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REPORTS

DATE:

10-21-11



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October 21, 2011

Mr. Edward Hansen
New Mexico Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

**Subject: Soil Assessment Report, Chevron Mittie Weatherly Tank Battery No. 3
Unit F, Section 17, T-21S, R-37E, Lea Co., NM**

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Dear Mr. Hansen:

Chevron has completed an initial soil assessment around the Mittie Weatherly Tank Battery No. 3, located in Section 17, T-21S, R-37E in Lea County. This assessment was conducted in response to Rice Operating Company's (ROC) BD F-17 Termination Request, (AP-47). Please find attached a summary report of this assessment.

As described in the report, no release from Chevron's tank battery, which would have resulted in the elevated chloride concentrations in the soil and groundwater reported near ROC's F-17 Junction Box and in the associated groundwater monitoring wells, was identified. Based on these findings, no additional assessment of the Chevron tank battery appears warranted at this time.

If you have questions, please contact me at 713-372-9207.

Sincerely,

Matthew P. Hudson

Enclosure



**SOIL ASSESSMENT REPORT
CHEVRON MITTIE WEATHERLY TANK BATTERY #3**

**UNIT F, SECTION 17, T-21-S, R-37-E
LEA COUNTY, NEW MEXICO**





SOIL ASSESSMENT REPORT CHEVRON MITTIE WEATHERLY TANK BATTERY #3

**UNIT F, SECTION 17, T-21-S, R-37-E
LEA COUNTY, NEW MEXICO**

Prepared For:

Mr. Matt Hudson

Chevron Environmental Management Company

**Prepared by:
Conestoga-Rovers
& Associates**

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**OCTOBER 18, 2011
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1.0 INTRODUCTION AND BACKGROUND

The Chevron Mittie Weatherly No. 3 Tank Battery is situated approximately 3 miles northwest of Eunice, New Mexico (FIGURE 1) and approximately 300 feet northwest of the F-17 Junction Box (FIGURE 2). A Termination Request for Rice Operating Company (ROC's) F-17 Junction Box BD SWD System (AP #47) dated June 24, 2011, was submitted to the New Mexico Oil Conservation Division (NMOCD) by Tetra Tech on behalf of ROC. The Termination Request contained hydrogeological information pertaining to chloride-affected soil and groundwater media in the vicinity of ROC's F-17 Junction Box location. Of note, the Tetra Tech report presented groundwater data exhibiting low chloride concentrations in MW-4, reportedly situated 'upgradient' from the subject Chevron tank battery. Another monitoring well MW-3, reportedly located 'downgradient' of the tank battery, exhibited elevated chloride concentrations in the groundwater. The ROC report submitted to the NMOCD states an "apparent groundwater impact from an upgradient source" to the junction box area which presumably could implicate the Chevron Weatherly Tank Battery No. 3 as a possible source. On September 6, 2011, Mr. Ed Hansen with the New Mexico Oil Conservation Division (NMOCD) contacted Mr. Matt Hudson with Chevron Environmental Management Company (CEMC) and provided CEMC with copy of the June 24, 2011 submittal. The communication also promulgated September 14 deadline for a response to the agency's request for CEMC's plans to assess soil conditions in the vicinity of the Chevron Mittie Weatherly No. 3 Tank Battery location. CEMC responded to the NMOCD prior to September 14 with plans to install four soil borings along the southern perimeter of the tank battery. The soil boring program was implemented on October 3, 2011 and results of the assessment are included in this Soil Assessment Report prepared by Conestoga-Rovers & Associates (CRA) on behalf of CEMC.

CRA has reviewed the Tetra Tech 2011 Termination Request correspondence and AP-47 Annual Groundwater Monitoring Reports from 2002, 2006, 2007 and 2009 obtained from NMOCD files. Four monitoring wells (MW-1,-2,-3 and -4) have been installed in this location. MW-1 (FIGURE 2) was installed in 2002 approximately 15 feet northwest of the F-17 Junction Box location. The well log (APPENDIX A) presented chloride titration data, collected in 5-foot intervals that exhibited chloride impacts from 5 feet below ground surface (bgs) to the soil/groundwater interface, situated at approximately 75 feet bgs. Chloride concentrations reported in the soil ranged from 352 parts per million (ppm) to as high as 5,197 ppm. The widespread chloride-impacted vadose zone down to the water table in MW-1 is a strong indication that the boring is situated in a source area. MW-1 chloride concentration trends in groundwater have been variable (2970 to 320 mg/L), with a more decreasing trend since 2007. The most recent concentration available is 320 mg/L in February 2011.

In 2006, monitoring wells MW-2 and MW-3 were installed southeast and northwest, respectively to MW-1. Historical chloride concentration trends, as illustrated in the June 24, 2011 ROC report, show MW-2 to have sustained relatively consistent chloride levels around 60 mg/L. MW-3 chloride concentration trends have been variable (2500 to 412 mg/L), with a more decreasing trend since 2010. The most recent concentration available is 570 mg/L in February 2011. MW-4 was installed north of the Weatherly Tank Battery No. 3 in July 2010. Chloride concentrations in groundwater from this well have been steady at 64 mg/L from three sampling events performed in 2010 – 2011.

The inferred groundwater flow direction, based on data from the Tetra Tech reports (and regional data), is toward the southeast. However, evaluation of groundwater elevation data from the reports indicate that the groundwater monitoring elevation data have not been updated and the well elevations may not have been surveyed by a professional land surveyor. The most recent groundwater gradient map reviewed, October 4, 2007, showed a difference in groundwater elevation of 0.11 feet between MW-3 and MW-1, over a distance of approximately 140 feet. This calculates to a gradient of 0.00078 feet per foot. Given this very slight measured gradient, and the potential imprecision in the measurements, actual groundwater flow direction cannot be confirmed to be consistently toward the southeast. The June 24, 2011 Termination Request submitted by ROC to the NMOCD did not contain a groundwater gradient map (esp. to include recently installed MW-4 well 'upgradient' to the Weatherly Tank Battery No. 3) demonstrating the current groundwater flow direction.

2.0 SOIL ASSESSMENT RESULTS

The objectives of the soil boring program are to evaluate subsurface conditions for the presence of elevated chloride concentrations in soils at the sampled locations adjacent to the Chevron Mittie Weatherly Tank Battery No. 3 (FIGURE 2). On October 3, 2011 CRA's drilling contractor, Harrison & Cooper (H&C), installed four soil borings at selected locations along the southern end of the Weatherly Tank Battery No. 3 as shown on FIGURE 2. The four soil borings were drilled approximately 20 feet below the ground surface (bgs). Prior to mobilizing drilling and hydrovac equipment to the location, the boring locations were marked and a utility notification made 48-hours prior to mobilization. All field work was coordinated with management personnel of the Eunice FMT. Hydro-excavation methods performed by H&C were employed as a borehole clearance method to clear each boring location prior to moving in the drill rig. An air-rotary rig, operated by a water well driller licensed in New Mexico, was utilized to advance the borings. A field scientist recorded the subsurface lithology and drilling observations on soil boring logs. General soil boring specifications include 5-inch diameter boreholes with split-spoon and/or drill cutting samples collected on 5-foot intervals.

The general lithology of the subsurface soils is described as follows: reddish-brown sands, loose to firm and dry from the ground surface to 4 to 8 feet bgs, followed by tan to buff, fine grain sand interval, interbedded with discontinuous and indurated caliche seams, dry and approximately 5 to 8 feet thick, underlain by 6 to 10 thick interval of tan to reddish-brown sands, dry with thin caliche interbeds to the total depth of 20 feet bgs.

Four soil samples were collected from each of the soil borings (SB-1,-2-3 and -4) at the following intervals: 5'-6', 9'-10', 14'-15' and 19'-20'. A total of 16 samples were analyzed for chlorides using EPA Method 300.0. The soil analytical results are summarized in TABLE I. SB-1 exhibited the highest chloride impacts with concentrations ranging from 41.0 to 74.7 milligrams per kilogram (mg/kg). The remaining three soil borings exhibited minimal impacts. Certified laboratory reports are provided in APPENDIX B.

Based on the analytical results of this limited soil investigation, no release from the tank battery was identified that would have resulted in the chloride impacts in soil and groundwater in the vicinity of the F-17 Junction Box and associated monitoring wells MW-1 and MW-3.

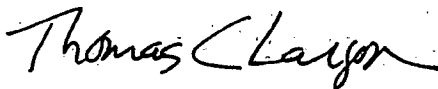
3.0 SUMMARY OF FINDINGS

This Soil Assessment Report presents a summary of historical information and data collected as part of the October 3, 2011 soil assessment in the vicinity of the Chevron Mittie Weatherly Tank Battery No. 3 location. Review of data from ROC annual groundwater monitoring reports (2002, 2006, 2007 and 2009) and a June 24, 2011 Termination Request submitted to the NMOCD have been performed by CRA on behalf of CEMC. The following is a summary of findings pertaining to these investigations.

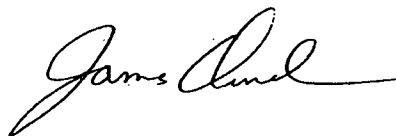
- CEMC has responded to the NMOCD request on September 6, 2011 to provide the agency with plans to assess soil conditions in the vicinity of the Weatherly Tank Battery in a timely matter.
- Chloride-impacted soils extending from 5 feet to the water table have been documented in MW-1, situated adjacent to the F-17 Junction Box. Chloride concentrations reported in the soil ranged from 352 parts per million (ppm) to as high as 5,197 ppm. The widespread chloride-impacted vadose zone down to the water table in MW-1 is a strong indication that the boring is situated in a source area.
- Historic chloride concentrations in groundwater in MW-1 and MW-3 have been variable and currently show decreasing trends. This data could suggest that the chloride plume is mobile or dispersion (from source areas) is occurring.
- Accurate groundwater elevation data are pertinent to the evaluation of the relative position of potential 'source areas' to chloride-impacted and non-impacted monitoring wells.
- Soil assessment activities consisting of four soil borings advanced to 20 feet bgs and the collection of 16 soil samples for chloride analysis south of the Weatherly Tank Battery No. 3 were performed on October 3, 2011.
- Based on the analytical results of this limited soil assessment, no release, of sufficient magnitude to result in the chloride concentrations observed in soil and groundwater in the vicinity of F-17 and MW-1/MW-3, was identified.

Based on data summarized in this limited soil investigation report, no further assessment activities appear warranted at this time.

All of which is Respectfully Submitted,
CONESTOGA-ROVERS & ASSOCIATES

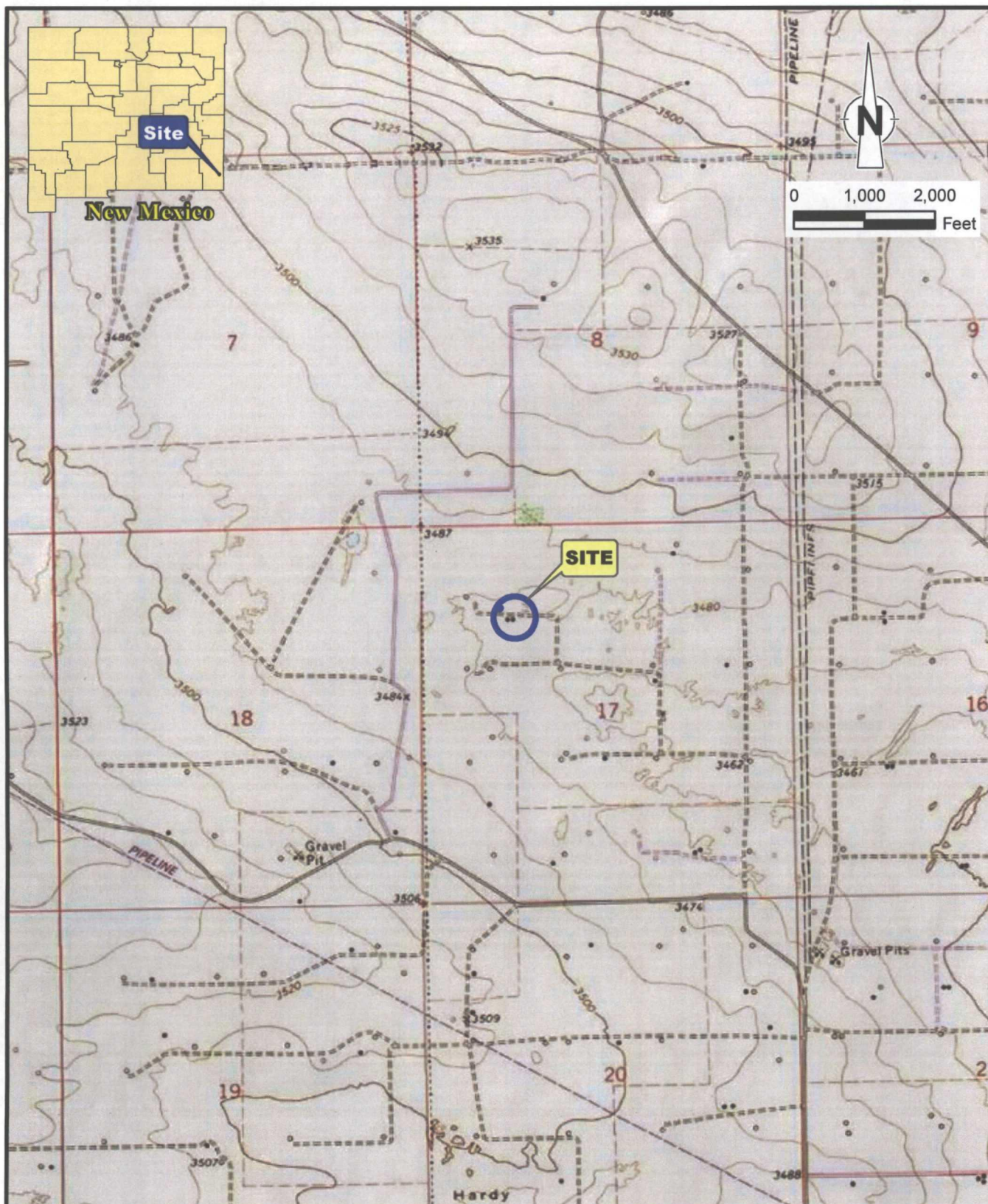


Thomas C. Larson, PG
Midland Operations Manager



James Ornelas
Senior Project Manager

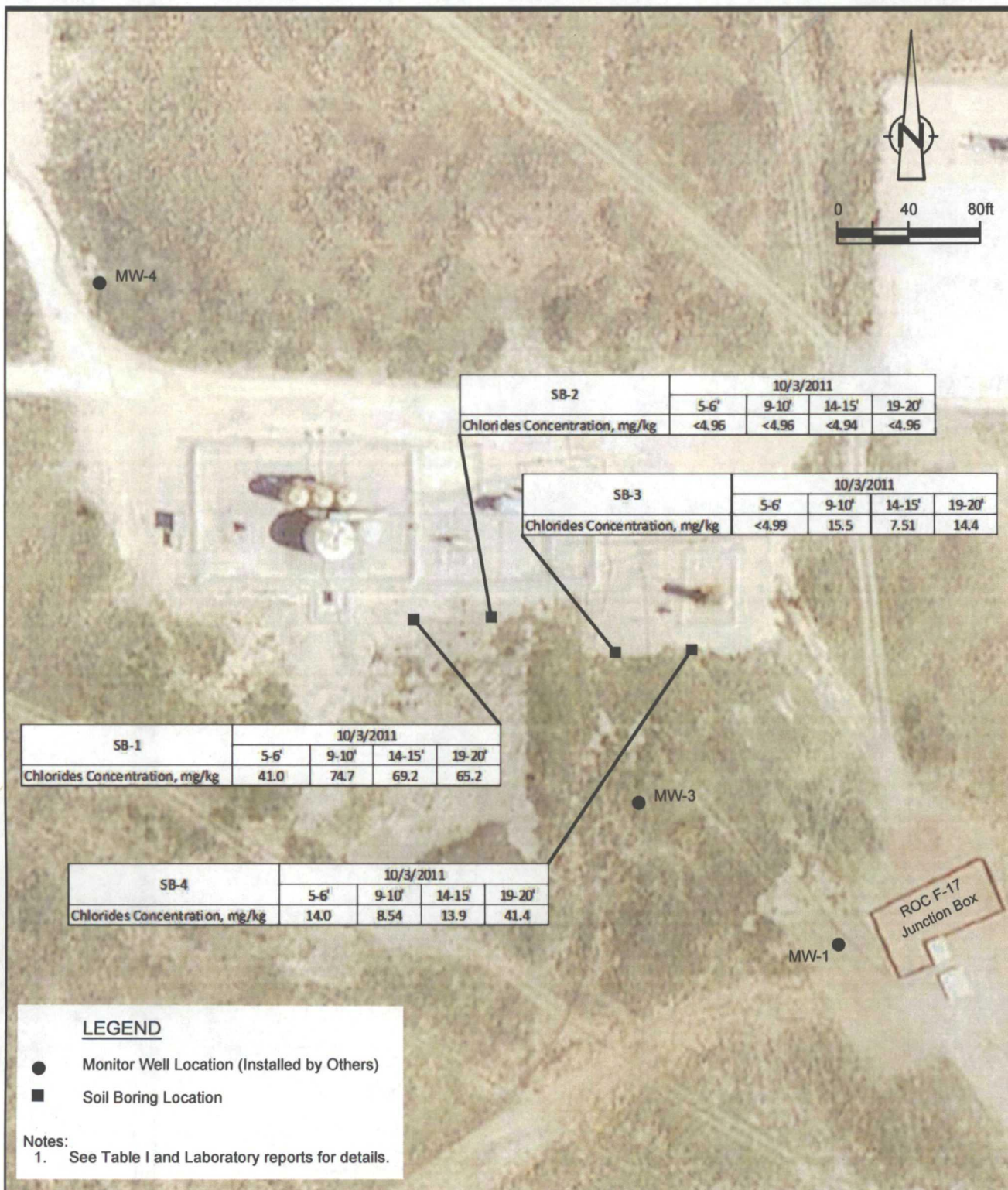
FIGURES



RE: USGS 7.5 Minute Topographic Maps.

figure 1
 SITE LOCATION MAP
 WEATHERLY TANK BATTERY NO. 3
 LEA COUNTY, NEW MEXICO
 Chevron Environmental Management Company





RE: GIS Based Aerial Photograph

figure 2

CHLORIDE CONCENTRATIONS IN SOILS MAP
WEATHERLY TANK BATTERY NO. 3
LEA COUNTY, NEW MEXICO
Chevron Environmental Management Company



TABLES

TABLE I
SOIL ANALYTICAL SUMMARY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
WEATHERLY TANK BATTERY NO. 3
LEA COUNTY, NEW MEXICO
NMOCD Recommended Remediation Action Levels (Total Ranking Score = 10)

Sample ID	Depth (feet)	Sample Date	Chlorides (mg/kg)
NMOCD RRAL (Site Specific Ranking =10)			500 mg/kg
SB-1	5-6	10/3/11	41.0
	9-10	10/3/11	74.7
	14-15	10/3/11	69.2
	19-20	10/3/11	65.2
SB-2	5-6	10/3/11	<4.96
	9-10	10/3/11	<4.96
	14-15	10/3/11	<4.94
	19-20	10/3/11	<4.96
SB-3	5-6	10/3/11	<4.99
	9-10	10/3/11	15.5
	14-15	10/3/11	7.51
	19-20	10/3/11	14.4
SB-4	5-6	10/3/11	14.0
	9-10	10/3/11	8.54
	14-15	10/3/11	13.9
	19-20	10/3/11	41.1

Notes:

1. Chlorides analyzed by 300.0
2. Bold concentrations above lab reporting limits.
3. ND - Results where below detection limits.

APPENDICES

APPENDIX A

DRILLING LOG	Site Name/Location	BORING/WELL INFORMATION			Logged by: Eades
RICE Operating Company 122 West Taylor Hobbs, New Mexico 88240 (505) 393-9174	Jct. F-17 17-T21S-R37E BD SWD System Lea County, NM	Well No. MW 1	Date Drilled: 11-18-02	Driller: Eades	Completion: Packed with: bentonite; grouted at surface.
		Well Depth: 85'	Boring Depth: 65'	Well Material: PVC	
		Casing Length: 88'	Boring Diameter: 2"	Casing Size: 2"	
		Screen Length: 20'	Drilling Method: Air Rotary	Slot Size: N/A	

DEPTH	SUBSURFACE LITHOLOGY	SAMPLE TYPE	Test Results (ppm)		REMARKS	Boring
			CI	TPH		
0	Ground surface		Titrate	EPA 418.1		
	Top Soil					
5	Caliche	Grab	2,212		grout	
10	Tan caliche and loam chunks	Grab	492			
15	Sand	Grab	2,412			
20	Red sand	Grab	5,197			
21	Sand and Sandstone Stringers					2" PVC
25	Red Sand	Grab	3,152			
30	Tan caliche powder	Grab	4,628			
34	Sand					
35	Tan sand	Grab	2,508			
36	Sand and Sandstone Stringers				bentonite	
40	Tan Sand	Grab	352			
45	Tan Sand	Grab	2,420			
50	Reddish-brown sand	Grab	2,133			
55	Sandy Gravel	Grab	2,665			
60	Reddish-brown sand	Grab	1,905			
64	Sand and Sandstone Stringer					
65	Tan sand and Caliche	Grab	1,800			
70	Tan sand and caliche moist	Grab	1,209		screen	
75	Tan sand with rocks; moist	Grab	425			
80					water	
85	Sand and Sandstone Stringers					

APPENDIX B

RIGHT SOLUTIONS RIGHT PARTNER

Client: Conestoga-Rovers & Associates
 Project: EMC Weatherly Tank Battery #3
 Work Order: 1110174

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1110174-01	SB-1 5'-6'	Soil		10/3/2011 12:25	10/5/2011 08:50	<input type="checkbox"/>
1110174-02	SB-1 9'-10'	Soil		10/3/2011 12:27	10/5/2011 08:50	<input type="checkbox"/>
1110174-03	SB-1 14'-15'	Soil		10/3/2011 12:29	10/5/2011 08:50	<input type="checkbox"/>
1110174-04	SB-1 19'-20'	Soil		10/3/2011 12:31	10/5/2011 08:50	<input type="checkbox"/>
1110174-05	SB-2 5'-6'	Soil		10/3/2011 12:10	10/5/2011 08:50	<input type="checkbox"/>
1110174-06	SB-2 9'-10'	Soil		10/3/2011 12:12	10/5/2011 08:50	<input type="checkbox"/>
1110174-07	SB-2 14'-15'	Soil		10/3/2011 12:14	10/5/2011 08:50	<input type="checkbox"/>
1110174-08	SB-2 19'-20'	Soil		10/3/2011 12:16	10/5/2011 08:50	<input type="checkbox"/>
1110174-09	SB-3 5'-6'	Soil		10/3/2011 11:10	10/5/2011 08:50	<input type="checkbox"/>
1110174-10	SB-3 9'-10'	Soil		10/3/2011 11:15	10/5/2011 08:50	<input type="checkbox"/>
1110174-11	SB-3 14'-15'	Soil		10/3/2011 11:18	10/5/2011 08:50	<input type="checkbox"/>
1110174-12	SB-3 19'-20'	Soil		10/3/2011 11:20	10/5/2011 08:50	<input type="checkbox"/>
1110174-13	SB-4 5'-6'	Soil		10/3/2011 11:40	10/5/2011 08:50	<input type="checkbox"/>
1110174-14	SB-4 9'-10'	Soil		10/3/2011 11:42	10/5/2011 08:50	<input type="checkbox"/>
1110174-15	SB-4 14'-15'	Soil		10/3/2011 11:44	10/5/2011 08:50	<input type="checkbox"/>
1110174-16	SB-4 19'-20'	Soil		10/3/2011 11:46	10/5/2011 08:50	<input type="checkbox"/>

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-1 5'-6'
Collection Date: 10/3/2011 12:25 PM

Work Order: 1110174
Lab ID: 1110174-01
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
			E300		Prep Date: 10/10/2011	Analyst: RPM
Chloride	41.0		4.92	mg/Kg	1	10/11/2011 09:44 PM
Surr: Selenate (surr)	97.2		85-115	%REC	1	10/11/2011 09:44 PM
MOISTURE						
			SW3550			Analyst: KAH
Percent Moisture	13.7		0.0100	wt%	1	10/10/2011 04:00 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-1 9'-10'
Collection Date: 10/3/2011 12:27 PM

Work Order: 1110174
Lab ID: 1110174-02
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
Chloride	74.7		E300	4.99 mg/Kg	1	Prep Date: 10/10/2011 Analyst: RPM 10/11/2011 10:47 PM
Surr: Selenate (surr)	99.9			85-115 %REC	1	10/11/2011 10:47 PM
MOISTURE						
Percent Moisture	11.3		SW3550	0.0100 wt%	1	Analyst: KAH 10/10/2011 04:00 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-1 14'-15'
Collection Date: 10/3/2011 12:29 PM

Work Order: 1110174
Lab ID: 1110174-03
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
			E300		Prep Date: 10/10/2011	Analyst: RPM
Chloride	69.2		4.92	mg/Kg	1	10/11/2011 11:08 PM
Surr: Selenate (surr)	97.1		85-115	%REC	1	10/11/2011 11:08 PM
MOISTURE						
			SW3550			Analyst: KAH
Percent Moisture	8.53		0.0100	wt%	1	10/10/2011 04:00 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates

Project: EMC Weatherly Tank Battery #3

Sample ID: SB-1 19'-20'

Collection Date: 10/3/2011 12:31 PM

Work Order: 1110174

Lab ID: 1110174-04

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
			E300		Prep Date: 10/10/2011	Analyst: RPM
Chloride	65.2		4.91	mg/Kg	1	10/11/2011 11:29 PM
Surr: Selenate (surr)	96.0		85-115	%REC	1	10/11/2011 11:29 PM
MOISTURE						
			SW3550			Analyst: KAH
Percent Moisture	9.53		0.0100	wt%	1	10/10/2011 04:00 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-2 5'-6'
Collection Date: 10/3/2011 12:10 PM

Work Order: 1110174
Lab ID: 1110174-05
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
Chloride	ND		E300	4.96 mg/Kg	1	Prep Date: 10/10/2011 Analyst: RPM 10/11/2011 11:50 PM
Surr: Selenate (surr)	98.3		85-115	%REC	1	10/11/2011 11:50 PM
MOISTURE						
Percent Moisture	10.6		SW3550	0.0100 wt%	1	Analyst: KAH 10/10/2011 04:00 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-2 9'-10'
Collection Date: 10/3/2011 12:12 PM

Work Order: 1110174
Lab ID: 1110174-06
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
Chloride	ND		E300	4.96 mg/Kg	1	Prep Date: 10/10/2011 Analyst: RPM 10/12/2011 12:12 AM
Surr: Selenate (surr)	110			85-115 %REC	1	10/12/2011 12:12 AM
MOISTURE						
Percent Moisture	10.9		SW3550	0.0100 wt%	1	Analyst: KAH 10/10/2011 04:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-2 14'-15'
Collection Date: 10/3/2011 12:14 PM

Work Order: 1110174
Lab ID: 1110174-07
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)			E300		Prep Date: 10/10/2011	Analyst: RPM
Chloride	ND		4.94	mg/Kg	1	10/12/2011 12:33 AM
Surr: Selenate (surr)	93.8		85-115	%REC	1	10/12/2011 12:33 AM
MOISTURE			SW3550			Analyst: KAH
Percent Moisture	9.14		0.0100	wt%	1	10/10/2011 04:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-2 19'-20'
Collection Date: 10/3/2011 12:16 PM

Work Order: 1110174
Lab ID: 1110174-08
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
Chloride	ND		E300	4.96 mg/Kg	1	Prep Date: 10/10/2011 Analyst: RPM 10/12/2011 12:54 AM
Surr: Selenate (surr)	94.4		85-115	%REC	1	10/12/2011 12:54 AM
MOISTURE						
Percent Moisture	8.76		SW3550	0.0100 wt%	1	Analyst: KAH 10/10/2011 04:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-3 5'-6'
Collection Date: 10/3/2011 11:10 AM

Work Order: 1110174
Lab ID: 1110174-09
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
			E300			Prep Date: 10/10/2011 Analyst: RPM
Chloride	ND		4.99	mg/Kg	1	10/12/2011 01:15 AM
Surr: Selenate (surr)	96.3		85-115	%REC	1	10/12/2011 01:15 AM
MOISTURE						
			SW3550			Analyst: KAH
Percent Moisture	1.69		0.0100	wt%	1	10/10/2011 04:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-3 9'-10'
Collection Date: 10/3/2011 11:15 AM

Work Order: 1110174
Lab ID: 1110174-10
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
Chloride	15.5		E300			Prep Date: 10/10/2011 Analyst: RPM
			4.91	mg/Kg	1	10/12/2011 01:36 AM
Surr: Selenate (surr)	98.0		85-115	%REC	1	10/12/2011 01:36 AM
MOISTURE						
Percent Moisture	6.14		SW3550			Analyst: KAH
			0.0100	wt%	1	10/10/2011 04:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-3 14'-15'
Collection Date: 10/3/2011 11:18 AM

Work Order: 1110174
Lab ID: 1110174-11
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
Chloride	7.51		E300			Prep Date: 10/10/2011 Analyst: RPM
			4.93	mg/Kg	1	10/12/2011 01:57 AM
Surr: Selenate (surr)	97.8		85-115	%REC	1	10/12/2011 01:57 AM
MOISTURE						
Percent Moisture	3.66		SW3550			Analyst: KAH
			0.0100	wt%	1	10/10/2011 04:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-3 19'-20'
Collection Date: 10/3/2011 11:20 AM

Work Order: 1110174
Lab ID: 1110174-12
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
Chloride	14.4		E300			Prep Date: 10/10/2011 Analyst: RPM
			4.95	mg/Kg	1	10/12/2011 03:00 AM
Surr: Selenate (surr)	98.0		85-115	%REC	1	10/12/2011 03:00 AM
MOISTURE						
Percent Moisture	6.95		SW3550			Analyst: KAH
			0.0100	wt%	1	10/10/2011 04:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-4 5'-6'
Collection Date: 10/3/2011 11:40 AM

Work Order: 1110174
Lab ID: 1110174-13
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>						
ANIONS - EPA 300.0 (1993)			E300		Prep Date: 10/10/2011	Analyst: RPM
Chloride	14.0		4.96	mg/Kg	1	10/12/2011 03:21 AM
Surr: Selenate (surr)	95.6		85-115	%REC	1	10/12/2011 03:21 AM
MOISTURE			SW3550			Analyst: KAH
Percent Moisture	12.7		0.0100	wt%	1	10/10/2011 04:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-4 9'-10'
Collection Date: 10/3/2011 11:42 AM

Work Order: 1110174
Lab ID: 1110174-14
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
			E300			Prep Date: 10/10/2011 Analyst: RPM
Chloride	8.54		4.98	mg/Kg	1	10/12/2011 03:43 AM
Surr: Selenate (surr)	96.9		85-115	%REC	1	10/12/2011 03:43 AM
MOISTURE						
			SW3550			Analyst: KAH
Percent Moisture	23.0		0.0100	wt%	1	10/10/2011 04:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-4 14'-15'
Collection Date: 10/3/2011 11:44 AM

Work Order: 1110174
Lab ID: 1110174-15
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
			E300		Prep Date: 10/10/2011	Analyst: RPM
Chloride	13.9		4.92	mg/Kg	1	10/12/2011 04:04 AM
Surr: Selenate (surr)	96.3		85-115	%REC	1	10/12/2011 04:04 AM
MOISTURE						
			SW3550			Analyst: KAH
Percent Moisture	25.1		0.0100	wt%	1	10/10/2011 04:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
Sample ID: SB-4 19'-20'
Collection Date: 10/3/2011 11:46 AM

Work Order: 1110174
Lab ID: 1110174-16
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONS - EPA 300.0 (1993)						
			E300		Prep Date: 10/10/2011	Analyst: RPM
Chloride	41.1		4.95	mg/Kg	1	10/12/2011 04:25 AM
Surr: Selenate (surr)	96.3		85-115	%REC	1	10/12/2011 04:25 AM
MOISTURE						
			SW3550			Analyst: KAH
Percent Moisture	9.88		0.0100	wt%	1	10/10/2011 04:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Work Order: 1110174
Project: EMC Weatherly Tank Battery #3

QC BATCH REPORT

Batch ID: 56053 Instrument ID ICS3000 Method: E300

MBLK	Sample ID: WBLKS2-101011-56053				Units: mg/Kg		Analysis Date: 10/11/2011 05:11 PM			
Client ID:	Run ID: ICS3000_111011A				SeqNo: 2555715		Prep Date: 10/10/2011		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	ND	5.0								
Surr: Selenate (surr)	48.35	1.0	50	0	96.7	85-115	0			

LCS	Sample ID: WLCSS2-101011-56053				Units: mg/Kg		Analysis Date: 10/11/2011 05:32 PM			
Client ID:	Run ID: ICS3000_111011A				SeqNo: 2555717		Prep Date: 10/10/2011		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	193.1	5.0	200	0	96.6	90-110	0			
Surr: Selenate (surr)	50.27	1.0	50	0	101	85-115	0			

LCSD	Sample ID: WLCSDS2-101011-56053					Units: mg/Kg		Analysis Date: 10/11/2011 05:53 PM		
Client ID:	Run ID: ICS3000_111011A				SeqNo: 2555719		Prep Date: 10/10/2011		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	194	5.0	200	0	97	90-110	193.1	0.429	20	
Surr: Selenate (surr)	50.48	1.0	50	0	101	85-115	50.27	0.417	20	

MS	Sample ID: 1110145-01AMS				Units: mg/Kg		Analysis Date: 10/11/2011 07:58 PM			
Client ID:	Run ID: ICS3000_111011A				SeqNo: 2555722		Prep Date: 10/10/2011		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	201.5	4.9	97.88	108.4	95.1	75-125	0			
Surr: Selenate (surr)	48.07	0.98	48.94	0	98.2	80-120	0			

MS	Sample ID: 1110174-16AMS				Units: mg/Kg		Analysis Date: 10/12/2011 04:46 AM			
Client ID: SB-4 19'-20'		Run ID: ICS3000_111011A			SeqNo: 2555758		Prep Date: 10/10/2011		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	138.2	4.9	98.85	41.09	98.3	75-125	0			
Surr: Selenate (surr)	49.17	0.99	49.43	0	99.5	80-120	0			

MSD	Sample ID: 1110145-01AMSD				Units: mg/Kg		Analysis Date: 10/11/2011 08:19 PM			
Client ID:	Run ID: ICS3000_111011A				SeqNo: 2555724		Prep Date: 10/10/2011		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	202.2	4.9	97.85	108.4	95.9	75-125	201.5	0.349	20	
Surr: Selenate (surr)	48.15	0.98	48.92	0	98.4	80-120	48.07	0.164	20	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Conestoga-Rovers & Associates
Work Order: 1110174
Project: EMC Weatherly Tank Battery #3

QC BATCH REPORT

Batch ID: **56053** Instrument ID **ICS3000** Method: **E300**

MSD Sample ID: **1110174-16AMSD** Units: **mg/Kg** Analysis Date: **10/12/2011 05:07 AM**

Client ID: **SB-4 19'-20'** Run ID: **ICS3000_111011A** SeqNo: **2555759** Prep Date: **10/10/2011** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	138.6	4.9	98.77	41.09	98.7	75-125	138.2	0.249	20	
<i>Surr: Selenate (surr)</i>	<i>49.21</i>	<i>0.99</i>	<i>49.39</i>	<i>0</i>	<i>99.6</i>	<i>80-120</i>	<i>49.17</i>	<i>0.0817</i>	<i>20</i>	

The following samples were analyzed in this batch:

1110174-01A	1110174-02A	1110174-03A
1110174-04A	1110174-05A	1110174-06A
1110174-07A	1110174-08A	1110174-09A
1110174-10A	1110174-11A	1110174-12A
1110174-13A	1110174-14A	1110174-15A
1110174-16A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Conestoga-Rovers & Associates
Work Order: 1110174
Project: EMC Weatherly Tank Battery #3

QC BATCH REPORT

Batch ID: **R117460** Instrument ID **Balance1** Method: **SW3550**

DUP Sample ID: **1110174-05ADUP** Units: **wt%** Analysis Date: **10/10/2011 04:00 PM**

Client ID: **SB-2 5'-6'** Run ID: **BALANCE1_111010C** SeqNo: **2554820** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	10.53	0.010	0	0	0	0-0	10.56	0.264	20	

The following samples were analyzed in this batch:

1110174-01A	1110174-02A	1110174-03A
1110174-04A	1110174-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Conestoga-Rovers & Associates
Work Order: 1110174
Project: EMC Weatherly Tank Battery #3

QC BATCH REPORT

Batch ID: **R117466** Instrument ID **Balance1** Method: **SW3550**

DUP Sample ID: **1110219-03ADUP** Units: **wt%** Analysis Date: **10/10/2011 04:30 PM**

Client ID: Run ID: **BALANCE1_111010D** SeqNo: **2554975** Prep Date: DF: 1

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	1.297	0.010	0	0	0	0-0	1.365	5.08	20	

The following samples were analyzed in this batch:

1110174-06A	1110174-07A	1110174-08A
1110174-09A	1110174-10A	1110174-11A
1110174-12A	1110174-13A	1110174-14A
1110174-15A	1110174-16A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 14-Oct-11

Client: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3
WorkOrder: 1110174

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<u>Units Reported</u>	<u>Description</u>
mg/Kg	Milligrams per Kilogram
wt%	



ALS Laboratory Group
10450 Stanciff Rd., Suite 210
Houston, Texas 77099
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Fax. +1 281 530 5887

Chain of Custody Form

Page 1 of 2

1110174

CRA-MID: Conestoga-Rovers & Associates
Project: EMC Weatherly Tank Battery #3

Customer Information

Purchase Order	
Work Order	
Company Name	CRA
Send Report To	jomelas@cra-world.com
Address	2135 Sloy 250 West
City/State/Zip	Midland TX
Phone	
Fax	
e-Mail Address	

Project Information

Project Name	EMC Weatherly Tank Battery #3
Project Number	076339
Bill To Company	CRA
Invoice Attn	James O'neal
Address	
City/State/Zip	
Phone	
Fax	
e-Mail Address	

ALS Project Manager:

Chlorides

TDS



No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SB-1 5'-6'	10/03	1225	S	Nat	1	X	X									
2	SB-1 9'-10'		1227	S		1	X	X									
3	SB-1 14'-15'		1229	S		1	X	X									
4	SB-1 19'-20'		1231	S		1	X	X									
5	SB-2 5'-6'		1210	S		1	X	X									
6	SB-2 9'-10'		1212	S		1	X	X									
7	SB-2 14'-15'		1214	S		1	X	X									
8	SB-2 19'-20'		1216	S		1	X	X									
9	SB-3 5'-6'		1110	S		1	X	X									
10	SB-3 9'-10'		1115	S		1	X	X									

Sampler(s) Please Print & Sign

Relinquished by: *James O'neal*

Relinquished by: *James O'neal*

Relinquished by: *James O'neal*

Relinquished by: *James O'neal*

Relinquished by: *James O'neal*

Relinquished by: *James O'neal*

Relinquished by: *James O'neal*

Relinquished by: *James O'neal*

Relinquished by: *James O'neal*

Relinquished by: *James O'neal*

Shipment Method

Received by: *James O'neal*

Received by: *James O'neal*

Received by: *James O'neal*

Received by: *James O'neal*

Received by: *James O'neal*

Received by: *James O'neal*

Received by: *James O'neal*

Received by: *James O'neal*

Received by: *James O'neal*

Required Turnaround Time: (Check Box)

☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Notes:

Cooler ID

Cooler Temp

QC Package: (Check One Box Below)

☐ Level II Std QC ☐ TRRP Checklist

☐ Level III Std QC ☐ TRRP Level IV

☐ Level IV SW846/CLP ☐ Other

Preservative Key: 1-HCl 2-HNO₃ 3-H₂SO₄ 4-NaOH 5-Na₂S₂O₃ 6-NaHSO₄ 7-Other 8-4°C 9-5035

1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Laboratory Group.
2. Unless otherwise agreed in a formal contract, services provided by ALS Laboratory Group are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ALS Environmental

Sample Receipt Checklist

Client Name: **CRA-MID**

Date/Time Received: **05-Oct-11 08:50**

Work Order: **1110174**

Received by: **RDN**

Checklist completed by Raymond N Gamboa

07-Oct-11

Reviewed by:

eSignature

Date

eSignature

Date

Matrices: **Soil**

Carrier name: **FedEx**

Shipping container/cooler in good condition?

Yes ☒

No ☐

Not Present ☐

Custody seals intact on shipping container/cooler?

Yes ☒

No ☐

Not Present ☐

Custody seals intact on sample bottles?

Yes ☐

No ☐

Not Present ☒

Chain of custody present?

Yes ☒

No ☐

Chain of custody signed when relinquished and received?

Yes ☒

No ☐

Chain of custody agrees with sample labels?

Yes ☒

No ☐

Samples in proper container/bottle?

Yes ☒

No ☐

Sample containers intact?

Yes ☒

No ☐

Sufficient sample volume for indicated test?

Yes ☒

No ☐

All samples received within holding time?

Yes ☒

No ☐

Container/Temp Blank temperature in compliance?

Yes ☒

No ☐

Temperature(s)/Thermometer(s):

1.1c

002

Cooler(s)/Kit(s):

Water - VOA vials have zero headspace?

Yes ☐

No ☐

No VOA vials submitted ☒

Water - pH acceptable upon receipt?

Yes ☐

No ☐

N/A ☒

pH adjusted?

Yes ☐

No ☐

N/A ☒

pH adjusted by:

Login Notes:

Client Contacted:

Date Contacted:


Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

 ALS Environmental 10450 Stancilff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL	
	Date: <u>10/09</u>	Time: <u>1:30</u>
	Name: <u>JAMES O</u>	
	Company: <u>CPA</u>	
Seal Broken By: <u>[Signature]</u>		
Date: <u>10/5/11</u>		

“การขยายตัวของภาคบริการและการค้าปลีก และการค้าปลีก

8758875637016

Tracking Number

e

nder's
ne

James Ornelas

Phone

96-001432

Company

42

Address:

2135 S Loop 250 West

10

State

K

zip

1946

inference