1R - 427-170

REPORTS

DATE:

July 10, 2009

TRIDENT ENVIRONMENTAL

CERTIFIED MAIL
RETURN RECIEPT NO. 7099 3400 0017 1737 2633

July 10, 2009

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

RE: **ICP Report and Termination Request**
EME Jct. J-1 Site (NMOCD Case No. 1R427-170)
T20S-R36E-Section 1, Unit Letter J
Lea County, New Mexico

Mr. Hansen:

On behalf of Rice Operating Company (ROC), Trident Environmental (Trident) is submitting this ICP Report and Termination Request for the above-referenced site in accordance with 19.15.29 NMAC. The investigation demonstrated that neither chloride nor hydrocarbons are present in the vadose zone in quantities that represent a threat to groundwater quality; however, regional impact from an unknown offsite source(s) of chlorides is evident.

Background

In accordance with the OCD-approved *Investigation and Characterization Plan* (ICP) dated December 27, 2007 (Attachment A) to investigate potential groundwater concerns at this site near Monument, five soil borings and two monitoring well installations were conducted on June 2, 2008. Groundwater was encountered at approximately 26 feet below ground surface (ft bgs). The ICP includes background information, a site location map, and a site map showing preliminary soil sampling results performed by ROC in August 2004.

Table 1: Soil Boring Sample Results

Boring/ Monitoring Well	Depth (ft bgs)	Field Chloride (ppm)
B-1	15	324
	20	394
	25	317
B-2	5	232
	10	621
	15	653
	20	392
	25	488
B-3	5	205
	10	475
	15	483
	20	516
	25	408
B-4	5	568
	10	794
	15	543
	20	450
	25	479
B-5	5	147
	10	276
	15	476
	20	536
	25	780
MW-1	5	272
	10	255
	15	421
	20	561
	25	676
MW-2	5	282
	10	724
	15	497
	20	423
	25	348

Vadose Zone Sampling Results

Soil samples in each boring and monitoring well were collected at 5-foot intervals and field tested for chloride concentrations. Several samples were split and submitted to Cardinal Laboratories which showed very consistent agreement. Earlier sampling activities during the removal of the junction box and excavation of a 30 ft wide by 30 ft long by 12 ft deep area in August 2004, did not indicate hydrocarbon impact to the vadose zone in any of the samples as all photoionization detector (PID) readings were 0.1 ppm, and total petroleum hydrocarbons (TPH) concentrations were well below OCD guidelines for samples submitted to the laboratory for analysis by Method 8015M (Attachment A).

Visual inspection of all soil samples during the subsequent soil boring activities in June 2008 indicated no presence of hydrocarbons. Results of soil boring sample activities are summarized in Table 1 and depicted on Figure 1. Copies of the soil boring lithologic logs are included in Attachment B. Laboratory analytical reports for soil sample analyses are included in Attachment C.

Field chloride values averaged less than 457 parts per million (ppm) and did not exceed 794 ppm; therefore, there is no indication of the vadose zone beneath the junction box of being a source of chlorides observed in the groundwater on site.

In addition, installation of a clay layer at 6 ft bgs on September 2, 2004, eliminates any potential threat of constituents of concern beneath the former junction box.

The site was tilled and seeded with a native grass mix in October 2004 and is being monitored for growth.

Simulation Modeling

The AMIGO program, developed for the American Petroleum Institute (API), was used to simulate the potential impact to groundwater due to chloride transport through the vadose zone. The input to the model employed all available field data collected from the site. Model input data that was not site-specific was conservatively estimated based on professional judgment, referenced publications, and interpolation of known data from nearby sites. An additional conservative measure taken was in not inputting the very low-permeability clay barrier installed at 6 ft bgs into the model simulation. The results of the simulation indicate that the chloride mass within the vadose zone will not contribute more than 41 mg/L in the groundwater below the site, if no further corrective actions are taken. Therefore, the AMIGO simulation demonstrates that any residual chlorides in the vadose zone do not pose a threat to groundwater quality. Attachment D includes a list of the specific parameters used in the simulation and the output of the AMIGO program for the EME Jct. J-1 site.

Groundwater Sampling Results

The monitoring wells were developed and sampled pursuant to OCD guidelines. Copies of the monitoring well construction diagrams, lithologic logs, and laboratory reports for soil and groundwater analyses are attached. Four quarters of groundwater sampling and laboratory analysis (Table 2) confirms that chloride and total dissolved solids (TDS) exceed the Water Quality Control Commission (WQCC) standards at the site; however, chloride and TDS concentrations are known to be elevated on a regional scale in this area near Monument as is clearly evidenced by the consistently higher chloride and TDS concentrations in the upgradient monitoring well (MW-2) at this site. A monitoring well was not installed downgradient from monitoring well MW-1 because of the likelihood of an unknown, upgradient, and offsite source of chlorides and TDS. Groundwater gradient maps that include the chloride, TDS, and groundwater elevations for each of the five sampling events are depicted in Figures 2A, 2B, 2C, 2D, and 2E. Copies of all laboratory reports for soil and groundwater analyses are included in Attachment C.

Table 2: Summary of Groundwater Monitoring Results

Monitoring Well	Sample Date	Depth to Groundwater (feet BTOC)	Chloride (mg/L)	TDS (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethyl-benzene (mg/L)	Xylene (mg/L)
MW-1	06/24/08	34.10	5,200	13,300	0.072	0.014	< 0.002	< 0.006
	08/15/08	34.31	5,200	12,100	< 0.001	< 0.001	< 0.001	< 0.003
	11/18/08	34.38	5,350	11,600	< 0.001	< 0.001	< 0.001	< 0.003
	02/17/09	34.39	5,300	11,200	< 0.001	< 0.001	< 0.001	< 0.003
	06/03/09	34.55	5,300	10,700	< 0.001	< 0.001	< 0.001	< 0.003
MW-2	06/24/08	33.76	5,500	14,400	0.017	0.004	< 0.002	< 0.006
	08/15/08	33.87	5,900	12,500	< 0.001	< 0.001	< 0.001	< 0.003
	11/18/08	33.98	5,450	12,200	< 0.001	< 0.001	< 0.001	< 0.003
	02/17/09	33.98	5,500	10,800	< 0.001	< 0.001	< 0.001	< 0.003
	06/03/09	34.13	5,300	12,900	< 0.001	< 0.001	< 0.001	< 0.003
WQCC Standards			250	1000	0.01	0.75	0.75	0.62

The BTEX analytical data from the initial sampling event conducted on June 24, 2008, are not consistent with any of the investigation activities, because no indications of hydrocarbons were observed while collecting subsurface soil samples in August 2004 or July 2008. Furthermore, four subsequent groundwater sampling events confirm BTEX concentrations are below the laboratory detection limits for each constituent. Laboratory or sampling errors are suspected for the June 2008 BTEX anomaly.

Recommendations

The evidence provided herein demonstrates that operation of the EME J-1 junction box did not contribute to the chlorides observed in groundwater at the site, nor does the vadose zone exhibit any potential future threat to groundwater. Therefore, we conclude that conditions at the site do not meet the criteria that would mandate corrective action under Part 29 of NMAC Rule 19 and respectfully request termination of the regulatory file for this site. Upon NMOCD approval of site termination, ROC will plug the monitoring wells.

ROC is the service provider (agent) for the EME Salt Water Disposal System and has no ownership of any portion of the pipelines, wells, or facilities. The EME System is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis. Environmental remediation projects of this magnitude require System Partner AFE approval and work begins as funds are received.

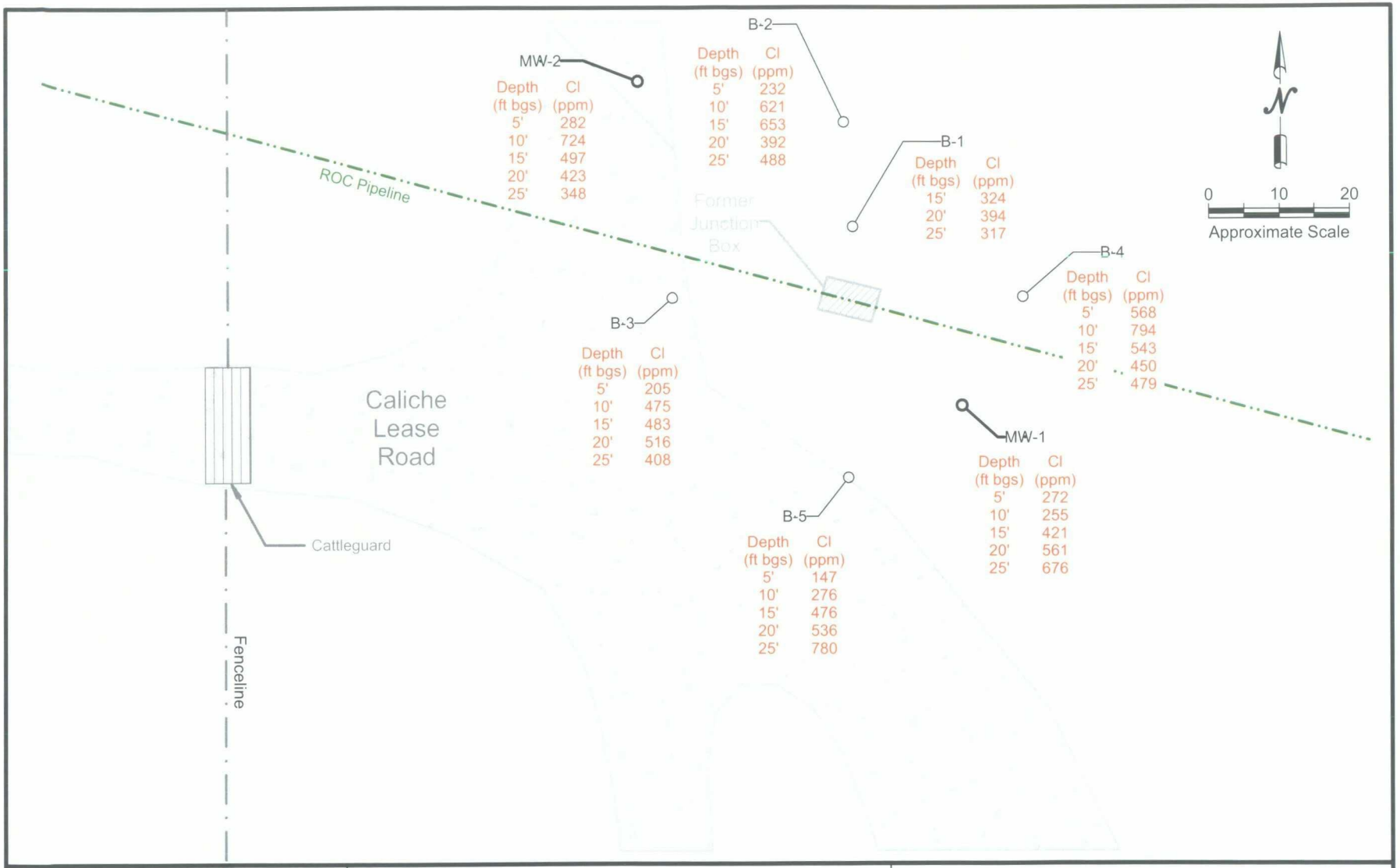
Thank you for your consideration concerning this request for site termination. Please feel free to call me at 432-638-8740 or Hack Conder at 575-393-9174, if you have any questions.

Sincerely,

Gilbert J. Van Deventer, REM, PG
Trident Environmental - Project Manager

cc: Hack Conder (Rice Operating Co. – Hobbs, NM)
Larry "Buddy" Hill (NMOCD District 1 –Hobbs, NM)
Brad Jones (NMOCD - Santa Fe, NM)

Figures



TRIDENT ENVIRONMENTAL

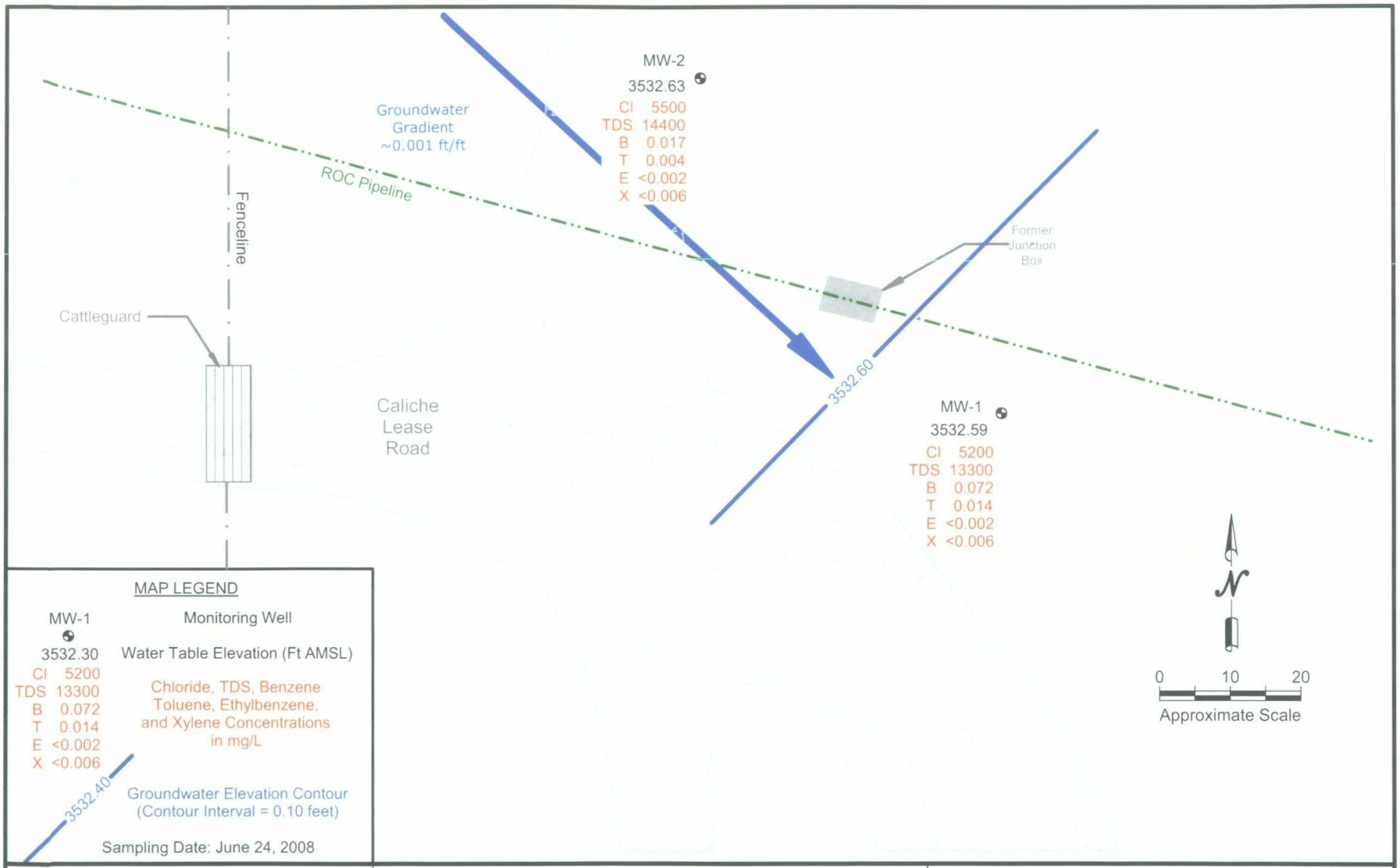
EME Jct. J-1 Site

T20S - R36E - Section 1, Unit J

RICE *Operating Company*

FIGURE 1

SOIL BORING SAMPLE RESULTS



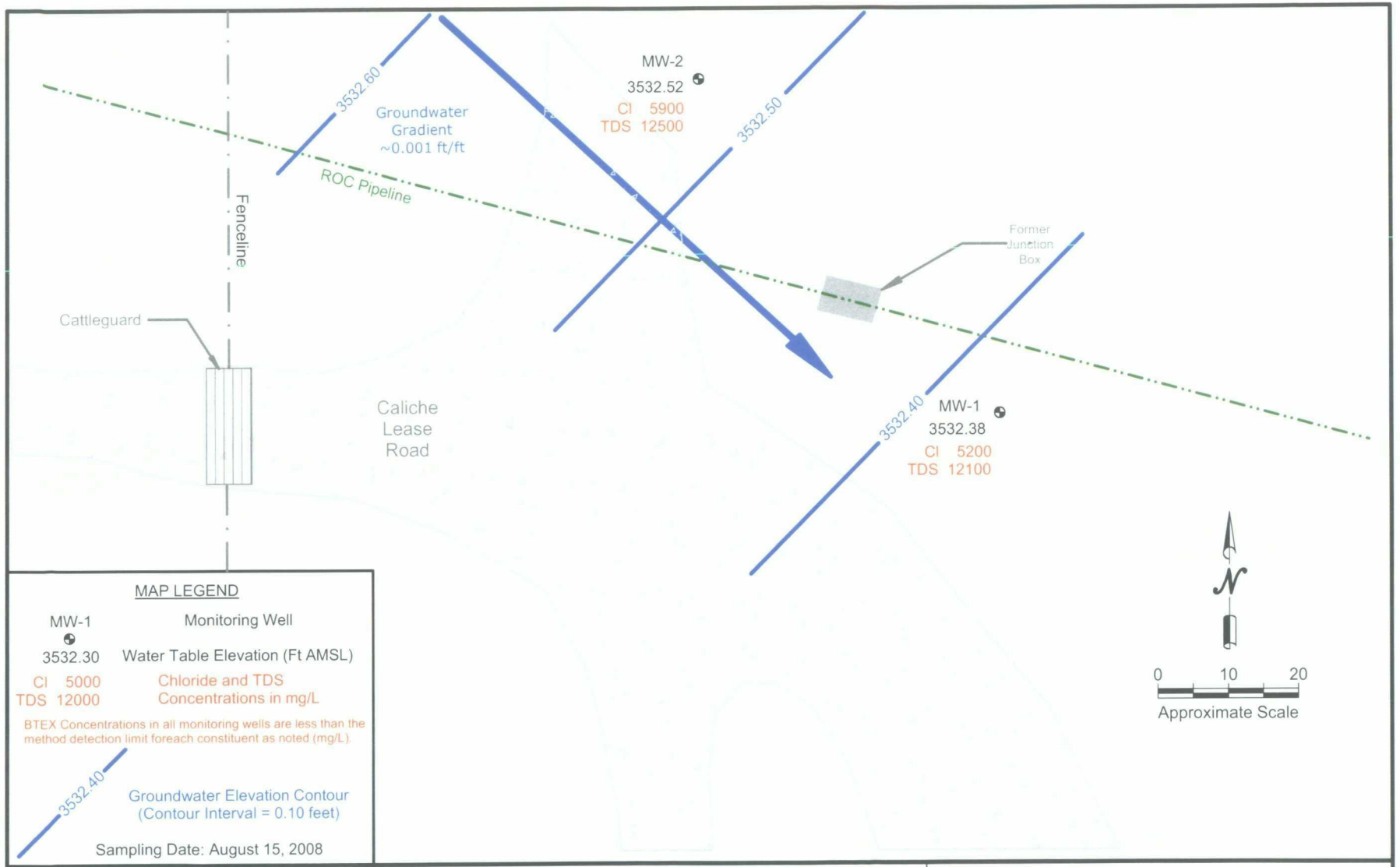
TRIDENT ENVIRONMENTAL

EME Jct. J-1 Site

T20S - R36E - Section 1, Unit J

RICE Operating Company

Figure 2A
Groundwater Gradient and Chloride, TDS, & BTEX Concentration Map



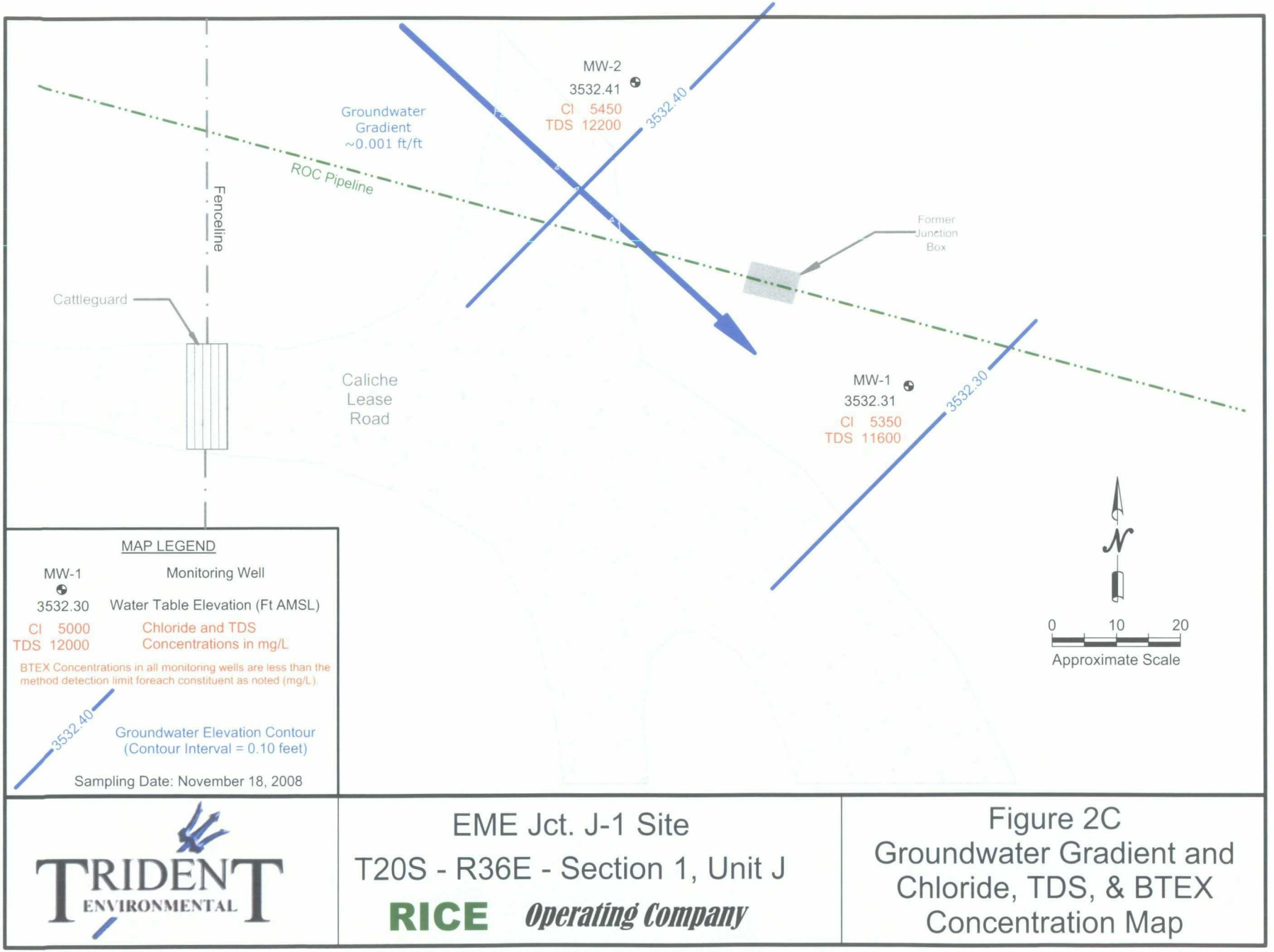
TRIDENT ENVIRONMENTAL

EME Jct. J-1 Site

T20S - R36E - Section 1, Unit J

RICE Operating Company

Figure 2B
Groundwater Gradient and Chloride, TDS, & BTEX Concentration Map



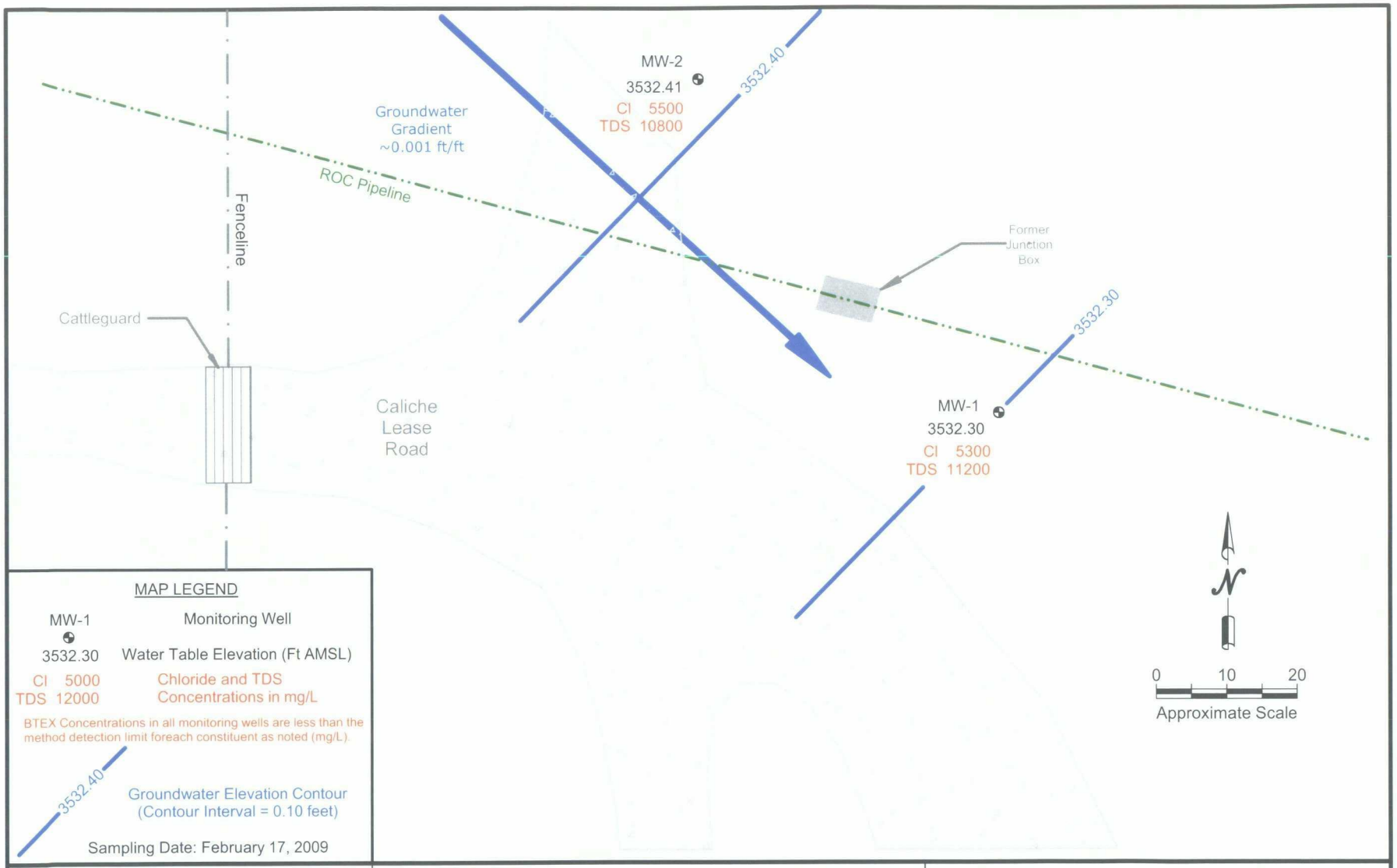
TRIDENT ENVIRONMENTAL

EME Jct. J-1 Site

T20S - R36E - Section 1, Unit J

RICE Operating Company

Figure 2C
Groundwater Gradient and Chloride, TDS, & BTEX Concentration Map



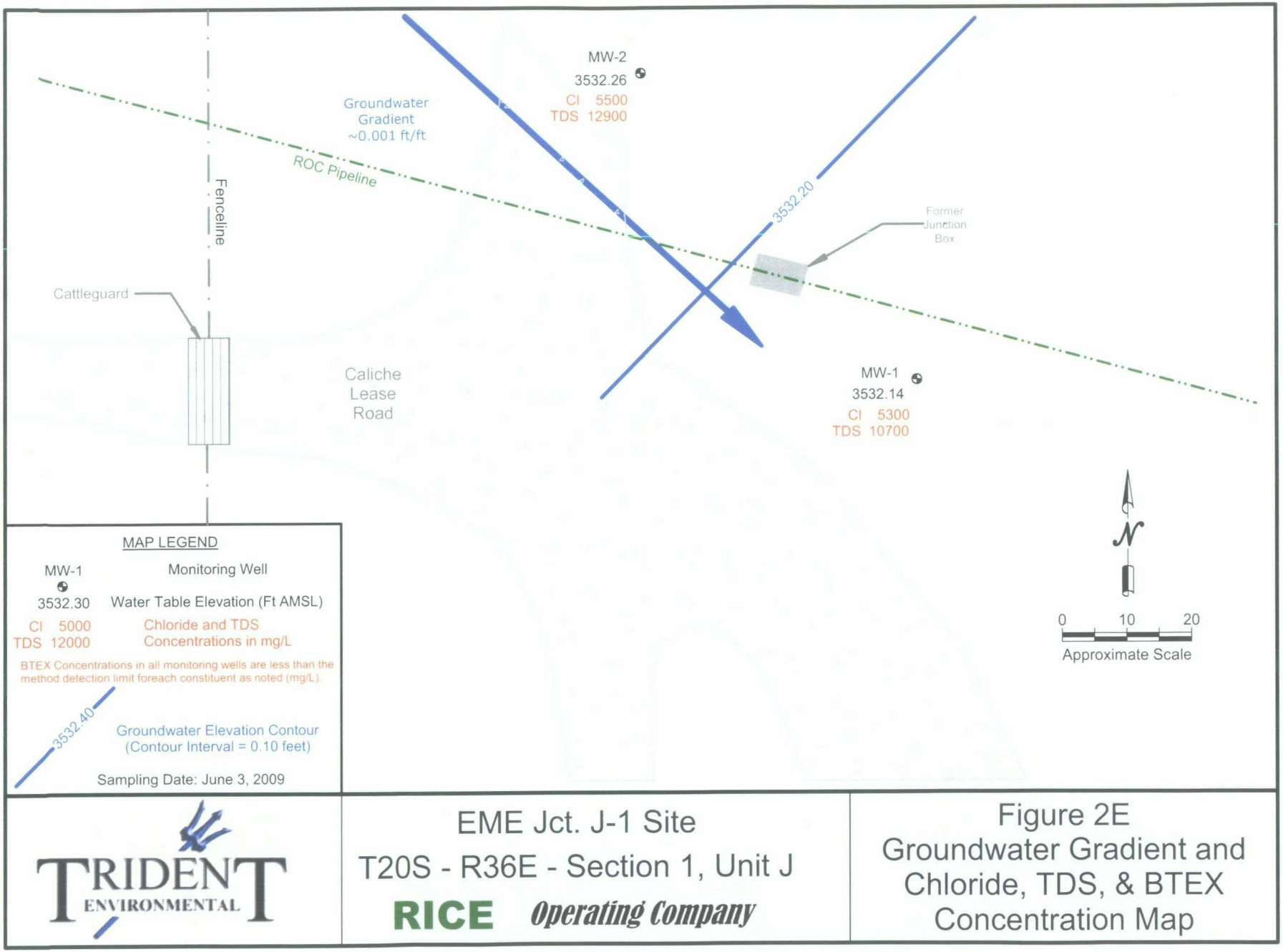
TRIDENT ENVIRONMENTAL

EME Jct. J-1 Site

T20S - R36E - Section 1, Unit J

RICE Operating Company

Figure 2D
Groundwater Gradient and
Chloride, TDS, & BTEX
Concentration Map



TRIDENT ENVIRONMENTAL

EME Jct. J-1 Site

T20S - R36E - Section 1, Unit J

RICE Operating Company

Figure 2E
Groundwater Gradient and
Chloride, TDS, & BTEX
Concentration Map

Attachment A

Investigation and Characterization Plan
(December 27, 2007)

CERTIFIED MAIL
RETURN RECIEPT NO. 7099 3400 0017 1737 2138

December 27, 2007

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

RE: **INVESTIGATION & CHARACTERIZATION PLAN**
EME **Jct. J-1 Site**
T20S-R36E-Section 1, Unit Letter J

Mr. Hansen:

RICE Operating Company (ROC) has retained Trident Environmental to address potential environmental concerns at the above-referenced site. ROC is the service provider (agent) for the Blinebry-Drinkard (BD) 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 Partners, who provide all operating capital on a percentage ownership/usage basis. Environmental projects of this magnitude require System Partner AFE approval and work begins as funds are received. In general, project funding is not forthcoming until NMOCD approves the work plan. Therefore, your timely review of this submission is requested.

For all environmental projects, ROC will choose a path forward that:

- protects public health,
- provides the greatest net environmental benefit,
- complies with NMOCD Rules, and
- is supported by good science.

Each site shall have three submissions or a combination of:

1. This Investigation and Characterization Plan (ICP) is a proposal for data gathering and site characterization and assessment.

2. Upon evaluating the data and results from this ICP, a recommended remedy will be submitted in a Corrective Action Plan (CAP).

3. Finally, after implementing the remedy, a closure report with final documentation will be submitted.

BACKGROUND

The Jct. J-1 site is located at township 20 south, range 36 east, section 1, unit letter J approximately three miles southwest of Monument, New Mexico as shown on the attached Site Topographic Map (Figure 1). The site is situated on state land with grazing rights allotted to James R. Byrd. Land in the site area is primarily utilized for natural oil and gas production and pasture land for cattle grazing.

Groundwater in the site area occurs within the High Plains aquifer under water table (unconfined) conditions (Hart and McAda, 1985) at a depth of approximately 30-35 feet bgs. The saturated portion of the aquifer is estimated to be 10-15 ft thick (Nicholson and Clebsch, 1961).

PREVIOUS WORK

In March 2004, ROC initiated the removal of the J-1 junction box as part of the Junction Box Upgrade Program. The J-1 junction box was permanently removed and 3-inch polyethylene line was installed inside the existing 8-inch A/C pipeline to maintain the operation of the saltwater disposal system.

Initial soil sampling activities at the former junction box location were conducted between August 16 and 19, 2004 by trenching with a backhoe. During the course of excavating an area 30 feet wide by 30 feet long to a depth of 12 feet below ground surface (bgs), soil samples were collected at regular intervals directly beneath the former junction box, at a point 5 feet north of the junction box, and at 15 feet from the junction box in each of four directions as shown in Figure 2. On August 23, 2004, composite soil samples were recovered from the floor and walls of the excavation, and from blended soil to be used for backfill, for laboratory analysis. All soil samples were tested for chloride content using field-adapted Method 9253 (QP-03) and headspace readings were recorded using a Mini-RAE Model 76 photoionization detector (PID). There was no indication of hydrocarbon impact to the vadose zone in any of the samples as all PID readings were 0.1 ppm, and total petroleum hydrocarbons (TPH) concentrations were well below NMOCD guidelines for samples submitted to the laboratory for analysis by Method 8015M. Although the highest chloride concentration measured only 1,208 parts per million (ppm), chloride levels did not conclusively decline vertically or horizontally throughout the 30 x 30 x 12-ft-deep excavation.

Following characterization activities, the excavated soil was blended on site and backfilled to a depth of 6 feet bgs. A 1-foot thick compacted clay layer was installed to prevent potential downward migration of any residual constituents of concern and the remaining blended soils were placed above the clay. An identification plate was placed on the surface to mark the location of the former junction box and the disturbed surface was seeded with a blend of native vegetation on October 4, 2004.

Notice of potential groundwater impact was sent to the NMOCD October 15, 2004. A Junction Box Disclosure Report (attached) documenting the procedures described above was submitted to the OCD with all the 2004 annual junction box reports.

RECOMMENDATION FOR FURTHER ACTIONS

The replacement of the junction box has minimized the threat of additional impact from the vadose zone, however further investigation and characterization of the site is necessary to delineate the vadose zone below twelve feet and evaluate the potential for groundwater impact. The additional assessment is also necessary to assist ROC in selecting the appropriate soil and/or groundwater remedy.

Task 1 *Evaluate Concentrations of Constituents of Concern in the Vadose Zone*

Subsurface soil samples for characterization of the lateral and vertical extent of chloride-impacted soil will be collected at a maximum of 5-foot intervals using a drilling rig in accordance with the procedures explained in QP-02, QP-03, and QP-07 (attached). Soil samples will be field-tested for chloride content using the titration method. A concentration of 1,000 ppm chloride will be used to delineate the extent of impact to the vadose zone. Preliminary sampling results indicate no hydrocarbon impact to the vadose zone, however if further sampling activities exhibit evidence of hydrocarbon-impact, samples will also be collected for headspace analysis using an organic vapor meter (OVM), which will be calibrated to assume a benzene response factor. Select samples with OVM headspace readings above 100 ppm, if present, will also be analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B.

Task 2 *Evaluate Concentrations of Constituents of Concern in the Groundwater*

If we detect evidence of groundwater impact, one monitoring well will be placed in the area with the greatest potential for groundwater impact, in accordance with EPA and industry standards and developed by bailing with a rig or hand bailer, or pumping with a submersible pump to remove fine-grained sediment disturbed during drilling and to ensure collection of representative samples. If data suggest ground water impairment, two quarters of ground water monitoring will be conducted to confirm any initial result. If groundwater impact is confirmed, additional monitoring wells may be installed to determine the local groundwater gradient direction and lateral extent of groundwater impact. Groundwater samples will be collected in accordance with procedures explained in QP-04 and QP-05 (attached), and analyzed for BTEX, major ions, and total dissolved solids (TDS).

The information gathered from tasks 1 and 2 will be evaluated and utilized to design a soil and/or ground water remedy if needed. The remedy that offers the greatest environmental benefit while causing the least environmental impairment will be selected. Such recommendations and findings will be presented to NMOCD in a subsequent Corrective Action Plan (CAP). When evaluating any proposed remedy or investigative work, ROC will confirm that there is a reasonable relationship between the benefits created by the proposed remedy or assessment and the economic and social costs.

We appreciate the opportunity to work with you on this project. Please feel free to call me at 432-638-8740 or Kristin Pope at 505-393-9174, if you have any questions.

Sincerely,

Gilbert J. Van Deventer, REM, PG
Trident Environmental - Project Manager

cc: CDH, JSC, KFP, file

enclosures: site location and sampling maps, disclosure report, photos, and sampling procedures

Site Location Map

And

Site Map of Soil Sampling Results

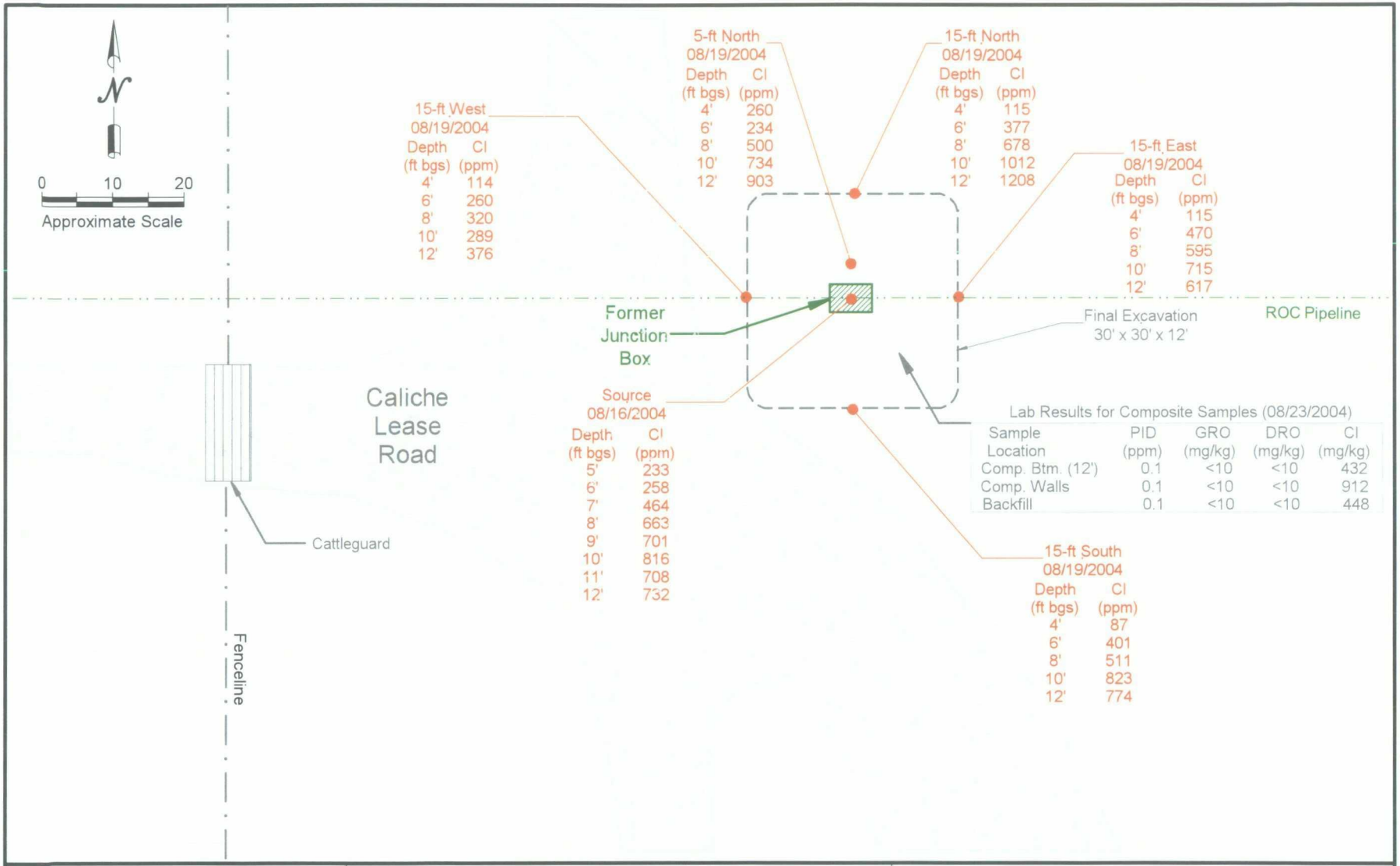
USGS Monument South (NM)
Topographic Quadrangle (1975)

TRIDENT ENVIRONMENTAL

EME Jct. J-1 Site
T20S - R37E - Section 6 - Unit L
RICE Operating Company

FIGURE 1

SITE
TOPOGRAPHIC MAP



TRIDENT ENVIRONMENTAL

EME Jct. J-1 Site

T210S - R376E - Section 1, Unit J

RICE *Operating Company*

FIGURE 2

EXCAVATION SOIL SAMPLING RESULTS

Junction Box Disclosure Report

RICE OPERATING COMPANY
JUNCTION BOX **DISCLOSURE*** REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
							Length	Width	Depth
EME	J-1	J	1	20S	36E	Lea	no box--eliminated		

LAND TYPE: BLM ____ STATE X FEE LANDOWNER ____ OTHER ____

Depth to Groundwater 40 feet NMOCD SITE ASSESSMENT RANKING SCORE: 20

Date Started 8/16/2004 Date Completed 9/6/2004 OCD Witness No

Soil Excavated 400 cubic yards Excavation Length 30 Width 30 Depth 12 feet

Soil Disposed 0 cubic yards Offsite Facility n/a Location n/a

FINAL ANALYTICAL RESULTS: **Sample Date** 8/23/2004 **Sample Depth** 12 ft

Procure 5-point composite sample of bottom and 4-point composite sample of excavation sidewalls. TPH and chloride laboratory test results completed by using an approved lab and testing procedures pursuant to NMOCD guidelines.

Sample Location	PID ppm	GRO mg/kg	DRO mg/kg	Chloride mg/kg
4-WALL COMP.	0.1	<10.0	<10.0	432
BOTTOM COMP.	0.1	<10.0	<10.0	912
REMED. BACKFILL	0.1	<10.0	<10.0	448

CHLORIDE FIELD TESTS

LOCATION	DEPTH (ft)	ppm
vertical at junction	5	233
	6	258
	7	464
	8	663
	9	701
	10	816
	11	708
	12	732
15 ft North of junction	4	115
	6	377
	8	678
	10	1012
	12	1208
background	n/a	60
4-wall comp.	n/a	311
bottom comp.	12	738
remed. backfill	n/a	415

General Description of Remedial Action: This junction has been eliminated and slip-lined with a new poly pipeline. The box lumber was removed and the site was delineated using a backhoe while PID screenings and chloride field tests were conducted at regular intervals. Chloride concentrations did not conclusively decline vertically or horizontally throughout the 30 x 30 x 12-ft-deep excavation. No physical indications of hydrocarbon impact were observed, all PID readings were 0.1 ppm, and TPH concentrations were well below NMOCD guidelines. The excavated soil was blended on site and backfilled to 6 ft BGS. At 6 ft, a 1-ft-thick compacted clay barrier was installed to inhibit the downward migration of chloride. The remaining soils were backfilled on top of the clay. The disturbed surface was seeded with a blend of native vegetation on 10/4/2004 and will be monitored for growth. An identification plate has been placed on the surface for future considerations.

ADDITIONAL EVALUATION IS *HIGH* PRIORITY

enclosures: chloride graphs, photos, lab results, PID field screenings, clay test, diagram

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

SITE SUPERVISOR Joe Gatts SIGNATURE Joe Gatts COMPANY RICE Operating Company

REPORT ASSEMBLED BY Kristin Farris Pope SIGNATURE Kristin Farris Pope

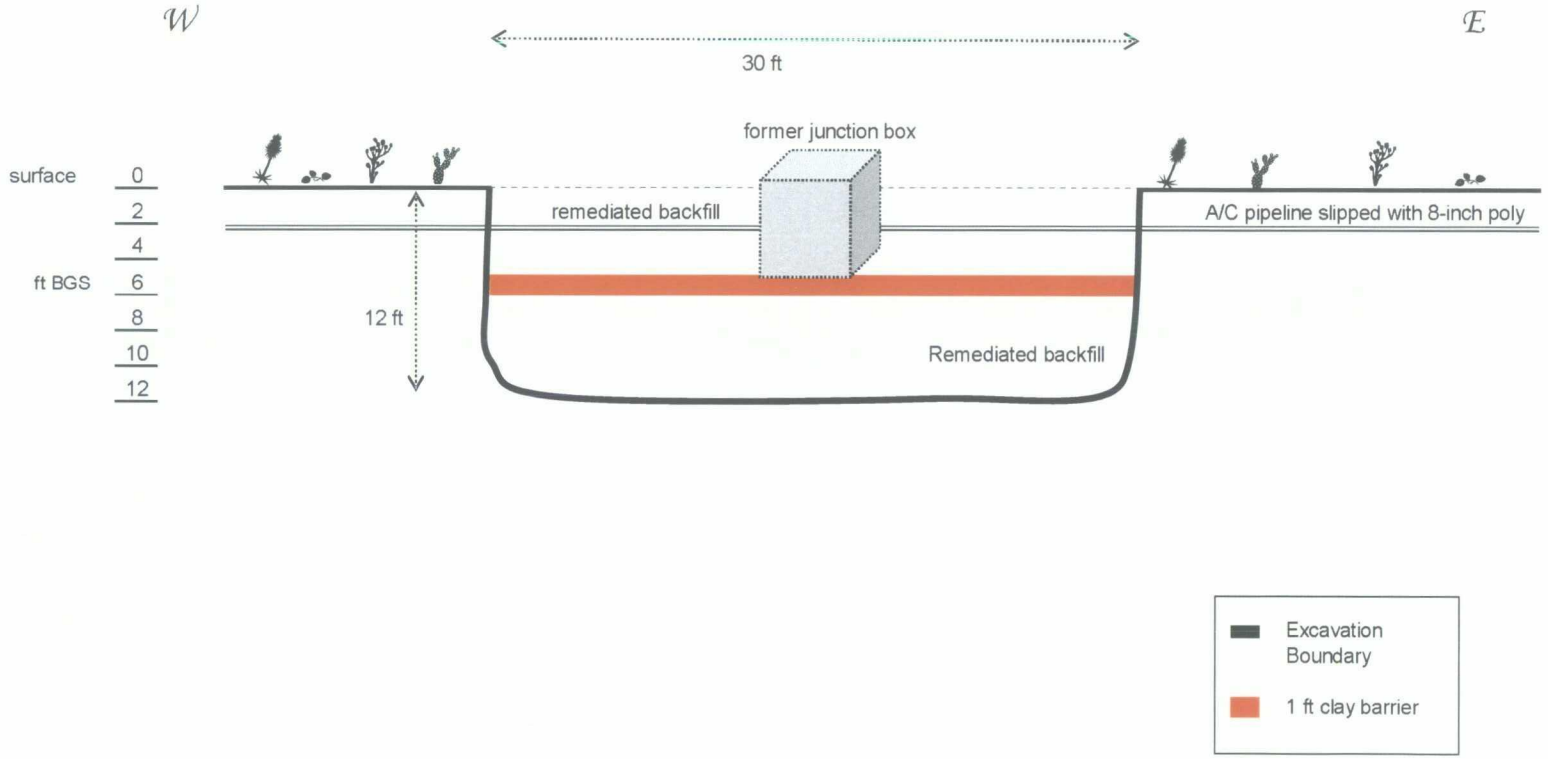
DATE 10/15/2004 TITLE Project Scientist

**** This site is a "DISCLOSURE." It will be placed on a prioritized list of similar sites for further consideration.***

EME jct. J-1

30 x 30 x 12 ft

Excavation Cross-Section



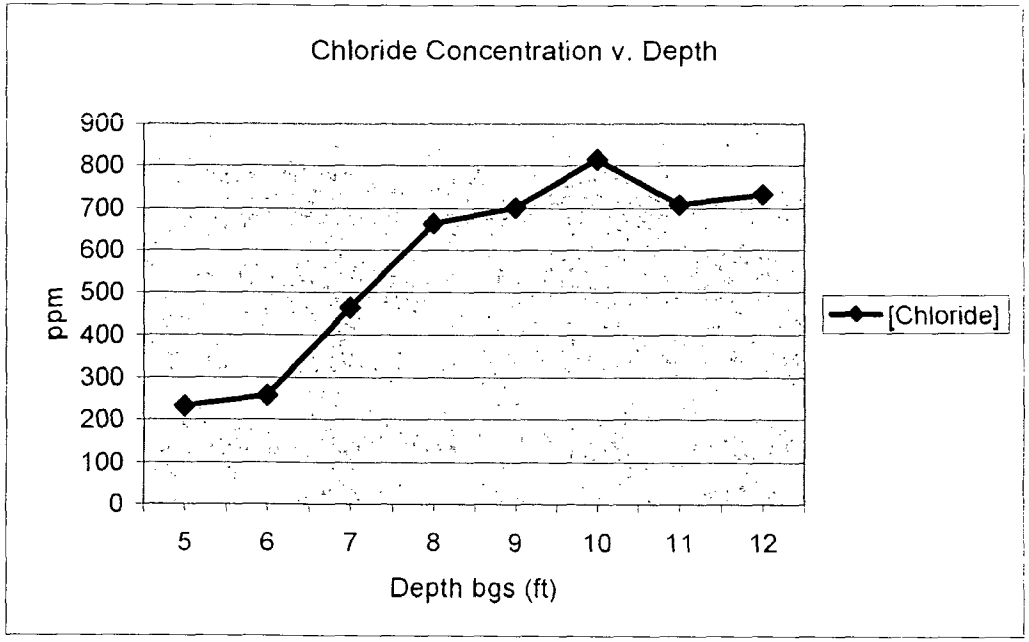
EME jct. J-1

T20S, R36E

Vertical Delineation at Source

Depth bgs (ft)	[Cl] ppm
5	233
6	258
7	464
8	663
9	701
10	816
11	708
12	732

Groundwater = 40 ft



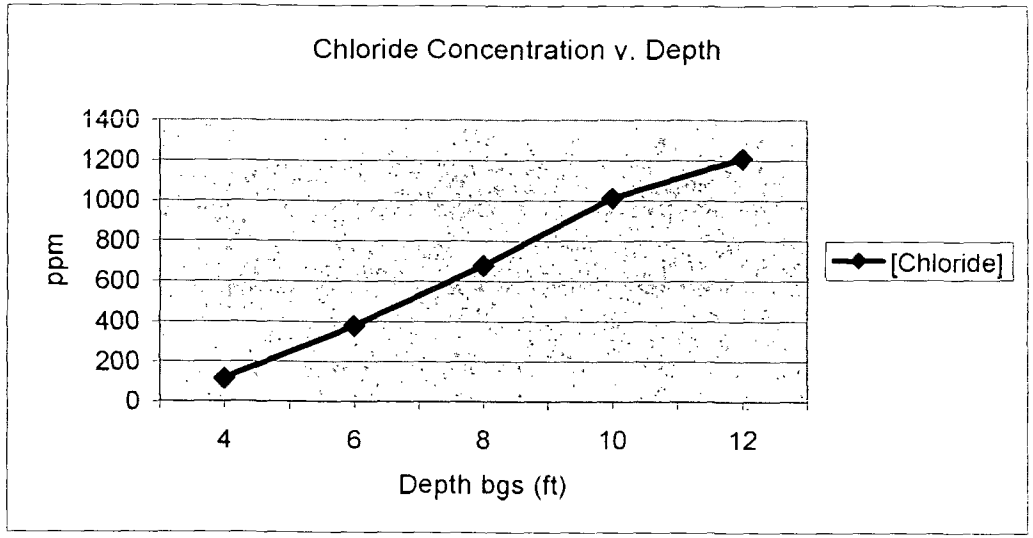
EME jct. J-1

T20S, R36E

15 ft North of junction

Depth bgs (ft)	[Cl] ppm
4	115
6	377
8	678
10	1012
12	1208

Groundwater = 40 ft



EME jct. J-1

unit 'J', Sec. 1, T20S, R36E

undisturbed junction box 12/30/2003

box lumber removed 7/28/2004

beginning excavation 8/16/2004

final excavation 8/23/2004

testing clay 9/2/2004

compacted clay at 6 ft BGS 9/2/2004

seeding disturbed surface; ID plate in foreground 10/4/2004

tilling seed into soil 10/4/2004

ARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING
ATTN: ROY RASCON
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 08/26/04
Reporting Date: 08/30/04
Project Number: NOT GIVEN
Project Name: EME J-1
Project Location: NOT GIVEN

Sampling Date: 08/23/04
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC/AH

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/Kg)	DRO (>C_{10}-C_{28}) (mg/Kg)	Cl* (mg/Kg)
ANALYSIS DATE		08/28/04	08/28/04	08/27/04
H9080-1	BOTTOM COMP @ 12'BGS	<10.0	<10.0	912
H9080-2	4 WALL COMP.	<10.0	<10.0	432
H9080-3	REMD. BACKFILL	<10.0	<10.0	448
Quality Control		791	780	1010
True Value QC		800	800	1000
% Recovery		98.9	97.5	101
Relative Percent Difference		1.0	1.8	6.8

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; Cl^-: Std. Methods 4500-Cl^-B
*Analyses performed on 1:4 w:v aqueous extracts.

Chemist

8/30/04
Date

H9080.XLS

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page____ of____

Company Name:	Rice Operating	**BILL TO**	
Project Manager:	Ray Rasco	P.O. #:	
Address:	122 W Taylor	Company:	
City:	Hobbs	State: NM Zip: 88240	Attn:
Phone #:	393 7174	Fax #:	Address:
Project #:		Project Owner:	City:
Project Name:	FME J-1		State: Zip:
Project Location:			Phone #:
Sampler Name:			Fax #:

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	ANALYSIS REQUEST: Cl.	TPH 8015
H6020-1	Butt Comp - 12' bgs	C	1			X							8/23/04	1:00	X	X
-2	Trunk Comp	C	1			X							8/23/04	1:15	X	X
-3	REMD BACKFILL	C	1			X							8/23/04	1:30	X	X

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.

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all costs of collections, including attorney's fees.

Sampler Relinquished:	Date:	Received By:	Phone Result: ☐ Yes ☐ No Add'l Phone #:
	Time:		Fax Result: ☐ Yes ☐ No Add'l Fax #:
Relinquished By:	Date: 8/24/04	Received By: (Lab Staff)	REMARKS:
	Time: 7:10		
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition Cool ☒ Yes ☐ No Intact ☒ Yes ☐ No	CHECKED BY: (Initials)

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

HOBBS, NEW MEXICO 88240
PHONE: (505) 393-9174 FAX: (505) 397-1471

VOC FIELD TEST REPORT FORM

MINI RAE PLUS CLASSIC PHOTOIONIZATION GAS DETECTOR

MODEL NO: PGM 761S
SERIAL NO: 104412
CALIBRATION GAS
GAS COMPOSITION: ISOBUTYLENE 100 PPM
AIR BALANCE
LOT NO: 02-22-30
FILL DATE: 5/20/03
EXP. DATE: 11/20/04
ACCURACY: +or 2%
METER READING
ACCURACY: 100.1

SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE
EME	J-1	J	1		

SAMPLE	PID RESULT	SAMPLE	PID RESULT
15' North 4'	0.1	15' South 10'	0.1
15' North 6'	0.1	15' South 12'	0.1
15' North 8'	0.1	15' West 4'	0.1
15' North 10'	0.1	15' West 6'	0.1
15' North 12'	0.1	15' West 8'	0.1
15' East 4'	0.1	15' West 10'	0.1
15' East 6'	0.1	15' West 12'	0.1
15' East 8'	0.1		
15' East 10'	0.1		
15' East 12'	0.1		
15' South 4'	0.1		
15' South 6'	0.1		
15' South 8'	0.1		

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

Joe Stotts
Signature

8/19/04
Date

HOBBS, NEW MEXICO 88240
PHONE: (505) 393-9174 FAX: (505) 397-1471

VOC FIELD TEST REPORT FORM

MINI RAE PLUS CLASSIC PHOTOIONIZATION GAS DETECTOR

MODEL NO: PGM 761S
SERIAL NO: 104412
CALIBRATION GAS
GAS COMPOSITION: ISOBUTYLENE 100 PPM
AIR BALANCE
LOT NO: 02-22-30 FILL DATE: 5/20/03
EXP. DATE: 11/20/04 ACCURACY: + or 2%
METER READING
ACCURACY: 100.1

SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE
EME	J-1	J	1		

SAMPLE	PID RESULT	SAMPLE	PID RESULT
15' North 4'	0.1	15' South 10'	0.1
15' North 6'	0.1	15 South 12'	0.1
15' North 8'	0.1	15' West 4'	0.1
15' North 10'	0.1	15' West 6'	0.1
15' North 12'	0.1	15' West 8'	0.1
15' East 4'	0.1	15' West 10'	0.1
15' East 6'	0.1	15' West 12'	0.1
15' East 8'	0.1		
15' East 10'	0.1		
15' East 12'	0.1		
15' South 4'	0.1		
15' South 6'	0.1		
15' South 8'	0.1		

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

Joe Tatt
Signature

8/19/04
Date

HOBBS, NEW MEXICO 88240
PHONE: (505) 393-9174 FAX: (505) 397-1471

VOC FIELD TEST REPORT FORM

MINI RAE PLUS CLASSIC PHOTOIONIZATION GAS DETECTOR

MODEL NO: PGM 761S
CALIBRATION GAS
GAS COMPOSITION: ISOBUTYLENE
AIR
LOT NO: 02-22-30
EXP. DATE: 11/20/04
METER READING
ACCURACY: 100.1

SERIAL NO: 104412

100 PPM
BALANCE
FILL DATE: 5/20/05
ACCURACY: ± or - 2%

SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE
EME	J-1	J	1		

SAMPLE	PID RESULT	SAMPLE	PID RESULT
Source 5'	0.1		
Source 6'	0.1		
Source 7'	0.1		
Source 8'	0.1		
Source 9'	0.1		
Source 10'	0.1		
Source 11'	0.1		
Source 12'	0.1		
5' North 4'	0.1		
5' North 6'	0.1		
5' North 8'	0.1		
5' North 10'	0.1		
5' North 12'	0.1		

I certify that I have calibrated the above instrument in accordance to the manufacturer operation manual.

Joe Watts
Signature

8/16/04
Date

LABORATORY TEST REPORT

PETTIGREW & ASSOCIATES, P.A.
1110 N. GRIMES
HOBBS, NM 88240
(505) 393-9827

DEBRA P. HICKS, P.E./L.S.I.
WILLIAM M. HICKS, III, P.E./P.S.

AASHTO R18

To:	Rice Operating Attn: Carolyn Haynes 122 W. Taylor Hobbs, NM 88240	**Material:**	Red Clay
		Test Method:	ASTM: D 2922
Project:	JCT J-16 ~~STATE~~ EME		
Date of Test:	August 24, 2004	**Depth:**	2' Below Bottom of Pipe

Test No.	Location	Dry Density % Maximum	% Moisture	Depth
SG-1	Pit - 20' W. & 10' N. of SE Corner	104.4	16.7	

Control Density: 106.2
ASTM: D 698

Optimum Moisture: 17.3

Required Compaction: 95%

Lab No.: 04 10114-10115

Copies To: Rice

PETTIGREW & ASSOCIATES

BY: S.E.T.

RICE *Operating Company*
Quality Procedures

QP-02: Procedure for Obtaining Soil Samples for Transportation to a Lab

QP-03: Sampling and Testing Protocol for Chloride Titration

QP-04: Development of Cased Water-Monitoring Wells

QP-05: Procedure for Obtaining Water Samples (Cased Wells)

QP-07: Sampling and Testing Protocol for VOC in Soil

Rice Operating Company

Quality Procedure

Procedure for Obtaining
Soil Samples for Transportation to a Laboratory

1.0 Purpose

This procedure outlines the methods to be employed when obtaining soil samples to be taken to a laboratory for analysis.

2.0 Scope

This procedure is to be used when collecting soil samples intended for ultimate transfer to a testing laboratory.

3.0 Preliminary

3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the soil. The shipment should include a Certificate of Compliance from the manufacturer of the collection bottle or vial and a Serial Number for the lot of containers. Retain this Certificate for future documentation purposes.

3.2 If collecting TPH, BTEX, RCRA 8 metals, cation /anions or O&G, the sample jar may be a clear 4 oz. container with Teflon lid. If collecting PAH's, use an amber 4 oz. container.

4.0 Chain of Custody

4.1 Prepare a Sample Plan. The plan will list the number, location and designation of each planned sample and the individual tests to be performed on the sample. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.

4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.

4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label.) Affix the labels to the jars.

5.0 Sampling Procedure

5.1. Do not touch the soil with your bare hands. Use new latex gloves with each sample to help minimize any cross-contamination.

5.2. Go to the sampling point with the sample container. If not analyzing for ions or metals, use a trowel to obtain the soil.

5.3. Pack the soil tightly into the container leaving the top slightly domed. Screw the lid down tightly. Enter the time of collection onto the sample collection jar label.

5.4. Place the sample directly on ice for transport to the laboratory if required.

5.5. Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

6.0 Documentation

6.1 The testing laboratory shall provide the following minimum information:

a. Project and sample name.
b. Signed copy of the original Chain of Custody Form including the time the sample was received by the lab.
c. Results of the requested analyses
d. Test Methods employed
e. Quality Control methods and results

Rice Operating Company

QUALITY PROCEDURE

Sampling and Testing Protocol Chloride Titration Using .282 Normal Silver Nitrate Solution

1.0 Purpose

This procedure is to be used to determine the concentration of chloride in soil.

2.0 Scope

This procedure is to be used as the standard field measurement for soil chloride concentrations.

3.0 Sample Collection and Preparation

3.1 Collect at least 80 grams of soil from the sample collection point. Take care to insure that the sample is representative of the general background to include visible concentrations of hydrocarbons and soil types. If necessary, prepare a composite sample for soils obtained at several points in the sample area. Take care to insure that no loose vegetation, rocks or liquids are included in the sample(s).

3.2 The soil sample(s) shall be immediately inserted into a one-quart or larger polyethylene freezer bag. Care should be taken to insure that no cross-contamination occurs between the soil sample and the collection tools or sample processing equipment.

3.3 The sealed sample bag should be massaged to break up any clods.

4.0 Sample Preparation

4.1 Tare a clean glass vial having a minimum 40 ml capacity. Add at least 10 grams of the soil sample and record the weight.

4.2 Add at least 10 grams of reverse osmosis water to the soil sample and shake for 20 seconds.

4.3 Allow the sample to set for a period of 5 minutes or until the separation of soil and water.

4.4 Carefully pour the free liquid extract from the sample through a paper filter into a clean plastic cup if necessary.

5.0 Titration Procedure

5.1 Using a graduated pipette, remove 10 ml extract and dispense into a clean plastic cup.

5.2 Add 2-3 drops potassium chromate (K_2CrO_4) to mixture.

5.3 If the sample contains any sulfides (hydrogen or iron sulfides are common to oilfield soil samples) add 2-3 drops of hydrogen peroxide (H_2O_2) to mixture.

5.4 Using a 1 ml pipette, carefully add .282 normal silver nitrate (one drop at a time) to the sample while constantly agitating it. Stop adding silver nitrate when the solution begins to change from yellow to red. Be consistent with endpoint recognition.

5.5 Record the ml of silver nitrate used.

6.0 Calculation

To obtain the chloride concentration, insert measured data into the following formula:

$$\frac{.282 \times 35.450 \times \text{ml } AgNO_2}{\text{ml water extract}} \times \frac{\text{grams of water in mixture}}{\text{grams of soil in mixture}}$$

Using Step 5.0, determine the chloride concentration of the RO water used to mix with the soil sample. Record this concentration and subtract it from the formula results to find the net chloride in the soil sample.

Record all results on the delineation form.

Rice Operating Company

Quality Procedure
Development of Cased Water-Monitoring Wells

1.0 Purpose

This procedure outlines the methods to be employed to develop cased monitoring wells.

2.0 Scope

This procedure shall be used for developed, cased water monitoring wells. It is not to be used for standing water samples such as ponds or streams.

3.0 Sample Collection and Preparation

3.1 Prior to development, the static water level and height of the water column within the well casing will be measured with the use of an electric D.C. probe or a steel engineer's tape and water sensitive paste.

3.2 All measurements will be recorded within a field log notebook.

3.3 All equipment used to measure the static water level will be decontaminated after each use by means of Liquinox, a phosphate free laboratory detergent, and water to reduce the possibility of cross-contamination. The volume of water in each well casing will be calculated.

4.0 Purging

4.1 Wells will be purged by using a 2" decontaminated submersible pump or dedicated one liter Teflon bailer. Wells should be purged until the pH and conductivity are stabilized and the turbidity has been reduced to the greatest extent possible.

4.2 If a submersible is used the pump will be decontaminated prior to use by scrubbing the outside surface of tubing and wiring with a Liquinox water mixture, pumping a Liquinox-water mixture through the pump, and a final flush with fresh water.

5.0 Water Disposal

5.1 All purge and decontamination water will be temporarily stored within a portable tank to be later disposed of in an appropriate manner.

6.0 Records

6.1 Rice Operating Company will record the amount of water removed from the well during development procedures. The purge volume will be reported to the appropriate regulatory authority when filing the closure report.

Rice Operating Company

Quality Procedure

Procedure for Obtaining Water Samples (Cased Wells) Using One Liter Bailer

1.0 Purpose

This procedure outlines the methods to be employed in obtaining water samples from cased monitoring wells.

2.0 Scope

This procedure shall be used for developed, cased water monitoring wells. It is not to be used for standing water samples such as ponds or streams.

3.0 Preliminary

3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the water. The shipment should include a Certificate of Compliance from the manufacturer of the collection bottle or vial and a Serial Number for the lot of containers. Retain this Certificate for future documentation purposes.

3.2 The following table shall be used to select the appropriate sampling container, preservative method and holding times for the various elements and compounds to be analyzed.

Compound to be Analyzed	Sample Container Size	Sample Container Description	Cap Requirements	Preservative	Maximum Hold Time
BTEX	40 ml	VOA Container	Teflon Lined	HCl	7 days
TPH	1 liter	clear glass	Teflon Lined	HCl	28 days
PAH	1 liter	amber glass	Teflon Lined	Ice	7 days
Cation/Anion	1 liter	clear glass	Teflon Lined	None	48 Hrs
Metals	1 liter	HD polyethylene	Any Plastic	Ice/HNO_3	28 Days
TDS	300 ml	clear glass	Any Plastic	Ice	7 Days

4.0 Chain of Custody

4.1 Prepare a Sample Plan. The plan will list the well identification and the individual tests to be performed at that location. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.

4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.

4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label). Affix the labels to the jars.

5.0 Bailing Procedure

5.1 Identify the well from the sites schematics. Place pre-labeled jar(s) next to the well. Remove the plastic cap from the well bore by first lifting the metal lever and then unscrewing the entire assembly.

5.2 Using a dedicated one liter Teflon bailer, purge a minimum of three well volumes. Place the water in storage container for transport to a ROC disposal facility.

5.3 Take care to insure that the bailing device and string do not become cross-contaminated. A clean pair of rubber gloves should be used when handling either the retrieval string or bailer. The retrieval string should not be allowed to come into contact with the ground.

6.0 Sampling Procedure

6.1 Once the well has been bailed in accordance with 5.2 of this procedure, a sample may be decanted into the appropriate sample collection jar directly from the bailer. The collection jar should be filled to the brim. Once the jar is sealed, turn the jar over to detect any bubbles that may be present. Add additional water to remove all bubbles from the sample container.

6.2 Note the time of collection on the sample jar with a fine Sharpie.

6.3 Place the sample directly on ice for transport to the laboratory. The preceding table shows the maximum hold times between collection and testing for the various analyses.

6.4 Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

7.0 Documentation

7.1 The testing laboratory shall provide the following minimum information:

A. Project and sample name.
B. Signed copy of the original Chain of Custody Form including the time the sample was received by the lab.
C. Results of the requested analyses
D. Test Methods employed
E. Quality Control methods and results

Calculation for Determining the Minimum Bailing Volume for Monitor Wells
Formula V= ($\pi r^2 h$)
2" well [V/231=gal] X 3 = Purge Volume

V=Volume
π=pi
r=inside radius of the well bore
h=maximum height of well bore in water table

Example:

π	r^2	h(in)	V(cu.in)	V(gal)	X 3 Volumes	Actual
3.1416	1	180	565.488	2.448	7.34 gal	>10 gal

Rice Operating Company

QUALITY PROCEDURE
Sampling and Testing Protocol for VOC in Soil

1.0 Purpose

This procedure is to be used to determine the concentrations of Volatile Organic Compounds in soils.

2.0 Scope

This procedure is to be used as the standard field measurement for soil VOC concentrations. It is not to be used as a substitute for full spectrographic speciation of organic compounds.

3.0 Procedure

3.1 Sample Collection and Preparation

3.1.1 Collect at least 500 g. of soil from the sample collection point. Take care to insure that the sample is representative of the general background to include visible concentrations of hydrocarbons and soil types. If necessary, prepare a composite sample of soils obtained at several points in the sample area. Take care to insure that no loose vegetation, rocks or liquids are included in the sample(s).

3.1.2 The soil sample(s) shall be immediately inserted into a one-quart or larger polyethylene freezer bag and sealed. When sealed, the bag should contain a nearly equal space between the soil sample and trapped air. Record the sample name and the time that the sample was collected on the Field Analytical Report Form.

3.1.3 The sealed samples shall be allowed to set for a minimum of five minutes at a temperature of between 10-15 Celsius, (59-77 ^{0}F). The sample temperatures may be adjusted by cooling the sample in ice, or by heating the sample within a generally controlled environment such as the inside of a vehicle. The samples should not be placed directly on heated surfaces or placed in direct heat sources such as lamps or heater vents.

3.1.4 The sealed sample bag should be massaged to break up any clods, and to provide the soil sample with as much exposed surface area as practically possible.

3.2 Sampling Procedure

3.2.1 The instrument to be used in conducting VOC concentration testing shall be an Environmental Instruments 13471 OVM / Datalogger or a similar PID-type instrument. (Device will be identified on VOC Field Test Report Form.) Prior to use, the instrument shall be zeroed-out in accordance with the appropriate maintenance and calibration procedure outlined in the instrument operation manual. The PID device will be calibrated each day it's used.

3.2.2 Carefully open one end of the collection bag and insert the probe tip into the bag taking care that the probe tip not touch the soil sample or the sidewalls of the bag.

3.2.3 Set the instrument to retain the highest result reading value. Record the reading onto the Field Test Report Form.

3.2.4 If the instrument provides a reading exceeding 100 ppm, proceed to conduct BTEX Speciation in accordance with **QP-02 and QP-06. If the reading is 100 ppm or less, NMOCD BTEX guideline has been met and no further testing for BTEX is necessary. File the Field Test Report Form in the project file.**

4.0 Clean-up

After testing, the soil samples shall be returned to the sampling location, and the bags collected for off-site disposal. **IN NO CASE SHALL THE SAME BAG BE USED TWICE. EACH SAMPLE CONTAINER MUST BE DISCARDED AFTER EACH USE.**

Gil Van Deventer

From: "Gil Van Deventer" <gilbertvandeventer@suddenlink.net>
To: "Hansen, Edward J., EMNRD" <edwardj.hansen@state.nm.us>
"Scott Curtis" <scurtis@riceswd.com>; "Wayne Price" <wayne.price@state.nm.us>; "Kristin Pope" <kpope@riceswd.com>
Sent: Thursday, December 27, 2007 10:57 AM
Attach: J-1 ICP_sans_Discl-Rpt_QP.pdf
Subject: Investigation & Characterization Plan - EME Jct. J-1 Site

Attention: Edward Hansen, New Mexico Oil Conservation Division - Environmental Bureau

Subject: Investigation & Characterization Plan

Site Name: EME Jct. J-1 Site

Site Location: T20S-R36E-Section 1, Unit Letter J

Site Agent: RICE Operating Company

Hello Edward:

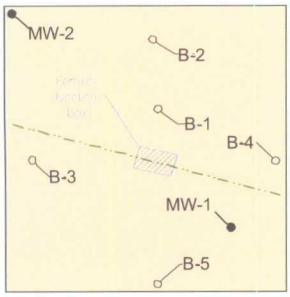
Trident Environmental is pleased to submit the attached abbreviated version of the *Investigation & Characterization Plan* (ICP) for the above-referenced site. One complete hard copy and one copy on compact disk is being sent via USPS Certified Mail (# 7099 3400 0017 1737 2138) today.

Thank you for your consideration of this ICP. If you have any questions, please contact me at 432-638-8740, or Kristin Pope at [illegible], 505-393-9174.

Sincerely,
Gilbert J. Van Deventer, PG, REM
Trident Environmental
www.trident-environmental.com
Work/Mobile: 432-638-8740
Fax: 413-403-9968
Home: 432-682-0727

Attachment B

Lithologic Logs
And
Monitoring Well Construction Diagrams



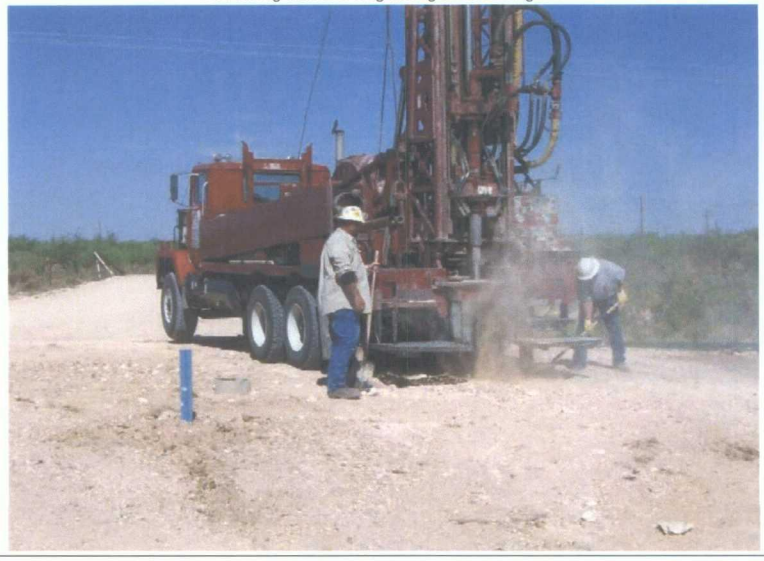
SOIL BORING LITHOLOGIC LOG

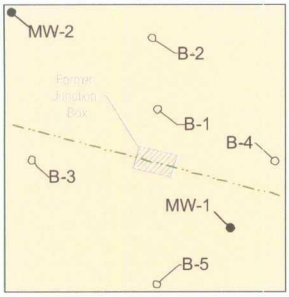
BOREHOLE NO.: B-1
SITE ID: EME Jct. J-1
CONTRACTOR: Harrison & Cooper, Inc.
DRILLING METHOD: Air Rotary
START DATE: 06/02/08
COMPLETION DATE: 06/02/08
COMMENTS: Boring located at 10 feet north of former junction box (plate marker)

TOTAL DEPTH: 25 Feet
CLIENT: RICE *Operating Company*
COUNTY: Lea
STATE: New Mexico
LOCATION: T20S-R37E-Sec 1-Unit J
FIELD REP.: G. Van Deventer

	Sample			Chloride (ppm)		USCS	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOLIDATION, DISTINGUISHING FEATURES
	Depth	Time	Type	Field	Lab		
3/8 Bentonite Hole Plug			Surface			BF	Compacted backfill material consisting of fine-grained sand, very pale orange (10YR 8/2) with calcium carbonate in matrix. Sand grains are moderately well-sorted, subrounded, unconsolidated, dry.
	5					CL	Compacted clay layer, grayish red (5R 4/2).
	10					BF	Compacted backfill material consisting of fine-grained sand, very pale orange (10YR 8/2) with calcium carbonate in matrix. Sand grains are moderately well-sorted, subrounded, unconsolidated, dry.
	15	0915	Cuttings	324		SM/CAL	Fine- to medium-grained sand, very pale orange (10YR 8/2) with calcium carbonate in matrix. Sand grains are moderately well-sorted, subrounded, unconsolidated, dry.
	20	0920	Cuttings	394			As above.
	25	0925	Cuttings	317	256	SW	Fine sand, light brown 5YR 6/4, well-sorted, rounded/subrounded, unconsolidated, dry.
5"	30	0927	Cuttings				Fine sand, light brown 5YR 6/4, well-sorted, rounded/subrounded, unconsolidated, moist.
	35						Bottom of boring at 30 ft below ground surface.
	40						
	45						
	50						
	55						

View facing west showing drilling of soil boring B-1





SOIL BORING LITHOLOGIC LOG

BOREHOLE NO.: B-2
SITE ID: EME Jct. J-1
CONTRACTOR: Harrison & Cooper, Inc.
DRILLING METHOD: Air Rotary
START DATE: 06/02/08
COMPLETION DATE: 06/02/08
COMMENTS: Boring located at 25 feet north of former junction box (plate marker)

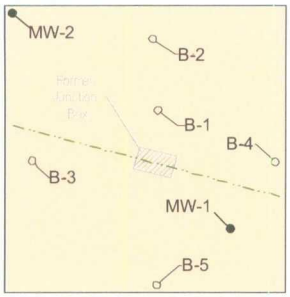
TOTAL DEPTH: 25 Feet
CLIENT: RICE *Operating Company*
COUNTY: Lea
STATE: New Mexico
LOCATION: T20S-R37E-Sec 1-Unit J
FIELD REP.: G. Van Deventer

Sample			Chloride (ppm)		USCS	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOLIDATION, DISTINGUISHING FEATURES
Depth	Time	Type	Field	Lab		
		Surface			CAL	Caliche
5	1002	Cuttings	232		SM	Fine- to medium-grained sand, light brown (5YR 6/4) with some caliche. Sand grains are rounded/subrounded, moderately sorted, unconsolidated, dry.
10	1003	Cuttings	621		SM/CAL	Very fine- to fine-grained sand, very pale orange (10YR 8/2) with calcium carbonate in matrix, unconsolidated, dry.
15	1004	Cuttings	653	688		Very fine- to fine-grained sand, very pale orange (10YR 8/2) with calcium carbonate in matrix, unconsolidated, dry.
20	1005	Cuttings	392			As above
25	1007	Cuttings	488	464	SW	Fine- to medium grained sand, light brown 5YR 6/4, moderately well-sorted, rounded/subrounded, unconsolidated, dry.
						As above with higher moisture content.
						Bottom of boring at 30 ft below ground surface.

3/8 Bentonite Hole Plug

5"

30
35
40
45
50



SOIL BORING LITHOLOGIC LOG

BOREHOLE NO.: B-3
SITE ID: EME Jct. J-1
CONTRACTOR: Harrison & Cooper, Inc.
DRILLING METHOD: Air Rotary
START DATE: 06/02/08
COMPLETION DATE: 06/02/08
COMMENTS: Boring located at 25 feet west of former junction box (plate marker)

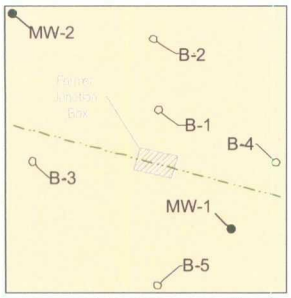
TOTAL DEPTH: 25 Feet
CLIENT: RICE *Operating Company*
COUNTY: Lea
STATE: New Mexico
LOCATION: T20S-R37E-Sec 1-Unit J
FIELD REP.: G. Van Deventer

Sample			Chloride (ppm)		USCS	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOLIDATION, DISTINGUISHING FEATURES
Depth	Time	Type	Field	Lab		
		Surface				
5	1048	Cuttings	205		SM/CAL	Very fine- to fine-grained sand, very pale orange (10YR 8/2) with calcium carbonate in matrix, unconsolidated, dry.
10	1049	Cuttings	475			As above.
					SW	Fine- to medium-grained sand, grayish-orange (10YR 7/4), rounded/subrounded and well-sorted grains, unconsolidated, dry.
15	1050	Cuttings	483			Fine- to medium-grained sand, grayish-orange (10YR 7/4), rounded/subrounded and well-sorted grains, unconsolidated, dry.
20	1055	Cuttings	516	576	SW/CAL	Fine- to medium-grained sand, grayish-orange (10YR 7/4) with hard caliche nodules (pea-sized to 1/2" chunks)
					SW	Fine- to medium grained sand, light brown 5YR 6/4, well-sorted, rounded/subrounded, unconsolidated, dry.
25	1056	Cuttings	408	352		As above with higher moisture content.
30						Bottom of boring at 30 ft below ground surface.
35						
40						
45						
50						

3/8 Bentonite Hole Plug

← 5" →

View facing northeast showing hole plugging at boring B-3.



SOIL BORING LITHOLOGIC LOG

BOREHOLE NO.: B-4
SITE ID: EME Jct. J-1
CONTRACTOR: Harrison & Cooper, Inc.
DRILLING METHOD: Air Rotary
START DATE: 06/02/08
COMPLETION DATE: 06/02/08
COMMENTS: Boring located at 25 feet east of former junction box (plate marker)

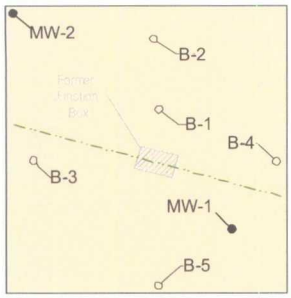
TOTAL DEPTH: 25 Feet
CLIENT: RICE *Operating Company*
COUNTY: Lea
STATE: New Mexico
LOCATION: T20S-R37E-Sec 1-Unit J
FIELD REP.: G. Van Deventer

Sample			Chloride (ppm)		USCS	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOLIDATION, DISTINGUISHING FEATURES
Depth	Time	Type	Field	Lab		
	1254	Surface				
5	1255	Cuttings	568			Very fine- to fine-grained sand, very pale orange (10YR 8/2) with calcium carbonate in matrix, unconsolidated, dry.
10	1256	Cuttings	794	848	SM/CAL	Very fine- to fine-grained sand, grayish-orange (10YR 7/4) with calcium carbonate in matrix, unconsolidated, dry.
15	1257	Cuttings	543			Fine-grained sand, light brown 5YR 6/4, subrounded and moderately sorted grains, unconsolidated, dry.
20	1258	Cuttings	450			Very fine- to fine-grained sand, grayish-orange (10YR 7/4) with soft caliche in matrix, unconsolidated, dry.
					SW	Fine- to medium grained sand, light brown 5YR 5/6, moderately well-sorted, rounded/subrounded, unconsolidated, dry.
25	1300	Cuttings	479	512		As above with higher moisture content.
						Bottom of boring at 30 ft below ground surface.
30						
35						
40						
45						
50						

3/8 Bentonite Hole Plug

5"

View facing southeast showing drilling of soil boring B-4.



SOIL BORING LITHOLOGIC LOG

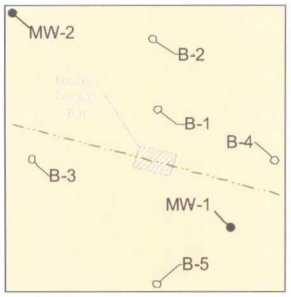
BOREHOLE NO.: B-5
SITE ID: EME Jct. J-1
CONTRACTOR: Harrison & Cooper, Inc.
DRILLING METHOD: Air Rotary
START DATE: 06/02/08
COMPLETION DATE: 06/02/08
COMMENTS: Boring located at 25 feet south of former junction box (plate marker)

TOTAL DEPTH: 25 Feet
CLIENT: RICE *Operating Company*
COUNTY: Lea
STATE: New Mexico
LOCATION: T20S-R37E-Sec 1-Unit J
FIELD REP.: G. Van Deventer

	Sample			Chloride (ppm)		USCS	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOLIDATION, DISTINGUISHING FEATURES
	Depth	Time	Type	Field	Lab		
3/8 Bentonite Hole Plug		1335	Surface				
	5	1336	Cuttings	147			Very fine- to fine-grained sand, very pale orange (10YR 8/2) with calcium carbonate in matrix, unconsolidated, dry.
	10	1337	Cuttings	276		SM/CAL	Very fine- to fine-grained sand, grayish-orange (10YR 7/4) with calcium carbonate in matrix, unconsolidated, dry.
	15	1338	Cuttings	476			Very fine- to fine-grained sand, grayish-orange (10YR 7/4) with calcium carbonate in matrix, unconsolidated, dry.
	20	1339	Cuttings	536			Very fine- to fine-grained sand, grayish-orange (10YR 7/4) with soft caliche in matrix, unconsolidated, dry.
	25	1340	Cuttings	780	736	SW	Fine- to medium grained sand, light brown 5YR 5/6, moderately well-sorted, rounded/subrounded, unconsolidated, dry.
← 5" →							As above with higher moisture content.
	30						Bottom of boring at 30 ft below ground surface.
	35						
	40						
	45						
	50						

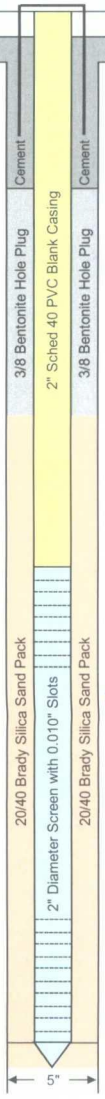
View facing south showing drilling of soil boring B-5

LITHOLOGIC LOG AND MONITORING WELL CONSTRUCTION DIAGRAM



MONITOR WELL NO.: MW-1
SITE ID: EME Jct. J-1
CONTRACTOR: Harrison & Cooper, Inc.
DRILLING METHOD: Air Rotary
START DATE: 06/02/08
COMPLETION DATE: 06/02/08
COMMENTS: Monitoring well located approximately 19 feet southeast of former junction box (marker plate).

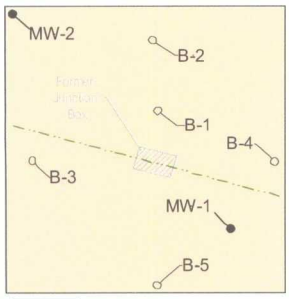
TOTAL DEPTH: 40 Feet
CLIENT: RICE *Operating Company*
COUNTY: Lea
STATE: New Mexico
LOCATION: T20S-R37E-Sec 1-Unit J
FIELD REP.: G. Van Deventer



Depth	Time	Sample Type	Chloride (ppm) Field	Chloride (ppm) Lab	USCS	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOLIDATION, DISTINGUISHING FEATURES
	1408	Surface				
5	1409	Cuttings	272			Very fine- to fine-grained sand, very pale orange (10YR 8/2) with calcium carbonate in matrix, unconsolidated, dry.
10	1410	Cuttings	255		SM/CAL	Very fine- to fine-grained sand, grayish-orange (10YR 7/4) with very pale orange (10YR 8/2) calcium carbonate in matrix, unconsolidated, dry.
15	1411	Cuttings	421			Very fine- to fine-grained sand, grayish-orange (10YR 7/4) with calcium carbonate in matrix, unconsolidated, dry.
20	1412	Cuttings	561			Fine-grained sand, grayish-orange (10YR 7/4) moderately sorted, subrounded/rounded, unconsolidated, dry.
						Fine- to medium grained sand, light brown 5YR 5/6, moderately well-sorted, rounded/subrounded, unconsolidated, dry.
25	1415	Cuttings	676	656		Fine- to medium grained sand, light brown 5YR 5/6, moderately well-sorted, rounded/subrounded, unconsolidated, slightly moist.
30	1417				SW	Fine and medium-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, damp.
35	1420					Fine and medium-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, very moist.
40	1430					Fine and medium-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, wet.
						Bottom of boring at 40 ft below ground surface.
45						
50						
55						
60						

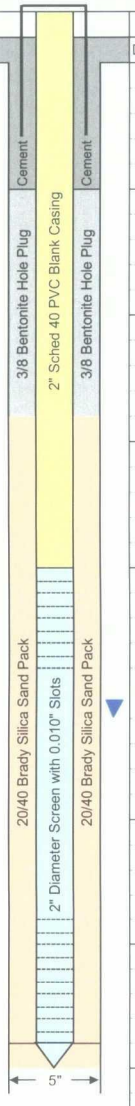
View facing west showing completed monitoring well MW-1

LITHOLOGIC LOG AND MONITORING WELL CONSTRUCTION DIAGRAM



MONITOR WELL NO.: MW-2
SITE ID: EME Jct. J-1
CONTRACTOR: Harrison & Cooper, Inc.
DRILLING METHOD: Air Rotary
START DATE: 06/02/08
COMPLETION DATE: 06/02/08
COMMENTS: Monitoring well located approximately 43 feet northwest of former junction box (marker plate).

TOTAL DEPTH: 40 Feet
CLIENT: RICE *Operating Company*
COUNTY: Lea
STATE: New Mexico
LOCATION: T20S-R37E-Sec 1-Unit J
FIELD REP.: G. Van Deventer



Depth	Time	Sample Type	Chloride (ppm) Field	Chloride (ppm) Lab	USCS	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOLIDATION, DISTINGUISHING FEATURES
	1525	Surface				
5	1526	Cuttings	282			Very fine- to fine-grained sand, light brown (5YR 6/4) and grayish-orange (10YR 7/4) with calcium carbonate in matrix, unconsolidated, dry.
10	1527	Cuttings	724	960	SM/CAL	Very fine- to fine-grained sand, grayish-orange (10YR 7/4) with calcium carbonate in matrix, unconsolidated, dry.
15	1528	Cuttings	497			Very fine- to fine-grained sand, grayish-orange (10YR 7/4) with calcium carbonate in matrix, unconsolidated, dry.
20	1529	Cuttings	423			Very fine- to fine-grained sand, grayish-orange (10YR 7/4) with calcium carbonate in matrix, unconsolidated, dry.
						Fine- to medium grained sand, light brown 5YR 5/6, moderately well-sorted, rounded/subrounded, unconsolidated, dry.
25	1532	Cuttings	348	336		Fine- to medium grained sand, light brown 5YR 6/4, moderately well-sorted, rounded/subrounded, unconsolidated, slightly moist.
30	1535				SW	Fine and medium-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, damp.
35	1537					Fine and medium-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, very moist.
40	1540					Fine and medium-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, wet.
45						Bottom of boring at 40 ft below ground surface.
50						View facing southeast showing completed monitoring well MW-2 (foreground) and MW-1 (background).
55						
60						

Attachment C

Laboratory Analytical Reports

and

Chain of Custody Documentation

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/13/08
Reporting Date: 06/13/08
Project Number: NOT GIVEN
Project Name: EME JCT. J-1
Project Location: EME JCT. J-1

Analysis Date: 06/13/08
Sampling Date: 06/02/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: KS

LAB NO.	SAMPLE ID	Cl^- (mg/kg)
H14979-1	SB #1 @ 25'	256
H14979-2	SB #3 @ 25'	352
H14979-3	MW #1 @ 25'	656
Quality Control		500
True Value QC		500
% Recovery		100
Relative Percent Difference		2.0

METHOD: Standard Methods	4500-ClB

Note: Analyses performed on 1:4 w:v aqueous extracts.

Chemist

06/13/08
Date

H14979 RICE

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 Company	**BILL TO**	
Project Manager:	Hack Conder	P.O. #:	
Address:	122 West Taylor	Company:	
City:	Hobbs	State: NM Zip: 88240	Attn:
Phone #:	393-9174	Fax #: 397-1471	Address:
Project #:		Project Owner:	City:
Project Name:	EME jct. J-1		State: Zip:
Project Location:	EME jct. J-1		Phone #:
Sampler Name:	Lara Weinheimer/Darnell Mitchell		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
H14479-1	SB #1 @ 25'	G	1			✓					✓		6/2/08	9:21	✓
-2	SB #3 @ 25'	G	1			✓					✓		6/2/08	10:53	✓
-3	MW #1 @ 25'	G	1			✓					✓		6/2/08	2:15	✓

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: Lara Weinheimer	Date: 6-13-08 Time: 8:55 am	Received By: Misty LeBart	Phone Result: ☐ Yes ☑ No Add'l Phone #:
Relinquished By:	Date: Time:	Received By:	Fax Result: ☐ Yes ☑ No Add'l Fax #:
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	CHECKED BY: (Initials) MCAB	REMARKS: email results Hconder@riceswd.com; jpurvis@riceswd.com; Lweinheimer@rice.swd.com

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

*client needs samples back after testing.

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/18/08
Reporting Date: 06/18/08
Project Number: NOT GIVEN
Project Name: EME JCT. J-1
Project Location: EME JCT. J-1

Analysis Date: 06/18/08
Sampling Date: 06/02/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: KS

LAB NO.	SAMPLE ID	Cl^- (mg/kg)
H15006-1	SB #4 @ 25'	512
H15006-2	SB #2 @ 15'	688
H15006-3	SB #2 @ 25'	464
H15006-4	SB #3 @ 20'	576
H15006-5	SB #4 @ 10'	848
H15006-6	SB #5 @ 25'	736
H15006-7	MW #2 @ 10'	960
H15006-8	MW #2 @ 25'	336
Quality Control		500
True Value QC		500
% Recovery		100
Relative Percent Difference		< 0.1

METHOD: Standard Methods	4500-Cl^-B

Note: Analyses performed on 1:4 w:v aqueous extracts.

Chemist

06/18/08
Date

H15006 RICE

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 Company	**BILL TO**	
Project Manager:	Hack Conder	P.O. #:	
Address:	122 West Taylor	Company:	
City:	Hobbs	State: NM Zip: 88240	Attn:
Phone #:	393-9174	Fax #: 397-1471	Address:
Project #:		Project Owner:	City:
Project Name:	EME jct. J-1		State: Zip:
Project Location:	EME jct. J-1		Phone #:
Sampler Name:	Lara Weinheimer/Darnell Mitchell		Fax #:

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	ANALYSIS REQUEST: Chlorides
H15006-1	SB #4 @ 25'	G				✓					✓		1:00	6-2-08	✓
-2	SB #2 @ 15'	G				✓					✓		10:04	6-2-08	✓
-3	SB #2 @ 25'	G				✓					✓		10:07	6-2-08	✓
-4	SB #3 @ 20'	G				✓					✓		10:52	6-2-08	✓
-5	SB #4 @ 10'	G				✓					✓		12:56	6-2-08	✓
-6	SB #5 @ 25'	G				✓					✓		1:40	6-2-08	✓
-7	MW #2 @ 10'	G				✓					✓		3:27	6-2-08	✓
-8	MW #2 @ 25'	G				✓					✓		3:31	6-2-08	✓

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: L. Weinheimer	Date: 6-15-08	Received By:	Phone Result: ☐ Yes ☑ No Add'l Phone #:
	Time: 10:05		Fax Result: ☐ Yes ☑ No Add'l Fax #:
Relinquished By:	Date:	Received By:	REMARKS: email results
	Time:		Hconder@riceswd.com; jpurvis@riceswd.com; Lweinheimer@rice.swd.com

Delivered By: (Circle One)
Sampler - UPS - Bus - Other:

Sample Condition: Cool ☑ Yes ☐ No / Intact ☑ Yes ☐ No

CHECKED BY: (Initials) MCBB

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

*Lara needs samples returned

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR STREET
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/24/08
Reporting Date: 06/26/08
Project Number: NOT GIVEN
Project Name: EME JUNCTION J-1
Project Location: T20S-R36E-SEC1 J~LEA COUNTY, NM

Sampling Date: 06/24/08
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: CK
Analyzed By: HM/KS

LAB NUMBER	SAMPLE ID	Na (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Conductivity (u S/cm)	T-Alkalinity ($mgCaCO_3$/L)
ANALYSIS DATE:		06/26/08	06/26/08	06/26/08	06/26/08	06/25/08	06/25/08
H15049-1	MONITOR WELL #1	1,980	1,020	510	12.5	15,600	200
H15049-2	MONITOR WELL #2	2,170	1,080	510	13.1	16,400	236
Quality Control		NR	52.1	51.0	2.96	1,418	NR
True Value QC		NR	50.0	50.0	3.00	1,413	NR
% Recovery		NR	104	102	98.7	100	NR
Relative Percent Difference		NR	8.0	< 0.1	1.3	1.1	NR
METHODS:			SM3500-Ca-D	3500-Mg E	8049	120.1	310.1

LAB NUMBER	SAMPLE ID	Cl (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	HCO_3 (mg/L)	pH (s.u.)	TDS (mg/L)
ANALYSIS DATE:		06/25/08	06/26/08	06/25/08	06/25/08	06/25/08	06/24/08
H15049-1	MONITOR WELL #1	5,200	1,390	0	244	6.92	13,300
H15049-2	MONITOR WELL #2	5,500	1,480	0	288	6.88	14,400
Quality Control		510	41.8	NR	988	7.05	NR
True Value QC		500	40.0	NR	1000	7.00	NR
% Recovery		102	105	NR	98.8	101	NR
Relative Percent Difference		2.0	0.6	NR	1.2	0.3	NR
METHODS:		SM4500-Cl-B	375.4	310.1	310.1	150.1	160.1

Chemist

Date

H15049 RICE

CARDINAL LABORATORIES

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR STREET
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/24/08
Reporting Date: 06/26/08
Project Number: NOT GIVEN
Project Name: EME JUNCTION J-1
Project Location: T20S-R36E-SEC1 J-LEA COUNTY, NM

Sampling Date: 06/24/08
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: CK
Analyzed By: HM/KS

LAB NUMBER	SAMPLE ID	Na (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Conductivity (µS/cm)	T-Alkalinity (mgCaCO$_3$/L)
ANALYSIS DATE:		06/26/08	06/26/08	06/26/08	06/26/08	06/25/08	06/25/08
H15049-1	MONITOR WELL #1	1,980	1,020	510	12.5	15,600	200
H15049-2	MONITOR WELL #2	2,170	1,080	510	13.1	16,400	236
Quality Control		NR	52.1	51.0	2.96	1,418	NR
True Value QC		NR	50.0	50.0	3.00	1,413	NR
% Recovery		NR	104	102	98.7	100	NR
Relative Percent Difference		NR	3.0	< 0.1	1.3	1.1	NR
METHODS:			SM3500-Ca-D	3500-Mg E	8049	120.1	310.1

LAB NUMBER	SAMPLE ID	Cl (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	HCO_3 (mg/L)	pH (s.u.)	TDS (mg/L)
ANALYSIS DATE:		06/25/08	06/26/08	06/25/08	06/25/08	06/25/08	06/24/08
H15049-1	MONITOR WELL #1	5,200	1,390	0	244	6.92	13,300
H15049-2	MONITOR WELL #2	5,500	1,480	0	288	6.88	14,400
Quality Control		510	41.8	NR	988	7.05	NR
True Value QC		500	40.0	NR	1000	7.00	NR
% Recovery		102	105	NR	98.8	101	NR
Relative Percent Difference		2.0	0.6	NR	1.2	0.3	NR
METHODS:		SM4500-Cl-B	375.4	310.1	310.1	150.1	160.1

Chemist

Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR ST.
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/24/08
Reporting Date: 06/30/08
Project Number: NOT GIVEN
Project Name: EME JUNCTION J-1
Project Location: T20S-R36E-SEC1 J ~ LEA CO., NM

Sampling Date: 06/24/08
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: CK
Analyzed By: CK

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE:		06/27/08	06/27/08	06/27/08	06/27/08
H15049-1	MONITOR WELL #1	0.072	0.014	<0.002	<0.006
H15049-2	MONITOR WELL #2	0.017	0.004	<0.002	<0.006
Quality Control		0.051	0.043	0.045	0.139
True Value QC		0.050	0.050	0.050	0.150
% Recovery		102	85.6	90.7	92.7
Relative Percent Difference		3.8	5.0	6.2	6.9

METHOD: EPA SW-846 8260B

Chemist

Date

H15049WB RICE

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # _____

Company Name	BILL TO Company	PO#
RICE Operating Company	RICE Operating Company	

Project Manager	Address (Street, City, Zip)
Hack Conder	122 W Taylor Street ~ Hobbs New Mexico 88240

Address (Street, City, Zip)	Phone#	Fax#
122 W Taylor Street ~ Hobbs New Mexico 88240	(575) 393-9174	(575)397-1471

Phone #	Fax #
(575) 393-9174	(575)397-1471

Project #	Project Name
	EME Junction J-1

Project Location	Sampler Signature: Cathy Watkins
T20S-R36E-Sec1 J ~ Lea County New Mexico	

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE		PRESERVATIVE METHOD: HCL (Acetate/VOA)	HNO_3	$NaHSO_4$	H_2SO_4	ICE / Other (Specify)	NONE		SAMPLING: DATE (2008)	TIME
	Monitor Well #1	G	3	X					2				1			6-24	
	Monitor Well #2	G	3	X					2				1			6-24	

ANALYSIS REQUEST

(Circle or Specify Method No.)

MTBE 8021B/5002	BTEX 8021B/602	TPH 418.1/TX1005/TX1005 Extended (C35+)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol 8260B/624	GC/MS Semi Vol 8270C/625	PLEAS 8082/608	Pesticides 8081A/608	BOD TSS pH	Moisture Content		Cations (Ca Mg Na K)	Anions (Cl SO4 CO3 HCO3)	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours
	X																X	X	X		
	X																X	X	X		

Relinquished by	Date	Time	Received by	Date	Time
Cathy Watkins					
Relinquished by	Date	Time	Received By (Laboratory Staff)	Date	Time

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

Phone Results	Yes	No	
Fax Results	Yes	No	Additional Fax Number

REMARKS:

Email Re hconder@riceswd.com
lweinheimer@riceswd.com
rozanne@valornet.com

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR STREET
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/15/08
Reporting Date: 08/25/08
Project Number: NOT GIVEN
Project Name: EME JUNCTION J-1
Project Location: T20S-R36E-SEC1 J ~ LEA COUNTY, NM

Sampling Date: 08/15/08
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: HM/TR

LAB NUMBER	SAMPLE ID	Na (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Conductivity (uS/cm)	T-Alkalinity ($mgCaCO_3/L$)
ANALYSIS DATE:		08/20/08	08/20/08	08/20/08	08/20/08	08/19/08	08/19/08
H15748-1	MONITOR WELL #1	2,130	1,040	486	14.6	15,500	240
H15748-2	MONITOR WELL #2	2,640	1,040	510	14.6	15,900	272
Quality Control		NR	48.1	48.1	3.00	1,391	NR
True Value QC		NR	50.0	50.0	3.00	1,413	NR
% Recovery		NR	96.2	96.2	98.5	98.4	NR
Relative Percent Difference		NR	8.0	5.9	6.9	1.4	NR
METHODS:		SM3500-Ca-D		3500-Mg E	8049	120.1	310.1

LAB NUMBER	SAMPLE ID	Cl (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	HCO_3 (mg/L)	pH (s.u.)	TDS (mg/L)
ANALYSIS DATE:		08/19/08	08/19/08	08/19/08	08/19/08	08/19/08	08/19/08
H15748-1	MONITOR WELL #1	5,200	1,630	0	293	6.23	12,100
H15748-2	MONITOR WELL #2	5,900	1,810	0	332	6.57	12,500
Quality Control		510	43.9	NR	976	7.05	NR
True Value QC		500	40.0	NR	1000	7.00	NR
% Recovery		102	110	NR	97.6	101	NR
Relative Percent Difference		2.0	2.4	NR	2.5	0.7	NR
METHODS:		SM4500-Cl-B	375.4	310.1	310.1	150.1	160.1

Chemist

08.26.08
Date

H15748 RICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/15/08
Reporting Date: 08/19/08
Project Number: NOT GIVEN
Project Name: EME JUNCTION J-1
Project Location: T20S-R36E-SEC1 J ~ LEA CO., NM

Sampling Date: 08/15/08
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: ZL

LAB NUME SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE	08/18/08	08/18/08	08/18/08	08/18/08
H15748-1 MONITOR WELL #1	<0.001	<0.001	<0.001	<0.003
H15748-2 MONITOR WELL #2	<0.001	<0.001	<0.001	<0.003
Quality Control	0.054	0.045	0.047	0.152
True Value QC	0.050	0.050	0.050	0.150
% Recovery	107	90.8	93.6	101
Relative Percent Difference	1.9	2.2	2.2	7.4

METHOD: EPA SW-846 8021B

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Lab Director

8/26/08
Date

H15748WB.RICE

101 East Marland - Hobbs, New Mexico 88240
Tel (575) 393-2326
Fax (575) 393-2476

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # _____

Company Name: RICE Operating Company	BILL TO Company: RICE Operating Company PO#
Project Manager: Hack Conder	Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240
Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240	Phone#: (575) 393-9174 Fax#: (575)397-1471
Phone # (575) 393-9174	Fax #: (575)397-1471
Project #:	Project Name: EME Junction J-1
Project Location: T20S-R36E-Sec1 J ~ Lea County New Mexico	Sampler Signature: Rozanne Johnson (575)631-9310 rozanne@valornet.com

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL (2 40ml VOA)	HNO_3	$NaHSO_4$	H_2SO_4	ICE (1-1 Liter HDPE)	NONE	SAMPLING: DATE (2008)	TIME
H15748-1	Monitor Well #1	G	3	X				2				1		8-15	8:50
-2	Monitor Well #2	G	3	X				2				1		8-15	9:40

ANALYSIS REQUEST

(Circle or Specify Method No.)

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005 / TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content		Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours
	X																X	X	X		
	X																X	X	X		

Relinquished by: Rozanne Johnson	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received By: (Laboratory Staff) Date: 8/15/08 Time: 2:15
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition: Cool: Yes ✓ / No; Intact: Yes ✓ / No	CHECKED BY (Initials)	

Phone Results: Yes / No

Fax Results: Yes / No Additional Fax Number:

REMARKS:

Email Re hconder@riceswd.com
lweinheimer@riceswd.com
rozanne@valornet.com

CARDINAL LABORATORIES

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR STREET
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 11/19/08
Reporting Date: 11/24/08
Project Number: NOT GIVEN
Project Name: EME JUNCTION J-1
Project Location: T20S-R36E-SEC1 J - LEA CO., NM

Sampling Date: 11/18/08
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: HM/TR

LAB NUMBE	SAMP_E ID	Na (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Conductivity (µS/cm)	T-Alkalinity ($mgCaCO_3/L$)
ANALYSIS DATE:		11/24/08	11/21/08	11/24/08	11/21/08	11/20/08	11/20/08
H16358-1	MONITOR WELL #1	2,220	1,060	474	14.8	13,100	256
H16358-2	MONITOR WELL #2	2,190	1,100	510	14.4	13,300	280

Quality Control	NR	48.1	48.6	2.77	1,430	NR
True Value QC	NR	50.0	50.0	3.00	1,413	NR
% Recovery	NR	96.2	97.2	92.4	101	NR
Relative Percent Difference	NR	8.0	<0.1	10.3	0.1	NR
METHODS:		SM3500-Ca-D	3500-Mg E	8049	120.1	310.1

LAB NUMBE	SAMP_E ID	Cl (mg/L)	SO_4 (mg/L)	CO_3 (mg/L)	HCO_3 (mg/L)	pH (s.u.)	TDS (mg/L)
ANALYSIS DATE:		11/21/08	11/21/08	11/20/08	11/20/08	11/20/08	11/19/08
H16358-1	MONITOR WELL #1	5,550	1,590	0	312	6.79	11,600
H16358-2	MONITOR WELL #2	5,450	1,600	0	342	6.77	12,200

Quality Control	500	45.5	NR	1000	7.02	NR
True Value QC	500	40.0	NR	1000	7.00	NR
% Recovery	100	114	NR	100	100	NR
Relative Percent Difference	<0.1	1.6	NR	<0.1	0.1	NR
METHODS:	SM4500-Cl-B	375.4	310.1	310.1	150.1	160.1

Chemist

Date

H16358 RICE

CARDINAL LABORATORIES

[illegible] • [illegible] • [illegible] • HOBBS, NM [illegible]

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 11/19/08
Reporting Date: 11/26/08
Project Number: NOT GIVEN
Project Name: EME JUNCTION J-1
Project Location: T20S-R36E-SEC 1 J- LEA CO., NM

Sampling Date: 11/18/08
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: ZL

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		11/25/08	11/25/08	11/26/08	11/25/08
H16358-1	MONITOR WELL #1	<0.001	<0.001	<0.001	<0.003
H16358-2	MONITOR WELL #2	<0.001	<0.001	<0.001	<0.003
Quality Control		0.060	0.049	0.055	0.151
True Value QC		0.050	0.050	0.050	0.150
% Recovery		120	98.0	110	101
Relative Percent Difference		3.4	2.1	1.2	3.0

METHOD: EPA SW-846 8260B

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE AND TOTAL XYLENES.

Chemist

Date

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # _____

Company Name	BILL TO Company	PO#
RICE Operating Company	RICE Operating Company	

Project Manager	Address (Street, City, Zip)
Hack Conder	122 W Taylor Street ~ Hobbs, New Mexico 88240

Address (Street, City, Zip)	Phone#	Fax#
122 W Taylor Street ~ Hobbs, New Mexico 88240	(575) 393-9174	(575)397-1471

Phone #	Fax #
(575) 393-9174	(575)397-1471

Project #	Project Name
	EME Junction J-1

Project Location	Sampler Signature
T20S-R36E-Sec1 J ~ Lea County New Mexico	Rozanne Johnson (575)631-9310

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL	HNO_3	$NaHSO_4$	H_2SO_4	ICE	NONE	SAMPLING: DATE (2008)	TIME
	Monitor Well #1	G	3	X				2				1		11-18	13:15
	Monitor Well #2	G	3	X				2				1		11-18	14:05

ANALYSIS REQUEST

(Circle or Specify Method No.)

MTBE 8021B/5030	BTEX 8021B/602	TPH 418.1/TX1005 / TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO_4, CO_3, HCO_3)	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours
	X															X	X	X		
	X															X	X	X		

Relinquished by	Date	Time	Received by:	Date	Time
Rozanne Johnson					
Relinquished by:	Date:	Time:	Received By: (Laboratory Staff)	Date	Time:

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

Phone Results	Yes	No		
Fax Results	Yes	No	Additional Fax Number	

REMARKS:

Email Re hconder@riceswd.com
lweinheimer@riceswd.com
rozanne@valornet.com

CARDINAL LABORATORIES

[illegible] • [illegible] GARLAND • [illegible]

[illegible] RESULTS [illegible]
[illegible] OPERATING [illegible]
ATTN: [illegible] CONDER
[illegible] TAYLOR STREET
HOBBS, NM 88240
FAX TO: [illegible]

Receiving Date: [illegible]
Reporting Date: [illegible]
Project Number: NOT GIVEN
Project Name: [illegible]
Project Location: T20S-R[illegible]E-SEC [illegible] LEA CO. NM

Sampling Date: [illegible]
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: [illegible]
Analyzed By: HM/TR

LAB NUMBER SAMPLE ID	Na (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Conductivity (uS/cm)	T-Alkalinity (mgCaCO3/L)
ANALYSIS DATE	02/20/09	02/20/09	[illegible]	[illegible]	02/20/09	[illegible]
H16920-1 MONITOR WELL #1	[illegible]	[illegible]	[illegible]	[illegible]	14,700	[illegible]
H16920-2 MONITOR WELL #2	[illegible]	[illegible]	[illegible]	[illegible]	15,000	[illegible]
Quality Control	NR	48.1	[illegible]	3.80	1,42[illegible]	NR
True Value QC	NR	50.0	[illegible]	[illegible]	1,41[illegible]	NR
% Recovery	NR	[illegible]	102	[illegible]	101	NR
Relative Percent Difference	NR	[illegible]	[illegible]	[illegible]	0.4	NR
METHODS:		SM3500-Ca-D	3500-Mg E	8049	120.1	310.1

	Cl (mg/L)	SO4 (mg/L)	CO3 (mg/L)	HCO3 (mg/L)	pH (s.u.)	TDS (mg/L)
ANALYSIS DATE	02/19/09	02/19/09	02/19/09	02/19/09	02/19/09	02/19/[illegible]
H16920-1 MONITOR WELL #1	[illegible]	1,[illegible]	[illegible]	[illegible]	7.[illegible]	[illegible]
H16920-2 MONITOR WELL #2	[illegible]	1,[illegible]	[illegible]	[illegible]	7.[illegible]	10,[illegible]
Quality Control	500	[illegible]	NR	[illegible]	7.0[illegible]	NR
True Value QC	500	40.0	NR	[illegible]	7.00	NR
% Recovery	100	[illegible]	NR	[illegible]	[illegible]	NR
Relative Percent Difference	[illegible]	[illegible]	NR	[illegible]	0.4	NR
METHODS:	SM4500-Cl-B	375.4	310.1	310.1	150.1	[illegible]

Chemist

Date

CARDINAL LABORATORIES

PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 02/18/09
Reporting Date: 02/20/09
Project Number: NOT GIVEN
Project Name: EME JUNCTION J-1
Project Location: T20S-R36E-SEC1 J ~ LEA CO., NM

Sampling Date: 02/17/09
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: CK
Analyzed By: ZL

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		02/19/09	02/19/09	02/19/09	02/19/09
H16920-1	MONITOR WELL #1	<0.001	<0.001	<0.001	<0.003
H16920-2	MONITOR WELL #2	<0.001	<0.001	<0.001	<0.003
Quality Control		0.051	0.049	0.050	0.149
True Value QC		0.050	0.050	0.050	0.150
% Recovery		102	98.0	100	99.3
Relative Percent Difference		<1.0	1.4	1.8	1.3

METHOD: EPA SW-846 8021 B

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES

Chemist

Date

H16920WB RICE

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # _____

Company Name: RICE Operating Company	BILL TO Company: RICE Operating Company — P.O.#
Project Manager: Hack Conder	Address (Street, City, Zip): 122 W Taylor Street ~ Hobbs, New Mexico 88240
Address (Street, City, Zip): 122 W Taylor Street ~ Hobbs, New Mexico 88240	Phone#: (575) 393-9174 — Fax#: (575)397-1471
Phone #: (575) 393-9174	Fax #: (575)397-1471
Project #:	Project Name: EME Junction J-1
Project Location: T20S-R36E-Sec1 J ~ Lea County New Mexico	Sampler Signature: Rozanne Johnson (575)631-9310

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL	HNO_3	$NaHSO_4$	H_2SO_4	ICE	NONE	SAMPLING: DATE (2009)	TIME
	Monitor Well #1	G	3	X				2				1		2-17	12:45
	Monitor Well #2	G	3	X				2				1		2-17	13:30

ANALYSIS REQUEST

(Circle or Specify Method No.)

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005 / TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content		Cations (Ca, Mg, Na, K)	Anions (Cl, SO_4, CO_3, HCO_3)	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours
	X																X	X	X		
	X																X	X	X		

Relinquished by	Date	Time	Received by — Date: Time
Relinquished by	Date	Time	Received By: (Laboratory Staff) — Date: Time
Delivered By: (Circle One) Sampler - UPS - Bus - Other	Sample Condition: Cool: Yes / No — Intact: Yes / No		CHECKED BY: (Initials)

Phone Results: Yes / No

Fax Results: Yes / No — Additional Fax Number

REMARKS:

Email Re hconder@riceswd.com
lweinheimer@riceswd.com
rozanne@valornet.com

CARDINAL LABORATORIES

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/05/09
Reporting Date: 06/11/09
Project Number: NOT GIVEN
Project Name: EME JUNCTION J-1
Project Location: T20S-R36E-SEC1 J ~ LEA CO., NM

Sampling Date: 06/03/09
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: AB/HM

LAB NO.	SAMPLE ID	Cl (mg/L)	SO_4 (mg/L)	TDS (mg/L)
Analysis Date:		06/11/09	06/11/09	06/09/09
H17563-1	MONITOR WELL #1	5,000	1,340	10,700
H17563-2	MONITOR WELL #2	5,500	1,330	12,900
Quality Control		500	39.7	NR
True Value QC		500	40.0	NR
% Recovery		100	99.3	NR
Relative Percent Difference		2.0	7.3	1.7
METHOD: Standard Methods, EPA		4500-Cl B	375.4	160.1

Not accredited for chloride, sulfate and TDS.

Chemist

Date

H17563 RICE

CARDINAL LABORATORIES

[illegible]

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/05/09
Reporting Date: 06/09/09
Project Number: NOT GIVEN
Project Name: EME JUNCTION J-1
Project Location: T20S-R36E-SEC1 J~ LEA CO., NM

Sampling Date: 06/03/09
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: ZL

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		06/08/09	06/08/09	06/08/09	06/08/09
H17566-1	MONITOR WELL #1	<0.001	<0.001	<0.001	<0.003
H17566-2	MONITOR WELL #2	<0.001	<0.001	<0.001	<0.003
Quality Control		0.058	0.053	0.049	0.148
True Value QC		0.050	0.050	0.050	0.150
% Recovery		116	106	98.0	98.7
Relative Percent Difference		0.7	9.7	8.5	5.8

METHOD: EPA SW-846 8021 B

TEXAS NELAP ACCREDITATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES

Chemist

Date

H17566WB RICE

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # ____ ____ ____ ____ ____

Company Name: RICE Operating Company	BILL TO Company: RICE Operating Company — PO#:
Project Manager: Hack Conder	Address (Street, City, Zip): 122 W Taylor Street ~ Hobbs, New Mexico 88240
Address (Street, City, Zip): 122 W Taylor Street ~ Hobbs, New Mexico 88240	Phone#: (575) 393-9174 — Fax#: (575)397-1471
Phone #: (575) 393-9174	Fax #: (575)397-1471
Project #:	Project Name: EME Junction J-1
Project Location: T20S-R36E-Sec1 J ~ Lea County New Mexico	Sampler Signature: Rozanne Johnson (575)631-9310

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL	HNO_3	$NaHSO_4$	H_2SO_4	ICE	NONE	SAMPLING: DATE (2009)	TIME	MTBE 8021B/8021	BTEX 8021B/8021	TPH 418.1/TX1005/TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi Vol. 8270C/625	PCB's 8082/608	Pesticides 608/1.4/608	BOD TSS pH	Moisture Content	Cations (Ca Mg Na K)	Anions (Cl SO4 CO3 HCO3)	Sulfates	Total Dissolved Solids	Chlorides	Turn Around Time - 24 Hours
	Monitor Well #1	G	3	X				2				1		6-3	12:40		X																X	X	X	
	Monitor Well #2	G	3	X				2				1		6-3	13:25		X																X	X	X	

Relinquished by: Rozanne Johnson	Date: 6-5-09	Time: 9:00	Received by:
Relinquished by:	Date:	Time: 11:25	Received By: (Laboratory Staff)
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition: Cool: Yes / No; Intact: Yes / No		CHECKED BY: (Initials)

Date: 6-5-09 Time: 9:01

Phone Results:		Yes		No
Fax Results:		Yes		No — Additional Fax Number:

REMARKS:

Email Re hconder@riceswd.com
lweinheimer@riceswd.com
rozanne@valornet.com

Attachment D

Input and Results of the AMIGO Simulation

INPUT AND RESULTS OF THE AMIGO SIMULATION

The AMIGO program, developed for the American Petroleum Institute (API), was used to simulate the potential impact to groundwater due to chloride transport through the vadose zone. The input to the model employed all available field data collected from the site. Model input data that was not site-specific was conservatively estimated based on professional judgment, referenced publications, and interpolation of known data from nearby sites. The specific parameters used in the simulation at the EME Jct J-1 site are listed in the table below.

Table 1: AMIGO Input Parameters

Model Parameter	Value	Source of Value
Climate (non-smoothed)	1946 - 1992	Pearl, NM Station
Distance (ft) to potential receptor (water well)	NA	No water well within 1000 ft of site (NMOSE & USGS Databases)
Background Chloride Concentration in Aquifer (mg/L)	5,200	Lowest concentration measured on site (upgradient-offsite source)
Aquifer Porosity (unitless)	0.25	Sample description
Depth to Groundwater (ft below ground surface)	30	Measured on site
Aquifer Thickness (ft)	30	Nicholson & Clebsch (1961) and interpolated from nearby sites
Slope of Water Table	0.001	Measured on site
Hydraulic Conductivity (ft/d)	10	Professional Judgment (based on aquifer tests conducted by Trident in Lea County)
Longitudinal Dispersivity (unitless)	10	Professional Judgment Conservative Assumption
Transverse Dispersivity (unitless)	1	Professional Judgment Conservative Assumption
Average Chloride Load (kg/m^2)	5.03	Calculated from site data using Massload spreadsheet
Maximum Length of Spill in Direction of Groundwater Flow (ft)	30	Site Data (conservatively used length and width of excavation)
Plant Uptake Trigger (%)	1	Professional Judgment Conservative Assumption
Surface Layer Lithology	Med. Sand	Lithology of on site soil borings
Soil Profile at Depth (Ratio - Caliche : Medium Sand)	1 : 5	Lithology of on site soil borings

It is important to note that the background chloride concentration of 5,200 mg/L (lowest concentration observed at monitoring well MW-1) was used due to the strong likelihood of an unknown, upgradient, offsite source causing the impairment at the site. Offsite encroachment of chlorides in groundwater at the site is clearly evidenced by the consistently higher chloride and

TDS concentrations in the upgradient monitoring well (MW-2) located 64 feet northwest of MW-1. Chloride and TDS concentrations are known to be elevated on a regional scale in this area near Monument.

The caliche and medium sand (1:5 ratio) soil types used in the simulation are consistent with those described in the lithologic logs for each soil boring and monitoring well. An additional conservative measure taken was in not accounting for the presence of the very low-permeability clay barrier installed at 6 ft bgs into the model simulation.

Published values of hydraulic conductivity range from 2 ft/day to 200 ft/day in Lea County. A conservative value of 10 ft/day for hydraulic conductivity was used based on experience of Trident Environmental in conducting aquifer tests in Lea County at sites with similar lithology and hydrogeologic characteristics. Dispersivity is a scale-dependent parameter which is generally larger as the scale of the plume increases. Longitudinal dispersivity represents the spreading of the plume in the direction of groundwater flow and the transverse component represents spreading perpendicular to the flow direction. A typical rule of thumb is that the longitudinal dispersivity is 10 percent of the length of the plume (National Research Council, 1990). However, values of dispersivity reported in the literature range generally range from 1 to 100 percent of the problem scale (Gelhar, 1986). Usually, the longitudinal dispersivity is 5 to 10 times higher than transverse. Dispersivity terms do not have a significant impact to the AMIGO simulations. A conservative value of 10 was used for longitudinal dispersivity and a value of 1 for the transverse component.

The *Massload* spreadsheet which compliments the AMIGO modeling simulation tool was used to calculate the potential chloride load in the vadose zone that could potentially contribute to the chlorides already present in groundwater. This was accomplished by inputting the field chloride analyses for each depth sampled in the vadose zone from the five soil borings (B-1 through B-5), two monitoring wells (MW-1 and MW-2), and three trenches (located 15 feet north, east and south of the former junction box where the higher chloride concentrations were observed). With each sample point weighted equally, the chloride load was calculated to be 5.03 kg/m^2 as shown in Table 2.

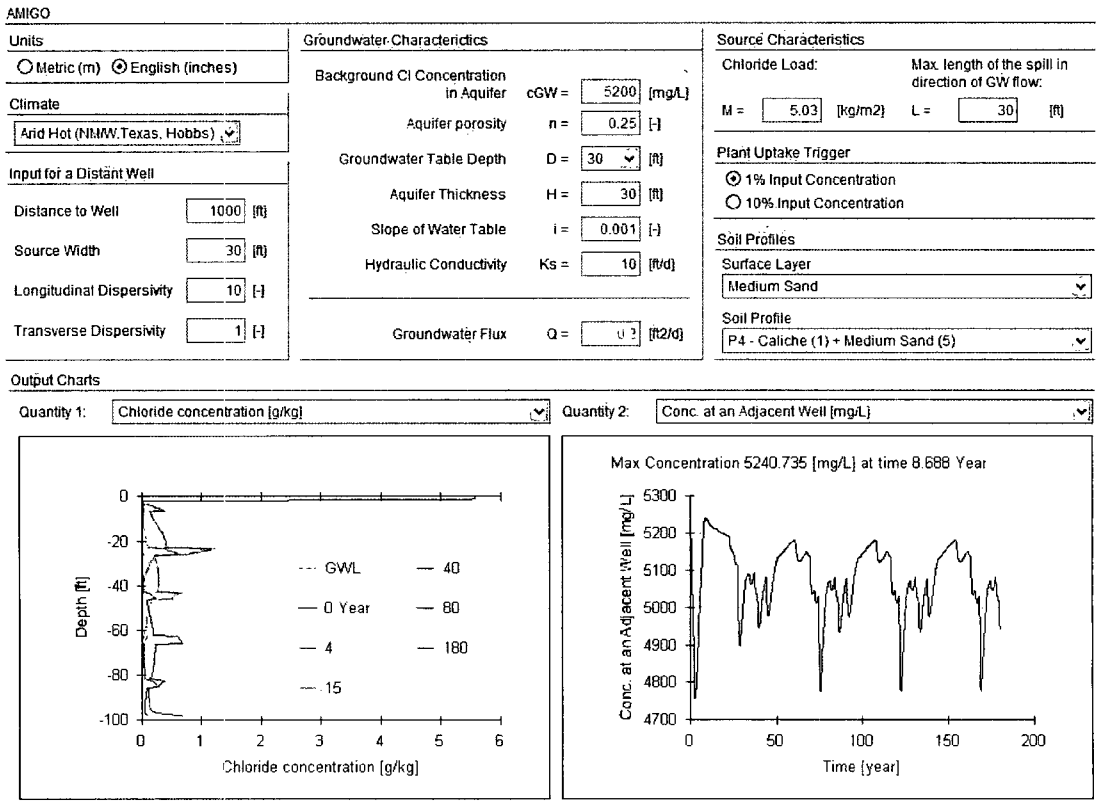
Table 2: AMIGO Input Parameters

Soil Boring, Monitoring Well, or Trench Location	Proportional Area Weights	Chl. Load of each Borehole	Equal Area Weights
B-1	0.10	5.95	1.00
B-2	0.10	2.40	1.00
B-3	0.10	4.88	1.00
B-4	0.10	7.14	1.00
B-5	0.10	1.54	1.00
MW-1	0.10	5.00	1.00
MW-2	0.10	5.45	1.00
15-ft East of Jct Box	0.10	5.68	1.00
15-North of Jct Box	0.10	6.03	1.00
15-ft South of Jct Box	0.10	6.20	1.00
Sum of weights	1		10

Averaged Chloride Load of All Boreholes: 5.03 kg/m^2

Input of the data described above resulted in the simulation as depicted in Figure 1 below which includes the AMIGO groundwater output charts copied directly from the model results screen.

Figure 1: AMIGO Output Charts



The results of the simulation indicate that the chloride mass within the vadose zone will not contribute more than 41 mg/L in the groundwater below the site, if no further corrective actions are taken.

The simulated concentration in groundwater is a *worst-case* prediction because of the conservative input parameters used in the model. The above-described AMIGO simulation supports the conclusion that the chlorides in the vadose zone do not represent a threat to human health and the environment.