

AP - 66

STAGE 1 & 2 WORKPLANS

DATE:

Dec. 5, 2005

December 5, 2005

Stage I Abatement Plan



EME N-5 Junction

R.T. HICKS CONSULTANTS, LTD.

901 RIO GRANDE BLVD. NW, SUITE F-142, ALBUQUERQUE, NM 87104

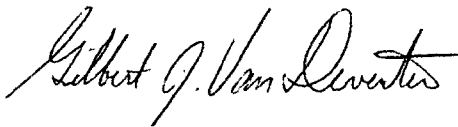
STAGE 1 ABATEMENT PLAN

EME N-5 JUNCTION BOX SITE **T20S, R37E, SECTION 5, UNIT LETTER N** **LEA COUNTY, NEW MEXICO**

Prepared for:

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DECEMBER 5, 2005

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DATE:

DECEMBER 5, 2005

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1.0 EXECUTIVE SUMMARY

The N-5 Junction Box site is operated by Rice Operating Company (ROC) and is located in Township 20 South, Range 37 East, Section 5, unit letter N approximately 3 miles southwest of Monument, NM.

Identification of soil and ground water impacts occurred during junction box upgrade operations as part of the approved Junction Box Upgrade Program in August 2001. This Stage 1 Abatement Plan incorporates the preliminary findings from previous investigations and the contents of an Investigation and Characterization Plan (ICP) submitted on March 11, 2005, that satisfy the required elements of a Stage 1 Abatement Plan in accordance with New Mexico Oil Conservation Division (NMOCD) Rule 19. Section 7.0 of this report describes the abatement options that were evaluated and proposed to further satisfy the Stage 1 elements. Quality assurance protocols and the proposed schedule of activities are included in sections 8.0 and 9.0, respectively.

The source of this impact is historic. The upgrade 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 and evaluate the extent of ground water impact by historical releases from the junction box or other off site sources. Depth to ground water beneath the site area is approximately 33 feet below ground surface. The constituents of concern include chloride, sulfate, total dissolved solids (TDS), and benzene, toluene, ethylbenzene, and xylenes (BTEX). Additional assessment is also necessary to assist ROC in selecting the appropriate soil and/or ground water remedy.

When implementing 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.

ROC is the service provider (operator) for the EME SWD System and has no ownership of any portion of the pipeline, well, or facility. The System is owned by a consortium of oil producers, (System Partners) who provide all operating capital on a percentage ownership/usage basis. Environmental projects of this magnitude require System Partner Authorization for Expenditure (AFE) approval and work begins as funds are received. In general, project funding is not forthcoming until NMOCD approves the work plan.

2.0 CHRONOLOGY OF EVENTS

The subsurface soils at the N-5 junction box site were initially investigated on August 17, 2001, by trenching with a backhoe and field-testing for chloride and hydrocarbon levels. This investigation indicated chloride and hydrocarbon impact to the vadose zone.

On December 20, 2001, three soil borings were performed 20 feet to the south, west, and north of the junction box for further delineation of impacted soils.

A monitoring well (MW-1) was installed within a few feet northwest of the former junction box on January 10, 2002, and has been sampled and analyzed for BTEX, major ions, and TDS on a quarterly basis since that date.

ROC submitted notification of ground water impact to the NMOCD on January 18, 2002.

During 2003 the replacement of the existing junction box with a lined watertight plastic junction box was completed after the replacement of the 10-inch diameter A/C pipeline with 6-inch diameter PVC pipeline for continuance to the M-5 SWD system.

The Annual Monitor Well Reports for the N-5 Junction Box site were submitted annually with the most recent submission on January 21, 2005.

On December 8, 2004, Mr. Wayne Price of the NMOCD office in Santa Fe requested a ground water investigation and remediation plan for the N-5 Junction Box site.

Trident Environmental submitted an Investigation and Characterization Plan (ICP) on March 11, 2005, to address potential environmental concerns at the above-referenced site.

On May 5, 2005, Mr. Daniel Sanchez of the NMOCD requested that ROC submit an abatement plan to the NMOCD pursuant to Rule 19.

3.0 BACKGROUND

3.1 SITE LOCATION AND LAND USE

The N-5 Junction Box site is located on Bureau of Land Management (BLM) Land in Township 20 South, Range 37 East, Section 5, unit letter N, approximately 3 miles southwest of Monument, NM as shown on the attached Site Location Map (Plate 1). Land in the site area is primarily utilized for crude oil production and cattle ranching. According to production data records from the NMOCD Online database, Read & Stevens Inc., Lynx Petroleum Consultants Inc., and Nadel & Gussman Permian, LLC, are actively producing crude oil and gas in the area. Plate 2 is an aerial photograph of the area showing this land use.

3.2 NATURE OF RELEASE AND SUMMARY OF PREVIOUS WORK

The subsurface soils at the N-5 junction box site were initially investigated on August 17, 2001, by trenching with a backhoe and field-testing for chloride and hydrocarbon levels. This investigation indicated chloride and hydrocarbon impact to the vadose zone. On December 20, 2001, three soil borings were performed 20 feet south, west, and north of the junction box. To further assess if ground water was impacted with chlorides, a monitoring well (MW-1) was installed within a few feet northwest of the former junction box on January 2002, and has been sampled and analyzed for BTEX, major ions, and TDS on a quarterly basis since that date. During 2003, the replacement of the existing junction box with a lined watertight plastic junction box was completed after the replacement of the 10-inch diameter A/C pipeline with 6-inch diameter PVC pipeline for continuance to the M-5 SWD system, which is located approximately ½ mile northwest of the N-5 junction box site.

4.0 GEOLOGY AND HYDROGEOLOGY

4.1 REGIONAL AND LOCAL GEOLOGY

According to published information (Nicholson and Clebsch, 1961 and Barnes, 1976) the site is underlain by Quaternary colluvial deposits composed of sand, silt, and gravel deposited by slopewash, and talus from the Ogallala Formation. The colluvial deposits are often calichified (indurated with cemented calcium carbonate) with caliche layers from 1 to 20-feet thick. The lithology of the colluvial deposits is very similar to that of the Ogallala since the Ogallala is the source of the re-deposited colluvial sediments. The nearest outcropping of the Ogallala Formation occurs approximately one mile north of Monument along what is known as the Llano Estacado (caprock). The thickness of the colluvium deposits and Ogallala Formation is approximately 75-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. The thickness of the Dockum Group is estimated at approximately 300-feet in the site area although its thickness in southern Lea County varies from 0 to 1,270-feet thick (Nicholson and Clebsch, 1961).

Based on the descriptions provided in lithologic logs, the subsurface soils are composed of caliche, poorly graded sand, sandstone stringers, and fine-grained sand. Lithologic logs for three borings are included in Appendix A.

4.2 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.

The regional gradient of the Ogallala aquifer in the site area generally flows toward the southeast and the hydraulic gradient varies from approximately 0.001 to 0.01 feet/feet. Recharge to the Ogallala aquifer occurs primarily by infiltration of precipitation at a slow rate (typically one quarter to one half inch of water per year) due to the characteristically arid climate of southern Lea County (Nicholson and Clebsch, 1961). Hydraulic conductivity values are estimated between 26 and 50-feet per day and specific yields of 0.23 for the Ogallala aquifer near the site area based on limited published information (McAda, 1984). There are no surface water bodies located within a mile of the site.

Depth to ground water beneath the site area is approximately 33 feet below ground surface. A regional ground water gradient map that includes the N-5 junction box, P-6 line leak, M-5 SWD, and E-5 junction box sites is shown in Plate 3.

4.3 WATER WELL INVENTORY

The purpose of a water well inventory is two-fold. First and foremost is to identify the location of potential water supply receptors (domestic, irrigation, or livestock wells). Secondly, it can assist in defining the regional ground water gradient and establishing background water quality conditions. A field survey was conducted on June 10, 2005, to verify the existence of the wells identified from the sources specified in the following sections. Plate 4 depicts the approximate location of the wells identified in this section.

4.3.1 USGS MONUMENT SW TOPOGRAPHIC MAP

According to the USGS Monument SW topographic map, there are two windmills located approximately 0.8 miles southwest of the site in Section 7, unit letter H, and 1.0 miles southeast in Section 8, unit letter I, respectively. Information regarding these windmills was not found in the other databases used for this inventory. Both of these out of service windmills were verified during field operations.

4.3.2 NMOCD OFFICE IN HOBBS

Based on records at the NMOCD office in Hobbs, the five sites listed below are being investigated for ground water impairment.

Table 1: NMOCD Ground Water Investigation Sites Within 1 mile of the Site

Site Name	Site Operator	No. of MWs	Distance from Site
Bertha Barber Site	Marathon Oil Co.	~ Fifteen	~1/3 mi. NE
JR Phillips #2 Tank Battery Site	ChevronTexaco	Nine	~0.9 mi. NW
M-5 SWD Site	Rice Operating Co.	One	~500 ft ESE
P-6 Line Leak Site	Rice Operating Co.	Two	~1/3 mi. WNW
K-6 Junction Box Site	Rice Operating Co.	One	~2/3 mi. WNW

4.3.3 USGS NATIONAL WATER INFORMATION SYSTEM (NWISWS) WEBSITE

One water well designated with the site name 20S.37E.05.13440 has been monitored by the USGS since 1968. The well is located approximately 0.4 miles north-northwest of the site. This well has been used for livestock watering, however it was not in use during the field survey.

4.3.4 NMSEO IW.A.T.E.R.S. WEBSITE

According to the iW.A.T.E.R.S. website of the New Mexico Office of the State Engineer, 22 water wells have been identified within a 1-mile radius of the site as listed below.

Table 2: NMOSE Registered Wells Within 1 mile of the Site

File No.	T20S R37E Section	Well Use	Permit Date	Original Owner	Distance from Site
L1145	6.414	PRO	06/22/1951	Gulf Oil Co.	0.7 mi. WNW
L1253	8.231	PRO	08/26/1953	Gulf Oil Co.	0.5 mi. SE
L1450	5.130	PRO	05/29/1952	Marathon Oil Co.	0.6 mi. NNW
L1487	6.414	PRO	07/15/1952	Gulf Oil Co.	0.7 mi. WNW
L1572	5.331	PRO	09/15/1952	Exploration Drilling Co.	0.3 mi. WNW
L2102	5.340	PRO	03/30/1953	E. F. Moran Inc.	0.13 mi. SW
L2139	8.222	PRO	04/15/1953	Gackle Drilling Co.	0.6 mi. ESE
L2274	8.130	PRO	07/14/1953	Sinclair Oil Co.	0.5 mi. SSW
L2278	5.430	DOM	09/28/1987	Laughlin Estate	0.3 mi. E
L2460	7.210	PRO	01/25/1954	Moran Drilling Co.	0.8 mi. WSW
L2463	8.321	PRO	02/01/1954	Amerada Petroleum Co.	0.7 mi. S
L2483	8.144	PRO	03/08/1954	Moran Drilling Co.	0.6 mi. SSE
L2488	5.230	PRO	02/24/1954	The Texas Co.	0.6 mi. NE
L2497	5.333	PRO	04/01/1954	Amerada Petroleum Co.	0.3 mi. WSW
L2533	7.230	PRO	05/12/1954	Moran Drilling Co.	0.6 mi. WSW
L2553	6.434	PRO	06/01/1954	Gulf Oil Co.	0.6 mi. W
L2801	6.233	PRO	03/22/1955	Amerada Petroleum Co.	0.9 mi. NW
L3810	6.144	PRO	05/10/1962	Texaco Inc.	1.0 mi. NW
L4619	6.423	PRO	03/29/1961	Gulf Oil Co.	0.6 mi. NW
L5980	4.300	DOM	07/06/1966	M. E. Laughlin	0.9 mi. E
L7619	8.422	IRR	10/08/1976	Jim Cooper	0.7 mi. SSW
L7619S	8.411	IRR	10/08/1976	Jim Cooper	0.8 mi. SW

PRO – Prospecting for oil & gas production. Water supply for oil & gas drilling

IRR – Irrigation well

DOM – Domestic well

Eighteen of the permitted wells in the preceding table were apparently constructed for temporary water supply for oil well drilling. In accordance with requirements of the NMSEO, these wells were to be plugged upon completion of the permitted use; therefore it is presumed that they no longer exist, with the exception of well no. L3810, which was located during the field survey and found to be abandoned but intact.

Four of the permitted wells in the preceding table were identified during the field survey:

- L2278: Active water supply well (livestock watering)
- L5980: Active water supply well (oil field water supply)
- L7619: Water supply well (not in use; purpose unknown)
- L7619S: Active water supply well (oil field water supply)

5.0 SUBSURFACE SOILS

A summary of all preliminary soil sampling performed to date is shown in Plate 5. Soil delineation field activities were initiated on August 17, 2001, as part of the Junction Box Upgrade Program. Investigation activities were conducted with a backhoe by trenching to 18-feet below ground surface (bgs) adjacent to the south side of the junction box. Soil samples were analyzed in the field for chlorides using field-adapted Method 9253 (QP-03) and screened with a Mega TPH Analyzer (field modified Method 418.1). Field chlorides steadily decreased from a maximum concentration of 500 milligrams per kilogram (mg/kg) at 6.5 feet bgs to 300 mg/kg at the bottom of the trench (18 feet bgs).

To further delineate depth of impact in the vadose zone, three soil borings were performed 20-feet to the south, west, and north of the junction box on December 20, 2001. Soil samples were again analyzed in the field for chlorides using field-adapted Method 9253 and screened with a Mega TPH Analyzer. Field chlorides in borings SB-1 and SB-2 recorded a concentration of 100 mg/kg throughout each boring. In boring SB-3 chlorides decreased from a maximum concentration of 500 mg/kg at 16 feet bgs to 100 mg/kg at 26 feet bgs. Copies of the lithologic logs for the boring are included in Appendix A.

Based on the results of the three borings a monitoring well (MW-1) was installed within a few feet of the northwest side of the junction box on January 10, 2002, to a depth of 40-feet bgs. Laboratory analytical results for gas range organics (GRO) and diesel range organics (DRO) using EPA Method 8015M of a sample near the interface of the vadose zone and saturated zone indicated a GRO concentration of <50 milligrams per kilogram (mg/kg) and DRO concentration of 445 mg/kg at 36 feet bgs. Benzene and total BTEX concentrations of <0.005 mg/kg and 0.479 mg/kg, respectively, were reported by the laboratory using EPA Method 8021B for the same sample interval. The laboratory-determined chloride concentration for this sample was 80 mg/kg. Copies of the laboratory analytical report and chain of custody form for the monitoring well sample is included in Appendix B.

6.0 GROUND WATER QUALITY

6.1 MONITORING PROGRAM

Monitoring well (MW-1) has been sampled on a quarterly basis for major ions, TDS, and BTEX. A summary of historical analytical results and ground water elevations is listed in Table 1. Analytical results for the most recent sampling event conducted on August 11, 2005, are also depicted in graphical format in Figure 1 (see below). A copy of the laboratory analytical report and chain of custody form for the most recent ground water sampling event is included in Appendix B.

6.2 HYDROCARBONS IN GROUND WATER

Benzene concentrations in monitoring well MW-1 have been below the laboratory detection limit of 0.001 mg/L for each sampling event. BTEX concentrations for each constituent have been below the WQCC standards for all sampling events.

6.3 OTHER CONSTITUENTS OF CONCERN

Chloride concentrations in monitoring well MW-1 (1,860 mg/L) exceed the WQCC standard of 250 mg/L.

The TDS concentration in monitoring well MW-1 (4,480 mg/L) exceeds the WQCC standard of 1,000 mg/L.

Background and up-gradient concentrations of these compounds are unknown. Chloride and TDS concentrations in monitoring well MW-1 had remained relatively stable, however they have steadily increased since the May 2004 sampling event. This increase in chloride and TDS concentrations may relate to a corresponding decrease in ground water levels over the same period, or may be due to incoming migration from an offsite, up-gradient source.

Table 3: Summary of Ground Water Monitoring Results

Monitoring Well	Sample Date	Depth to Ground water (feet BTOC)	Ground water Elevation (feet AMSL)	Chloride (mg/L)	TDS (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylene (mg/L)
MW-1	01/10/02	35.50	3503.85	1,160	2,652	<0.002	<0.002	<0.006	<0.006
	05/13/02	37.47	3501.88	993	2,520	<0.001	0.002	0.003	0.009
	08/12/02	37.75	3501.60	939	2,700	<0.001	<0.001	<0.001	0.001
	11/04/02	37.90	3501.45	1,200	3,083	<0.002	<0.002	<0.002	<0.006
	03/14/03	37.78	3501.57	1,050	2,310	<0.001	0.002	0.004	0.011
	05/29/03	38.00	3501.35	1,130	3,230	<0.001	0.001	0.004	0.01
	08/22/03	38.42	3500.93	1,200	2,930	---	---	---	---
	11/20/03	38.63	3500.72	1,150	3,200	<0.001	0.002	0.003	0.012
	02/20/04	38.50	3500.85	1,180	2,575	<0.002	<0.002	<0.002	<0.006
	05/26/04	37.80	3501.55	1,000	2,583	<0.002	0.005	0.005	0.010
	09/02/04	37.94	3501.41	1,150	3,170	<0.001	0.001	0.002	0.003
	12/21/04	35.12	3504.23	1,330	3,990	<0.001	<0.001	<0.001	<0.001
	01/26/05	34.03	3505.32	1,810	4,280	<0.001	<0.001	0.001	0.001
	02/08/05	33.79	3505.56	1,640	4,280	<0.001	<0.001	0.002	0.001
	05/02/05	34.50	3504.85	2,140	5,680	<0.001	<0.001	0.003	0.002
	08/11/05	33.39	3505.96	1,860	4,480	<0.001	<0.001	<0.001	<0.001
WQCC Standards				250	1000	0.01	0.75	0.75	0.62

Figure 1
EME N-5 Junction Box Site
Chloride, TDS, and Water Table Elevation Values Versus Time Graph (MW-1)



7.0 STAGE 1 ABATEMENT PLAN

7.0 WATER WELL INVENTORY

If access is granted and the well is in usable condition, the wells identified in the water well inventory in section 4.3 will be evaluated for use in defining the regional ground water gradient, establishing background water quality conditions, and identifying potential off site sources.

7.2 EVALUATE CONSTITUENTS OF CONCERN IN THE VADOSE ZONE AND GROUND WATER

Further delineation of the vertical and lateral extent of impact will be accomplished with soil borings. Soil samples will be collected from soil borings at regular depth intervals no less than five feet, screened in the field using a photoionization detector (PID) and field tested for chlorides (QP-03). Soil lithology and the presence of any observed staining or odor will be recorded. Ten percent (10%) of the soil samples will be submitted for laboratory analysis as confirmation of the field sampling. The following concentrations of analytes will be used to delineate the lateral and vertical extent of impact to the vadose zone:

- o 100 ppm OVM, and/or 10 mg/kg benzene and 50 mg/kg BTEX
- o 250 ppm chloride

Depth to ground water at the site is approximately 33-feet bgs. Additional monitoring wells may be installed based on delineation results and the presence or absence of existing wells. If existing wells are not present or ROC can not obtain access to existing wells, one up-gradient and one down-gradient well will be installed.

7.3 STAGE 2 ABATEMENT PLAN

A Stage 2 Abatement Plan detailing results of the investigation activities described above will be submitted to the NMOCD. The Stage 2 Abatement Plan will include the abatement options that will be evaluated and the proposed remedy to further satisfy the Stage 2 elements.

8.0 QUALITY ASSURANCE / QUALITY CONTROL

Sampling and analytical procedures shall be performed in accordance with Title 20 NMAC 6.3107.B and Section 103 of the Water Quality Standards for Interstate and Intrastate Streams in New Mexico (20 NMAC 6.1). Specific quality procedures for collecting and analyzing soil and ground water samples are included in Appendix C.

9.0 PROPOSED SCHEDULE OF ACTIVITIES

The proposed schedule of activities is listed in Table 4 below.

Table 4: Proposed Schedule of Activities

Task	Date of Task Completion
Submission of Progress Reports to NMOCD	Quarterly beginning 30 days from approval of Stage 1 Abatement Plan by NMOCD
Ground water Monitoring	Continued on a quarterly frequency.
Water well inventory and evaluation of constituents of concern in the vadose zone and ground water.	Within 45 days of Stage 1 Abatement Plan approval by NMOCD
Submission Stage 2 Abatement Plan	Within 45 days after completion of tasks summarized in the Stage 1 Abatement Plan

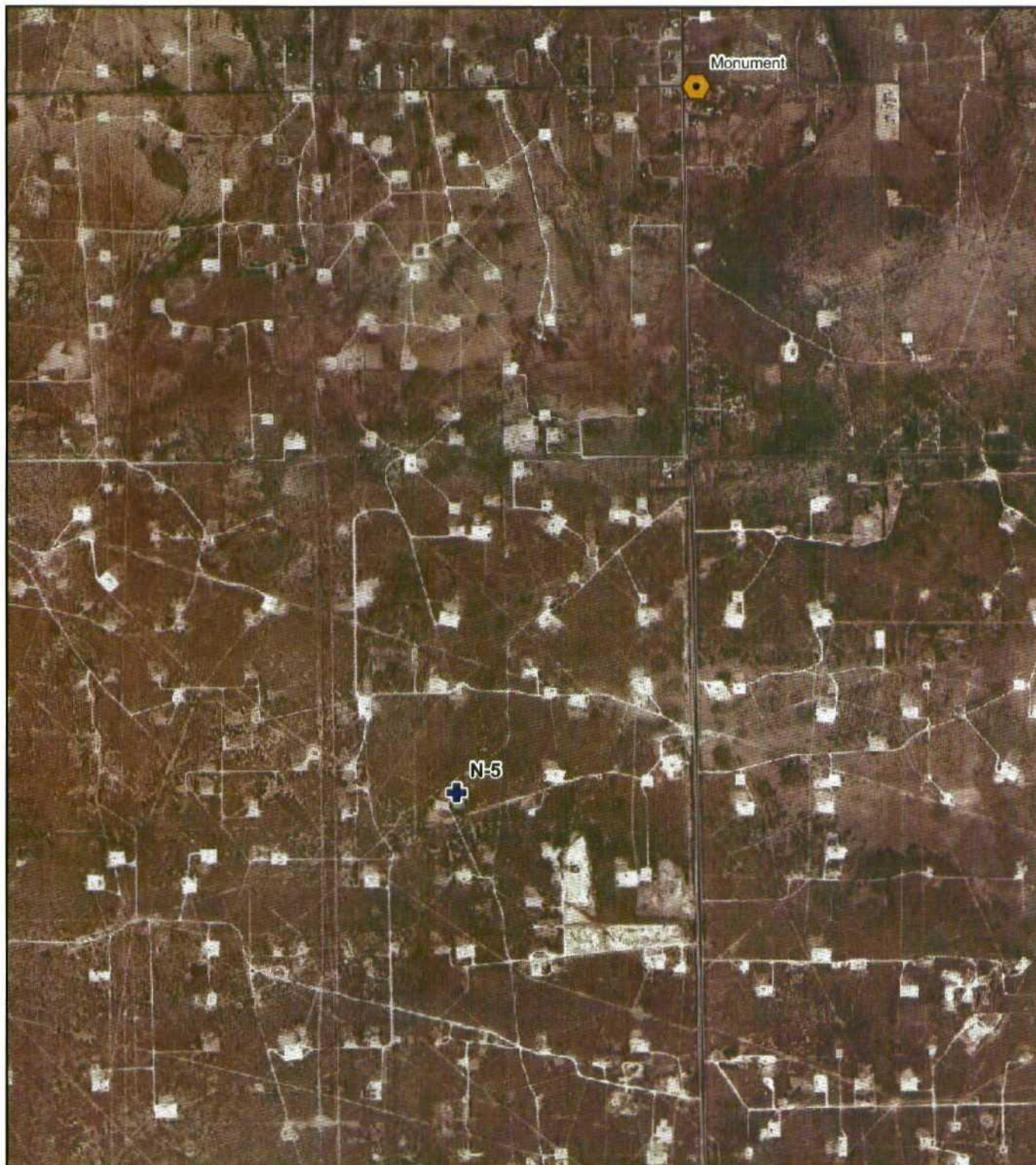
It may be necessary to extend the completion dates for the tasks outlined above dependent on contractor availability, weather conditions, or other unforeseen considerations.

PLATES

This is a topographic map of a region in Montana, centered around the town of Field. The map features a grid of latitude and longitude lines. Key geographical features include:

- Field, Montana:** Labeled in the upper left quadrant.
- N-S Junction Box:** A specific point of interest marked in the center-right area.
- Proposed Road:** A thick black line with a dotted pattern, indicating a planned route. It starts at the bottom of the map and runs north, passing near the N-S Junction Box.
- Topography:** Contour lines and elevation points (e.g., 3500, 3550, 3600) are used to show the terrain's elevation.
- Other Labels:** Various smaller labels such as 'FIELD', 'N-S Junction Box', and 'FIELD' are scattered across the map.

December 2005



Source: <http://rgis.unm.edu> (2004)

0 1,250 2,500 5,000 7,500 Feet



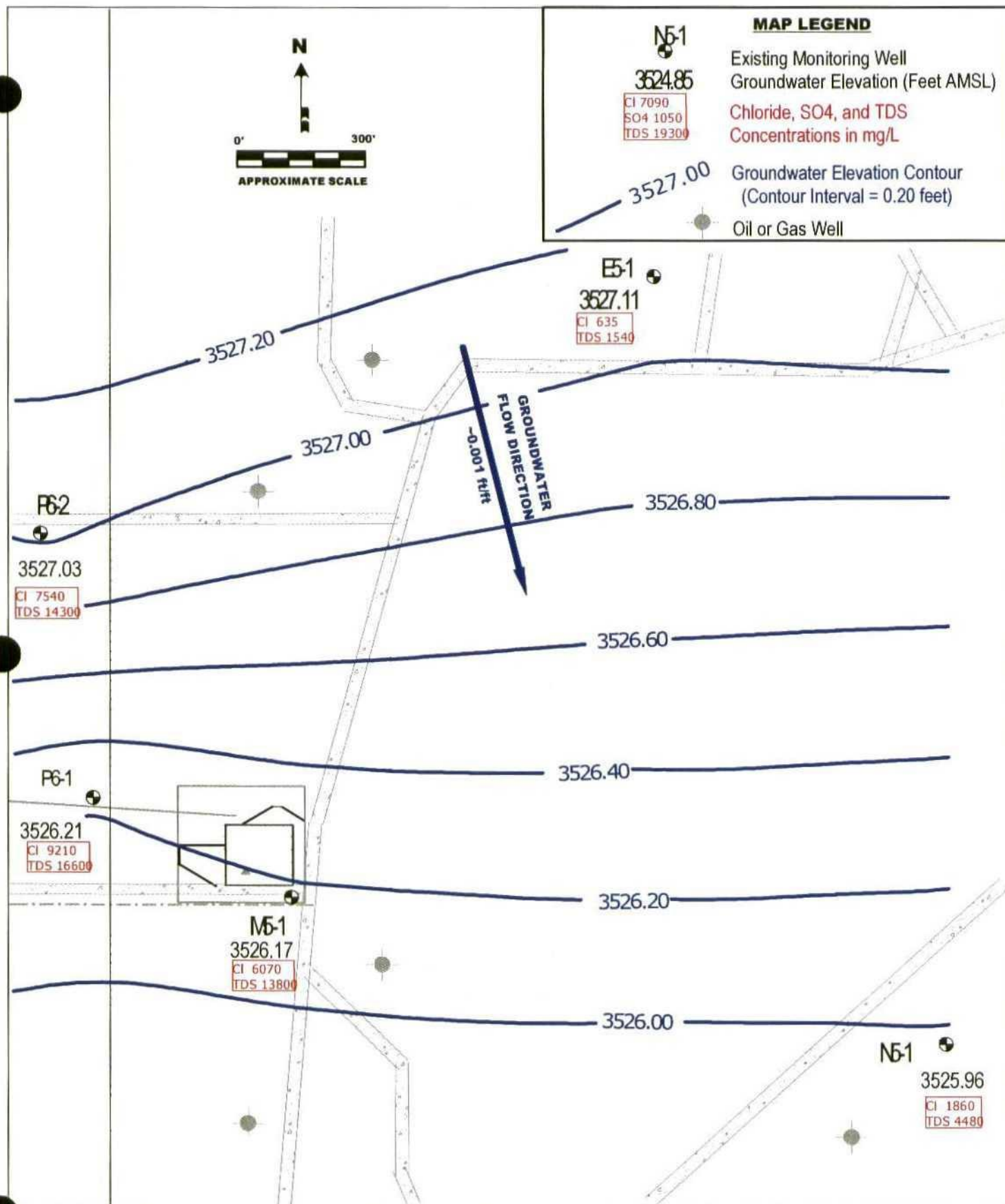
R.T. Hicks Consultants, Ltd
1909 Brunson Ave.
Midland, TX 79701
Ph: 432-638 8740
Fax: 413-403-9968

2004 Aerial Photo: N-5 site

Plate 2

ROC N-5 Stage 1 Abatement Plan

November 2005



R. T. HICKS CONSULTANTS, LTD.

1909 Brunson Ave., Midland TX 79701

Site: EME N-5 Junction Box

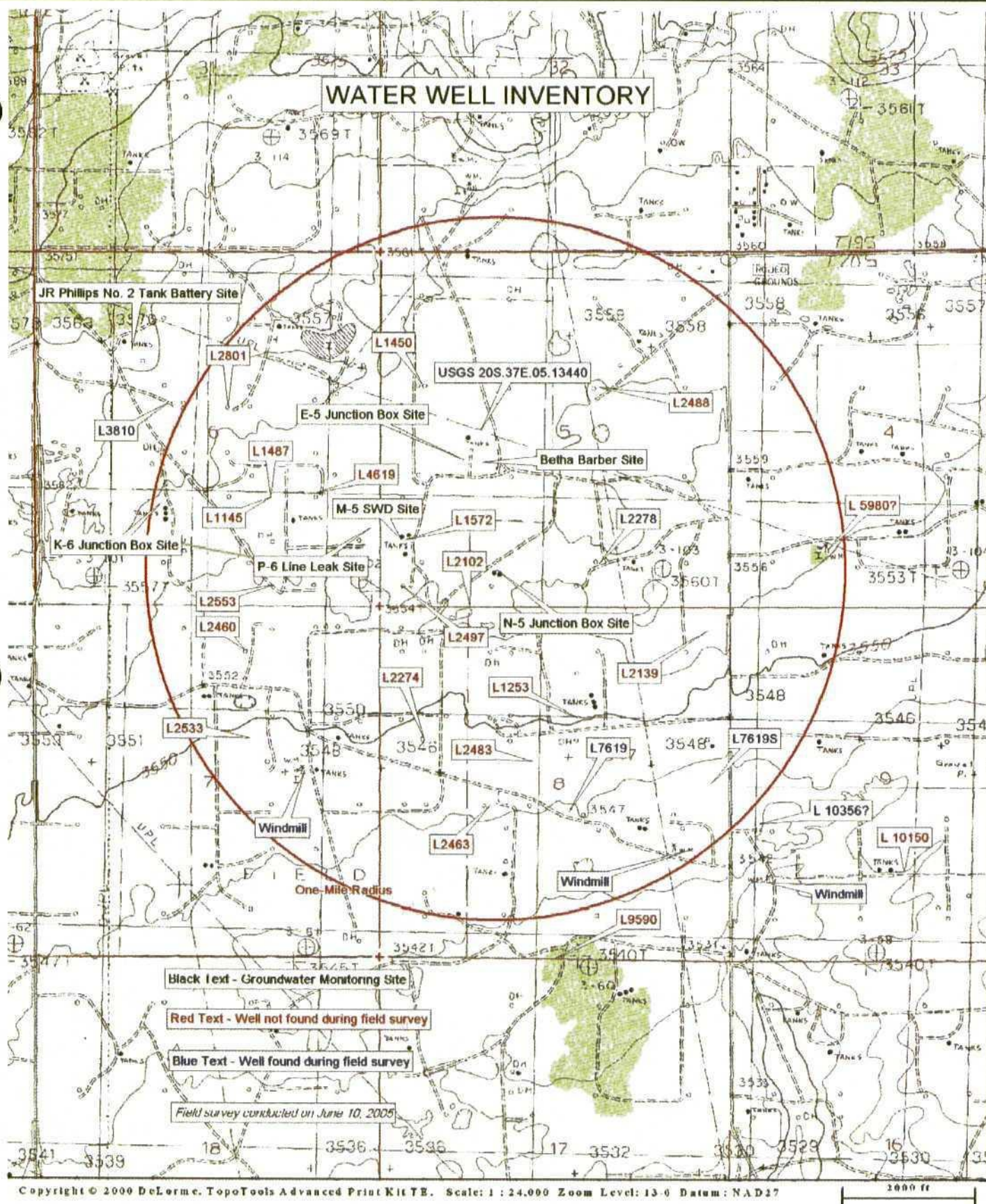
Date: August 11, 2005

Author: GJV Checked By: RTH

Approximate Scale: 1 inch = 300 feet

PLATE 3

REGIONAL GROUNDWATER
GRADIENT MAP



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EME N-5 Junction Box

Plate 4

Location of Nearby Wells

December 2005

MAP LEGEND

- MW-1 Monitoring Well
- SB1 Soil Sample Location

SB3
12/20/01

Depth (Ft bgs)	Mega TPH (ppm)	Chloride (ppm)
4	14	100
8	20	200
12	28	250
16	16	250
20	11	100
26	518	100

0' 10'
Approximate Scale (Feet)

MW-1
01/10/02

Depth (Ft bgs)	GRO (mg/kg)	DRO (mg/kg)	Chloride (ppm)
32	<50	445	80

Rice Operating Company
6 inch PVC Pipeline

SB2
12/20/01

Depth (Ft bgs)	Mega TPH (ppm)	Chloride (ppm)
4	18	100
8	28	100
12	35	100
16	28	100
20	638	100
24	1,800	100
26	1,340	100

SB
08/17/01

Depth (Ft bgs)	Mega TPH (ppm)	Chloride (ppm)
6.5	NA	500
8.5	NA	350
11.5	NA	350
14	NA	500
15	NA	300
18	19600	300

SB1
12/20/01

Depth (Ft bgs)	Mega TPH (ppm)	Chloride (ppm)
4	23	100
8	15	100
12	123	100
22	60	100
28	1,041	100
33	221	100
35	153	NA

PLATE 5
PRELIMINARY
SOIL SAMPLE
RESULTS

Site: EME N-5 Junction Box Site

Sampling Dates: 8/17/01, 12/20/01, & 1/10/02

Sampled By: R. E. Environmental Services

Approximate Scale: 1 inch = 10 feet

R. T. HICKS CONSULTANTS, LTD.
1909 Brunson Ave., Midland TX 79701

APPENDICES

APPENDIX A

Lithologic Logs

Atkins Engineering Associates, Inc. 2904 W. 2nd St., Roswell, NM 88202-3156			LOG OF BORING Rice N-5 TH's 1-3 (Page 1 of 1)		
Rice Operating Company 122 West Taylor Hobbs, New Mexico 88240			Date : 12-01 Drill Start : 1430 Drill End : 1730 Site Location : 2.5 mi. SW Monument, NM		Auger Type : Hollow Stem Logged By : Mort Bates Boring Location : 3 TH's on the N., W., : South edge of pit
Contact: Donnie Anderson Job #Riceoil.air.01					

Depth in feet	GRAPHIC	USCS	Samples	DESCRIPTION	TPH Lab	
0				Caliche, white, firm, dry		
0				Poorly graded sand, w/caliche, tan, loose, dry		
5		SP	100		23	
10			100	Poorly graded sand, tan, loose, dry	15	
15		SP	100		143	
20			100		60	
25		SS		Sandstone, tan, hard, dry		
25		SP	100	Poorly graded sand, tan, loose, damp	1041	
30						
30				Sand, tan, loose, wet	221	
35			100		153	
35		SP	113			
40						
45						
50						

30' Lab. 100% 30ppm L + CED 120, 145 DRD
 BENTONITE 1.005, TALCUM 0.068, ETHYL BENTONITE 0.28, TOTAL 1.353

Backfill cuttings

Bentonite seal

Atkins Engineering
Associates, Inc.

2904 W. 2nd St., Roswell, NM 88202-3156

LOG OF BORING Rice N-5 TH's 1-3

(Page 1 of 1)

Rice Operating Company

122 West Taylor

Hobbs, New Mexico 88240

Contact: Donnie Anderson

Job #Riceoil.air.01

Date : 12-01

Drill Start : 1430

Drill End : 1730

Site Location : 2.5 mi. SW Monument, NM

Auger Type : Hollow Stem

Logged By : Mort Bates

Boring Location : 3 TH's on the N. W.,

: South edge of pit

Depth in feet	GRAPHIC	USCS	Samples	DESCRIPTION	TPH Lab	
0				582 20' WEST OF JCT		
0				Caliche, white, firm, dry		
5		SP	100	Poorly graded sand, w/caliche, tan, loose, dry	18	
10			100		38	
15		SP	100	Poorly graded sand, tan, loose, dry	35	
20			100		28	
25		SS	100	Sandstone, tan, hard, dry	638	
30		SP	100	Poorly graded sand, tan, loose, damp	1300	
35					1240	
40						
45						
50		SP		Sand, tan, loose, wet		

Backfill cuttings

Bentonite seal

12-21-2001 C:\TECH\BORING\AIR

Atkins Engineering Associates, Inc. 2904 W. 2nd St., Roswell, NM 88202-3156				LOG OF BORING Rice N-5 TH's 1-3 (Page 1 of 1)			
Rice Operating Company 122 West Taylor Hobbs, New Mexico 88240				Date : 12-01 Drill Start : 1430 Drill End : 1730 Site Location : 2.5 mi. SW Monument, NM		Auger Type : Hollow Stem Logged By : Mort Bates Boring Location : 3 TH's on the N., W., : South edge of pit	
Contact: Donnie Anderson Job #Riceoil.air.01							

Depth in feet	GRAPHIC	USCS	Samples	DESCRIPTION	TPH	Lab	
				<i>SB 3 20' NORTH of JCT</i>			
0				Caliche, white, firm, dry			
5		SP	100	Poorly graded sand, w/caliche, tan, loose, dry	14		Backfill cuttings
10			200		20		
15			350	Poorly graded sand, tan, loose, dry	23		
20		SP	250		16		
25			150		11		
		SS		Sandstone, tan, hard, dry			
		SP	100	Poorly graded sand, tan, loose, damp	513		
30							Bentonite seal
35							
40		SP		Sand, tan, loose, wet			
45							
50							

12-21-2001 C:\PROJECTS\BORING\AIR

BOX LOCATION

LAND TYPE: BLM XXX STATE FEE LANDOWNER OTHER

Depth to Groundwater 34 feet NMOCD SITE ASSESSMENT RANKING SCORE: 20

Date Started	8/17/2001	Date Completed	not complete	OCD Witness	No
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Soil Excavated	48	cubic yards	Excavation	Length	n/a	Width	n/a	Depth	n/a	feet
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Soil Disposed	48	cubic yards	Offsite Facility	Sundance	Location	Eunice, NM
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FINAL ANALYTICAL RESULTS:		Sample Date	n/a	Sample Depth	n/a
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Sample Location	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Total Xylenes mg/kg	GRO mg/kg	DRO mg/kg	Chlorides mg/kg
Vadose Zone Samples Will Be Included With Final Closure Report							

(see annual groundwater report for results). ROC has contracted a hydrologic consultant to assist ROC in developing a remediation plan for the vadose zone at groundwater-impacted sites with the ultimate objective being final closure.

CHLORIDE FIELD TESTS

LOCATION	DEPTH (ft)	ppm
Vertical	6.5	500
	8.5	350
	11.5	350
	15	300
	18	300

DATE 1/23/2003 PRINTED NAME Kristin Farris

SIGNATURE Kristin Lopez TITLE Project Scientist

**The rest of the appendices are
available on the CD attached to this
report.**

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

December 5, 2005

Wayne Price

NMOCD Environmental Bureau

1220 South St. Francis Drive

Santa Fe, New Mexico 87505

Via E-mail

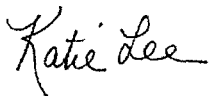
RE: Junction N-5, T20S, R37E, Section 5, Unit N; NMOCD Case # 1R0427-90

Dear Mr. Price,

On behalf of Rice Operating Company, R.T. Hicks Consultants, Ltd. is pleased to submit the Stage I Abatement Plan for the above-referenced site. Text for Rice Operating Company's proposed public notice is attached to this letter. CD copies of this email follow via FedEx. If you have any questions or concerns, please do not hesitate to contact us.

Sincerely,

R.T. Hicks Consultants, Ltd.



Katie Lee

Staff Scientist

Copy: Hobbs NMOCD office; Rice Operating Company;
R.T. Hicks Consultants Midland office

NOTICE OF PUBLICATION

**State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division**

Notice is hereby given that pursuant to New Mexico Oil Conservation Division Regulations, the following Stage 1 Abatement Plan Proposal has been submitted to the Director of the Oil Conservation Division, 1220 S. St. Francis Dr., Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

Rice Operating Company, Carolyn Doran Haynes, Operations Engineer, Telephone (505) 393-9174, 122 West Taylor, Hobbs, New Mexico 88240, has submitted a Stage 1 Abatement Plan Revision Proposal for the Pipeline Junction EME N-5, located in Section 5, Township 20 South, Range 37 East, Lea County, approximately 3 miles southwest of Monument, NM. To access the site, proceed south on Highway 322, approximately 2.75 miles. Turn right onto Caliche Lease Road and continue west 1 mile. Turn right and proceed north 0.5 miles, turn left and continue west 0.2 miles, turn right and proceed north 0.5 miles, turn right and continue northeast 0.2 miles to the site. Rice Operating Company operates a saltwater disposal pipeline at the site. Soil impacts at the site include chlorides and TDS. Groundwater samples exhibit elevated chloride concentrations. The Stage 1 Abatement Plan Proposal presents site soil and groundwater investigation activities and planned remediation.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The Stage 1 Abatement Plan Revision Proposal may be viewed at the above address or at the Oil Conservation Division District Office, 1625 N. French Drive, Hobbs, New Mexico 88240, Telephone (505) 393-6161 between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed Stage 1 Abatement Plan, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which written comments may be submitted to him.

1.0 EXECUTIVE SUMMARY

The N-5 Junction Box site is operated by Rice Operating Company (ROC) and is located in Township 20 South, Range 37 East, Section 5, unit letter N approximately 3 miles southwest of Monument, NM.

Identification of soil and ground water impacts occurred during junction box upgrade operations as part of the approved Junction Box Upgrade Program in August 2001. This Stage 1 Abatement Plan incorporates the preliminary findings from previous investigations and the contents of an Investigation and Characterization Plan (ICP) submitted on March 11, 2005, that satisfy the required elements of a Stage 1 Abatement Plan in accordance with New Mexico Oil Conservation Division (NMOCD) Rule 19. Section 7.0 of this report describes the abatement options that were evaluated and proposed to further satisfy the Stage 1 elements. Quality assurance protocols and the proposed schedule of activities are included in sections 8.0 and 9.0, respectively.

The source of this impact is historic. The upgrade 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 and evaluate the extent of ground water impact by historical releases from the junction box or other off site sources. Depth to ground water beneath the site area is approximately 33 feet below ground surface. The constituents of concern include chloride, sulfate, total dissolved solids (TDS), and benzene, toluene, ethylbenzene, and xylenes (BTEX). Additional assessment is also necessary to assist ROC in selecting the appropriate soil and/or ground water remedy.

When implementing 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.

ROC is the service provider (operator) for the EME SWD System and has no ownership of any portion of the pipeline, well, or facility. The System is owned by a consortium of oil producers, (System Partners) who provide all operating capital on a percentage ownership/usage basis. Environmental projects of this magnitude require System Partner Authorization for Expenditure (AFE) approval and work begins as funds are received. In general, project funding is not forthcoming until NMOCD approves the work plan.