AP - 008

STAGE 1 & 2 REPORTS

DATE:

Sept. 10, 1999

RICE Operating Company

122 West Taylor • Hobbs, New Mexico 88240
Phone: (505)393-9174 • Fax: (505) 397-1471

CERTIFIED MAIL
RETURN RECEIPT NO. Z 577 009 521

September 13, 1999

Mr. Roger C. Anderson
State of NM Energy and Minerals Dept.
Oil Conservation Division
2040 South Pacheco St.
Santa Fe, NM 87505

Re: Stage I Abatement Plan Report:
Junction I-9 Release Site
Hobbs Salt Water Disposal System
NE/4 SE/4 Section 09-T19S-R38E
Lea County, New Mexico

Dear Mr. Anderson:

Upon receipt of NMOCD approval for the Stage I Abatement Plan for the I-9 Release Site, Rice Operating Company (ROC) bid and then contracted with ARCADIS Geraghty & Miller to perform a sampling event and compose the Stage I Abatement Plan Report.

The sampling event of July 7, 1999 did confirm the presence of BTEX in levels higher than the NM WQCC limits in the two down-gradient monitor wells. Because of this result and because the NMOCD subsequently requested (August 10, 1999), ROC contracted through Arcadis Geraghty & Miller to drill an additional down-gradient monitor well in order to more exactly define groundwater impact. The results of the new boring (MW4) and its groundwater analytical results are included in the enclosed Stage I Abatement Report.

The enclosed ARCADIS Geraghty & Miller report compiles information acquired since the discovery of groundwater impact at the I-9 Release Site and incorporates the NMOCD requests described in the May 24, 1999 letter and the August 10, 1999 letter.

ROC and Arcadis Geraghty & Miller concur that the area of groundwater impact has been adequately delineated with the drilling, completion, and sampling of MW4. The results of water samples from MW4 indicate that BTEX concentrations are non-detectable at this location.

ROC and ARCADIS Geraghty & Miller concur that the vadose zone impact has been adequately delineated with the previous borings. Further evaluation will be conducted and documented as excavation occurs during the Stage II Abatement Work Plan.

ROC will await the NMOCD's response to this Stage I Abatement Report before any further activities will be scheduled for this site. Upon approval of the Stage I Abatement Report, ROC will prepare and submit a Stage II Abatement Work Plan, describing the remedial activities planned for this site.

As always, the Hobbs and Santa Fe offices of the NMOCD will be notified at least 48 hours in advance of any significant event scheduled for this site.

If you have any questions, please contact me at 505-393-9174.

Sincerely,

Carolyn Doran Haynes

Carolyn Doran Haynes
Operations Engineer

Enclosures
Cc: KH, LBG, F. McCallum, file,
Mr. Chris Williams, OCD Hobbs Office

Junction 1-9 Release Site

Stage 1 Abatement Report
(Site Assessment Investigation)

ARCADIS
GERAGHTY & MILLER

10 September 1999

PREPARED FOR

Rice Operating Company
Hobbs, New Mexico

ARCADIS GERAGHTY & MILLER

Junction 1-9 Release Site

Stage 1 Abatement Report (Site Assessment Investigation)

Prepared for:
Rice Operating Company
Hobbs, New Mexico

Prepared by:
ARCADIS Geraghty & Miller Inc
1030 Andrews Hwy.
Suite 120
Midland
Texas 79701
Tel 915 699 1381
Fax 915 699 1978

Our Ref.:
MT000591.0001

Date:
10 September 1999

Table of Contents

Tables

Figures

Appendices

1. INTRODUCTION

The subject site is a former pipeline connection point on the Rice Operating Company Hobbs Salt Water Disposal System. The pipeline transports produced water from oil and gas leases to a permitted well for disposal by subsurface injection. The site is located in southwest Hobbs, New Mexico approximately 0.6 miles south of the intersection of Grimes Street and Stanolind Road (NE ¼ of the NE ¼ of Section 4, T19S-R38E, Lea County) (Figure 1).

2. SITE HISTORY

A pipeline leak was discovered and repaired at the subject site on June 5, 1998. Notification of an unauthorized release was submitted to the New Mexico Oil Conservation Division (NMOCD) District I Office located in Hobbs, New Mexico. A Stage I Abatement Plan was submitted to NMOCD on January 19, 1999. Interim abatement site activities including assessment of impacts to soil and groundwater and excavation of impacted soil were conducted from August 24, 1998 to September 2, 1999. Recovery of phase-separated hydrocarbons from groundwater has been conducted from January 18 to May 7, 1999. A total of four monitor wells, one recovery well and nine boreholes was installed at the subject site (Figure 2). Correspondence between Rice Operating and the NMOCD is included in Appendix A.

3. GEOLOGY AND HYDROGEOLOGY

The Ogallala Formation is the principal source of groundwater in the subject area. Depth to groundwater in Lea County ranges from approximately 12 feet below ground surface (bgs) to approximately 300 feet bgs. The Ogallala consists of predominantly coarse fluvial conglomerate and sandstone and fine-grained Eolian siltstone and clay. Where present in the subject area, the Ogallala unconformably overlies Triassic red-beds. The regional and site groundwater gradient (Figure 3) is to the south/southeast.

Depth to groundwater at the subject site is approximately 31 feet bgs. Groundwater elevations measured in the three monitor wells at the subject site are shown in Table 1.

Subsurface geology in the subject area consists of approximately one foot of light brown, fine-grained, calcareous sand underlain by white to gray caliche to a depth of approximately 15 feet bgs. The caliche is underlain by predominantly gray limestone and silty caliche to a depth of approximately 32 feet and red-brown and light brown to pink fine-grained sand. Boring lithology logs are included in this report in Appendix B.

Rice Operating Company conducted a field search and review of the New Mexico State Engineer water well database. No evidence of impact to surface water bodies was identified. Two stock wells were located near the subject. One well is located approximately 1200 feet northwest of the site, and one well is located approximately 3500 feet southeast of the site.

Table 1
GROUNDWATER ELEVATIONS
Junction I-9 Site
HOBBS, NEW MEXICO

MONITORING WELL	TOP OF CASING	DATE	DEPTH TO GROUNDWATER	WATER ELEVATION
	(feet)*		(feet)*	(feet)*
MW-1	3595.37	01/12/99	31.75	3563.62
MW-1	3595.37	01/16/99	32.04	3563.33
MW-1	3595.37	08/31/99	29.03	3566.34
MW-2	3595.58	01/12/99	31.82	3563.76
MW-2	3595.58	01/16/99	32.04	3563.54
MW-2	3595.58	08/31/99	28.89	3566.69
MW-3	3595.62	01/12/99	30.58	3565.04
MW-3	3595.62	01/16/99	31.85	3563.77
MW-3	3595.62	08/31/99	26.24	3569.38
MW-4	3595.15	09/02/99	28.98	3566.17

*Based on survey data provided by Rice Operating Company. Used surveyed benchmark = top of casing on MW-3.

4. FIELD ACTIVITIES AND METHODOLOGY

Field activities were conducted between August 12, 1998 and September 2, 1999. Field activities included drilling and soil sampling of nine boreholes, drilling and sampling of four monitor wells, drilling of one recovery well and recovery of phase-separated hydrocarbons from the recovery well. All field activities were performed in accordance with the Stage 1 Abatement Plan (Site Assessment Investigation) as approved by the NMOCD. Photographs of field activities are included in Appendix C.

4.1 Excavation of Soil

Excavation activities were performed at the site between August 24, 1998 and September 21, 1998 to identify the vertical extent of impact. Where excavated, impacted soils were observed to a depth of at least 16 feet bgs. The soil sample

obtained from the deepest point of the excavation exhibited an organic vapor meter (OVM) reading of 264 parts per million (ppm). The area of excavation is shown in Figure 4.

4.2 Installation and Sampling of Boreholes

A total of nine boreholes (B-1 through B-9) was drilled at this location (Figure 2). Boreholes B-1 through B-7 were drilled under the direction of Enercon Services Inc. Borehole lithology descriptions are included in Appendix B. Soil samples were screened in the field for volatile organic compounds (VOCs) using an OVM, and were inspected for the presence of staining or odor. The soil borings encountered groundwater at depths ranging from approximately 31 feet to 33 feet bgs. Borings B-1 and B-2 encountered phase-separated hydrocarbons on top of the groundwater.

A minimum of two soil samples was collected from each of the boreholes and submitted for analysis for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons (TPH) using USEPA Method 8021B and 8015B, respectively.

Boreholes B-8 and B-9 were installed under the direction of Rice Operating Company for the purpose of identifying the recovery well location. No soil samples from boreholes B-8 and B-9 were submitted for laboratory analysis.

4.3 Installation and Sampling of Monitor Wells

A total of four monitor wells and one recovery well was installed in the subject area. Monitor well locations are shown in Figure 2.

Monitor wells were constructed using 2-inch inside-diameter Schedule 40 PVC casing. The recovery well was constructed of 4-inch inside-diameter Schedule 40 PVC casing. The wells were constructed with fifteen feet of slotted PVC casing, 10 feet below top of groundwater and five feet above top of groundwater. The wells were sand-packed with a five-foot bentonite plug placed immediately above the sand pack. The wells were grouted above the bentonite plug with cement containing 3-5% bentonite and completed with a flush-mounted cover. Monitor well construction diagrams are included in Appendix D.

Groundwater samples were collected from MW-1, MW-2 and MW-3 on January 16, 1999 and analyzed for volatile organics, semi-volatile organics, general chemistry and

metals using USEPA Methods 8260, 8270 C, 325.3, 4500, 150.1, 120.1, 375.4, 160.1, and 6010B.

MW-1 and MW-2 were resampled on July 7, 1999 to determine if BTEX concentrations were representative of downgradient aquifer conditions. The groundwater samples were submitted for analysis for BTEX using USEPA Method 8021B.

MW-4 was sampled on September 2, 1999 and analyzed for volatile organics, semi-volatile organics, general chemistry and metals using USEPA Methods 8260, 8270 C, 325.3, 4500, 150.1, 120.1, 375.4, 160.1, and 6010B.

5. LABORATORY ANALYTICAL RESULTS

5.1 Soil Sample Analytical Results

Soil sample analytical results are summarized in Table 2. Laboratory analytical results are included in Appendix E.

TABLE 2
SOIL SAMPLE ANALYTICAL RESULTS

Boring	Depth (feet)	OVM Reading (ppm)	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Xylenes mg/kg	TPH mg/kg
B-1	20-20.6	54	0.684	0.759	11.000	21.700	1,070
	28	261	0.285	1.000	9.170	24.600	1,200
	30	195	1.130	1.030	13.800	19.500	1,130
B-2	25-26	274	0.477	0.716	11.300	25.200	520
	30-31	174	<.050	0.070	0.870	2.510	278
B-3	25	214	<0.200	1.520	6.950	15.900	369
	31-33	8	<0.050	<0.050	<0.050	<0.150	<10
B-4	20	177	<0.050	0.207	0.178	0.764	50
	30	6.2	<0.050	<0.050	<0.050	<0.150	47
B-5	20	174	<0.050	0.288	0.188	0.759	22
	25	81	<0.050	0.268	0.264	0.566	69
	30	28	<0.050	<0.050	<0.050	<0.150	18
B-6	20-21	290	<0.050	1.390	1.440	4.660	71
	25-26	237	0.460	4.260	12.200	26.400	234
	30-31	255	0.581	0.130	2.900	4.170	25
B-7	25-26	125	<0.050	0.100	<0.050	<0.150	106
	30	145	<0.050	0.214	0.865	2.190	10

Benzene concentrations range from not detected to 1.130 milligrams per kilogram (mg/kg). Toluene concentrations range from not detected to 4.260 mg/kg. Ethlybenzene concentrations range from not detected to 13.800 mg/kg. Xylene concentrations range from not detected to 26.400 mg/kg. TPH concentrations (diesel range organics) range from not detected to 1,200 mg/kg.

Boreholes B-8 and B-9 were drilled on January 7, 1998 under the direction of a Rice Operating Company representative to identify the location for placement of a recovery well. No soil or groundwater samples were collected for analysis from B-8 and B-9.

All boreholes were plugged to surface with a cement grout containing a minimum of 3-5% bentonite.

5.2 Groundwater Sample Analytical Results

Groundwater analytical results are summarized in Table 3. Laboratory analytical results are included in Appendix E. Groundwater samples were collected from MW-1, MW-2 and MW-3 on January 16, 1999 and analyzed for volatile organics, semi-volatile organics, general chemistry and metals. Groundwater samples were collected from boreholes B-3 and B-4 on October 21, 1998 and analyzed for BTEX, chlorides and TDS. MW-1 and MW-2 were resampled on July 7, 1999 and analyzed for BTEX to identify if BTEX concentrations detected in the January 16, 1999 downgradient samples were representative of aquifer conditions. MW-4 was sampled September 2, 1999 and submitted for analysis of BTEX, polyaromatic hydrocarbons (PAH), general chemistry and metals.

Benzene was detected in the samples collected from MW-1 and MW-2 on January 16, 1999 and July 7, 1999 at a concentration of 0.008 milligrams per liter (mg/L), 0.017 mg/L, 0.262 mg/L and 0.289 mg/L, respectively. Benzene was detected in the samples collected from B-3 and B-4 at a concentration of 14.2 mg/L and 0.618 mg/L, respectively. Toluene was detected in the samples collected from MW-1 on July 7, 1999 and B-4 at a concentration of 0.01 mg/L and 0.331 mg/L, respectively. Ethylbenzene was detected in the samples collected from MW-1 and MW-2 on January 16, 1999 and July 7, 1999 at a concentration of 0.032 mg/L, 0.007 mg/L, 0.286 mg/L and 0.061 mg/L, respectively. Ethylbenzene was detected in the samples collected from B-3 and B-4 at a concentration of 1.31 mg/L and 0.182 mg/L, respectively. Xylenes were detected in the samples collected from MW-1 and MW-2 on January 16, 1999 and July 7, 1999 at a concentration of 0.012 mg/L, 0.012 mg/L, 0.131 mg/L, and 0.008 mg/L, respectively. Xylenes were detected in the samples collected from B-3 and B-4 at a concentration of 0.780 mg/L and 0.226 mg/L, respectively. 1,2,4-trimethylbenzene

was detected in the January 1999 sample collected from MW-1 at a concentration of 0.007 mg/L. No other analyzed organic compounds were detected.

No BTEX or PAH compounds were detected in the water sample collected from MW-4 on September 2, 1999.

Naturally-occurring inorganic analytes (metals, chlorides, pH, sulfate, TDS, calcium, potassium, bicarbonate, manganese and sodium) were detected in the groundwater samples collected from MW-1, MW-2, MW-3 and MW-4.

6. HEALTH AND SAFETY

All site activities were performed in accordance with Occupational Safety and Health Administration (OSHA) standards. All on-site personnel were required to wear a hard hat, safety glasses and steel-toe shoes during work activities.

7. CONCLUSIONS

7.1 Soil

The vertical extent of hydrocarbon-impacted soil ranges from approximately 25 to 31 feet bgs. Based on analytical data and field screening (OVM readings, odor and staining) the horizontal extent of hydrocarbon-impacted soil has been identified north, south and east of the release site. Delineation of the extent of hydrocarbon-impacted soil to the west will be performed in conjunction with Stage II Abatement activities. Figure 5 is a map of TPH concentrations in soil at a depth of 20-25 feet bgs. If more than one sample was analyzed from this interval (for example 20 feet bgs and 25 feet bgs), the analytical results from the deepest sample were used.

7.2 Groundwater

The regional and site groundwater gradient is to the south/southeast. Depth to groundwater at the subject site is approximately 31 feet bgs.

Phase-separated hydrocarbons were measured in Boreholes B-1 and B-2 and are present in recovery well RW-1. To date, approximately 0.796 gallons of phase-separated hydrocarbons have been removed from RW-1. A summary of recovery volumes is included in Appendix F.

Benzene was detected at a concentration above the New Mexico Water Quality Control Commission (20 NMAC 6.2 3-103) standard of 0.01 mg/L in the sample collected from MW-2 on January 16, the samples collected from MW-1 and MW-2 on July 7, 1999 and the samples collected from B-3 on B-4. Figure 6 is an isopleth map showing benzene concentrations. Because all of the wells/boreholes were not sampled during each sampling event, the highest concentration of benzene detected in each well/borehole was used.

Ethylbenzene and xylenes were detected in the sample collected from B-3 at concentrations above the 20 NMAC 6.2 3-103 standard of 0.75 mg/L and 0.62 mg/L, respectively.

No BTEX or PAH compounds were detected in the sample collected from monitor well MW-4.

No other organic compounds analyzed were detected above 20 NMAC 6.2 3-103 standards.

Naturally-occurring inorganic analytes (metals, chlorides, pH, sulfate, total dissolved solids, calcium, potassium, bicarbonate, manganese and sodium) were detected in the groundwater samples collected from MW-1, MW-2 and MW-3 on January 16, 1999. Aluminum, iron and manganese were detected in MW-1, MW-2 and MW-3 above 20 NMAC 6.2 3-103 standards of 5.0 mg/L, 1.0 mg/L, and 0.2 mg/L, respectively. Barium was detected above the 20 NMAC 6.2 3-103 standard of 1.0 mg/L in the sample collected from MW-3. Total dissolved solids were detected above the 20 NMAC 6.2 3-103 standard of 1000 mg/L in the samples collected from MW-2 and MW-3 and B-3 and B-4. Chlorides were detected in the sample collected from B-4 above the 20 NMAC 6.2 3-103 standard of 250 mg/L.

The same inorganic analytes (metals, chlorides, pH, sulfate, total dissolved solids, calcium, potassium, bicarbonate, manganese and sodium) were detected in the groundwater sample collected from new well MW-4 on September 2, 1999. Iron was detected at a concentration above the 20 NMAC 6.23-103 standard of 1.0 mg/L. Total dissolved solids for MW-4 were reported at 770 parts per million (ppm), which is below the NMAC standard of 1000 ppm.

No other inorganic compounds analyzed were detected above 20 NMAC 6.2 3-103 standards.

8. RECOMMENDATIONS

The drilling of an additional downgradient monitor well, referred to as MW-4, has delineated the horizontal extent of benzene concentrations above 20 NMAC 6.2 3-103 standards. Following review of this data and approval by NMOCD that no further assessment activities be performed at the subject site, Rice Operating Company will submit a Stage II Abatement Plan to NMOCD for remedial activities at the site. Remedial activities will likely include continued recovery of phase-separated hydrocarbons, excavation of hydrocarbon-impacted soil and semi-annual monitoring of groundwater.

9. REFERENCES

Groundwater Handbook; United States Environmental Protection Agency, Office of Research and Development, Center for Environmental Research Information; 1992

Hydrology and Hydrochemistry of the Ogallala Aquifer, Southern High Plains, Texas Panhandle and Eastern New Mexico; Report Number 177; Bureau of Economic Geology; 1988

Hydrogeochemistry and Water Resources of the Lower Dockum Group in the Texas Panhandle and Eastern New Mexico; Report Number 161: Bureau of Economic Geology; 1986

New Mexico Water Quality Control Commission, Title 20 Chapter 6, Part 2, Subpart I

ARCADIS GERAGHTY & MILLER

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

Well Name	MW-1		MW-2		MW-3	MW-4	B-3	B-4
Date Sampled	1/16/99	7/7/99	1/16/99	7/7/99	1/16/99	9/2/99	10/21/98	10/21/98
Compound Name	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
VOCs								
Benzene	0.008	0.262	0.017	0.289	ND	ND	14.200	0.618
Bromobenzene	ND	NA	ND	NA	ND	NA	NA	NA
Bromochloromethane	ND	NA	ND	NA	ND	NA	NA	NA
Bromodichloromethane	ND	NA	ND	NA	ND	NA	NA	NA
Bromoform	ND	NA	ND	NA	ND	NA	NA	NA
Bromomethane	ND	NA	ND	NA	ND	NA	NA	NA
n-butylbenzene	ND	NA	ND	NA	ND	NA	NA	NA
sec-butylbenzene	ND	NA	ND	NA	ND	NA	NA	NA
tert-butylbenzene	ND	NA	ND	NA	ND	NA	NA	NA
Carbon tetrachloride	ND	NA	ND	NA	ND	NA	NA	NA
Chlorobenzene	ND	NA	ND	NA	ND	NA	NA	NA
Chlorodibromomethane	ND	NA	ND	NA	ND	NA	NA	NA
Chloroethane	ND	NA	ND	NA	ND	NA	NA	NA
Chloroform	ND	NA	ND	NA	ND	NA	NA	NA
Chloromethane	ND	NA	ND	NA	ND	NA	NA	NA
2-Chlorotoluene	ND	NA	ND	NA	ND	NA	NA	NA
4-Chlorotoluene	ND	NA	ND	NA	ND	NA	NA	NA
1,2-Dibromo-3-chloropropane	ND	NA	ND	NA	ND	NA	NA	NA
1,2-Dibromoethane	ND	NA	ND	NA	ND	NA	NA	NA
Dibromomethane	ND	NA	ND	NA	ND	NA	NA	NA
1,2-Dichlorobenzene	ND	NA	ND	NA	ND	NA	NA	NA
1,3-Dichlorobenzene	ND	NA	ND	NA	ND	NA	NA	NA
1,4-Dichlorobenzene	ND	NA	ND	NA	ND	NA	NA	NA
Dichlorodifluoromethane	ND	NA	ND	NA	ND	NA	NA	NA
1,1-Dichloroethane	ND	NA	ND	NA	ND	NA	NA	NA
1,2-Dichlorethane	ND	NA	ND	NA	ND	NA	NA	NA
1,1-Dichloroethene	ND	NA	ND	NA	ND	NA	NA	NA
cis-1,2-dichloroethene	ND	NA	ND	NA	ND	NA	NA	NA
trans-1,2-dichloroethene	ND	NA	ND	NA	ND	NA	NA	NA
1,2-Dichloropropane	ND	NA	ND	NA	ND	NA	NA	NA
1,3-Dichloropropane	ND	NA	ND	NA	ND	NA	NA	NA
2,2-Dichloropropane	ND	NA	ND	NA	ND	NA	NA	NA
1,1-Dichloropropene	ND	NA	ND	NA	ND	NA	NA	NA
Ethylbenzene	0.032	0.286	0.007	0.061	ND	ND	1.310	0.182
Hexachlorobutadiene	ND	NA	ND	NA	ND	NA	NA	NA
Isopropylbenzene	ND	NA	ND	NA	ND	NA	NA	NA
p-isopropytoluene	ND	NA	ND	NA	ND	NA	NA	NA
Methylene chloride	ND	NA	ND	NA	ND	NA	NA	NA
Naphthalene	ND	NA	ND	NA	ND	NA	NA	NA
n-propylbenzene	ND	NA	ND	NA	ND	NA	NA	NA
Styrene	ND	NA	ND	NA	ND	NA	NA	NA
1,1,1,2-Tetrachloroethane	ND	NA	ND	NA	ND	NA	NA	NA
1,1,2,2-Tetrachloroethane	ND	NA	ND	NA	ND	NA	NA	NA
Tetrachloroethene	ND	NA	ND	NA	ND	NA	NA	NA

ARCADIS GERAGHTY&MILLER

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

Well Name	MW-1		MW-2		MW-3	MW-4	B-3	B-4
Date Sampled	1/16/99	7/7/99	1/16/99	7/7/99	1/16/99	9/2/99	10/21/98	10/21/98
Compound Name	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Toluene	ND	0.01	ND	<0.005	ND	ND	<0.050	0.331
1,2,3-Trichlorobenzene	ND	NA	ND	NA	ND	NA	NA	NA
1,2,4-Trichlorobenzene	ND	NA	ND	NA	ND	NA	NA	NA
1,1,1-Trichloroethane	ND	NA	ND	NA	ND	NA	NA	NA
1,1,2-Trichloroethane	ND	NA	ND	NA	ND	NA	NA	NA
Trichloroethene	ND	NA	ND	NA	ND	NA	NA	NA
Trichlorofluoromethane	ND	NA	ND	NA	ND	NA	NA	NA
1,2,3-Trichloropropane	ND	NA	ND	NA	ND	NA	NA	NA
1,2,4-Trimethylbenzene	0.007	NA	ND	NA	ND	NA	NA	NA
1,3,5-Trimethylbenzene	ND	NA	ND	NA	ND	NA	NA	NA
Vinyl chloride	ND	NA	ND	NA	ND	NA	NA	NA
Xylenes, total	0.012	0.131	0.012	0.008	ND	ND	0.78	0.226
Acetone	ND	NA	ND	NA	ND	NA	NA	NA
Carbon disulfide	ND	NA	ND	NA	ND	NA	NA	NA
Vinyl acetate	ND	NA	ND	NA	ND	NA	NA	NA
2-Butanone	ND	NA	ND	NA	ND	NA	NA	NA
1,2-Dichloroethene	ND	NA	ND	NA	ND	NA	NA	NA
2-Chloethylvinylether	ND	NA	ND	NA	ND	NA	NA	NA
4-Methyl-2-pentanone	ND	NA	ND	NA	ND	NA	NA	NA
cis-1,3-dichloropropene	ND	NA	ND	NA	ND	NA	NA	NA
trans-1,3-dichloropropene	ND	NA	ND	NA	ND	NA	NA	NA
2-Hexanone	ND	NA	ND	NA	ND	NA	NA	NA
Methyl tert butyl ether	ND	NA	ND	NA	ND	NA	NA	NA
SVOCs								
Acenaphthene	ND	NA	ND	NA	ND	ND	NA	NA
Acenaphthylene	ND	NA	ND	NA	ND	ND	NA	NA
Aniline	ND	NA	ND	NA	ND	NA	NA	NA
Anthracene	ND	NA	ND	NA	ND	NA	NA	NA
Benzo(a)anthracene	ND	NA	ND	NA	ND	ND	NA	NA
Benzo(b)fluoranthene	ND	NA	ND	NA	ND	ND	NA	NA
Benzo(k)fluoranthene	ND	NA	ND	NA	ND	ND	NA	NA
Benzo(a)pyrene	ND	NA	ND	NA	ND	ND	NA	NA
Benzoic acid	ND	NA	ND	NA	ND	NA	NA	NA
Benzo(g,h,i)perylene	ND	NA	ND	NA	ND	ND	NA	NA
Benzyl alcohol	ND	NA	ND	NA	ND	NA	NA	NA
4-Bromophenylphenyl ether	ND	NA	ND	NA	ND	NA	NA	NA
Butybenzylphthalate	ND	NA	ND	NA	ND	NA	NA	NA
di-n-butyl phthalate	ND	NA	ND	NA	ND	NA	NA	NA
Carbazole	ND	NA	ND	NA	ND	NA	NA	NA
4-Chloroaniline	ND	NA	ND	NA	ND	NA	NA	NA
bis(2-chloroethoxy)methane	ND	NA	ND	NA	ND	NA	NA	NA
bis(2-chloroethyl)ether	ND	NA	ND	NA	ND	NA	NA	NA
bis(2-chloroisopropyl)ether	ND	NA	ND	NA	ND	NA	NA	NA
4-Chloro-3-methylphenol	ND	NA	ND	NA	ND	NA	NA	NA

ARCADIS GERAGHTY&MILLER

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

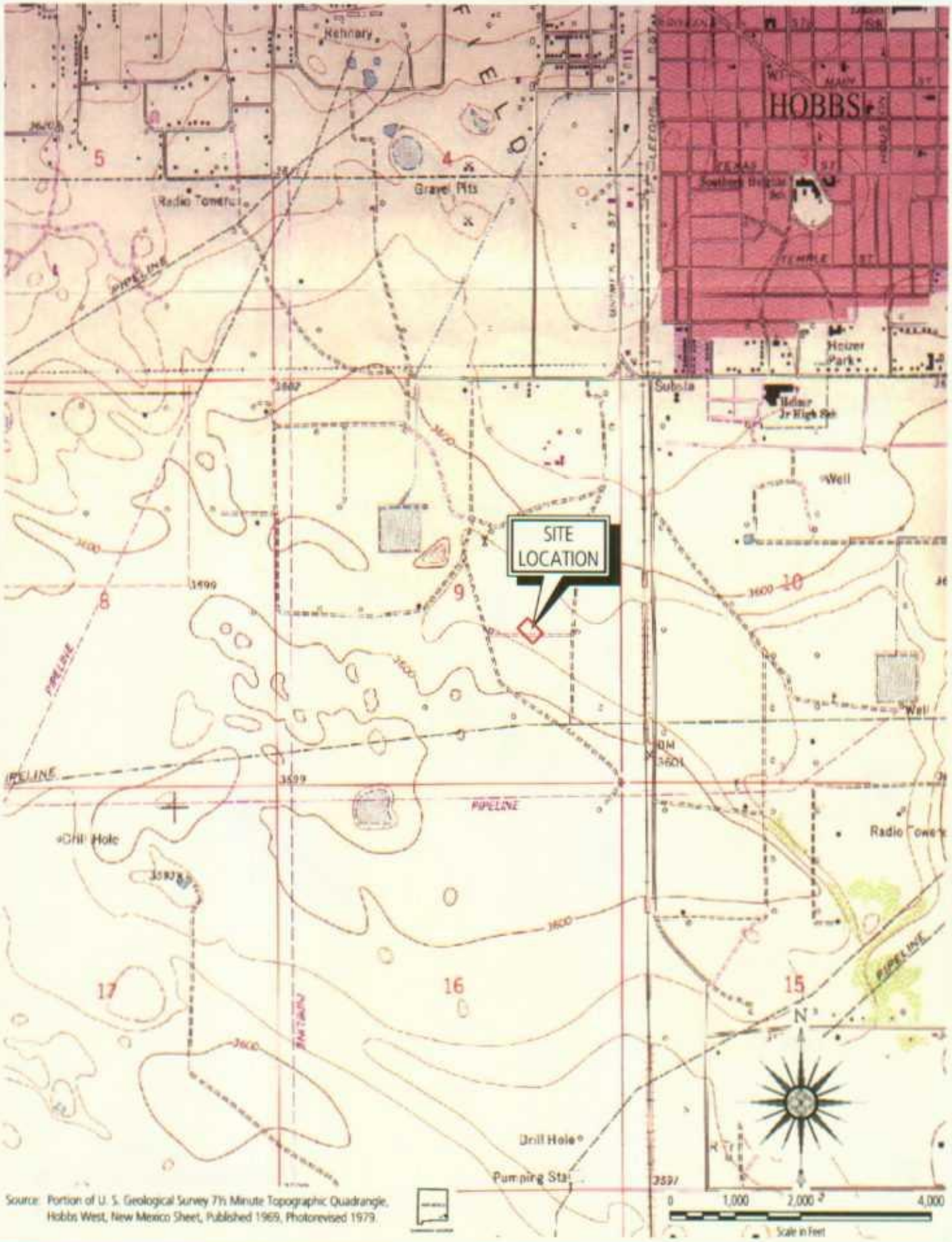
Well Name	MW-1		MW-2		MW-3	MW-4	B-3	B-4
Date Sampled	1/16/99	7/7/99	1/16/99	7/7/99	1/16/99	9/2/99	10/21/98	10/21/98
Compound Name	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
2-Chloronaphthalene	ND	NA	ND	NA	ND	NA	NA	NA
2-Chlorophenol	ND	NA	ND	NA	ND	NA	NA	NA
4-Chlorophenylphenyl ether	ND	NA	ND	NA	ND	NA	NA	NA
Chrysene	ND	NA	ND	NA	ND	ND	NA	NA
Dibenz(a,h)anthracene	ND	NA	ND	NA	ND	ND	NA	NA
Dibenzofuran	ND	NA	ND	NA	ND	NA	NA	NA
1,2-Dichlorobenzene	ND	NA	ND	NA	ND	NA	NA	NA
1,3-Dichlorobenzene	ND	NA	ND	NA	ND	NA	NA	NA
1,4-Dichlorobenzene	ND	NA	ND	NA	ND	NA	NA	NA
3,3-Dichlorobenzidine	ND	NA	ND	NA	ND	NA	NA	NA
2,4-Dichlorophenol	ND	NA	ND	NA	ND	NA	NA	NA
Diethylphthalate	ND	NA	ND	NA	ND	NA	NA	NA
2,4-Dimethylphenol	ND	NA	ND	NA	ND	NA	NA	NA
Dimethyl phthalate	ND	NA	ND	NA	ND	NA	NA	NA
4,6-Dinitro-2-methylphenol	ND	NA	ND	NA	ND	NA	NA	NA
2,4-Dinitrophenol	ND	NA	ND	NA	ND	NA	NA	NA
2,4-Dinitrotoluene	ND	NA	ND	NA	ND	NA	NA	NA
2,6-Dinitrotoluene	ND	NA	ND	NA	ND	NA	NA	NA
1,2-Diphenylhydrazine	ND	NA	ND	NA	ND	NA	NA	NA
bis(2-ethylhexyl)phthalate	ND	NA	ND	NA	ND	NA	NA	NA
Fluoranthene	ND	NA	ND	NA	ND	ND	NA	NA
Fluorene	ND	NA	ND	NA	ND	ND	NA	NA
Hexachlorobenzene	ND	NA	ND	NA	ND	NA	NA	NA
Hexachlorobutadiene	ND	NA	ND	NA	ND	NA	NA	NA
Hexachloroethane	ND	NA	ND	NA	ND	NA	NA	NA
Hexachlorocyclopehtadiene	ND	NA	ND	NA	ND	NA	NA	NA
Indeno(1,2,3-cd)pyrene	ND	NA	ND	NA	ND	ND	NA	NA
Isophorone	ND	NA	ND	NA	ND	NA	NA	NA
2-Methylnaphthalene	ND	NA	ND	NA	ND	NA	NA	NA
2-Methylphenol	ND	NA	ND	NA	ND	NA	NA	NA
4-Methylphenol	ND	NA	ND	NA	ND	NA	NA	NA
Naphthalene	ND	NA	ND	NA	ND	ND	NA	NA
2-Nitroaniline	ND	NA	ND	NA	ND	NA	NA	NA
3-Nitroaniline	ND	NA	ND	NA	ND	NA	NA	NA
4-Nitroaniline	ND	NA	ND	NA	ND	NA	NA	NA
Nitrobenzene	ND	NA	ND	NA	ND	NA	NA	NA
2-Nitrophenol	ND	NA	ND	NA	ND	NA	NA	NA
4-Nitrophenol	ND	NA	ND	NA	ND	NA	NA	NA
N-nitrosodiphenylamine	ND	NA	ND	NA	ND	NA	NA	NA
N-nitroso-di-n-propylamine	ND	NA	ND	NA	ND	NA	NA	NA
Di-n-octyl phthalate	ND	NA	ND	NA	ND	NA	NA	NA
Pentachlorophenol	ND	NA	ND	NA	ND	NA	NA	NA
Phenanthrene	ND	NA	ND	NA	ND	ND	NA	NA
Phenol	ND	NA	ND	NA	ND	NA	NA	NA
Pyrene	ND	NA	ND	NA	ND	ND	NA	NA

ARCADIS GERAGHTY&MILLER

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

Well Name	MW-1		MW-2		MW-3	MW-4	B-3	B-4
Date Sampled	1/16/99	7/7/99	1/16/99	7/7/99	1/16/99	9/2/99	10/21/98	10/21/98
Compound Name	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Pyridine	ND	NA	ND	NA	ND	NA	NA	NA
1,2,4-Trichlorobenzene	ND	NA	ND	NA	ND	NA	NA	NA
2,4,5-Trichlorophenol	ND	NA	ND	NA	ND	NA	NA	NA
2,4,6-Trichlorophenol	ND	NA	ND	NA	ND	NA	NA	NA
General Chemistry								
Resistivity	0.74	NA	0.58	NA	0.53	0.0009	NA	NA
Specific Gravity	0.982	NA	0.985	NA	0.996	NA	NA	NA
Chloride	128	NA	230	NA	195	100	230	2400
Carbonate ($CaCO_3$)	ND	NA	ND	NA	ND	ND	NA	NA
Bicarbonate ($CaCO_3$)	332	NA	322	NA	370	220	NA	NA
pH	7.29	NA	7.51	NA	7.51	NA	NA	NA
Sulfate	318	NA	372	NA	483	180	NA	NA
Total dissolved solids	890	NA	1190	NA	1340	770	1710	5460
Calcium	727	NA	578	NA	1255	93	NA	NA
Potassium	3	NA	30	NA	8	2.4	NA	NA
Sodium	144	NA	171	NA	310	124	NA	NA
Metals								
Silver	ND	NA	ND	NA	ND	ND	NA	NA
Aluminum	12.3	NA	16.5	NA	32.7	3.1	NA	NA
Arsenic	0.019	NA	0.025	NA	0.028	0.03	NA	NA
Barium	0.87	NA	0.970	NA	3.91	0.11	NA	NA
Cadmium	ND	NA	ND	NA	ND	ND	NA	NA
Cobalt	ND	NA	ND	NA	ND	ND	NA	NA
Chromium	ND	NA	0.02	NA	0.03	ND	NA	NA
Copper	0.02	NA	0.02	NA	0.02	0.03	NA	NA
Iron	9.34	NA	11.6	NA	26.4	2.4	NA	NA
Mercury	ND	NA	ND	NA	ND	ND	NA	NA
Manganese	0.214	NA	0.288	NA	0.535	0.03	NA	NA
Molybdenum	ND	NA	ND	NA	0.03	0.02	NA	NA
Nickel	0.02	NA	ND	NA	0.05	0.1	NA	NA
Lead	0.005	NA	0.007	NA	0.013	0.008	NA	NA
Selenium	ND	NA	ND	NA	ND	0.02	NA	NA
Zinc	0.05	NA	0.04	NA	0.04	0.04	NA	NA

All results are reported in milligrams per liter (mg/L)
NA - Not analyzed
ND - Not detected



Source: Portion of U. S. Geological Survey 7½ Minute Topographic Quadrangle, Hobbs West, New Mexico Sheet, Published 1969, Photorevised 1979.

ARCADIS GERAGHTY & MILLER
1030 Andrews Highway Suite 120, Midland, TX 79701-3872 Tel: 915/699-1381 Fax: 915/699-1978

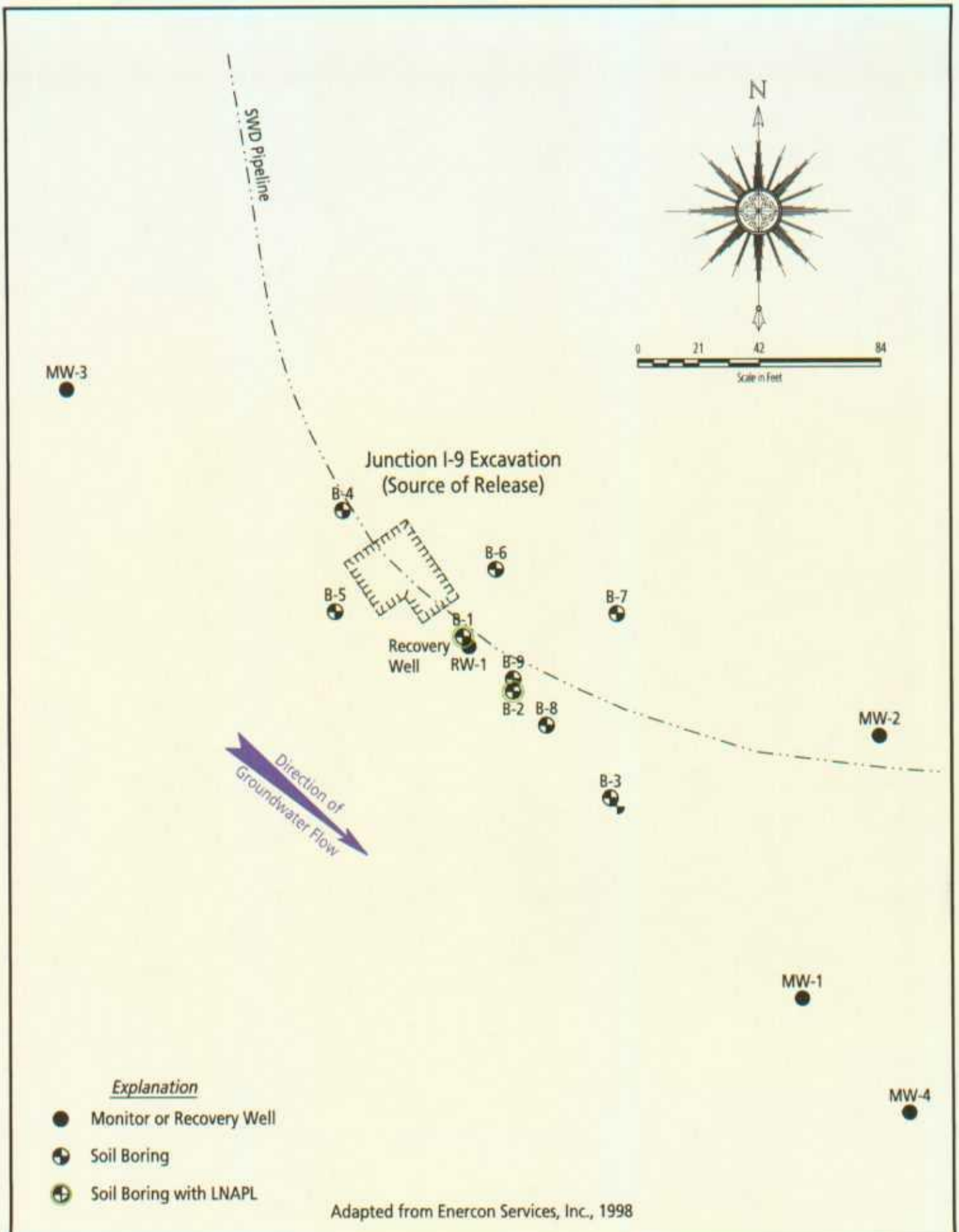
DATE	COMPILER	PROJECT MANAGER	REGIONAL MANAGER
SEPTEMBER 10, 1999	S. HALL	S. HALL	A. SCHMIDT

RICE OPERATING COMPANY
JUNCTION I-9 RELEASE SITE, 09-T19S-R38E, HOBBS SWD SYSTEM ABATEMENT

SITE LOCATION MAP

LEA COUNTY, NEW MEXICO

FILE NAME	UNIQUE NUMBER
MT591101.DWG	31-014-00206
PROJECT NUMBER	FIGURE
MT000591.0001	1



Adapted from Enercon Services, Inc., 1998

ARCADIS GERAGHTY & MILLER
1030 Andrews Highway Suite 120, Midland, TX 79701-3872 Tel: 915/699-1381 Fax: 915/699-1978

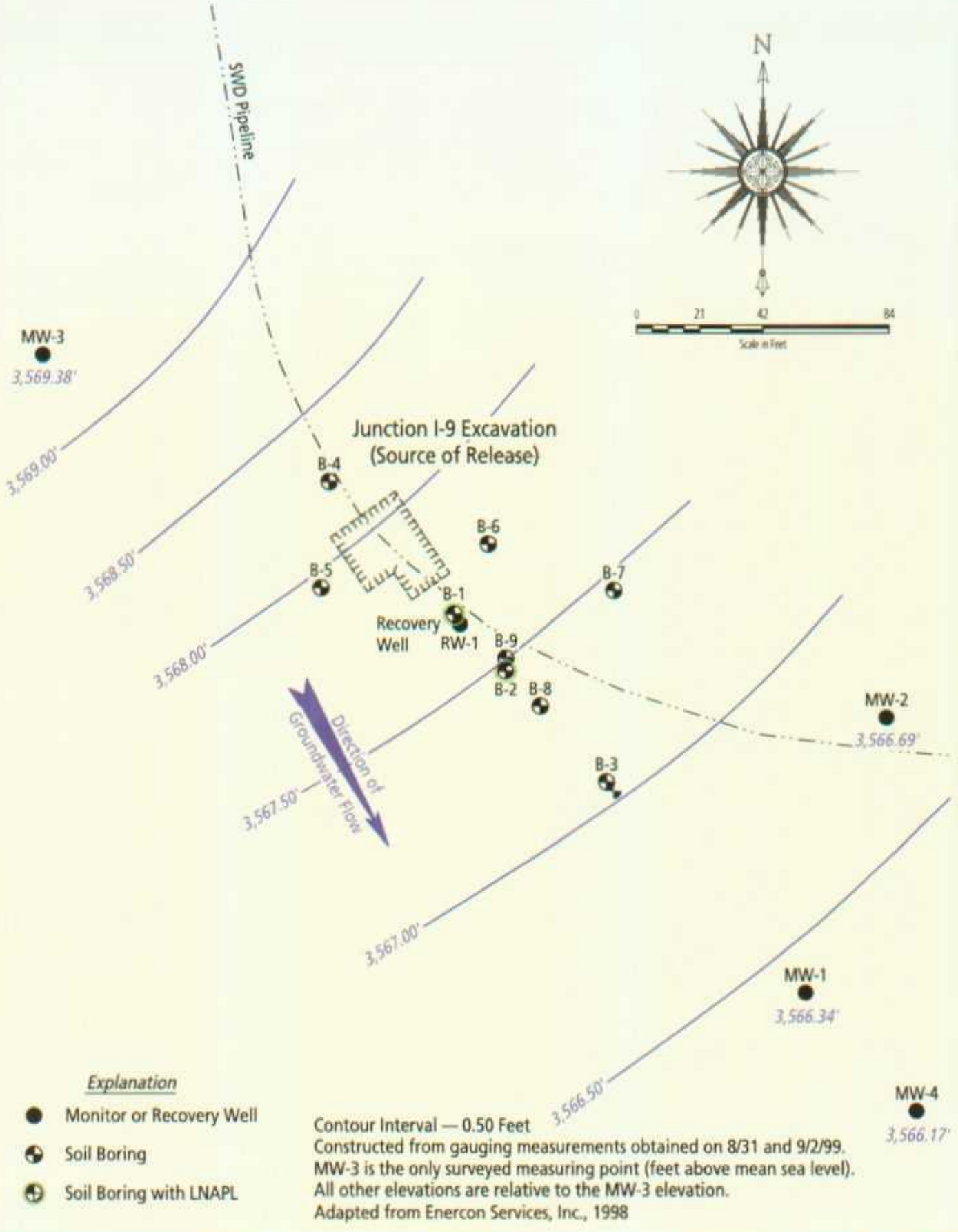
DATE	COMPILER	PROJECT MANAGER	REGIONAL MANAGER
SEPTEMBER 10, 1999	S. HALL	S. HALL	A. SCHMIDT

RICE OPERATING COMPANY
JUNCTION I-9 RELEASE SITE, 09-T19S-R38E, HOBBS SWD SYSTEM ABATEMENT

MONITOR WELL AND BORING LOCATIONS

LEA COUNTY, NEW MEXICO

FILE NAME	UNIQUE NUMBER
MT591102.DWG	31-014-06207
PROJECT NUMBER	FIGURE
MT000591.0001	2



ARCADIS GERAGHTY & MILLER
1930 Andrews Highway Suite 120, Midland, TX 79701-3872 Tel: 915/699-1181 Fax: 915/699-1978

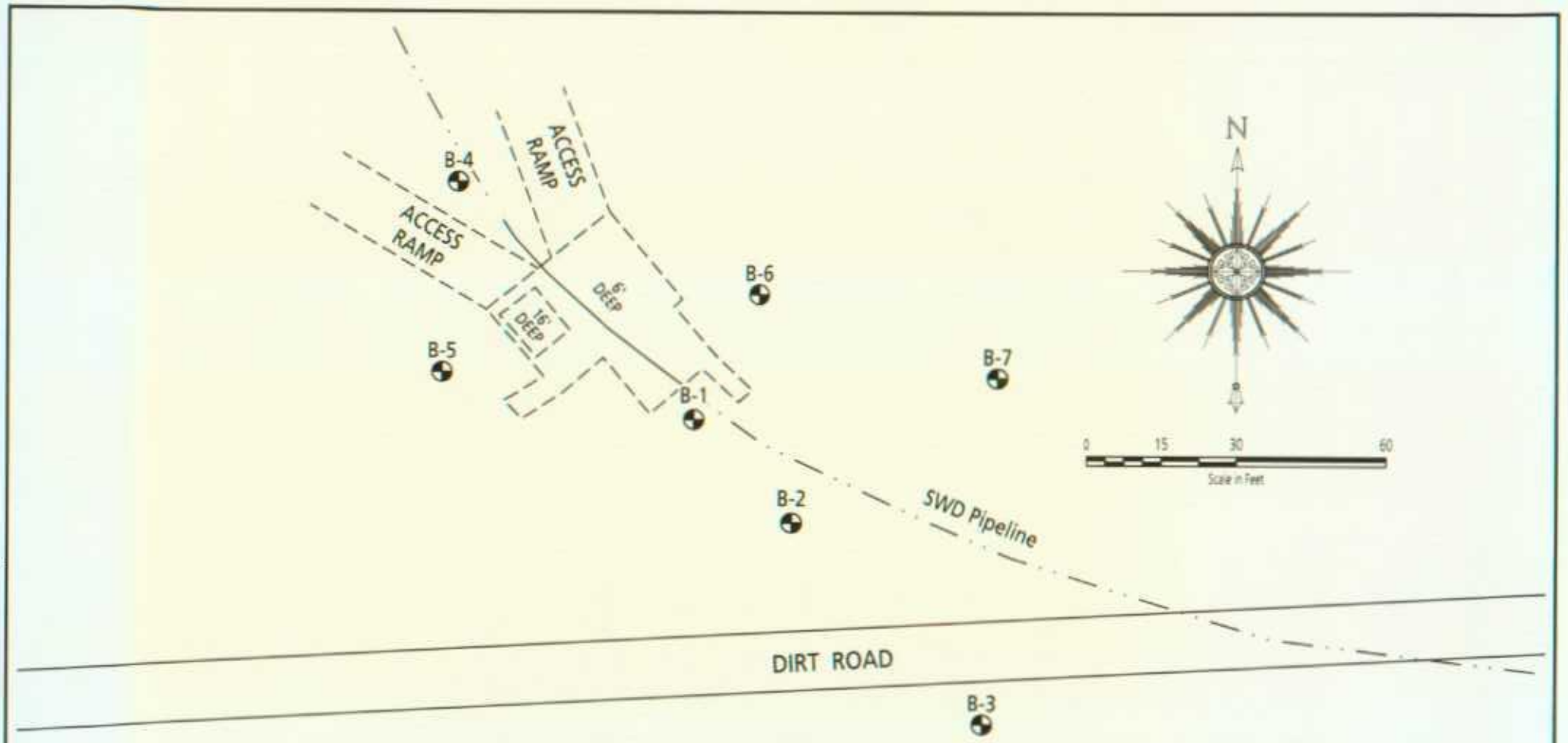
DATE	COMPILER	PROJECT MANAGER	REGIONAL MANAGER
SEPTEMBER 10, 1999	S. HALL	S. HALL	A. SCHMIDT

RICE OPERATING COMPANY
JUNCTION I-9 RELEASE SITE, 09-T19S-R38E, HOBBS SWD SYSTEM ABATEMENT

FILE NAME	UNIQUE NUMBER
MT591103.DWG	31-014-00208

POTENTIOMETRIC SURFACE MAP
LEA COUNTY, NEW MEXICO

PROJECT NUMBER	FIGURE
MT000591.0001	3



Explanation

Excavation

Soil Boring

Pipeline (underground)

Adapted from Enercon Services, Inc., 1998

ARCADIS GERAGHTY & MILLER

1030 Andrews Highway Suite 120, Midland, TX 79701-3672 Tel: 915/699-1381 Fax: 915/699-1078

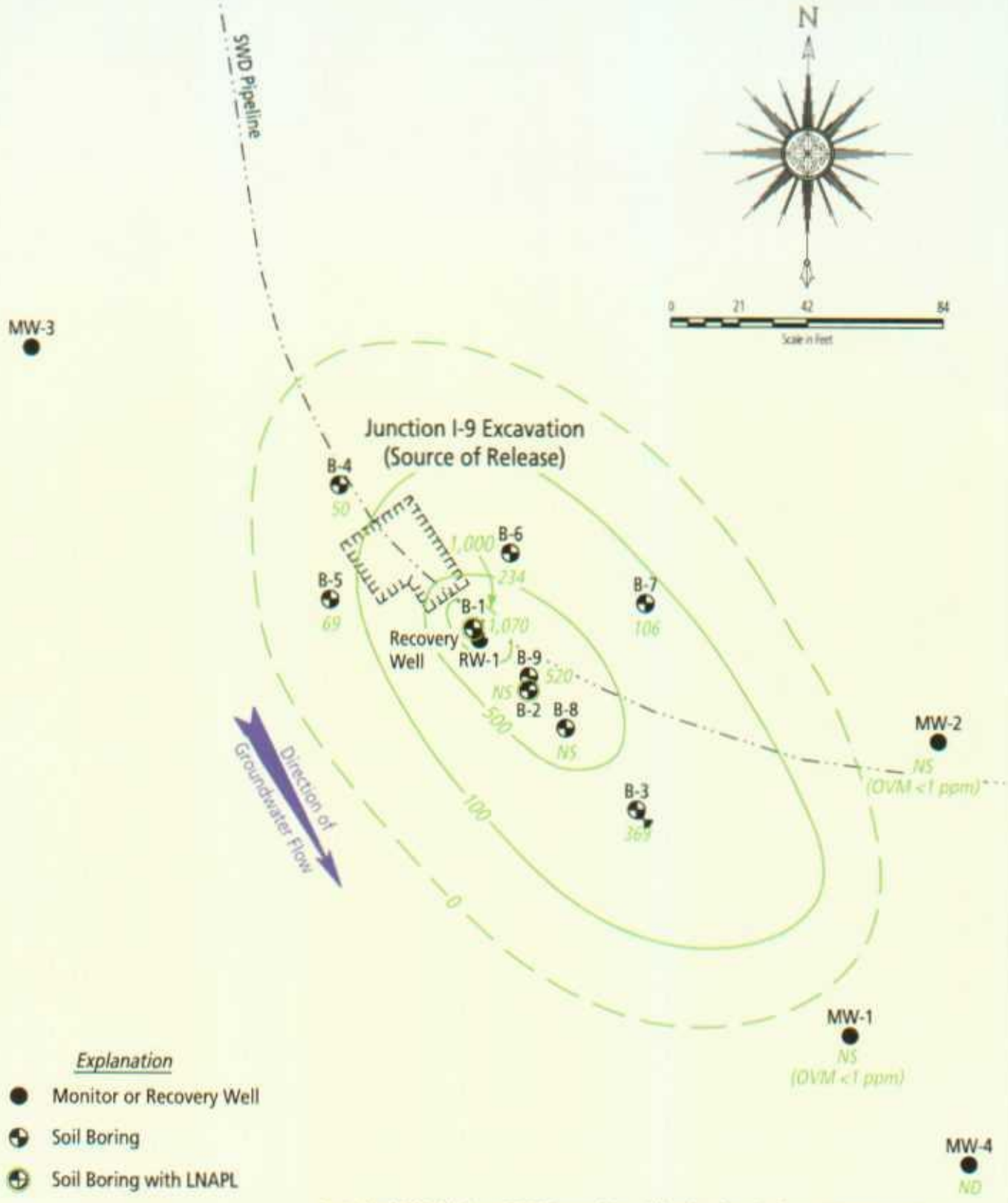
DATE	FILE NAME	FILE LOCATION	COMPILER	PROJECT MANAGER	REGIONAL MANAGER
SEPTEMBER 10, 1999	MT591104.DWG	I:\DWG\RICE OPER\MT000591.001	S. HALL	S. HALL	A. SCHMIDT
				CHECKED	UNIQUE NUMBER
				S. TISCHER	31-014-00209

RICE OPERATING COMPANY
JUNCTION I-9 RELEASE SITE, 09-T19S-R36E, HOBBS SWD SYSTEM ABATEMENT

EXCAVATION AND SOIL BORING LOCATIONS

LEA COUNTY, NEW MEXICO

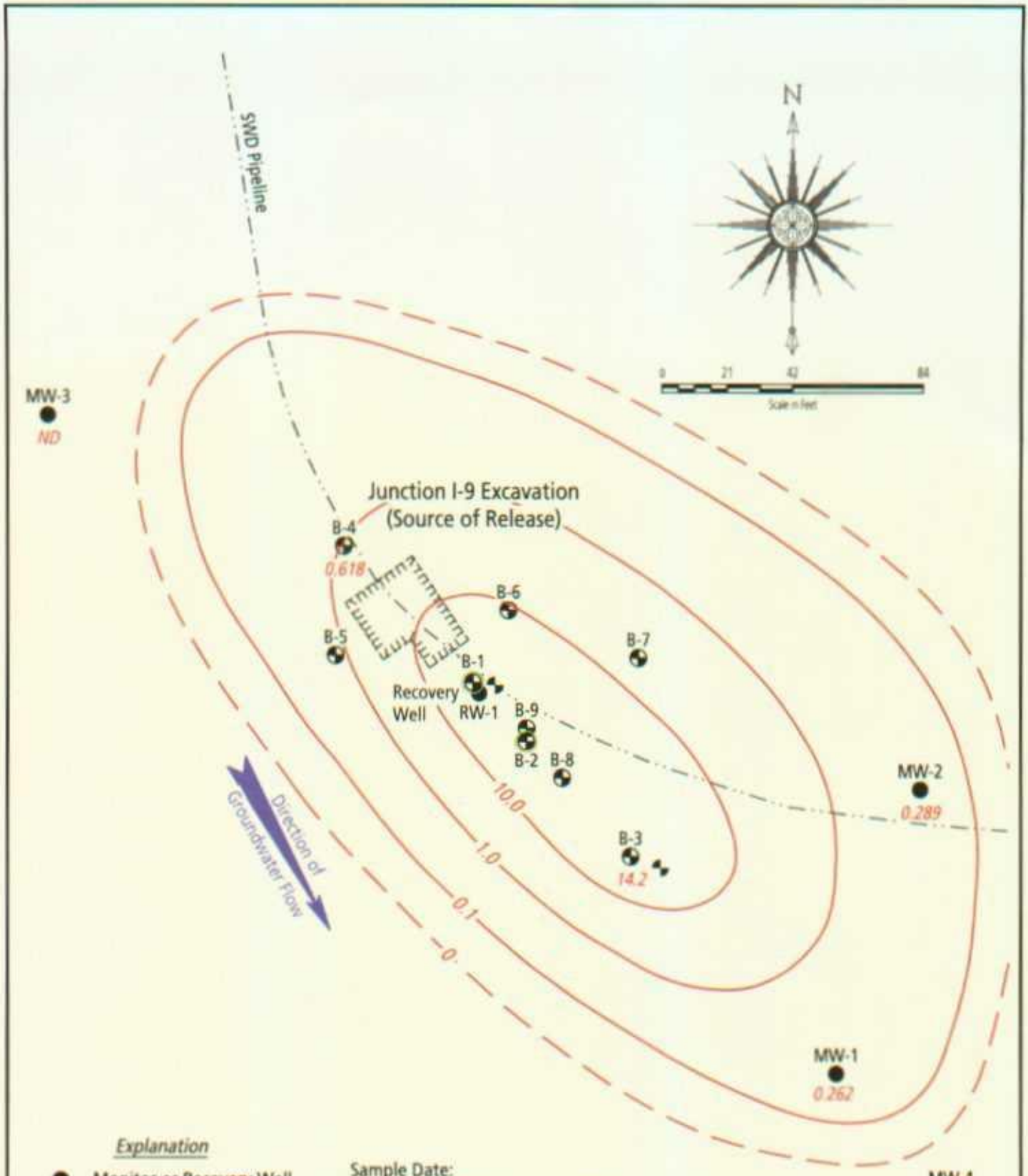
PROJECT NUMBER	FIGURE
MT000591.0001	4



ARCADIS GERAGHTY&MILLER

1004 Andrews Highway Suite 120, Midland, TX 79701-3872 Tel: 915/699-1181 Fax: 915/699-1978

DATE: SEPTEMBER 10, 1999	COMPILER: S. HALL	PROJECT MANAGER: S. HALL	REGIONAL MANAGER: A. SCHMIDT
RICE OPERATING COMPANY JUNCTION I-9 RELEASE SITE, 19-T19S-R38E, HOBBS SWD SYSTEM ABATEMENT		FILE NAME: MT591105.DWG	UNIQUE NUMBER: 31-014-00210
TOTAL PETROLEUM HYDROCARBON CONCENTRATIONS IN SOIL 20-25 FEET BELOW GROUND SURFACE LEA COUNTY, NEW MEXICO		PROJECT NUMBER: MT000591.0001	FIGURE: 5



Explanation

- Monitor or Recovery Well
- Soil Boring
- Soil Boring with LNAPL
- ND Not Detected

Sample Date:

MW-1 and MW-2	— 7/7/99
MW-3	— 1/16/99
B-3 and B-4	— 10/21/98
MW-4	— 9/2/98

Concentrations in milligrams per kilogram (mg/kg)

Adapted from Enercon Services, Inc., 1998

ARCADIS GERAGHTY & MILLER
1030 Andrews Highway Suite 120, Midland, TX 79701-3872 Tel: 915/699-1381 Fax: 915/699-1978

DATE	COMPILER	PROJECT MANAGER	REGIONAL MANAGER
SEPTEMBER 10, 1999	S. HALL	S. HALL	A. SCHMIDT

RICE OPERATING COMPANY
JUNCTION I-9 RELEASE SITE, 09-T19S-R38E, HOBBS SWD SYSTEM ABATEMENT

HIGHEST BENZENE CONCENTRATIONS IN GROUNDWATER

LEA COUNTY, NEW MEXICO

FILE NAME	UNIQUE NUMBER
MT591106.DWG	31-014-00211
PROJECT NUMBER	FIGURE
MT000591.0001	6

APPENDIX A

INTERIM ABATEMENT COMMUNICATIONS

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

May 24, 1999

CERTIFIED MAIL
RETURN RECEIPT NO: Z 357 870 129

Carolyn Doran Haynes
Operations Engineer
Rice Operating Company
122 West Taylor
Hobbs, New Mexico 88240

RE: Stage 1 Abatement Plan
Junction I-9 Release Site
NE 1/4 SE 1/4 Section 09-Ts19s-R38e
Hobbs Salt Water Disposal System
Lea County, New Mexico

Dear Ms. Haynes:

The New Mexico Oil Conservation Division (NMOCD) is in receipt of Rice Operating Company's (ROC) letter dated April 23, 1999 concerning public notice requirements for the above captioned Stage 1 Abatement Plan. As of this date, NMOCD has not received any response to the public notices issued. The interim investigation and remediation activities conducted to date are satisfactory and the Stage 1 Abatement Plan i.e. (Investigation Plan) submitted on January 19, 1999 is hereby approved with the following conditions:

1. All final soil samples submitted for laboratory analyses shall be sampled for BTEX (8021), TPH (418.1 or 8015 GRO & DRO) and Chlorides.

2. ROC shall complete the new monitor well(s) as follows:

   a. At least 15 feet of well screen shall be placed across the water table interface with 5 feet of the well screen above the water table and 10 feet of the well screen below the water table.

   b. An appropriately sized gravel pack shall be set in the annulus around the well screen from the bottom of the hole to 2-3 feet above the top of the well screen.

   c. A 2-3 foot bentonite plug shall be placed above the gravel pack.

   d. The remainder of the hole shall be grouted to the surface with cement containing 3-5% bentonite.

   e. A concrete pad shall be placed at the surface around the well. The well shall be installed with a suitable protective locking device.

   f. The well(s) shall be developed after construction using EPA approved procedures.

3. No less than 48 hours after the well(s) are developed, ground water from all monitor well(s) shall be purged, sampled and analyzed for concentrations of benzene, toluene, ethylbenzene, xylene, polycyclic aromatic hydrocarbons (PAH), total dissolved solids (TDS) and New Mexico Water Quality Control Commission (WQCC) metals and major cations and anions using EPA approved methods and quality assurance/quality control (QA/QC) procedures.

4. All wastes generated during the investigation shall be disposed of at an OCD approved facility.

5. ROC shall submit the results of the investigation to the OCD Santa Fe Office **by July 23, 1999** with a copy provided to the OCD Hobbs District Office and shall include the following investigative information:

   a. A description of all investigation, remediation and monitoring activities which have occurred including conclusions and recommendations.

   b. A geologic/lithologic log and well completion diagram for each monitor well.

   c. A water table potentiometric map showing the location of the leaks and spills, excavated areas, monitor wells, and any other pertinent site features as well as the direction and magnitude of the hydraulic gradient.

   d. Isopleth maps for contaminants of concern which were observed during the investigations.

   e. Summary tables of all ground water quality sampling results and copies of all laboratory analytical data sheets and associated QA/QC data taken within the past year.

   f. The quantity and disposition of all recovered product and/or wastes generated.

6. ROC will notify the OCD Santa Fe office and the OCD District office at least 48 hours in advance of all scheduled activities such that the OCD has the opportunity to witness the events and/or split samples during OCD's normal business hours.

Please be advised that NMOCD approval of this plan does not relieve ROC of liability should their investigations and/or operations fail to adequately investigate and/or remediate contamination that poses a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve ROC of responsibility for compliance with any other federal, state, or local laws and/or regulations.

If you have any questions, please contact Wayne Price of my staff at (505) 827-7155.

Sincerely,

Roger C. Anderson
Environmental Bureau Chief

RCA/wp
cc: OCD Hobbs Office
Bill McNeil-Landowner

RICE *Operating Company*

122 West Taylor • Hobbs, New Mexico 88240
Phone: (505)393-9174 • Fax: (505) 397-1471

CERTIFIED MAIL
RETURN RECEIPT NO: P 622 726 279

January 19, 1999

Mr. Wayne Price
New Mexico Energy and Minerals Department
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: Stage I Abatement Plan
Junction I-9 Release Site
Unit Letter I, Section 9 of T19S R38E
Hobbs Salt Water Disposal System
Lea County, New Mexico

Mr. Price:

Enclosed is the Stage I Abatement Plan required by your letter dated December 17, 1998. I have also enclosed a draft Notice of Publication. Within 15 days after the New Mexico Oil Conservation Division (OCD) determines that the Stage I Abatement Plan is administratively complete, Rice Operating Company will issue public notice in a form approved by OCD in a newspaper of general circulation in the county in which the release occurred, and in a newspaper of general circulation in the State. Prior to public notice, Rice shall give written notice, as approved by the OCD, of this Stage I Abatement Plan to the following persons:

- Surface owners of record within 1 mile of the perimeter of the geographic area where the standards and requirements are exceeded.
- The County Commission for the geographic area where the standards and requirements are exceeded is located.
- The appropriate city official(s) for the geographic area where the standards and requirements are exceeded is located.

- Those persons, as identified by the Director, who have requested notification.

- The New Mexico Trustee for Natural Resources, and any other local, state, or federal governmental agency affected, as identified by the Director, which shall be notified by certified mail.

- The appropriate Governor or President of any Indian Tribe, Pueblo or Nation if the geographic area where the standards and requirements are exceeded is located or partially located within tribal boundaries or within 1 mile of the tribal boundaries, who shall be notified by certified mail.

Please contact me at (505) 393-9174 with your comments or suggested changes.

Sincerely,

F. Wesley Root

F. Wesley Root
Projects Manager

Enclosure: Notice of Publication

Cc. Mr. Chris Williams, NMOCD District I Office
Mr. Loy Goodheart, Rice Operating Company
Mr. Ken Hasten, Rice Operating Company
File

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 I Abatement Plan has been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

Rice Operating Company, F. Wesley Root (505) 393-9174, 122 West Taylor, Hobbs, New Mexico 88240, has submitted a Stage I Abatement Plan Proposal for Pipeline Junction I-9, Hobbs Salt Water Disposal System, 0.6 miles southwest of Hobbs in the NE/4, SE/4 of Section 09, Township 19 South, Range 38 East, Lea County, New Mexico. The site is approximately one acre where Rice Operating Company operates a saltwater disposal pipeline. Light Non-Aqueous Phase Liquid (LNAPL) has been observed on the ground water. The Stage I Abatement Plan presents the following subsurface investigation activities: determine site geology and hydrogeology, and physical properties of the aquifer; conduct a registered water well search within a one mile radius of the site; installation of monitoring wells to delineate impact at the site; collect soil and groundwater samples for laboratory analysis from each monitor well to determine the magnitude of impact to ground water; survey all well locations to establish a relative datum; obtain depth to ground water measurements; calculate the ground water gradient and flow direction; and prepare a report summarizing field activities and laboratory results.

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 I Abatement Plan may be viewed at the above address or at the Oil Conservation Division District Office, 1000 West Broadway, Hobbs, New Mexico 88240, Telephone (505) 392-4046, between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed Stage I 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 comments may be submitted to him.

RICE *Operating Company*

122 West Taylor • Hobbs, NM 88240
Phone: (505) 393-9174 • Fax: (505) 397-1471

April 23, 1999

Mr. Wayne Price
NM Energy, Minerals, and Natural Resources Department
Oil Conservation Division, Environmental Bureau
2040 S. Pacheco
Santa Fe, NM 87505

RE: **Stage I Abatement Plan**
Junction I-9 Release Site
Unit Letter I, Section 9 of T19S, R38E
Hobbs Salt Water Disposal System
Lea County, New Mexico

Mr. Price:

Attached please find the proof of notification for Rice Operating Company's Stage I Abatement Plan for the junction I-9 Release Site. Included in this package are the affidavits of publication from the three newspapers that were required: Albuquerque Journal, Hobbs News Sun, Lovington Daily Leader; copies of the certified mail return cards from the notification mailed to owners of record within one mile radius of the site; and copies of the certified mail return cards from the notification mailed to "those persons as identified by the Director, who have requested notification."

The public notice was published in these three newspapers on April 9, 1999. It is understood that there is a 30-day waiting period for public comment, and that after the 30 days, the Stage I Abatement Plan will be reviewed for approval or approval with conditions. Rice Operating Company will expect to hear from you the week of May 10, 1999.

Sincerely,

Carolyn Doran Haynes

Carolyn Doran Haynes
Operations Engineer

Attachment
Cc: KH, JC, LG, file, Mr. Chris Williams, OCD Hobbs District Office

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

March 25, 1999

CERTIFIED MAIL
RETURN RECEIPT NO: Z 357 870 113

Carolyn Doran Haynes
Operations Engineer
Rice Operating Company
122 West Taylor
Hobbs, New Mexico 88240

RE: Stage I Abatement Plan
Junction I-9 Release Site
NE 1/4 SE 1/4 Section 09-Ts19s-R38e
Hobbs Salt Water Disposal System
Lea County, New Mexico

Dear Ms.Haynes:

The New Mexico Oil Conservation Division (OCD) has reviewed Rice Operating Company 's (ROC) January 19, 1999 Stage I Abatement Plan for the above referenced site. This document contains ROC's Stage 1 Abatement Plan Proposal for investigating ground water contamination resulting from a salt water disposal pipeline spill at ROC's Junction I-9 Release site.

The OCD has determined that the Stage 1 Abatement Plan Proposal is administratively complete. Before the OCD can issue approval of the Stage 1 proposal, the OCD requires that:

1. ROC issue by April 9, 1999 the attached public notice of the Stage 1 proposal in the Albuquerque Journal, Hobbs News Sun and the Lovington Daily Leader pursuant to OCD Rule 19.G.(2).

2. Prior to issuing the public notice, ROC will also issue written notice of the Stage 1 proposal pursuant to OCD Rule 19.G.(1). For written notification of "those persons, as identified by the Director, who have requested notification" pursuant to OCD Rule 19.G.(1).(d), enclosed you will find a 3.5" disk containing a "WordPerfect" listing of those persons.

Please provide the OCD with proof of notice upon completing issuance of the written and public notice. If you have any questions, please contact Wayne Price of my staff at (505) 827-7155.

Sincerely,

Roger C. Anderson
Environmental Bureau Chief

xc: Chris Williams, OCD Hobbs District Office
Bill McNeill- Landowner

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, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

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 Proposal for the Pipeline Junction I-9, Hobbs Salt Water Disposal System, located approximately .6 miles southwest of Hobbs, NM in the NE 1/4, SE 1/4 of Section 09, Township 19 South, Range 38 East, NMPM, Lea County, New Mexico. Rice Operating Company operates a salt water disposal pipeline at the site. Phase-separated hydrocarbon (PSH) has been observed on the ground water. The Stage 1 Abatement Plan Proposal presents the following subsurface investigation activities: determine site geology and hydrogeology; conduct a registered water well search within a 1 mile radius of the site; install a minimum of 3 monitoring wells; if necessary, install additional wells; collect soil samples for field screening and/or laboratory analysis from each boring; collect ground water samples for laboratory analysis from each monitoring well; obtain depth to ground water measurements and calculate the ground water gradient and direction; survey all well locations by a professional land surveyor registered in the State of New Mexico; and prepare a report summarizing field activities and laboratory results.

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 Proposal may be viewed at the above address or at the Oil Conservation Division Hobbs 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 Proposal, 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.

122 West Taylor, Hobbs NM
phone: (505) 393-9174
fax: (505) 397-1471

Rice Operating Company

Fax

To:	Mr. Chris Williams NMOCD District I Office	**From:**	F. Wesley Root
Fax:	(505) 393-0720	**Pages**	1
Phone	(505) 393-6161	**Date:**	01/14/99
Re:	Interim Abatement Jct I-9, 09-T19S-R38E Lea County, NM	**CC:**	Mr. Roger Anderson / Wayne Price NMOCD Environmental Bureau NMOCD Santa Fe Office

- **Comments:** 48 hour Ground Water Sampling Notification.

The three monitor wells installed on January 7 and 8, 1999 at the above listed site will be sampled by an independent contractor on January 16, 1999. Sampling will be conducted pursuant to item 4 of the NMOCD abatement approval letter dated December 17, 1998 with the following exception. A separate PAH analysis will not be performed since PAH compounds will be included in the volatile and semi-volatile analysis.

F. Wesley Root

TRANSACTION REPORT

Transmission
Transaction(s) completed

NO.	TX DATE/TIME	DESTINATION	DURATION	PGS.	RESULT	MODE
206	JAN. 6 15:46	15053930720	0° 00' 38"	001	OK	Normal

RICE *OPERATING COMPANY*
122 WEST TAYLOR
HOBBS, NM 88240
Phone: (505) 393-9174
Fax: (505) 397-1471

TO: NMOCD Hobbs Office **DATE:** 1-6-99

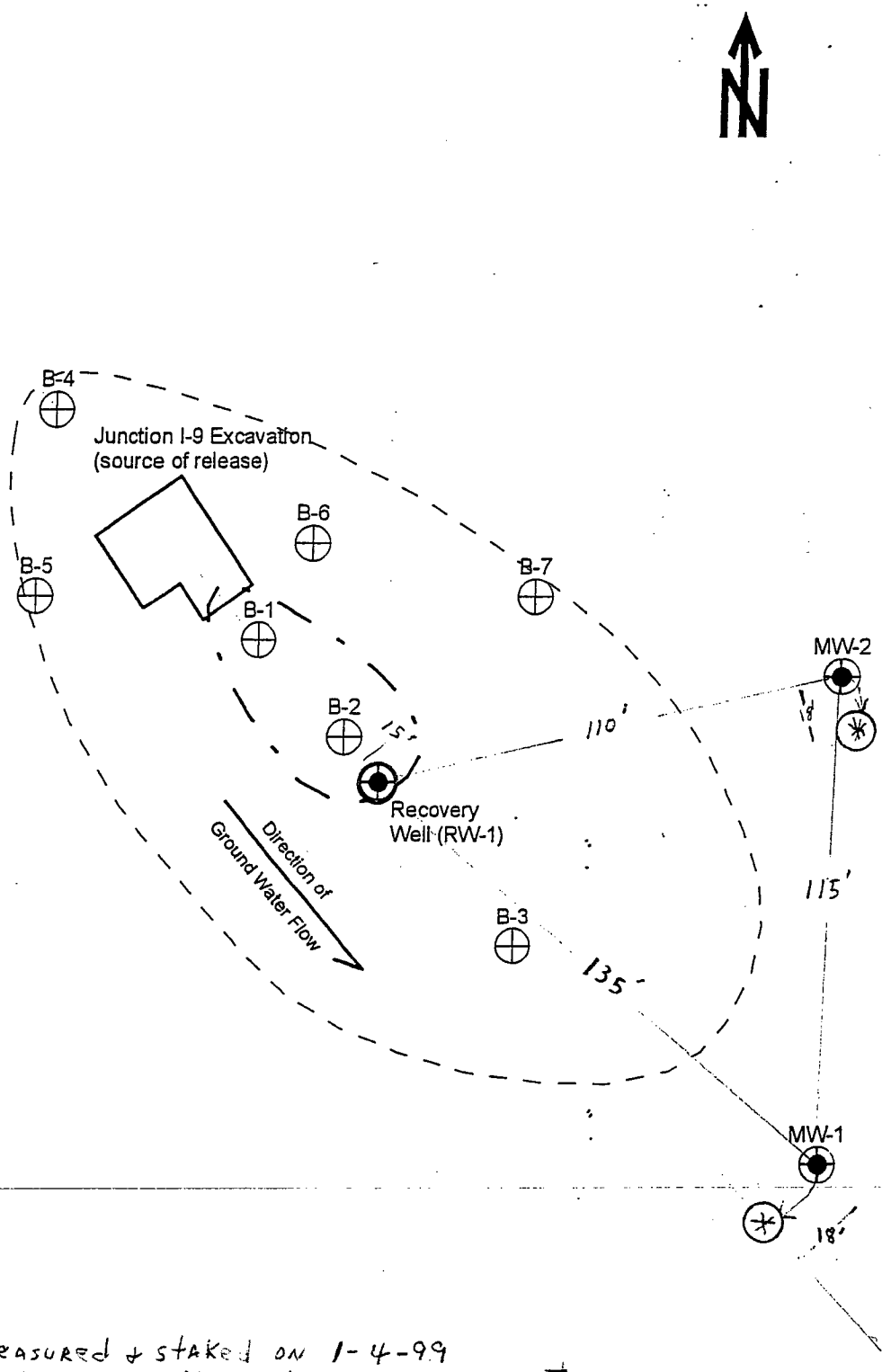
ATTN: Chris Williams

FROM: Wes Root

SUBJECT: Interim Abatement, Jct I-9 Site, 09-T19S-R38E, Lea Co. NM

COVER PAGE PLUS 0 **PAGE(S) TO FOLLOW**

COMMENTS: As we discussed on January 4, 1999, installation of the three wells to be used for interim abatement at the Junction I-9 site will begin Thursday January 7, 1999. The drilling contractor will begin at 7:00 AM. I understand from our conversation this afternoon that Paul Kautz, NMOCD representative, may inspect drilling operations at the site.



Locations measured & staked on 1-4-99
Paul Kautz w/NMOCD witnessed well placement

SITE MAP

Jct. I-9 Release Site
09-T19S-R38E, Hobbs SWD System
Lea County, New Mexico

Rice Operating Company
122 W. Taylor
Hobbs, NM 88240

Legend

- Proposed location for recovery well / monitor well
- Soil boring completed in 10 / 98
- Estimated boundary of crude oil plume
- Estimated boundary of dissolved hydrocarbon plume

Map Scale

0' 20' 40'

RICE *Operating Company*

122 West Taylor • Hobbs, New Mexico 88240
Phone: (505)393-9174 • Fax: (505) 397-1471

December 18, 1998

Mr. Wayne Price
New Mexico Energy and Minerals Department
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: Junction I-9 Release Site
Unit Letter I, Section 9 of T19S R38E
Hobbs Salt Water Disposal System
Lea County, New Mexico

Mr. Price:

Thank you for your prompt review and approval of our request to initiate interim abatement measures at the above referenced site. However, based on the contents of your approval letter, there apparently has been a slight misunderstanding as to our conversations on December 15 and 17, 1998. Specifically, the reason we want to initiate interim abatement, why we would like to include monitoring wells, and the number of wells we want to install need to be clarified.

Rice requested interim abatement because it just makes good sense to begin abatement of the crude oil floating on the ground water; we are concerned that the Stage I Abatement approval process will take several months; and pursuant to New Mexico Oil Conservation Division (NMOCD) Rule 19.D.(g), we are allowed, with NMOCD approval, to begin abating water pollution while abatement plan approval is pending.

Rice Operating Company wishes to install a total of three wells, one recovery well and two down gradient monitoring wells as part of the interim abatement measures. As I stated on December 15th, the direction of ground water flow at the site could be accurately determined if there are three wells present. This information would allow us to develop a more accurate Stage I Abatement Plan.

While a potential for the release to have impacted water wells does exist, visual inspection of the two water wells we have identified within a one mile radius of the site to date showed no evidence of adverse impact. Both water wells are used to supply a stock tank. The well I discussed with you on December 15th is located approximately ¼ of a mile northwest of and in an apparent up gradient position relative to the site. The well I found on December 16th is located ¾ of a mile down gradient from the release site.

At this time there is no reason to assume that either water well has been adversely affected by our release and their existence had absolutely no bearing on Rice's decision to request installation of monitoring wells. The location of the two wells is shown on the enclosed topographic map.

Therefore, while we appreciate the decision to allow three monitoring wells to be installed, the combination of one recovery well and two monitor wells should be more than adequate for Rice to develop the Stage I Abatement plan. The three wells will be installed pursuant to the conditions specified in the approval letter. A site map showing the proposed locations for the recovery well (RW-1) and two monitoring wells (MW-1 and MW-2) is enclosed.

The two monitoring wells will be initially sampled for the parameters included in condition 4 of your approval letter. If these results are below regulatory limits, Rice requests that the NMOCD allow parameters, such as metals, be removed from future testing.

If you have any questions please feel free to call.

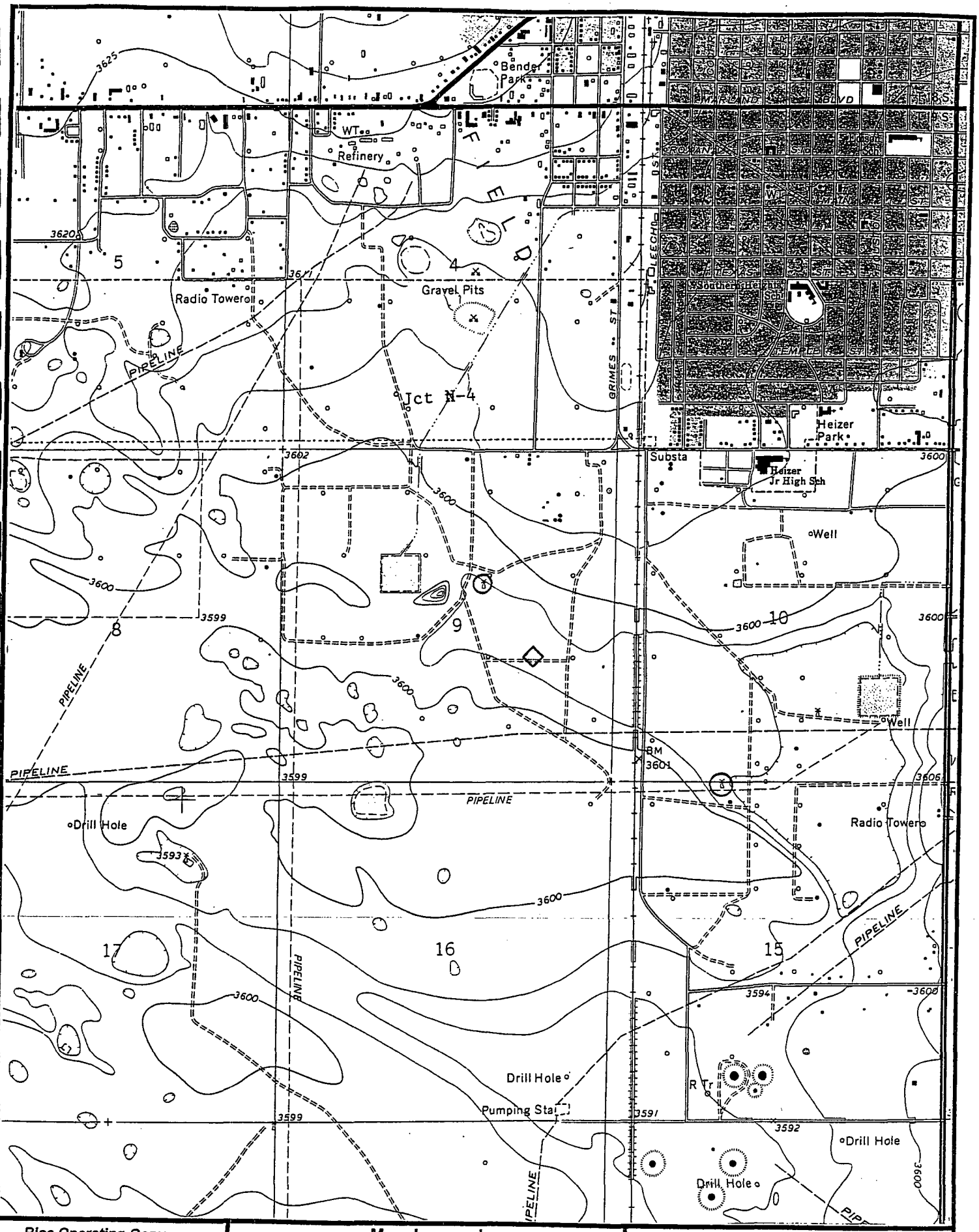
Sincerely,

F. Wesley Root

F. Wesley Root
Projects Manager

Enclosures

cc. Mr. Chris Williams, NMOCD District I Office
KH. File



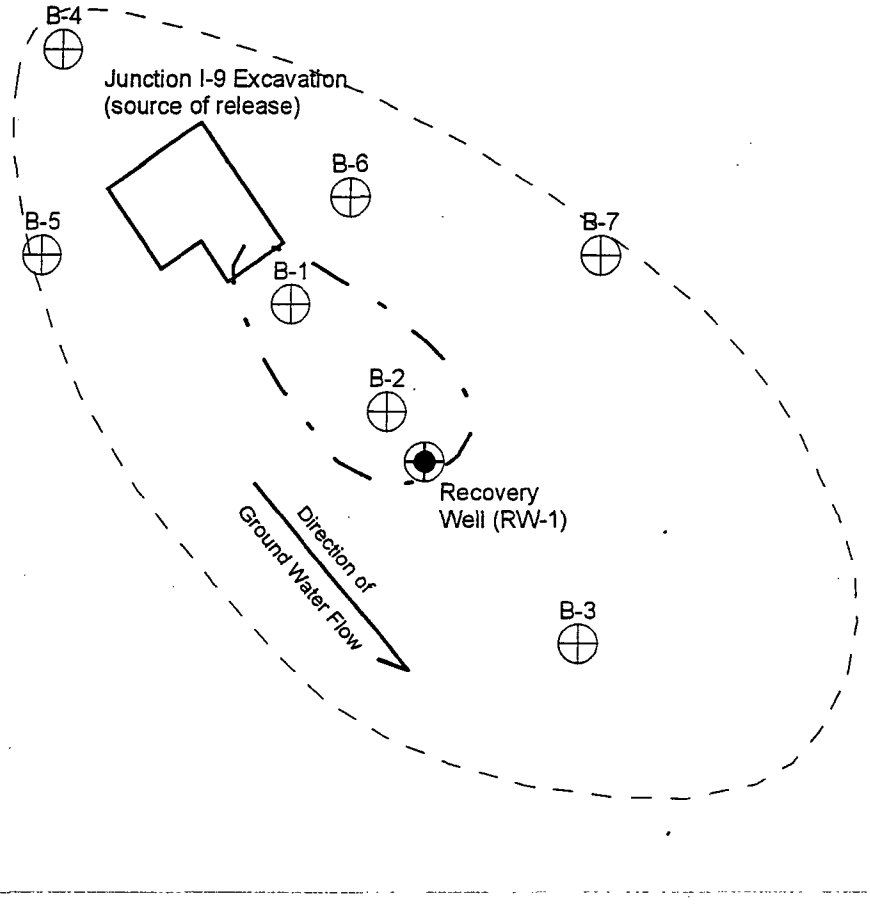
Rice Operating Company
122 W. Taylor
Hobbs, NM 88240
Ph: (505) 393-9174 FAX 397-1471

Map Legend

○ - Stock Well Location
◇ - Junction I-9 Site
Hobbs West Topographic Map, Scale 1" = 2,000'

Junction I-9

Hobbs SWD System
Ltr I, Sec 09-T19S-R38E
Lea Co. NM



SITE MAP

Jct. I-9 Release Site
09-T19S-R38E, Hobbs SWD System
Lea County, New Mexico

Rice Operating Company
122 W. Taylor
Hobbs, NM 88240

Legend

- Proposed location for recovery well / monitor well
- Soil boring completed in 10 / 98
- Estimated boundary of crude oil plume
- Estimated boundary of dissolved hydrocarbon plume

Map Scale

0' 20' 40'

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

CERTIFIED MAIL
RETURN RECEIPT NO: P 288 259 090

December 17, 1998

Mr. F. Wesley Root
Projects Manager
Rice Operating Company (ROC)
122 West Taylor
Hobbs, New Mexico 88240

RE: Abatement Plan (AP-8) Requirement
Rice Operating Company
Hobbs Salt Water Disposal System
UL I-Sec 9-Ts19s-R38e
Lea County, New Mexico

Dear Mr. Root:

New Mexico Oil Conservation Division (NMOCD) is in receipt of your letter sent by fax dated December 15, 1998 **requesting permission to initiate emergency interim abatement measures** at the above referenced facility. NMOCD also acknowledges your verbal request pursuant to our telephone conversation on December 17, 1998 to allow three monitor wells to be installed in addition to the one recovery well. It is NMOCD's understanding this decision was made after you confirmed that there is a domestic water well located down gradient from the spill site.

Therefore due to the potential for impacts on down gradient water wells and pursuant to NMOCD Rule 19.D.(g) your request is hereby approved subject to the following conditions:

1. All recovery and monitor wells shall be constructed per your drawing, except monitor wells can have different casing size. The annulus above the bentonite plug shall be grouted to the surface with an approved type cement grout containing 3-5% bentonite. Boring logs shall be recorded with all appropriate information.

2. Product recovery records shall be maintained and shall include volumes recovered, the product thickness measured before each recovery event, and the disposition of all waste generated. These Field records shall be maintained and submitted in subsequent reports. ROC shall properly retain a sample of the recovered oil for future possible fingerprinting.

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

3. NMOCD will allow one recovery well as proposed, and three monitor wells strategically located to determine the groundwater gradient and located a sufficient distance from the recovery well to make a preliminary determination of the down gradient extent of contamination.

4. Initial groundwater sampling analysis for all monitor wells shall include volatile organics (Method 8060), Semi-volatile organics (Method 8270), PAH's (Method 8310), WQCC Metals, and General Chemistry (PH, TDS, Conductivity, Major Cations and Anions).

5. ROC shall notify the District office 48 hours in advance before commencing any significate activities.

6. The above emergency action shall not interfere with the normal abatement plan process pursuant to NMOCD Rule 19.

Please be advised that NMOCD approval of this emergency plan does not relieve ROC of liability should their operations fail to adequately investigate and remediate contamination that poses a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve ROC of responsibility for compliance with any other federal, state, or local laws and/or regulations.

If you require any further information or assistance please do not hesitate to write or call me at (505-827-7155).

Sincerely Yours,

Wayne Price

Wayne Price-Environmental Bureau

cc: Chris Williams-NMOCD District I Supervisor
Bill McNeill-Hobbs

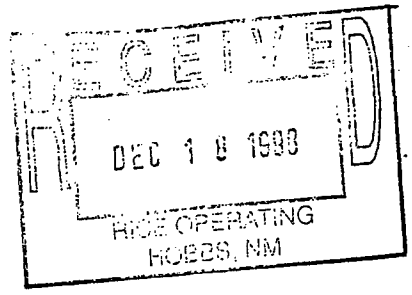
file: O/wp/riceaba1

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

Certified Mail
Return Receipt No. Z 357 870 111

December 16, 1998



Mr. Bill McNeill
P.O. Box 1058
Hobbs, NM 88241
505-392-8790

Re: Abatement Plan (AP-8) Requirement
Rice Operating Company
Hobbs Salt Water Disposal System
Lea County, New Mexico

Dear Mr. McNeill:

New Mexico Oil Conservation Division (NMOCD) hereby gives notice that NMOCD has required Rice Operating Company to submit an Abatement Plan for the above referenced facility located in Unit Letter I, Section 9-Ts 19s-R38e, pursuant to NMOCD Rule 19 (Prevention and Abatement of Water Pollution). A copy of Rule 19 has been enclosed for your information.

Pursuant to our telephone conversation on December 15, 1998 NMOCD understands that you are the current land owner and that one of your down gradient water wells approximately 1/4 mile away which is used for watering domestic stock has been impacted from this spill. We understand your technical adviser has sampled this well to verify this fact and has indicted to you that ground water movement could be as high as three feet per day. In order to expedite this matter NMOCD respectfully requests that you send us a map showing the location of your well in reference to the spill, the analytical results of any water quality sampling, and information from your technical adviser as to the ground water flow rate.

NMOCD understands you wish to intervene in this case and will copy you on all correspondence concerning this issue. NMOCD is very concerned about any oilfield groundwater contamination in the state of New Mexico and requires that a responsible person abate pollution in accordance with all applicable rules and regulations.

If you require any further information or assistance please do not hesitate to write or call me at (505-827-7155).

Sincerely Yours,

Wayne Price

Wayne Price-Environmental Bureau

cc: Roger Anderson-Environmental Bureau Chief, Santa Fe, NM
Lori Wrotenbery-NMOCD Director
Mr. Wes Root-Rice Operating Co.-Hobbs
OCD District I Office-Hobbs

attachments-1

file: O/wp/mcneille

RICE *Operating Company*

122 West Taylor • Hobbs, New Mexico 88240
Phone: (505)393-9174 • Fax: (505) 397-1471

December 15, 1998

Mr. Wayne Price
New Mexico Energy and Minerals Department
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: Junction I-9 Release Site
Unit Letter I, Section 9 of T19S R38E
Hobbs Salt Water Disposal System
Lea County, New Mexico

Mr. Price:

Rice Operating Company requests that the New Mexico Oil Conservation Division approve the installation of a recovery well at the above listed site as an interim abatement measure.

As we discussed during our telephone conversation this morning, the well would be used to recover crude oil floating on top of the water table at the site until an abatement plan pursuant to 19 NMAC 15.A.19 can be approved and implemented. A site map showing the proposed location for the recovery well (RW-1) and well construction diagram are enclosed.

Crude oil would be recovered by manually bailing the well a minimum of three days per week. The initial bailing schedule will be Monday, Wednesday, and Friday. After measuring the volume of crude oil recovered during each bailing event, the recovered fluids will be placed back into the Hobbs Salt Water Disposal System for disposal. A monthly summary of the crude oil volume recovered, including a cumulative total, will be prepared and kept on file at our Hobbs Office.

Your prompt response to this request will greatly assist our abatement efforts. If you have any questions please feel free to call.

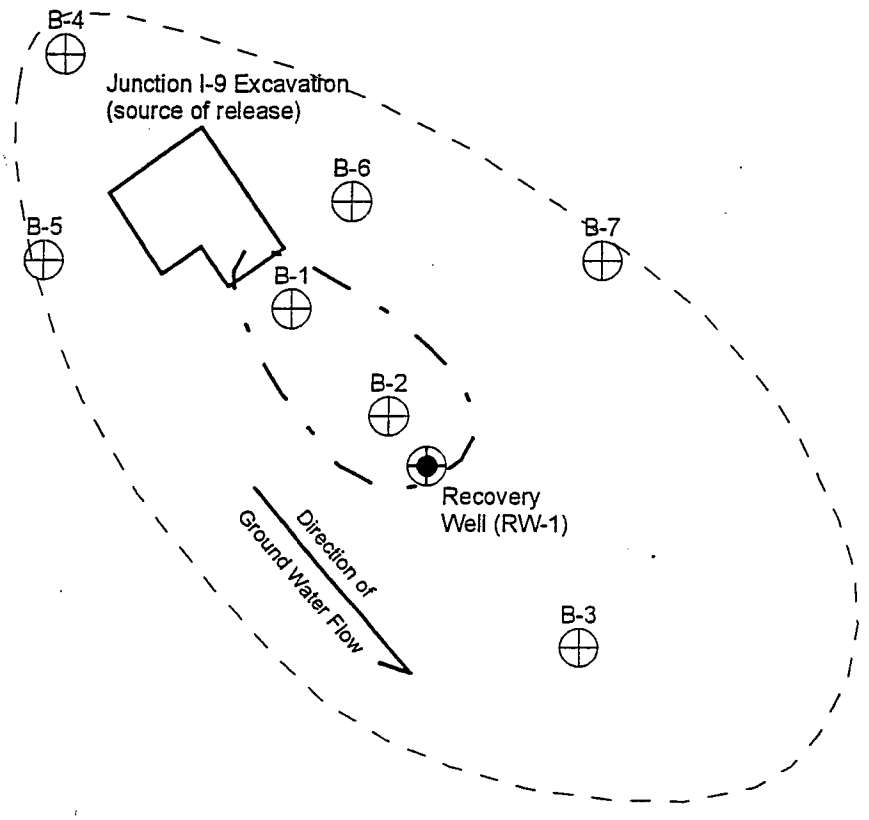
Sincerely,

F. Wesley Root

F. Wesley Root
Projects Manager

Enclosure

cc. Mr. Chris Williams, NMOCD District I Office
KH. File



SITE MAP

Jct. I-9 Release Site
09-T19S-R38E, Hobbs SWD System
Lea County, New Mexico

Rice Operating Company
122 W. Taylor
Hobbs, NM 88240

Legend

- Proposed location for recovery well
- Soil boring completed in 10 / 98
- Estimated boundary of crude oil plume
- Estimated boundary of dissolved hydrocarbon plume

Map Scale

0' 20' 40'

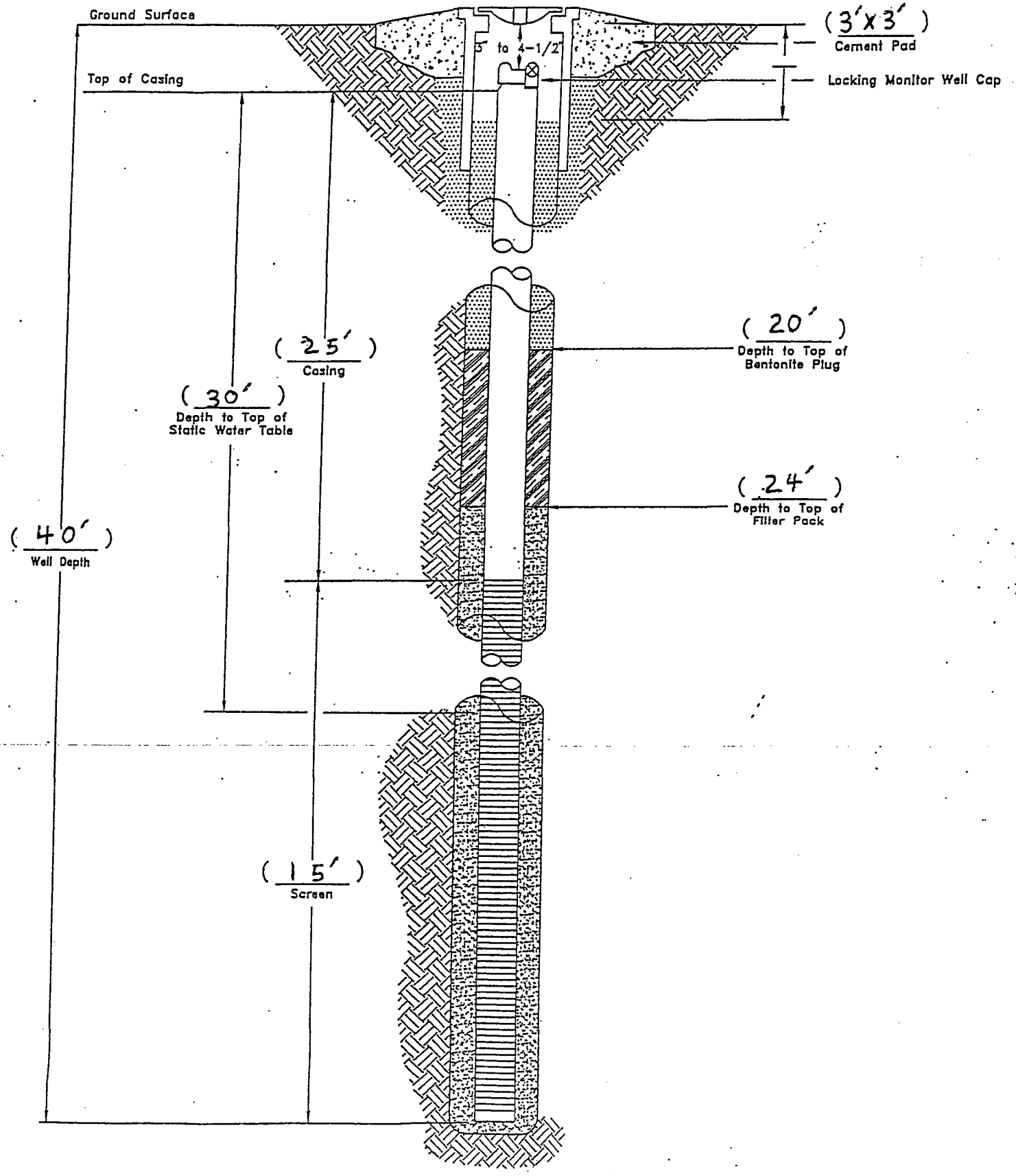
...ce Operating Company

Junction I-9 Release Site
Unit Ltr. I, 09-T19S-R38E
Hobbs SWD System, Lea Co. NM

Construction Diagram
Flush Mounted Recovery Well

Job Number:	Installation Date:	Monitor Well Number:
		RW-1

Bore Size:	Casing Size:	Casing Elevation:	Screen Size:	Top of Water Elevation:
40 feet	7-inches	4-inch PVC	0.02-inch Slot	



NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

CERTIFIED MAIL
RETURN RECEIPT NO: P 288 259 088

Mr. F. Wesley Root
Projects Manager
Rice Operating Company (ROC)
122 West Taylor
Hobbs, New Mexico 88240

RE: Abatement Plan (AP-8) Requirement
Rice Operating Company
Hobbs Salt Water Disposal System
Lea County, New Mexico

Dear Mr. Root:

The New Mexico Oil Conservation Division (OCD) has reviewed Rice Operating Company's (ROC) Release Notification letter dated October 22, 1998 concerning the discovery of hydrocarbon-impacted ground water on October 20, 1998 located at ROC's Hobbs Salt Water Disposal System Unit letter I, Section 9, Township 19 south, Range 38 east in Lea County, New Mexico.

Pursuant to 19 NMAC 15.A.19.C.1, the OCD requires an abatement plan for the ROC site to abate ground water pollution. To initiate the abatement plan process, the OCD requires that ROC submit to the OCD by January 20, 1999 a Stage 1 abatement plan investigation proposal pursuant to OCD Rule 19.E.1. and OCD Rule 19.E.3.

If you have any questions, please contact Wayne Price of my staff at (505) 827-7155.

Sincerely,

/Roger C. Anderson

Roger C. Anderson
Environmental Bureau Chief

xc: Chris Williams-NMOCD District I Supervisor

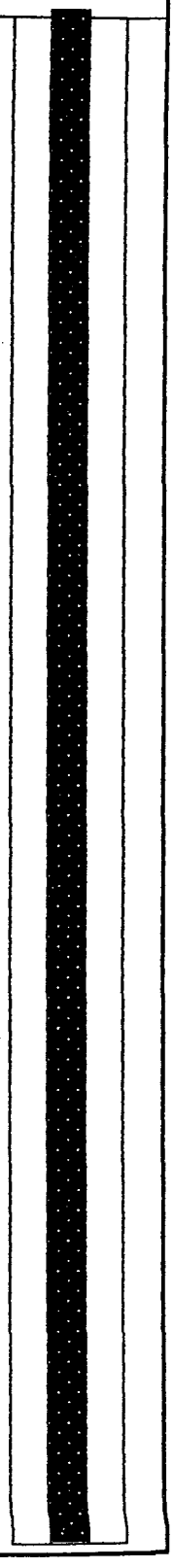
DRILLING LOG

RICE *Operating Company*
122 West Taylor
Hobbs, New Mexico 88240
Phone: (505) 393-9174
Fax: (505) 397-1471

Site Name /Location
Junction I-9
09-T19S-R38E
Hobbs SWD System
Lea Co. New Mexico

Well No.	Date Drilled:	Driller:	Logged by:
B-9	1-7-99	C. Harrison	FWR
Well Depth:	**Boring Depth:**	**Well Material:**	**Construction:**
N/A	40'	N/A	Plugged boring by filling from total depth to surface with bentonite
Casing Length:	**Boring Diameter:**	**Casing Size:**	
N/A	8"	N/A	
Screen Length:	**Drilling Method:**	**Slot Size:**	
N/A	Air Rotary	N/A	

DEPTH (Feet)	SUBSURFACE LITHOLOGY	Sample Type	OVM (ppm)	REMARKS
0–3	Light brown, fine-grained, calcareous sand			
5		Drill Cuttings	>1	
8–9	White to light gray Caliche			
10		Drill Cuttings	>1	
14–15		Drill Cuttings	>1	
19–20		Drill Cuttings	127	Hydrocarbon stain
22–23	Indurated red-brown silicious sandstone			
24–25		Drill Cuttings	173	Hydrocarbon stain
26	Light gray caliche			
30		Drill Cuttings	46	
32–33	Indurated red-brown silicious sandstone			Depth to Water 0.00 feet LNAPL gauged 1-8-99
34–35		Drill Cuttings	4	
36	Light brown to pink fine-grained sand			
39		Drill Cuttings	>1	
40				



APPENDIX B

BORING LITHOLOGY LOGS

ENERCON SERVICES, INC. 2775 VILLA CREEK, SUITE 120 DALLAS, TX 75234-7420	RECORD OF SUBSURFACE EXPLORATION	
Project #: EV-958	Well/Boring #: B-1	Date Drilled: 10/20/98
Project: Junction I-9 Hobbs SWD System Lea County, New Mexico	Drilling Company: West Texas Water Well Service	Drilling Method: Air Rotary
	Driller: Bernie	Logged By: SAL

DEPTH (FEET)	SOIL DESCRIPTION	SAMPLE NUMBER/ TIME	SAMPLE TYPE	OVA (PPM)	REMARKS/SAMPLE DESCRIPTION
0	Brown sandy top soil to 6"				
	Brown silty fine SAND 6" to 2'				
	White to tan caliche-soft crumbly from 2' to 5'	1 / 8:45	SS	0	Sample 1 collected from 4' to 5' using a split spoon sampling device. Sample was light tan to white caliche.
5	Light tan caliche with fine sand 5' to 10'.				
		2 / 8:55	SS	85	Sample 2 collected from 10' to 12' using a split spoon. Sample was light tan with some gray staining. Some odor.
10	Light tan caliche with fine tan sand from 10' to 15'.				
		3 / 9:00	SS	297	Sample 3 collected from 15' to 16' using a split spoon. Sample was light tan caliche and fine sand stained gray. Strong odor.
15	Light tan fine caliche and sand stained gray, 15' to 20'.				
		4 / 9:10	SS	54	Sample 4 collected from 20' to 20'.6" using a split spoon. Sample was hard light blue stained caliche and chert. Some odor.
20	Light blue caliche with blue stained chert, very hard from 20' to approximately 20.6 feet. Then sandy tan to tan and gray stained layer to 25'.				
		5 / 9:40	Core	254	Sample 5 collected from 25' to 26' using a split spoon. Sample was soft caliche and fine sand stained gray. Strong odor.
25	Caliche stained blue-gray, some fine sand tan to gray from 25' to approximately 28'. Hard	6 / 9:50	Core	261	Sample 6 collected at 28' using a core sampling tool. Sample was hard red chert and caliche stained blue-gray. Strong odor.
	Hard red chert stained blue-gray. Caliche stained gray from 28' to 30'.				
30		7 / 10:00	Core	195	Sample 7 collected at 30' using a core sampling tool. Sample was power caliche stained gray. Some odor.
	Caliche and sand stained gray from 30' to approximately 32'.				
		8 / 10:10	Core	110	Sample 8 collected at 32' using a core sampling tool. Sample was light tan sand and caliche. No staining and no odor.
35	Light tan caliche with chips of pink-red chert and no odor from 32' to 34'.				
40	*Total depth of boring, 34 feet.* **Depth to groundwater, 31.6 feet measured on 10/21/98.** **Phase-separated hydrocarbon (PSH), 0.8 feet, measured on 10/21/98.**				

ABBREVIATIONS AND SYMBOLS

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
THD - Texas Highway Department Cone
CT-5' - Continuous Sampler

HSA - Hollow Stem Auger
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

ENERCON SERVICES, INC. 2775 VILLA CREEK, SUITE 120 DALLAS, TX 75234-7420	RECORD OF SUBSURFACE EXPLORATION	
Project #: EV-958	Well/Boring #: B-2	Date Drilled: 10/20/98
Project: Junction I-9 Hobbs SWD System Lea County, New Mexico	Drilling Company: West Texas Water Well Service	Drilling Method: Air Rotary
	Driller: Bernie	Logged By: SAL

DEPTH (FEET)	SOIL DESCRIPTION	SAMPLE NUMBER/ TIME	SAMPLE TYPE	OVA (PPM)	REMARKS/SAMPLE DESCRIPTION
0	Brown sandy top soil to 6"				
	Brown silty fine sand 6" to 2'				
	White to tan caliche-soft crumbly from 2' to 5'	1 / 10:45	SS	0	Sample 1 collected from 5' to 6' using a split spoon sampling device. Sample was light tan to white, soft, crumbly caliche.
5	Light tan to white caliche with fine sand, crumbly, soft, 5' to 10'.				
		2 / 10:50	SS	0	Sample 2 collected from 10' to 12' using a split spoon. Sample was light tan caliche. No odor.
10	Light tan caliche with fine tan sand, crumbly and soft, from 10' to 15'.				
		3 / 10:55	Core	2	Sample 3 collected from 15' to 16' using a coring tool. Sample was light tan/white caliche and fine sand stained gray. No odor.
15	Hard white caliche and tan fine sand. Some blue-gray color, 15' to 20'.				
		4 / 11:00	Core	266	Sample 4 collected from 20' to 21' using a coring tool. Sample was hard blue-gray stained caliche. Strong odor.
20	Hard caliche stained blue-gray, 20' to 23'. Strong odor. Then hard blue-gray stained caliche and chert, 23' to 25'.				
		5 / 11:10	Core	274	Sample 5 collected from 25' to 26' using a coring tool. Sample was hard caliche and chert stained blue-gray. Strong odor.
25	Hard caliche stained blue-gray with blue-gray stained chert mixed in, 25' to 28'.				
	Light tan caliche stained blue-gray with chips of chert, 28' to 30'.	6 / 11:20	Core	174	Sample 6 collected at 30' to 31' using a core sampling tool. Sample was white caliche stained gray with black lines running through the sample core. Some odor.
30	Light tan caliche stained gray with thin black lines in the center of the core, from 30' to 33'.				
35					
40	Total depth of boring, 33 feet. **Depth to groundwater, 31.6 feet measured on 10/21/98.** **Phase-separated hydrocarbon (PSH), 0.7 feet, measured on 10/21/98.**				

ABBREVIATIONS AND SYMBOLS

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
THD - Texas Highway Department Cone
CT-5' - Continuous Sampler

HSA - Hollow Stem Auger
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

ENERCON SERVICES, INC. 2775 VILLA CREEK, SUITE 120 DALLAS, TX 75234-7420	RECORD OF SUBSURFACE EXPLORATION	
Project #: EV-958	Well/Boring #: B-3	Date Drilled: 10/20/98
Project: Junction I-9 Hobbs SWD System Lea County, New Mexico	Drilling Company: West Texas Water Well Service Driller: Bernie	Drilling Method: Air Rotary Logged By: SAL

DEPTH (FEET)	SOIL DESCRIPTION	SAMPLE NUMBER/ TIME	SAMPLE TYPE	OVA (PPM)	REMARKS/SAMPLE DESCRIPTION
0	Brown sandy top soil to 6".				
	Brown silty fine sand 6" to 2'.				
5	Light tan caliche 2' to 15'. No evidence of staining and no odor.				
10					
15	Light tan soft caliche and fine sand with intermittent hard layers and no evidence of staining from 15' to approximately 25'.	1 / 14:05	Core	2.2	Sample 1 collected at 15' using a coring tool. Sample was light tan/white caliche and fine sand no staining. No odor.
20		2 / 14:10	Core	1.3	Sample 2 collected at 20' using a coring tool. Sample was light tan and soft. No stain. No odor.
25	Light tan caliche stained blue-gray. Staining color became darker blue-gray from 25' to approximately 30'.	3 / 14:20	Core	214	Sample 3 collected at 25' using a coring tool. Sample was crumbly caliche stained blue-gray. Strong odor.
30	Crumbly caliche stained dark gray with thin black lines in the center of the core, from 30' to 31'.	4 / 14:30	Core	137	Sample 4 collected from 30' to 31' using a coring tool. Sample was dark gray stained caliche with black lines running through the sample core. Some odor.
35	Tan sand from 31' 33'.	5 / 1435	SS	8	Sample 5 collected from 31' to 33' using a split spoon. Sample was tan sand, no stain or odor.
40	Total depth of boring, 33 feet. **Depth to groundwater, 31 feet measured on 10/21/98.** **Phase-separated hydrocarbon (PSH), NONE, measured on 10/21/98.**				

ABBREVIATIONS AND SYMBOLS

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
THD - Texas Highway Department Cone
CT-5' - Continuous Sampler

HSA - Hollow Stem Auger
CFA - Continuos Flight Augers
DC - Driving Casing
MD - Mud Drilling

ENERCON SERVICES, INC. 2775 VILLA CREEK, SUITE 120 DALLAS, TX 75234-7420	RECORD OF SUBSURFACE EXPLORATION	
Project #: EV-958	Well/Boring #: B-4	Date Drilled: 10/20/98
Project: Junction I-9 Hobbs SWD System Lea County, New Mexico	Drilling Company: West Texas Water Well Service	Drilling Method: Air Rotary
	Droller: Bernie	Logged By: SAL

DEPTH (FEET)	SOIL DESCRIPTION	SAMPLE NUMBER/ TIME	SAMPLE TYPE	OVA (PPM)	REMARKS/SAMPLE DESCRIPTION
0	Brown sandy top soil to 6"				
	Brown silty fine sand 6" to 2'				
	White to tan caliche-soft crumbly from 2' to 5'	1 / 15:05	SS	3	Sample 1 collected from 5' to 6' using a split spoon sampling device. Sample was light tan to white, soft, crumbly caliche. Dry and no odor.
5	Light tan to white caliche with fine sand, crumbly, soft, 5' to 10'.				
		2 / 15:10	SS	1.7	Sample 2 collected from 10' to 12' using a split spoon. Sample was light tan, dry caliche. No odor.
10	Light tan caliche with fine tan sand, crumbly and soft, from 10' to approximately 14'.				
		3 / 15:12	Core	10	Sample 3 collected at 15' using a coring tool. Sample was light tan/white caliche with red hard pieces of chert. No odor.
15	Hard red chert with white and light tan hard caliche and some sand, 14' to approximately 20'.				
		4 / 15:15	Core	177	Sample 4 collected at 20' using a coring tool. Sample was powdered, blue-gray stained caliche. Odor.
20	Dry powdered caliche stained blue-gray with odor, from 20' to 30'. At approximately25' and 28' is thin layer of red chert.				
		5 / 15:25	Core	91	Sample 5 collected at 25' using a coring tool. Sample was caliche with some chert, stained blue-gray. Some odor.
25					
		6 / 15:40	SS	6.2	Sample 6 collected at 30' using a split spoon sampling tool. Sample was white caliche stained light blue-gray. Slight odor.
30	Light tan caliche with light gray stain and very little odor, from 30' to approximately 33'.				
35					
40	Total depth of boring, 33 feet. **Depth to groundwater, 32.8 feet measured on 10/21/98.** **Phase-separated hydrocarbon (PSH), NONE, measured on 10/21/98.**				

ABBREVIATIONS AND SYMBOLS

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
THD - Texas Highway Department Cone
CT-5' - Continuous Sampler

HSA - Hollow Stem Auger
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

ENERCON SERVICES, INC. 2775 VILLA CREEK, SUITE 120 DALLAS, TX 75234-7420	RECORD OF SUBSURFACE EXPLORATION	
Project #: EV-958	Well/Boring #: B-5	Date Drilled: 10/20/98
Project: Junction I-9 Hobbs SWD System Lea County, New Mexico	Drilling Company: West Texas Water Well Service Driller: Bernie	Drilling Method: Air Rotary Logged By: SAL

DEPTH (FEET)	SOIL DESCRIPTION	SAMPLE NUMBER/ TIME	SAMPLE TYPE	OVA (PPM)	REMARKS/SAMPLE DESCRIPTION
0	Brown sandy top soil to 6"				
	Brown silty fine sand 6" to 2'				
	White to tan caliche-soft crumbly from 2' to 5'				
5	Light tan to white caliche with fine sand, crumbly, dry, soft, 5' to 15'.				
10					
		1 / 16:15	Core	21	Sample 1 collected at 15' using a coring tool. Sample was light tan/white caliche, dry, crumbly, stained blue-gray. Some odor.
15	Dry tan crumbly caliche stained blue-gray from 15' to 30'. Some odor. Red chert encountered at approximately 26'.				
		2 / 16:23	Core	174	Sample 2 collected at 20' using a a coring tool. Sample was light tan/white caliche, dry, crumbly, stained blue-gray. Some odor.
20					
		3 / 16:35	Core	81	Sample 3 collected at 25' using a coring tool. Sample was light tan caliche and chert stained blue-gray. Some odor.
25					
		4 / 16:45	Core	28	Sample 4 collected at 30' using a core sampling tool. Sample was white caliche stained gray with black lines running through the sample core. Some odor.
30	Light tan caliche stained gray with thin black lines in the center of the core, from 30' to 33'.				
35					
40	**Total depth of boring, 33 feet.** **Depth to groundwater, 32.7 feet measured on 10/21/98.** **Phase-separated hydrocarbon (PSH), NONE, measured on 10/21/98.**				

ABBREVIATIONS AND SYMBOLS

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
THD - Texas Highway Department Cone
CT-5' - Continuous Sampler

HSA - Hollow Stem Auger
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

ENERCON SERVICES, INC. 2775 VILLA CREEK, SUITE 120 DALLAS, TX 75234-7420	RECORD OF SUBSURFACE EXPLORATION	
Project #: EV-958	Well/Boring #: B-6	Date Drilled: 10/21/98
Project: Junction I-9 Hobbs SWD System Lea County, New Mexico	Drilling Company: West Texas Water Well Service	Drilling Method: Air Rotary
	Driller: Bernie	Logged By: SAL

DEPTH (FEET)	SOIL DESCRIPTION	SAMPLE NUMBER/ TIME	SAMPLE TYPE	OVA (PPM)	REMARKS/SAMPLE DESCRIPTION
0	Brown sandy top soil to 6"				
	Light tan to gray caliche and sand from 6" to 5'.	1 / 8:35	Core	0	Sample 1 collected from 5' to 7' using a coring tool. Sample was light gray silty sand. No odor.
5	Light gray caliche and silty sand from 5' to 15'.				
		2 / 8:40	Core	1.4	Sample 2 collected from 10' to 12' using a coring tool. Sample was light gray caliche and silty sand. No odor.
10					
		3 / 8:45	Core	3.2	Sample 3 collected from 15' to 16' using a coring tool. Sample was gray to brown silty sand. No odor.
15	Light gray to brown silty sand from 15' to approximately 25'.				
		4 / 8:47	Core	290	Sample 4 collected from 20' to 21' using a coring tool. Sample was light brown and gray silty sand. Strong odor.
20					
		5 / 8:50	Core	237	Sample 5 collected from 25' to 26' using a coring tool. Sample was light gray and tan silty sand. Strong odor.
25	Tan and gray silty sand from 25' to approximately 30'.				
		6 / 9:05	Core	255	Sample 6 collected at 30' to 31' using a core sampling tool. Sample was tan sand Some odor.
30	Tan sand from 30 to 33'.				
35					
40	**Total depth of boring, 33 feet.** **Depth to groundwater, 32.7 feet measured on 10/21/98.** **Phase-separated hydrocarbon (PSH), NONE, measured on 10/21/98.**				

ABBREVIATIONS AND SYMBOLS

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
THD - Texas Highway Department Cone
CT-5' - Continuous Sampler

HSA - Hollow Stem Auger
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

ENERCON SERVICES, INC. 2775 VILLA CREEK, SUITE 120 DALLAS, TX 75234-7420	RECORD OF SUBSURFACE EXPLORATION	
Project #: EV-958	Well/Boring #: B-7	Date Drilled: 10/21/98
Project: Junction I-9 Hobbs SWD System Lea County, New Mexico	Drilling Company: West Texas Water Well Service Driller: Bernie	Drilling Method: Air Rotary Logged By: SAL

DEPTH (FEET)	SOIL DESCRIPTION	SAMPLE NUMBER/ TIME	SAMPLE TYPE	OVA (PPM)	REMARKS/SAMPLE DESCRIPTION
0	Brown sandy top soil to 6"				
	Light tan to gray caliche and sand from 6" to 5'.				
5	Light gray caliche and silty sand from 5' to 15'.				
10					
15	Light tan dry, crumbly caliche from 15' to approximately 25'.	1 / 9:30	Core	3.6	Sample 1 collected from 15' to 16' using a coring tool. Sample was tan crumbly caliche. No odor.
20		2 / 9:40	Core	6.6	Sample 2 collected from 20' to 21' using a coring tool. Sample was tan crumbly caliche. No odor.
25	Soft light tan caliche with hard blue-gray stained caliche from 25' to approximately 30'.	3 / 9:45	Core	125	Sample 3 collected from 25' to 26' using a coring tool. Sample was soft tan caliche and hard blue-gray caliche. Some odor.
30	Light tan silty sand from 30' to 31'.	4 / 9:55	Core	145	Sample 4 collected at 30' to 31' using a core sampling tool. Sample was light tan silty sand. No staining. Some odor.
35					
40	**Total depth of boring, 31 feet.** **Depth to groundwater, NONE.** **Phase-separated hydrocarbon (PSH), NONE, measured on 10/21/98.**				

ABBREVIATIONS AND SYMBOLS

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
THD - Texas Highway Department Cone
CT-5' - Continuous Sampler

HSA - Hollow Stem Auger
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

DRILLING LOG

RICE *Operating Company*
122 West Taylor
Hobbs, New Mexico 88240
Phone: (505) 393-9174
Fax: (505) 397-1471

Site Name /Location
Junction I-9
09-T19S-R38E
Hobbs SWD System
Lea Co. New Mexico

Well No.	Date Drilled:	Driller:	Logged by:
B-8	1-7-99	C. Harrison	FWR
Well Depth:	**Boring Depth:**	**Well Material:**	**Construction:**
N/A	40'	N/A	Plugged boring by filling from total depth to surface with bentonite
Casing Length:	**Boring Diameter:**	**Casing Size:**	
N/A	8"	N/A	
Screen Length:	**Drilling Method:**	**Slot Size:**	
N/A	Air Rotary	N/A	

DEPTH (Feet)	SUBSURFACE LITHOLOGY	Sample Type	OVM (ppm)	REMARKS	Boring
0					
1	Light brown, fine-grained, calcareous sand				
2					
3					
4		Drill Cuttings	>1		
5					
6					
7					
8	White to light gray Caliche				
9		Drill Cuttings	>1		
10					
11					
12					
13					
14		Drill Cuttings	>1		
15					
16					
17					
18					
19		Drill Cuttings	>1		
20					
21					
22					
23					
24		Drill Cuttings	22		
25					
26					
27					
28					
29		Drill Cuttings	19	Hydrocarbon stain	
30					
31				Depth to Water 0.00 feet LNAPL gauged 1-8-99	
32					
33	Light brown to pink fine-grained sand				
34		Drill Cuttings	>1		
35					
36				Bentonite Seal	
37					
38					
39		Drill Cuttings	>1		
40					

APPENDIX C

MONITOR WELL CONSTRUCTION DIAGRAMS

DRILLING LOG

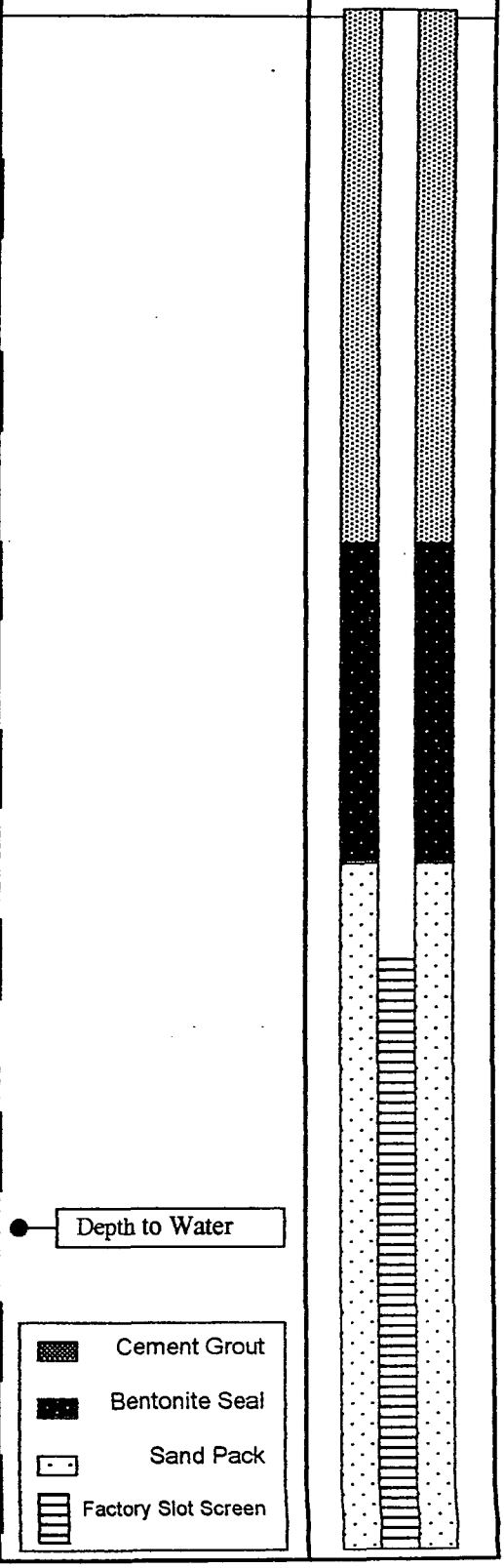
RICE *Operating Company*
122 West Taylor
Hobbs, New Mexico 88240
Phone: (505) 393-9174
Fax: (505) 397-1471

Site Name /Location

Junction I-9
09-T19S-R38E
Hobbs SWD System
Lea Co. New Mexico

Well No.	Date Drilled:	Driller:	Logged by:
MW-1	1-7-99	C. Harrison	FWR
Well Depth: 40'	**Boring Depth:** 40'	**Well Material:** Sch 40 PVC	**Construction:** Flush-mount set in 3' by 3' pad w/ locking cap
Casing Length: 25'	**Boring Diameter:** 6"	**Casing Size:** 2"	
Screen Length: 15'	**Drilling Method:** Air Rotary	**Slot Size:** 0.02"	

DEPTH (Feet)	SUBSURFACE LITHOLOGY	Sample Type	OVM (ppm)	REMARKS
0–1	Light brown, fine-grained, calcareous sand			
1–27	White to light gray Caliche	Drill Cuttings	>1	
27–33	Gray limestone	Drill Cuttings	>1	Depth to Water
33–37	Indurated red-brown silicious sandstone	Drill Cuttings	>1	
37–40	Light brown to pink fine-grained sand	Drill Cuttings	>1	



DRILLING LOG

RICE *Operating Company*
122 West Taylor
Hobbs, New Mexico 88240
Phone: (505) 393-9174
Fax: (505) 397-1471

Site Name /Location

Junction I-9
09-T19S-R38E
Hobbs SWD System
Lea Co. New Mexico

Well No.	Date Drilled:	Driller:	Logged by:
MW-2	1-7-99	C. Harrison	FWR
Well Depth: 40'	**Boring Depth:** 40'	**Well Material:** Sch 40 PVC	**Construction:** Flush-mount set in 3' by 3' pad w/ locking cap
Casing Length: 25'	**Boring Diameter:** 6"	**Casing Size:** 2"	
Screen Length: 15'	**Drilling Method:** Air Rotary	**Slot Size:** 0.02"	

DEPTH (Feet)	SUBSURFACE LITHOLOGY	Sample Type	OVM (ppm)	REMARKS	Well Design
0–18	Light brown, fine-grained, calcareous sand; White to light gray Caliche	Drill Cuttings	>1		
18–20	Light gray limestone	Drill Cuttings	>1		
20–29	Light gray, silty, caliche	Drill Cuttings	>1		
29–32	Gray limestone	Drill Cuttings	>1		
32–40	Light brown to pink fine-grained sand	Drill Cuttings	>1		

Depth to Water

Cement Grout
Bentonite Seal
Sand Pack
Factory Slot Screen

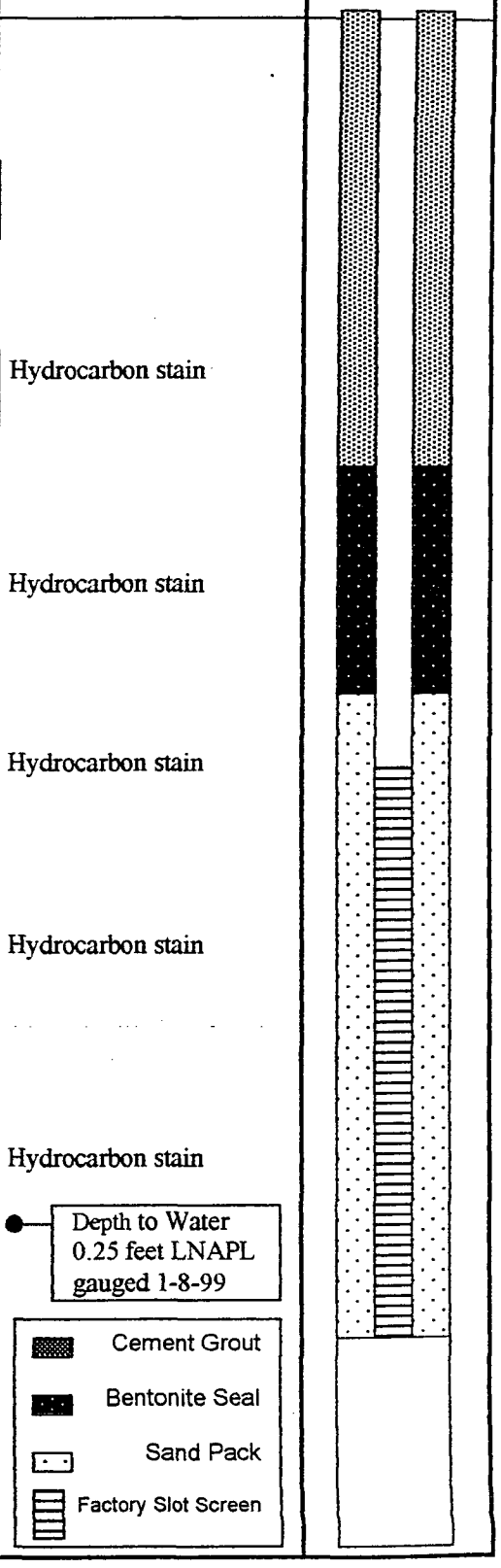
DRILLING LOG

RICE *Operating Company*
122 West Taylor
Hobbs, New Mexico 88240
Phone: (505) 393-9174
Fax: (505) 397-1471

Site Name /Location
Junction I-9
09-T19S-R38E
Hobbs SWD System
Lea Co. New Mexico

Well No.	Date Drilled:	Driller:	Logged by:
RW-1	1-7-99	C. Harrison	FWR
Well Depth:	**Boring Depth:**	**Well Material:**	**Construction:**
35'	35'	Sch 40 PVC	Flush-mount set in 3' by 3' pad w/ locking cap
Casing Length:	**Boring Diameter:**	**Casing Size:**	
20'	8"	4"	
Screen Length:	**Drilling Method:**	**Slot Size:**	
15'	Air Rotary	0.02"	

DEPTH (Feet)	SUBSURFACE LITHOLOGY	Sample Type	OVM (ppm)	REMARKS
0–5	Light brown, fine-grained, calcareous sand; White to light gray Caliche	Drill Cuttings	>1	
5–10		Drill Cuttings	48	Hydrocarbon stain
10–15		Drill Cuttings	180	Hydrocarbon stain
15–20	Gray limestone	Drill Cuttings	114	Hydrocarbon stain
20–25	Light gray, silty, caliche	Drill Cuttings	212	Hydrocarbon stain
25–30	Gray limestone interbedded with red-brown silicous sandstone	Drill Cuttings	89	Hydrocarbon stain
30–35	Indurated red-brown silicious sandstone	Drill Cuttings	>1	Depth to Water 0.25 feet LNAPL gauged 1-8-99
35–40				



DRILLING LOG

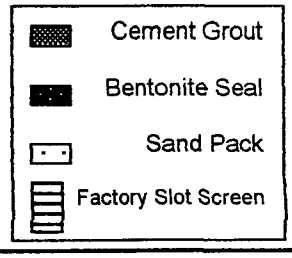
RICE *Operating Company*
122 West Taylor
Hobbs, New Mexico 88240
Phone: (505) 393-9174
Fax: (505) 397-1471

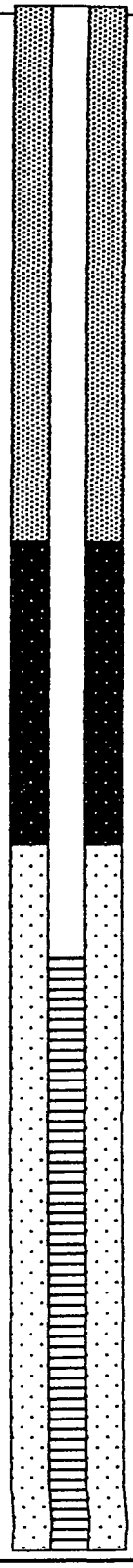
Site Name /Location

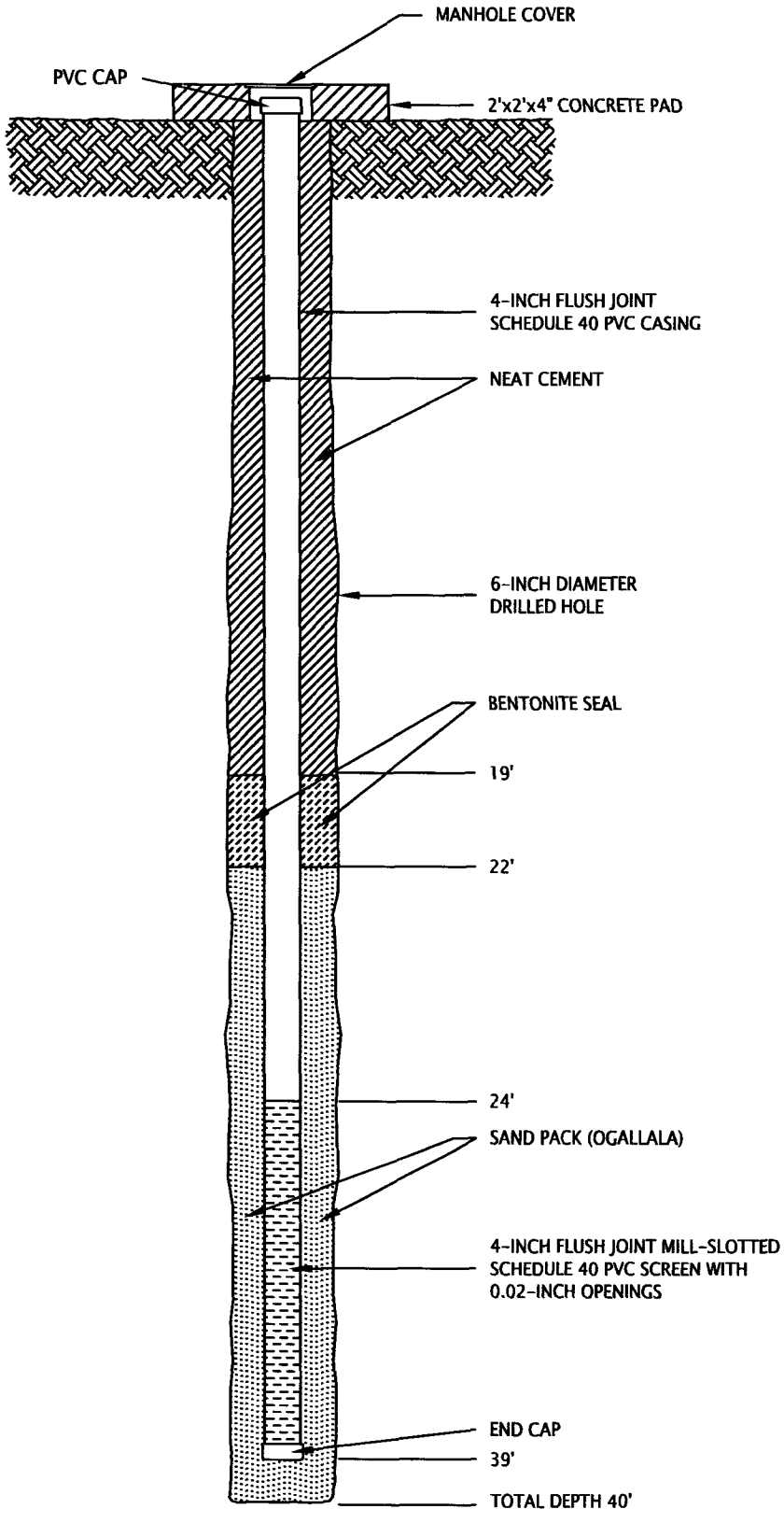
Junction I-9
09-T19S-R38E
Hobbs SWD System
Lea Co. New Mexico

Well No.	Date Drilled:	Driller:	Logged by:
MW-3	1-8-99	C. Harrison	FWR
Well Depth: 40'	**Boring Depth:** 40'	**Well Material:** Sch 40 PVC	**Construction:** Flush-mount set in 3' by 3' pad w/ locking cap
Casing Length: 25'	**Boring Diameter:** 6"	**Casing Size:** 2"	
Screen Length: 15'	***Drilling Method:*** Air Rotary	***Slot Size:*** 0.02"	

DEPTH (Feet)	SUBSURFACE LITHOLOGY	Sample Type	OVM (ppm)	REMARKS	Well Design
0					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					







MW-4
NOT TO SCALE

RICE OPERATING COMPANY
JUNCTION I-9 RELEASE SITE, 09-T19S-R38E,
HOBBS SWD SYSTEM ABATEMENT

WELL COMPLETION DIAGRAM

LEA COUNTY, NEW MEXICO

ARCADIS
GERAGHTY & MILLER
1030 Andrews Highway
Suite 120, Midland, TX 79701-3872
Tel: 915/699-1381 Fax: 915/699-1978

COMPILER D. McNEESE	DATE SEPTEMBER 10, 1999
PROJECT MANAGER S. HALL	REGIONAL MANAGER A. SCHMIDT
CHECKED S. TISCHER	FILE LOCATION \DWG\RICE\MT000591.001
FILE NAME MT591107.DWG	UNIQUE NUMBER 31-014-00212
PROJECT NUMBER MT000591.0001	APPENDIX C

APPENDIX D

LABORATORY ANALYTICAL RESULTS

Certes
Environmental Laboratories

2209 Wisconsin Street, Suite 200
Dallas, Texas 75229
972-620-7966
800-394-2872
972-620-7963 FAX • Email: certes@aol.com

CERTES ENVIRONMENTAL LABORATORIES
ANALYTICAL REPORT

Certes File Number: **98-3543**

Client Project I.D.:

EV 958

Prepared for:

ENERCON SERVICES, INC. - DALLAS
2775 Villa Creek Suite 120
Dallas, TX 75234

Attention:
Scott Lowry

Report Date:

10/30/98

Included are the results of chemical analyses for the samples submitted to Certes Environmental Laboratories, L.L.C., on 10/22/98. All analytical results met Quality Control requirements as set by the industry accepted criteria. Please refer to the Laboratory Quality Control Results section of this report.

Sincerely,

Certes Environmental Laboratories, L.L.C.

Bharat Vandra
Laboratory Manager

ATTACHMENT E
LABORATORY REPORTS

		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
Client Sample ID: B-1/20'-20.6'							Sample Number:	98-3543-001
Date Sampled:	10/20/98						Sample Matrix:	Solid
Time Sampled:	9:10						Sampled By:	SL
EPA 8021B	Benzene	684	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Toluene	759	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Ethyl benzene	11000	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Xylenes (Total)	21700	µg/Kg	600	10/23/98	10/23/98	DWT	40
	Total BTEX (Calculated)	34143	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	97%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	158%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	1070	mg/Kg	500	10/26/98	10/27/98	JCA	50
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	50
	p-Terphenyl (SS)	*0%	60-140%		10/26/98	10/27/98	JCA	50

** Surrogate recovery is out of range*

		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
Client Sample ID: B-1/28'							Sample Number:	98-3543-002
Date Sampled:	10/20/98						Sample Matrix:	Solid
Time Sampled:	9:50						Sampled By:	SL
EPA 8021B	Benzene	285	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Toluene	1000	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Ethyl benzene	9170	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Xylenes (Total)	24600	µg/Kg	600	10/23/98	10/23/98	DWT	40
	Total BTEX (Calculated)	35055	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	93%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	153%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	1200	mg/Kg	500	10/26/98	10/27/98	JCA	50
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	50
	p-Terphenyl (SS)	*0%	60-140%		10/26/98	10/27/98	JCA	50

** Surrogate recovery is out of range*

		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
Client Sample ID: B-1/30'							Sample Number:	98-3543-003
Date Sampled:	10/20/98						Sample Matrix:	Solid
Time Sampled:	10:00						Sampled By:	SL
EPA 8021B	Benzene	1130	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Toluene	1030	µg/Kg	200	10/23/98	10/23/98	DWT	40

Certes Environmental Laboratories
2209 Wisconsin Street, Suite 200 Dallas, Texas, 75229 • 972-620-7966 • 800-394-2872 • FAX 972-620-7963 • Email: certes@aol.com

Sample: 98-3543-003 continued...		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
EPA 8021B	Ethyl benzene	13800	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Xylenes (Total)	19500	µg/Kg	600	10/23/98	10/23/98	DWT	40
	Total BTEX (Calculated)	35460	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	84%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	141%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	1130	mg/Kg	500	10/26/98	10/27/98	JCA	50
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	50
	p-Terphenyl (SS)	*0%	60-140%		10/26/98	10/27/98	JCA	50

** Surrogate recovery is out of range*

Client Sample ID: **B-2/25'-26'** Sample Number: **98-3543-004**
Date Sampled: **10/20/98** Sample Matrix: **Solid**
Time Sampled: **11:10** Sampled By: **SL**

EPA 8021B	Benzene	477	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Toluene	716	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Ethyl benzene	11300	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Xylenes (Total)	25200	µg/Kg	600	10/23/98	10/23/98	DWT	40
	Total BTEX (Calculated)	37693	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	89%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	142%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	520	mg/Kg	250	10/26/98	10/27/98	JCA	25
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	25
	p-Terphenyl (SS)	*0%	60-140%		10/26/98	10/27/98	JCA	25

** Surrogate recovery is out of range*

Client Sample ID: **B-2/30'-31'** Sample Number: **98-3543-005**
Date Sampled: **10/20/98** Sample Matrix: **Solid**
Time Sampled: **11:20** Sampled By: **SL**

EPA 8021B	Benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Toluene	70	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Ethyl benzene	870	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Xylenes (Total)	2510	µg/Kg	150	10/23/98	10/23/98	DWT	10
	Total BTEX (Calculated)	3450	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	111%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	135%	49-158%		10/23/98	10/23/98	DWT	1

Certes Environmental Laboratories
2209 Wisconsin Street, Suite 200 Dallas, Texas, 75229 • 972-620-7966 • 800-394-2872 • FAX 972-620-7963 • Email: certes@aol.com

Sample: 98-3543-005 continued...		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
EPA 8015B	TPH (DRO)	278	mg/Kg	250	10/26/98	10/27/98	JCA	25
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	25
	p-Terphenyl (SS)	*0%	60-140%		10/26/98	10/27/98	JCA	25

** Surrogate recovery is out of range*

Client Sample ID: B-3/25' Sample Number: 98-3543-006
Date Sampled: 10/20/98 Sample Matrix: Solid
Time Sampled: 14:20 Sampled By: SL

EPA 8021B	Benzene	<200	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Toluene	1520	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Ethyl benzene	6950	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Xylenes (Total)	15900	µg/Kg	600	10/23/98	10/23/98	DWT	40
	Total BTEX (Calculated)	24370	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	102%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	145%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	369	mg/Kg	250	10/26/98	10/27/98	JCA	25
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	25
	p-Terphenyl (SS)	*0%	60-140%		10/26/98	10/27/98	JCA	25

** Surrogate recovery is out of range*

Client Sample ID: B-3/31'-33' Sample Number: 98-3543-007
Date Sampled: 10/20/98 Sample Matrix: Solid
Time Sampled: 14:35 Sampled By: SL

EPA 8021B	Benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Toluene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Ethyl benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Xylenes (Total)	<150	µg/Kg	150	10/23/98	10/23/98	DWT	10
	Total BTEX (Calculated)	0	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	108%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	96%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	<10	mg/Kg	10	10/26/98	10/27/98	JCA	1
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	1
	p-Terphenyl (SS)	80%	60-140%		10/26/98	10/27/98	JCA	1

Certes Environmental Laboratories
2209 Wisconsin Street, Suite 200 Dallas, Texas, 75229 • 972-620-7966 • 800-394-2872 • FAX 972-620-7963 • Email: certes@aol.com

		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
Client Sample ID: B-4/20'						Sample Number: 98-3543-008		
Date Sampled: 10/20/98						Sample Matrix: Solid		
Time Sampled: 15:15						Sampled By: SL		
EPA 8021B	Benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Toluene	207	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Ethyl benzene	178	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Xylenes (Total)	764	µg/Kg	150	10/23/98	10/23/98	DWT	10
	Total BTEX (Calculated)	1149	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	111%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	134%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	50	mg/Kg	10	10/26/98	10/27/98	JCA	1
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	1
	p-Terphenyl (SS)	64%	60-140%		10/26/98	10/27/98	JCA	1
Client Sample ID: B-4/30'						Sample Number: 98-3543-009		
Date Sampled: 10/20/98						Sample Matrix: Solid		
Time Sampled: 15:40						Sampled By: SL		
EPA 8021B	Benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Toluene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Ethyl benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Xylenes (Total)	<150	µg/Kg	150	10/23/98	10/23/98	DWT	10
	Total BTEX (Calculated)	0	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	109%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	108%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	47	mg/Kg	10	10/26/98	10/27/98	JCA	1
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	1
	p-Terphenyl (SS)	70%	60-140%		10/26/98	10/27/98	JCA	1
Client Sample ID: B-5/20'						Sample Number: 98-3543-010		
Date Sampled: 10/20/98						Sample Matrix: Solid		
Time Sampled: 16:23						Sampled By: SL		
EPA 8021B	Benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Toluene	288	µg/Kg	50	10/23/98	10/23/98	DWT	10

Certes Environmental Laboratories
2209 Wisconsin Street, Suite 200 Dallas, Texas, 75229 • 972-620-7966 • 800-394-2872 • FAX 972-620-7963 • Email: certes@aol.com

Sample: 98-3543-010 continued...		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
EPA 8021B	Ethyl benzene	188	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Xylenes (Total)	759	µg/Kg	150	10/23/98	10/23/98	DWT	10
	Total BTEX (Calculated)	1235	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	112%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	125%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	22	mg/Kg	10	10/26/98	10/27/98	JCA	1
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	1
	p-Terphenyl (SS)	72%	60-140%		10/26/98	10/27/98	JCA	1

Client Sample ID: **B-5/25'** Sample Number: **98-3543-011**
Date Sampled: **10/20/98** Sample Matrix: **Solid**
Time Sampled: **16:35** Sampled By: **SL**

EPA 8021B	Benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Toluene	268	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Ethyl benzene	264	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Xylenes (Total)	566	µg/Kg	150	10/23/98	10/23/98	DWT	10
	Total BTEX (Calculated)	1098	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	104%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	135%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	69	mg/Kg	10	10/26/98	10/27/98	JCA	1
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	1
	p-Terphenyl (SS)	*57%	60-140%		10/26/98	10/27/98	JCA	1

Surrogate recovery is out of range

Client Sample ID: **B-5/30'** Sample Number: **98-3543-012**
Date Sampled: **10/20/98** Sample Matrix: **Solid**
Time Sampled: **16:45** Sampled By: **SL**

EPA 8021B	Benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Toluene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Ethyl benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Xylenes (Total)	<150	µg/Kg	150	10/23/98	10/23/98	DWT	10
	Total BTEX (Calculated)	0	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	111%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	99%	49-158%		10/23/98	10/23/98	DWT	1

Certes Environmental Laboratories
2209 Wisconsin Street, Suite 200 Dallas, Texas, 75229 • 972-620-7966 • 800-394-2872 • FAX 972-620-7963 • Email: certes@aol.com

Sample: 98-3543-012 continued...		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
EPA 8015B	TPH (DRO)	18	mg/Kg	10	10/26/98	10/27/98	JCA	1
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	1
	p-Terphenyl (SS)	63%	60-140%		10/26/98	10/27/98	JCA	1

Client Sample ID: B-6/20'-21' Sample Number: 98-3543-013
Date Sampled: 10/21/98 Sample Matrix: Solid
Time Sampled: 8:47 Sampled By: SL

EPA 8021B	Benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Toluene	1390	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Ethyl benzene	1440	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Xylenes (Total)	4660	µg/Kg	150	10/23/98	10/23/98	DWT	10
	Total BTEX (Calculated)	7490	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	114%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	127%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	71	mg/Kg	10	10/26/98	10/27/98	JCA	1
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	1
	p-Terphenyl (SS)	61%	60-140%		10/26/98	10/27/98	JCA	1

Client Sample ID: B-6/25'-26' Sample Number: 98-3543-014
Date Sampled: 10/21/98 Sample Matrix: Solid
Time Sampled: 8:50 Sampled By: SL

EPA 8021B	Benzene	460	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Toluene	4260	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Ethyl benzene	12200	µg/Kg	200	10/23/98	10/23/98	DWT	40
	Xylenes (Total)	26400	µg/Kg	600	10/23/98	10/23/98	DWT	40
	Total BTEX (Calculated)	43320	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	85%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	143%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	234	mg/Kg	50	10/26/98	10/27/98	JCA	5
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	5
	p-Terphenyl (SS)	86%	60-140%		10/26/98	10/27/98	JCA	5

Certes Environmental Laboratories
2209 Wisconsin Street, Suite 200 Dallas, Texas, 75229 • 972-620-7966 • 800-394-2872 • FAX 972-620-7963 • Email: certes@aol.com

		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
Client Sample ID: B-6/30'-31'							Sample Number:	98-3543-015
Date Sampled: 10/21/98							Sample Matrix:	Solid
Time Sampled: 9:05							Sampled By:	SL
EPA 8021B	Benzene	581	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Toluene	130	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Ethyl benzene	2900	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Xylenes (Total)	4170	µg/Kg	150	10/23/98	10/23/98	DWT	10
	Total BTEX (Calculated)	7781	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	116%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	152%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	25	mg/Kg	10	10/26/98	10/27/98	JCA	1
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	1
	p-Terphenyl (SS)	67%	60-140%		10/26/98	10/27/98	JCA	1

		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
Client Sample ID: B-7/25'-26'							Sample Number:	98-3543-016
Date Sampled: 10/21/98							Sample Matrix:	Solid
Time Sampled: 9:45							Sampled By:	SL
EPA 8021B	Benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Toluene	100	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Ethyl benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Xylenes (Total)	<150	µg/Kg	150	10/23/98	10/23/98	DWT	10
	Total BTEX (Calculated)	100	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	103%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	117%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	106	mg/Kg	10	10/26/98	10/27/98	JCA	1
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	1
	p-Terphenyl (SS)	*59%	60-140%		10/26/98	10/27/98	JCA	1

** Surrogate recovery is out of range*

		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
Client Sample ID: B-7/30'							Sample Number:	98-3543-017
Date Sampled: 10/21/98							Sample Matrix:	Solid
Time Sampled: 9:55							Sampled By:	SL
EPA 8021B	Benzene	<50	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Toluene	214	µg/Kg	50	10/23/98	10/23/98	DWT	10

Certes Environmental Laboratories
2209 Wisconsin Street, Suite 200 Dallas, Texas, 75229 • 972-620-7966 • 800-394-2872 • FAX 972-620-7963 • Email: certes@aol.com

Sample: 98-3543-017 continued...		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
EPA 8021B	Ethyl benzene	865	µg/Kg	50	10/23/98	10/23/98	DWT	10
	Xylenes (Total)	2190	µg/Kg	150	10/23/98	10/23/98	DWT	10
	Total BTEX (Calculated)	3269	µg/Kg		10/23/98	10/23/98	DWT	1
	**Quality Control Surrogate				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	115%	74-119%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	117%	49-158%		10/23/98	10/23/98	DWT	1
EPA 8015B	TPH (DRO)	10	mg/Kg	10	10/26/98	10/27/98	JCA	1
	**Quality Control Surrogate				10/26/98	10/27/98	JCA	1
	p-Terphenyl (SS)	89%	60-140%		10/26/98	10/27/98	JCA	1

Certes Environmental Laboratories
2209 Wisconsin Street, Suite 200 Dallas, Texas, 75229 • 972-620-7966 • 800-394-2872 • FAX 972-620-7963 • Email: certes@aol.com

	Benzene	Toluene	Ethyl benzene	Xylenes	Diesel Range Organics
Matrix Spike					
Batch Number	102398H1	102398H1	102398H1	102398H1	DROS-0099
Date Prepared	10/23/98	10/23/98	10/23/98	10/23/98	10/26/98
Date Analyzed	10/23/98	10/23/98	10/23/98	10/23/98	10/27/98
Spiked Sample ID	3543-17	3543-17	3543-17	3543-17	N/A
Spike Level (mg/L) (µg/L) (mg/Kg) (µg/Kg)	100	100	100	200	83.3
Spike Result (mg/L) (µg/L) (mg/Kg) (µg/Kg)	108	104	93	183	30.0*
% Recovery	108	104	93	92	N/A
Spike Duplicate Result (mg/L) (µg/L) (mg/Kg) (µg/Kg)	111	107	96	191	196*
% Recovery Duplicate	111	107	96	96	N/A
Relative Percent Difference (RPD)	3	3	3	4	N/A
Control Limits (%low-%high)	70-130	70-130	70-130	70-130	53.3-112
Method Blank (mg/L) (µg/L) (mg/Kg) (µg/Kg)	<1	<1	<1	<3	<10.0
Laboratory Control Sample					
Spike Level (mg/L) (µg/L) (mg/Kg) (µg/Kg)	100	100	100	200	83.3
Spike Result (mg/L) (µg/L) (mg/Kg) (µg/Kg)	110	110	111	227	63.1
% Recovery	110	110	111	114	75
Spike Duplicate Result (mg/L) (µg/L) (mg/Kg) (µg/Kg)	N/A	N/A	N/A	N/A	70.5
% Recovery Duplicate	N/A	N/A	N/A	N/A	85
Relative Percent Difference (RPD)	N/A	N/A	N/A	N/A	11
Control Limits (%low-%high)	70-130	70-130	70-130	70-130	53.3-112

***See Case Narrative**

µg/l = micrograms per liter (ppb)
µg/kg = micrograms per kilogram (ppb)
< = less than
MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Laboratory Control Sample
BS = Blank Spike
µmhos/cm = micromhos/centimeter

mg/l = milligrams per liter (ppm)
mg/kg = milligrams per kilogram (ppm)
% = percent
RPD = Relative Percentage Difference
RW - Reagent Water
LCSD = Laboratory Control Sample Duplicate
BSD = Blank Spike Duplicate

Certes

Environmental Laboratories, L.L.C.
2209 Wisconsin Street, Suite 200
Dallas, Texas 75229
972-620-7966 972-620-7963 Fax

Analysis(es) Requested 1/2

Client Name: Rice Operating Company Enercon-Dallas
Phone No.:
Client Address: 122 West Taylor
Fax No.:
Billing Address: City: Hobbs State: NM Zip: 88240
Purchase Order No.: To ensure proper billing, please reference quotation number.
Project Manager: Scott A. Lowry
Site Location: Junction Box I 9 Hobbs SWD Sys

Certes No.	Sample ID	Date	Time	Matrix[1]	No. & Type of Container[2] V	G	J	O	P[3]	BTEX	TPH 8015 (DRO)
10	B-5 / 20'	10/20/98	1623	Soil			1 ✓			✓	✓
11	B-5 / 25'	10/20/98	1635	Soil			1 ✓			✓	✓
12	B-5 / 30'	10/20/98	1646	Soil			1 ✓			✓	✓
13	B-6 / 20-21'	10/21/98	847	Soil			1 ✓			✓	✓
14	B-6 / 25'-26'	10/21/98	850	Soil			1 ✓			✓	✓
15	B-6 / 30'-31'	10/21/98	905	Soil			1 ✓			✓	✓
16	B-7 / 25'-26'	10/21/98	945	Soil			1 ✓			✓	✓
17	B-7 / 30'	10/21/98	955	Soil			1 ✓			✓	✓

Sampled By: SAL

1 Matrix: A - Air Bag; C - Charcoal Tube; L - Liquid; OL - Oil; S - Soil; SD - Solid; SL - Sludge; WP - Wipe; W - Water/Wastewa
2 Container Type: V - 40ml VOA Vial; G - Amber or Glass 1 Liter; J - 250ml Wide-mouth Glass Jar; O - Other:
3 Preservative: HCl - Hydrochloric Acid; HNO_3 - Nitric Acid; H_2SO_4 - Sulfuric Acid; O - Other:

TAT
Standard: Date Required 10/30
RUSH: Date Required

Client Project ID: EV 958 Rice Operating Co.

Special Instructions (including specific detection limits): Client will back 8015 DRO &/or GRO KL 5pm 10/22

Certes Job Number: 98-3543 1/2

	Date	Time	Received By
Relinquished by Sampler			
Relinquished by	Date	Time	Received By
Relinquished by	Date 10/22/98	Time 1655	Received By Laboratory Ricki Rose

NOTE: By submitting these samples, you agree to the terms and conditions contained in Certes' Schedule of Fees. Certes cannot accept verbal changes. Please FAX written changes to (972) 620-7963

Certes

Environmental Laboratories, L.L.C.
2209 Wisconsin Street, Suite 200
Dallas, Texas 75229
972-620-7966 972-620-7963 Fax

Analysis(es) Requested

2/2

Client Name: ~~Rice Operating Co.~~ Enercon - Dallas
Phone No.:
Client Address: 122 West Taylor
Fax No.:
Billing Address:
City: Hobbs State: NM Zip: 88240
Purchase Order No.:
To ensure proper billing, please reference quotation number.
Project Manager: Scott A. Lowry
Site Location: Junction Box I9 Hobbs SW/Sec

Certes No.	Sample ID	Date	Time	Matrix[1]	No. & Type of Container[2] V	G	J	O	P[3]	BTEX	TPH 8015 (DRO)
1	B-1 / 20'-20.6	10/20/98	916	Soil			1 ✓			✓	✓
2	B-1 / 28'	10/20/98	950	Soil			1 ✓			✓	✓
3	B-1 / 30'	10/20/98	10	Soil			1 ✓			✓	✓
4	B-2 / 25'-26'	10/20/98	1110	Soil			1 ✓			✓	✓
5	B-2 / 30-31'	10/20/98	1120	Soil			1 ✓			✓	✓
6	B-3 / 25'	10/20/98	1420	Soil			1 ✓			✓	✓
7	B-3 / 31-33'	10/20/98	1435	Soil			1 ✓			✓	✓
8	B-4 / 20'	10/20/98	1515	Soil			1 ✓			✓	✓
9	B-4 / 30'	10/20/98	1540	Soil			1 ✓			✓	✓

Sampled By: SAL

1 Matrix: A - Air Bag; C - Charcoal Tube; L - Liquid; OL - Oil; S - Soil; SD - Solid; SL - Sludge; WP - Wipe; W - Water/Wastew
2 Container Type: V - 40ml VOA Vial; G - Amber or Glass 1 Liter; J - 250ml Wide-mouth Glass Jar; O - Other:
3 Preservative: HCl - Hydrochloric Acid; HNO_3 - Nitric Acid; H_2SO_4 - Sulfuric Acid; O - Other:

TAT
Standard ~~Date Required~~: 10/30
RUSH: Date Required:

Client Project ID: EV 958 Rice Operating Co.

Special Instructions (including specific detection limits)
Client will call back 8015 DRO &/or GRO
AL SAL 10/22

Certes Job Number: 98-3543

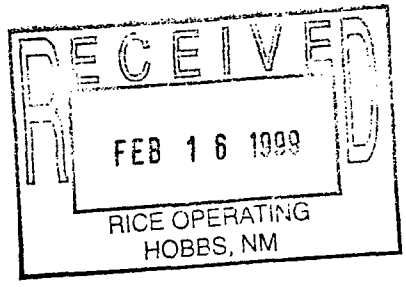
2/2

Relinquished by Sampler	Date 10/22/98	Time	Received By
Relinquished by	Date	Time	Received By
Relinquished by	Date 10/22/98	Time 1655	Received By Laboratory Ricki Rose

NOTE: By submitting these samples, you agree to the terms and conditions contained in Certes' Schedule of Fees. Certes cannot accept verbal changes. Please FAX written changes to (972) 620-7963

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

February 10, 1999



F. Wesley Root
RICE OPERATING COMPANY
122 West Taylor
Hobbs, NM 88240

The following report contains analytical results for the sample(s) received at Southern Petroleum Laboratories (SPL) on January 19, 1999. The sample(s) was assigned to Certificate of Analysis No. (s) 9901761 and analyzed for all parameters as listed on the chain of custody.

Sample MW-2 (SPL#9901761-01D) was randomly chosen as a quality Control sample for Total metals analysis by SW-846 method 6010. The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries were outside of advisable limits for Aluminum and Iron. A Laboratory Control Sample (LCS) was analyzed as a Quality Control check for the analytical batch and all recoveries were within acceptable limits.

Any data flags or quality control exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

If you have any questions or comments pertaining to this data report, please do not hesitate to contact me. Please reference the above Certificate of Analysis No. during any inquiries.

Again, SPL is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Southern Petroleum Laboratories

Electa Brown
Project Manager

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 99-01-761

Approved for Release by:

Electa Brown, Project Manager — Date: 2/10/99

Greg Grandits
Laboratory Director

Cynthia Schreiner
Quality Assurance Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-02

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-1

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 12:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Liquid-liquid extraction SEMIVOLATILES Method 3520C *** Analyzed by: KL Date: 01/20/99 13:00:00	01/20/99		
Chloride Method 325.3 * Analyzed by: CV Date: 01/29/99 11:00:00	128	2	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TK Date: 01/19/99 16:20:00	ND	2	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TK Date: 01/19/99 16:20:00	332	2	mg/L
pH Method 150.1 * Analyzed by: TK Date: 01/19/99 17:00:00	7.29		pH Units
Resistivity Method 120.1 * Analyzed by: TK Date: 01/19/99 16:50:00	0.74	0.001	Mohms-cm

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-02

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-1

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 12:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sulfate Method 375.4 * Analyzed by: TW Date: 01/28/99 13:30:00	318	25	mg/L
Specific Gravity ASTM D1429 Analyzed by: DS Date: 02/02/99 14:00:00	0.982		g/cm3
Total Dissolved Solids Method 160.1 * Analyzed by: DS Date: 02/05/99 10:00:00	890	20	mg/L
Silver, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.01	mg/L
Aluminum, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	12.3	0.1	mg/L
Arsenic, Total Method 6010B *** Analyzed by: EG Date: 01/21/99 15:28:00	0.019	0.005	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-02

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-1

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 12:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Barium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.870	0.005	mg/L
Calcium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	727	1	mg/L
Cadmium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.005	mg/L
Cobalt, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.01	mg/L
Chromium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.01	mg/L
Copper, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.02	0.01	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-02

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-1

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 12:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Iron, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	9.34	0.02	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 01/20/99 14:50:00	ND	0.0002	mg/L
Potassium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	3	2	mg/L
Magnesium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	43.9	0.1	mg/L
Manganese, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.214	0.005	mg/L
Molybdenum, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.02	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-02

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-1

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 12:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	144	0.5	mg/L
Nickel, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.02	0.02	mg/L
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: EE Date: 01/19/99 13:00:00	01/19/99		
Lead, Total Method 6010B *** Analyzed by: EG Date: 01/21/99 15:28:00	0.005	0.005	mg/L
Selenium, Total Method 6010B *** Analyzed by: EG Date: 01/21/99 15:28:00	ND	0.005	mg/L
Zinc, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.05	0.02	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-02

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-1

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 12:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Benzene	8	5	ug/L
Bromobenzene	ND	5	ug/L
Bromochloromethane	ND	5	ug/L
Bromodichloromethane	ND	5	ug/L
Bromoform	ND	5	ug/L
Bromomethane	ND	10	ug/L
n-Butylbenzene	ND	5	ug/L
sec-Butylbenzene	ND	5	ug/L
tert-Butylbenzene	ND	5	ug/L
Carbon tetrachloride	ND	5	ug/L
Chlorobenzene	ND	5	ug/L
Chlorodibromomethane	ND	5	ug/L
Chloroethane	ND	10	ug/L
Chloroform	ND	5	ug/L
Chloromethane	ND	10	ug/L
2-Chlorotoluene	ND	5	ug/L
4-Chlorotoluene	ND	5	ug/L
1,2-Dibromo-3-chloropropane	ND	5	ug/L
1,2-Dibromoethane	ND	5	ug/L
Dibromomethane	ND	5	ug/L
1,2-Dichlorobenzene	ND	5	ug/L
1,3-Dichlorobenzene	ND	5	ug/L
1,4-Dichlorobenzene	ND	5	ug/L
Dichlorodifluoromethane	ND	10	ug/L
1,1-Dichloroethane	ND	5	ug/L
1,2-Dichloroethane	ND	5	ug/L
1,1-Dichloroethene	ND	5	ug/L
cis-1,2-Dichloroethene	ND	5	ug/L
trans-1,2-Dichloroethene	ND	5	ug/L
1,2-Dichloropropane	ND	5	ug/L
1,3-Dichloropropane	ND	5	ug/L
2,2-Dichloropropane	ND	5	ug/L
1,1-Dichloropropene	ND	5	ug/L
Ethylbenzene	32	5	ug/L
Hexachlorobutadiene	ND	5	ug/L
Isopropylbenzene	ND	5	ug/L
p-Isopropyltoluene	ND	5	ug/L
Methylene chloride	ND	5	ug/L

METHOD: 8260 Water, Volatile Organics

(continued on next page)

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-02

Rice Operating Company

SAMPLE ID: MW-1

ANALYTICAL DATA (continued)

PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	5	ug/L
n-Propylbenzene	ND	5	ug/L
Styrene	ND	5	ug/L
1,1,1,2-Tetrachloroethane	ND	5	ug/L
1,1,2,2-Tetrachloroethane	ND	5	ug/L
Tetrachloroethene	ND	5	ug/L
Toluene	ND	5	ug/L
1,2,3-Trichlorobenzene	ND	5	ug/L
1,2,4-Trichlorobenzene	ND	5	ug/L
1,1,1-Trichloroethane	ND	5	ug/L
1,1,2-Trichloroethane	ND	5	ug/L
Trichloroethene	ND	5	ug/L
Trichlorofluoromethane	ND	5	ug/L
1,2,3-Trichloropropane	ND	5	ug/L
1,2,4-Trimethylbenzene	7	5	ug/L
1,3,5-Trimethylbenzene	ND	5	ug/L
Vinyl chloride	ND	10	ug/L
Xylenes (total)	12	5	ug/L
Acetone	ND	100	ug/L
Carbon Disulfide	ND	5	ug/L
Vinyl Acetate	ND	10	ug/L
2-Butanone	ND	20	ug/L
1,2-Dichloroethene (total)	ND	5	ug/L
2-Chloroethylvinylether	ND	10	ug/L
4-Methyl-2-Pentanone	ND	10	ug/L
cis-1,3-Dichloropropene	ND	5	ug/L
trans-1,3-Dichloropropene	ND	5	ug/L
2-Hexanone	ND	10	ug/L
Methyl t-Butyl Ether	ND	10	ug/L

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
1,2-Dichloroethane-d4	50 ug/L	86	76	114
Toluene-d8	50 ug/L	102	88	110
4-Bromofluorobenzene	50 ug/L	86	86	115

ANALYZED BY: GLT DATE/TIME: 01/23/99 20:10:00
METHOD: 8260 Water, Volatile Organics
NOTES: * - Practical Quantitation Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-02

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-1

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 12:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Acenaphthene	ND	5	ug/L
Acenaphthylene	ND	5	ug/L
Aniline	ND	5	ug/L
Anthracene	ND	5	ug/L
Benzo(a)Anthracene	ND	5	ug/L
Benzo(b)Fluoranthene	ND	5	ug/L
Benzo(k)Fluoranthene	ND	5	ug/L
Benzo(a)Pyrene	ND	5	ug/L
Benzoic Acid	ND	25	ug/L
Benzo(g,h,i)Perylene	ND	5	ug/L
Benzyl alcohol	ND	5	ug/L
4-Bromophenylphenyl ether	ND	5	ug/L
Butylbenzylphthalate	ND	5	ug/L
di-n-Butyl phthalate	ND	5	ug/L
Carbazole	ND	5	ug/L
4-Chloroaniline	ND	5	ug/L
bis(2-Chloroethoxy)Methane	ND	5	ug/L
bis(2-Chloroethyl)Ether	ND	5	ug/L
bis(2-Chloroisopropyl)Ether	ND	5	ug/L
4-Chloro-3-Methylphenol	ND	5	ug/L
2-Chloronaphthalene	ND	5	ug/L
2-Chlorophenol	ND	5	ug/L
4-Chlorophenylphenyl ether	ND	5	ug/L
Chrysene	ND	5	ug/L
Dibenz(a,h)Anthracene	ND	5	ug/L
Dibenzofuran	ND	5	ug/L
1,2-Dichlorobenzene	ND	5	ug/L
1,3-Dichlorobenzene	ND	5	ug/L
1,4-Dichlorobenzene	ND	5	ug/L
3,3'-Dichlorobenzidine	ND	10	ug/L
2,4-Dichlorophenol	ND	5	ug/L
Diethylphthalate	ND	5	ug/L
2,4-Dimethylphenol	ND	5	ug/L
Dimethyl Phthalate	ND	5	ug/L
4,6-Dinitro-2-Methylphenol	ND	25	ug/L
2,4-Dinitrophenol	ND	25	ug/L
2,4-Dinitrotoluene	ND	5	ug/L
2,6-Dinitrotoluene	ND	5	ug/L

METHOD: 8270C, Semivolatile Organics - Water

(continued on next page)

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-02

Rice Operating Company

SAMPLE ID: MW-1

ANALYTICAL DATA (continued)

PARAMETER	RESULTS	PQL*	UNITS
1,2-Diphenylhydrazine	ND	5	ug/L
bis(2-Ethylhexyl)Phthalate	ND	5	ug/L
Fluoranthene	ND	5	ug/L
Fluorene	ND	5	ug/L
Hexachlorobenzene	ND	5	ug/L
Hexachlorobutadiene	ND	5	ug/L
Hexachloroethane	ND	5	ug/L
Hexachlorocyclopentadiene	ND	5	ug/L
Indeno(1,2,3-cd)Pyrene	ND	5	ug/L
Isophorone	ND	5	ug/L
2-Methylnaphthalene	ND	5	ug/L
2-Methylphenol	ND	5	ug/L
4-Methylphenol	ND	5	ug/L
Naphthalene	ND	5	ug/L
2-Nitroaniline	ND	25	ug/L
3-Nitroaniline	ND	25	ug/L
4-Nitroaniline	ND	25	ug/L
Nitrobenzene	ND	5	ug/L
2-Nitrophenol	ND	5	ug/L
4-Nitrophenol	ND	25	ug/L
N-Nitrosodiphenylamine	ND	5	ug/L
N-Nitroso-Di-n-Propylamine	ND	5	ug/L
Di-n-Octyl Phthalate	ND	5	ug/L
Pentachlorophenol	ND	25	ug/L
Phenanthrene	ND	5	ug/L
Phenol	ND	5	ug/L
Pyrene	ND	5	ug/L
Pyridine	ND	5	ug/L
1,2,4-Trichlorobenzene	ND	5	ug/L
2,4,5-Trichlorophenol	ND	10	ug/L
2,4,6-Trichlorophenol	ND	5	ug/L

METHOD: 8270C, Semivolatile Organics - Water

(continued on next page)

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-02

Rice Operating Company

SAMPLE ID: MW-1

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
Nitrobenzene-d5	50 ug/L	74	35	114
2-Fluorobiphenyl	50 ug/L	78	43	116
Terphenyl-d14	50 ug/L	60	33	141
Phenol-d5	75 ug/L	21	10	110
2-Fluorophenol	75 ug/L	37	21	110
2,4,6-Tribromophenol	75 ug/L	65	10	123

ANALYZED BY: YL DATE/TIME: 01/22/99 19:55:00
EXTRACTED BY: KL DATE/TIME: 01/20/99 13:00:00
METHOD: 8270C, Semivolatile Organics - Water
NOTES: * - Practical Quantitation Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-01

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-2

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 11:20:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Liquid-liquid extraction SEMIVOLATILES Method 3520C *** Analyzed by: KL Date: 01/20/99 13:00:00	01/20/99		
Chloride Method 325.3 * Analyzed by: CV Date: 01/29/99 11:00:00	230	5	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TK Date: 01/19/99 16:20:00	ND	2	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TK Date: 01/19/99 16:20:00	322	2	mg/L
pH Method 150.1 * Analyzed by: TK Date: 01/19/99 17:00:00	7.51		pH Units
Resistivity Method 120.1 * Analyzed by: TK Date: 01/19/99 16:50:00	0.58	0.001	Mohms-cm

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-01

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-2

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 11:20:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sulfate Method 375.4 * Analyzed by: TW Date: 01/28/99 13:30:00	372	25	mg/L
Specific Gravity ASTM D1429 Analyzed by: DS Date: 02/02/99 14:00:00	0.985		g/cm3
Total Dissolved Solids Method 160.1 * Analyzed by: DS Date: 02/05/99 10:00:00	1190	20	mg/L
Silver, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.01	mg/L
Aluminum, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	16.5	0.1	mg/L
Arsenic, Total Method 6010B *** Analyzed by: EG Date: 01/21/99 15:28:00	0.025	0.005	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-01

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-2

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 11:20:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Barium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.970	0.005	mg/L
Calcium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	578	1	mg/L
Cadmium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.005	mg/L
Cobalt, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.01	mg/L
Chromium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.02	0.01	mg/L
Copper, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.02	0.01	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-01

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-2

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 11:20:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Iron, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	11.6	0.02	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 01/20/99 14:50:00	ND	0.0002	mg/L
Potassium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	30	2	mg/L
Magnesium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	101	0.1	mg/L
Manganese, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.288	0.005	mg/L
Molybdenum, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.02	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-01

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-2

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 11:20:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	171	0.5	mg/L
Nickel, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.02	mg/L
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: EE Date: 01/19/99 13:00:00	01/19/99		
Lead, Total Method 6010B *** Analyzed by: EG Date: 01/21/99 15:28:00	0.007	0.005	mg/L
Selenium, Total Method 6010B *** Analyzed by: EG Date: 01/21/99 15:28:00	ND	0.005	mg/L
Zinc, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.04	0.02	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-01

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-2

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 11:20:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Benzene	17	5	ug/L
Bromobenzene	ND	5	ug/L
Bromochloromethane	ND	5	ug/L
Bromodichloromethane	ND	5	ug/L
Bromoform	ND	5	ug/L
Bromomethane	ND	10	ug/L
n-Butylbenzene	ND	5	ug/L
sec-Butylbenzene	ND	5	ug/L
tert-Butylbenzene	ND	5	ug/L
Carbon tetrachloride	ND	5	ug/L
Chlorobenzene	ND	5	ug/L
Chlorodibromomethane	ND	5	ug/L
Chloroethane	ND	10	ug/L
Chloroform	ND	5	ug/L
Chloromethane	ND	10	ug/L
2-Chlorotoluene	ND	5	ug/L
4-Chlorotoluene	ND	5	ug/L
1,2-Dibromo-3-chloropropane	ND	5	ug/L
1,2-Dibromoethane	ND	5	ug/L
Dibromomethane	ND	5	ug/L
1,2-Dichlorobenzene	ND	5	ug/L
1,3-Dichlorobenzene	ND	5	ug/L
1,4-Dichlorobenzene	ND	5	ug/L
Dichlorodifluoromethane	ND	10	ug/L
1,1-Dichloroethane	ND	5	ug/L
1,2-Dichloroethane	ND	5	ug/L
1,1-Dichloroethene	ND	5	ug/L
cis-1,2-Dichloroethene	ND	5	ug/L
trans-1,2-Dichloroethene	ND	5	ug/L
1,2-Dichloropropane	ND	5	ug/L
1,3-Dichloropropane	ND	5	ug/L
2,2-Dichloropropane	ND	5	ug/L
1,1-Dichloropropene	ND	5	ug/L
Ethylbenzene	7	5	ug/L
Hexachlorobutadiene	ND	5	ug/L
Isopropylbenzene	ND	5	ug/L
p-Isopropyltoluene	ND	5	ug/L
Methylene chloride	ND	5	ug/L

METHOD: 8260 Water, Volatile Organics

(continued on next page)

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-01

Rice Operating Company

SAMPLE ID: MW-2

ANALYTICAL DATA (continued)

PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	5	ug/L
n-Propylbenzene	ND	5	ug/L
Styrene	ND	5	ug/L
1,1,1,2-Tetrachloroethane	ND	5	ug/L
1,1,2,2-Tetrachloroethane	ND	5	ug/L
Tetrachloroethene	ND	5	ug/L
Toluene	ND	5	ug/L
1,2,3-Trichlorobenzene	ND	5	ug/L
1,2,4-Trichlorobenzene	ND	5	ug/L
1,1,1-Trichloroethane	ND	5	ug/L
1,1,2-Trichloroethane	ND	5	ug/L
Trichloroethene	ND	5	ug/L
Trichlorofluoromethane	ND	5	ug/L
1,2,3-Trichloropropane	ND	5	ug/L
1,2,4-Trimethylbenzene	ND	5	ug/L
1,3,5-Trimethylbenzene	ND	5	ug/L
Vinyl chloride	ND	10	ug/L
Xylenes (total)	12	5	ug/L
Acetone	ND	100	ug/L
Carbon Disulfide	ND	5	ug/L
Vinyl Acetate	ND	10	ug/L
2-Butanone	ND	20	ug/L
1,2-Dichloroethene (total)	ND	5	ug/L
2-Chloroethylvinylether	ND	10	ug/L
4-Methyl-2-Pentanone	ND	10	ug/L
cis-1,3-Dichloropropene	ND	5	ug/L
trans-1,3-Dichloropropene	ND	5	ug/L
2-Hexanone	ND	10	ug/L
Methyl t-Butyl Ether	ND	10	ug/L

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
1,2-Dichloroethane-d4	50 ug/L	84	76	114
Toluene-d8	50 ug/L	104	88	110
4-Bromofluorobenzene	50 ug/L	90	86	115

ANALYZED BY: GLT DATE/TIME: 01/23/99 19:42:00
METHOD: 8260 Water, Volatile Organics
NOTES: * - Practical Quantitation Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-01

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-2

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 11:20:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Acenaphthene	ND	5	ug/L
Acenaphthylene	ND	5	ug/L
Aniline	ND	5	ug/L
Anthracene	ND	5	ug/L
Benzo(a)Anthracene	ND	5	ug/L
Benzo(b)Fluoranthene	ND	5	ug/L
Benzo(k)Fluoranthene	ND	5	ug/L
Benzo(a)Pyrene	ND	5	ug/L
Benzoic Acid	ND	25	ug/L
Benzo(g,h,i)Perylene	ND	5	ug/L
Benzyl alcohol	ND	5	ug/L
4-Bromophenylphenyl ether	ND	5	ug/L
Butylbenzylphthalate	ND	5	ug/L
di-n-Butyl phthalate	ND	5	ug/L
Carbazole	ND	5	ug/L
4-Chloroaniline	ND	5	ug/L
bis(2-Chloroethoxy)Methane	ND	5	ug/L
bis(2-Chloroethyl)Ether	ND	5	ug/L
bis(2-Chloroisopropyl)Ether	ND	5	ug/L
4-Chloro-3-Methylphenol	ND	5	ug/L
2-Chloronaphthalene	ND	5	ug/L
2-Chlorophenol	ND	5	ug/L
4-Chlorophenylphenyl ether	ND	5	ug/L
Chrysene	ND	5	ug/L
Dibenz(a,h)Anthracene	ND	5	ug/L
Dibenzofuran	ND	5	ug/L
1,2-Dichlorobenzene	ND	5	ug/L
1,3-Dichlorobenzene	ND	5	ug/L
1,4-Dichlorobenzene	ND	5	ug/L
3,3'-Dichlorobenzidine	ND	10	ug/L
2,4-Dichlorophenol	ND	5	ug/L
Diethylphthalate	ND	5	ug/L
2,4-Dimethylphenol	ND	5	ug/L
Dimethyl Phthalate	ND	5	ug/L
4,6-Dinitro-2-Methylphenol	ND	25	ug/L
2,4-Dinitrophenol	ND	25	ug/L
2,4-Dinitrotoluene	ND	5	ug/L
2,6-Dinitrotoluene	ND	5	ug/L

METHOD: 8270C, Semivolatile Organics - Water

(continued on next page)

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-01

Rice Operating Company

SAMPLE ID: MW-2

ANALYTICAL DATA (continued)

PARAMETER	RESULTS	PQL*	UNITS
1,2-Diphenylhydrazine	ND	5	ug/L
bis(2-Ethylhexyl)Phthalate	ND	5	ug/L
Fluoranthene	ND	5	ug/L
Fluorene	ND	5	ug/L
Hexachlorobenzene	ND	5	ug/L
Hexachlorobutadiene	ND	5	ug/L
Hexachloroethane	ND	5	ug/L
Hexachlorocyclopentadiene	ND	5	ug/L
Indeno(1,2,3-cd)Pyrene	ND	5	ug/L
Isophorone	ND	5	ug/L
2-Methylnaphthalene	ND	5	ug/L
2-Methylphenol	ND	5	ug/L
4-Methylphenol	ND	5	ug/L
Naphthalene	ND	5	ug/L
2-Nitroaniline	ND	25	ug/L
3-Nitroaniline	ND	25	ug/L
4-Nitroaniline	ND	25	ug/L
Nitrobenzene	ND	5	ug/L
2-Nitrophenol	ND	5	ug/L
4-Nitrophenol	ND	25	ug/L
N-Nitrosodiphenylamine	ND	5	ug/L
N-Nitroso-Di-n-Propylamine	ND	5	ug/L
Di-n-Octyl Phthalate	ND	5	ug/L
Pentachlorophenol	ND	25	ug/L
Phenanthrene	ND	5	ug/L
Phenol	ND	5	ug/L
Pyrene	ND	5	ug/L
Pyridine	ND	5	ug/L
1,2,4-Trichlorobenzene	ND	5	ug/L
2,4,5-Trichlorophenol	ND	10	ug/L
2,4,6-Trichlorophenol	ND	5	ug/L

METHOD: 8270C, Semivolatile Organics - Water

(continued on next page)

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-01

Rice Operating Company

SAMPLE ID: MW-2

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
Nitrobenzene-d5	50 ug/L	78	35	114
2-Fluorobiphenyl	50 ug/L	82	43	116
Terphenyl-d14	50 ug/L	56	33	141
Phenol-d5	75 ug/L	21	10	110
2-Fluorophenol	75 ug/L	37	21	110
2,4,6-Tribromophenol	75 ug/L	73	10	123

ANALYZED BY: YL DATE/TIME: 01/22/99 19:24:00
EXTRACTED BY: KL DATE/TIME: 01/20/99 13:00:00
METHOD: 8270C, Semivolatile Organics - Water
NOTES: * - Practical Quantitation Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-03

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-3

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 14:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Liquid-liquid extraction SEMIVOLATILES Method 3520C *** Analyzed by: KL Date: 01/20/99 13:00:00	01/20/99		
Chloride Method 325.3 * Analyzed by: CV Date: 01/29/99 11:00:00	195	5	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TK Date: 01/19/99 16:20:00	ND	2	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TK Date: 01/19/99 16:20:00	370	2	mg/L
pH Method 150.1 * Analyzed by: TK Date: 01/19/99 17:00:00	7.51		pH Units
Resistivity Method 120.1 * Analyzed by: TK Date: 01/19/99 16:50:00	0.53	0.001	Mohms-cm

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-03

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-3

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 14:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sulfate Method 375.4 * Analyzed by: TW Date: 01/28/99 13:30:00	483	25	mg/L
Specific Gravity ASTM D1429 Analyzed by: DS Date: 02/02/99 14:00:00	0.996		g/cm3
Total Dissolved Solids Method 160.1 * Analyzed by: DS Date: 02/05/99 10:00:00	1340	40	mg/L
Silver, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.01	mg/L
Aluminum, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	32.7	0.1	mg/L
Arsenic, Total Method 6010B *** Analyzed by: EG Date: 01/21/99 15:28:00	0.028	0.005	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-03

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-3

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 14:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Barium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	3.91	0.005	mg/L
Calcium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	1255	1	mg/L
Cadmium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.005	mg/L
Cobalt, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	ND	0.01	mg/L
Chromium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.03	0.01	mg/L
Copper, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.02	0.01	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-03

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-3

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 14:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Iron, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	26.4	0.02	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 01/20/99 14:50:00	ND	0.0002	mg/L
Potassium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	8	2	mg/L
Magnesium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	76.5	0.1	mg/L
Manganese, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.535	0.005	mg/L
Molybdenum, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.03	0.02	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-03

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

DATE: 02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-3

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 14:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Sodium, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	310	0.5	mg/L
Nickel, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.05	0.02	mg/L
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: EE Date: 01/19/99 13:00:00	01/19/99		
Lead, Total Method 6010B *** Analyzed by: EG Date: 01/21/99 15:28:00	0.013	0.005	mg/L
Selenium, Total Method 6010B *** Analyzed by: EG Date: 01/21/99 15:28:00	ND	0.005	mg/L
Zinc, Total Method 6010B *** Analyzed by: JM Date: 01/20/99 10:00:00	0.04	0.02	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-03

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-3

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 14:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Benzene	ND	5	ug/L
Bromobenzene	ND	5	ug/L
Bromochloromethane	ND	5	ug/L
Bromodichloromethane	ND	5	ug/L
Bromoform	ND	5	ug/L
Bromomethane	ND	10	ug/L
n-Butylbenzene	ND	5	ug/L
sec-Butylbenzene	ND	5	ug/L
tert-Butylbenzene	ND	5	ug/L
Carbon tetrachloride	ND	5	ug/L
Chlorobenzene	ND	5	ug/L
Chlorodibromomethane	ND	5	ug/L
Chloroethane	ND	10	ug/L
Chloroform	ND	5	ug/L
Chloromethane	ND	10	ug/L
2-Chlorotoluene	ND	5	ug/L
4-Chlorotoluene	ND	5	ug/L
1,2-Dibromo-3-chloropropane	ND	5	ug/L
1,2-Dibromoethane	ND	5	ug/L
Dibromomethane	ND	5	ug/L
1,2-Dichlorobenzene	ND	5	ug/L
1,3-Dichlorobenzene	ND	5	ug/L
1,4-Dichlorobenzene	ND	5	ug/L
Dichlorodifluoromethane	ND	10	ug/L
1,1-Dichloroethane	ND	5	ug/L
1,2-Dichloroethane	ND	5	ug/L
1,1-Dichloroethene	ND	5	ug/L
cis-1,2-Dichloroethene	ND	5	ug/L
trans-1,2-Dichloroethene	ND	5	ug/L
1,2-Dichloropropane	ND	5	ug/L
1,3-Dichloropropane	ND	5	ug/L
2,2-Dichloropropane	ND	5	ug/L
1,1-Dichloropropene	ND	5	ug/L
Ethylbenzene	ND	5	ug/L
Hexachlorobutadiene	ND	5	ug/L
Isopropylbenzene	ND	5	ug/L
p-Isopropyltoluene	ND	5	ug/L
Methylene chloride	ND	5	ug/L

METHOD: 8260 Water, Volatile Organics

(continued on next page)

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-03

Rice Operating Company

SAMPLE ID: MW-3

ANALYTICAL DATA (continued)

PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	5	ug/L
n-Propylbenzene	ND	5	ug/L
Styrene	ND	5	ug/L
1,1,1,2-Tetrachloroethane	ND	5	ug/L
1,1,2,2-Tetrachloroethane	ND	5	ug/L
Tetrachloroethene	ND	5	ug/L
Toluene	ND	5	ug/L
1,2,3-Trichlorobenzene	ND	5	ug/L
1,2,4-Trichlorobenzene	ND	5	ug/L
1,1,1-Trichloroethane	ND	5	ug/L
1,1,2-Trichloroethane	ND	5	ug/L
Trichloroethene	ND	5	ug/L
Trichlorofluoromethane	ND	5	ug/L
1,2,3-Trichloropropane	ND	5	ug/L
1,2,4-Trimethylbenzene	ND	5	ug/L
1,3,5-Trimethylbenzene	ND	5	ug/L
Vinyl chloride	ND	10	ug/L
Xylenes (total)	ND	5	ug/L
Acetone	ND	100	ug/L
Carbon Disulfide	ND	5	ug/L
Vinyl Acetate	ND	10	ug/L
2-Butanone	ND	20	ug/L
1,2-Dichloroethene (total)	ND	5	ug/L
2-Chloroethylvinylether	ND	10	ug/L
4-Methyl-2-Pentanone	ND	10	ug/L
cis-1,3-Dichloropropene	ND	5	ug/L
trans-1,3-Dichloropropene	ND	5	ug/L
2-Hexanone	ND	10	ug/L
Methyl t-Butyl Ether	ND	10	ug/L

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
1,2-Dichloroethane-d4	50 ug/L	84	76	114
Toluene-d8	50 ug/L	106	88	110
4-Bromofluorobenzene	50 ug/L	86	86	115

ANALYZED BY: GLT DATE/TIME: 01/23/99 20:38:00
METHOD: 8260 Water, Volatile Organics
NOTES: * - Practical Quantitation Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-03

Rice Operating Company
122 West Taylor
Hobbs, NM 88240
ATTN: F. Wesley Root

02/09/99

PROJECT: Jct. I-9 Hobbs SWD System
SITE: 09-T195-R38E, Lea County
SAMPLED BY: Rice Operating Company
SAMPLE ID: MW-3

PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 01/16/99 14:30:00
DATE RECEIVED: 01/19/99

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Acenaphthene	ND	5	ug/L
Acenaphthylene	ND	5	ug/L
Aniline	ND	5	ug/L
Anthracene	ND	5	ug/L
Benzo(a)Anthracene	ND	5	ug/L
Benzo(b)Fluoranthene	ND	5	ug/L
Benzo(k)Fluoranthene	ND	5	ug/L
Benzo(a)Pyrene	ND	5	ug/L
Benzoic Acid	ND	25	ug/L
Benzo(g,h,i)Perylene	ND	5	ug/L
Benzyl alcohol	ND	5	ug/L
4-Bromophenylphenyl ether	ND	5	ug/L
Butylbenzylphthalate	ND	5	ug/L
di-n-Butyl phthalate	ND	5	ug/L
Carbazole	ND	5	ug/L
4-Chloroaniline	ND	5	ug/L
bis(2-Chloroethoxy)Methane	ND	5	ug/L
bis(2-Chloroethyl)Ether	ND	5	ug/L
bis(2-Chloroisopropyl)Ether	ND	5	ug/L
4-Chloro-3-Methylphenol	ND	5	ug/L
2-Chloronaphthalene	ND	5	ug/L
2-Chlorophenol	ND	5	ug/L
4-Chlorophenylphenyl ether	ND	5	ug/L
Chrysene	ND	5	ug/L
Dibenz(a,h)Anthracene	ND	5	ug/L
Dibenzofuran	ND	5	ug/L
1,2-Dichlorobenzene	ND	5	ug/L
1,3-Dichlorobenzene	ND	5	ug/L
1,4-Dichlorobenzene	ND	5	ug/L
3,3'-Dichlorobenzidine	ND	10	ug/L
2,4-Dichlorophenol	ND	5	ug/L
Diethylphthalate	ND	5	ug/L
2,4-Dimethylphenol	ND	5	ug/L
Dimethyl Phthalate	ND	5	ug/L
4,6-Dinitro-2-Methylphenol	ND	25	ug/L
2,4-Dinitrophenol	ND	25	ug/L
2,4-Dinitrotoluene	ND	5	ug/L
2,6-Dinitrotoluene	ND	5	ug/L

METHOD: 8270C, Semivolatile Organics - Water

(continued on next page)

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-03

Rice Operating Company

SAMPLE ID: MW-3

ANALYTICAL DATA (continued)

PARAMETER	RESULTS	PQL*	UNITS
1,2-Diphenylhydrazine	ND	5	ug/L
bis(2-Ethylhexyl)Phthalate	ND	5	ug/L
Fluoranthene	ND	5	ug/L
Fluorene	ND	5	ug/L
Hexachlorobenzene	ND	5	ug/L
Hexachlorobutadiene	ND	5	ug/L
Hexachloroethane	ND	5	ug/L
Hexachlorocyclopentadiene	ND	5	ug/L
Indeno(1,2,3-cd)Pyrene	ND	5	ug/L
Isophorone	ND	5	ug/L
2-Methylnaphthalene	ND	5	ug/L
2-Methylphenol	ND	5	ug/L
4-Methylphenol	ND	5	ug/L
Naphthalene	ND	5	ug/L
2-Nitroaniline	ND	25	ug/L
3-Nitroaniline	ND	25	ug/L
4-Nitroaniline	ND	25	ug/L
Nitrobenzene	ND	5	ug/L
2-Nitrophenol	ND	5	ug/L
4-Nitrophenol	ND	25	ug/L
N-Nitrosodiphenylamine	ND	5	ug/L
N-Nitroso-Di-n-Propylamine	ND	5	ug/L
Di-n-Octyl Phthalate	ND	5	ug/L
Pentachlorophenol	ND	25	ug/L
Phenanthrene	ND	5	ug/L
Phenol	ND	5	ug/L
Pyrene	ND	5	ug/L
Pyridine	ND	5	ug/L
1,2,4-Trichlorobenzene	ND	5	ug/L
2,4,5-Trichlorophenol	ND	10	ug/L
2,4,6-Trichlorophenol	ND	5	ug/L

METHOD: 8270C, Semivolatile Organics - Water

(continued on next page)

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9901761-03

Rice Operating Company

SAMPLE ID: MW-3

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
Nitrobenzene-d5	50 ug/L	86	35	114
2-Fluorobiphenyl	50 ug/L	86	43	116
Terphenyl-d14	50 ug/L	56	33	141
Phenol-d5	75 ug/L	25	10	110
2-Fluorophenol	75 ug/L	45	21	110
2,4,6-Tribromophenol	75 ug/L	87	10	123

ANALYZED BY: YL DATE/TIME: 01/22/99 20:27:00
EXTRACTED BY: KL DATE/TIME: 01/20/99 13:00:00
METHOD: 8270C, Semivolatile Organics - Water
NOTES: * - Practical Quantitation Limit ND - Not Detected
NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

QUALITY CONTROL

DOCUMENTATION

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SPL Contract:

Lab Code: Case No.: 9901750 SAS No.: SDG No.:

Matrix Spike - EPA Sample No.: 99-006 A/B

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	50	0	56	112	61-145
Trichloroethene	50	0	52	104	71-120
Benzene	50	0	52	104	76-127
Toluene	50	0	53	106	76-125
Chlorobenzene	50	0	51	102	75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	50	58	106	6	14	61-145
Trichloroethene	50	47	100	4	14	71-120
Benzene	50	50	104	0	11	76-127
Toluene	50	48	108	2	13	76-125
Chlorobenzene	50	48	102	0	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits due to matrix interferences

SPL Houston Labs

RECOVERY REPORT

Client Name: Client SDG: n990123
Sample Matrix: LIQUID Fraction: VOA
Lab Smp Id: METHSPIKE-8260W Client Smp ID: LCS
Level: LOW Operator: GLT
Data Type: MS DATA SampleType: METHSPIKE
SpikeList File: 8260_water.spk Quant Type: ISTD
Sublist File: 8260_lcs.sub
Method File: /var/chem/n.i/n990123.b/n8260w.m
Misc Info: N023W1//N023CW1

	SPIKE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
8	1,1-Dichloroethene	50	53	106.00	61-145
29	Trichloroethene	50	52	104.00	71-120
25	Benzene	50	52	104.00	76-127
37	Toluene	50	53	106.00	76-125
45	Chlorobenzene	50	51	102.00	75-130

	SURROGATE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
$ 21	1,2-Dichloroethane	50	41	82.00	76-114
$ 36	Toluene-d8	50	51	102.00	88-110
$ 56	Bromofluorobenzene	50	43	86.00	86-115

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

SPL Blank QC Report

Matrix: Aqueous
Sample ID: VLBLK
Batch: N990123122720

Reported on: 01/25/99 17:44
Analyzed on: 01/23/99 10:55
Analyst: GLT

METHOD 8260/8240 N023B01

Compound	Result	Detection Limit	Units
Dichlorodifluoromethane	ND	10	ug/L
Chloromethane	ND	10	ug/L
Vinyl Chloride	ND	10	ug/L
Bromomethane	ND	10	ug/L
Chloroethane	ND	10	ug/L
Trichlorofluoromethane	ND	5	ug/L
Acetone	ND	100	ug/L
1,1-Dichloroethene	ND	5	ug/L
Methylene Chloride	ND	5	ug/L
Carbon Disulfide	ND	5	ug/L
trans-1,2-Dichloroethene	ND	5	ug/L
1,1-Dichloroethane	ND	5	ug/L
Vinyl Acetate	ND	10	ug/L
2-Butanone	ND	20	ug/L
cis-1,2-Dichloroethene	ND	5	ug/L
1,2-Dichloroethene (total)	ND	5	ug/L
2,2-Dichloropropane	ND	5	ug/L
Bromochloromethane	ND	5	ug/L
Chloroform	ND	5	ug/L
1,1,1-Trichloroethane	ND	5	ug/L
1,2-Dichloroethane	ND	5	ug/L
1,1-Dichloropropene	ND	5	ug/L
Benzene	ND	5	ug/L
Carbon Tetrachloride	ND	5	ug/L
1,2-Dichloropropane	ND	5	ug/L
Trichloroethene	ND	5	ug/L
Dibromomethane	ND	5	ug/L
Bromodichloromethane	ND	5	ug/L
2-Chloroethylvinylether	ND	10	ug/L
4-Methyl-2-Pentanone	ND	10	ug/L
cis-1,3-Dichloropropene	ND	5	ug/L
trans-1,3-Dichloropropene	ND	5	ug/L
Toluene	ND	5	ug/L
1,1,2-Trichloroethane	ND	5	ug/L

Notes
ND - Not detected.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

SPL Blank QC Report

Matrix: Aqueous
Sample ID: VLBLK
Batch: N990123122720

Reported on: 01/25/99 17:44
Analyzed on: 01/23/99 10:55
Analyst: GLT

METHOD 8260/8240 N023B01

Compound	Result	Detection Limit	Units
1,3-Dichloropropane	ND	5	ug/L
2-Hexanone	ND	10	ug/L
Dibromochloromethane	ND	5	ug/L
1,2-Dibromoethane	ND	5	ug/L
Tetrachloroethene	ND	5	ug/L
Chlorobenzene	ND	5	ug/L
1,1,1,2-Tetrachloroethane	ND	5	ug/L
Ethylbenzene	ND	5	ug/L
Bromoform	ND	5	ug/L
Styrene	ND	5	ug/L
Xylene (Total)	ND	5	ug/L
1,1,2,2-Tetrachloroethane	ND	5	ug/L
1,2,3-Trichloropropane	ND	5	ug/L
Isopropylbenzene	ND	5	ug/L
Bromobenzene	ND	5	ug/L
N-Propylbenzene	ND	5	ug/L
2-Chlorotoluene	ND	5	ug/L
4-Chlorotoluene	ND	5	ug/L
1,3,5-Trimethylbenzene	ND	5	ug/L
tert-Butylbenzene	ND	5	ug/L
1,2,4-Trimethylbenzene	ND	5	ug/L
1,3-Dichlorobenzene	ND	5	ug/L
sec-Butylbenzene	ND	5	ug/L
1,4-Dichlorobenzene	ND	5	ug/L
p-Isopropyltoluene	ND	5	ug/L
1,2-Dichlorobenzene	ND	5	ug/L
n-Butylbenzene	ND	5	ug/L
1,2-Dibromo-3-Chloropropan	ND	5	ug/L
1,2,4-Trichlorobenzene	ND	5	ug/L
Naphthalene	ND	5	ug/L
Hexachlorobutadiene	ND	5	ug/L
1,2,3-Trichlorobenzene	ND	5	ug/L
Methyl t-Butyl Ether	ND	10	ug/L

Notes
ND - Not detected.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

SPL Blank QC Report

Matrix: Aqueous
Sample ID: VLBLK
Batch: N990123122720

Reported on: 01/25/99 17:44
Analyzed on: 01/23/99 10:55
Analyst: GLT

METHOD 8260/8240 N023B01

Surrogate	Result	QC Criteria	Units
1,2-Dichloroethane-d4	86	76-114	% Recovery
Toluene-d8	102	88-110	% Recovery
Bromofluorobenzene	88	86-115	% Recovery

Samples in Batch 9901761-01 9901761-02 9901761-03

Notes

ND - Not detected.

3C

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SPL Contract:

Lab Code: Case No: [redacted] SAS No: SDG No:

Matrix Spike - EPA Sample No: [redacted] Level (low/med):

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATIO (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC
Phenol	75	0	16	21	12-110
2-Chlorophenol	75	0	38	51	27-123
1,4-Dichlorobenzene	50	0	29	58	36- 97
N-Nitroso-di-n-propylamine	50	0	32	64	41-116
1,2,4-Trichlorobenzene	50	0	34	68	39- 110
4-Chloro-3-methylphenol	75	0	47	63	23-110
Acenaphthene	50	0	38	76	46-125
4-Nitrophenol	75	0	19	25	25-150
2,4-Dinitrotoluene	50	0	38	76	50-150
Pentachlorophenol	75	0	51	68	9-125
Pyrene	50	0	58	116	26-127

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATIO (ug/L)	MSD % REC #	% RPD #	QC LIMITS RP	QC LIMITS REC
Phenol	75	18	24	13	42	12-110
2-Chlorophenol	75	47	63	21	40	27-123
1,4-Dichlorobenzene	50	34	68	16	28	36- 97
N-Nitroso-di-n-propylamine	50	46	92	36	38	41-116
1,2,4-Trichlorobenzene	50	40	80	16	28	39-110
4-Chloro-3-methylphenol	75	56	75	17	42	23-110
Acenaphthene	50	45	90	17	31	46-125
4-Nitrophenol	75	19	25	0	50	25-150
2,4-Dinitrotoluene	50	44	88	15	50	50-150
Pentachlorophenol	75	56	75	10	50	9-125
Pyrene	50	62	124	7	31	26-127

Column to be used to flag recovery and RPD values with an asterisk

RPD: 0 out of 11 outside limits

Spike Recovery: 0 out of 22 outside limits

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

SPL Blank QC Report

Matrix: Aqueous
Sample ID: BLANK
Batch: E990120042258

Reported on: 02/02/99 17:15
Analyzed on: 01/21/99 19:37
Analyst: YL

METHOD 8270 H020B03

Compound	Result	Detection Limit	Units
Pyridine	ND	5	ug/L
Phenol	ND	5	ug/L
Aniline	ND	5	ug/L
bis(2-Chloroethyl)ether	ND	5	ug/L
2-Chlorophenol	ND	5	ug/L
1,3-Dichlorobenzene	ND	5	ug/L
1,4-Dichlorobenzene	ND	5	ug/L
Benzyl alcohol	ND	5	ug/L
1,2-Dichlorobenzene	ND	5	ug/L
2-Methylphenol	ND	5	ug/L
bis(2-chloroisopropyl)ethe	ND	5	ug/L
4-Methylphenol	ND	5	ug/L
N-Nitroso-di-n-propylamine	ND	5	ug/L
Hexachloroethane	ND	5	ug/L
Nitrobenzene	ND	5	ug/L
Isophorone	ND	5	ug/L
2-Nitrophenol	ND	5	ug/L
2,4-Dimethylphenol	ND	5	ug/L
Benzoic acid	ND	25	ug/L
bis(2-Chloroethoxy)methane	ND	5	ug/L
2,4-Dichlorophenol	ND	5	ug/L
1,2,4-Trichlorobenzene	ND	5	ug/L
Naphthalene	ND	5	ug/L
4-Chloroaniline	ND	5	ug/L
Hexachlorobutadiene	ND	5	ug/L
4-Chloro-3-methylphenol	ND	5	ug/L
2-Methylnaphthalene	ND	5	ug/L
Hexachlorocyclopentadiene	ND	5	ug/L
2,4,6-Trichlorophenol	ND	5	ug/L
2,4,5-Trichlorophenol	ND	10	ug/L
2-Chloronaphthalene	ND	5	ug/L
2-Nitroaniline	ND	25	ug/L
Dimethylphthalate	ND	5	ug/L
2,6-Dinitrotoluene	ND	5	ug/L

Notes
ND - Not detected.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

SPL Blank QC Report

Matrix: Aqueous
Sample ID: BLANK
Batch: E990120042258

Reported on: 02/02/99 17:15
Analyzed on: 01/21/99 19:37
Analyst: YL

METHOD 8270 H020B03

Compound	Result	Detection Limit	Units
Acenaphthylene	ND	5	ug/L
3-Nitroaniline	ND	25	ug/L
Acenaphthene	ND	5	ug/L
2,4-Dinitrophenol	ND	25	ug/L
4-Nitrophenol	ND	25	ug/L
Dibenzofuran	ND	5	ug/L
2,4-Dinitrotoluene	ND	5	ug/L
Diethylphthalate	ND	5	ug/L
4-Chlorophenyl-phenylether	ND	5	ug/L
Fluorene	ND	5	ug/L
4-Nitroaniline	ND	25	ug/L
4,6-Dinitro-2-methylphenol	ND	25	ug/L
n-Nitrosodiphenylamine	ND	5	ug/L
1,2-Diphenylhydrazine	ND	5	ug/L
4-Bromophenyl-phenylether	ND	5	ug/L
Hexachlorobenzene	ND	5	ug/L
Pentachlorophenol	ND	25	ug/L
Phenanthrene	ND	5	ug/L
Anthracene	ND	5	ug/L
Carbazole	ND	5	ug/L
Di-n-butylphthalate	ND	5	ug/L
Fluoranthene	ND	5	ug/L
Pyrene	ND	5	ug/L
Butylbenzylphthalate	ND	5	ug/L
3,3'-Dichlorobenzidine	ND	10	ug/L
Benzo[a]anthracene	ND	5	ug/L
Chrysene	ND	5	ug/L
bis(2-Ethylhexyl)phthalate	ND	5	ug/L
Di-n-octylphthalate	ND	5	ug/L
Benzo[b]fluoranthene	ND	5	ug/L
Benzo[k]fluoranthene	ND	5	ug/L
Benzo[a]pyrene	ND	5	ug/L
Indeno[1,2,3-cd]pyrene	ND	5	ug/L
Dibenz[a,h]anthracene	ND	5	ug/L

Notes
ND - Not detected.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

SPL Blank QC Report

Matrix: Aqueous
Sample ID: BLANK
Batch: E990120042258

Reported on: 02/02/99 17:15
Analyzed on: 01/21/99 19:37
Analyst: YL

METHOD 8270 H020B03

Compound	Result	Detection Limit	Units
Benzo[g,h,i]perylene	ND	5	ug/L

Surrogate	Result	QC Criteria	Units
Nitrobenzene-d5	74	35-114	% Recovery
2-Fluorobiphenyl	84	43-116	% Recovery
Terphenyl-d14	112	33-141	% Recovery
Phenol-d5	19	10-110	% Recovery
2-Fluorophenol	36	21-110	% Recovery
2,4,6-Tribromophenol	73	10-123	% Recovery

Samples in Batch 9901761-01 9901761-02 9901761-03

Notes
ND - Not detected.

Trace-icp

ICP Spectroscopy Method 6010 Quality Control Report

Analyst: EG

Matrix: Water Units: mg/L

Date:012199 Time:1528 File Name: 0121PB6

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Laboratory Control Sample

Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver						
Aluminum						
Arsenic	ND	4.00	4.29	107	3.20	4.80
Barium						
Beryllium						
Calcium						
Cadmium						
Cobalt						
Chromium						
Copper						
Iron						
Potassium						
Magnesium						
Manganese						
Sodium						
Nickel						
Lead	ND	2.00	2.07	103	1.60	2.40
Antimony						
Selenium	ND	4.00	4.26	106	3.20	4.80
Thallium						
Vanadium						
Zinc						

Work Orders in Batch

Work Order	Fractions
99-01-761	01D-03D

Matrix Spike - Spike Duplicate Results

Work Order Spiked: 9901761-01D

Element	Sample Result	Spike Added	Matrix Spike Result	Matrix Spike Recovery	Matrix Spike Duplicate Result	Matrix Spike Duplicate Recovery	QC Limits % Recovery		Spike RPD %	QC Limits %
Silver										
Aluminum										
Arsenic	0.0249	2.0	1.921	94.8	1.949	96.2	80	120	1.5	20.0
Barium										
Beryllium										
Calcium										
Cadmium										
Cobalt										
Chromium										
Copper										
Iron										
Potassium										
Magnesium										
Manganese										
Sodium										
Nickel										
Lead	0.0073	1.0	0.8777	87.0	0.8826	87.5	80	120	0.6	20.0
Antimony										
Selenium	ND	2.0	1.869	93.5	1.883	94.2	80	120	0.7	20.0
Thallium										
Vanadium										
Zinc										

Checked: EG. 1/22/99

ICP

ICP Spectroscopy Method 6010 Quality Control Report

Analyst: JM

Matrix: Water Units: mg/L

Date:012099 Time:1000 File Name: 0120PB2

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Laboratory Control Sample

Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver	ND	2.00	2.07	103	1.60	2.40
Aluminum	ND	2.00	2.03	101	1.60	2.40
Arsenic						
Barium	ND	2.00	2.01	100	1.60	2.40
Beryllium						
Calcium	ND	20.00	21.07	105	16.00	24.00
Cadmium	ND	2.00	2.07	104	1.60	2.40
Cobalt	ND	2.00	2.09	104	1.60	2.40
Chromium	ND	2.00	2.12	106	1.60	2.40
Copper	ND	2.00	2.05	102	1.60	2.40
Iron	ND	2.00	2.12	106	1.60	2.40
Potassium	ND	20.00	20.52	103	16.00	24.00
Magnesium	ND	20.00	20.37	102	16.00	24.00
Manganese	ND	2.00	2.04	102	1.60	2.40
Molybdenum	ND	2.00	2.12	106	1.60	2.40
Nickel	ND	2.00	2.09	104	1.60	2.40
Lead						
Antimony						
Selenium						
Thallium						
Vanadium						
Zinc	ND	2.00	2.07	103	1.60	2.40

Work Orders in Batch

Work Order	Fractions
99-01-761	01D-03D
99-01-705	04B
99-01-734	01A

Matrix Spike - Spike Duplicate Results Work Order Spiked: 9901761-01D

Element	Sample Result	Spike Added	Matrix Spike Result	Matrix Spike Recovery		Matrix Spike Duplicate Result	Matrix Spike Duplicate Recovery		QC Limits % Recovery		Spike RPD %		QC Limits %
Silver	ND	1.0	0.886	88.6		0.9046	90.5		80	120	2.1		20.0
Aluminum	16.53	1.0	20.81	428.0	*	21.15	462.0	*	80	120	7.6		20.0
Arsenic													
Barium	0.9704	1.0	1.857	88.7		1.856	88.6		80	120	0.1		20.0
Beryllium													
Calcium	578.2	100.0	665.8	87.6		677.8	99.6		80	120	12.8		20.0
Cadmium	ND	1.0	0.8877	88.8		0.9043	90.4		80	120	1.9		20.0
Cobalt	ND	1.0	0.8559	85.6		0.8698	87.0		80	120	1.6		20.0
Chromium	0.015	1.0	0.8921	87.7		0.9073	89.2		80	120	1.7		20.0
Copper	0.0248	1.0	0.9108	88.6		0.9355	91.1		80	120	2.7		20.0
Iron	11.58	1.0	13.38	180.0	*	13.5	192.0	*	80	120	6.5		20.0
Potassium	30.28	10.0	39.69	94.1		41.04	107.6		80	120	13.4		20.0
Magnesium	100.9	10.0	109.5	86.0		112.6	117.0		80	120	30.5	**	20.0
Manganese	0.2882	1.0	1.131	84.3		1.152	86.4		80	120	2.5		20.0
Molybdenum	ND	1.0	0.8831	88.3		0.8925	89.3		80	120	1.1		20.0
Nickel	ND	1.0	0.8679	86.8		0.8882	88.8		80	120	2.3		20.0
Lead													
Antimony													
Selenium													
Thallium													
Vanadium													
Zinc	0.0435	1.0	0.9025	85.9		0.9227	87.9		80	120	2.3		20.0

* Spike Results Outside Method Limits
** Spike RPD Outside Method Limits
Elements Post Spiked:Ca (10x dilution)

Checked: JM 1/21/99

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 01/20/99
Analyzed on: 01/20/99
Analyst: AG

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Mercury, Total
Method 7470 A***

SPL Sample ID Number	Blank Value ug/L	LCS Concentration ug/L	Measured Concentration ug/L	% Recovery	QC Limits Recovery
LCS	ND	2.0	2.0	100	80 - 120

-9901533

Samples in batch:

9901761-01D 9901761-02D 9901761-03D

COMMENTS:
LCS= SPL ID# 94-452-49-12

ICP

ICP Spectroscopy Method 6010 Quality Control Report

Analyst: JM

Matrix: Water Units: mg/L

Date:012099 Time:1000 File Name: 0120PB4

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Laboratory Control Sample

Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver						
Aluminum						
Arsenic						
Barium						
Beryllium						
Calcium						
Cadmium						
Cobalt						
Chromium						
Copper						
Iron						
Potassium						
Magnesium						
Manganese						
Sodium	ND	20.00	19.95	100	16.00	24.00
Nickel						
Lead						
Antimony						
Selenium						
Thallium						
Vanadium						
Zinc						

Work Orders in Batch

Work Order	Fractions
99-01-761	01D-03D

Matrix Spike - Spike Duplicate Results

Work Order Spiked: 9901761-01D

Element	Sample Result	Spike Added	Matrix Spike Result	Matrix Spike Recovery		Matrix Spike Duplicate Result	Matrix Spike Duplicate Recovery	QC Limits % Recovery		Spike RPD %		QC Limits %
Silver												
Aluminum												
Arsenic												
Barium												
Beryllium												
Calcium												
Cadmium												
Cobalt												
Chromium												
Copper												
Iron												
Potassium												
Magnesium												
Manganese												
Sodium	171.3	10.0	175	37.0	*	181.4	101.0	80	120	92.8	**	20.0
Nickel												
Lead												
Antimony												
Selenium												
Thallium												
Vanadium												
Zinc												

* Spike Results Outside Method Limits
** Spike RPD Outside Method Limits

Checked: 2/5/99

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 01/31/99
Analyzed on: 01/29/99
Analyst: CV

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Chloride
Method 325.3 *

SPL Sample ID Number	Blank Value mg/L	LCS Concentration mg/L	Measured Concentration mg/L	% Recovery	QC Limits Recovery
LCS	ND	105.0	99.3	94.6	94 - 106

-9901837

Samples in batch:

9901409-01D	9901409-02D	9901409-03D	9901409-04D
9901410-01D	9901410-02D	9901410-03D	9901410-04D
9901411-01D	9901411-02D	9901411-03D	9901411-04D
9901761-01C	9901761-02C	9901761-03C	

COMMENTS:

LCS-SPL ID#94453222-14

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 01/31/99
Analyzed on: 01/29/99
Analyst: CV

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Chloride
Method 325.3 *

SPL Sample ID Number	Method Blank mg/L	Sample Result mg/L	Spike Added mg/L	Matrix Spike Result mg/L	Matrix Spike Recovery %	Matrix Spike Duplicate Result mg/L	Matrix Spike Duplicate Recovery %	RPD (%)	QC LIMITS (Advisory) RPD Max	QC LIMITS (Advisory) % REC
9901761-01C	ND	46.1	50.0	95.7	99.2	95.7	99.2	0	5	92 -109

-9901836

Samples in batch:

9901409-01D	9901409-02D	9901409-03D	9901409-04D
9901410-01D	9901761-01C	9901761-02C	9901761-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 01/19/99
Analyzed on: 01/19/99
Analyst: TK

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Carbonate, as CaCO3
Method SM 4500-CO2D **

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mg/L	Duplicate Sample mg/L	RPD	RPD Max.
9901705-04A	ND	ND	0	5

-9901480

Samples in batch:

9901705-04A 9901761-01C 9901761-02C 9901761-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 01/19/99
Analyzed on: 01/19/99
Analyst: TK

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Bicarbonate, as CaCO3
Method SM 4500-CO2D **

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mg/L	Duplicate Sample mg/L	RPD	RPD Max.
9901705-04A	722.2	722.4	0	5

-9901479

Samples in batch:

9901705-04A 9901761-01C 9901761-02C 9901761-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 01/19/99
Analyzed on: 01/19/99
Analyst: TK

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

pH
Method 150.1 *

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration pH Units	Duplicate Sample pH Units	RPD	RPD Max.
9901705-04A	6.87	6.86	0.1	1.0

-9901483

Samples in batch:

9901705-04A 9901761-01C 9901761-02C 9901761-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 01/19/99
Analyzed on: 01/19/99
Analyst: TK

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Resistivity
Method 120.1 *

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration Momhs-cm	Duplicate Sample Momhs-cm	RPD	RPD Max.
9901761-02C	0.74	0.74	0	1.0

-9901484

Samples in batch:

9901705-04A 9901761-01C 9901761-02C 9901761-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 01/29/99
Analyzed on: 01/28/99
Analyst: TW

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Sulfate
Method 375.4 *

SPL Sample ID Number	Blank Value mg/L	LCS Concentration mg/L	Measured Concentration mg/L	% Recovery	QC Limits Recovery
LCS	ND	26.80	25.64	95.7	82 - 111

-9901785

Samples in batch:

9901408-01D 9901408-02D 9901408-03D 9901408-04D
9901416-01D 9901520-01D 9901761-01C 9901761-02C
9901761-03C

COMMENTS:

SPL LCS#95535252-14

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 01/29/99
Analyzed on: 01/28/99
Analyst: TW

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Sulfate
Method 375.4 *

SPL Sample ID Number	Method Blank mg/L	Sample Result mg/L	Spike Added mg/L	Matrix Spike Result mg/L	Matrix Spike Recovery %	Matrix Spike Duplicate Result mg/L	Matrix Spike Duplicate Recovery %	RPD (%)	QC LIMITS (Advisory) RPD Max	% REC
9901408-01D	ND	8.58	10.00	18.17	95.9	18.61	100	4.2	9.5	84 -120

-9901784

Samples in batch:

9901408-01D 9901408-02D 9901408-03D 9901408-04D
9901416-01D 9901520-01D 9901761-01C 9901761-02C
9901761-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/02/99
Analyzed on: 02/02/99
Analyst: DS

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Specific Gravity
ASTM D1429

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration g/cm3	Duplicate Sample g/cm3	RPD	RPD Max.
9901761-01C	0.9849	0.9852	0	1.0

-9902059

Samples in batch:

9901761-01C 9901761-02C 9901762-03C

COMMENTS:

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/09/99
Analyzed on: 02/05/99
Analyst: DS

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Total Dissolved Solids
Method 160.1 *

SPL Sample ID Number	Blank Value mg/L	LCS Concentration mg/L	Measured Concentration mg/L	% Recovery	QC Limits Recovery
LCS	nd	430.9	425	98.6	93 - 107

-9902251

Samples in batch:

9901761-01C 9901761-02C 9901761-03C

COMMENTS:

lcs= spl id#95535254-2

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 02/09/99
Analyzed on: 02/05/99
Analyst: DS

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Total Dissolved Solids
Method 160.1 *

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mg/L	Duplicate Sample mg/L	RPD	RPD Max.
9901761-01C	1182	1186	0.3	5

-9902250

Samples in batch:

9901761-01C 9901761-02C 9901761-03C

COMMENTS:

SPL, Inc.

Analysis Request & Chain of Custody Record

SPL Workorder No: 9901761

107210

page 1 of 2

Client Name: Rice Operating Company
Address/Phone: 122 West Taylor, Hobbs, NM 88240
Client Contact: F. Wesley Root
Project Name: Jct. I-9
Project Number: Hobbs SWD System
Project Location: 09-T19S-R38E, Lea County, New Mexico
Invoice To: Rice Operating Company

SAMPLE ID	DATE	TIME	comp	grab	matrix (W=water S=soil SL=sludge O=other:)	bottle (P=plastic A=amber glass G=glass V=vial)	size (1=1 liter 4=4oz 40=vial 8=8oz 16=16oz)	pres. (1=HCl 2=HNO3 3=H2SO4 O=other:)	Number of Containers	Requested Analysis: VOC 8260	SVOC 8270	Mineral Pattern **	WQCC Metals *
MW-2	1-16-99	11:20		V	W	V	40	1	3	V			
MW-2	1-16-99	11:20		V	W	A	1	ICE	1		V		
MW-2	1-16-99	11:20		V	W	P	1	ICE	1			V	
MW-2	1-16-99	11:20		V	W	P	1	2	2				V
MW-1	1-16-99	12:30		V	W	V	40	1	3	V			
MW-1	1-16-99	12:30		V	W	A	1	ICE	1		V		
MW-1	1-16-99	12:30		V	W	P	1	ICE	1			V	
MW-1	1-16-99	12:30		V	W	P	1	2	2				V
MW-3	1-16-99	14:30		V	W	V	40	1	3	V			
MW-3	1-16-99	14:30		V	W	A	1	ICE	1		V		

Client/Consultant Remarks: See Attached List for Analytical parameters of Mineral Pattern & WQCC Metals

Laboratory remarks:

Intact? ☐ Y ☐ N

Temp: 3C

Requested TAT

24hr ☐ 72hr ☐

48hr ☐ Standard ☒

Other ☐ _____

Special Reporting Requirements: Fax Results ☐ Raw Data ☐ Standard QC ☐ Level 3 QC ☐ Level 4 QC ☐

Special Detection Limits (specify):

PM review (initial): EB

	date	time
1. Relinquished by Sampler: Dan Daw	1/18/99	14:00
2. Received by:		
3. Relinquished by:	date	time
4. Received by:		
5. Relinquished by:	date	time
6. Received by Laboratory: [signature]	1/19/99	1000

☒ 8880 Interchange Drive, Houston, TX 77054 (713) 660-0901

☐ 500 Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775

☐ 459-Hughes Drive, Traverse City, MI 49684 (616) 947-5777

SPL, Inc.

Analysis Request & Chain of Custody Record

SPL Workorder No: 9901761 | 107211 | page 2 of 2

Client Name: Rice Operating Company
Address/Phone: 122 West Taylor, Hobbs, NM 88240
Client Contact: F. Wesley Root
Project Name: Jct. I-9
Project Number: Hobbs SWD System
Project Location: 07-T19S-R38E, Lea County, New Mexico
Invoice To: Rice Operating Company

SAMPLE ID	DATE	TIME	comp	grab	matrix (W=water S=soil SL=sludge O=other:)	bottle (P=plastic A=amber glass G=glass V=vial)	size (1=1 liter 4=4oz 40=vial 8=8oz 16=16oz)	pres. (1=HCl 2=HNO3 3=H2SO4 O=other:)	Number of Containers	Requested Analysis: Mineral Pattern**	Requested Analysis: WQCC Metals *
MW-3	1-16-99	14:30		V	W	P	1	ICE	1	V	
MW-3	1-16-99	14:30		V	W	P	1	2	2		V

Client/Consultant Remarks: See Attached List for Analytical parameters of Mineral Pattern & WQCC Metals

Laboratory remarks:

Intact? ☐ Y ☐ N
Temp: 3C

Requested TAT

24hr ☐ 72hr ☐
48hr ☐ Standard ☒
Other ☐ _____

Special Reporting Requirements: Fax Results ☐ Raw Data ☐ Standard QC ☐ Level 3 QC ☐ Level 4 QC ☐

Special Detection Limits (specify):

PM review (initial): GB

	date	time
1. Relinquished by Sampler:	1/18/99	14:00
2. Received by:		
3. Relinquished by:	date	time
4. Received by:		
5. Relinquished by:	date	time
6. Received by Laboratory:	1/19/99	1000

☒ 8880 Interchange Drive, Houston, TX 77054 (713) 660-0901
☐ 459-Hughes Drive, Traverse City, MI 49684 (616) 947-5777
☐ 500 Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775

SPL Houston Environmental Laboratory

Sample Login Checklist

Date:	Time:
1-19-99	1000

SPL Sample ID:
9901761

			Yes	No
1	Chain-of-Custody (COC) form is present.		—	
2	COC is properly completed.		—	
3	If no, Non-Conformance Worksheet has been completed.			
4	Custody seals are present on the shipping container.		—	
5	If yes, custody seals are intact.		—	
6	All samples are tagged or labeled.		✓	
7	If no, Non-Conformance Worksheet has been completed.			
8	Sample containers arrived intact		—	
9	Temperature of samples upon arrival:		3 C	
10	Method of sample delivery to SPL:	SPL Delivery		
		Client Delivery		
		FedEx Delivery (airbill #)	808198483322	
		Other:		
11	Method of sample disposal:	SPL Disposal	—	
		HOLD		
		Return to Client		

Name:	Date:
[signature]	1-19-99

		Result	Units	Reporting Limit	Date Prepared	Date Analyzed	Analyzed By	Dilution
Client Sample ID: **B-3**						Sample Number:	**98-3544-001**	
Date Sampled: **10/21/98**						Sample Matrix:	**Liquid**	
Time Sampled: **9:30**						Sampled By:	**SL**	
EPA 8021B	Benzene	**14200**	µg/L	50	10/23/98	10/23/98	DWT	50
	Toluene	<50	µg/L	50	10/23/98	10/23/98	DWT	50
	Ethyl benzene	**1310**	µg/L	50	10/23/98	10/23/98	DWT	50
	Xylenes (Total)	**780**	µg/L	150	10/23/98	10/23/98	DWT	50
	Total BTEX (Calculated)	**16290**	µg/L		10/23/98	10/23/98	DWT	1
	****Quality Control Surrogate**				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	**108%**	74-116%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	**102%**	80-151%		10/23/98	10/23/98	DWT	1
EPA 160.1	Total Dissolved Solids	**1710**	mg/L	10	10/28/98	10/28/98	SM	1
SM 4500ClB	Chloride	**230**	mg/L	50	10/28/98	10/28/98	AJ	10

Client Sample ID: **B-4**						Sample Number:	**98-3544-002**	
Date Sampled: **10/21/98**						Sample Matrix:	**Liquid**	
Time Sampled: **10:55**						Sampled By:	**SL**	
EPA 8021B	Benzene	**618**	µg/L	5	10/23/98	10/23/98	DWT	5
	Toluene	**331**	µg/L	5	10/23/98	10/23/98	DWT	5
	Ethyl benzene	**182**	µg/L	5	10/23/98	10/23/98	DWT	5
	Xylenes (Total)	**226**	µg/L	15	10/23/98	10/23/98	DWT	5
	Total BTEX (Calculated)	**1357**	µg/L		10/23/98	10/23/98	DWT	1
	****Quality Control Surrogate**				10/23/98	10/23/98	DWT	1
	Difluorobenzene (SS)	**110%**	74-116%		10/23/98	10/23/98	DWT	1
	4-Bromofluorobenzene (SS)	**111%**	80-151%		10/23/98	10/23/98	DWT	1
EPA 160.1	Total Dissolved Solids	**5460**	mg/L	10	10/28/98	10/28/98	SM	1
SM 4500ClB	Chloride	**2400**	mg/L	250	10/28/98	10/28/98	AJ	50

Certes

Environmental Laboratories, L.L.C.
2209 Wisconsin Street, Suite 200
Dallas, Texas 75229
972-620-7966 972-620-7963 Fax

Analysis(es) Requested

Client Name	Phone No.
RICE COMPANY	505 393 7174
Client Address	**Fax No.**
122 WEST TAYLOR	505 397 1471
Billing Address	**City / State / Zip**
	HOBBS NM 88240
Purchase Order No.	**To ensure proper billing, please reference quotation number.**
	EV 955
Project Manager	**Site Location**
SCOTT A. LOWRY	JUNCTION EAST HOBBS SWD SYS.

Certes No.	Sample ID	Date	Time	Matrix[1]	No. & Type of Container[2] V	G	J	O	P[3]	BTEX	CHLORIDES	TDS
	B-3	10/21/98	430	L	2	2				✓	✓	✓
	B-4	10/21/98	1055	L	2	1				✓	✓	✓

Sampled By: AL

1 Matrix: A - Air Bag; C - Charcoal Tube; L - Liquid; OL - Oil; S - Soil; SD - Solid; SL - Sludge; WP - Wipe; W - Water/Wastev
2 Container Type: V - 40ml VOA Vial; G - Amber or Glass 1 Liter; J - 250ml Wide-mouth Glass Jar; O - Other: _____
3 Preservative: HCl - Hydrochloric Acid; HNO_2 - Nitric Acid; H_2SO_4 - Sulfuric Acid; O - Other: _____

TAT
Standard: Date Required 10/30
RUSH: Date Required _____

Client Project ID: EV 955

Special Instructions (including specific detection limits)

Certes Job Number

	Date	Time	
Relinquished by Sampler	10/22/98		Received By
Relinquished by			Received By
Relinquished by	10/22/98	11:55	Received By Laboratory

NOTE: By submitting these samples, you agree to the terms and conditions contained in Certes' Schedule of Fees. Certes cannot accept verbal changes. Please FAX written changes to (972) 620-7963.

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Tom Larson
Geraghty & Miller,Inc.
1030 Andrews Highway,Suite 120
Midland, TX 79701

Report Date: 7/13/99

Project Number: MT000591.0001
Project Name: N/A
Project Location: Rice (Hobbs)

Order ID Number: 99070811

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to TraceAnalysis, Inc. for analysis:

Sample Number	Sample Description	Matrix	Date Taken	Time Taken	Date Received
127806	MW-2	Water	7/7/99	11:00	7/8/99
127807	MW-1	Water	7/7/99	11:45	7/8/99

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 3 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Results Report

Sample Number: 127806
Description: MW-2

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		0.289	5	S 8021B	7/8/99	7/8/99	RC	PB01429	QC01776	0.001
Toluene (mg/L)		<0.005	5	S 8021B	7/8/99	7/8/99	RC	PB01429	QC01776	0.001
Ethylbenzene (mg/L)		0.061	5	S 8021B	7/8/99	7/8/99	RC	PB01429	QC01776	0.001
M,P,O-Xylene (mg/L)		0.008	5	S 8021B	7/8/99	7/8/99	RC	PB01429	QC01776	0.001
Total BTEX (mg/L)		0.358	5	S 8021B	7/8/99	7/8/99	RC	PB01429	QC01776	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.623	5	0.1	125	72 - 128	RC	PB01429	QC01776
4-BFB (mg/L)	0.619	5	0.1	124	72 - 128	RC	PB01429	QC01776

Sample Number: 127807
Description: MW-1

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		0.262	5	S 8021B	7/8/99	7/8/99	RC	PB01429	QC01776	0.001
Toluene (mg/L)		0.01	5	S 8021B	7/8/99	7/8/99	RC	PB01429	QC01776	0.001
Ethylbenzene (mg/L)		0.286	5	S 8021B	7/8/99	7/8/99	RC	PB01429	QC01776	0.001
M,P,O-Xylene (mg/L)		0.131	5	S 8021B	7/8/99	7/8/99	RC	PB01429	QC01776	0.001
Total BTEX (mg/L)		0.689	5	S 8021B	7/8/99	7/8/99	RC	PB01429	QC01776	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.642	5	0.1	128	72 - 128	RC	PB01429	QC01776
4-BFB (mg/L)	0.626	5	0.1	125	72 - 128	RC	PB01429	QC01776

Quality Control Report
Method Blanks

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
Benzene (mg/L)		<0.001	0.001	7/8/99	PB01429	QC01776
Toluene (mg/L)		<0.001	0.001	7/8/99	PB01429	QC01776
Ethylbenzene (mg/L)		<0.001	0.001	7/8/99	PB01429	QC01776
M,P,O-Xylene (mg/L)		<0.001	0.001	7/8/99	PB01429	QC01776
Total BTEX (mg/L)		<0.001	0.001	7/8/99	PB01429	QC01776

Quality Control Report
Lab Control Spikes and Duplicate Spike

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	MTBE (mg/L)	<0.001	1	0.1	0.117	117		80 - 120	0 - 20	QC01776
LCS	Benzene (mg/L)	<0.001	1	0.1	0.115	115		80 - 120	0 - 20	QC01776
LCS	Toluene (mg/L)	<0.001	1	0.1	0.116	116		80 - 120	0 - 20	QC01776
LCS	Ethylbenzene (mg/L)	<0.001	1	0.1	0.116	116		80 - 120	0 - 20	QC01776
LCS	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.349	116		80 - 120	0 - 20	QC01776

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/L)	1	0.1	0.100	100	72 - 128	QC01776
LCS	4-BFB (mg/L)	1	0.1	0.103	103	72 - 128	QC01776

LCSD	MTBE (mg/L)	<0.001	1	0.1	0.115	115	2	80 - 120	0 - 20	QC01776
LCSD	Benzene (mg/L)	<0.001	1	0.1	0.117	117	2	80 - 120	0 - 20	QC01776
LCSD	Toluene (mg/L)	<0.001	1	0.1	0.117	117	1	80 - 120	0 - 20	QC01776
LCSD	Ethylbenzene (mg/L)	<0.001	1	0.1	0.117	117	1	80 - 120	0 - 20	QC01776
LCSD	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.353	118	1	80 - 120	0 - 20	QC01776

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/L)	1	0.1	0.102	102	72 - 128	QC01776
LCSD	4-BFB (mg/L)	1	0.1	0.104	104	72 - 128	QC01776

Quality Control Report
Continuing Calibration Verification Standard

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Benzene (mg/L)		0.1	0.093	93	80 - 120	7/8/99	QC01776
ICV	Toluene (mg/L)		0.1	0.092	92	80 - 120	7/8/99	QC01776
ICV	Ethylbenzene (mg/L)		0.1	0.091	91	80 - 120	7/8/99	QC01776
ICV	M,P,O-Xylene (mg/L)		0.3	0.262	87	80 - 120	7/8/99	QC01776
CCV (1	Benzene (mg/L)		0.1	0.113	113	80 - 120	7/8/99	QC01776
CCV (1	Toluene (mg/L)		0.1	0.114	114	80 - 120	7/8/99	QC01776
CCV (1	Ethylbenzene (mg/L)		0.1	0.110	110	80 - 120	7/8/99	QC01776
CCV (1	M,P,O-Xylene (mg/L)		0.3	0.330	110	80 - 120	7/8/99	QC01776

GB[redacted]GHT & MILLER, INC.
Environmental Services

Laboratory Task Order No. 9607084

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number MT000591.0001

Project Location Rice (Hobbs)

Laboratory TRACE

Sampler(s)/Affiliation McNeese AGM Midland

SAMPLE IDENTITY	Code	Date/~~Time~~ Sampled	Time ~~Lab ID~~	SAMPLE BOTTLE / CONTAINER DESCRIPTION: BTEX (Hcl) 40ml								TOTAL
MW-2	L	7-7-99	1100	3			127806					3
MW-1	L	7-7-99	1145	3			127807					3

Total No. of Bottles/ Containers: 6

Sample Code: L = Liquid; S = Solid; A = Air

Relinquished by: [signature]	Organization: ARCADIS	Date 7/7/99	Time 1700	Seal Intact? Yes No N/A
Received by: Helen Shelton	Organization: Trace Analysis	Date 7/07/99	Time 5:00 PM	
Relinquished by: Helen Shelton	Organization: Trace Analysis	Date 7/07/99	Time 6:30 PM	Seal Intact? Yes No N/A
Received by:	Organization:	Date / /	Time	

Special Instructions/Remarks:

Delivery Method: ☐ In Person ☒ Common Carrier Greyhound SPECIFY 159-384-559-4 ☑ Lab Courier NA ☐ Other SPECIFY Ford 7/13

G&M Form 09-9-91

Southprint 91-1768

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 8 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4775 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Sharon Hall
Geraghty & Miller,Inc.
1030 Andrews Highway,Suite 120
Midland, TX 79701

Report Date: 9/8/99

Project Number: MT000591.0002
Project Name: N/A
Project Location: Rice (Hobbs, NM)

Order ID Number: 99090329

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to TraceAnalysis, Inc. for analysis:

Sample Number	Sample Description	Matrix	Date Taken	Time Taken	Date Received
131289	MW-4	Water	9/2/99	-	9/3/99

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 4 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Cation-Anion Balance Sheet

DATE: 9/9/99

Sample #	Calcium ppm	Magnesium ppm	Sodium ppm	Potassium ppm	Alkalinity ppm	Sulfate ppm	Chloride ppm	Nitrate ppm	Fluoride ppm	TDS ppm	EC µMhos/cm
131289	112	23	146	3.6	220.00	180	130	2.9	4.1	770	

Sample #	Calcium in meq/L	Magnesium in meq/L	Sodium in meq/L	Potassium in meq/L	Alkalinity in meq/L	Sulfate in meq/L	Chloride in meq/L	Nitrate in meq/L	Fluoride in meq/L	Total Cations in meq/L	Total Anions in meq/L	Percentage Error
131289	5.59	1.89	6.35	0.09	4.40	3.75	2.82	0.207031	0.215824	13.92	11.39	20.01186364

	EC/Cation	EC/Anion
131289	392.4558	1139.1455

range 0 to 0

TDS/EC	TDS/Cat	TDS/Anion
#DIV/0!	0.55	0.68

needs to be 0.55-0.77

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
1725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

ANALYTICAL RESULTS FOR
GERAGHTY & MILLER
Attention: Sharon Miller
1030 Andrews Hwy., Suite 120
Midland, Texas 79701

September 8, 1999
Receiving Date: 09/03/99
Sample Type: Water
Project No. MT300001.0000
Project Loc: Rice Hobbs, NM

Sampling Date: 08/09/99
Sample Condition: I & C
Sample Received By: VW
Project Name: N/A

TA#	Field Code	Cl (mg/L)	NO3-N* (mg/L)	SO4 (mg/L)	F (mg/L)
T131289	MW-4	100	2.9	180	4.1
ICV		11.50	4.62	11.60	1.06
CCV		11.53	4.65	11.61	1.08
Reporting Limit		0.5	0.2	0.5	0.1
Prep Date:		09/07/99	09/07/99	09/07/99	09/08/99
Analysis Date:		09/07/99	09/07/99	09/07/99	09/08/99
RPD		0	1	1	1
% Extraction Accuracy		90	97	93	98
% Instrument Accuracy		92	92	93	106

METHODS: EPA 300.0, 340.2
CHEMIST: JS
TOTAL Cl SPIKE: 625 mg/L
TOTAL NO3-N SPIKE: 250 mg/L
TOTAL SO4 SPIKE: 625 mg/L
TOTAL F SPIKE: 5.0 mg/L

TOTAL Cl CV: 12.5 mg/L
TOTAL NO3-NCV: 5.0 mg/L
TOTAL SO4 CV: 12.5 mg/L
TOTAL F CV: 1.0 mg/L

Director, Dr. Blair Leftwich

9-8-99
Date

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4775 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E Mail: lab@traceanalysis.com

September 8, 1999
Receiving Date: 09/03/99
Sample Type: Water
Project No: MT000591.0002
Project Loc: Rice Hobbs, NM
Project Name: N/A
Sampling Date: 09/02/99
Sample Condition: I & C
Sample Received by: VW
Extraction Date: 09/07/99
Analysis Date: 09/08/99

ANALYTICAL RESULTS FOR
GERAGHTY & MILLER, INC.
Attention: Sharon Hall
1030 Andrews Highway, Suite 120
Midland, Texas 79701

PAH Reporting T131289

8270 Compounds (mg/L)	Limit	MW-4	QC	RPD	%EA	%IA
Naphthalene	0.005	ND	57	11	86	96
Acenaphthylene	0.005	ND	58	11	95	96
Acenaphthene	0.005	ND	58	9	91	96
Fluorene	0.005	ND	55	11	92	91
Phenanthrene	0.005	ND	56	6	87	93
Anthracene	0.005	ND	7	4	84	95
Fluoranthene	0.005	ND	56	11	88	93
Pyrene	0.005	ND	50	8	80	84
Benzo[a]anthracene	0.005	ND	57	3	76	85
Chrysene	0.005	ND	58	4	72	98
Benzo[b]fluoranthene	0.005	ND	60	7	77	100
Benzo[k]fluoranthene	0.005	ND	57	13	75	94
Benzo[a]pyrene	0.005	ND	58	10	79	97
Indeno[1,2,3-cd]pyrene	0.005	ND	48	15	67	81
Dibenz[a,h]anthracene	0.005	ND	52	16	72	86
Benzo[g,h,i]perylene	0.005	ND	50	12	72	83

ND = Not Detected

SURROGATES	% RECOVERY
Nitrobenzene-d5 SURR	98
2-Fluorobiphenyl SURR	87
Terphenyl-d14 SURR	64

METHODS: EPA SW 846-8270, 3510.
CHEMIST: MA

Director, Dr. Blair Leftwich

9-8-99
Date

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

ANALYTICAL RESULTS FOR
GERAGHTY & MILLER, INC.
Attention: Sharon Hall
1030 Andrews Highway, Suite 120
Midland, Texas 79701

September 8, 1999
Receiving Date: 09/03/99
Sample Type: Water
Project No: MT000591.0002
Project Loc: Rice Hobbs, NM

Sampling Date: 09/02/99
Sample Condition: I & C
Sample Received by: VW
Project Name: N/A

TA#	FIELD CODE	RESISTIVITY (meg ohm - cm)
T131289	MW-4	0.0009
ICV		1,360
CCV		1,393
RPD		1
% Extraction Accuracy		---
% Instrument Accuracy		96
PREP DATE		09/07/99
ANALYSIS DATE		09/07/99

METHODS: EPA SM 2510B
CHEMIST: JS

Director, Dr. Blair Leftwich

9-8-99
Date

TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

ANALYTICAL RESULTS FOR
GERAGHTY & MILLER, INC.
Attention: Sharon Hall
1030 Andrews Highway, Suite 120
Midland, Texas 79701

September 8, 1999
Receiving Date: 09/03/99
Sample Type: Water
Project No: MT000601.0002
Project Loc: Rice Hobbs, NM

Sampling Date: 09/02/99
Sample Condition: Iced
Sample Received by: VW
Project Name: N/A

TA#	FIELD CODE	ALKALINITY (mg/L as CaCo3)			
		OH	CO3	HC03	TOTAL
T131289	MW-4	0	0	220	220
ICV					
CCV				2,220	
				2,260	
REPORTING LIMIT				1	
RPD				3	
% Extraction Accuracy				93	
% Instrument Accuracy				94	
PREP DATE				09/08/99	
ANALYSIS DATE				09/08/99	

METHODS: EPA 310.1
CHEMIST: MD

Director, Dr. Blair Leftwich

9-8-99
Date

Analytical Results Report

Sample Number: 121286
Description: MW-4

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		<0.005	5	S 8021B	9/3/99	9/3/99	RC	PB02234	QC02784	0.001
Toluene (mg/L)		<0.005	5	S 8021B	9/3/99	9/3/99	RC	PB02234	QC02784	0.001
Ethylbenzene (mg/L)		<0.005	5	S 8021B	9/3/99	9/3/99	RC	PB02234	QC02784	0.001
M,P,O-Xylene (mg/L)		<0.005	5	S 8021B	9/3/99	9/3/99	RC	PB02234	QC02784	0.001
Total BTEX (mg/L)		<0.005	5	S 8021B	9/3/99	9/3/99	RC	PB02234	QC02784	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.444	5	0.1	89	72 - 128	RC	PB02234	QC02784
4-BFB (mg/L)	0.437	5	0.1	87	72 - 128	RC	PB02234	QC02784

pH (s.u.)	7.5	1	E 150.1	9/3/99	9/3/99	RS	PB02225	QC02770	1
Specific Gravity (g/mL)	1.0017	1	D854-92	9/7/99	9/7/99	JS	PB02222	QC02769	
Total Dissolved Solids (mg/L)	770	1	E 160.1	9/4/99	9/7/99	MD	PB02229	QC02776	10

Quality Control Report
Method Blanks

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
Benzene (mg/L)		<0.001	0.001	9/3/99	PB02234	QC02784
Toluene (mg/L)		<0.001	0.001	9/3/99	PB02234	QC02784
Ethylbenzene (mg/L)		<0.001	0.001	9/3/99	PB02234	QC02784
M,P,O-Xylene (mg/L)		<0.001	0.001	9/3/99	PB02234	QC02784
Total BTEX (mg/L)		<0.001	0.001	9/3/99	PB02234	QC02784

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
Specific Gravity (g/mL)		1.0053		9/7/99	PB02222	QC02769

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
Total Dissolved Solids (mg/L)		<10	10	9/7/99	PB02229	QC02776

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

September 08, 1999
Receiving Date: 09/03/99
Sample Type: Liquid
Project No: MT000591.0002
Project Location: Rice Hobbs, NM

ANALYTICAL RESULTS FOR
GERAGHTY & MILLER, INC.
Attention: Sharon Hall
1030 Andrews Highway, Suite 120
Midland, TX 79701

Sampling Date: 09/02/99
Sample Condition: Intact & Cool
Sample Received by: VW
Project Name: NA

TOTAL METALS

TA#	FIELD CODE	Al (mg/L)	As (mg/L)	Ba (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Fe (mg/L)	Pb (mg/L)	Mg (mg/L)
T131289	MW-4	31	0.03	0.11	<0.005	<0.01	<0.01	0.03	2.4	0.008	23
ICV		10	0.99	1.0	1.0	1.0	1.0	0.99	0.98	1.0	19
CCV		10	1.0	1.0	1.0	1.0	1.0	1.0	0.99	1.0	20
METHOD BLANK		<0.10	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.02	<0.005	<1.0
REPORTING LIMIT		0.10	0.005	0.005	0.005	0.01	0.01	0.01	0.02	0.005	1.0
RPD		1	1	4	1	0	1	0	0	1	1
% Extraction Accuracy		113	99	93	97	99	98	98	100	95	96
% Instrument Accuracy		110	99	102	103	102	101	100	98	101	99
PREP DATE		09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99
ANALYSIS DATE		09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99

TA#	FIELD CODE	Mn (mg/L)	Mo (mg/L)	Ni (mg/L)	K (mg/L)	Ca (mg/L)	Na (mg/L)	Se (mg/L)	Ag (mg/L)	Zn (mg/L)	Hg (mg/L)
T131289	MW-4	0.33	0.02	0.10	3.6	112	116	0.02	<0.01	0.04	<0.0002
ICV		1.0	1.0	1.0	18	20	18	0.99	0.202	1.0	0.00094
CCV		1.0	1.0	1.0	18	20	18	1.0	0.209	1.0	0.00103
METHOD BLANK		<0.005	<0.02	<0.02	<1.0	<1.0	<2.0	<0.005	<0.01	<0.02	<0.0002
REPORTING LIMIT		0.005	0.02	0.02	1.0	1.0	2.0	0.005	0.01	0.02	0.0002
RPD			1	1	0	10	2	2	13	1	3
% Extraction Accuracy		95	98	99	109	92	123	98	90	100	89
% Instrument Accuracy		102	101	103	91	101	92	99	102	101	98
PREP DATE		09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/03/99
ANALYSIS DATE		09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/03/99

METHODS: EPA SW 846-3015, 6010B, 7470A.
CHEMIST: Al, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Ca, Na, Se, Ag, Zn: RR Hg: BP
TOTAL METALS SPIKE: 1.0 mg/L Al, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Mo, Ni, Se, Zn; 100 mg/L Mg, K, Ca, Na; 0.50 mg/L Ag; 0.0010 mg/L Hg.
TOTAL METALS CV: 1.0 mg/L Al, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Mo, Ni, Se, Zn; 20 mg/L Mg, K, Ca, Na; 0.20 mg/L Ag; 0.0010 mg/L Hg.

Director, Dr. Blair Leftwich

9-8-99
DATE

Quality Control Report
Duplicates

Standard	Param	Flag	Duplicate Result	Sample Result	Dilution	RPD	RPD Limit	QC Batch #
Duplicate	pH (s.u.)		8.7	8.7	1	0	0 - 20	QC02770

Standard	Param	Flag	Duplicate Result	Sample Result	Dilution	RPD	RPD Limit	QC Batch #
Duplicate	Specific Gravity (g/mL)		1.0000	1.0017	1	0	0 - 10	QC01709

Standard	Param	Flag	Duplicate Result	Sample Result	Dilution	RPD	RPD Limit	QC Batch #
Duplicate	Total Dissolved Solids (mg/L)		749	760	1	1	0 - 20	QC02776

Quality Control Report
Lab Control Spikes and Duplicate Spike

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	MTBE (mg/L)	<0.001	1	0.1	0.093	93		80 - 120	0 - 20	QC02784
LCS	Benzene (mg/L)	<0.001	1	0.1	0.093	93		80 - 120	0 - 20	QC02784
LCS	Toluene (mg/L)	<0.001	1	0.1	0.091	91		80 - 120	0 - 20	QC02784
LCS	Ethylbenzene (mg/L)	<0.001	1	0.1	0.09	90		80 - 120	0 - 20	QC02784
LCS	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.267	89		80 - 120	0 - 20	QC02784

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/L)	1	0.1	0.1	100	72 - 128	QC02784
LCS	4-BFB (mg/L)	1	0.1	0.098	98	72 - 128	QC02784

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCSD	MTBE (mg/L)	<0.001	1	0.1	0.104	104	6	80 - 120	0 - 20	QC02784
LCSD	Benzene (mg/L)	<0.001	1	0.1	0.098	98	5	80 - 120	0 - 20	QC02784
LCSD	Toluene (mg/L)	<0.001	1	0.1	0.097	97	6	80 - 120	0 - 20	QC02784
LCSD	Ethylbenzene (mg/L)	<0.001	1	0.1	0.098	98	9	80 - 120	0 - 20	QC02784
LCSD	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.291	97	9	80 - 120	0 - 20	QC02784

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/L)	1	0.1	0.1	100	72 - 128	QC02784
LCSD	4-BFB (mg/L)	1	0.1	0.099	99	72 - 128	QC02784

Quality Control Report
Continuing Calibration Verification Standard

Standard	Param	Flag	CCVo TRUE Conc.	CCVo Found Conc.	CCVo Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Benzene (mg/L)		0.1	0.094	94	80 - 120	9/3/99	QC02784
ICV	Toluene (mg/L)		0.1	0.092	92	80 - 120	9/3/99	QC02784
ICV	Ethylbenzene (mg/L)		0.1	0.092	92	80 - 120	9/3/99	QC02784
ICV	M,P,O-Xylene (mg/L)		0.3	0.274	91	80 - 120	9/3/99	QC02784
CCV (1	Benzene (mg/L)		0.1	0.098	98	80 - 120	9/3/99	QC02784
CCV (1	Toluene (mg/L)		0.1	0.096	96	80 - 120	9/3/99	QC02784
CCV (1	Ethylbenzene (mg/L)		0.1	0.095	95	80 - 120	9/3/99	QC02784
CCV (1	M,P,O-Xylene (mg/L)		0.3	0.281	94	80 - 120	9/3/99	QC02784

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	pH (s.u.)		7	7.0	100	80 - 120	9/3/99	QC02770
CCV (1	pH (s.u.)		7	7.1	101	80 - 120	9/3/99	QC02770

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Total Dissolved Solids (mg/L)		1000	970	97	80 - 120	9/7/99	QC02776
CCV (1	Total Dissolved Solids (mg/L)		1000	971	97	80 - 120	9/7/99	QC02776

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

September 09, 1999
Receiving Date: 09/03/99
Sample Type: Liquid
Project No: MT000591.0002
Project Location: Rice Hobbs, NM)

ANALYTICAL RESULTS FOR
GERAGHTY & MILLER, INC.
Attention: Sharon Hall
1030 Andrews Highway, Suite 120
Midland, TX 79701

Sampling Date: 09/02/99
Sample Condition: Intact & Cool
Sample Received by: VW
Project Name: NA

TOTAL METALS

TA#	FIELD CODE	Al (mg/L)	As (mg/L)	Ba (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Fe (mg/L)	Pb (mg/L)	Mg (mg/L)
T131289	MW-4	3.1	0.03	0.11	<0.005	<0.01	<0.01	0.03	2.4	0.008	23
ICV		1.0	0.99	1.0	1.0	1.0	1.0	0.99	0.98	1.0	19
CCV		1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.99	1.0	19
METHOD BLANK		<0.10	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.02	<0.005	<0.50
REPORTING LIMIT		0.10	0.005	0.005	0.005	0.01	0.01	0.01	0.02	0.005	0.50
RPD		6	1	4	1	0	1	0	0	1	2
% Extraction Accuracy		103	99	93	97	99	98	98	100	95	98
% Instrument Accuracy		100	99	102	103	102	101	100	98	101	99
PREP DATE		09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/09/99
ANALYSIS DATE		09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/07/99	09/09/99

		Mn (mg/L)	Mo (mg/L)	Ni (mg/L)	K (mg/L)	Ca (mg/L)	Na (mg/L)	Se (mg/L)	Ag (mg/L)	Zn (mg/L)	Hg (mg/L)
T131289	MW-4	0.03	0.02	0.10	2.4	93	124	0.02	<0.01	0.04	<0.0002
ICV		1.0	1.0	1.0	20	20	19	0.99	0.202	1.0	0.00094
CCV		1.0	1.0	1.0	20	20	19	1.0	0.209	1.0	0.00103
METHOD BLANK		<0.005	<0.02	<0.02	<0.50	<0.50	<0.50	<0.005	<0.01	<0.02	<0.0002
REPORTING LIMIT		0.005	0.02	0.02	0.50	0.50	0.50	0.005	0.01	0.02	0.0002
RPD		1	1	1	3	0	0	2	13	1	3
% Extraction Accuracy		96	98	99	98	99	95	98	90	100	89
% Instrument Accuracy		102	101	103	101	101	98	99	102	101	98
PREP DATE		09/07/99	09/07/99	09/07/99	09/09/99	09/09/99	09/09/99	09/07/99	09/07/99	09/07/99	09/03/99
ANALYSIS DATE		09/07/99	09/07/99	09/07/99	09/09/99	09/09/99	09/09/99	09/07/99	09/07/99	09/07/99	09/03/99

METHODS: EPA SW 846-3015, 6010B, 7470A.
CHEMIST: Al, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Ca, Na, Se, Ag, Zn: RR Hg: BP
TOTAL METALS SPIKE: 1.0 mg/L Al, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Mo, Ni, Se, Zn; 100 mg/L Mg, K, Ca, Na; 0.50 mg/L Ag; 0.0010 mg/L Hg.
TOTAL METALS CV: 1.0 mg/L Al, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Mo, Ni, Se, Zn; 20 mg/L Mg, K, Ca, Na; 0.20 mg/L Ag; 0.0010 mg/L Hg.

BL
Director, Dr. Blair Leftwich

9-5-99
DATE

Cation-Anion Balance Sheet

DATE: 9/9/99

Sample #	Calcium ppm	Magnesium ppm	Sodium ppm	Potassium ppm	Alkalinity ppm	Sulfate ppm	Chloride ppm	Nitrate ppm	Fluoride ppm	TDS ppm	EC µMHOs/cm
131289	93	23	124	2.4	220.00	180	100	2.9	4.1	770	

Sample #	Calcium in meq/L	Magnesium in meq/L	Sodium in meq/L	Potassium in meq/L	Alkalinity in meq/L	Sulfate in meq/L	Chloride in meq/L	Nitrate in meq/L	Fluoride in meq/L	Total Cations in meq/L	Total Anions in meq/L	Percentage Error
131289	4.64	1.89	5.39	0.06	4.40	3.75	2.82	0.207031	0.215824	11.99	11.39	5.109507752

	EC/Cation	EC/Anion
131289	1198.8762	1139.1455

range 0 to 0

TDS/EC	TDS/Cat	TDS/Anion	
#DIV/0!	0.64	0.68	needs to be 0.55-0.77

[redacted] & MILLER, INC.
Environment and Infrastructure
a heidemij company

Laboratory Task Order No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number MT000591.0002

Project Location Rice (Hobbs N.M.)

Laboratory Trace

Sampler(s)/Affiliation McNeese AGM
Midland, Tx

SAMPLE IDENTITY	Code	Date ~~Time~~ Sampled	Time ~~Lab ID~~	SAMPLE BOTTLE/CONTAINER DESCRIPTION: BTEX ★	PAH (HCl) ★	T.D.S. ★	New Mexico Water Quality Control Commission Metals, Cations & Anions	U. Plastic w/HNO3	Extra Amber Lt				TOTAL
MW 4	L	9-2-99	1200	3	1	1	1	1	1				8

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 8

Relinquished by: [signature]	Organization: ARADIS	Date 9/2/99	Time 1600	Seal Intact? Yes No N/A
Received by: [signature]	Organization: TRACE ANALYSIS	Date 9/2/99	Time 1600	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	

Special Instructions/Remarks: Rush Need by 9-8-99

Delivery Method: ☒ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☒ Lab Courier ☐ Other _____ (SPECIFY)

APPENDIX E

RECOVERY WELL VOLUMES

Hobbs SWD SYSTEM NE/4 SE/4 SEC 9 - T19S R38E LEA COUNTY NEW MEXICO

RICE EMPLOYEE	STURG.II	STURG.II	STURG.II	STURG.II	STURG.II	STURG.II	STURG.II	STURG.II	STURG.II	STURG.II		
DATE	JAN 18, 99	JAN 19 99	JAN20, 99	JAN21, 99	JAN22, 99	JAN25, 99	JAN26 99	JAN27, 99	JAN29, 99	FEB 1, 1999		
TIME - START	8:30	8:30	8:30	8:30	8:30	9:00	8:30	8:30	8:45	8:30		
TIME - END	10:30	9:30	9:30	9:30	9:30	10:30	9:30	9:30	9:15	9:00		
WELL NO.	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1		
WELL CONSTRUCTION	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT		
WELL SECURITY	Lock	Lock	Lock	Lock	Lock	Lock	Lock	Lock	Lock	Lock		
PURGING TIME	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
DEPTH TO WATER (FT)	31'6"	31'7"	31'7"	31'7"	31'6"	31'7"	31'7"	31'6"	3"-7'	3"-7"		
PSH THICKNESS (FT)	1/2"	2 1/2"	2 1/2"	1/2"	1/2"	3"	1"	2"	1"	2"		
Volume Water RECOVERED	1/2 Pint	1/2 pint	1/2 pint	1/2 pint	1/2 pint	1/2 pint	1/2 pint	pint	1/2 pint	1/2 pint		
VOLUME PSH RECOVERED	1oz	3oz	2oz	1oz	1 oz	2oz	1 1/2 oz	1 1/2 oz	1oz	1 1/2 oz		
PURGING TECHNIQUE	MANUAL Bailing	MANUAL Bailing	MANUAL Bailing	MANUAL Bailing	MANUAL Bailing	MANUAL Bailing	MANUAL Bailing	MANUAL Bailing	MANUAL Bailing	MANUAL Bailing		
SAMPLING TIME	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
SAMPLING TECHNIQUE	Seperation of oil + water					Seperation of oil + water				seperating oil + water		
WATER TEMPERATURE °F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
WATER pH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
SPECIFIC CONDUCTANCE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

WEATHER CONDITIONS:

REMARKS: 15.5 oz

Ref I-9

Hobbs SWD SYSTEM NE/4 SE/4 SEC 9 - T19S R38E LEA COUNTY NEW MEXICO

RICE EMPLOYEE	J. Sturgill	J. STURGILL	J. STURGILL	J. STURGILL	J. Sturgill	STURGILL	STURGILL	STURGILL	STURGILL			
DATE	2-9-99	2-15-99	2-16-99	2-17-99	2-18-99	2-22-99	2-23-99	2-25-99	2-26-99			
TIME - START												
TIME - END												
WELL NO.	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1			
WELL CONSTRUCTION	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT			
WELL SECURITY	Locked	Locked	Locked	Locked	Locked	Locked	Locked	Locked	Locked			
PURGING TIME	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
DEPTH TO WATER (FT)	31.7'	31.6'	31.4'	31.6"	31.6"	31.5'	31.6"	31.8"	31.6			
PSH THICKNESS (FT)	1/2"	2 1/2"	2 1/2"	1.5"	1"	2.5"	2"	2"	1.5"			
VOLUME WATER RECOVERED	1/2 pt	1/2 pt	1/2 pt	1/2 pt	1/2 pt	1/2 pt	1/2 pt	1/2 pint	1/2 pt			
VOLUME PSH RECOVERED	1/2 FLOZ	1.5 FLOZ	2 FLOZ	1 FLOZ	1/2 FLOZ	2 FLOZ	1.5 FLOZ	1.5 FLOZ	1 FLOZ *			
PURGING TECHNIQUE	MANNEL Bailing	MANNEL Bailing	MANNELL Bailing	MANNELL Bailing	MANNELL Bailing	MANNELL BAILING	MANNELL Bailing	MANNELL Bailing	MANNELL Bailing			
SAMPLING TIME	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
SAMPLING TECHNIQUE	Seperation Oil + Water	Seperation Oil + Water			Seperation Oil + Water		Seperation Oil + Water	Seperator Oil+Water	Seperator Oil+Water			
WATER TEMPERATURE °F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
WATER pH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
SPECIFIC CONDUCTANCE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			

WEATHER CONDITIONS:

REMARKS: * Collect 31 FLUID OUNCE from JAN 18, 1999 to Feb 26-1999

Hobbs SWD SYSTEM NE/4 SE/4 SEC 9 - T19S R38E LEA COUNTY New Mexico

ICE EMPLOYEE	STURGill	Sturgill	STURGill	STURGill	STURGill	STURGill	STURGill	STURGill				
DATE	3-4-99	3-5-99	3-10-99	3-11-99	3-15-99	3-16-99	3-17-99	3-22				
IME - START	8:30	8:30	8:30	8:30	8:45	8:00	9:00	9:00				
ME - END	9:00	9:00	9:00	9:00	9:15	8:30	9:30	9:30				
WELL NO.	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1				
WELL CONSTRUCTION	FLUSH mount	FLUSH mount	FLUSH mount	FLUSH mount	FLUSH mount	FLUSH mount	FLUSH mount	FLUSH mount				
WELL SECURITY	Locked	Locked	Locked	Locked	Locked	Locked	Locked	Locked				
PURGING TIME	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
DEPTH TO WATER (FT)	31"5	31"4'	31"C'	31."C'	31.'7"	31"C"	31."6'	31."5'				
PSH THICKNESS (FT)	2.5'	2'	1.5'	2'	2.5	2'	2'	2."				
VOLUME WATER RECOVERED	1/2 pt	1/2 pt	1/2 pt	1/2 pt	1/2 pt	1/2 pt	1/2 pt	1/2 pt				
VOLUME PSH RECOVERED	2FLOz	1.5FLOz	1FLOz	1.5FLOz	2 FLOz	2 FLOz	2FLOz	2FLOz				
PURGING TECHNIQUE	MANN-1 Bailer	MANNEL Bailer	MANNEL Bailer	MANNEL Bailee	MANNEL Bailer	MANNEL Bailer	MANNEL Bailer	MANNEL Bailee				
SAMPLING TIME	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
SAMPLING TECHNIQUE	Seperate Dilewater											
WATER TEMPERATURE °F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
WATER pH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				
SPECIFIC CONDUCTANCE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A				

WEATHER CONDITIONS:

REMARKS:

I-9

Hobbs SWD SYSTEM NE/4 SE/4 SEC 9 - T19S R38E LEA COUNTY New Mexico

RICE EMPLOYEE	J. Sturgill	J. Sturgill	J. Sturgill	J. Sturgill	J. Sturgill	J. Sturgill	J. Sturgill	J. Sturgill	J. Sturgill			
DATE	3-30	4-1	4-5	4-6	4-12	4-19	4-23	4-26	5-7			
TIME - START	8:00	8:15	8:00	9:15	9:00	8:45	10:15	9:00	10:00			
TIME - END	8:45	9:00	8:45	10:00	9:30	9:50	10:35	10:00	10:30			
WELL NO.	I-9 RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1	RW-1			
WELL CONSTRUCTION	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT	FLUSH MOUNT			
WELL SECURITY	Locked	Locked	Locked	Locked	Locked	Locked	Locked	Locked	Locked			
PURGING TIME	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
DEPTH TO WATER (FT)	31.6	31.7	31.7	31.6	31.5	31.5	31.6	31.6	31.5			
PSH THICKNESS (FT)	4"	4"	5"	4"	5"	5'	5"	5"	5"			
VOLUME WATER RECOVERED	1/2 pint	1/2 pt	1/2 pt	1/2 pt	1/2 pt	1/2 pt	1/2 pt	2 gals	3 gals			
VOLUME PSH RECOVERED	3 FLoz	3 FLoz	4 FLoz	3.5 FLoz	4. FLoz	4.5 FLoz	5 FLoz	14 FLoz	20 FLoz			
PURGING TECHNIQUE	MANNELL Bailing	MANNELL Bailing	MANNELL Bailing	MANNELL Bailing	MANNELL Bailing	MANNELL Bailing	MANNELL Bailing	MANNELL Bailing	MANNELL Bailing			
SAMPLING TIME	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
SAMPLING TECHNIQUE	Seperation oil water				Seperation oil water				Seperation oil water			
WATER TEMPERATURE °F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
WATER pH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
SPECIFIC CONDUCTANCE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			

WEATHER CONDITIONS:

REMARKS: