

## **LINN ENERGY**

2130 W. Bender Blvd.  
Hobbs, NM 88241  
Phone 575.738.1739

# H.E. West B Battery 2 and 4 – West B #19 2RP-1960

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## Corrective Action Plan

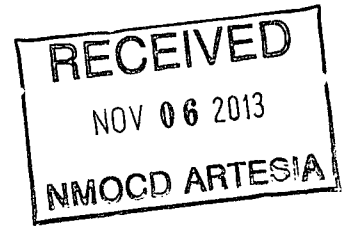
API No. 3001505125

Release Date: September 19<sup>th</sup>, 2013

Unit Letter C, Section 10, Township 17S, Range 31E

# Rice Environmental Consulting & Safety

P.O. Box 2948, Hobbs, NM 88241  
Phone 575.393.2967



**November 5<sup>th</sup>, 2013**

**Mike Bratcher**

New Mexico Energy, Minerals, & Natural Resources  
Oil Conservation Division, Environmental Bureau – District 2  
811 S. First St.  
Artesia, NM 88210

**RE: Corrective Action Plan (CAP)**

**Linn Energy – H.E. West B Battery 2 and 4 – West B #19 (2RP-1960)  
UL/C sec. 10 T17S R31E  
API No. 3001505125**

Mr. Bratcher:

Linn Energy (Linn) has retained Rice Environmental Consulting and Safety (RECS) to address potential environmental concerns at the above-referenced site.

## **Background and Previous Work**

The site is located approximately 7.5 miles northeast of Loco Hills, New Mexico at UL/C sec. 10 T17S R31E. This site is in an area of no known groundwater.

On September 19<sup>th</sup>, 2013, a release occurred along a Linn fiberglass pipeline releasing a total of 20 bbls of produced water and 1 bbls of oil. The line was uncovered due to wind erosion, which caused it to bow up and break. The release affected 917 sq ft of pasture land. NMOCD and BLM were notified on the release on September 20<sup>th</sup>, 2013, and NMOCD approved the initial C-141 on October 2<sup>nd</sup>, 2013 (Appendix A).

RECS personnel arrive at the site on September 20<sup>th</sup>, 2013. The wet soil was removed by hand shovel and taken to a NMOCD approved facility for disposal. The site was sampled at the surface and with depth at four sample points (Figure 1). All samples were field tested for chlorides and hydrocarbons and sent to a commercial laboratory for analyses (Appendix B). All samples returned laboratory chloride readings below 250 mg/kg, except for Vertical #2 at 6 inches, which returned a laboratory chloride reading of 2,400 mg/kg. Gasoline Range Organics (GRO) readings and Diesel Range Organics (DRO) readings were all non-detect or near non-detect. BTEX results in all samples were non-detect.

Photo documentation of these activities can be found in Appendix C.

## **Corrective Action Plan**

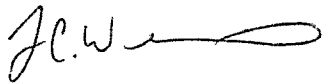
Based on the laboratory analyses, all sample points, except for Vertical #2 were below regulatory standards. Vertical #2 had a laboratory chloride value of 2,400 mg/kg at 6

inches; however, the laboratory chloride value dropped below 250 mg/kg at 1 ft bgs. Therefore RECS recommends that the area around Vertical #2 be hand shoveled to a depth of 1 ft bgs to remove the soil with the elevated chloride level (Figure 1). The excavated soil will be taken to a NMOCD approved facility for disposal. Clean soil will be imported to the site to serve as backfill and to contour the site to the surrounding location. The site will be seeded with a blend of native vegetation. Vegetation will also provide a natural infiltration barrier for the site since plants capture water through their roots thereby reducing the volume of water moving through the vadose zone to groundwater.

Once the CAP activities have been completed, ROC will submit a report detailing the CAP activities and a request for 'remediation termination' or similar closure status of the regulatory file.

RECS appreciates the opportunity to work with you on this project. Please call Hack Conder at (575) 393-2967 or me if you have any questions or wish to discuss the site.

Sincerely,

A handwritten signature in black ink, appearing to read 'J.C.W.' followed by a stylized flourish.

Lara Weinheimer  
Project Scientist  
RECS  
(575) 441-0431

Attachments:

- Figure 1 – Vertical Sampling Data
- Appendix A – Initial C-141
- Appendix B – Laboratory Analyses
- Appendix C – Photo Documentation

# Figures

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 2948, Hobbs, NM 88241  
Phone 575.393.2967

# Vertical Sampling Data

## Vertical #1

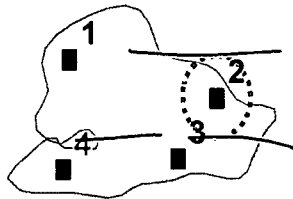
	Cl-	PID	GRO	DRO	B	T	E	X	BTEX
SS	16	1.9	<10	<10	<0.05	<0.05	<0.05	<0.15	<0.3
6"	<16	5	<10	<10	<0.05	<0.05	<0.05	<0.15	<0.3
1'	<16	1.2	<10	<10	<0.05	<0.05	<0.05	<0.15	<0.3

## Vertical #2

	Cl-	PID	GRO	DRO	B	T	E	X	BTEX
SS	80	22	<10	<10	<0.05	<0.05	<0.05	<0.15	<0.3
6"	2400	6.3	<10	10.1	<0.05	<0.05	<0.05	<0.15	<0.3
1'	32	18	<10	<10	<0.05	<0.05	<0.05	<0.15	<0.3

## Vertical #3

	Cl-	PID	GRO	DRO	B	T	E	X	BTEX
SS	<16	4.4	<10	<10	<0.05	<0.05	<0.05	<0.15	<0.3
6"	<16	2.3	<10	<10	<0.05	<0.05	<0.05	<0.15	<0.3
1'	<16	2	<10	<10	<0.05	<0.05	<0.05	<0.15	<0.3



## Vertical #4

	Cl-	PID	GRO	DRO	B	T	E	X	BTEX
SS	<16	0.9	<10	<10	<0.05	<0.05	<0.05	<0.15	<0.3
6"	<16	2.9	<10	<10	<0.05	<0.05	<0.05	<0.15	<0.3
1'	112	2.6	<10	<10	<0.05	<0.05	<0.05	<0.15	<0.3

## Legend

- VERTICAL
- SURFACE FIBERGLASS LINES
- ⋯ PROPOSED EXCAVATION
- STAIN 917 SQ FT

Cl- Field Data

Cl- Lab Data

DGW: NONE

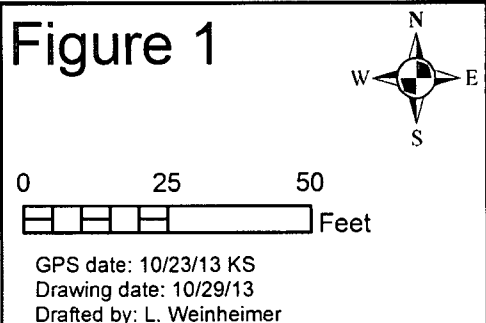
Landowner: BLM

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**LINN H.E. WEST**  
**B BATTERY 2 AND 4**  
**WEST B #19**  
 LEGALS: UL/C sec. 10  
 T-17-S R-31-E  
 EDDY COUNTY, NM  
 NMOCD CASE #: 2RP-1960

Figure 1



# Appendix A

Initial C-141

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 2948 Hobbs, NM 88241  
Phone 575.393.2967

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

State of New Mexico  
Energy Minerals and Natural Resources

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

RECEIVED

SEP 30 2013

NMOCD ARTESIA

Form C-141  
Revised October 10, 2003

Submit Copy to appropriate District Office in accordance with 19.15.29 NMAC

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report



Name of Company: Linn Operating	Contact: Brian Wall	
Address: 2130 W. Bender Hobbs, NM 88240	Telephone No.: 575-738-1739	
Facility Name: HE WEST B Battery 2 and 4 - West B #19	Facility Type: Waterflood	
Surface Owner: Federal	Mineral Owner:	API No.: 3001505125

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	10	17S	31E	660	North	1980	West	Eddy

Latitude: 32.8545167385998 Longitude: -103.859741264752

NATURE OF RELEASE

Type of Release: Produced Water / Oil	Volume of Release: 20bbls/1gal	Volume Recovered: 0 / 0
Source of Release: FiberGlass Pipeline	Date and Hour of Occurrence: 09/19/2013	Date and Hour of Discovery: 09/19/2013
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Mike Burton- BLM Mike Bratcher- NM OCD	
By Whom? Brian Wall	Date and Hour 09/20/2013	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	
If a Watercourse was Impacted, Describe Fully.*:		
Describe Cause of Problem and Remedial Action Taken.*: received call from pumper of injection plant about an alarm of low discharge pressure. We shut off headers and pressured up opening valves one by one. Line 1&2 would not hold pressure more than 400 psi. so we left lines shut in. called for a pump truck to pressure up and test line. shut off lateral lines and had truck start pumping on main trunk line but would not pressure up. Walked out line and found leak in pasture. 3" fiberglass line was uncovered from wind blowing sand away.		
Describe Area Affected and Cleanup Action Taken.*: line bowed up and ruptured causing an affected area about 15'x15'. an estimated 20 barrels of dirty black water and a light skim of oil was lost. repair and clean up has to be completed before the line can be re-buried. This line should not operate until it has been buried to prevent it from bowing and breaking. We cant cover the line until clean up has been accomplished		
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.		
Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Brian Wall	Approved by District Supervisor:	Signed By 
Title: Construction Foreman II	Approval Date: OCT 02 2013	Expiration Date:
E-mail Address: bwall@linenergy.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 09/30/2013 Phone: 806-367-0645	Remediation per OCD Rule & Guidelines, & like approval by BLM. SUBMIT REMEDIATION PROPOSAL NO LATER THAN:	

\* Attach Additional Sheets If Necessary

November 2, 2013

2RP-1912

# Appendix B

## Laboratory Analyses

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 2948 Hobbs, NM 88241  
Phone 575.393.2967



October 21, 2013

JACOB KAMPLAIN

RICE ENVIRONMENTAL CONSULTING & SAFETY LLC

419 W. CAIN

HOBBS, NM 88240

RE: H. E. WEST B #19

Enclosed are the results of analyses for samples received by the laboratory on 10/16/13 8:45.

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](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

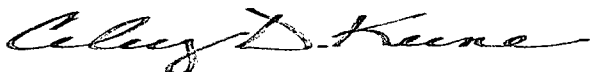
Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

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

Lab Director/Quality Manager

**Analytical Results For:**

RICE ENVIRONMENTAL CONSULTING & SAFETY  
JACOB KAMPLAIN  
419 W. CAIN  
HOBBS NM, 88240  
Fax To: (575) 397-1471

Received: 10/16/2013  
Reported: 10/21/2013  
Project Name: H. E. WEST B #19  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 10/15/2013  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: POINT 1 @ SURFACE (H302502-01)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	10/18/2013	ND	1.78	89.1	2.00	0.150		
Toluene*	<0.050	0.050	10/18/2013	ND	1.90	95.2	2.00	2.95		
Ethylbenzene*	<0.050	0.050	10/18/2013	ND	1.94	96.8	2.00	3.35		
Total Xylenes*	<0.150	0.150	10/18/2013	ND	5.87	97.9	6.00	6.19		
Total BTEX	<0.300	0.300	10/18/2013	ND						

Surrogate: 4-Bromofluorobenzene (PIE) 100 % 89.4-126

Chloride, SM4500Cl-B			mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	16.0	16.0	10/17/2013	ND	416	104	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	10/17/2013	ND	191	95.3	200	2.37		
DRO >C10-C28	<10.0	10.0	10/17/2013	ND	191	95.5	200	3.62		

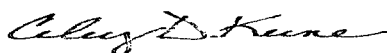
Surrogate: 1-Chlorooctane 103 % 65.2-140

Surrogate: 1-Chlorooctadecane 109 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

RICE ENVIRONMENTAL CONSULTING & SAFETY  
JACOB KAMPLAIN  
419 W. CAIN  
HOBBS NM, 88240  
Fax To: (575) 397-1471

Received: 10/16/2013  
Reported: 10/21/2013  
Project Name: H. E. WEST B #19  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 10/15/2013  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: POINT 1 @ 6" (H302502-02)**

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/18/2013	ND	1.78	89.1	2.00	0.150	
Toluene*	<0.050	0.050	10/18/2013	ND	1.90	95.2	2.00	2.95	
Ethylbenzene*	<0.050	0.050	10/18/2013	ND	1.94	96.8	2.00	3.35	
Total Xylenes*	<0.150	0.150	10/18/2013	ND	5.87	97.9	6.00	6.19	
Total BTX	<0.300	0.300	10/18/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIL) 100 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	10/17/2013	ND	416	104	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	10/16/2013	ND	191	95.3	200	2.37	
DRO >C10-C28	<10.0	10.0	10/16/2013	ND	191	95.5	200	3.62	

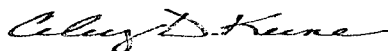
Surrogate: 1-Chlorooctane 91.2 % 65.2-140

Surrogate: 1-Chlorooctadecane 101 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

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Project Name: H. E. WEST B #19  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 10/15/2013  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: POINT 1 @ 1' (H302502-03)**

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/18/2013	ND	1.78	89.1	2.00	0.150	
Toluene*	<0.050	0.050	10/18/2013	ND	1.90	95.2	2.00	2.95	
Ethylbenzene*	<0.050	0.050	10/18/2013	ND	1.94	96.8	2.00	3.35	
Total Xylenes*	<0.150	0.150	10/18/2013	ND	5.87	97.9	6.00	6.19	
Total BTEX	<0.300	0.300	10/18/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 101 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	10/17/2013	ND	416	104	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	10/16/2013	ND	191	95.3	200	2.37	
DRO >C10-C28	<10.0	10.0	10/16/2013	ND	191	95.5	200	3.62	

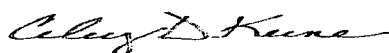
Surrogate: 1-Chlorooctane 95.5 % 65.2-140

Surrogate: 1-Chlorooctadecane 98.9 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

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Project Name: H. E. WEST B #19  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 10/15/2013  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: POINT 2 @ SURFACE (H302502-04)**

BTX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	10/18/2013	ND	1.93	96.4	2.00	1.36		
Toluene*	<0.050	0.050	10/18/2013	ND	1.99	99.3	2.00	2.92		
Ethylbenzene*	<0.050	0.050	10/18/2013	ND	2.01	100	2.00	2.99		
Total Xylenes*	<0.150	0.150	10/18/2013	ND	5.85	97.4	6.00	2.79		
Total BTX	<0.300	0.300	10/18/2013	ND						

Surrogate: 4-Bromofluorobenzene (PIL) 102 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	80.0	16.0	10/17/2013	ND	416	104	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	10/16/2013	ND	191	95.3	200	2.37	
DRO >C10-C28	<10.0	10.0	10/16/2013	ND	191	95.5	200	3.62	

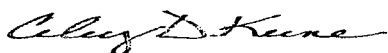
Surrogate: 1-Chlorooctane 99.6 % 65.2-140

Surrogate: 1-Chlorooctadecane 111 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

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Received: 10/16/2013  
Reported: 10/21/2013  
Project Name: H. E. WEST B #19  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 10/15/2013  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: POINT 2 @ 6" (H302502-05)**

BTX 8021B			mg/kg		Analyzed By: MS				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/18/2013	ND	1.93	96.4	2.00	1.36	
Toluene*	<0.050	0.050	10/18/2013	ND	1.99	99.3	2.00	2.92	
Ethylbenzene*	<0.050	0.050	10/18/2013	ND	2.01	100	2.00	2.99	
Total Xylenes*	<0.150	0.150	10/18/2013	ND	5.85	97.4	6.00	2.79	
Total BTX	<0.300	0.300	10/18/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 103 % 89.4-126

Chloride, SM4500Cl-B			mg/kg		Analyzed By: AP				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2400	16.0	10/17/2013	ND	416	104	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	10/16/2013	ND	191	95.3	200	2.37	
DRO >C10-C28	10.1	10.0	10/16/2013	ND	191	95.5	200	3.62	

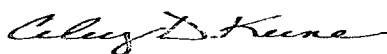
Surrogate: 1-Chlorooctane 90.1 % 65.2-140

Surrogate: 1-Chlorooctadecane 96.9 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 RICE ENVIRONMENTAL CONSULTING & SAFETY  
 JACOB KAMPLAIN  
 419 W. CAIN  
 HOBBS NM, 88240  
 Fax To: (575) 397-1471

 Received: 10/16/2013  
 Reported: 10/21/2013  
 Project Name: H. E. WEST B #19  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 10/15/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: POINT 2 @ 1' (H302502-06)**

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/18/2013	ND	1.93	96.4	2.00	1.36	
Toluene*	<0.050	0.050	10/18/2013	ND	1.99	99.3	2.00	2.92	
Ethylbenzene*	<0.050	0.050	10/18/2013	ND	2.01	100	2.00	2.99	
Total Xylenes*	<0.150	0.150	10/18/2013	ND	5.85	97.4	6.00	2.79	
Total BTX	<0.300	0.300	10/18/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 103 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	10/17/2013	ND	416	104	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	10/16/2013	ND	191	95.3	200	2.37	
DRO >C10-C28	<10.0	10.0	10/16/2013	ND	191	95.5	200	3.62	

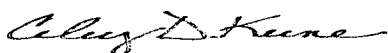
Surrogate: 1-Chlorooctane 102 % 65.2-140

Surrogate: 1-Chlorooctadecane 110 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

RICE ENVIRONMENTAL CONSULTING & SAFETY  
JACOB KAMPLAIN  
419 W. CAIN  
HOBBS NM, 88240  
Fax To: (575) 397-1471

Received: 10/16/2013  
Reported: 10/21/2013  
Project Name: H. E. WEST B #19  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 10/15/2013  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: POINT 3 @ SURFACE (H302502-07)**

BTEx 8021B			mg/kg		Analyzed By: MS				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/18/2013	ND	1.93	96.4	2.00	1.36	
Toluene*	<0.050	0.050	10/18/2013	ND	1.99	99.3	2.00	2.92	
Ethylbenzene*	<0.050	0.050	10/18/2013	ND	2.01	100	2.00	2.99	
Total Xylenes*	<0.150	0.150	10/18/2013	ND	5.85	97.4	6.00	2.79	
Total BTEx	<0.300	0.300	10/18/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 103 % 89.4-126

Chloride, SM4500Cl-B			mg/kg		Analyzed By: AP				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	10/17/2013	ND	416	104	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	10/16/2013	ND	191	95.3	200	2.37	
DRO >C10-C28	<10.0	10.0	10/16/2013	ND	191	95.5	200	3.62	

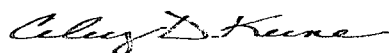
Surrogate: 1-Chlorooctane 104 % 65.2-140

Surrogate: 1-Chlorooctadecane 108 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

 RICE ENVIRONMENTAL CONSULTING & SAFETY  
 JACOB KAMPLAIN  
 419 W. CAIN  
 HOBBS NM, 88240  
 Fax To: (575) 397-1471

 Received: 10/16/2013  
 Reported: 10/21/2013  
 Project Name: H. E. WEST B #19  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 10/15/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: POINT 3 @ 6" (H302502-08)**

BTEx 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/18/2013	ND	1.93	96.4	2.00	1.36	
Toluene*	<0.050	0.050	10/18/2013	ND	1.99	99.3	2.00	2.92	
Ethylbenzene*	<0.050	0.050	10/18/2013	ND	2.01	100	2.00	2.99	
Total Xylenes*	<0.150	0.150	10/18/2013	ND	5.85	97.4	6.00	2.79	
Total BTEx	<0.300	0.300	10/18/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIL) 103 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	10/17/2013	ND	416	104	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	10/17/2013	ND	191	95.3	200	2.37	
DRO >C10-C28	<10.0	10.0	10/17/2013	ND	191	95.5	200	3.62	

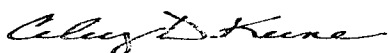
Surrogate: 1-Chlorooctane 99.3 % 65.2-140

Surrogate: 1-Chlorooctadecane 105 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

RICE ENVIRONMENTAL CONSULTING & SAFETY  
JACOB KAMPLAIN  
419 W. CAIN  
HOBBS NM, 88240  
Fax To: (575) 397-1471

Received: 10/16/2013  
Reported: 10/21/2013  
Project Name: H. E. WEST B #19  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 10/15/2013  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: POINT 3 @ 1' (H302502-09)**

BTX 8021B			mg/kg		Analyzed By: MS				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/18/2013	ND	1.93	96.4	2.00	1.36	
Toluene*	<0.050	0.050	10/18/2013	ND	1.99	99.3	2.00	2.92	
Ethylbenzene*	<0.050	0.050	10/18/2013	ND	2.01	100	2.00	2.99	
Total Xylenes*	<0.150	0.150	10/18/2013	ND	5.85	97.4	6.00	2.79	
Total BTX	<0.300	0.300	10/18/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 105 % 89.4-126

Chloride, SM4500Cl-B			mg/kg		Analyzed By: AP				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	10/17/2013	ND	416	104	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	10/17/2013	ND	191	95.3	200	2.37	
DRO >C10-C28	<10.0	10.0	10/17/2013	ND	191	95.5	200	3.62	

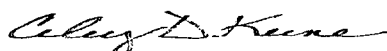
Surrogate: 1-Chlorooctane 106 % 65.2-140

Surrogate: 1-Chlorooctadecane 112 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

### Notes and Definitions

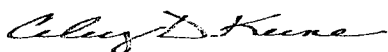
QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
ND	Analyte NOT DETECTED at or above the reporting 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

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Cardinal Laboratories

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Celey D. Keene, Lab Director/Quality Manager



**(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325) 673-7020**

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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:	Received By:	Phone Result:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Add'l Phone #:
Kyle Schnaidt		10-16-13	Jedi Henson	Fax Result:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Add'l Fax #:
Relinquished By:		Time:	Received By:	REMARKS:		
		8:45		kschnaidt@rice-ecs.com		
Delivered By: (Circle One)		Date:	Received By:	Knorman@rice-ecs.com		
Sampler - UPS - Bus - Other:		Time:		Kjones@riceswd.com; jkamplain@rice-ecs.com		
				hconder@rice-ecs.com; Lweinheimer@rice-ecs.com		
		Sample Condition	CHECKED BY:			
		Cool Intact	(Initials)			
		<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes	JAH			
		<input type="checkbox"/> No <input type="checkbox"/> No				

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

#54

October 29, 2013

JACOB KAMPLAIN

RICE ENVIRONMENTAL CONSULTING & SAFETY LLC

419 W. CAIN

HOBBS, NM 88240

RE: H. E. WEST B #19

Enclosed are the results of analyses for samples received by the laboratory on 10/23/13 15:40.

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](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

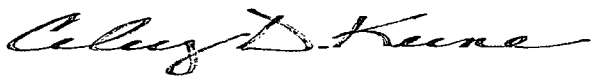
Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

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

Lab Director/Quality Manager

**Analytical Results For:**

RICE ENVIRONMENTAL CONSULTING & SAFETY  
JACOB KAMPLAIN  
419 W. CAIN  
HOBBS NM, 88240  
Fax To: (575) 397-1471

Received: 10/23/2013  
Reported: 10/29/2013  
Project Name: H. E. WEST B #19  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 10/23/2013  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: POINT 4 @ SURFACE (H302573-01)**
**BTEX 8021B**

mg/kg

Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/27/2013	ND	1.89	94.4	2.00	0.364	
Toluene*	<0.050	0.050	10/27/2013	ND	1.94	97.1	2.00	0.484	
Ethylbenzene*	<0.050	0.050	10/27/2013	ND	1.95	97.7	2.00	0.395	
Total Xylenes*	<0.150	0.150	10/27/2013	ND	5.87	97.8	6.00	0.0827	
Total BTEX	<0.300	0.300	10/27/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIL) 106 % 89.4-126

**Chloride, SM4500Cl-B**

mg/kg

Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	10/24/2013	ND	432	108	400	3.77	

**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	10/25/2013	ND	185	92.3	200	0.942	
DRO >C10-C28	<10.0	10.0	10/25/2013	ND	173	86.6	200	1.03	

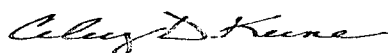
Surrogate: 1-Chlorooctane 88.3 % 65.2-140

Surrogate: 1-Chlorooctadecane 89.1 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

RICE ENVIRONMENTAL CONSULTING & SAFETY  
JACOB KAMPLAIN  
419 W. CAIN  
HOBBS NM, 88240  
Fax To: (575) 397-1471

Received: 10/23/2013  
Reported: 10/29/2013  
Project Name: H. E. WEST B #19  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 10/23/2013  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: POINT 4 @ 6" (H302573-02)**

BTX 8021B			mg/kg		Analyzed By: MS				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/28/2013	ND	2.16	108	2.00	2.91	
Toluene*	<0.050	0.050	10/28/2013	ND	2.20	110	2.00	2.57	
Ethylbenzene*	<0.050	0.050	10/28/2013	ND	2.21	110	2.00	2.96	
Total Xylenes*	<0.150	0.150	10/28/2013	ND	6.39	106	6.00	3.57	
Total BTX	<0.300	0.300	10/28/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 104 % 89.4-126

Chloride, SM4500Cl-B			mg/kg		Analyzed By: AP				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	10/24/2013	ND	432	108	400	3.77	

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	10/27/2013	ND	192	96.0	200	5.98	
DRO >C10-C28	<10.0	10.0	10/27/2013	ND	182	91.0	200	8.63	

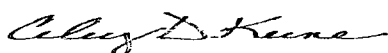
Surrogate: 1-Chlorooctane 94.0 % 65.2-140

Surrogate: 1-Chlorooctadecane 96.6 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

RICE ENVIRONMENTAL CONSULTING & SAFETY  
JACOB KAMPLAIN  
419 W. CAIN  
HOBBS NM, 88240  
Fax To: (575) 397-1471

Received: 10/23/2013  
Reported: 10/29/2013  
Project Name: H. E. WEST B #19  
Project Number: NONE GIVEN  
Project Location: NOT GIVEN

Sampling Date: 10/23/2013  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Jodi Henson

**Sample ID: POINT 4 @ 1' (H302573-03)**

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/28/2013	ND	2.16	108	2.00	2.91	
Toluene*	<0.050	0.050	10/28/2013	ND	2.20	110	2.00	2.57	
Ethylbenzene*	<0.050	0.050	10/28/2013	ND	2.21	110	2.00	2.96	
Total Xylenes*	<0.150	0.150	10/28/2013	ND	6.39	106	6.00	3.57	
Total BTX	<0.300	0.300	10/28/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 103 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	112	16.0	10/24/2013	ND	432	108	400	3.77	

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	10/27/2013	ND	192	96.0	200	5.98	
DRO >C10-C28	<10.0	10.0	10/27/2013	ND	182	91.0	200	8.63	

Surrogate: 1-Chlorooctane 91.9 % 65.2-140

Surrogate: 1-Chlorooctadecane 94.6 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager



**Notes and Definitions**

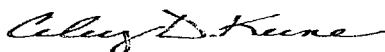
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received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

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Celey D. Keene, Lab Director/Quality Manager



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

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

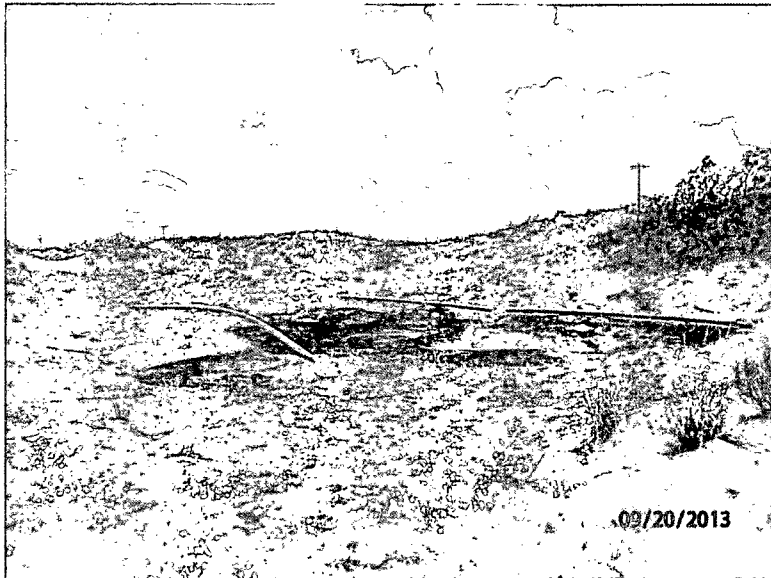
Company Name: <b>RECS</b>		<b>BILL TO</b>		<b>ANALYSIS REQUEST</b>																																			
Project Manager: <b>Jacob Kamplain</b>		P.O. #:		<div>Chlorides TPH 8015 M BTEX Texas TPH Complete Cations/Anions TDS</div>																																			
Address:		Company:																																					
City: <b>Hobbs</b> State: <b>NM</b> Zip: <b>88240</b>		Attn:																																					
Phone #:		Address:																																					
Project #:		City:																																					
Project Name:		State: Zip:																																					
Project Location: <b>H.E. West B #19</b>		Phone #:																																					
Sampler Name: <b>Kyle Schnaidt</b>		Fax #:																																					
FOR LAB USE ONLY				MATRIX		PRESERV.		SAMPLING																															
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											
<b>H302573</b>				<b>6</b>		<b>1</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>10-23-13</b>		<b>1:00</b>											
<b>1 Point 4 @ surface</b>				<b>6</b>		<b>1</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>1:05</b>													
<b>3 Point 4 @ 1'</b>				<b>6</b>		<b>1</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>X</b>		<b>1:10</b>													
<p>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.</p>																																							
Relinquished By:		Date:		Received By:		Phone Result:		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Add'l Phone #:		REMARKS:  kschnaidt@rice-ecs.com Knorman@rice-ecs.com Kjones@riceswd.com; jkamplain@rice-ecs.com hconder@rice-ecs.com; Lweinheimer@rice-ecs.com																											
Kyle Schnaidt		10-23-13		Jodi Benson		Fax Result:		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Add'l Fax #:																													
Time:		3:40																																					
Relinquished By:		Date:		Received By:																																			
		Time:																																					
Delivered By: (Circle One)				Sample Condition				CHECKED BY:																															
Sampler - UPS - Bus - Other:				Cool Intact				(Initials)																															
				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																															

# Appendix C

## Photo Documentation

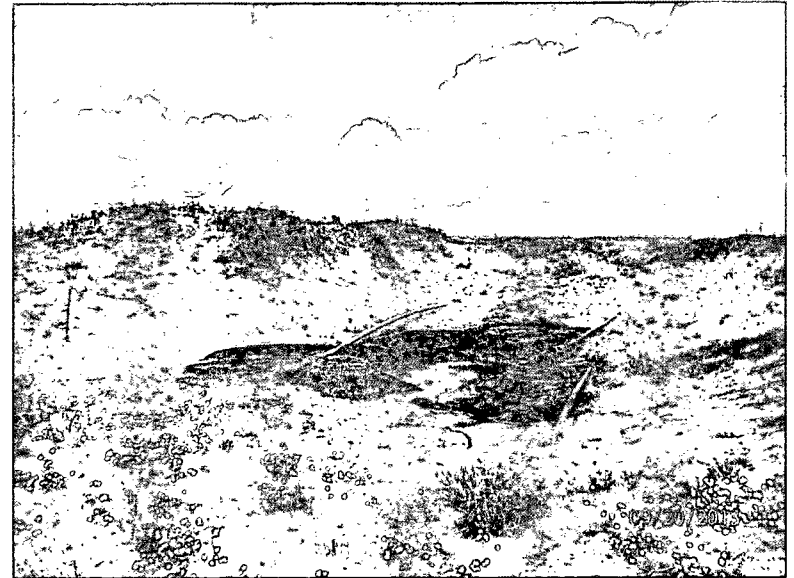
**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 2948 Hobbs, NM 88241  
Phone 575.393.2967

**Linn H.E. West B #19**  
Unit Letter C, Section 10, T17S, R31E



Initial site photo, facing north

9/20/13

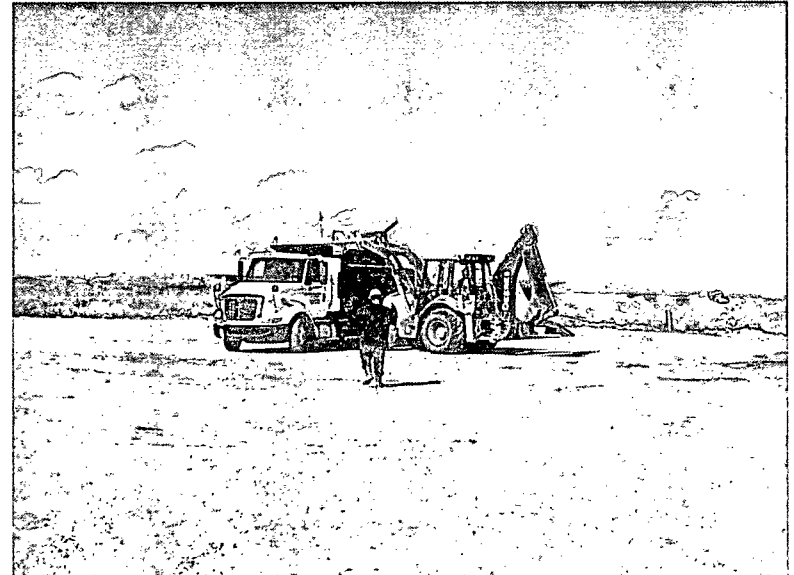


Initial site photo, facing northeast

9/20/13



Hand shoveling release area, facing southeast 9/20/13



Exporting soil, facing northeast

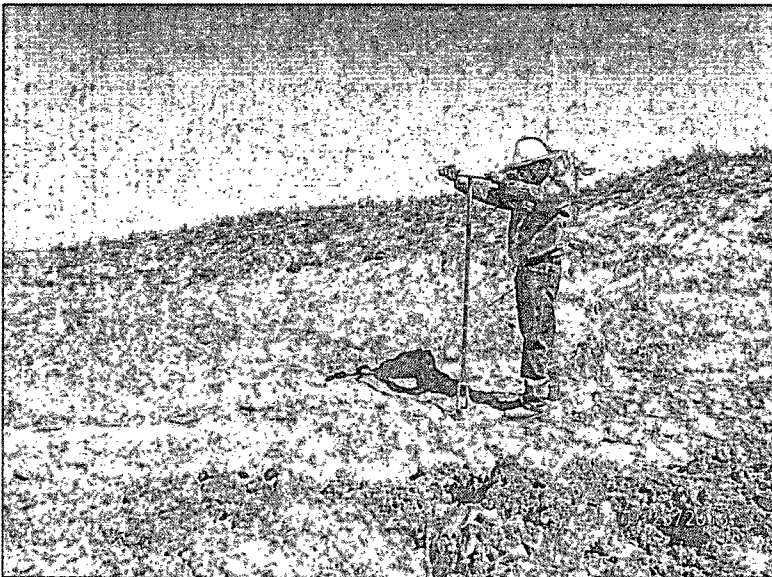
9/20/13



Hand shovel completed, facing northeast 9/20/13



Hand shovel completed, facing southeast 9/20/13



Hand auguring for depth, facing north 9/25/13



Plugging augur point in total with bentonite, facing south 9/25/13