EME Jct. K-19

2013

CLOSURE

RICE *Operating Company*
122 West Taylor • Hobbs, New Mexico 88240
Phone: (575) 393-9174 • Fax: (575) 397-1471

April 1, 2014

Mr. Leonard Lowe
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

RE: Termination Request
EME Jct. K-19: UL/K, Sec. 19, T19S, R37E
RICE Operating Company – Eunice Monument Eumont SWD System

Mr. Lowe:

Rice Operating Company (ROC) is the service provider (agent) for the EME Saltwater Disposal (SWD) System and has no ownership of any portion of the pipeline, well, or facility. The System is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

Background
In 2013, ROC initiated work on the former K-19 junction box. The site is located in UL/K, Sec. 19, T19S, R37E. NM OSE records indicate that groundwater would likely be encountered at a depth of approximately 42 +/- feet. The site was delineated using a backhoe to collect soil samples at regular intervals, creating a 3x7x7-ft deep excavation. Each sample was field titrated for chlorides and field screened using a PID for hydrocarbons, resulting in concentrations similar to background. The 7-ft sample was sent to a commercial laboratory for analysis of chloride and TPH, resulting in a chloride concentration of 64 mg/kg and concentrations of gasoline range organics (GRO) and diesel range organics (DRO) below detectable limits. A total of 12 yards of soil properly disposed of at a NMOCD approved facility. The excavation was backfilled with clean, imported soil and contoured to the surrounding area. A sample of the blowsand was submitted to a commercial laboratory for analysis of chloride, resulting in a concentration below detectable limits. On 6/11/2013, the site was seeded with a blend of native vegetation and is expected to return to a productive capacity at a normal rate. The junction box site map, area map, final report, photo documentation, laboratory analysis, PID sheet, chloride graph, and revegetation form are attached.

Recommendations
Site investigation demonstrates that residual chloride and hydrocarbons in the vadose zone will not with reasonable probability contaminate groundwater in excess of NMOCD standards. This site meets the requirements of the NMOCD-approved Revised Junction Box Upgrade Work Plan (July 16, 2003). As such, ROC request termination of the regulatory file, or similar closure status.

Please contact me at (575)393-2967 if you have any questions or wish to discuss this site. Thank you for your time and consideration.

Sincerely,
RICE Operating Company

Hack Conder
Environmental Manager

enclosures

RICE OPERATING COMPANY
JUNCTION BOX FINAL REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
Eunice Monument Eumont (EME)	Jct. K-19	K	19	19S	37E	Lea	Eliminated		

LAND TYPE: BLM ___ STATE ___ FEE LANDOWNER State OTHER ___

Depth to Groundwater 42 feet NMOCD SITE ASSESSMENT RANKING SCORE: 20

Date Started 6/3/2013 Date Completed 6/11/2013 OCD Witness No

Soil Excavated 5.4 cubic yards Excavation Length 3 Width 7 Depth 7 feet

Soil Disposed 12 cubic yards Offsite Facility Sundance Location Eunice, NM

FINAL ANALYTICAL RESULTS: **Sample Date** 6/4/2013, 6/11/2013 **Sample Depth** 7'

TPH and Chloride laboratory test results completed by using an approved lab and testing procedures pursuant to NMOCD guidelines.

Sample Location	PID (field) ppm	GRO mg/kg	DRO mg/kg	Chloride mg/kg
SOURCE 7' GRAB	0.0	<10	<10	64
TOPSOIL				<16

CHLORIDE FIELD TESTS		
LOCATION	DEPTH	mg/kg
background	6"	166
vertical delineation trench at the junction (source)	3'	108
	4'	139
	5'	107
	6'	138
	7'	166

General Description of Remedial Action: This junction box was eliminated during the pipeline replacement/upgrade program. After the former junction box was removed, an investigation was conducted using a backhoe to collect soil samples at regular intervals, creating a 3x7x7 ft. deep excavation. Chloride field tests performed on each sample yielded concentrations similar to that of the background sample. Organic vapors were measured using a PID, which yielded low concentrations. The deepest sample, 7 ft. below ground surface (BGS) was sent to a commercial laboratory for analysis of chloride and TPH, which confirmed low concentrations of each. The excavation was backfilled with clean, imported soil to ground surface and contoured to the surrounding area. A sample of the blowsand was sent to a commercial laboratory for analysis of chloride, resulting in a concentration below detectable limits. On 6/11/2013, the site was seeded with a blend of native vegetation and is expected to return to a productive capacity at a normal rate.

enclosures: site map, area map, photos, lab results, PID (field) screenings, chloride graph, revegetation form

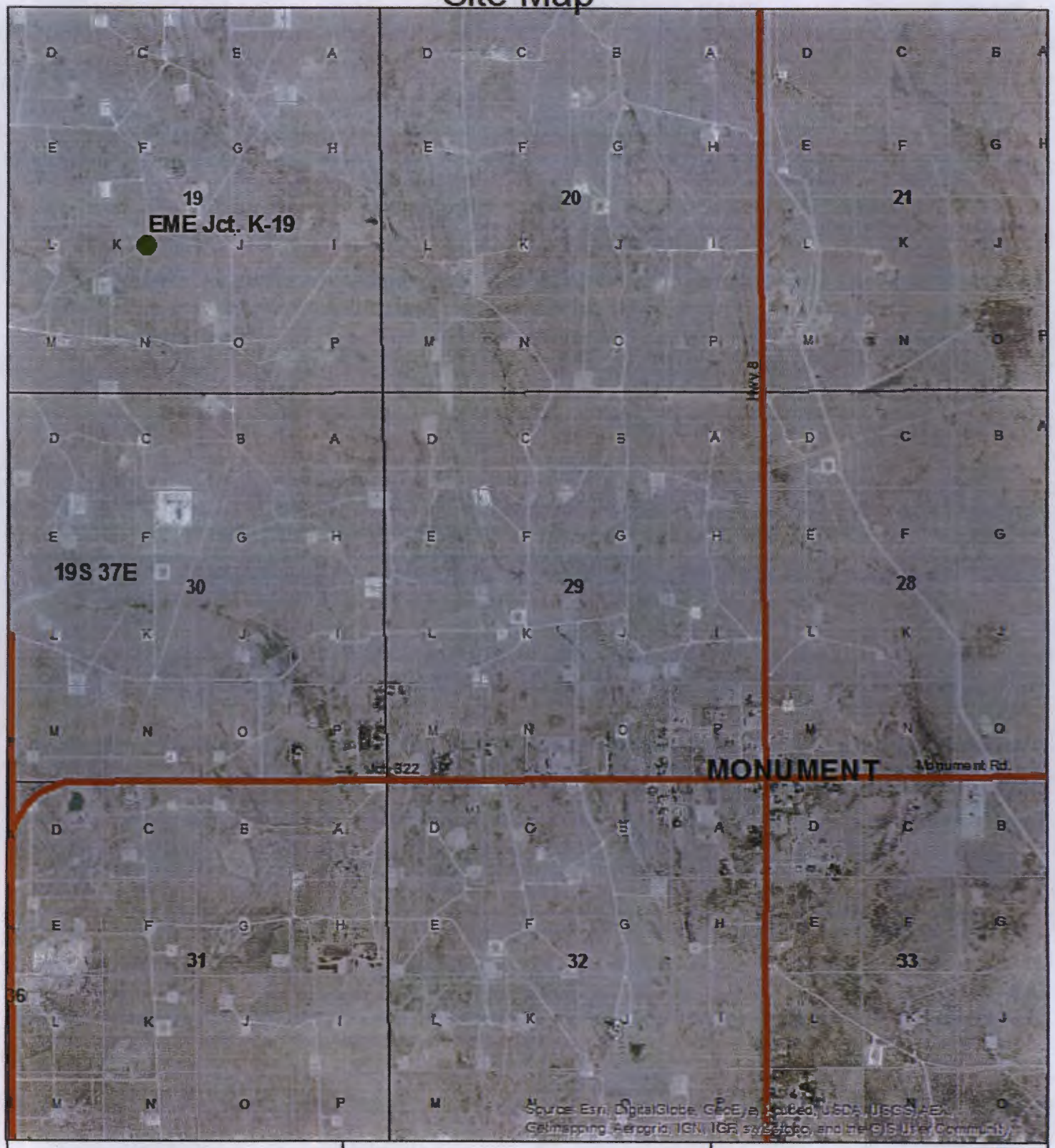
I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REPORT ASSEMBLED BY Laura Flores SIGNATURE Laura Flores COMPANY Rice Environmental Consulting & Safety

SITE SUPERVISOR Dyllan Yarbrough SIGNATURE Not Available COMPANY Rice Environmental Consulting & Safety

PROJECT LEADER Kyle Norman SIGNATURE Kyle Norman DATE 2-24-14

Site Map



RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

RECS

EME Jct. K-19

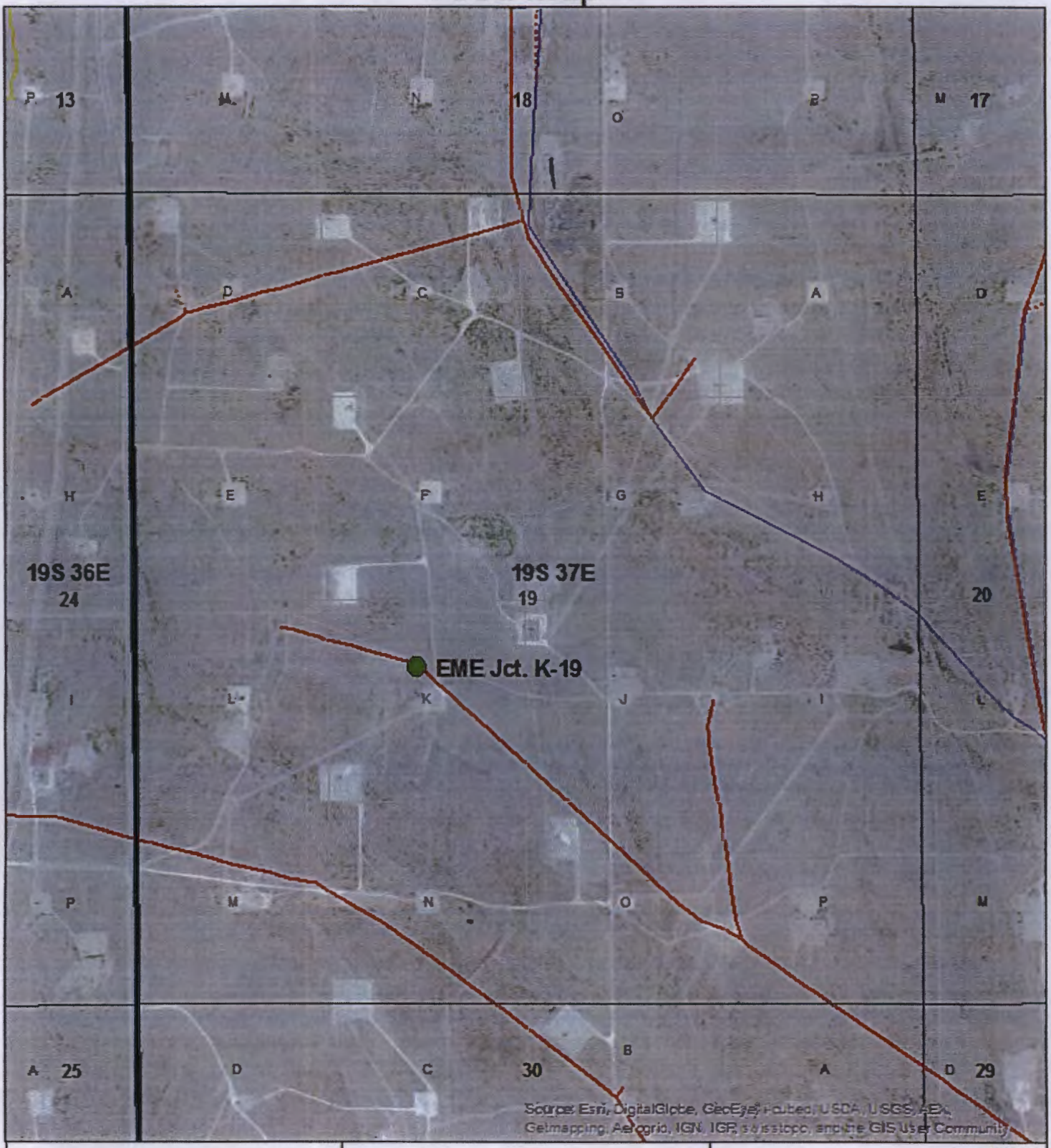
Unit Letter K, Section 19,
T19S, R37E
Lea County, NM

N
W E
S

0 1,250 2,500
Feet

Drawing date: 2/19/14 LF

Area Map



RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

RECS

EME Jct. K-19

Unit Letter K, Section 19,
T19S, R37E
Lea County, NM

N
W E
S

0 600 1,200
Feet

Drawing date: 2/19/14 LF

EME Jct. K-19

Unit K, Section 19, T19S, R37E

Digging initial vertical, facing east 6/4/13

Collecting sample, facing south 6/4/2013

Scraping disturbed area, facing south 6/6/2013

Seeding site, facing west 6/11/2013

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

June 10, 2013

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME K-19 JCT.

Enclosed are the results of analyses for samples received by the laboratory on 06/04/13 16:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	06/04/2013	Sampling Date:	06/04/2013
Reported:	06/10/2013	Sampling Type:	Soil
Project Name:	EME K-19 JCT.	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: VERTICAL @ 7' (H301308-01)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: DW**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	06/10/2013	ND	432	108	400	0.00	

TPH 8015M **mg/kg** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	06/07/2013	ND	199	99.6	200	2.79	
DRO >C10-C28	<10.0	10.0	06/07/2013	ND	209	104	200	5.01	

Surrogate: 1-Chlorooctane	*102 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*110 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name:	RICE Operating	BILL TO	
Project Manager:	Hack Conder	P.O. #:	
Address:		Company:	
City:	State: Zip:	Attn:	
Phone #:	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:		State: Zip:	
Project Location:	EME K-19 JCT	Phone #:	
Sampler Name:		Fax #:	

FOR LAB USE ONLY				MATRIX							PRESERV.			SAMPLING		ANALYSIS REQUEST											
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME													
H301308															BTEX	TPH											
1	Vertical @ 71	G	1			1					1		6/4/13	10:30	1	1											

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequental damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By:	Date: 6/4/13	Received By: Jodi Henson	Phone Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 4:30		Fax Result: ☐ Yes ☐ No Add'l Fax #:
Relinquished By:	Date:	Received By:	REMARKS: Email All
	Time:		
Delivered By: (Circle One)		Sample Condition: Cool ☑ Yes ☐ No; Intact ☑ Yes ☐ No	CHECKED BY: (Initials)
Sampler - UPS - Bus - Other:	5°C		

† Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

RICE ENVIRONMENTAL CONSULTING & SAFETY

122 West Taylor Hobbs, NM 88240
PHONE: (505) 393-9174 FAX: (505) 397-1471
PID METER CALIBRATION & FIELD REPORT FORM

	CK. MODEL NO.		
		MODEL: PGM 7300	SERIAL NO: 590-000508
		MODEL: PGM 7300	SERIAL NO: 590-000504
	X	MODEL: PGM 7320	SERIAL NO: 592-903318
		MODEL: PGM 7300	SERIAL NO: 590-000183

GAS COMPOSITION: ISOBUTYLENE 100PPM / AIR: BALANCE

LOT NO: HAL-248-100-1	EXPIRATION DATE: 7/1/2015
METER READING ACCURACY: 100	

ACCURACY : +/- 2%

COMPANY
RICE OPERATING

SYSTEM	JUNCTION	UNIT	SECTION	TOWN SHIP	RANGE
EME	Jct. K-19	K	19	19S	37E

SAMPLE ID	PID	SAMPLE ID	PID
Background @ 6"	0		
Source @ 3'	24.2		
Source @ 4'	0.4		
Source @ 5'	0		
Source @ 6'	2.5		
Source @ 7'	0		

I verify that I have calibrated the above instrument in accordance to the manufacture operation manual.

SIGNATURE: Not Available DATE: 6/4/2013

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

June 13, 2013

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME K-19 JCT.

Enclosed are the results of analyses for samples received by the laboratory on 06/12/13 8:10.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Rice Operating Company
Hack Conder
112 W. Taylor
Hobbs NM, 88240
Fax To: (575) 397-1471

Received:	06/12/2013	Sampling Date:	06/11/2013
Reported:	06/13/2013	Sampling Type:	Soil
Project Name:	EME K-19 JCT.	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: TOP SOIL (H301345-01)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: DW**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	06/13/2013	ND	416	104	400	3.77	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Celey D. Keene, Lab Director/Quality Manager

CARDINAL LABORATORIES

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240 2111 Beechwood, Abilene, TX 79603
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325)673-7020

Company Name:	RICE Operating	BILL TO	
Project Manager:	Hack Conder	P.O. #:	
Address:	419 W. Cain	Company:	
City:	Hobbs State: NM Zip: 88240	Attn:	
Phone #:	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:		State: Zip:	
Project Location:	EME K-19 JCT	Phone #:	
Sampler Name:	Dylan Yarbrough	Fax #:	

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST									
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS				
H30b345 -1	Top Soil	G	1			1					1		6/11/13	2:25	✓									

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By:	Date: 6/12/13	Received By:	Addi Henson
	Time: 6:55		
Relinquished By:	Date: 8:10	Received By:	
	Time:		

Delivered By: (Circle One)	Sample Condition	CHECKED BY:
Sampler - UPS - Bus - Other:	Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	(Initials)

Phone Result:	☐ Yes	☑ No	Add'l Phone #:
Fax Result:	☐ Yes	☑ No	Add'l Fax #:

REMARKS:

email results
Zconder@rice-ecs.com; Bbaker@rice-ecs.com;
hconder@rice-ecs.com; Lweinheimer@rice-ecs.com;
kjones@riceswd.com; Laura Pena, Kyle Norman

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

#54

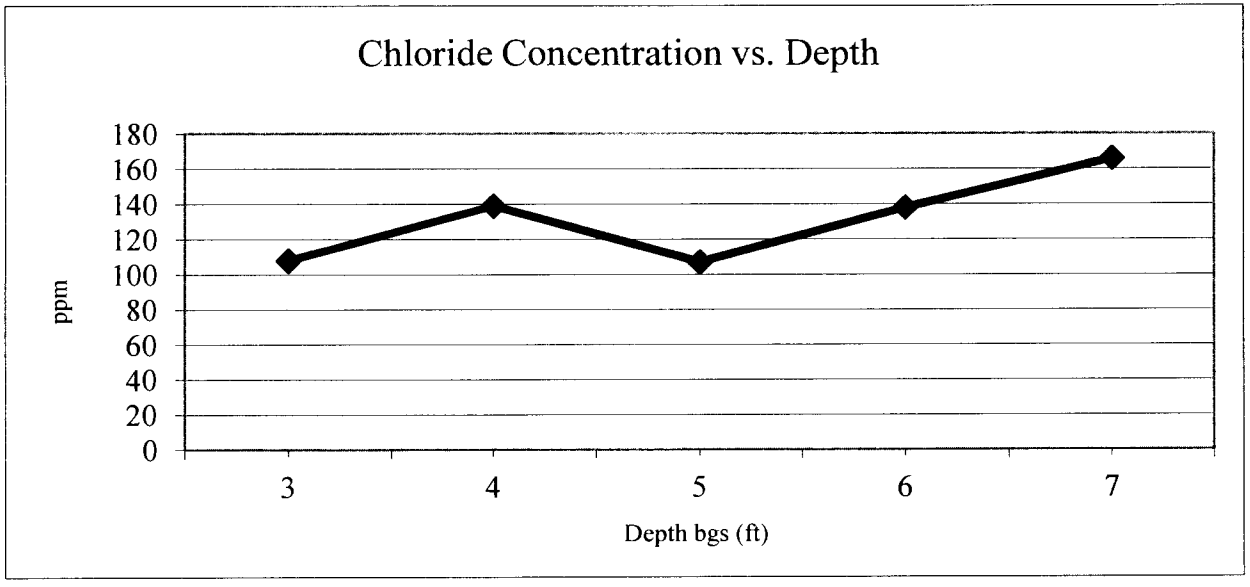
EME Jct. K-19

Unit 'K', Sec. 19, T19S, R37E

Backhoe samples at junction (source)

Depth bgs (ft)	[Cl⁻] ppm
3	108
4	139
5	107
6	138
7	166

Groundwater = 42 ft



PO Box 5630
Hobbs, NM 88241
Phone: (575) 393-4411
Fax: (575) 393-0293

VEGETATION FORM

1. General Information

Site name: EME Jct. K-19						
U/L	Section	Township	Range	County	Latitude	Longitude
K	19	19S	37E	Lea	N-32*38'1.222	W-103*17'34.878
Contact Name: Hack Conder						
Email:	hconder@rice-ecs.com					
Site size:	32 FT X 35 FT		square feet 1,120 sq. ft.			

2. Soils **Do not rip caliche subsoils; caliche rocks brought to the surface by ripping shall be removed.*

Salvaged from site		Bioremediated	X	Imported		Blended		Depth (in)		
Texture:	TOP SOIL			Describe soil & subsoil:		LIGHT BROWN FINE SAND				
Soil prep methods:	Rip	X	3"Depth (in)		Disc		Depth (in)		Rollerpack	
Date completed:	6/11/2013									

3. Bioremediation

Fertilizer		Hay		Other	X
Type:				Describe:	4 bgs RestorNHance, 1 bg Manure,
Lbs/acre:				2 bgs Potting Soil	

4. Seeding **Attach seed bag tags to this form. Seed bag tags shall contain the site name and S-T-R.*

Custom Seed Mix	X	Prescribed Mix		Seed Mix Name:	2.5 LBS Blue Grama, 2.5 LBS Side Oats	Date:	6/11/2013
Broadcast	MECHANICAL				Method:	USED PUSH SEEDER TO EVENLY SPREAD SEED	
Soil conditions during seed:	Dry	X	Damp		Wet		
Observations:	RAKED SEED AND AMMENDMENTS THOROUGHLY INTO SOIL						

5. Certification I hereby certify that the information in this form and attachments is true and complete to the best of my knowledge and belief.

Name: Dyllan Yarbrough	Title: Environmental Tech	Date:	6/11/2013
Signature:	Not Available		

RICE *Operating Company*
122 West Taylor • Hobbs, New Mexico 88240
Phone: (575) 393-9174 • Fax: (575) 397-1471

April 1, 2014

Mr. Leonard Lowe
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

RE: JUNCTION BOX UPGRADE REPORT for 2013
EME SWD SYSTEM
Lea County, New Mexico

Mr. Lowe:

Rice Operating Company (ROC) takes this opportunity to submit the Junction Box Upgrade results for the year 2013. Enclosed is a list of the completed junction boxes and their respective closure/disclosure dates. These boxes are located in the Eunice-Monument-Eumont (EME) Salt Water Disposal (SWD) System located in the vicinity of Eunice, New Mexico.

ROC completed 11 junction boxes in 2013.

Enclosed are the 2008 results (17 sites evaluated with 22 sampling locations) from the PID/BTEX study described in the NMOCD-approved Revised Junction Box Upgrade Work Plan (July 16, 2003). A third-party analysis, conducted by Peter Galusky, Jr. Ph.D. of Texerra, concluded from the data collected thus far that field-composited values tend to produce slightly higher BTEX numbers above the point at which BTEX concentrations become significant. This is likely due to the fact that BTEX is volatile and quickly biodegradable. This analysis was submitted to NMOCD on March 12, 2009. An appropriate number of sample sites could not be obtained to conduct a 2013 BTEX comparison analysis. Peter Galusky, Jr. Ph.D. of Texerra also compared ROC's 2013 chloride field tests to chloride laboratory analyses; the analysis is also enclosed. The study of this data continues to validate the accuracy of the chloride field tests employed by ROC.

ROC is the service provider (agent) for the EME SWD System and has no ownership of any portion of the pipeline, well, or facility. The System is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

Replacement/closure projects of this magnitude require System Party AFE approval and work begins as funds are received.

Thank you for your consideration of this Junction Box Upgrade Report for 2013.

RICE OPERATING COMPANY

Hack Conder
Environmental Manager

enclosures as stated

cc: SC, file, Mr. Geoffrey Leking
NMOCD, District I Office
1625 N. French Drive
Hobbs, NM 88240

Rice Operating Company
EME SWD System Junction Box Upgrade Project
2013 Completed Boxes

		Legal Description							
	Jct Box Name	Unit	Sec	T	R	Completion Date	OCD Assessment Score	Report Status	Case Number
1	B-19 EOL	B	19	19S	37E	6/28/2013	20	Closure	
2	E-21 EOL	E	21	20S	37E	1/8/2014	20	Closure	
3	JCT. D-19	D	19	19S	37E	5/10/2013	20	Closure	
4	JCT. D-20	D	20	19S	37E	6/10/2013	20	Closure	
5	JCT. F-26	F	26	20S	36E	11/7/2012	0	Closure	
6	JCT. H-4	H	4	20S	36E	6/7/2013	20	Closure	
7	JCT. I-9	I	9	20S	36E	6/7/2013	20	Closure	
8	JCT. K-19	K	19	19S	37E	6/11/2013	20	Closure	
9	M-9 EOL	M	9	21S	36E	6/24/2013	0	Closure	
10	O-28 EOL	O	28	20S	36E	n/a	0	Closure	
11	P-5 EOL	P	5	21S	36E	6/24/2013	0	Closure	

L. Peter Galusky, Jr. Ph.D., P.G.

Texerra

505 N Big Spring, Suite 404 Midland, Texas 79701
Tel: 432-634-9257 E-mail: lpg@texerra.com

March 10th, 2009

Mr. Brad Jones
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87504

Re: Comparison of Field versus Lab Compositing of BTEX soil samples
Rice Operating Company, Junction Box Upgrade Work Plan

Sent via Certified Mail w/ Return Receipt No. 7006 0100 0001 2438 3944

Dear Mr. Jones:

On behalf of Rice Operating Company (ROC) I am submitting the attached comparison and analysis of field versus laboratory soil compositing for soil BTEX samples. This is to address the question of whether it is better to mix multiple samples in the field or to do so in the laboratory in order to produce a composite, representative sample for analysis. This work was undertaken in support of ROC's Junction Box Upgrade Work Plan to ensure the quality of their field analysis program.

In brief, this work indicates that field compositing of soil samples generally gives rise to *slightly* higher BTEX values than does laboratory compositing of multiple samples. This is presumably due to the likelihood that field compositing and packaging of soil samples better preserves sample integrity. It would therefore appear that field compositing would represent the better method of procuring soil samples for subsequent analysis of BTEX.

Please call me if you have any questions or wish to discuss any of the details of this study.

ROC is the service provider (agent) for various Salt Water Disposal Systems (SWDs) and has no ownership of any portion of pipeline, well or facility. The SWD Systems that ROC operates are owned by a consortium of oil producers, System Partners, who provide all operating capital on a percentage ownership/usage basis.

Sincerely,

L. Peter Galusky, Jr. Ph.D.
Principal

Copy: Rice Operating Company,
Edward Hansen (NMOCD) sent certified mail w/ return receipt
No. 7006 0100 0001 2438 3937
Attachment: As noted, above.

Rice Operating Company
Comparison of Field Compositing versus Laboratory Compositing of Soil BTEX Samples[1]

The careful mixing of multiple soil samples is critical in order to produce a representative, composite sample from a respective study area (such as a excavation face or bottom). Field technicians typically take four or five "grab" samples from excavation walls and/or bottom and send each of these to a laboratory for analysis of the composite, or mixed, sample. It would be far simpler, however, to composite such samples in the field. This study was undertaken to determine if field compositing produced results substantially different than laboratory compositing for the analysis of BTEX. Data were provided by Rice Operating Company encompassing 22 sampling locations over the period of 2004 through 2008.

A comparison of lab-composited soil samples versus field-composited soil samples revealed a close correspondence for total BTEX between the two methods (Figure 1).

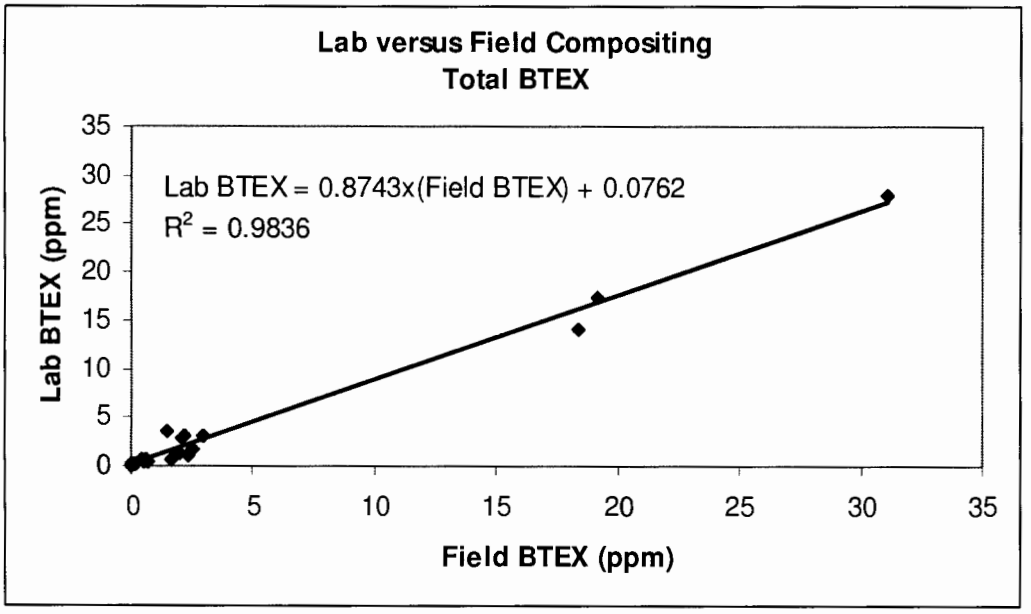


Figure 1 - Laboratory versus field-composited soil samples analyzed for BTEX.

The high R^2 value (0.9836) of the best-fit statistical regression line indicates a high degree of reliability in using the field-compositing method over the range of values observed. Below a "field-composited BTEX" value of 0.61 ppm the "lab-composited BTEX" values are slightly lower. However, above a field-composited BTEX value of 0.61 the lab-composited values run slightly lower. In other words, the field-composited values tended to produce slightly higher BTEX numbers above the point at which BTEX concentrations become significant.

There is a reason for this. BTEX is volatile and quickly biodegradable. The compositing and "packaging" of soil samples in the field minimize the handling and aeration that occur in the laboratory. Thus, field-composited soil samples lose less BTEX to evaporation and/or biodegradation prior to laboratory analysis. In other words, the field compositing and packaging of soil samples better preserves sample integrity, and for this reasons would appear to represent the better method of procuring soil samples for subsequent analysis of BTEX.

[1] Prepared 03-12-09 by L. Peter Galusky, Jr. of Texerra.

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March 25th, 2014

Mr. Leonard Lowe
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

Re: Comparison of 2013 Laboratory versus Field Measured Soil Chloride Values
Rice Operating Company, Junction Box Upgrade Work Plan

Mr. Lowe:

The attached comparison and analysis of 2013 laboratory versus field measured soil chloride values is submitted in support of Rice Operating Company's (ROC's) Junction Box Upgrade Work Plan to ensure the quality of their field analysis program.

In brief, this work indicates that Rice's 2013 field chloride measurement efforts provided a reasonable qualitative approximation of the laboratory-measured (and presumed true) values.

ROC is the service provider (agent) for various Salt Water Disposal Systems (SWDs) and has no ownership of any portion of pipeline, well or facility. The SWD Systems that ROC operates are owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

Please call me if you have any questions or wish to discuss this study.

Sincerely,

L. Peter Galusky, Jr. Ph.D.
Principal

Copy: Glenn VonGonten, NMOCD; Rice Operating Company
Attachment: As noted, above.

Rice Operating Company
Comparison of Laboratory to Field Measured Soil Chloride Concentrations
Based upon 2013 Field Data

A representative sample of 29 pairs of laboratory versus field measured soil chloride values was compared to determine how well field measurements matched laboratory measurements. It is assumed that laboratory measurements better represent the "true" values due to the controlled environment that a laboratory provides. A simple plot of the laboratory versus field measured soil chloride values is given below (Figure 1).

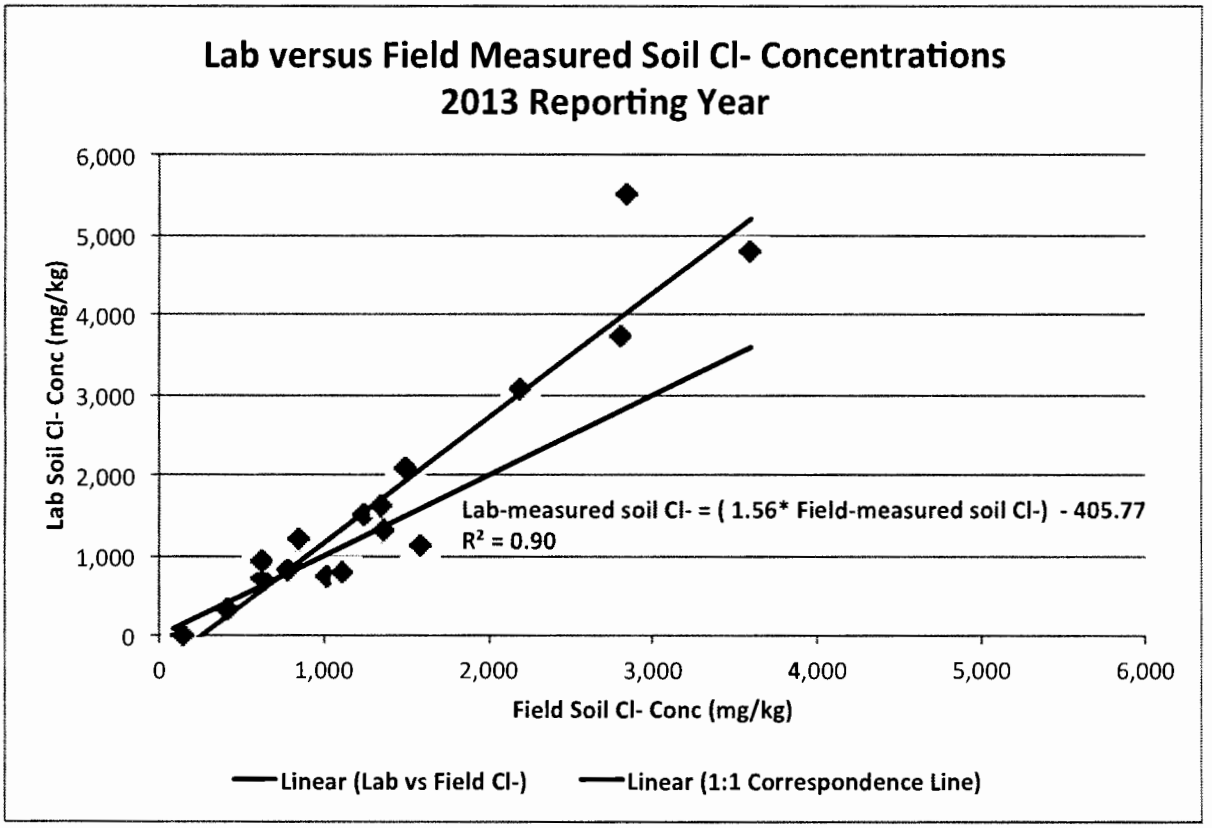

Figure 1 – Laboratory versus field measured soil chloride measurements (n = 29 paired sets).

A straight line fit to the data confirms a general linear trend over a wide range of soil chloride concentrations, and the R^2 value (0.90) indicates that field measurements provide a reliable approximation of laboratory-measured values. Based on the best-fit line of lab vs field measured values, field measured values overestimate lab measure values below a field measured value of 723 mg/kg and above this underestimate the lab-measured values. This is indicated in the graph where the (blue) best-fit line of lab vs field measured chlorides crosses the (black) line which would indicate a 1:1 correspondence.

Junction Box Upgrade Progam Closure/Disclosure Submissions for 2013

Updated 3-31-14

BD										**Closures**	**Disclosures**
Closure	4									4	
Disclosure	8										8
EME											
Closure	11									11	
Disclosure	0										0
Total	**23**									**15**	**8**