

1R - 426-150

REPORTS

DATE:

4-8-09

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

April 8th, 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: Submittal of **ICP Reports and Termination Requests** for
NMOCD Case Nos. 1R426-117 (BD Oxy Owen A), **1R426-150** (BD P-35-1),
1R427-181 (EME Phillips B EOL) and **1R427-06** (EME O-19 Jct)

Sent via E-mail and Certified Mail/Return Receipt No. 7006 0100 0001 2438 3951

Dear Mr. Jones:

Please find enclosed Investigation and Characterization Reports and Termination Requests for the above-referenced projects.

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

We appreciate your review consideration of these remediation termination requests.

Sincerely,



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

Cc: Rice Operating Company, Edward Hansen (NMOCD)

RECEIVED
2009 APR 14 PM 1 16

**Investigation and Characterization Report and Termination Request
Rice Operating Company – BD SWD System
BD P-35-1 Jct
UL P Sec 35 T 21S R 37E¹
NMOCD Case Number: 1R426-150**



April 8th, 2009

Prepared by:

L. Peter Galusky, Jr. Ph.D.
Texerra
505 N. Big Spring, Suite 404
Midland, Texas 79701
Web: www.texerra.com
E-mail: lpg@texerra.com

¹ Please note that the legal description was previously and incorrectly reported as T 22 R 38 E.

Investigation and Characterization Report and Termination Request

BD P-35-1 Jct

UL P Sec 35 T 21S R 37E

NMOCD Case Number: 1R426-150

Executive Summary

This report summarizes the findings of investigative work prescribed in the NMOCD approved Investigation and Characterization Plan for this site.

Rice Operating Company removed a wooden junction box at this location, replacing it with a new, water-tight junction box in May of 2006 as part of its facility maintenance and upgrade program. The original wood junction box was removed and the excavated soils were blended and backfilled into the excavation. The disturbed surface was then seeded with a native vegetation mix. Preliminary site investigation associated with the junction box replacement indicated significant residual soil chloride concentrations and measurable but low petroleum hydrocarbon concentrations.

The field investigation was completed on September 10th, 2008. Three soil borings were advanced at and near the location of the former junction box to depths of 40 to 50 ft bgs, and a monitor well was installed in the near-source borehole. Soil chloride concentrations averaged 618 ppm among the three soil borings and throughout the depth of drilling. Soil petroleum hydrocarbons were found to be below detection by both PID field reading and by laboratory analysis.

A simple soil chloride transport and groundwater dilution model was developed to estimate the potential effect of residual soil chloride leaching into groundwater over an elliptical reference plume having maximum dimensions of 250 ft by 100 ft. The model predicted that maximum anticipated elevation of groundwater chlorides caused by the movement of residual soil chlorides is less than 175 ppm, indicating that residual soil chlorides should not represent a significant hazard to groundwater quality. An initial sample from an at-source monitor well exhibited a chloride concentration of 352 ppm. However, it is to be expected that chloride concentrations at/near the center of the release would be higher than the model-predicted average value over the volume of the reference plume.

This level of chloride concentration, while somewhat above NMOCD's desired standard of 250 ppm, does not appear to warrant remedial actions (or the development of a Corrective Action Plan). Further, given that the monitor well is located within a high oil-field traffic location it may well be advisable to plug and abandon this well altogether, so as to avoid any potential for truck run-over and subsequent direct contamination of the aquifer through the well pipe.

It is therefore requested that NMOCD grant Rice Operating Company a "remediation termination" or similar closure status for this project and authorize the plugging and abandonment of the monitor well that was installed during this investigation.

Investigation and Characterization Report and Termination Request

BD P-35-1 Jct

UL P Sec 35 T 21S R 37E

NMOCD Case Number: 1R426-150

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Background

This report summarizes the findings of investigative work prescribed in the Investigation and Characterization Plan (ICP) for this site, which was approved by NMOCD on July 17th, 2008 (a copy of e-mail approval is given in the Appendix).

The site is located approximately one mile east/southeast of Eunice, New Mexico (Figure 1). The topography is gently sloping toward the southeast. Soils on the site are described in the Lea County Soil Survey moderately deep to deep sandy material overlying caliche of varying hardness. NM OSE records indicate that groundwater is likely to be encountered at a depth of 50+/- feet in unconsolidated Tertiary alluvium of the Ogallala Formation.

Rice Operating Company removed a wooden junction box at this location, replacing it with a new, water-tight junction box (located approx. 33 ft southwest of the original location) in May of 2006 as part of its facility maintenance and upgrade program. As the original wood junction box was removed soils were sampled using a backhoe, creating a 30 by 25 by 12 ft deep excavation. The excavated soils were blended and then backfilled into the excavation. The disturbed surface was then seeded with a native vegetation mix.

Low concentrations (30 ppm) of petroleum hydrocarbons (TPH) were encountered in the excavated soil. TPH concentrations were below detection (< 10.0 ppm) in the sidewalls and bottom of the excavation. Petroleum hydrocarbons were therefore ruled out as a potential constituent of concern. In contrast, chloride concentrations increased with depth to 2,185 ppm at 12 ft below ground surface. The surface (ecological) impact of this release was relatively small.

Objective, Scope and Methodology

The objective of the ICP is to: **a-** quantify the magnitude and extent of residual soil chlorides and petroleum hydrocarbons; **b-** determine if these pose a threat to groundwater quality under present conditions and **c-** develop a Corrective Action Plan (CAP) to protect groundwater if this is warranted.

The scope of the ICP encompasses the measured effects of past operations of the facility on soil and groundwater in the affected vicinity.

The methodology of the ICP entailed: **a-** drilling to obtain subsurface soil samples; **b-** analyzing these for chlorides using field titration procedures and for petroleum hydrocarbons using a Photo-ionization Detector (PID); **c-** verifying (QA/QC) the field methods against a subset of samples analyzed by a commercial laboratory; **d-** analyzing the data using graphical and statistical methods and **e-** interpreting the data using a simple mass-balance dilution model.

The field investigation was completed on September 10th, 2008. Harrison and Cooper, Inc. provided drilling services and Rice Operating Company personnel performed field chloride titrations and PID analyses. L. Peter Galusky, Jr. of Texerra supervised field activities. Confirmatory laboratory analyses were subsequently performed by Cardinal Laboratories.

BD P-35-1 Jct

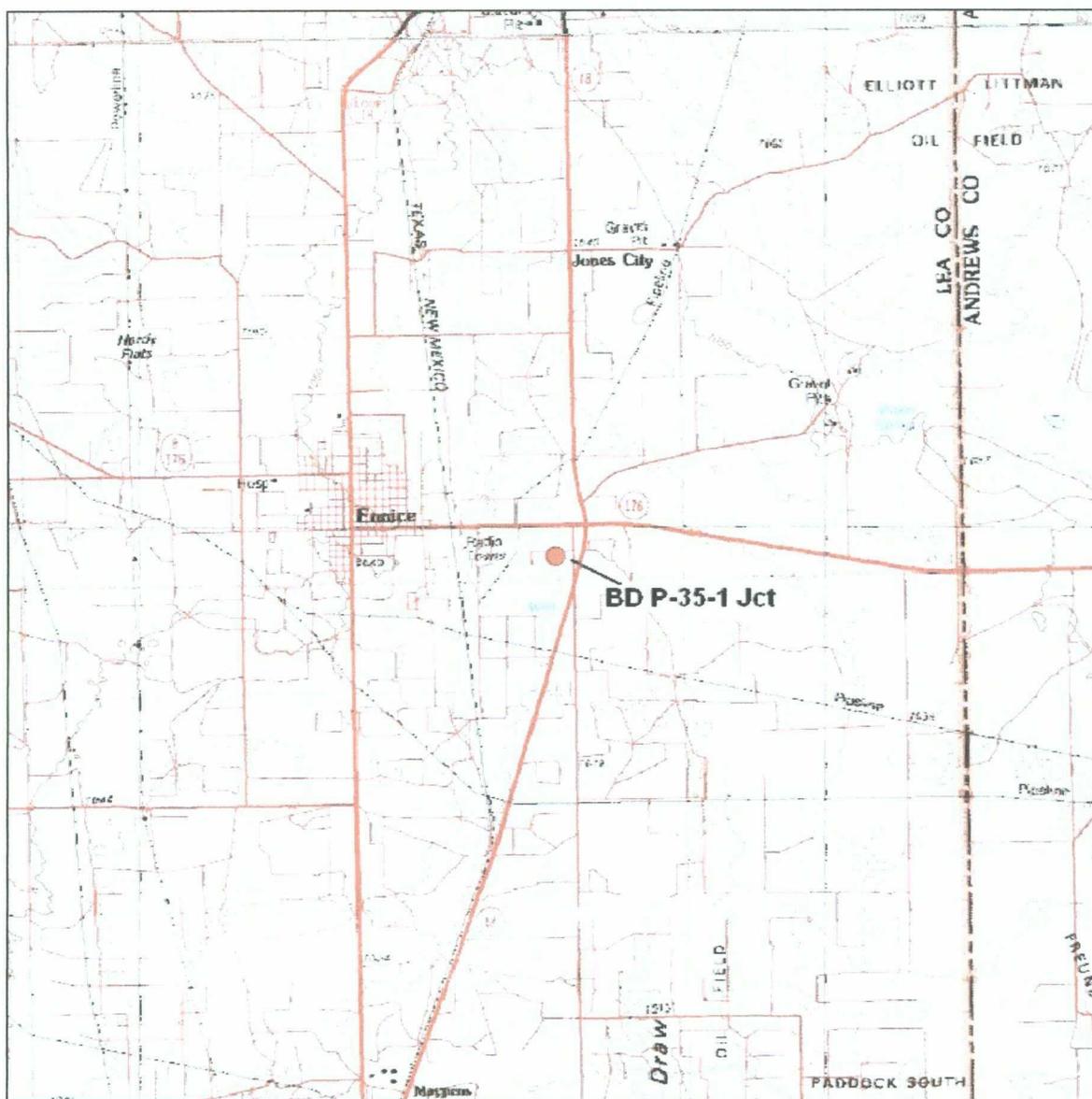


Figure 1 – BD P-35-1 location map on USGS topo base.

BD P-35-1 Jct

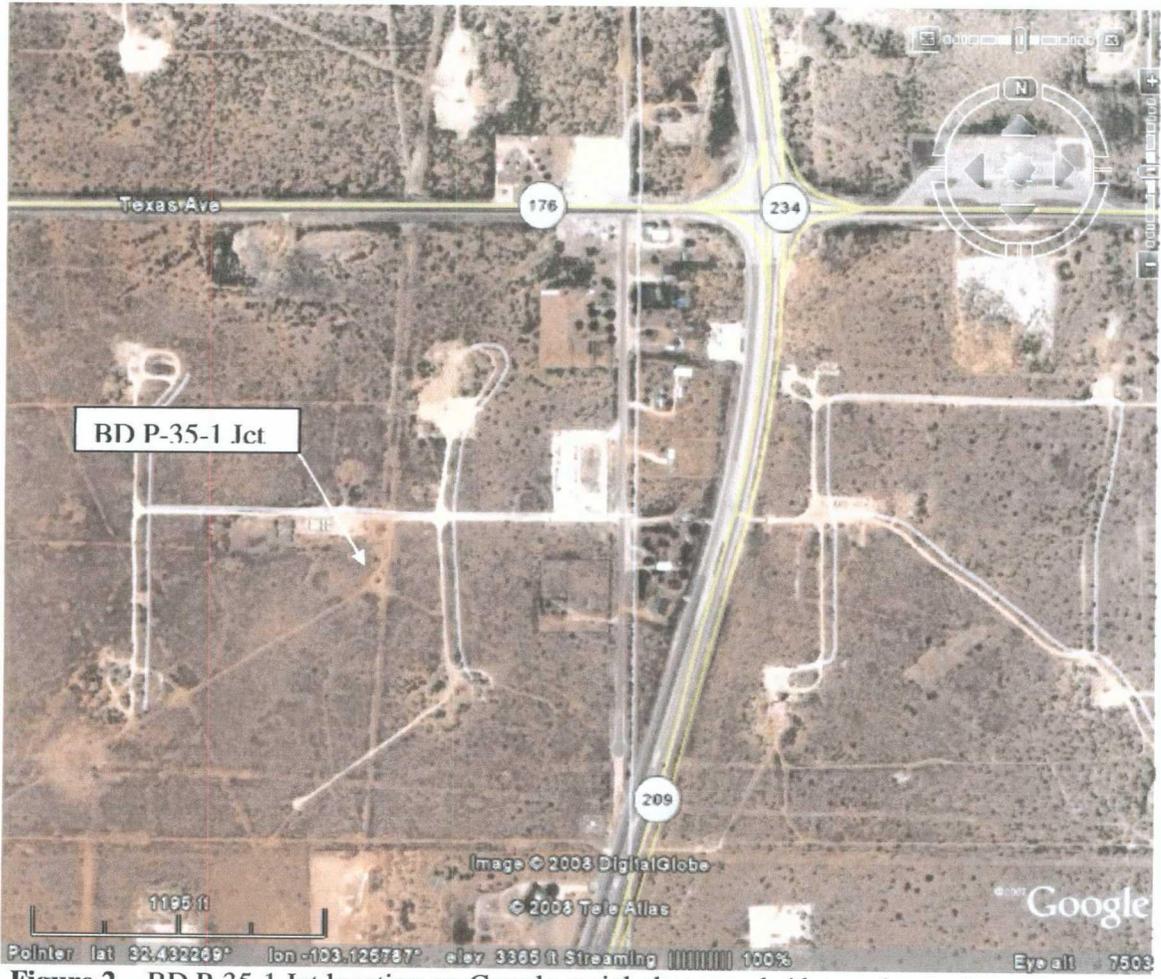


Figure 2 – BD P-35-1 Jct location on Google aerial photograph (date unknown).

Results and Discussion

Three soil borings were advanced at and near the location of the former junction box to depths of 40 to 50 ft bgs (Figures 3a, 3b). Soil chloride concentrations averaged 618 ppm among the three soil borings and throughout the depth of drilling. Soil petroleum hydrocarbons were found to be below detection by both PID field reading and by laboratory analysis (Appendix B2).

The total mass of residual soil chlorides at this location was estimated to be 5,933 lbs (Figure 4). In order to determine if these residual soil chlorides represent a potential hazard to down gradient groundwater quality, a simple soil chloride transport and groundwater dilution model (Figures 5 & 6) was developed to estimate the potential effect of this residual soil chloride leaching into groundwater over time given the following assumptions:

1. The center of mass of residual chlorides moves downward at a rate of 2.0 ft/yr.
2. It is assumed that these chlorides mix uniformly within an elliptical groundwater plume of dimensions 250 ft maximum length by 100 ft maximum width through a depth of 15 ft of the water table aquifer.
3. Natural dilution of the plume occurs at a rate of 10% per year.

The model predicted that maximum anticipated elevation of groundwater chlorides caused by the movement of residual soil chlorides is less than 175 ppm (Figure 7), indicating that residual soil chlorides should not represent a significant hazard to groundwater quality. An initial sample from an at-source monitor well (MW-1) exhibited a chloride concentration of 352 ppm (Appendix C4). However, it is to be expected that chloride concentrations at/near the center of the release would be higher than the model-predicted average value over the volume of the reference plume.

This level of chloride concentration, while somewhat above NMOCD's desired standard of 250 ppm, does not appear to warrant remedial actions (or the development of a Corrective Action Plan). Further, given that the monitor well is located within a high oil-field traffic location it may well be advisable to plug and abandon this well altogether, so as to avoid any potential for truck run-over and subsequent direct contamination of the aquifer through the well pipe.

It is therefore requested that NMOCD grant Rice Operating Company a "remediation termination" or similar closure status for this project and authorize the plugging and abandonment of the monitor well that was installed during this investigation.

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

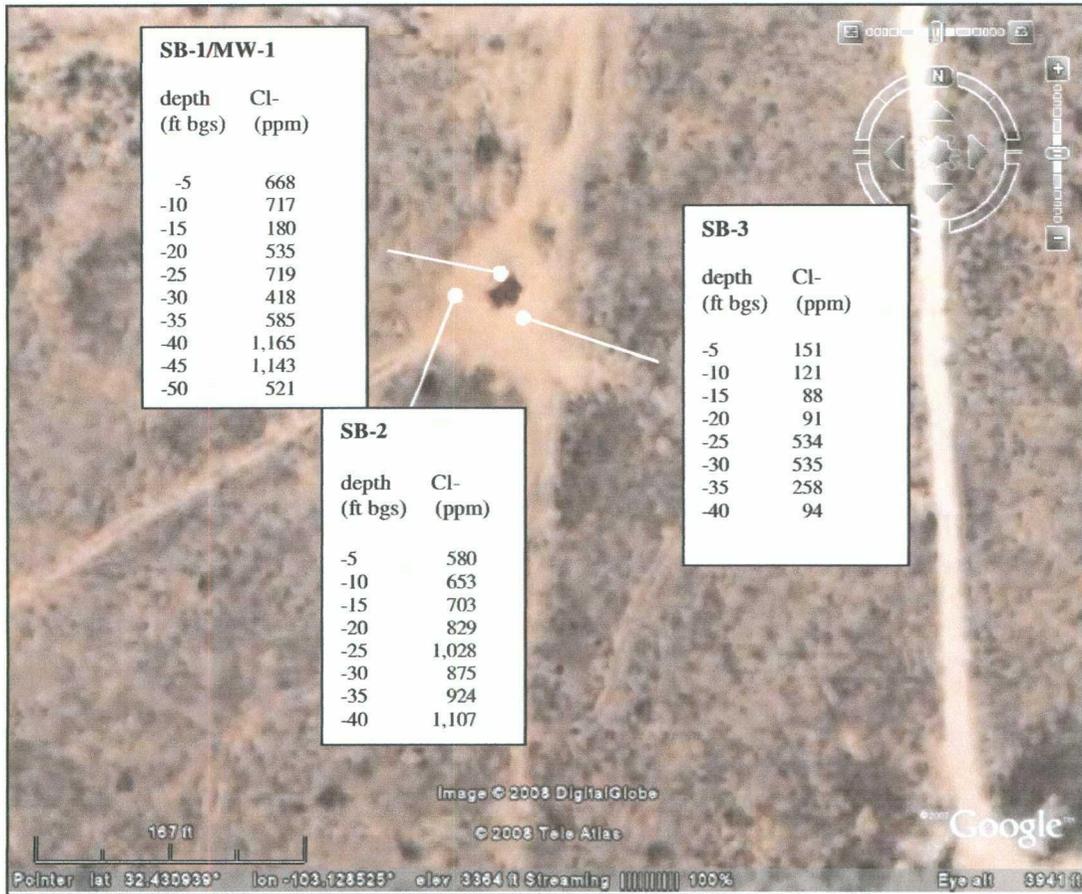


Figure 3a – Approximate soil boring locations and field-measured soil chloride concentrations.

BD P-35-1 Jct

Soil Boring Log

Rice Operating Company

BD SWD System

BD P-35-1

Identification: Avg of SB-1, SB-2 & SB-3

Location:

Date: 9/10/2008

Driller: Harrison & Cooper, Inc. (Ken Cooper supervising)

Drill method: Air rotary

Logged by: L. Peter Galusky, Jr., Texerra

Total depth: 50 ft below ground surface

Screened interval: 40 - 50 ft bgs

Pipe diameter:

<u>Depth (ft</u>	<u>Field</u>	<u>Lab</u>	<u>Field PID</u>	<u>Lab GRO</u>	<u>Lab DRO</u>	<u>Notes</u>
<u>below</u>	<u>Chloride</u>	<u>Chloride</u>	<u>test (ppm)</u>	<u>test (ppm)</u>	<u>test (ppm)</u>	
<u>ground</u>	<u>Test</u>	<u>Test</u>				
<u>surface)</u>	<u>(ppm)</u>	<u>(ppm)</u>				

-5	466		0.0			
-10	497		0.0			
-15	324		0.0	< 25.0	< 25.0	organics from SB-1 only
-20	485	551	0.0			
-25	761		0.0			
-30	610		0.0			
-35	589		0.0			
-40	789	831	0.0	< 25.0	< 25.0	organics from SB-1 only
-45	1,143		0.0			
-50	521		0.0			
avg	618		0			

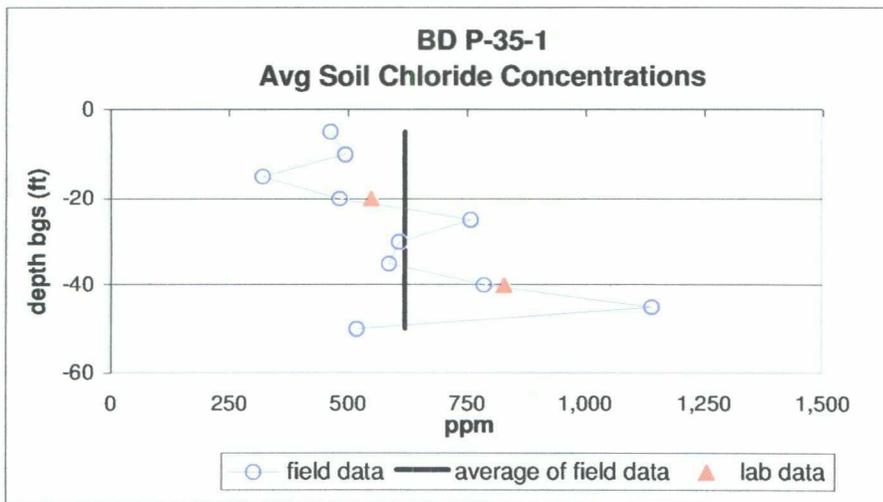


Figure 3b – Average soil chloride and petroleum hydrocarbon concentrations from three soil borings taken at/near the former junction box location.

Soil Chloride Calculator	
Estimates Mass of Soil Chloride, based upon Soil Chloride Concentration	
Rice Operating Company	
Site:	BD P-35-1
This estimate prepared by:	L. Peter Galusky, Jr.
Date:	4/1/2009
<u>Inputs in Blue Font</u>	
length of affected area (ft)	45
width of affected area (ft)	40
affected area (sq ft)	1,800
affected depth (ft)	48
depth to water table (ft)	48
avg Cl- conc of affected soil (ppm)	618
unsat zone mass density (lbs/cu yd)	3,000
volume of affected soil (cu yds)	3,200
total mass of affected soils (lbs)	9,600,000
mass of residual soil chloride (lbs)	5,933

Figure 4 - Estimation of residual soil chloride mass.

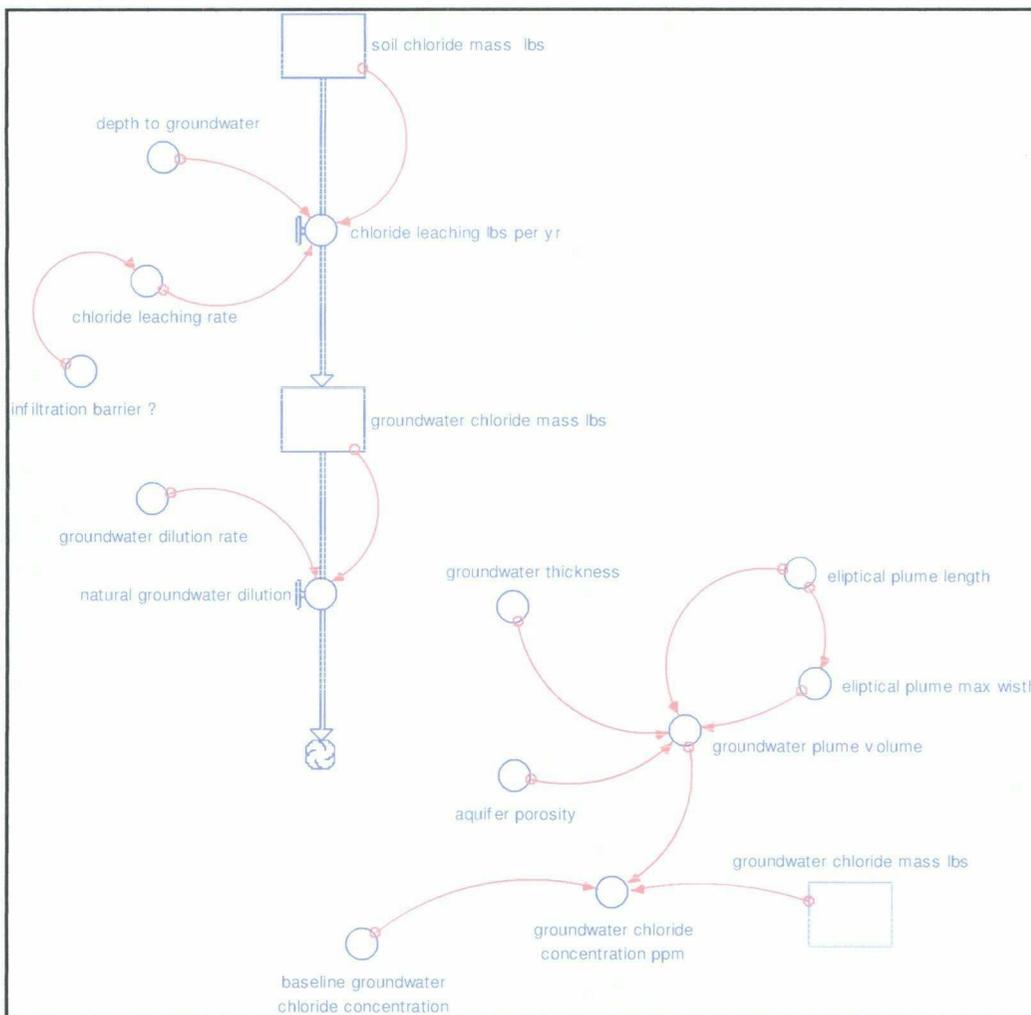


Figure 5- Schematic diagram of soil chloride – groundwater dilution model.

```

groundwater_chloride_mass_lbs(t) = groundwater_chloride_mass_lbs(t - dt) +
(chloride_leaching_lbs_per_yr - natural_groundwater_dilution) * dt
INIT groundwater_chloride_mass_lbs = 0

INFLOWS:
chloride_leaching_lbs_per_yr =
(chloride_leaching_rate/depth_to_groundwater)*soil_chloride_mass_lbs
OUTFLOWS:
natural_groundwater_dilution =
groundwater_chloride_mass_lbs*groundwater_dilution_rate
soil_chloride_mass_lbs(t) = soil_chloride_mass_lbs(t - dt) + (-
chloride_leaching_lbs_per_yr) * dt
INIT soil_chloride_mass_lbs = 5933

OUTFLOWS:
chloride_leaching_lbs_per_yr =
(chloride_leaching_rate/depth_to_groundwater)*soil_chloride_mass_lbs
aquifer_porosity = 0.33
baseline_groundwater_chloride_concentration = 0
chloride_leaching_rate = IF(infiltration_barrier_?=0) THEN 2.0 ELSE 2.0/20
depth_to_groundwater = 48
elliptical_plume_length = 250
elliptical_plume_max_wisth = elliptical_plume_length/2.5
groundwater_chloride_concentration_ppm =
119962*(groundwater_chloride_mass_lbs)/(groundwater_plume_volume*7.5)+baseline_gr
oundwater_chloride_concentration
groundwater_Cl_std = 250
groundwater_dilution_rate = 0.15
groundwater_plume_volume =
(3.14*(elliptical_plume_length/2)*(elliptical_plume_max_wisth/2)*groundwater_thickness)*
aquifer_porosity
groundwater_thickness = 15
infiltration_barrier_? = 0

```

Figure 6 – Model equations and parameter values for soil chloride – groundwater dilution model.

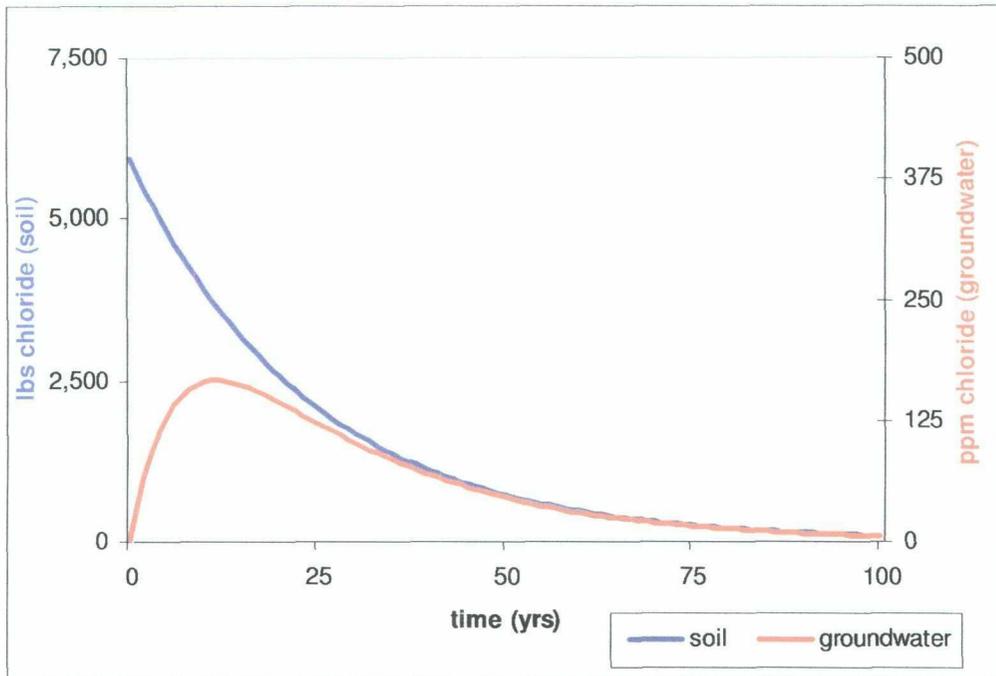
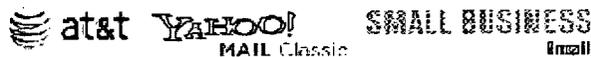


Figure 7 – Estimated change in baseline groundwater chloride concentrations (right axes) over time.

APPENDICES

- Appendix A - NMOCD approval of Investigation and Characterization Plan
- Appendix B – Soil Boring Logs
- Appendix C - Laboratory data
- Appendix D - Photographs



Print - Close Window

Subject: ICP Approvals: #1R427-06; #1R427-181; #1R426-117; #1R426-150
 Date: Thu, 17 Jul 2008 17:01:24 -0600
 From: "Hansen, Edward J., EMROD" <edward.j.hansen@state.nm.us>
 To: "Nack Conder" <nconder@riceswd.com>
 CC: "Price, Wayne, EMROD" <wayne.price@state.nm.us>, m.burrows@vabnet.com, lpg@texerra.com

Dear Mr. Conder:

The New Mexico Oil Conservation Division (NMOCD) has reviewed the submitted Investigation Characterization Plans (ICPs), dated May 30, 2008 and June 3, 2008, for the above referenced sites. The NMOCD hereby conditionally approves the following ICPs for the Rice Operating Company sites:

1. EME SWD Jct. O-19 submitted by Texerra on 6/6/2008 #1R427-06
2. EME SWD Phillips 'B' EOL submitted by Texerra on 6/6/2008 #1R427-181
3. BD SWD Oxy Owen 'A' submitted by Texerra on 6/6/2008 #1R426-117
4. BD SWD Jct. P-35-1 submitted by Texerra on 6/6/2008 #1R426-150

In the proposed work elements for all ICPs please include that the delineation of chlorides will be to 250 mg/Kg.

In the proposed work elements for EME SWD Phillips 'B' EOL (#1R427-181) and BD SWD Oxy Owen 'A' (#1R426-117) please include that the delineation of petroleum hydrocarbons will be to 100 ppm using a PID (or equivalent).

Also, for BD SWD Oxy Owen 'A' (#1R426-117) please include re-sampling of the backfill material for petroleum hydrocarbons.

In the proposed work elements for all ICPs please include the analyses for "general chemistry" (including chloride, TDS, and sulfate) and BTEX for potential groundwater sampling.

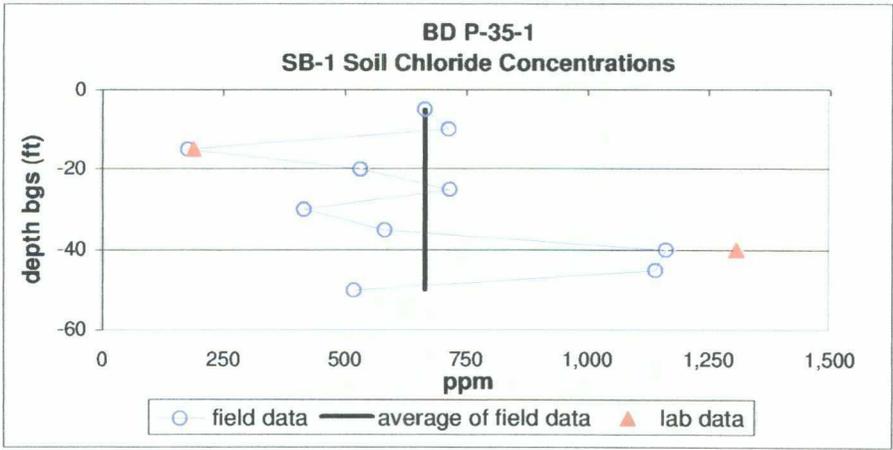
Also, please be advised that NMOCD approval of these plans does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

<http://b4.mail.yahoo.com/ym/texerra.com/ShowLetter?box=Rice%20Operating%20Co.&M...> 8/4/2008

Appendix A – NMOCD approval of Investigation and Characterization Plan.

BD P-35-1 Jct

Soil Boring Log							
Rice Operating Company		BD SWD System		BD P-35-1			
Identification:		SB-1					
Location:	Approx. 9 ft W of Rice			Date:	9/10/2008		
Driller:	Harrison & Cooper, Inc. (Ken Cooper supervising)						
Drill method:	Air rotary	L. Peter Galusky, Jr., Texerra					
Total depth:	50						
Screened interval:	40 - 50 ft bg:		Pipe diameter:	4 inch dia			
<u>Depth</u>							
<u>(ft</u>	<u>Field</u>	<u>Lab</u>	<u>Field</u>	<u>Lab</u>	<u>Lab</u>	<u>Well</u>	
<u>below</u>	<u>Chloride</u>	<u>Chloride</u>	<u>PID test</u>	<u>GRO</u>	<u>DRO</u>	<u>Schematic</u>	
<u>ground</u>	<u>Test</u>	<u>Test (ppm)</u>	<u>(ppm)</u>	<u>test</u>	<u>test</u>	<u>Description</u>	
<u>surface)</u>	<u>(ppm)</u>			<u>(ppm)</u>	<u>(ppm)</u>		
-5	668		0.0			oil stained sandy loam	solid pipe
-10	717		0.0			"	"
-15	180	192	0.0	< 25.0	< 25.0	"	"
						oil stained reddish brown coarse sandy loam	"
-20	535		0.0			light olive loamy sand, common small gravels	"
-25	719					"	"
-30	418					variegated olive brown and grayish white fine gravelly sandy loam	"
-35	585					"	"
-40	1,165	1,310		< 25.0	< 25.0	"	"
-45	1,143					tan fine gravelly sand	screen
-50	521					reddish brown gravelly sand, moist	"
avg	665		0				



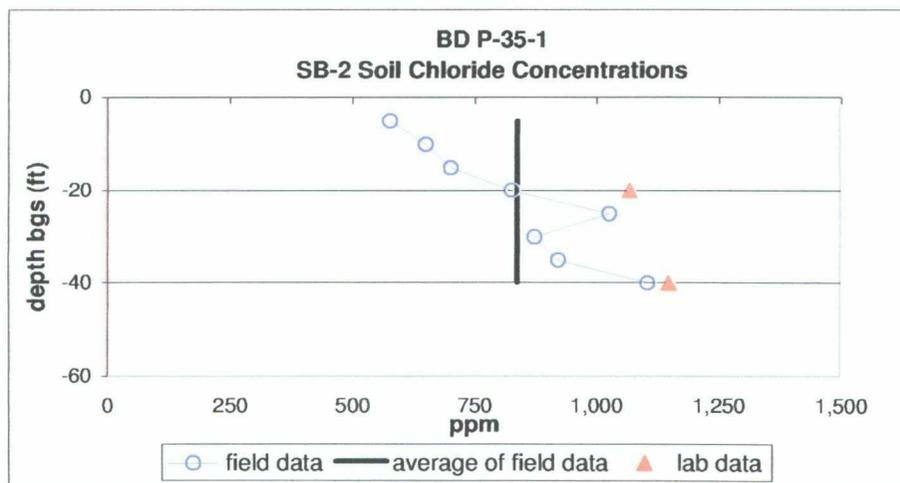
Appendix B1 – SB-1 soil boring log.

BD P-35-1 Jct

**Soil Boring Log
Rice Operating Company
BD SWD System
BD P-35-1**

Identification: SB-2
 Location: Approx. 15 ft SSE of Rice marker
 Date: 9/10/2008
 Driller: Harrison & Cooper, Inc. (Ken Cooper supervising)
 Drill method: Air rotary
 Logged by: L. Peter Galusky, Jr., Texerra
 Total depth: 40 ft below ground surface
 Screened interval: n/a (no well installed)
 Pipe diameter: "

<u>Depth (ft)</u> <u>below</u> <u>ground</u> <u>surface)</u>	<u>Field</u> <u>Chloride</u> <u>Test (ppm)</u>	<u>Lab</u> <u>Chloride</u> <u>Test (ppm)</u>	<u>Field PID</u> <u>test (ppm)</u>	<u>Lab GRO</u> <u>test (ppm)</u>	<u>Lab DRO</u> <u>test (ppm)</u>	<u>Cutting Description</u>
-5	580					pale yellowish brown loamy sand
-10	653					pale olive brown loamy sand
-15	703					fine gravelly, pale olive brown loamy sand
-20	829	1,070				yellowish brown gravelly loamy sand
-25	1,028					"
-30	875					variegated white & reddish brown gravelly loamy sand
-35	924					"
-40	1,107	1,150				"
avg	837					



Appendix B2 – SB-2 soil boring log.

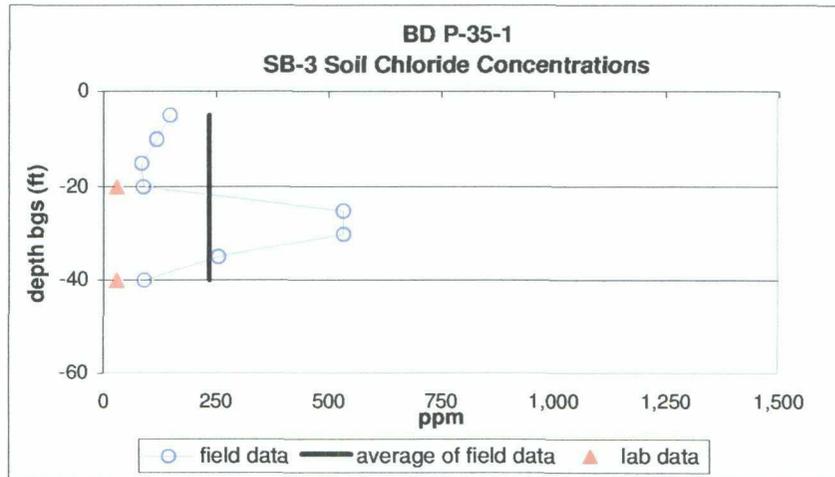
BD P-35-1 Jet

**Soil Boring Log
Rice Operating Company
BD SWD System
BD P-35-1**

Identification: SB-3
 Location: Approx. 31 ft W of Rice marker
 Date: 9/10/2008
 Driller: Harrison & Cooper, Inc. (Ken Cooper supervising)
 Drill method: Air rotary
 Logged by: L. Peter Galusky, Jr., Texerra
 Total depth: 40 ft below ground surface
 Screened interval: n/a (no well installed)
 Pipe diameter: "

Depth (ft
below Field Lab
ground Chloride Chloride Field PID Lab GRO Lab DRO
surface) Test (ppm) Test (ppm) test (ppm) test (ppm) test (ppm) Cutting Description

-5	151					reddish brown loamy sand
-10	121					pale brown loamy sand
-15	88					light reddish brown, fine gravelly loamy sand
-20	91	32				gravelly reddish brown loamy sand
-25	534					pale brown, gravelly loamy sand
-30	535					"
-35	258					"
-40	94	32				"
avg	234					



Appendix B3 – SB-3 soil boring log.



PHONE (575) 593-2325 • 1011 E. FARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
 RICE OPERATING COMPANY
 ATTN: JORDAN WOODFIN
 122 W. TAYLOR
 HOBBS, NM 88240

Receiving Date: 09/12/08
 Reporting Date: 09/16/08
 Project Number: NOT GIVEN
 Project Name: BD JCT P-35-1
 Project Location: SD JCT P-35-1

Sampling Date: 09/16/08
 Sample Type: SOIL
 Sample Condition: COOL & INTACT
 Sample Received By: ML
 Analyzed By: AB

L&S NUMBER	SAMPLE D	GRO	DRO
		(C ₂₇ -C ₃₃) (mg/kg)	(C ₁₀ -C ₃₄) (mg/kg)
ANALYSIS DATE		09/15/08	09/15/08
H15921-1	SS#1 @ 15FT	<25.0	<25.0
H15921-2	SS#1 @ 40FT	<25.0	<25.0
Quality Control		570	527
True Value QC		500	500
% Recovery		114	105
Relative Percent Difference		4.8	4.3

METHODS: TEN GRO & DRO EPA SW-846 8015 M

Abby Skene
 Chemist

09/16/08
 Date

H15921-1 RICE

PLEASE NOTE: Analytical Laboratory Cardinal Laboratories is not a certified laboratory for any of the listed parameters based on current criteria. Such as those in the table below. The results of data are subject to the accuracy and any other factors and/or other factors that may affect the results. While we strive to provide the most accurate data possible, we cannot guarantee the accuracy of the results. In no event shall Cardinal be held liable for any consequential damages, including, without limitation, business interruption, loss of profit, or loss of data incurred by client, as a result of any laboratory services, or any other loss or damage to the performance of services. The results of analysis are based on the data provided to the laboratory. Results may vary from those reported above. This report and data are not to be used for legal purposes. Results are for information only and do not constitute a warranty.

Appendix C1 – Cardinal Laboratories soil petroleum hydrocarbon data



PHONE (505) 295-3328 • 731 S. WAB. AVE. • HOBBBS, NM 86406

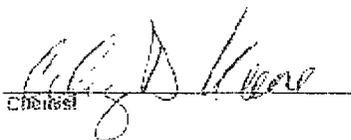
ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: JORDAN WOODFIN
122 W. TAYLOR
HOBBBS, NM 86406

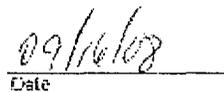
Receiving Date: 08/12/08
Reporting Date: 08/18/08
Project Number: NOT GIVEN
Project Name: BD JCT P-35-1
Project Location: BD JCT P-35-1

Sampling Date: 08/10/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: HM

LAB NUMBER	SAMPLE ID	Cl (mg/kg)
ANALYSIS DATE		08/15/08
H15921-1	SS#1 @ 15FT	192
H15921-2	SS#1 @ 40FT	1,310
H15921-3	SS#2 @ 20FT	1,880
H15921-4	SS#2 @ 40FT	1,150
H15921-5	SS#3 @ 26FT	32
H15921-6	SS#3 @ 40FT	32
Quality Control		500
True Value QC		500
% Recovery		100
Relative Percent Difference		2.0

METHODS: Cl: Std. Methods 4500-ClB
*Analyses performed on 1:4 w:w aqueous extracts.


Cheryl D. Wood


Date

H15921 TCL RICE

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Appendix C2 – Cardinal Laboratories soil chloride data.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

CARDINAL LABORATORIES
 101 Eastlawn, Hickory, NM 86300
 (505) 303-2338 FAX (505) 303-2378 (828) 875-7601 FAX (828) 875-7628
 RICE CENTER HWY

BILL TO

Company Name: W Taylor
 Address: State St. 391-1471
 Phone #: 503-391-1471
 Project #: BD JCT P-35-1
 Project Name: BD JCT P-35-1
 Project Location: State St. 391-1471
 Sample Name: State St. 391-1471

Lab ID	Sample I.D.	MOISTURE		PHOSPHORUS		NITROGEN		SULFUR		CATIONIC		ANIONIC		DATE	TIME
		GRAVIMETRIC	BY COLORIMETRY	BY ASH	BY ASH	BY ASH	BY ASH	BY ASH	BY ASH	BY ASH	BY ASH	BY ASH			
15921	SB #1 @ 5ft	X		X		X		X		X		X		9-10-08	9:25A
15922	SB #2 @ 20ft	X		X		X		X		X		X		9-10-08	9:25A
15923	SB #3 @ 40ft	X		X		X		X		X		X		9-10-08	9:25A
15924	SB #4 @ 20ft	X		X		X		X		X		X		9-10-08	9:25A
15925	SB #5 @ 40ft	X		X		X		X		X		X		9-10-08	9:25A

Client: W Taylor Date: 9/17/08 Time: 10:00 AM

Analyst: W Taylor Date: 9/17/08 Time: 10:00 AM

Lab Director: W Taylor Date: 9/17/08 Time: 10:00 AM

Sample Condition: Good Poor Other

Analysis: Yes No

Remarks: W Taylor

Cardinal Laboratories, Inc. 101 Eastlawn, Hickory, NM 86300
 (505) 303-2338 FAX (505) 303-2378 (828) 875-7601 FAX (828) 875-7628

Appendix C3 – Cardinal Laboratories soil data chain-of-custody form.



7906L (02/03) 383 2766 • 1111 E. UNIVERSITY • HOBBBS, NM 87405

ANALYTICAL RESULTS FOR
 RICE OPERATING COMPANY
 ATTN: HACK CONDER
 122 W. TAYLOR
 HOBBBS, NM 88240
 FAX TO: (505) 337-1471

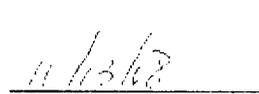
Receiving Date: 10/08/08 Sampling Date: 10/08/08
 Reporting Date: 10/13/08 Sample Type: WATER
 Project Number: NOT GIVEN Sample Condition: COOL & INTACT
 Project Name: 3D JUNCTION P-35-1 Sample Received By: ML
 Project Location: T255-R37E-SEC35 P ~ LEA CO., NM Analyzed By: ZL

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		10/10/08	10/10/08	10/10/08	10/10/08
H16082-1	MONITOR WELL #1	<0.001	<0.001	<0.001	<0.003
Quality Control		0.051	0.053	0.050	0.155
True Value QC		0.050	0.050	0.050	0.150
% Recovery		102	106	100	105
Relative Percent Difference		2.8	6.4	1.6	1.3

METHOD: EPA 821-846 8021B

TEXAS RELAP CERTIFICATION T104704368-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.


 Chemist


 Date

ALL TESTS, ANALYSIS, AND REPORTS... (Small print text regarding laboratory procedures and certifications)

Appendix C5 – Cardinal Laboratories monitor well data – petroleum hydrocarbons.



Appendix D – Harrison and Cooper completing MW-1.