1R - 427-09

WORKPLANS

DATE:
9-5-08

CERTIFIED MAIL
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TRIDENT ENVIRONMENTAL

September 5, 2008

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

RECEIVED
2008 SEP 8 PM 12 08

RE: **CORRECTIVE ACTION PLAN**
EME JUNCTION L-6 BOOT SITE
T20S-R37E-SECTION 6, UNIT LETTER L
NMOCD CASE NO.: 1R-0427-09

Mr. Hansen:

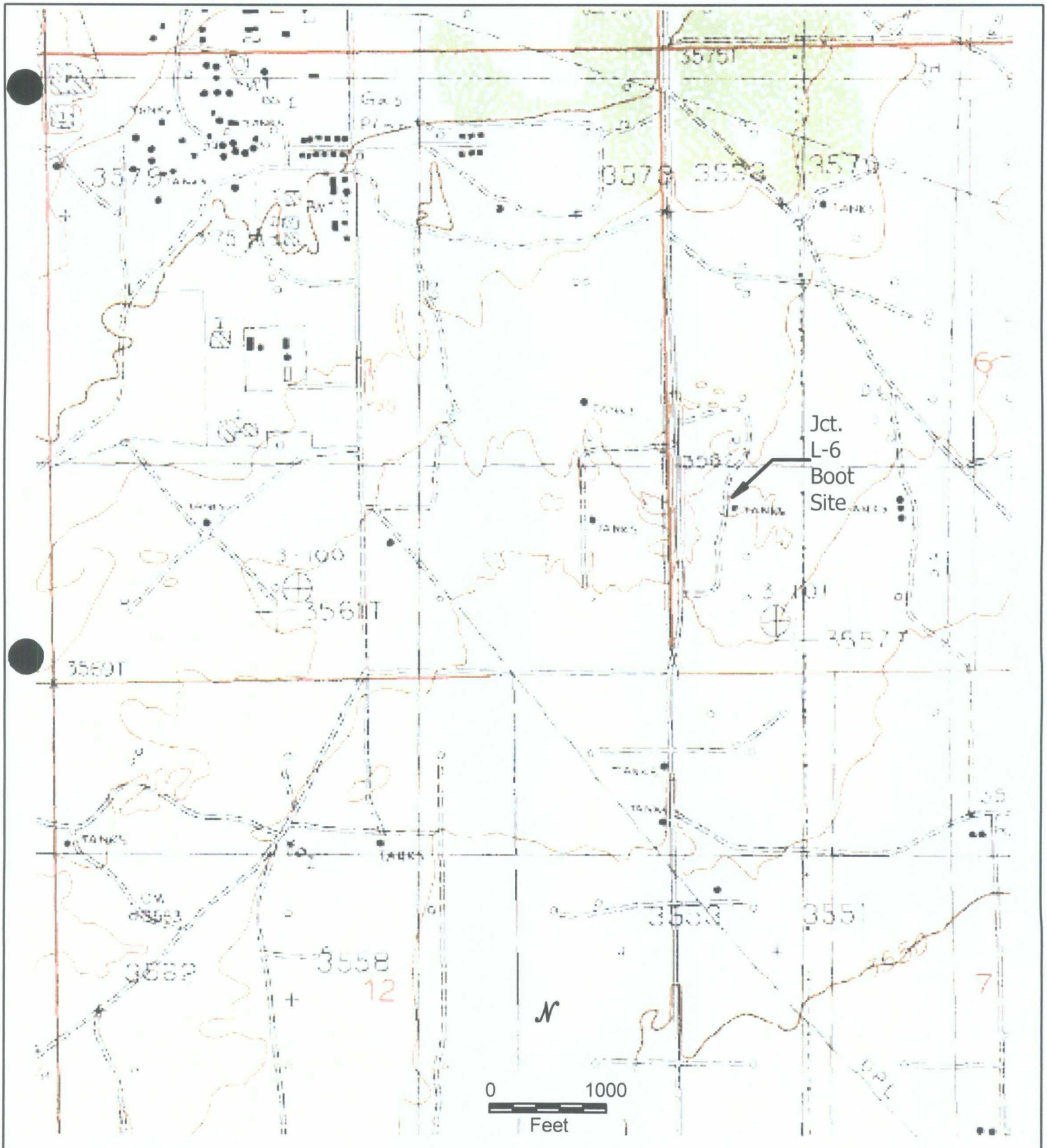
RICE Operating Company (ROC) retained Trident Environmental to address potential environmental concerns at the above-referenced site. ROC submitted a notification of groundwater impact to NMOCD on January 21, 2008 based on the findings of the activities performed in accordance with the Investigation & Characterization Plan (ICP). This Corrective Action Plan (CAP) incorporates the findings from the ICP and proposes recommendations for corrective action as requested by NMOCD in an email dated August 12, 2008.

Site Description

The L-6 Boot site is located at township 20 south, range 37 east, section 6, unit letter L approximately 2.5 miles southwest of Monument, NM as shown on the attached Site Location Map (Figure 1). The site is located on federal land under the jurisdiction of the Bureau of Land Management (BLM). Land in the site area is primarily utilized for crude oil production and cattle ranching. The chloride and TDS concentrations in groundwater are known to be elevated on a regional scale in this area near Monument.

Site History

In February 2003, ROC initiated replacement activities of the L-6 Boot junction box as part of the approved Junction Box Upgrade Program. The L-6 junction box was rebuilt at a location approximately 30 feet to the west. Initial soil sampling activities were conducted on July 15, 2003 and included the excavation of a twelve-foot deep trench. This investigation indicated chloride and hydrocarbon impact to the vadose zone.



USGS Monument South (NM)
Topographic Quadrangle (1975)

Approximate Scale: 1 inch = 1130 feet

TRIDENT ENVIRONMENTAL

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

FIGURE 1

SITE LOCATION MAP

An ICP was submitted to NMOCD on December 1, 2006, and approved on July 18, 2007. A subsurface soil investigation which included the installation of one soil boring for vertical delineation and three monitoring wells for horizontal delineation was conducted on October 29 and 31, 2007. The first groundwater sampling event occurred on December 3, 2007. ROC submitted a notification of groundwater impact to NMOCD on January 21, 2008 based on the findings of the activities performed in accordance with the ICP. On August 12, 2008, NMOCD requested submission of a corrective action work plan.

Regional and Local Geology

The site is underlain by Quaternary colluvium deposits composed of sand, silt, and gravel deposited by slopewash, and talus which were re-deposited from the underlying Ogallala Formation. These deposits are often calichified (indurated with cemented calcium carbonate) with caliche layers from 1 to 20 feet thick. The thickness of the colluvium deposits and Ogallala Formation at the site is estimated at 60 feet; however, it varies locally as a result of significant paleo-topography at the top of the underlying Triassic Dockum Group. Since Cretaceous Age rocks in the region have been removed by pre-Tertiary erosion, the colluvial deposits and Ogallala Formation rest unconformably on the Triassic Dockum Group. The uppermost unit of the Dockum Group is the Chinle Formation, which primarily consists of micaceous red clay and shale but also contains thin interbeds of fine-grained sandstone and siltstone. The red clays and shale of the Chinle Formation act as an aquitard beneath the water bearing colluvial deposits and therefore limit the amount of recharge to the underlying Dockum Group.

Based on the descriptions provided in lithologic logs, the subsurface soils are composed of very fine- to medium-grained sand and caliche. More detailed descriptions of the subsurface lithology are provided in the soil boring and monitoring well logs (Appendix A).

Regional and Local Hydrogeology

Potable ground water used in southern Lea County is derived primarily from the Ogallala Formation (including the colluvial deposits) and the Quaternary alluvium. Lower yields have also been provided by water bearing zones within the Triassic Dockum Group in a few scattered areas within southern Lea County. No potable water is known to be derived below the Triassic Dockum Group. Water from the Ogallala and alluvium aquifers in southern Lea County is used for irrigation, stock, domestic, industrial, and public supply purposes.

Water well records from the Office of the State Engineer (NMOSE) and the United States Geological Survey (USGS) websites were reviewed to determine if there are any active water supply wells in use for domestic, irrigation, livestock, municipal, or industrial purposes in the Jct. L-6 area. As a result of this review and several field reconnaissance

efforts there currently are no known potential water supply receptors within 1,000 feet of the Jct. L-6 site.

Recent data from the three monitoring wells at the Jct L-6 Boot site shows that the water table is at a depth of approximately 33 feet below ground surface (bgs) and slopes towards the southeast at a magnitude of approximately 0.002 ft/ft which is consistent with those of several other groundwater monitoring sites in the Monument area and the regional gradient as cited in published reports. The base of the aquifer is at approximately 60 ft bgs (Nicholson and Clebsch, 1961), therefore the saturated thickness is estimated at 27 feet. There is no surface water body located within a mile of the site.

Characterization of Vadose Zone Conditions

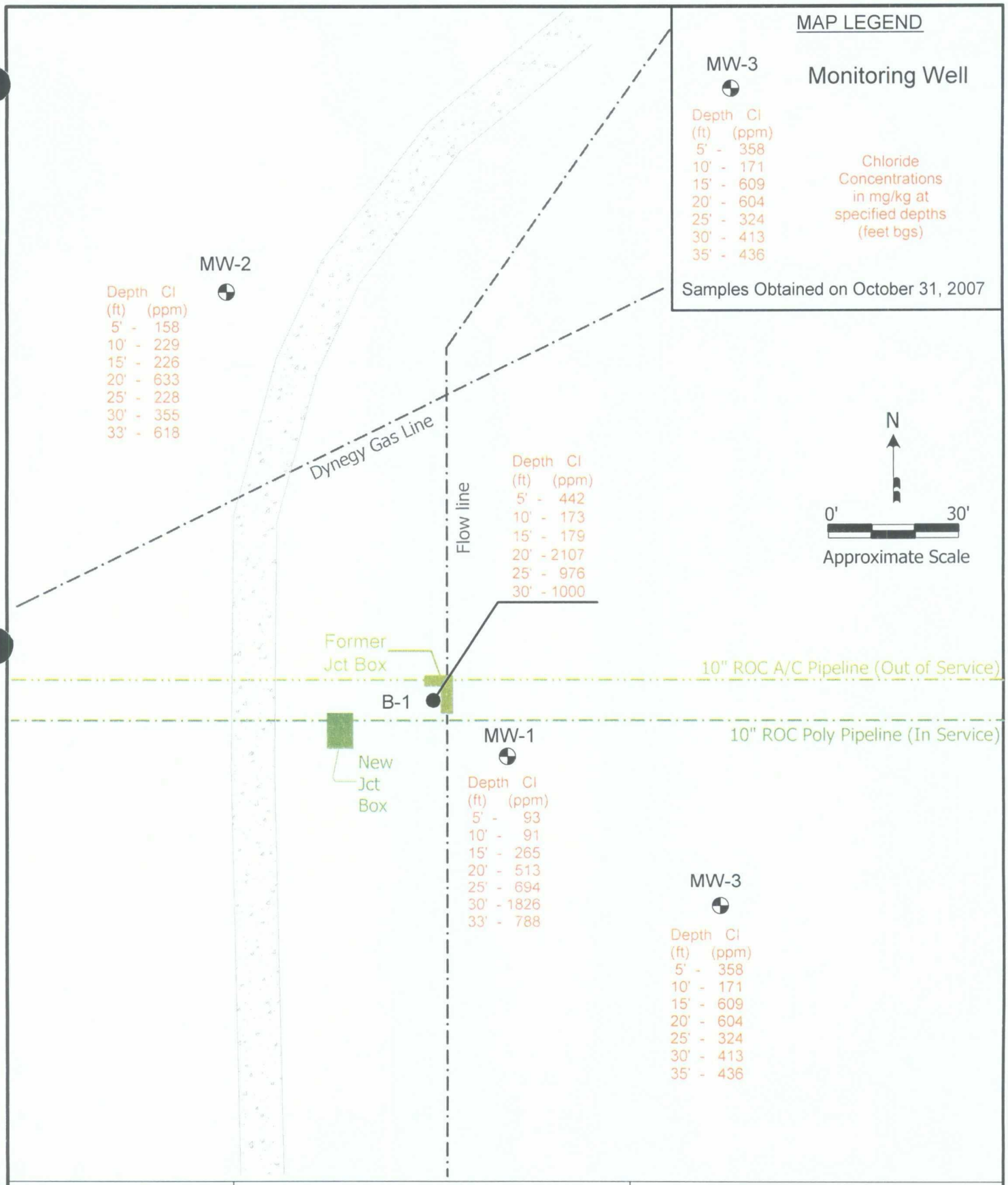
On October 29 and 31, 2007, soil samples were collected at 5-foot intervals using an air-rotary drilling rig at four locations to depths of approximately 33 feet. Three of the borings were converted into monitoring wells. Soil samples were tested for chloride content using field-adapted Method 9253 (QP-03) and headspace readings were recorded using a Mini-Rae Model PGM 7006 photoionization detector (PID) calibrated with 100 isobutylene in accordance with procedures explained in QP-07 (ICP Appendices). Select samples were submitted for laboratory analysis of chlorides (EPA Method 300.0), benzene, toluene, ethylbenzene, and xylenes (BTEX; EPA Method 8021B), and gas and diesel range organics (GRO/DRO; Method 8015M). Results of all chloride field tests, PID readings, and lab analytical results are summarized in Table 1 and also depicted in Figure 2.

There was no indication of hydrocarbon impact to the vadose zone in any of the samples, with the exception of boring B-1. Boring B-1 was advanced immediately adjacent to the former junction box and represents very localized and minimal impact. The maximum PID reading in boring B-1 was 196 ppm in at 5 ft bgs with PID readings quickly diminishing below that depth (ranging from 50 ppm at 15 ft bgs to 1 ppm at 20 ft bgs). Laboratory analysis of hydrocarbon constituents of concern (benzene, BTEX, and TPH) in boring B-1 at the 5-ft depth indicate impact is limited to the upper 5 to 10 feet of the vadose zone as summarized in Table 1. The source of this minimal hydrocarbon impact is likely from non-ROC operated crude oil flowlines directly overlying the former L-6 junction box.

Table 1: Hydrocarbon Analytical Results in Vadose Zone

Boring	Depth (ft bgs)	PID (ppm)	Regulated Hydrocarbons (mg/kg)					TPH (mg/kg)	
			B	T	E	X	BTEX	GRO	DRO
B-1	5' - 7'	196	0.021	0.017	0.325	1.849	2.213	<16.9	379

Chloride concentrations in the soil borings ranged from a minimum of 91 ppm at 10 ft bgs in MW-1 to a maximum of 1826 ppm at 30 ft bgs in MW-1. Background concentrations of chloride concentrations as represented by monitoring wells MW-2 and MW-3 ranged from 158 ppm to 618 ppm. Table 2 summarizes the chloride concentrations and PID readings measured during the soil sampling investigation.



TRIDENT ENVIRONMENTAL

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

FIGURE 2
SOIL SAMPLE CHLORIDE CONCENTRATION MAP
October 31, 2007

Table 2: Chloride Concentrations and PID Readings in Vadose Zone

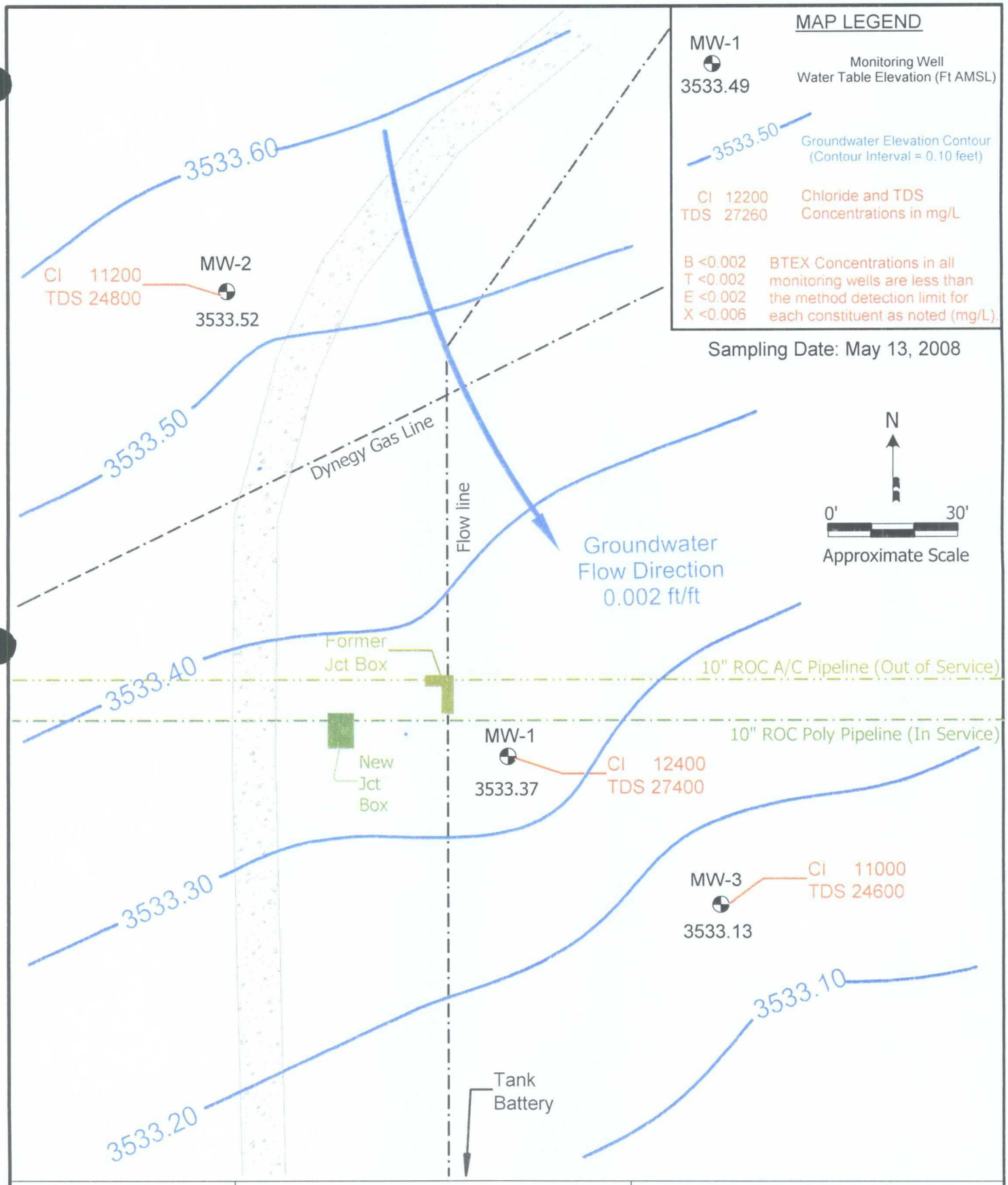
Boring/ Monitoring Well	Depth (ft bgs)	Field Chloride (ppm)	PID (ppm)
B-1	5' - 7'	442	196
	10' - 12'	173	39
	15' - 17'	179	50
	20' - 22'	1452	1
	25' - 27'	976	31
	28' - 30'	1000	2
MW-1	5' - 7'	93	0
	10' - 12'	91	0
	15' - 17'	265	0
	20' - 22'	513	0
	25' - 27'	694	0
	30' - 32'	1826	0
	33'	788	---
MW-2	5' - 7'	158	0
	10' - 12'	229	0
	15' - 17'	226	0
	20' - 22'	633	0
	25' - 27'	228	0
	28' - 30'	355	0
	33' - 35'	618	0
MW-3	5' - 7'	358	0
	10' - 12'	171	0
	15' - 17'	609	0
	20' - 22'	604	0
	25'	324	---
	30'	413	---

Photodocumentation of field activities are included in Appendix B. Laboratory analytical reports and chain of custody documentation are included in Appendix C.

Characterization of Groundwater Conditions

Monitoring wells MW-1, MW-2, and MW-3 have been sampled on a quarterly basis for major ions, TDS, and BTEX, since December 3, 2007. Recent data from the three monitoring wells show that the water table is at a depth of approximately 33 feet below ground surface (bgs) and slopes towards the southeast at a magnitude of approximately 0.002 ft/ft. A summary of historical analytical results and ground water elevations for monitoring wells MW-1, MW-2, and MW-3 are shown in Table 3 below. A map of the most current groundwater conditions for the Jct. L-6 Boot site is depicted in Figure 3. A copy of the laboratory analytical report and chain of custody form for the most recent ground water sampling event are included in Appendix C.

BTEX concentrations in monitoring wells MW-1, MW-2, and MW-3 have been below the WQCC standards for each constituent and for every sampling event taken place.



TRIDENT ENVIRONMENTAL

EME Jct. L-6 Boot Site

T20S - R37E - Section 6 - Unit L

RICE Operating Company

FIGURE 3
GROUNDWATER GRADIENT AND
CHLORIDE, TDS, & BTEX
CONCENTRATION MAP

Chloride concentrations in monitoring wells MW-1 (12,400 mg/L), MW-2 (11,200 mg/L), and MW-3 (11,000 mg/L) exceed the WQCC standard of 250 mg/L.

The TDS concentrations in monitoring wells MW-1 (27,400 mg/L), MW-2 (24,800 mg/L), and MW-3 (24,600 mg/L) exceed the WQCC standard of 1,000 mg/L.

Each monitoring well indicates chloride and TDS concentrations above WQCC standards; however, after three consecutive quarterly sampling events it is clear that the upgradient monitoring well (MW-2) has chloride and TDS concentrations consistent with those observed near the junction box (MW-1) and downgradient well MW-3. Therefore, we conclude with reasonable probability that the elevated chloride and TDS concentrations observed on site are due to the regional impact from an upgradient source(s) northwest of the former Jct L-6 Boot.

Recommendations for Corrective Action to Vadose Zone

The new construction and relocation of a watertight junction box has effectively mitigated any potential threat of chlorides and TDS from the former junction box area. The surrounding area is supportive of vegetation and will be re-seeded with a mixture of native grasses and plants that will re-vegetate the area at a natural rate. ROC will monitor the site for continued healthy growth of native vegetation and add amendments if necessary.

Recommendations for Corrective Action to the Groundwater

It has become clear that the upgradient monitoring well (MW-2) has chlorides and TDS concentrations consistent with those observed near the junction box (MW-1) and downgradient well MW-3, which indicates regional impact from an upgradient source(s) north and/or northwest to the site. Groundwater in this area of Monument, New Mexico, has been reported as regionally impacted with chlorides and unusable as early as 1952 (Nicholson and Clebsch, Groundwater Report 6, 1961). The exact source of groundwater impact at the Jct. L-6 Boot site is unknown because of the numerous potential facilities, past and present, located upgradient of the site.

At the request of the NMOCD via email communication on August 12, 2008 (Appendix D) a groundwater recovery system will be installed to pump and treat chloride-impacted groundwater. It is being conservatively assumed the observed chloride concentrations in monitoring well MW-1 (adjacent to the junction box) are, in part, the result of a release of chlorides to the groundwater table. With that assumption in mind, the following worst-case scenario estimate of chloride mass was calculated based on simple mass balance equations which are explained as follows:

Method 1 (Estimate of chloride mass in groundwater)

First, a 4,600 ft^2 area of the chloride plume from this release was estimated to be triangular-shaped with the apex originating from the former junction box and then fanning out downgradient towards, and ending at, MW-3. The aquifer thickness was estimated to be 27 ft (depth to water table at 33 feet subtracted from aquifer bottom at 60 feet. The total area multiplied by the thickness of the aquifer and its porosity (0.25) results in a total saturated pore space volume of 879,200 liters. Next, the difference between the highest chloride (12,400 mg/L on 05/13/08) observed in MW-1 (near the junction box "source") and the lowest chloride (11,200 mg/L on 05/13/08) observed in upgradient MW-2 was calculated. This net difference (1,200 mg/L) is conservatively presumed to be the chloride concentration in groundwater contributed by a release from the junction box. This chloride concentration multiplied by the saturated pore space volume results in a chloride mass of 1,055 kg. Future sampling results might dictate re-calculation by this method. These calculations are shown in the following table in the same order as described above.

Method 1: Estimate of Chloride Mass in Groundwater:

Parameter Type	Value	Parameter Validation (description of equations used)
Release area	4,600 ft^2	Area of Commingled Plume (triangulation)
Aquifer Thickness	27 ft	Known lithology of monitoring well MW-1 and published reports (Nicholson and Clebsch, 1961).
Porosity	0.25	Professional estimate for water saturated pore volume
Volume of impacted ground water below former excavation.	31,050 ft^3	Simple multiplication of each parameter listed above
Volume of Impacted Groundwater below former excavation.	8.792E+05 L	Unit conversion of previous value to liters.
Chloride concentration	1,200 mg/L	Difference between concentrations in MW-1 and MW-2 (May 13, 2008)
Total chloride mass	**1,055 kg**	Simple multiplication of two parameters listed above

Method 2 (Estimate of chloride mass in vadose zone)

First, the size of the impacted area is conservatively assumed to be 30-ft by 30-ft based on a combination of the soil delineation data and the maximum size used at other ROC junction box sites in the Monument area. The "*Amigo Massload*" Excel spreadsheet developed by Dave Hamilton with R T Hicks Consultants, Ltd (Albuquerque, NM) was used to calculate the potential chloride mass that could enter groundwater from the chloride load in the vadose zone. Only the equally-weighted chloride data (Table 1) from the near source soil samples (initial trench sampled in July 2003, and borings B-1 and MW-1 sampled last October) were used for this conservative calculation. The resulting chloride mass from this calculation is 1,272 kg as summarized in the following tables.

Method 2: Estimate of Chloride Mass in Vadose Zone

Soil Sample Identification	Proportional Area Weights	Chl. Load of each Borehole	Boring Chl. Load times Proport. Of Area
B-1	0.33	11.47 kg/m^2	3.78 kg/m^2
MW-1	0.33	7.74 kg/m^2	2.55 kg/m^2
Trench	0.34	26.10 kg/m^2	8.87 kg/m^2
		Total	15.21 kg/m^2
		Averaged Chloride Load of All Boreholes =	1.41 kg/ft^2

Parameter Type	Value	Parameter Validation (description of equations used)
Release area	900 ft^2	Typical 30-ft by 30-ft junction box delineation.
Averaged chloride load	1.41 kg/ft^2	Vertical chloride profile of trench, B-1 and MW-1
Total chloride mass	**1272 kg**	Simple multiplication of two parameters listed above

Adding both of the Method 1 and 2 estimates results in a total chloride mass of 2,327 kg.

A groundwater recovery system employed at the Jct. L-6 Boot site extracting water with chloride concentrations consistent with those in MW-1 (~10,000 mg/L) could extract 13.6 kg per day by (continuously) pumping at a rate of 1 gallon per minute (gpm) eight hours per day. At that rate it would take approximately 171 days and the equivalent of 1,464 barrels (bbls) to remove 2,327 kg of chloride mass.

Installation of a groundwater recovery system is contingent on BLM approval of right-of-way. It will likely be necessary to install a 4-inch diameter recovery well near MW-1 completed to the base of the aquifer (about 60 ft bgs). The conceptual design and specifications of the groundwater recovery system include a submersible or positive displacement pump capable of discharging at a minimum rate of 1 gpm. Due to the remoteness of the site, the necessary power supply for the system will likely be provided by a solar powered panel. Water from the recovery well will be stored on site for treatment by a portable reverse osmosis currently in use by ROC on other groundwater recovery sites. Treated water will be used for irrigation of the site vegetation. Untreated and/or rejected water will be used in pipeline maintenance operations. Flow rate, total volume, and chloride content of the recovered and treated groundwater will be measured.

ROC will continue quarterly groundwater sampling at each of the three monitoring wells.

Closure and Proposed Schedule of Activities

ROC will continue quarterly groundwater sampling at each of the four monitoring wells and vegetation will be monitored for growth and amendments added if necessary.

Upon approval of this Corrective Action Plan, ROC will schedule the site to be re-seeded and procure a drilling rig to install the recovery well. The ground water remedy at the Jct. L-6

Boot site will then be implemented using the same system after its completion at the EME Jct. K-6 site (AP-46).

At the completion of corrective actions as described herein, a final report will be submitted to the NMOCD with a request for closure of the regulatory file associated with this site.

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

Sincerely,

Gilbert J. Van Deventer, REM, PG
Trident Environmental

cc: Hack Conder (ROC), Marvin Burrows (ROC)

enclosures: Figures, tables, lithologic logs/well construction diagrams, photodocumentation, and lab reports

APPENDIX A

LITHOLOGIC LOGS

AND

MONITORING WELL CONSTRUCTION DIAGRAMS

SOIL BORING LITHOLOGIC LOG

BOREHOLE NO.: B-1
SITE ID: EME Jct. L-6 Boot
CONTRACTOR: Harrison & Cooper, Inc.
DRILLING METHOD: Air Rotary
START DATE: 10/29/07
COMPLETION DATE: 10/29/07
COMMENTS: Boring located at former junction box (2 feet west of plate marker)
Photo at left shows boring activities at B-1 (facing northwest).

TOTAL DEPTH: 30 Feet
CLIENT: RICE *Operating Company*
COUNTY: Lea
STATE: New Mexico
LOCATION: T20S-R37E-Sec 6-Unit L
FIELD REP.: G. Van Deventer

Depth	Time	Type	Chloride (ppm)	PID (ppm)	USCS	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOLIDATION, DISTINGUISHING FEATURES
		Surface			SW	Sandy loam (dune sand), light brown (5 YR 6/4), fine-grained, well-sorted, sub-to well-rounded grains, unconsolidated, dry.
5						
	0850	Split Spoon	442	196		Fine-grained sand, dark grayish, moderately well-sorted, subrounded, unconsolidated, slightly moist, moderate hydrocarbon odor. Sample submitted for laboratory analysis with results as follows: Benzene = 0.02 mg/kg , Toluene = 0.17 mg/kg, Etyhylbenzene = 0.33 mg/kg, Xylenes = 1.89 mg/kg GRO < 16.9 mg/kg, DRO = 379 mg/kg, TPH = 379 mg/kg
10						
	0855	Split Spoon	173	39		Fine-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, dry.
15					SM/CAL	
	0900	Split Spoon	179	50		Fine-grained sand, moderate orange pink (5YR 8/4) with some very pale orange (10YR 8/2) calcium carbonate in matrix. Sand grains are moderately well-sorted, subrounded, unconsolidated, dry.
20						
	0905	Split Spoon	1452	1		Fine-grained sand, moderate orange pink (5YR 8/4) with some very pale orange (10YR 8/2) calcium carbonate in matrix. Sand grains are moderately well-sorted, subrounded, unconsolidated, dry. Sample submitted for laboratory analysis with results as follows: Chloride = 4470 mg/kg
25						
	0910	Split Spoon	976	31	SW	Fine-grained sand, moderate orange pink (5YR 8/4), moderately well-sorted, subrounded, unconsolidated, dry.
	0920	Split Spoon	1000	2		Fine-grained sand, moderate orange pink (5YR 8/4), moderately well-sorted, subrounded, unconsolidated, damp.
30						
35						Bottom of boring at 30 ft below ground surface.
40						
45						
50						

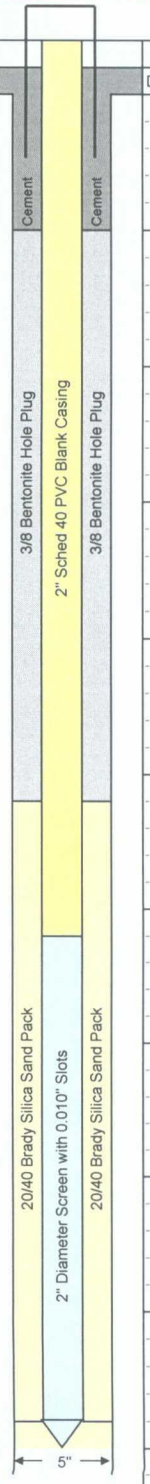
3/8 Bentonite Hole Plug

← 5" →

LITHOLOGIC LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

MONITOR WELL NO.: MW-1
SITE ID: EME Jct. L-6 Boot
CONTRACTOR: Harrison & Cooper, Inc.
DRILLING METHOD: Air Rotary
START DATE: 10/31/07
COMPLETION DATE: 10/31/07
COMMENTS: Monitoring well located approximately 15 feet southeast of former junction box (marker plate).

TOTAL DEPTH: 51 Feet
CLIENT: RICE *Operating Company*
COUNTY: Lea
STATE: New Mexico
LOCATION: T20S-R37E-Sec 6-Unit L
FIELD REP.: G. Van Deventer

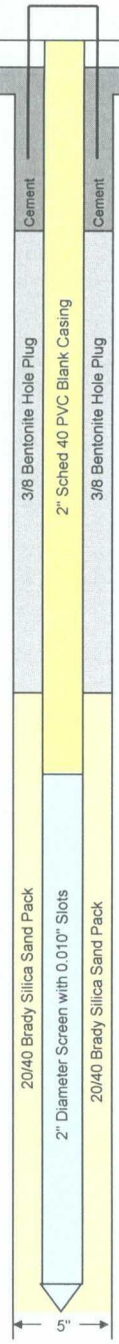


Depth	Time	Sample Type	Chloride (ppm)	PID (ppm)	USCS	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOLIDATION, DISTINGUISHING FEATURES
		Surface			CL/CAL	Imported clay-caliche pad constructed to allow access for drilling rig.
5					SW	Sandy loam (dune sand), light brown (5 YR 6/4), fine-grained, well-sorted, sub-to well-rounded grains, unconsolidated, dry.
	1014	Split Spoon	93	0		Fine and medium-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, dry.
10						
	1018	Split Spoon	91	0		Fine-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, dry.
15						
	1025	Split Spoon	265	0	SM/CAL	Very fine and fine-grained sand, grayish orange (10YR 7/4) with some very pale orange (10YR 8/2) calcium carbonate in matrix. Sand grains are moderately well-sorted, subrounded, unconsolidated, dry.
20						
	1033	Split Spoon	513	0		As above but only slightly calcium carbonate in matrix.
25						
	1042	Split Spoon	694	0	SW/CAL	Fine-grained sand, light brown (5 YR 6/4) with slight calcium carbonate in matrix, moderately well-sorted, subrounded, unconsolidated, dry.
30						Fine-grained sand, moderate orange pink (5YR 8/4), moderately well-sorted, subrounded, unconsolidated, damp.
	1055	Split Spoon	1826	0	SW	Fine and medium-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, dry. Sample submitted for laboratory analysis with results as follows: Chloride = 4730 mg/kg
	1100	Cuttings	788			
35						Fine and medium-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, dry.
40	1102					As above with some indurated intermittent sandstone streaks.
45	1105				SW/SS	As above with some indurated intermittent sandstone streaks.
50						As above with some indurated intermittent sandstone streaks.
55						Bottom of boring at 51 ft below ground surface.

LITHOLOGIC LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

MONITOR WELL NO.: MW-2
SITE ID: EME Jct. L-6 Boot
CONTRACTOR: Harrison & Cooper, Inc.
DRILLING METHOD: Air Rotary
START DATE: 10/29/07
COMPLETION DATE: 10/29/07
COMMENTS: Monitoring well located approximately 100 feet northwest of former junction box (marker plate).

TOTAL DEPTH: 45 Feet
CLIENT: RICE *Operating Company*
COUNTY: Lea
STATE: New Mexico
LOCATION: T20S-R37E-Sec 6-Unit L
FIELD REP.: G. Van Deventer

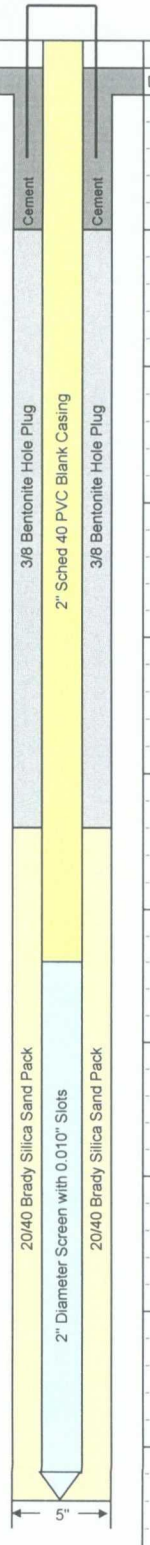


Depth	Time	Sample Type	Chloride (ppm)	PID (ppm)	USCS	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOLIDATION, DISTINGUISHING FEATURES
		Surface			SW	Sandy loam (dune sand), light brown (5YR 5/6), fine-grained, well-sorted, sub-to well-rounded grains, loose, unconsolidated, dry.
5						
	1205	Split Spoon	158	0		Fine and medium-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, loose, unconsolidated, dry.
10						
	1210	Split Spoon	229	0		Fine-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, dry.
15						
	1215	Split Spoon	226	0	SM/CAL	Fine-grained sand, grayish orange (10YR 7/4) with some very pale orange (10YR 8/2) calcium carbonate in matrix. Sand grains are moderately well-sorted, subrounded, unconsolidated, dry.
20						
	1220	Split Spoon	633	0		Fine-grained sand, grayish orange (10YR 7/4) with some very pale orange (10YR 8/2) calcium carbonate in matrix. Sand grains are moderately well-sorted, subrounded, unconsolidated, dry.
25						
	1230	Split Spoon	228	0	SW	Fine-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, dry.
	1240	Split Spoon	355	0		Fine-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, dry.
30						
	1250	Split Spoon	618	0		Fine-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, slightly moist.
35						
40					SW/SS	As above with some indurated intermittent sandstone streaks.
45						As above with some indurated intermittent sandstone streaks.
						Bottom of boring at 45 ft below ground surface.
50						
55						

LITHOLOGIC LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

MONITOR WELL NO.: MW-3
SITE ID: EME Jct. L-6 Boot
CONTRACTOR: Harrison & Cooper, Inc.
DRILLING METHOD: Air Rotary
START DATE: 10/31/07
COMPLETION DATE: 10/31/07
COMMENTS: Monitoring well located approximately 75 feet southeast of former junction box (marker plate).

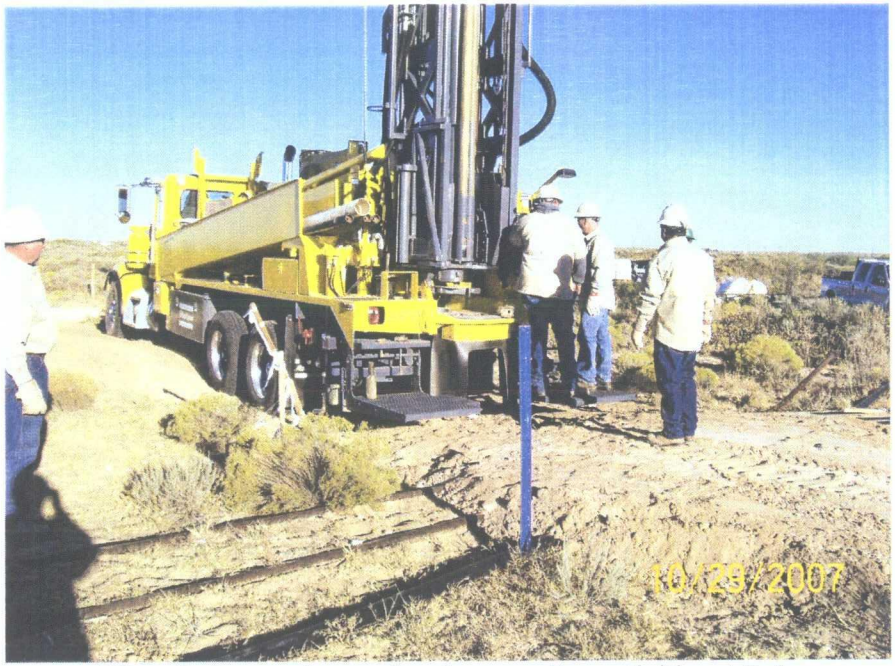
TOTAL DEPTH: 52 Feet
CLIENT: RICE *Operating Company*
COUNTY: Lea
STATE: New Mexico
LOCATION: T20S-R37E-Sec 6-Unit L
FIELD REP.: G. Van Deventer



Depth	Time	Sample Type	Chloride (ppm)	PID (ppm)	USCS	LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOLIDATION, DISTINGUISHING FEATURES
		Surface			CL/CAL	Imported clay-caliche pad constructed to allow access for drilling rig.
5					SW	Fine- and medium-grained dune (loamy) sand, light brown (5YR 5/6), well-sorted, sub-to well-rounded grains, loose, unconsolidated, dry.
	0833	Split Spoon	358	0		Fine- and medium-grained sand, light brown (5YR 5/6), well-sorted, sub-to well-rounded grains, loose, unconsolidated, dry.
10						
	0838	Split Spoon	171	0		Fine--grained sand, light brown (5YR 5/6), well-sorted, sub-to well-rounded grains, loose, unconsolidated, dry.
15						
	0844	Split Spoon	609	0	SM/CAL	Very fine and fine-grained sand, grayish orange (10YR 7/4) with some very pale orange (10YR 8/2) calcium carbonate in matrix. Sand grains are moderately well-sorted, subrounded, unconsolidated, dry. Sample submitted for laboratory analysis with results as follows: Chloride = 109 mg/kg
20						
	0853	Split Spoon	604	0	SW	Fine-grained sand, light brown (5 YR 6/4), moderately well-sorted, subrounded, unconsolidated, dry.
25	0856	Cuttings	324		SW/CAL	Fine-grained sand, light brown (5 YR 6/4) with slight calcium carbonate in matrix, moderately well-sorted, subrounded, unconsolidated, dry.
30	0858	Cuttings	413		SW	Very fine and fine-grained sand, grayish orange (10YR 7/4), moderately well-sorted, subrounded, unconsolidated, dry.
35	0859	Cuttings	436			Fine-grained sand, grayish orange (10YR 7/4), moderately well-sorted, subrounded, unconsolidated, slightly moist.
40	0904				SW/CAL	Fine-and medium-grained sand, grayish orange (10YR 7/4), slight calcium carbonate content in matrix, moderately well-sorted, subrounded, unconsolidated, slightly moist.
45	0906				SW/SS	Fine-and medium-grained sand, grayish orange (10YR 7/4), with some indurated intermittent sandstone streaks, moderately well-sorted, subrounded, unconsolidated, slightly moist.
50	0910					Fine-and medium-grained sand, grayish orange (10YR 7/4), with some indurated intermittent sandstone streaks, moderately well-sorted, subrounded, unconsolidated, slightly moist.
55						Bottom of boring at 52 ft below ground surface.

APPENDIX B

PHOTO DOCUMENTATION



View facing northwest showing sampling activities at B-1.

View facing northwest showing sampling activities at MW-1.

View facing southeast showing drilling of MW-2.

View facing northwest showing MW-3 (foreground) and MW-1 (background).

APPENDIX 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: KRISTIN FARRIS-POPE
122 W. TAYLOR ST.
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 05/15/08
Reporting Date: 05/21/08
Project Number: NOT GIVEN
Project Name: EME L-6 BOOT
Project Location: T20S-R37E-SEC6 L ~ LEA CO., NM

Sampling Date: 05/13/08
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		05/19/08	05/19/08	05/19/08	05/19/08
H14821-1	MONITOR WELL #1	<0.002	<0.002	<0.002	<0.006
H14821-2	MONITOR WELL #2	<0.002	<0.002	<0.002	<0.006
H14821-3	MONITOR WELL #3	<0.002	<0.002	<0.002	<0.006
Quality Control		0.101	0.094	0.108	0.331
True Value QC		0.100	0.100	0.100	0.300
% Recovery		101	94.5	108	110
Relative Percent Difference		0.9	0.9	0.8	3.5

METHOD: EPA SW-846 8260B

Chemist

05/21/08
Date

H14821WB RICE

CARDINAL LABORATORIES

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

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

Receiving Date: 05/15/08
Reporting Date: 05/21/08
Project Number: NOT GIVEN
Project Name: EME L-6 BOOT
Project Location: T20S-R37E-SEC6 L~LEA COUNTY, NM

Sampling Date: 05/13/08
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
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:		05/20/08	05/20/08	05/20/08	05/19/08	05/16/08	05/16/08
H14821-1	MONITOR WELL #1	7,900	1,440	462	37.2	38,000	392
H14821-2	MONITOR WELL #2	7,190	1,280	437	33.2	34,700	356
H14821-3	MONITOR WELL #3	6,970	1,240	437	33.8	34,100	352
Quality Control		NR	52.1	48.6	3.14	1,405	NR
True Value QC		NR	50.0	50.0	3.00	1,413	NR
% Recovery		NR	104	97.2	105	99.4	NR
Relative Percent Difference		NR	1.5	3.8	1.3	0.9	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:		05/16/08	05/19/08	05/16/08	05/16/08	05/16/08	05/17/08
H14821-1	MONITOR WELL #1	12,400	4,680	0	478	6.62	27,400
H14821-2	MONITOR WELL #2	11,200	4,350	0	434	6.62	24,800
H14821-3	MONITOR WELL #3	11,000	4,080	0	429	6.61	24,600
Quality Control		500	45.1	NR	976	7.01	NR
True Value QC		500	40.0	NR	1000	7.00	NR
% Recovery		100	113	NR	97.6	100	NR
Relative Percent Difference		< 0.1	5.7	NR	1.2	0.3	NR
METHODS:		SM4500-Cl-B	375.4	310.1	310.1	150.1	160.1

Kristin Farris-Pope
Chemist

05/21/08
Date

H14821 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: Kristin Farris-Pope, Project Scientist	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 L-6 Boot
Project Location: T20S-R37E-Sec6 L ~ Lea County - New Mexico	Sampler Signature: Rozanne Johnson (575)631-9310 rozanne@valornet.com

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 (2 40ml VOA)	HNO_3	$NaHSO_4$	H_2SO_4	ICE (1-1 Liter HDPE)	NONE	SAMPLING: DATE (2008)	TIME	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
H14821-1	Monitor Well #1	G	3	X				2				1		5-13	13:00		X																X	X	X		
-2	Monitor Well #2	G	3	X				2				1		5-13	12:05		X																X	X	X		
-3	Monitor Well #3	G	3	X				2				1		5-13	10:55		X																X	X	X		

Relinquished by: Rozanne Johnson	Date: 5-15-2008	Time: 2:55P	Received by: [signature]
Relinquished by:	Date:	Time:	Received By: (Laboratory Staff)

Date: 5/15/08 Time: 2:55P

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

Sample Condition: Cool: Yes ✓ / No — Intact: Yes ✓ / No

CHECKED BY: (Initials) MK

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

REMARKS:

Email Results to: kpope@riceswd.com, lweinheimer@riceswd.com, rozanne@valornet.com

WELL SAMPLING DATA FORM

CLIENT: RICE *Operating Company* WELL ID: Monitor Well #1

SYSTEM: EME DATE: May 13, 2008

SITE LOCATION: L-6 Boot SAMPLER: Rozanne Johnson

PURGING METHOD: ☐ Hand Bailed ☑ Pump, Type: Purge Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ On-site Drum ☐ Drums ☑ SWD Disposal Facility

TOTAL DEPTH OF WELL: 53.65 Feet

DEPTH TO WATER: 37.30 Feet

HEIGHT OF WATER COLUMN: 16.35 Feet

WELL VOLUME: 2.6 Gal.

2 In. Well Diameter

9 Gallons purged prior to sampling

TIME	TEMP. °C	COND. mS/cm	pH	PHYSICAL APPEARANCE AND REMARKS
13:00	20.2	37.18	6.58	Silt/Sand to Clear with no odor.
				Samples Collected with Disposable Bailer
				BTEX (2-40ml VOA)
				Major Ions/TDS (1-1000ml Plastic)

COMMENTS:

Myron Model 6P instrument used to obtain pH, conductivity, and temperature measurements.

Delivered samples to Cardinal Laboratories in Hobbs, New Mexico for BTEX, Major Ions, and TDS analysis.

WELL SAMPLING DATA FORM

CLIENT: RICE *Operating Company* WELL ID: Monitor Well #2

SYSTEM: EME DATE: May 13, 2008

SITE LOCATION: L-6 Boot SAMPLER: Rozanne Johnson

PURGING METHOD: ☐ Hand Bailed ☑ Pump, Type: Purge Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ On-site Drum ☐ Drums ☑ SWD Disposal Facility

TOTAL DEPTH OF WELL: 47.67 Feet

DEPTH TO WATER: 34.98 Feet

HEIGHT OF WATER COLUMN: 12.69 Feet

WELL VOLUME: 2.0 Gal.

2 In. Well Diameter

8 Gallons purged prior to sampling

TIME	TEMP. °C	COND. mS/cm	pH	PHYSICAL APPEARANCE AND REMARKS
12:05	20.1	33.14	6.58	Silt/Sand to Clear with no odor.
				Samples Collected with Disposable Bailer
				BTEX (2-40ml VOA)
				Major Ions/TDS (1-1000ml Plastic)

COMMENTS:

Myron Model 6P instrument used to obtain pH, conductivity, and temperature measurements.

Delivered samples to Cardinal Laboratories in Hobbs, New Mexico for BTEX, Major Ions, and TDS analysis.

WELL SAMPLING DATA FORM

CLIENT: RICE *Operating Company* WELL ID: Monitor Well #3

SYSTEM: EME DATE: May 13, 2008

SITE LOCATION: L-6 Boot SAMPLER: Rozanne Johnson

PURGING METHOD: ☐ Hand Bailed ☑ Pump, Type: Purge Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ On-site Drum ☐ Drums ☑ SWD Disposal Facility

TOTAL DEPTH OF WELL: 55.75 Feet

DEPTH TO WATER: 37.81 Feet

HEIGHT OF WATER COLUMN: 17.94 Feet

WELL VOLUME: 2.9 Gal.

2 In. Well Diameter

10 Gallons purged prior to sampling

TIME	TEMP. °C	COND. mS/cm	pH	PHYSICAL APPEARANCE AND REMARKS
10:55	20.1	32.92	6.60	Silt/Sand to Clear with no odor.
				Samples Collected with Disposable Bailer
				BTEX (2-40ml VOA)
				Major Ions/TDS (1-1000ml Plastic)

COMMENTS:

Myron Model 6P instrument used to obtain pH, conductivity, and temperature measurements.

Delivered samples to Cardinal Laboratories in Hobbs, New Mexico for BTEX, Major Ions, and TDS analysis.

Analytical Report 292192

for

Rice Operating Co.

Project Manager: Kristin Pope

EME Jct. L-6 Boot Site

EME Jct. L-6 Boot

09-NOV-07

12600 West I-20 East Odessa, Texas 79765

A Xenco Laboratories Company

Texas certification numbers:
Houston, TX T104704215

Florida certification numbers:
Houston, TX E871002 - Miami, FL E86678 - Tampa, FL E86675

Houston - Dallas - San Antonio - Austin - Tampa - Miami - Latin America
Midland - Corpus Christi - Atlanta

09-NOV-07

Project Manager: **Kristin Pope**
Rice Operating Co.
122 West Taylor
Hobbs, NM 88240

Reference: XENCO Report No: **292192**
EME Jct. L-6 Boot Site
Project Address: T20S R37E Sec 6L, Lea County, NM

Kristin Pope:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 292192. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 292192 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron, II
Odessa Laboratory Manager

Sample Cross Reference 292192

Rice Operating Co., Hobbs, NM

EME Jct. L-6 Boot Site

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
B-1 (5'-7')	S	Oct-29-07 08:50		292192-001
B-1 (20'-22')	S	Oct-29-07 09:05		292192-002
MW-1 (30'-32')	S	Oct-31-07 10:55		292192-003
MW-3 (15'-17')	S	Oct-31-07 08:44		292192-004

Certificate of Analysis Summary 292192

Rice Operating Co., Hobbs, NM

Project Name: EME Jct. L-6 Boot Site

Project Id: EME Jct. L-6 Boot
Contact: Kristin Pope
Project Location: T20S R37E Sec 6L, Lea County, NM

Date Received in Lab: Wed Oct-31-07 05:05 pm
Report Date: 09-NOV-07
Project Manager: Brent Barron, II

Analysis Requested													
	Lab Id:	292192-001		292192-002		292192-003		292192-004					
	Field Id:	B-1 (5'-7')		B-1 (20'-22')		MW-1 (30'-32')		MW-3 (15'-17')					
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL					
	Sampled:	Oct-29-07 08:50		Oct-29-07 09:05		Oct-31-07 10:55		Oct-31-07 08:44					
BTEX by EPA 8021B	*Extracted:*	Nov-02-07 12:41											
	Analyzed:	Nov-03-07 02:17											
	Units/RL:	mg/kg	RL										
Benzene		0.0201	0.0056										
Toluene		0.1694	0.0056										
Ethylbenzene		0.3253	0.0056										
m,p-Xylene		1.514	0.0113										
o-Xylene		0.3354	0.0056										
Total Xylenes		1.8494											
Total BTEX		2.3642											
Inorganic Anions by EPA 300	*Extracted:*												
	Analyzed:			Nov-08-07 17:50		Nov-08-07 19:27		Nov-08-07 19:51					
	Units/RL:			mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride				4470	139	4730	118	109	27.7				
Percent Moisture	*Extracted:*												
	Analyzed:	Nov-01-07 09:30											
	Units/RL:	%	RL										
Percent Moisture		11.3	1.00										
TPH by SW8015 Mod	*Extracted:*	Nov-02-07 12:30											
	Analyzed:	Nov-03-07 19:22											
	Units/RL:	mg/kg	RL										
C6-C12 Gasoline Range Hydrocarbons		ND	16.9										
C12-C28 Diesel Range Hydrocarbons		329	16.9										
C28-C35 Oil Range Hydrocarbons		50.1	16.9										
Total TPH		379.1											

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Brent Barron
Odessa Laboratory Director

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the MQL and above the SQL.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

* Outside XENCO'S scope of NELAC Accreditation

Form 2 - Surrogate Recoveries

Project Name: EME Jct. L-6 Boot Site

Work Order #: 292192 **Project ID:** EME Jct. L-6 Boot

Lab Batch #: 707688 **Sample:** 292192-003 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg

BTEX by EPA 8021B	SURROGATE RECOVERY STUDY				
Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0323	0.0300	108	80-120	
4-Bromofluorobenzene	0.0340	0.0300	113	80-120	

Lab Batch #: 707688 **Sample:** 292192-003 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg

BTEX by EPA 8021B	SURROGATE RECOVERY STUDY				
Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0346	0.0300	115	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

Lab Batch #: 707688 **Sample:** 501055-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg

BTEX by EPA 8021B	SURROGATE RECOVERY STUDY				
Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0301	0.0300	100	80-120	
4-Bromofluorobenzene	0.0288	0.0300	96	80-120	

Lab Batch #: 707688 **Sample:** 501055-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg

BTEX by EPA 8021B	SURROGATE RECOVERY STUDY				
Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0325	0.0300	108	80-120	
4-Bromofluorobenzene	0.0273	0.0300	91	80-120	

Lab Batch #: 707688 **Sample:** 501055-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg

BTEX by EPA 8021B	SURROGATE RECOVERY STUDY				
Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0300	0.0300	100	80-120	
4-Bromofluorobenzene	0.0291	0.0300	97	80-120	

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: EME Jct. L-6 Boot Site

Work Order #: 292192 **Project ID:** EME Jct. L-6 Boot

Lab Batch #: 707820 **Sample:** 292192-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.1624	0.1500	108	80-120	
4-Bromofluorobenzene	0.1739	0.1500	116	80-120	

Lab Batch #: 707820 **Sample:** 501091-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0299	0.0300	100	80-120	
4-Bromofluorobenzene	0.0290	0.0300	97	80-120	

Lab Batch #: 707820 **Sample:** 501091-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0319	0.0300	106	80-120	
4-Bromofluorobenzene	0.0252	0.0300	84	80-120	

Lab Batch #: 707820 **Sample:** 501091-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0300	0.0300	100	80-120	
4-Bromofluorobenzene	0.0275	0.0300	92	80-120	

Lab Batch #: 707874 **Sample:** 292192-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg

TPH by SW8015 Mod Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	17.6	100	18	70-135	**
o-Terphenyl	9.26	50.0	19	70-135	**

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: EME Jct. L-6 Boot Site

Work Order #: 292192 **Project ID:** EME Jct. L-6 Boot

Lab Batch #: 707874 **Sample:** 501103-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg

TPH by SW8015 Mod Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	100	108	70-135	
o-Terphenyl	45.3	50.0	91	70-135	

Lab Batch #: 707874 **Sample:** 501103-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg

TPH by SW8015 Mod Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.2	100	91	70-135	
o-Terphenyl	44.6	50.0	89	70-135	

Lab Batch #: 707874 **Sample:** 501103-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg

TPH by SW8015 Mod Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	100	107	70-135	
o-Terphenyl	48.1	50.0	96	70-135	

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Blank Spike Recovery

Project Name: EME Jct. L-6 Boot Site

Work Order #: 292192 **Project ID:** EME Jct. L-6 Boot

Lab Batch #: 708123 **Sample:** 708123-1-BKS **Matrix:** Solid

Date Analyzed: 11/08/2007 **Date Prepared:** 11/08/2007 **Analyst:** MAB

Reporting Units: mg/kg **Batch #:** 1

Inorganic Anions by EPA 300 Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
	BLANK /BLANK SPIKE RECOVERY STUDY					
Chloride	ND	50.0	49.6	99	75-125	

Blank Spike Recovery [D] = 100*[C]/[B]
All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: EME Jct. L-6 Boot Site

Work Order #: 292192 **Project ID:** EME Jct. L-6 Boot

Analyst: SHE **Date Prepared:** 11/01/2007 **Date Analyzed:** 11/01/2007

Lab Batch ID: 707688 **Sample:** 501055-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BTEX by EPA 8021B	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY										
Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	ND	0.1000	0.1006	101	0.1	0.1006	101	0	70-130	35	
Toluene	ND	0.1000	0.1002	100	0.1	0.1005	101	0	70-130	35	
Ethylbenzene	ND	0.1000	0.1021	102	0.1	0.1032	103	1	71-129	35	
m,p-Xylene	ND	0.2000	0.2000	100	0.2	0.2021	101	1	70-135	35	
o-Xylene	ND	0.1000	0.1007	101	0.1	0.1019	102	1	71-133	35	

Analyst: SHE **Date Prepared:** 11/02/2007 **Date Analyzed:** 11/03/2007

Lab Batch ID: 707820 **Sample:** 501091-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BTEX by EPA 8021B	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY										
Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	ND	0.1000	0.0891	89	0.1	0.0868	87	3	70-130	35	
Toluene	ND	0.1000	0.0889	89	0.1	0.0860	86	3	70-130	35	
Ethylbenzene	ND	0.1000	0.0929	93	0.1	0.0877	88	6	71-129	35	
m,p-Xylene	ND	0.2000	0.1808	90	0.2	0.1710	86	6	70-135	35	
o-Xylene	ND	0.1000	0.0953	95	0.1	0.0900	90	6	71-133	35	

Relative Percent Difference RPD = 200*|(D-F)/(D+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: EME Jct. L-6 Boot Site

Work Order #: 292192 **Project ID:** EME Jct. L-6 Boot

Analyst: SHE **Date Prepared:** 11/02/2007 **Date Analyzed:** 11/03/2007

Lab Batch ID: 707874 **Sample:** 501103-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

TPH by SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY										
C6-C12 Gasoline Range Hydrocarbons	ND	1000	929	93	1000	935	94	1	70-135	35	
C12-C28 Diesel Range Hydrocarbons	ND	1000	933	93	1000	934	93	0	70-135	35	

Relative Percent Difference RPD = 200*|(D-F)/(D+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS / MSD Recoveries

Project Name: EME Jct. L-6 Boot Site

Work Order # : 292192 **Project ID:** EME Jct. L-6 Boot

Lab Batch ID: 707688 **QC- Sample ID:** 292192-003 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 11/01/2007 **Date Prepared:** 11/01/2007 **Analyst:** SHE

Reporting Units: mg/kg

BTEX by EPA 8021B Analytes	MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY										
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	ND	0.1000	0.0859	86	0.1000	0.0904	90	5	70-130	35	
Toluene	ND	0.1000	0.0828	83	0.1000	0.0862	86	4	70-130	35	
Ethylbenzene	ND	0.1000	0.0814	81	0.1000	0.0860	86	6	71-129	35	
m,p-Xylene	ND	0.2000	0.1661	83	0.2000	0.1715	86	4	70-135	35	
o-Xylene	ND	0.1000	0.0826	83	0.1000	0.0869	87	5	71-133	35	

Lab Batch ID: 708123 **QC- Sample ID:** 292192-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 11/08/2007 **Date Prepared:** 11/08/2007 **Analyst:** MAB

Reporting Units: mg/kg

Inorganic Anions by EPA 300 Analytes	MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY										
	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	4470	1390	5930	105	1390	7100	189	57	75-125	20	XF

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

Relative Percent Difference RPD = 200*(D-G)/(D+G)

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not ApplicableN = See Narrative, EQL = Estimated Quantitation Limit

Sample Duplicate Recovery

Project Name: EME Jct. L-6 Boot Site

Work Order #: 292192

Lab Batch #: 708123 **Project ID:** EME Jct. L-6 Boot
Date Analyzed: 11/08/2007 **Date Prepared:** 11/08/2007 **Analyst:** MAB
QC- Sample ID: 292192-002 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: mg/kg

Inorganic Anions by EPA 300	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Chloride	4470	4460	0	20	

Lab Batch #: 707814
Date Analyzed: 11/01/2007 **Date Prepared:** 11/01/2007 **Analyst:** RBA
QC- Sample ID: 292190-001 D **Batch #:** 1 **Matrix:** Soil
Reporting Units: %

Percent Moisture	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture	4.81	5.34	10	20	

Spike Relative Difference RPD 200 * | (B-A)/(B+A) |
All Results are based on MDL and validated for QC purposes.

Environmental Lab of Texas/Xenco Laboratories

12600 West I-20 East
Odessa, Texas 79763
Phone: 432-563-1800
Fax: 432-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Kristin Pope
Company Name: RICE Operating Company
Company Address: 122 West Taylor, Hobbs, New Mexico 88240
Telephone No: 505-393-9174 Fax No: 505-397-1471
Email Recipients: kpope@riceswd.com, lweinheimer@riceswd.com, gil@trident-environmental.com
Sampler Signature:

Project Name: EME Jct. L-6 Boot Site
Project #: EME Jct. L-6 Boot
Project Loc: T20S R37E Sec 6L, Lea County, NM
PO #:

(lab use only)
ORDER #: 292192

FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	HNO3	HCl	NaOH	H2SO4	None	Other (Specify)	Matrix: Water	Sludge	Soil	Other (specify)	Analyze For: TPH 418.1 (8015M) 1005 1006	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	SAR / ESP / CEC	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles (8260B)	Semivolatiles (8270)	HTEX 8021B(5030)	RCI	pH	TDS: 160	Chloride (300.1)	RUSH TAT (Pre-Schedule)	Standard TAT
01	B-1 (5'-7')	10-29-07	0850	1	✓								✓		X							X				X		✓
02	B-1 (20'-22')	10-29-07	0905	1	✓								✓		X							X				X		✓
03	MW-1 (30'-32')	10-31-07	1055	1	✓								✓		X							X				X		✓
04	MW-3 (15'-17')	10-31-07	1344	1	✓								✓		X							X				X		✓

Special Instructions: Please email copy of lab analysis report to recipients listed above.

Sample Containers Intact? Y N
Temperature Upon Receipt: 6.0
Laboratory Comments:
4 - 4 oz glass
ID on Lid.

Relinquished by	Date	Time	Received by	Date	Time
	10/31/07	1705			
Relinquished by	Date	Time	Received by ELOT:	Date	Time
			Andrea Leam	10-31-07	17:05

Environmental Lab of Texas/Xenco Laboratories

12600 West I-20 East
Odessa, Texas 79763
Phone 432-563-1800
Fax 432-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Kristin Pope

Company Name: RICE Operating Company

Company Address: 122 West Taylor, Hobbs, New Mexico 88240

Telephone No: 505-393-9174 Fax No: 505-397-1471

Email Recipients: kpope@riceswd.com, lweinheimer@riceswd.com, gil@trident-environmental.com

Sampler Signature:

Project Name: EME Jct. L-6 Boot Site

Project #: EME Jct. L-6 Boot

Project Loc: T20S R37E Sec 6L, Lea County, NM

PO #:

(lab use only)
ORDER #:

FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	HNO3	HCl	H2SO4	NaOH	Zn Acetate	Other (Specify)	Matrix: Water	Sludge	Soil	Other (Specify)	Analyze For: TPH 418.1 (8015M) TRRP 1005	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	TCLP Herbicides	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	Volatiles 8260B	Semivolatiles 8270C	BTEX 8021B 5030	PAH	MCRA	TDS 160.1	Chloride (EPA 300.0)		IRUSH TAT (Pre-Schedule)	Standard TAT
B-1 (5'-7')	10-29-07	0850	1	✓									✓		✓								✓				✓			✓
B-1 (20'-22')	10-29-07	0905	1	✓									✓		✓								X				✓			✓
MW-1 (30'-32')	10-31-07	1055	1	✓									✓		X								X				✓			✓
MW-3 (15'-17')	10-31-07	0844	1	✓									✓		X								X				✓			✓

Special Instructions: Please email copy of lab analysis report to recipients listed above.

Sample Containers Intact? Y N
Temperature Upon Receipt: 6.0
Laboratory Comments:
4 - 4oz glass
ID on Lid.

Relinquished by	Date	Time	Received by	Date	Time
	10/31/07	1705			
Relinquished by	Date	Time	Received by ELOT:	Date	Time
			Andrea Lann	10-31-07	17:05

Environmental Lab of Texas

Variance/ Corrective Action Report- Sample Log-In

Client: Rice

Date/ Time: 10.31.07 17.05

Lab ID #: 292192

Initials: CL

Sample Receipt Checklist

				Client Initials
#1	Temperature of container/ cooler?	(Yes)	No	6.0 °C	
#2	Shipping container in good condition?	(Yes)	No		
#3	Custody Seals intact on shipping container/ cooler?	Yes	No	~~Not Present~~	
#4	Custody Seals intact on sample bottles/ container?	Yes	No	~~Not Present~~	
#5	Chain of Custody present?	(Yes)	No		
#6	Sample instructions complete of Chain of Custody?	(Yes)	No		
#7	Chain of Custody signed when relinquished/ received?	(Yes)	No		
#8	Chain of Custody agrees with sample label(s)?	Yes	No	ID written on Cont./ Lid	
#9	Container label(s) legible and intact?	(Yes)	No	Not Applicable	
#10	Sample matrix/ properties agree with Chain of Custody?	(Yes)	No		
#11	Containers supplied by ELOT?	(Yes)	No		
#12	Samples in proper container/ bottle?	(Yes)	No	See Below	
#13	Samples properly preserved?	(Yes)	No	See Below	
#14	Sample bottles intact?	(Yes)	No		
#15	Preservations documented on Chain of Custody?	(Yes)	No		
#16	Containers documented on Chain of Custody?	(Yes)	No		
#17	Sufficient sample amount for indicated test(s)?	(Yes)	No	See Below	
#18	All samples received within sufficient hold time?	(Yes)	No	See Below	
#19	Subcontract of sample(s)?	Yes	No	Not Applicable	
#20	VOC samples have zero headspace?	(Yes)	No	Not Applicable	

Variance Documentation

Contact: _____ Contacted by: _____ Date/ Time: _____

Regarding: _____

Corrective Action Taken: _____

Check all that Apply:

- ☐ See attached e-mail/ fax
- ☐ Client understands and would like to proceed with analysis
- ☐ Cooling process had begun shortly after sampling event

Carrie Kelly

From: Gil Van Deventer [gilbertvandeventer@suddenlink.net]
Sent: Monday, November 05, 2007 5:53 PM
To: carrie.kelly@xenco.com
Cc: Brent Barron; Lara Weinheimer
Subject: Revised COC for EME Jct L-6 Boot
Attachments: COC_L-6_103107_rev.pdf

Carrie

I just noticed that I inadvertently checked off the TPH & BTEX analysis boxes instead of the chloride boxes as intended on the chain of custody for three samples I submitted last Wednesday. I have attached the revised COC. Please accept my apologies for this inconvenience and let me know if I need to compensate for any costs resulting from my error.

Requested analyses:
B-1 (5' - 7') TPH (8015) and BTEX (8021B)
B-1 (20' 22') Chloride only
MW-1 (30' 32') Chloride only
MW-3 (15' - 17') Chloride only

Thanks - Gil

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

11/6/2007

APPENDIX D

NMOCD CORRESPONDENCE

From: Hansen, Edward J., EMNRD
Sent: Tuesday, August 12, 2008 4:35 PM
To: 'Hack Conder'
Cc: Price, Wayne, EMNRD; 'Marvin Burrows'
Subject: Workplans for 1R427-09, 1R426-09, 1R428-76, and 1R427-172

Dear Mr. Conder:

The New Mexico Oil Conservation Division (OCD) has determined after reviewing your Notification of Groundwater Impact for each of the following four sites:

1) Rice EME L-6 Boot
Unit L, Section 6, T20S, R37E
Lea County, New Mexico
OCD Case #1R0427-09

2) Rice BD H-19
Unit H, Section 19, T21S, R37
Lea County, New Mexico
OCD Case #1R0426-09

3) Rice Hobbs Jct. M-4
Unit M, Section 4, T19S, R38E
Lea County, New Mexico
OCD Case #1R0428-76

4) Rice EME Gaither Boot
Unit I, Section 34, T19S, R36E
Lea County, New Mexico
OCD Case #1R0427-172

that the Rice Operating Company (ROC) must submit for each of the four sites a separate corrective action workplan in accordance with OCD Rule 116 (19.15.3.116 NMAC) to remediate the ground water contamination at each of these sites. The workplans must include a schedule for immediate implementation of groundwater remediation and source control. The workplans must be submitted to the OCD Santa Fe Office within 30 days.

Specifically, the workplan for the Rice EME L-6 Boot site must include that an estimation of the chloride mass that has contaminated the groundwater by the release at the Rice EME L-6 Boot Site and a plan for the removal of that chloride mass from the groundwater. An existing groundwater monitoring well may be used for this purpose. Also, please propose a treatment and / or disposal method for that chloride mass.

Also, for the Rice EME Gaither Boot additional site investigation must be performed at the site; i.e., an upgradient groundwater monitoring well must be installed at the site to determine the regional background groundwater quality. If the background quality is similar to the downgradient well sample results, then the workplan must include that an estimation of the chloride mass that has contaminated the groundwater by the release at the Rice EME Gaither Boot Site and a plan for the removal of that chloride

mass from the groundwater. An existing groundwater monitoring well may be used for this purpose. Also, please propose a treatment and / or disposal method for that chloride mass. *[However, if the background quality is not similar to the downgradient well sample results, then an Abatement Plan may be required. Therefore, please submit the analytical results for the upgradient well to the OCD prior to submitting the workplan. Additional time for submittal of the workplan for this site may be requested.]*

ROC should submit one paper copy and an electronic copy on CD for each of the workplans and for all future workplans and/or reports for each of the sites. Please be sure to include the current corresponding OCD Case # on each of the respective workplans. If you have any questions regarding this matter, please call me at (505) 476-3489.

Edward J. Hansen
Hydrologist
Environmental Bureau