kg	10	43.0	4	3.85

Sample: 348236 - PAD-10'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107590	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91075	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture			10.4	%	1	0

Sample: 348237 - PAD-15'

Laboratory: Midland

Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107601	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**269**	**269**	<20.5	mg/Kg	5	20.5	4	3.85

Sample: 348237 - PAD-15'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107590	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91075	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture			6.10	%	1	0

Sample: 348238 - PAD-20'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107601	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**136**	**136**	<19.8	mg/Kg	5	19.8	4	3.85

Sample: 348238 - PAD-20'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107590	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91075	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture			2.76	%	1	0

Sample: 348239 - PAD-25'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	107601	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91073	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	SDL Based Result	MQL Based Result	Method Blank Result	Units	Dilution	SDL	MQL (Unadjusted)	MDL (Unadjusted)
Chloride			**56.2**	**56.2**	<19.4	mg/Kg	5	19.4	4	3.85

Sample: 348239 - PAD-25'

Laboratory:	Midland				
Analysis:	Moisture Content	Analytical Method:	ASTM D 2216-05	Prep Method:	N/A
QC Batch:	107590	Date Analyzed:	2013-12-13	Analyzed By:	AR
Prep Batch:	91075	Sample Preparation:	2013-12-12	Prepared By:	AR

Parameter	F	C	RL Result	Units	Dilution	RL
Moisture		1	0.975	%	1	0

Method Blanks

Method Blank (1)

QC Batch: 107600 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | QC Preparation: 2013-12-12 | Prepared By: AR

Parameter	F	C	Result	Units	Reporting Limits
Chloride			<3.85	mg/Kg	3.85

Method Blank (1)

QC Batch: 107601 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | QC Preparation: 2013-12-12 | Prepared By: AR

Parameter	F	C	Result	Units	Reporting Limits
Chloride			<3.85	mg/Kg	3.85

Duplicate (2) Duplicated Sample: 348231

QC Batch: 107505 | Date Analyzed: 2013-12-12 | Analyzed By: AR
Prep Batch: 91022 | QC Preparation: 2013-12-11 | Prepared By: AR

Param	F	C	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Moisture		1	9.11	9.85	%	1	8	20

Duplicate (1) Duplicated Sample: 348239

QC Batch: 107590 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91075 | QC Preparation: 2013-12-12 | Prepared By: AR

continued ...

duplicate continued ...

Param	F	C	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Moisture		1	1.04	0.975	%	1	6	20

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 107600 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | QC Preparation: 2013-12-12 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2670	mg/Kg	1	2500	<3.85	107	89.7 - 115.9

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2520	mg/Kg	1	2500	<3.85	101	89.7 - 115.9	6	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: 107601 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | QC Preparation: 2013-12-12 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2480	mg/Kg	1	2500	<3.85	99	89.7 - 115.9

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2650	mg/Kg	1	2500	<3.85	106	89.7 - 115.9	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: 348231

QC Batch: 107600 | Date Analyzed: 2013-12-13 | Analyzed By: AR
Prep Batch: 91073 | QC Preparation: 2013-12-12 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2530	mg/Kg	5	2500	72.8	98	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			2630	mg/Kg	5	2500	72.8	102	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: 348239

QC Batch: 107601 Date Analyzed: 2013-12-13 Analyzed By: AR
Prep Batch: 91073 QC Preparation: 2013-12-12 Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2660	mg/Kg	5	2500	55.7	104	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			2750	mg/Kg	5	2500	55.7	108	78.9 - 121	3	20

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

Calibration Standards

Standard (CCV-1)

QC Batch: 107600 Date Analyzed: 2013-12-13 Analyzed By: AR

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	103	103	85 - 115	2013-12-13

Standard (CCV-2)

QC Batch: 107600 Date Analyzed: 2013-12-13 Analyzed By: AR

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	96.7	97	85 - 115	2013-12-13

Standard (CCV-1)

QC Batch: 107601 Date Analyzed: 2013-12-13 Analyzed By: AR

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	98.3	98	85 - 115	2013-12-13

Standard (CCV-2)

QC Batch: 107601 Date Analyzed: 2013-12-13 Analyzed By: AR

Param	F	C	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	102	102	85 - 115	2013-12-13

Limits of Detection (LOD)

Test	Method	Matrix	Instrument	Analyte	Spike Amount	Pass
Chloride (Titration)	SM 4500-Cl B	soil	N/A	Chloride	10.0	Pass

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	T104704392-13-7	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 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.
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

Attachments

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

LAB Order ID # 1312 06M

Page ____ of ____

TraceAnalysis, Inc.

email: lab@traceanalysis.com

6701 Aberdeen Ave, Ste 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

5002 Basin Street, Suite A1
Midland, Texas 79703
Tel (432) 689-6301
Fax (432) 689-6313

200 East Sunset Rd., Suite E
El Paso, Texas 79922
Tel (915) 585-3443
Fax (915) 585-4944

BioAquatic Testing
2501 Mayes Rd., Ste 100
Carrollton, Texas 75006
Tel (972) 242-7750

Company Name: Sport Environmental Services, PLLC	**Phone #:** (432) 683-1100
Address: 502 N. Big Spring Street, Midland, Texas 79701	**Fax #:** (888) 500-0622
Contact Person: Debi S. Moore, M.E., R.E.P.A.	**E-mail:** debi@sportenvironmental.com
Invoice to: same as above	
Project #: N/A	**Project Name:** Siana Oil & Gas - Curry Fed #2 SWD Release
Project Location: (include state) Lea County, New Mexico	**Sampler Signature:**

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME
548230	PP4-5'	1			X								X	12/6/13	0925
231	PP4-10'	1			X								X	12/6/13	0926
232	PP4-15'	1			X								X	12/6/13	0928
233	PP4-20'	1			X								X	12/6/13	0930
234	PP4-25'	1			X								X	12/6/13	0931
235	PAD-5'	1			X								X	12/6/13	1055
236	PAD-10'	1			X								X	12/6/13	1057
237	PAD-15'	1			X								X	12/6/13	1100
238	PAD-20'	1			X								X	12/6/13	1102
239	PAD-25'	1			X								X	12/6/13	1105

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB #	MTBE 8021B / 602 / 8260B / 624	BTEX 8021B / 602 / 8260B / 624	TPH 418.1 / TX1005 / DRO / TVHC	PAH 8270C / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B / 200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	Pesticides 8081A / 608	BOD, TSS, pH	Moisture Content	Cl, F, SO_4, NO_3-N, NO_2-N, PO_4-P, Alkalinity	Na, Ca, Mg, K, TDS, EC	Volatiles by Method 8260	Turn Around Time if different from standard	Hold
548230																X	X				
231																X	X				
232																X	X				
233																X	X				
234																X	X				
235																X	X				
236																X	X				
237																X	X				
238																X	X				
239																X	X				

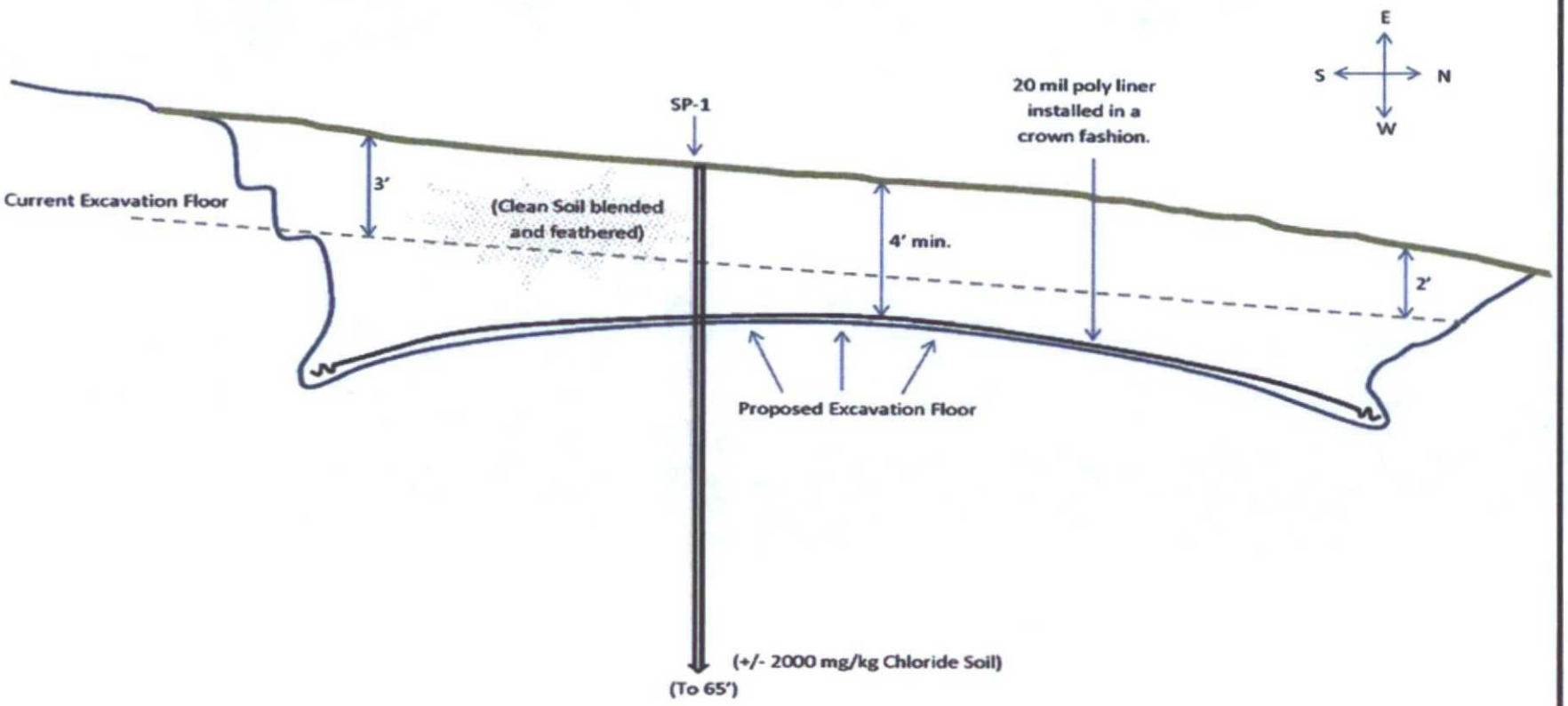
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	
[signature]	SPORT ENV	12/6/13	0856	T.SPORT	SES	12-6-13	0856	INST ____ OBS ____ °C COR ____ °C
TSPORT	SES	12-6-13	1200	[signature]	SES	12-6-13	1200	INST ____ OBS ____ °C COR ____ °C
[signature]	SES	12-6-13	1302	[signature]	TA	12/6/13	13:02	INST [illegible] OBS 3.4 °C COR 3.3 °C

LAB USE ONLY
Intact (Y) / N
Headspace Y / N / (NA)
Log-in Review ____
Carrier # [illegible]

REMARKS: Midland - All

☐ Dry Weight Basis Required
☐ TRRP Report Required
☐ Check If Special Reporting Limits Are Needed

ORIGINAL COPY



SPORT ENVIRONMENTAL SERVICES	**Siana Operating, LLC** **Curry Federal #2 SWD** **Section 22, T-23-S, R-34-E** **Lee County, New Mexico**	Proposed Encapsulation Design Author: mlb Drawing Date: 3/5/2014 Site Visit Date: 3/4/2014	Attachment 3