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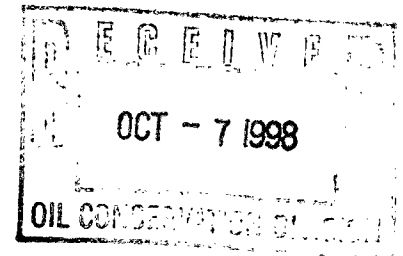
REPORTS

DATE:

1978 →

RICE *Operating Company*

122 West Taylor
HOBBS, NEW MEXICO 88240
(505) 393-9174



October 6, 1998

Mr. Roger Anderson
New Mexico Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

**RE: Groundwater Remediation
 Pipeline Leak, Junction L-31, ABO SWD System
 SE 1/4 of Section 31, T16S, R37E
 Lea County, New Mexico**

Mr. Anderson:

Enclosed for your review is an unbound copy of the groundwater remediation operations performed in 1996, 1997, and 1998 at the above-referenced site. The work was conducted in accordance with recommendations from the New Mexico Oil Conservation Division and Rice Operating Company.

Background Information

Groundwater contamination was discovered at the site in September 1995 and groundwater recovery operations were initiated in October 1995. Remediation was accomplished by recovering groundwater from the former City of Lovington municipal water supply well (COL-6) using a submersible pump.

A subsurface investigation was performed in April 1996 to assess the extent of contamination (Subsurface Investigation Report, dated April 19, 1997). During the investigation three monitor wells (MW-1, MW-2, and MW-3) were installed. The three monitor wells were placed in a triangular configuration around the release location and orientated so that MW-1 is located upgradient and monitor wells MW-2 and MW-3 are located downgradient relative to regional ground water flow.

Groundwater Remediation Operations

Seven groundwater sampling events have been completed since the monitor wells were installed on April 17, 1996. A potentiometric surface map was constructed on the top of the water table from gauging data obtained during the sampling events. This data consistently shows that depth to the water table is approximately 77 feet below ground surface and the direction of groundwater flow is toward the east-southeast. Copies of the potentiometric surface maps and groundwater measurement tables are presented for each calendar year in Appendix A (1998), Appendix B (1997), and Appendix C (1998).

Monthly summaries of recovery system operations showing the volume recovered, pump rates, and monthly totals are presented for each calendar year in Appendices A, B, and C.

Sampling and Analytical Procedures

Prior to development and sampling, the monitor wells were gauged to obtain water level measurements. The wells were surge bailed to remove any fine granulated materials and then purged by manual bailing prior to collecting groundwater samples for laboratory analysis.

After purging, a water sample was obtained using a disposable bailer. The sample was placed into appropriate sample containers (typically a one-liter glass jar and two 40-milliliter sample vials) with zero headspace, labeled for sample identification, sealed with QA/QC seals, and preserved at 4° C in accordance with EPA Method 600/4-82-029. A chain-of-custody documenting the sample collection times and delivery time to the laboratory was completed for each event. The samples were transported to Cardinal Laboratories in Hobbs, New Mexico or shipped to Southern Petroleum Laboratories in Houston, Texas for analysis. The samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), total dissolved solids (TDS), and chloride using EPA Methods SW 846-8260, 600/4-79-02-160.1, and 600/4-79-02-325.3, respectively.

All work associated with the groundwater monitoring events was performed by independent contractors. During at least one monitoring event per year the groundwater samples were analyzed for major cation and anion concentrations in addition to the above-listed constituents.

Analytical Results

BTEX concentrations in the water samples collected from MW-1, MW-3, MW-2 and COL-6 since April 17, 1996 have consistently recorded BTEX levels below method detection limits demonstrating that the dissolved hydrocarbon contamination has been successfully removed from the site.

TDS and Chloride levels in the water samples collected from the two downgradient monitor wells (MW-2 and MW-3) have consistently recorded levels below New Mexico Water Quality Control Commission (WQCC) human health standards for groundwater.

Since 1996, the well that most often contained TDS and chloride levels that exceeded WQCC standards (TDS < 1,000 ppm; Chloride < 250 ppm) was the upgradient well, MW-1. These results indicate that TDS and chloride levels near the WQCC standards represent background conditions at the site.

Analytical results from the groundwater samples obtained on February 14, 1998 and the samples collected on August 16, 1998 recorded concentrations below the WQCC standards in all of the wells with the exception of a TDS level of 1,091 ppm in MW-1 from February 14, 1998. The results of these two monitoring events are significant because groundwater recovery operations were shut-in during this time to allow the site reach equilibrium conditions. Typically if contamination is still present, an increase in contaminate levels is seen when pumping is stopped. In this instance, levels decreased in all four wells.

Summaries of the analytical results, copies of the laboratory reports, and chains-of-custody are presented for each calendar year in Appendices A, B, and C.

Conclusions

Based on the findings of these activities, Rice Operating has effectively delineated the extent of contamination and successfully remediated the groundwater to levels below background and near or below WQCC human health standards for groundwater.

Rice Operating Company requests that the NMOCD accept this document as a final report for the site and issue a letter requiring no further action.

Please contact me at the above listed number if you have any questions.

Sincerely,



F. Wesley Root
Projects Manager

Attachments: Appendices A through C

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

APPENDIX A

**1998 GROUNDWATER RECOVERY
AND
MONITORING OPERATIONS**

Appendix A

1998 Groundwater Recovery and Monitoring Operations

A.1 Figures

February 14, 1998 Potentiometric Surface Map

August 16, 1998 Potentiometric Surface Map

A.2 Tables

Summary of Groundwater Measurements 1998

Summary of Water Sample Analytical Results 1998

Summary of Recovery System Operations 1998

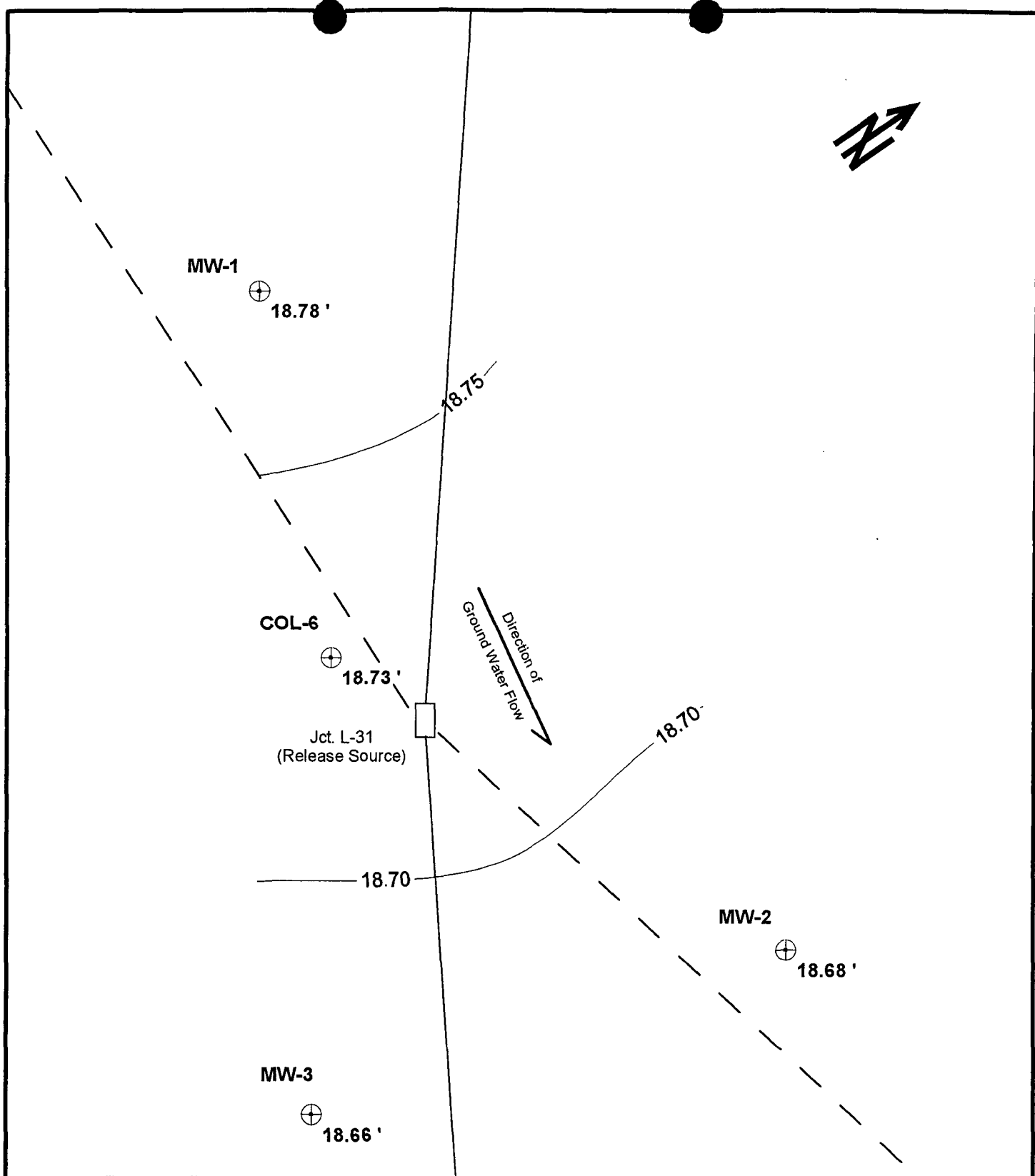
A.3 Analytical Results

February 14, 1998 Groundwater Monitoring Event

August 16, 1998 Groundwater Monitoring Event

APPENDIX A.1

FIGURES



POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

Jct. L-31 Release Site
31-T16S-R37E, Abo SWD System
Lea County, New Mexico

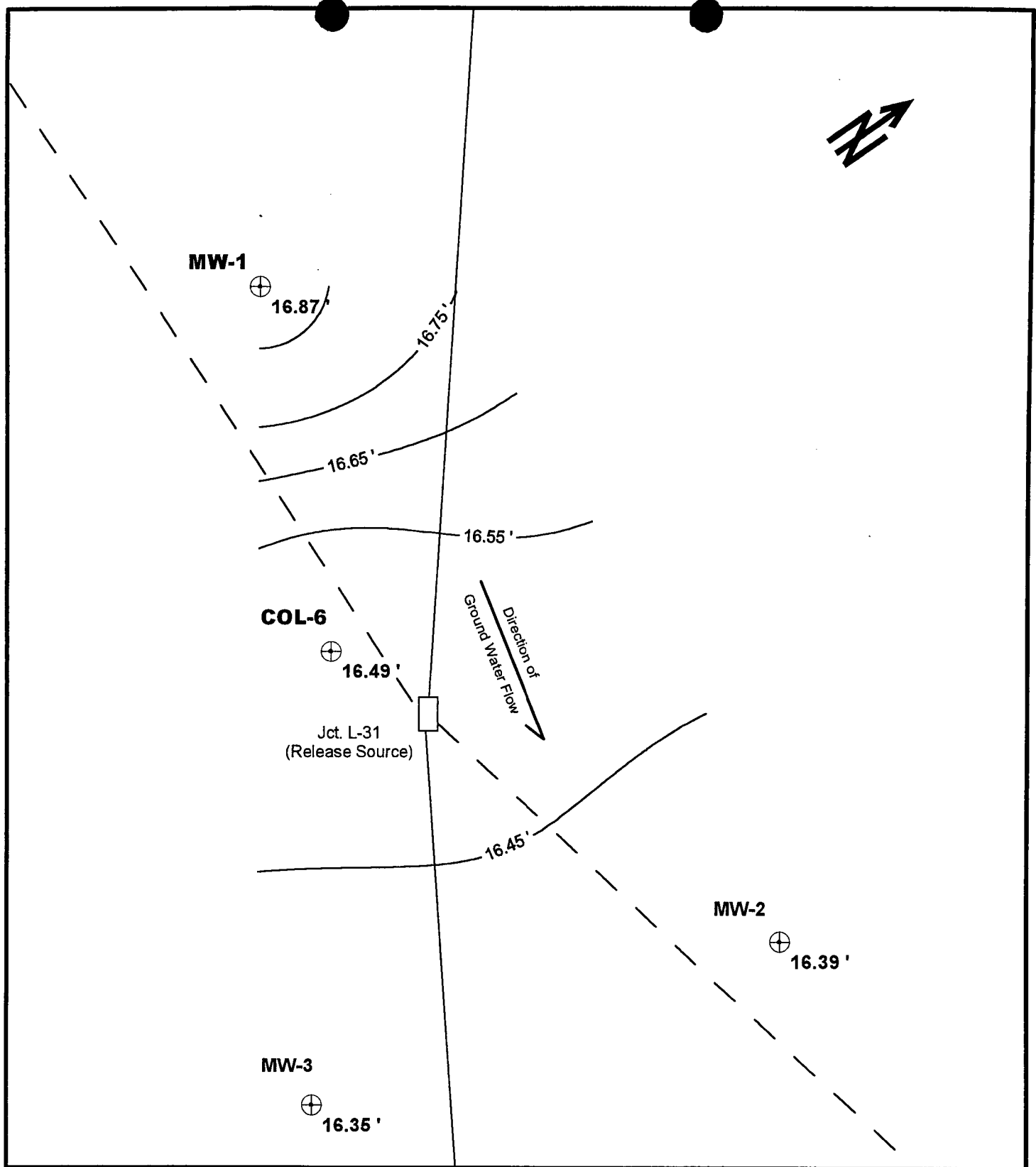
Rice Operating Company
 122 W. Taylor
 Hobbs, NM 88240

Legend

Contour interval = 0.05 feet
 Constructed from gauging measurements obtained on 2/14/98
 Relative BM = 100 feet, top of casing on MW-1
 ——— Rice Operating 4" AC pipeline
 - - - City of Lovington 6" AC pipeline

Map Scale

0 feet 15 feet 30 feet



POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

Jct. L-31 Release Site
31-T16S-R37E, Abo SWD System
Lea County, New Mexico

Rice Operating Company
 122 W. Taylor
 Hobbs, NM 88240

Legend

Contour interval = 0.10 feet
 Constructed from gauging measurements obtained on 8/16/98
 Relative BM = 100 feet, top of casing on MW-1

———— Rice Operating 4" AC pipeline
 - - - City of Lovington 6" AC pipeline

Map Scale

0 feet 15 feet 30 feet

APPENDIX A.2

TABLES

1998

**SUMMARY OF GROUNDWATER MEASUREMENTS
JCT L-31 SPILL SITE, ABO SWD SYSTEM**

Well Name	Date Gauged	Depth to Water*	Water Elevation**	Casing Elevation**	Surface Elevation**	LNAPL Thickness
MW-1	02/14/98	81.22	18.78	100.00	97.6	0.00
MW-1	08/16/98	83.13	16.87	100.00	97.6	0.00
MW-2	02/14/98	81.15	18.68	99.83	97.2	0.00
MW-2	08/16/98	83.44	16.39	99.83	97.2	0.00
MW-3	02/14/98	81.27	18.66	99.93	97.4	0.00
MW-3	08/16/98	83.58	16.35	99.93	97.4	0.00
COL-6	02/14/98	81.58	18.73	100.31	97.6	0.00
COL-6	08/16/98	83.82	16.49	100.31	97.6	0.00

* Well casings are marked to provide consistent reference points for gauging operations.

** Calculated from survey plat performed by Rice Operating Company.

Correction equation for the water elevation suppression effect caused by the presence of LNAPLs.

Corrected water elevation = Elevation - (Depth to water - (Specific gravity * LNAPL thickness))

where specific gravity = 0.82 for crude oil.

COL-6 = City of Lovington Well No. 6. All measurements are in feet.

1998
SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS
BTEX, TDS, AND CHLORIDES
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Well Name	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)	TDS (mg/l)	Chloride (mg/l)
NMWQCC	Standards	0.010	0.750	0.750	0.620	N/A	1,000	250
MW-1	02/14/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	1091	144
MW-1	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	573	94
MW-2	02/14/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	600	36
MW-2	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	418	76
MW-3	02/18/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	954	48
MW-3	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	317	42
COL-6	02/14/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	571	128
COL-6	08/16/98	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	442	69

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico.

Benzene, toluene, ethylbenzene, and xylene (BTEX); total dissolved solids (TDS); and chloride analyses were conducted using EPA Methods 8020, 160.1, and 352.3, respectively.

Results presented in bold print exceed NMWQCC human health standards for ground water.

COL-6 = City of Lovington Well No. 6.

All results are reported in milligrams per liter (mg/l), parts per million (ppm).

1998
SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS
WATER QUALITY DATA
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Well Name	Date Sampled	Total Dissolved Solids (TDS)	pH (S. U.)	Chloride (Cl)	Sodium (Na)	Calcium (Ca)	Magnesium (Mg)	Potassium (K)	Sulfate (SO4)	Carbonate (CO3)	Bicarbonate (HCO3)
NMWQCC	Standards	1,000 mg/l	6 to 9	250 mg/l	N/A	N/A	N/A	N/A	600 mg/l	N/A	N/A
MW-1	02/14/98	1,091	6.98	144	188.0	78.0	9.0	0.2	136.0	0	361
MW-1	08/16/98	573	N/A	94	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-2	02/14/98	600	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-2	08/16/98	418	N/A	76	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-3	02/14/98	954	N/A	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-3	08/16/98	317	N/A	42	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COL-6	02/14/98	571	7.48	128	87.0	80.0	15.0	0.3	83.0	0.0	224
COL-6	08/16/98	442	N/A	69	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico.

COL-6 = City of Lovington Well No. 6.

All results are reported in milligrams per liter (mg/l): parts per million (ppm).

Results presented in bold print exceed NMWQCC human health standards for ground water.

1998
QUARTERLY SUMMARY OF RECOVERY SYSTEM OPERATIONS
GROUNDWATER RECOVERY VOLUMES
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Avg. Analytical Result		Description
				Chloride (ppm)	TDS (ppm)	
JAN 1998	744	446,400	10.0	N/A	N/A	Groundwater Monitoring Event
FEB 1998	192	115,200	10.0	128	571	
MAR 1998	0	0	0.0	N/A	N/A	
1ST QTR	936	561,600	10.0	128	571	
APR 1998	0	0	0.0	N/A	N/A	
MAY 1998	0	0	0.0	N/A	N/A	
JUN 1998	0	0	0.0	N/A	N/A	
2ND QTR	0	0	0.0	N/A	N/A	
JUL 1998	0	0	0.0	N/A	N/A	Groundwater Monitoring Event
AUG 1998	0	0	0.0	69	442	
SEP 1998	0	0	0.0	N/A	N/A	
3RD QTR	0	0	0.0	69	442	
OCT 1998	0	0	N/A	N/A	N/A	
NOV 1998	0	0	N/A	N/A	N/A	
DEC 1998	0	0	N/A	N/A	N/A	
4TH QTR	0	0	N/A	N/A	N/A	
1998			RATE & ANALYTICAL AVERAGES			
TOTALS	936	561,600	10.0	99	507	

JANUARY 1998
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
01/01/98	24	14,400	10	Ground water recovered with submersible pump						
01/02/98	24	14,400	10	"			"			
01/03/98	24	14,400	10	"			"			
01/04/98	24	14,400	10	"			"			
01/05/98	24	14,400	10	"			"			
01/06/98	24	14,400	10	"			"			
01/07/98	24	14,400	10	"			"			
01/08/98	24	14,400	10	"			"			
01/09/98	24	14,400	10	"			"			
01/10/98	24	14,400	10	"			"			
01/11/98	24	14,400	10	"			"			
01/12/98	24	14,400	10	"			"			
01/13/98	24	14,400	10	"			"			
01/14/98	24	14,400	10	"			"			
01/15/98	24	14,400	10	"			"			
01/16/98	24	14,400	10	"			"			
01/17/98	24	14,400	10	"			"			
01/18/98	24	14,400	10	"			"			
01/19/98	24	14,400	10	"			"			
01/20/98	24	14,400	10	"			"			
01/21/98	24	14,400	10	"			"			
01/22/98	24	14,400	10	"			"			
01/23/98	24	14,400	10	"			"			
01/24/98	24	14,400	10	"			"			
01/25/98	24	14,400	10	"			"			
01/26/98	24	14,400	10	"			"			
01/27/98	24	14,400	10	"			"			
01/28/98	24	14,400	10	"			"			
01/29/98	24	14,400	10	"			"			
01/30/98	24	14,400	10	"			"			
01/31/98	24	14,400	10	Ground water recovered with submersible pump						
JAN 98				AVERAGE PUMP RATE & ANALYTICAL RESULT						
TOTALS	744	446,400	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A

FEBRUARY 1998
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
02/01/98	24	14,400	10	Ground water recovered with submersible pump						
02/02/98	24	14,400	10	"	"	"	"	"	"	"
02/03/98	24	14,400	10	"	"	"	"	"	"	"
02/04/98	24	14,400	10	"	"	"	"	"	"	"
02/05/98	24	14,400	10	"	"	"	"	"	"	"
02/06/98	24	14,400	10	"	"	"	"	"	"	"
02/07/98	24	14,400	10	"	"	"	"	"	"	"
02/08/98	24	14,400	10	Ground water recovered with submersible pump						
02/09/98	0	0	0	Recovery well shut-in for groundwater monitoring event						
02/10/98	0	0	0	"	"	"	"	"	"	"
02/11/98	0	0	0	"	"	"	"	"	"	"
02/12/98	0	0	0	"	"	"	"	"	"	"
02/13/98	0	0	0	"	"	"	"	"	"	"
02/14/98	0	0	0	128	571	<0.001	<0.001	<0.001	<0.006	<0.006
02/15/98	0	0	0	Recovery well shut-in.						
02/16/98	0	0	0	"	"	"	"	"	"	"
02/17/98	0	0	0	"	"	"	"	"	"	"
02/18/98	0	0	0	"	"	"	"	"	"	"
02/19/98	0	0	0	"	"	"	"	"	"	"
02/20/98	0	0	0	"	"	"	"	"	"	"
02/21/98	0	0	0	"	"	"	"	"	"	"
02/22/98	0	0	0	"	"	"	"	"	"	"
02/23/98	0	0	0	"	"	"	"	"	"	"
02/24/98	0	0	0	"	"	"	"	"	"	"
02/25/98	0	0	0	"	"	"	"	"	"	"
02/26/98	0	0	0	"	"	"	"	"	"	"
02/27/98	0	0	0	"	"	"	"	"	"	"
02/28/98	0	0	0	Recovery well shut-in.						
FEB 98				AVERAGE PUMP RATE & ANALYTICAL RESULT						
TOTALS	192	115,200	10	128	571	<0.001	<0.001	<0.001	<0.006	<0.006

MARCH 1998
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
03/01/98	0	0	0	Recovery well shut-in.						
03/02/98	0	0	0	"	"					
03/03/98	0	0	0	"	"					
03/04/98	0	0	0	"	"					
03/05/98	0	0	0	"	"					
03/06/98	0	0	0	"	"					
03/07/98	0	0	0	"	"					
03/08/98	0	0	0	"	"					
03/09/98	0	0	0	"	"					
03/10/98	0	0	0	"	"					
03/11/98	0	0	0	"	"					
03/12/98	0	0	0	"	"					
03/13/98	0	0	0	"	"					
03/14/98	0	0	0	"	"					
03/15/98	0	0	0	"	"					
03/16/98	0	0	0	"	"					
03/17/98	0	0	0	"	"					
03/18/98	0	0	0	"	"					
03/19/98	0	0	0	"	"					
03/20/98	0	0	0	"	"					
03/21/98	0	0	0	"	"					
03/22/98	0	0	0	"	"					
03/23/98	0	0	0	"	"					
03/24/98	0	0	0	"	"					
03/25/98	0	0	0	"	"					
03/26/98	0	0	0	"	"					
03/27/98	0	0	0	"	"					
03/28/98	0	0	0	"	"					
03/29/98	0	0	0	"	"					
03/30/98	0	0	0	"	"					
03/31/98	0	0	0	Recovery well shut-in.						
MAR 98				AVERAGE PUMP RATE & ANALYTICAL RESULT						
TOTALS	0	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

APRIL 1998
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
04/02/98	0	0	0	Recovery well shut-in.						
04/03/98	0	0	0	"	"					
04/04/98	0	0	0	"	"					
04/05/98	0	0	0	"	"					
04/06/98	0	0	0	"	"					
04/07/98	0	0	0	"	"					
04/08/98	0	0	0	"	"					
04/09/98	0	0	0	"	"					
04/10/98	0	0	0	"	"					
04/11/98	0	0	0	"	"					
04/12/98	0	0	0	"	"					
04/13/98	0	0	0	"	"					
04/14/98	0	0	0	"	"					
04/15/98	0	0	0	"	"					
04/16/98	0	0	0	"	"					
04/17/98	0	0	0	"	"					
04/18/98	0	0	0	"	"					
04/19/98	0	0	0	"	"					
04/20/98	0	0	0	"	"					
04/21/98	0	0	0	"	"					
04/22/98	0	0	0	"	"					
04/23/98	0	0	0	"	"					
04/24/98	0	0	0	"	"					
04/25/98	0	0	0	"	"					
04/26/98	0	0	0	"	"					
04/27/98	0	0	0	"	"					
04/28/98	0	0	0	"	"					
04/29/98	0	0	0	"	"					
04/30/98	0	0	0	Recovery well shut-in.						
APR 98				AVERAGE PUMP RATE & ANALYTICAL RESULTS						
TOTALS	0	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

MAY 1998
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
05/01/98	0	0	0	Recovery well shut-in.						
05/02/98	0	0	0	"	"					
05/03/98	0	0	0	"	"					
05/04/98	0	0	0	"	"					
05/05/98	0	0	0	"	"					
05/06/98	0	0	0	"	"					
05/07/98	0	0	0	"	"					
05/08/98	0	0	0	"	"					
05/09/98	0	0	0	"	"					
05/10/98	0	0	0	"	"					
05/11/98	0	0	0	"	"					
05/12/98	0	0	0	"	"					
05/13/98	0	0	0	"	"					
05/14/98	0	0	0	"	"					
05/15/98	0	0	0	"	"					
05/16/98	0	0	0	"	"					
05/17/98	0	0	0	"	"					
05/18/98	0	0	0	"	"					
05/19/98	0	0	0	"	"					
05/20/98	0	0	0	"	"					
05/21/98	0	0	0	"	"					
05/22/98	0	0	0	"	"					
05/23/98	0	0	0	"	"					
05/24/98	0	0	0	"	"					
05/25/98	0	0	0	"	"					
05/26/98	0	0	0	"	"					
05/27/98	0	0	0	"	"					
05/28/98	0	0	0	"	"					
05/29/98	0	0	0	"	"					
05/30/98	0	0	0	"	"					
05/31/98	0	0	0	Recovery well shut-in.						
MAY 98				AVERAGE PUMP RATE & ANALYTICAL RESULTS						
TOTALS	0	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

JUNE 1998
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
06/01/98	0	0	0	Recovery well shut-in.						
06/02/98	0	0	0	"	"					
06/03/98	0	0	0	"	"					
06/04/98	0	0	0	"	"					
06/05/98	0	0	0	"	"					
06/06/98	0	0	0	"	"					
06/07/98	0	0	0	"	"					
06/08/98	0	0	0	"	"					
06/09/98	0	0	0	"	"					
06/10/98	0	0	0	"	"					
06/11/98	0	0	0	"	"					
06/12/98	0	0	0	"	"					
06/13/98	0	0	0	"	"					
06/14/98	0	0	0	"	"					
06/15/98	0	0	0	"	"					
06/16/98	0	0	0	"	"					
06/17/98	0	0	0	"	"					
06/18/98	0	0	0	"	"					
06/19/98	0	0	0	"	"					
06/20/98	0	0	0	"	"					
06/21/98	0	0	0	"	"					
06/22/98	0	0	0	"	"					
06/23/98	0	0	0	"	"					
06/24/98	0	0	0	"	"					
06/25/98	0	0	0	"	"					
06/26/98	0	0	0	"	"					
06/27/98	0	0	0	"	"					
06/28/98	0	0	0	"	"					
06/29/98	0	0	0	"	"					
06/30/98	0	0	0	Recovery well shut-in.						
JUN 98				AVERAGE PUMP RATE & ANALYTICAL RESULTS						
TOTALS	0	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

JULY 1998
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
07/01/98	0	0	0	Recovery well shut-in.						
07/02/98	0	0	0	"	"					
07/03/98	0	0	0	"	"					
07/04/98	0	0	0	"	"					
07/05/98	0	0	0	"	"					
07/06/98	0	0	0	"	"					
07/07/98	0	0	0	"	"					
07/08/98	0	0	0	"	"					
07/09/98	0	0	0	"	"					
07/10/98	0	0	0	"	"					
07/11/98	0	0	0	"	"					
07/12/98	0	0	0	"	"					
07/13/98	0	0	0	"	"					
07/14/98	0	0	0	"	"					
07/15/98	0	0	0	"	"					
07/16/98	0	0	0	"	"					
07/17/98	0	0	0	"	"					
07/18/98	0	0	0	"	"					
07/19/98	0	0	0	"	"					
07/20/98	0	0	0	"	"					
07/21/98	0	0	0	"	"					
07/22/98	0	0	0	"	"					
07/23/98	0	0	0	"	"					
07/24/98	0	0	0	"	"					
07/25/98	0	0	0	"	"					
07/26/98	0	0	0	"	"					
07/27/98	0	0	0	"	"					
07/28/98	0	0	0	"	"					
07/29/98	0	0	0	"	"					
07/30/98	0	0	0	"	"					
07/31/98	0	0	0	Recovery well shut-in.						
JUL 98			AVERAGE PUMP RATE & ANALYTICAL RESULTS							
TOTALS	0	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

AUGUST 1998
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
08/01/98	0	0	0	Recovery well shut-in.						
08/02/98	0	0	0	"	"					
08/03/98	0	0	0	"	"					
08/04/98	0	0	0	"	"					
08/05/98	0	0	0	"	"					
08/06/98	0	0	0	"	"					
08/07/98	0	0	0	"	"					
08/08/98	0	0	0	"	"					
08/09/98	0	0	0	"	"					
08/10/98	0	0	0	"	"					
08/11/98	0	0	0	"	"					
08/12/98	0	0	0	"	"					
08/13/98	0	0	0	"	"					
08/14/98	0	0	0	"	"					
08/15/98	0	0	0	"	"					
08/16/98	0	0	0	69	442	<0.001	<0.001	<0.001	<0.006	<0.006
08/17/98	0	0	0	Recovery well shut-in.						
08/18/98	0	0	0	"	"					
08/19/98	0	0	0	"	"					
08/20/98	0	0	0	"	"					
08/21/98	0	0	0	"	"					
08/22/98	0	0	0	"	"					
08/23/98	0	0	0	"	"					
08/24/98	0	0	0	"	"					
08/25/98	0	0	0	"	"					
08/26/98	0	0	0	"	"					
08/27/98	0	0	0	"	"					
08/28/98	0	0	0	"	"					
08/29/98	0	0	0	"	"					
08/30/98	0	0	0	"	"					
08/31/98	0	0	0	Recovery well shut-in.						
AUG 98				AVERAGE PUMP RATE & ANALYTICAL RESULTS						
TOTALS	0	0	0.0	69	442	<0.001	<0.001	<0.001	<0.006	<0.006

SEPTEMBER 1998
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
09/01/98	0	0	0	Recovery well shut-in.						
09/02/98	0	0	0	"	"					
09/03/98	0	0	0	"	"					
09/04/98	0	0	0	"	"					
09/05/98	0	0	0	"	"					
09/06/98	0	0	0	"	"					
09/07/98	0	0	0	"	"					
09/08/98	0	0	0	"	"					
09/09/98	0	0	0	"	"					
09/10/98	0	0	0	"	"					
09/11/98	0	0	0	"	"					
09/12/98	0	0	0	"	"					
09/13/98	0	0	0	"	"					
09/14/98	0	0	0	"	"					
09/15/98	0	0	0	"	"					
09/16/98	0	0	0	"	"					
09/17/98	0	0	0	"	"					
09/18/98	0	0	0	"	"					
09/19/98	0	0	0	"	"					
09/20/98	0	0	0	"	"					
09/21/98	0	0	0	"	"					
09/22/98	0	0	0	"	"					
09/23/98	0	0	0	"	"					
09/24/98	0	0	0	"	"					
09/25/98	0	0	0	"	"					
09/26/98	0	0	0	"	"					
09/27/98	0	0	0	"	"					
09/28/98	0	0	0	"	"					
09/29/98	0	0	0	"	"					
09/30/98	0	0	0	Recovery well shut-in.						
SEP 98				AVERAGE PUMP RATE & ANALYTICAL RESULTS						
TOTALS	0	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

APPENDIX A.3

ANALYTICAL RESULTS



PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: F. WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 02/16/98
Reporting Date: 02/19/98
Project Owner: ABO SWD SYSTEM
Project Name: JCT L-31
Project Location: ABO SWD SYSTEM, LEA CO., NM

Sampling Date: 02/14/98
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		02/18/98	02/18/98	02/18/98	02/18/98
H3461-1	MW-3	<0.002	<0.002	<0.002	<0.006
H3461-2	MW-2	<0.002	<0.002	<0.002	<0.006
H3461-3	CL-6	<0.002	<0.002	<0.002	<0.006
H3461-4	MW-1	<0.002	<0.002	<0.002	<0.006
Quality Control		0.106	0.108	0.102	0.304
True Value QC		0.100	0.100	0.100	0.300
% Accuracy		106	108	102	101
Relative Percent Difference		3.6	3.1	0	0.8

METHOD: EPA SW 846-8260

Buyer's R. Coche
Chemist

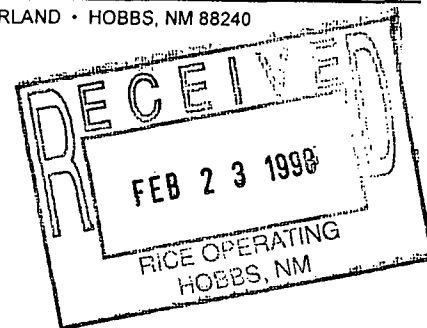
2/19/98
Date

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PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240



ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: F. WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 02/16/98
Reporting Date: 02/19/98
Project Owner: ABO SWD SYSTEM
Project Name: JCT L-31
Project Location: ABO SWD SYSTEM, LEA CO., NM

Sampling Date: 02/14/98
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: HM

LAB NUMBER	SAMPLE ID	TDS (mg/L)	Cl (mg/L)
ANALYSIS DATE:		02/18/98	02/16/98
H3461-1	MW-3	954	48
H3461-2	MW-2	600	36
Quality Control		NR	472
True Value QC		NR	500
% Accuracy		NR	94.4
Relative Percent Difference		0.3	4.0
METHODS: EPA 600/4-79-02		160.1	325.3

H3461.XLS
Chemist

2/19/98
Date

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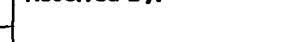
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

Page 1 of 1

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Sampler Relinquished: 		Date: 2/16/98 Time: 11:50	Received By: 	Phone Result: <input type="checkbox"/> Yes <input type="checkbox"/> No Additional Fax #: _____ Fax Result: <input type="checkbox"/> Yes <input type="checkbox"/> No REMARKS:
Relinquished By:		Date: _____ Time: _____	Received By: (Lab Staff)	
Delivered By: (Circle One) <u>Sampler</u> - UPS - Bus - Other:		Sample Condition: Cool <input type="checkbox"/> Intact <input type="checkbox"/> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No	CHECKED BY: (Initials)	

Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.



PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

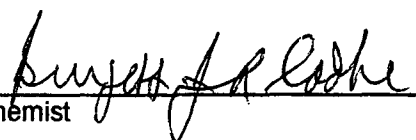
ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: F. WESLEY ROOT
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (505) 397-1471

Receiving Date: 08/17/98
Reporting Date: 08/18/98
Project Number: NOT GIVEN
Project Name: ABO SPILL SITE
Project Location: ABO SWS SYSTEM, LEA CO. NM

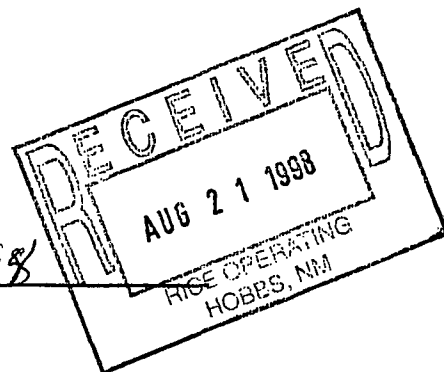
Sampling Date: 08/16/98
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: AH
Analyzed By: BC

LAB NO.	SAMPLE ID	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE		08/17/98	08/17/98	08/17/98	08/17/98
H3795-1	MW-3	<0.002	<0.002	<0.002	<0.006
H3795-2	MW-2	<0.002	<0.002	<0.002	<0.006
H3795-3	MW-1	<0.002	<0.002	<0.002	<0.006
H3795-4	COL-6	<0.002	<0.002	<0.002	<0.006
Quality Control		0.092	0.090	0.088	0.270
True Value QC		0.100	0.100	0.100	0.300
% Recovery		91.5	90.4	88.4	90.1
Relative Percent Difference		8.5	8.1	5.6	5.1

METHOD: EPA SW 846-8260


Chemist

8/18/98
Date



H3795-1.XLS

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Page ____ of ____

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APPENDIX B

**1997 GROUNDWATER RECOVERY
AND
MONITORING OPERATIONS**

Appendix B

1997 Groundwater Recovery and Monitoring Operations

B.1 Figures

April 23, 1997 Potentiometric Surface Map

July 2, 1997 Potentiometric Surface Map

December 6, 1997 Potentiometric Surface Map

December 23, 1997 Potentiometric Surface Map

B.2 Tables

Summary of Groundwater Measurements 1997

Summary of Water Sample Analytical Results 1997

Summary of Recovery System Operations 1997

B.3 Analytical Results

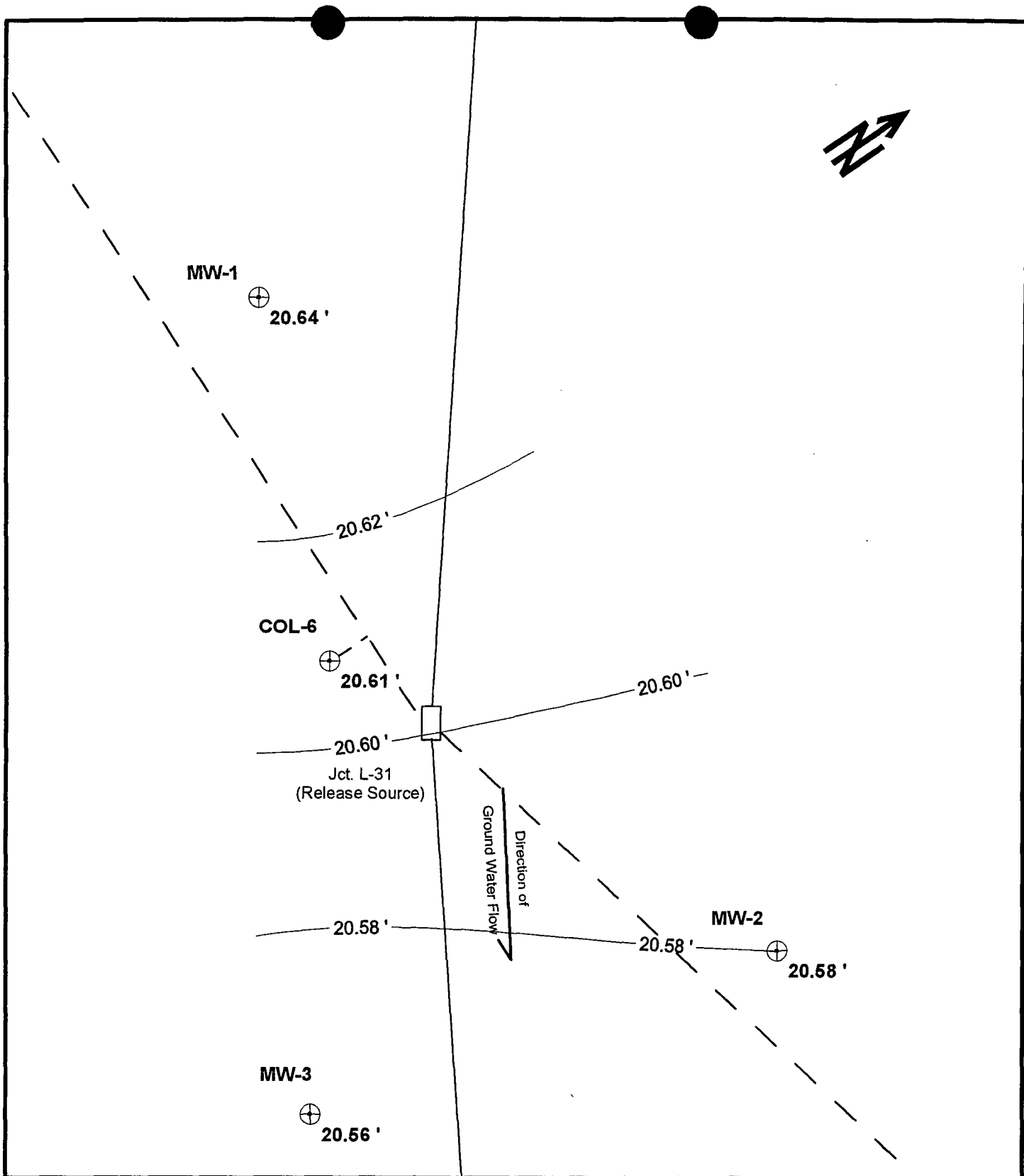
April 3, 1997 Groundwater Monitoring Event

July 2, 1997 Groundwater Monitoring Event

December 6, 1997 Groundwater Monitoring Event

APPENDIX B.1

FIGURES



POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

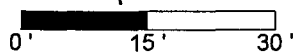
Jct. L-31 Release Site
31-T16S-R37E, Abo SWD System
Lea County, New Mexico

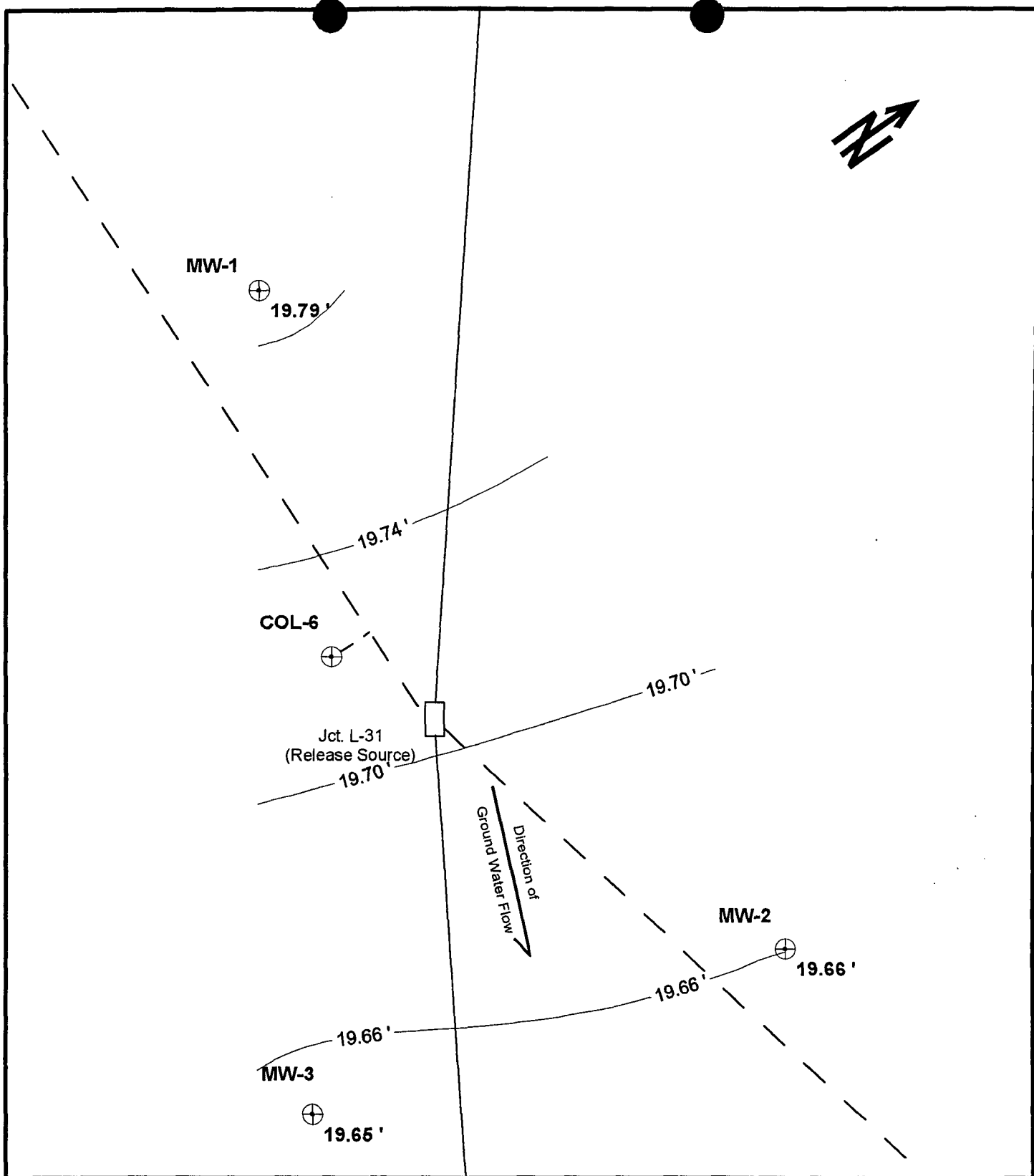
Rice Operating Company
 122 W. Taylor
 Hobbs, NM 88240

Legend

Contour interval = 0.02 feet
 Constructed from gauging measurements obtained on 4/23/97
 Relative BM = 100 feet, top of casing on MW-1
 ——— Rice Operating 4" AC pipeline
 - - - City of Lovington 6" AC pipeline

Map Scale





POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

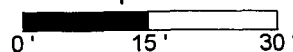
Jct. L-31 Release Site
31-T16S-R37E, Abo SWD System
Lea County, New Mexico

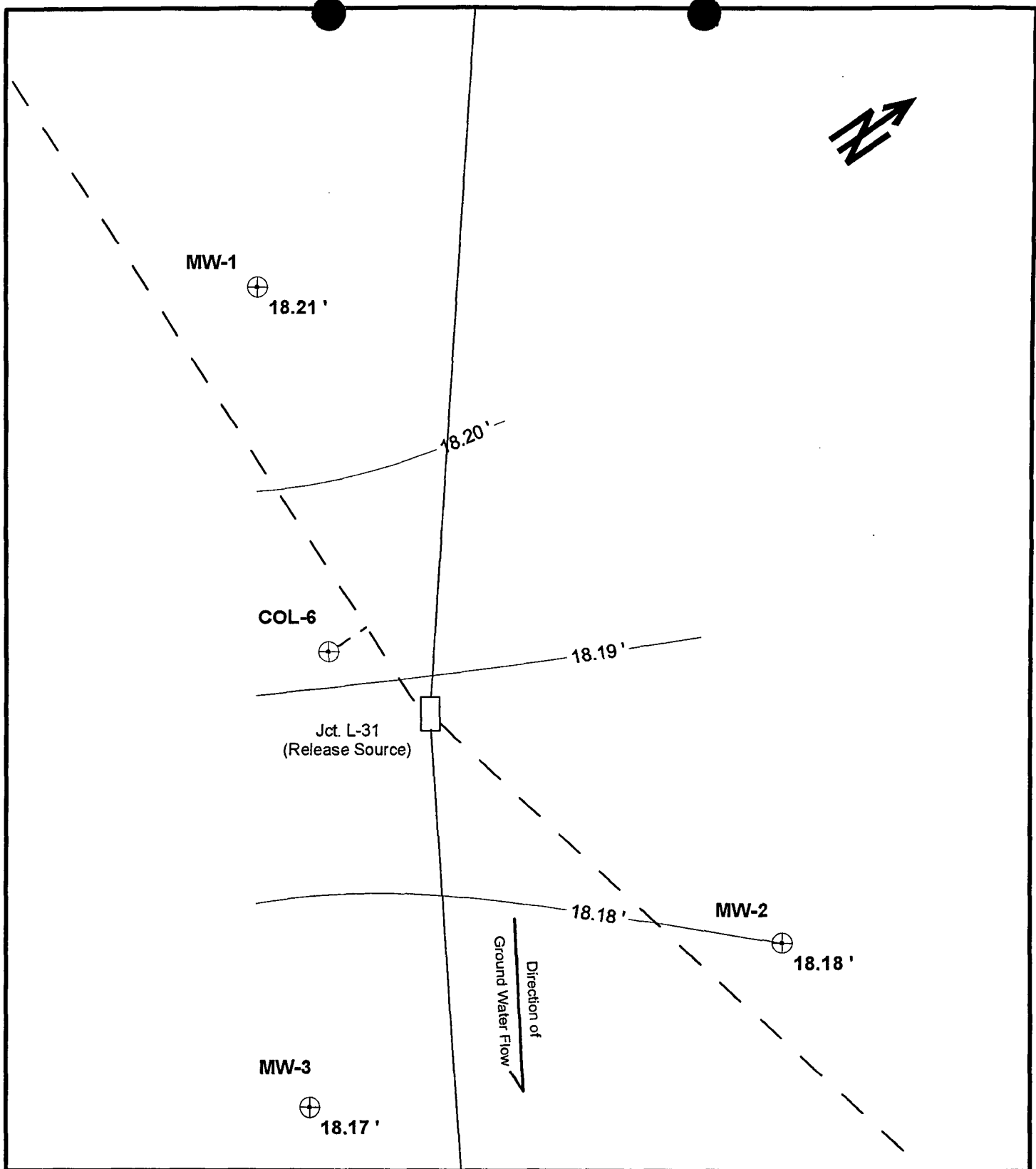
Rice Operating Company
 122 W. Taylor
 Hobbs, NM 88240

Legend

Contour interval = 0.04 feet
 Constructed from gauging measurements obtained on 7/02/97
 Relative BM = 100 feet, top of casing on MW-1
 ——— Rice Operating 4" AC pipeline
 - - - City of Lovington 6" AC pipeline

Map Scale





POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

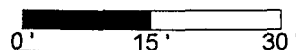
Jct. L-31 Release Site
31-T16S-R37E, Abo SWD System
Lea County, New Mexico

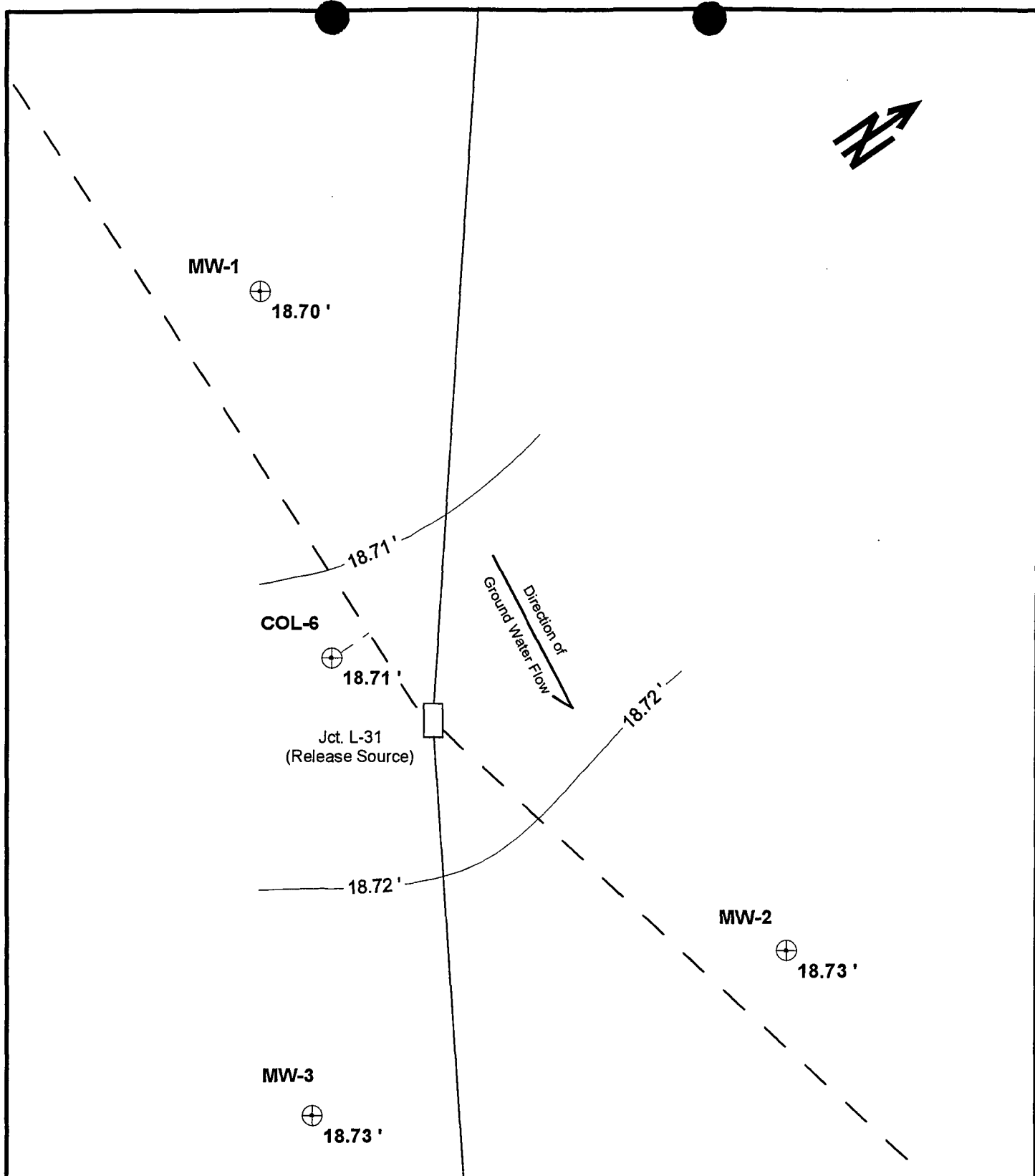
Rice Operating Company
 122 W. Taylor
 Hobbs, NM 88240

Legend

Contour interval = 0.01 feet
 Constructed from gauging measurements obtained on 12/06/97
 Relative BM = 100 feet, top of casing on MW-1
 ——— Rice Operating 4" AC pipeline
 - - - City of Lovington 6" AC pipeline

Map Scale





POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

Jct. L-31 Release Site
31-T16S-R37E, Abo SWD System
Lea County, New Mexico

Rice Operating Company
 122 W. Taylor
 Hobbs, NM 88240

Legend

Contour interval = 0.01 feet
 Constructed from gauging measurements obtained on 12/23/97
 Relative BM = 100 feet, top of casing on MW-1
 ——— Rice Operating 4" AC pipeline
 - - - City of Lovington 6" AC pipeline

Map Scale

0' 15' 30'

APPENDIX B.2

TABLES

1997
SUMMARY OF GROUNDWATER MEASUREMENTS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Well Name	Date Gauged	Depth to Water*	Water Elevation**	Casing Elevation**	Surface Elevation**	LNAPL Thickness
MW-1	04/23/97	79.36	20.64	100.00	97.6	0.00
MW-1	07/02/97	80.21	19.79	100.00	97.6	0.00
MW-1	12/06/97	81.79	18.21	100.00	97.6	0.00
MW-1	12/23/97	81.30	18.70	100.00	97.6	0.00
MW-2	04/23/97	79.25	20.58	99.83	97.2	0.00
MW-2	07/02/97	80.17	19.66	99.83	97.2	0.00
MW-2	12/06/97	81.65	18.18	99.83	97.2	0.00
MW-2	12/23/97	81.10	18.73	99.83	97.2	0.00
MW-3	04/23/97	79.37	20.56	99.93	97.4	0.00
MW-3	07/02/97	80.28	19.65	99.93	97.4	0.00
MW-3	12/06/97	81.76	18.17	99.93	97.4	0.00
MW-3	12/23/97	81.20	18.73	99.93	97.4	0.00
COL-6	04/23/97	79.70	20.61	100.31	97.6	0.00
COL-6	12/23/97	81.60	18.71	100.31	97.6	0.00

* Well casings are marked to provide consistent reference points for gauging operations.

** Calculated from survey plat performed by Rice Operating Company.

Correction equation for the water elevation suppression effect caused by the presence of LNAPLs.

Corrected water elevation = Elevation - (Depth to water - (Specific gravity * LNAPL thickness))

where specific gravity = 0.82 for crude oil.

COL-6 = City of Lovington Well No. 6. All measurements are in feet.

1997
SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS
BTEX, TDS, AND CHLORIDES
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Well Name	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)	TDS (mg/l)	Chloride (mg/l)
NMWQCC	Standards	0.010	0.750	0.750	0.620	N/A	1,000	250
MW-1	04/03/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	1042	258
MW-1	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	1066	250
MW-1	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	449	80
MW-2	04/03/97	0.0020	<0.0010	<0.0010	<0.0030	<0.0030	617	92
MW-2	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	464	96
MW-2	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0060	857	180
MW-3	04/03/97	0.5070	0.0020	0.0020	0.0090	0.5200	515	58
MW-3	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	454	58
MW-3	12/06/97	<0.0020	<0.0020	<0.0020	<0.0060	<0.0030	364	48
MW-3 (SPL)	12/06/97	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	N/A	N/A
COL-6	04/03/97	0.0010	<0.0010	<0.0010	<0.0030	<0.0030	780	276
	07/02/97	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	836	246
COL-6	12/06/97	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico.

Samples labeled (SPL) were analyzed by Southern Petroleum Laboratories, Houston, Texas.

Benzene, toluene, ethylbenzene, and xylene (BTEX); total dissolved solids (TDS); and chloride analyses were conducted using EPA Methods 8020, 160.1, and 352.3, respectively.

Results presented in bold print exceed NMWQCC human health standards for ground water.

COL-6 = City of Lovington Well No. 6.

All results are reported in milligrams per liter (mg/l); parts per million (ppm).

1997

SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS
WATER QUALITY DATA
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Well Name	Date Sampled	Total Dissolved Solids (TDS)	pH (S. U.)	Chloride (Cl)	Sodium (Na)	Calcium (Ca)	Magnesium (Mg)	Potassium (K)	Sulfate (SO ₄)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)
NMWQCC Standards		1,000 mg/l	6 to 9	250 mg/l	N/A	N/A	N/A	N/A	600 mg/l	N/A	N/A
MW-1	04/03/97	1,042	7.44	258	250.0	83.0	25.0	0.6	200.0	0	346
MW-1	07/02/97	1,066	N/A	250	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-1	12/06/97	449	N/A	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-2	04/03/97	617	7.25	92	52.0	64.0	24.0	0.1	87.0	64.0	185
MW-2	07/02/97	464	N/A	96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-2	12/06/97	857	N/A	180	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-3	04/03/97	515	7.36	58	63.0	69.0	18.0	<0.1	106.0	0.0	234
MW-3	07/02/97	454	N/A	58	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-3	12/06/97	364	N/A	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COL-6	04/03/97	780	7.65	276	166.0	88.0	29.0	1.9	126.0	0.0	224
COL-6	07/02/97	836	N/A	246	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COL-6	12/06/97	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico.

COL-6 = City of Lovington Well No. 6.

All results are reported in milligrams per liter (mg/l); parts per million (ppm).

Results presented in bold print exceed NMWQCC human health standards for ground water.

1997
QUARTERLY SUMMARY OF RECOVERY SYSTEM OPERATIONS
GROUNDWATER RECOVERY VOLUMES
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Avg. Analytical Result		Description
				Chloride (ppm)	TDS (ppm)	
JAN 1997	744	1,026,720	23.0	244	806	
FEB 1997	672	927,360	23.0	220	694	
MAR 1997	744	1,026,720	23.0	172	669	
1ST QTR	2,160	2,980,800	23.0	212	723	
APR 1997	185	244,200	22.0	232	632	Groundwater Monitoring Event
MAY 1997	744	982,080	22.0	184	742	
JUN 1997	672	887,040	22.0	N/A	N/A	
2ND QTR	1,601	2,113,320	22.0	208	687	
JUL 1997	518	683,760	22.0	211	772	Groundwater Monitoring Event
AUG 1997	744	982,080	22.0	168	685	
SEP 1997	720	950,400	22.0	156	544	
3RD QTR	1,982	2,616,240	22.0	178	667	
OCT 1997	744	982,080	22.0	140	617	Groundwater Monitoring Event
NOV 1997	720	950,400	22.0	140	621	
DEC 1997	96	126,720	22.0	165	565	
4TH QTR	1,560	2,059,200	22.0	148.3	601.0	
1997			RATE & ANALYTICAL AVERAGES			
TOTALS	7,303	9,769,560	22.3	187	669	

JANUARY 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
01/01/97	24	33,120	23	Ground water recovered with submersible pump						
01/02/97	24	33,120	23	"	"	"	"	"	"	"
01/03/97	24	33,120	23	"	"	"	"	"	"	"
01/04/97	24	33,120	23	"	"	"	"	"	"	"
01/05/97	24	33,120	23	"	"	"	"	"	"	"
01/06/97	24	33,120	23	"	"	"	"	"	"	"
01/07/97	24	33,120	23	"	"	"	"	"	"	"
01/08/97	24	33,120	23	"	"	"	"	"	"	"
01/09/97	24	33,120	23	"	"	"	"	"	"	"
01/10/97	24	33,120	23	"	"	"	"	"	"	"
01/11/97	24	33,120	23	"	"	"	"	"	"	"
01/12/97	24	33,120	23	"	"	"	"	"	"	"
01/13/97	24	33,120	23	"	"	"	"	"	"	"
01/14/97	24	33,120	23	"	"	"	"	"	"	"
01/15/97	24	33,120	23	"	"	"	"	"	"	"
01/16/97	24	33,120	23	"	"	"	"	"	"	"
01/17/97	24	33,120	23	"	"	"	"	"	"	"
01/18/97	24	33,120	23	"	"	"	"	"	"	"
01/19/97	24	33,120	23	"	"	"	"	"	"	"
01/20/97	24	33,120	23	"	"	"	"	"	"	"
01/21/97	24	33,120	23	"	"	"	"	"	"	"
01/22/97	24	33,120	23	"	"	"	"	"	"	"
01/23/97	24	33,120	23	"	"	"	"	"	"	"
01/24/97	24	33,120	23	"	"	"	"	"	"	"
01/25/97	24	33,120	23	"	"	"	"	"	"	"
01/26/97	24	33,120	23	"	"	"	"	"	"	"
01/27/97	24	33,120	23	"	"	"	"	"	"	"
01/28/97	24	33,120	23	"	"	"	"	"	"	"
01/29/97	24	33,120	23	"	"	"	"	"	"	"
01/30/97	24	33,120	23	244	806	N/A	N/A	N/A	N/A	N/A
01/31/97	24	33,120	23	Ground water recovered with submersible pump						
JAN 97				AVERAGE PUMP RATE & ANALYTICAL RESULT						
TOTALS	744	1,026,720	23.0	244	806	N/A	N/A	N/A	N/A	N/A

FEBRUARY 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
02/01/97	24	33,120	23	Ground water recovered with submersible pump						
02/02/97	24	33,120	23	"	"	"	"	"	"	"
02/03/97	24	33,120	23	"	"	"	"	"	"	"
02/04/97	24	33,120	23	"	"	"	"	"	"	"
02/05/97	24	33,120	23	"	"	"	"	"	"	"
02/06/97	24	33,120	23	"	"	"	"	"	"	"
02/07/97	24	33,120	23	"	"	"	"	"	"	"
02/08/97	24	33,120	23	"	"	"	"	"	"	"
02/09/97	24	33,120	23	"	"	"	"	"	"	"
02/10/97	24	33,120	23	"	"	"	"	"	"	"
02/11/97	24	33,120	23	"	"	"	"	"	"	"
02/12/97	24	33,120	23	"	"	"	"	"	"	"
02/13/97	24	33,120	23	"	"	"	"	"	"	"
02/14/97	24	33,120	23	"	"	"	"	"	"	"
02/15/97	24	33,120	23	"	"	"	"	"	"	"
02/16/97	24	33,120	23	"	"	"	"	"	"	"
02/17/97	24	33,120	23	"	"	"	"	"	"	"
02/18/97	24	33,120	23	"	"	"	"	"	"	"
02/19/97	24	33,120	23	"	"	"	"	"	"	"
02/20/97	24	33,120	23	"	"	"	"	"	"	"
02/21/97	24	33,120	23	"	"	"	"	"	"	"
02/22/97	24	33,120	23	"	"	"	"	"	"	"
02/23/97	24	33,120	23	"	"	"	"	"	"	"
02/24/97	24	33,120	23	"	"	"	"	"	"	"
02/25/97	24	33,120	23	"	"	"	"	"	"	"
02/26/97	24	33,120	23	"	"	"	"	"	"	"
02/27/97	24	33,120	23	"	"	"	"	"	"	"
02/28/97	24	33,120	23	220	694	N/A	N/A	N/A	N/A	N/A
FEB 97				AVERAGE PUMP RATE & ANALYTICAL RESULT						
TOTALS	672	927,360	23.0	220	694	N/A	N/A	N/A	N/A	N/A

MARCH 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
03/01/97	24	33,120	23	Ground water recovered with submersible pump						
03/02/97	24	33,120	23	"			"			
03/03/97	24	33,120	23	"			"			
03/04/97	24	33,120	23	"			"			
03/05/97	24	33,120	23	"			"			
03/06/97	24	33,120	23	"			"			
03/07/97	24	33,120	23	"			"			
03/08/97	24	33,120	23	"			"			
03/09/97	24	33,120	23	"			"			
03/10/97	24	33,120	23	"			"			
03/11/97	24	33,120	23	"			"			
03/12/97	24	33,120	23	"			"			
03/13/97	24	33,120	23	"			"			
03/14/97	24	33,120	23	"			"			
03/15/97	24	33,120	23	"			"			
03/16/97	24	33,120	23	"			"			
03/17/97	24	33,120	23	"			"			
03/18/97	24	33,120	23	"			"			
03/19/97	24	33,120	23	"			"			
03/20/97	24	33,120	23	"			"			
03/21/97	24	33,120	23	"			"			
03/22/97	24	33,120	23	"			"			
03/23/97	24	33,120	23	"			"			
03/24/97	24	33,120	23	"			"			
03/25/97	24	33,120	23	"			"			
03/26/97	24	33,120	23	"			"			
03/27/97	24	33,120	23	"			"			
03/28/97	24	33,120	23	"			"			
03/29/97	24	33,120	23	"			"			
03/30/97	24	33,120	23	"			"			
03/31/97	24	33,120	23	172	669	N/A	N/A	N/A	N/A	N/A
MAR 97				AVERAGE PUMP RATE & ANALYTICAL RESULT						
TOTALS	744	1,026,720	23.0	172	669	N/A	N/A	N/A	N/A	N/A

APRIL 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
04/01/97	8	10,890	23	Ground water recovered with submersible pump						
04/02/97	0	0	0	Recovery well shut-in for groundwater monitoring event						
04/03/97	0	0	0	276	780	<0.001	<0.001	<0.001	<0.003	<0.003
04/04/97	0	0	0	Recovery well shut-in.						
04/05/97	0	0	0	"		"				
04/06/97	0	0	0	"		"				
04/07/97	0	0	0	"		"				
04/08/97	0	0	0	"		"				
04/09/97	0	0	0	"		"				
04/10/97	0	0	0	"		"				
04/11/97	0	0	0	"		"				
04/12/97	0	0	0	"		"				
04/13/97	0	0	0	"		"				
04/14/97	0	0	0	"		"				
04/15/97	0	0	0	"		"				
04/16/97	0	0	0	"		"				
04/17/97	0	0	0	"		"				
04/18/97	0	0	0	"		"				
04/19/97	0	0	0	"		"				
04/20/97	0	0	0	"		"				
04/21/97	0	0	0	"		"				
04/22/97	0	0	0	"		"				
04/23/97	9	11,550	21	Ground water recovered with submersible pump						
04/24/97	24	31,680	22	"		"				
04/25/97	24	31,680	22	"		"				
04/26/97	24	31,680	22	"		"				
04/27/97	24	31,680	22	"		"				
04/28/97	24	31,680	22	"		"				
04/29/97	24	31,680	22	"		"				
04/30/97	24	31,680	22	188	483	N/A	N/A	N/A	N/A	N/A
APR 97			AVERAGE PUMP RATE & ANALYTICAL RESULT							
TOTALS	185	244,200	22.0	232	632	<0.001	<0.001	<0.001	<0.003	<0.003

MAY 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
05/01/97	24	31,680	22	Ground water recovered with submersible pump						
05/02/97	24	31,680	22	"	"	"	"	"	"	"
05/03/97	24	31,680	22	"	"	"	"	"	"	"
05/04/97	24	31,680	22	"	"	"	"	"	"	"
05/05/97	24	31,680	22	"	"	"	"	"	"	"
05/06/97	24	31,680	22	"	"	"	"	"	"	"
05/07/97	24	31,680	22	"	"	"	"	"	"	"
05/08/97	24	31,680	22	"	"	"	"	"	"	"
05/09/97	24	31,680	22	"	"	"	"	"	"	"
05/10/97	24	31,680	22	"	"	"	"	"	"	"
05/11/97	24	31,680	22	"	"	"	"	"	"	"
05/12/97	24	31,680	22	"	"	"	"	"	"	"
05/13/97	24	31,680	22	"	"	"	"	"	"	"
05/14/97	24	31,680	22	"	"	"	"	"	"	"
05/15/97	24	31,680	22	"	"	"	"	"	"	"
05/16/97	24	31,680	22	"	"	"	"	"	"	"
05/17/97	24	31,680	22	"	"	"	"	"	"	"
05/18/97	24	31,680	22	"	"	"	"	"	"	"
05/19/97	24	31,680	22	"	"	"	"	"	"	"
05/20/97	24	31,680	22	"	"	"	"	"	"	"
05/21/97	24	31,680	22	"	"	"	"	"	"	"
05/22/97	24	31,680	22	"	"	"	"	"	"	"
05/23/97	24	31,680	22	"	"	"	"	"	"	"
05/24/97	24	31,680	22	"	"	"	"	"	"	"
05/25/97	24	31,680	22	"	"	"	"	"	"	"
05/26/97	24	31,680	22	"	"	"	"	"	"	"
05/27/97	24	31,680	22	"	"	"	"	"	"	"
05/28/97	24	31,680	22	184	742	N/A	N/A	N/A	N/A	N/A
05/29/97	24	31,680	22	Ground water recovered with submersible pump						
05/30/97	24	31,680	22	"	"	"	"	"	"	"
05/31/97	24	31,680	22	"	"	"	"	"	"	"
MAY 97				AVERAGE PUMP RATE & ANALYTICAL RESULT						
TOTALS	744	982,080	22.0	184	742	N/A	N/A	N/A	N/A	N/A

JUNE 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
06/01/97	24	31,680	22	Ground water recovered with submersible pump						
06/02/97	24	31,680	22	"	"	"	"	"	"	"
06/03/97	24	31,680	22	"	"	"	"	"	"	"
06/04/97	24	31,680	22	"	"	"	"	"	"	"
06/05/97	24	31,680	22	"	"	"	"	"	"	"
06/06/97	24	31,680	22	"	"	"	"	"	"	"
06/07/97	24	31,680	22	"	"	"	"	"	"	"
06/08/97	24	31,680	22	"	"	"	"	"	"	"
06/09/97	24	31,680	22	"	"	"	"	"	"	"
06/10/97	24	31,680	22	"	"	"	"	"	"	"
06/11/97	24	31,680	22	"	"	"	"	"	"	"
06/12/97	24	31,680	22	"	"	"	"	"	"	"
06/13/97	24	31,680	22	"	"	"	"	"	"	"
06/14/97	24	31,680	22	"	"	"	"	"	"	"
06/15/97	24	31,680	22	"	"	"	"	"	"	"
06/16/97	24	31,680	22	"	"	"	"	"	"	"
06/17/97	24	31,680	22	"	"	"	"	"	"	"
06/18/97	24	31,680	22	"	"	"	"	"	"	"
06/19/97	24	31,680	22	"	"	"	"	"	"	"
06/20/97	24	31,680	22	"	"	"	"	"	"	"
06/21/97	24	31,680	22	"	"	"	"	"	"	"
06/22/97	24	31,680	22	"	"	"	"	"	"	"
06/23/97	24	31,680	22	"	"	"	"	"	"	"
06/24/97	24	31,680	22	"	"	"	"	"	"	"
06/25/97	24	31,680	22	"	"	"	"	"	"	"
06/26/97	24	31,680	22	"	"	"	"	"	"	"
06/27/97	24	31,680	22	"	"	"	"	"	"	"
06/28/97	24	31,680	22	"	"	"	"	"	"	"
06/29/97	0	0	0	Recovery well shut-in for groundwater monitoring event						
06/30/97	0	0	0	"	"	"	"	"	"	"
JUN 97				AVERAGE PUMP RATE & ANALYTICAL RESULT						
TOTALS	672	887,040	22.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

JULY 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
07/01/97	0	0	0	Recovery well shut-in for groundwater monitoring event						
07/02/97	0	0	0	246	836	<0.001	<0.001	<0.001	<0.003	<0.003
07/03/97	0	0	0	Recovery well shut-in						
07/04/97	0	0	0	"	"	"	"	"	"	"
07/05/97	0	0	0	"	"	"	"	"	"	"
07/06/97	0	0	0	"	"	"	"	"	"	"
07/07/97	0	0	0	"	"	"	"	"	"	"
07/08/97	0	0	0	"	"	"	"	"	"	"
07/09/97	0	0	0	"	"	"	"	"	"	"
07/10/97	14	18,480	22	Ground water recovered with submersible pump						
07/11/97	24	31,680	22	"	"	"	"	"	"	"
07/12/97	24	31,680	22	"	"	"	"	"	"	"
07/13/97	24	31,680	22	"	"	"	"	"	"	"
07/14/97	24	31,680	22	"	"	"	"	"	"	"
07/15/97	24	31,680	22	"	"	"	"	"	"	"
07/16/97	24	31,680	22	"	"	"	"	"	"	"
07/17/97	24	31,680	22	"	"	"	"	"	"	"
07/18/97	24	31,680	22	"	"	"	"	"	"	"
07/19/97	24	31,680	22	"	"	"	"	"	"	"
07/20/97	24	31,680	22	"	"	"	"	"	"	"
07/21/97	24	31,680	22	"	"	"	"	"	"	"
07/22/97	24	31,680	22	"	"	"	"	"	"	"
07/23/97	24	31,680	22	"	"	"	"	"	"	"
07/24/97	24	31,680	22	"	"	"	"	"	"	"
07/25/97	24	31,680	22	"	"	"	"	"	"	"
07/26/97	24	31,680	22	"	"	"	"	"	"	"
07/27/97	24	31,680	22	"	"	"	"	"	"	"
07/28/97	24	31,680	22	"	"	"	"	"	"	"
07/29/97	24	31,680	22	"	"	"	"	"	"	"
07/30/97	24	31,680	22	"	"	"	"	"	"	"
07/31/97	24	31,680	22	176	707	N/A	N/A	N/A	N/A	N/A
JUL 97			AVERAGE PUMP RATE & ANALYTICAL RESULT							
TOTALS	518	683,760	22.0	211	772	<0.001	<0.001	<0.001	<0.003	<0.003

AUGUST 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
08/01/97	24	31,680	22	Ground water recovered with submersible pump						
08/02/97	24	31,680	22	"			"			
08/03/97	24	31,680	22	"			"			
08/04/97	24	31,680	22	"			"			
08/05/97	24	31,680	22	"			"			
08/06/97	24	31,680	22	"			"			
08/07/97	24	31,680	22	"			"			
08/08/97	24	31,680	22	"			"			
08/09/97	24	31,680	22	"			"			
08/10/97	24	31,680	22	"			"			
08/11/97	24	31,680	22	"			"			
08/12/97	24	31,680	22	"			"			
08/13/97	24	31,680	22	"			"			
08/14/97	24	31,680	22	"			"			
08/15/97	24	31,680	22	"			"			
08/16/97	24	31,680	22	"			"			
08/17/97	24	31,680	22	"			"			
08/18/97	24	31,680	22	"			"			
08/19/97	24	31,680	22	"			"			
08/20/97	24	31,680	22	"			"			
08/21/97	24	31,680	22	"			"			
08/22/97	24	31,680	22	"			"			
08/23/97	24	31,680	22	"			"			
08/24/97	24	31,680	22	"			"			
08/25/97	24	31,680	22	"			"			
08/26/97	24	31,680	22	"			"			
08/27/97	24	31,680	22	168	685	N/A	N/A	N/A	N/A	N/A
08/28/97	24	31,680	22	Ground water recovered with submersible pump						
08/29/97	24	31,680	22	"			"			
08/30/97	24	31,680	22	"			"			
08/31/97	24	31,680	22	"			"			
AUG 97			AVERAGE PUMP RATE & ANALYTICAL RESULT							
TOTALS	744	982,080	22.0	168	685	N/A	N/A	N/A	N/A	N/A

SEPTEMBER 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
09/01/97	24	31,680	22	Ground water recovered with submersible pump						
09/02/97	24	31,680	22	"	"	"	"	"	"	"
09/03/97	24	31,680	22	"	"	"	"	"	"	"
09/04/97	24	31,680	22	"	"	"	"	"	"	"
09/05/97	24	31,680	22	"	"	"	"	"	"	"
09/06/97	24	31,680	22	"	"	"	"	"	"	"
09/07/97	24	31,680	22	"	"	"	"	"	"	"
09/08/97	24	31,680	22	"	"	"	"	"	"	"
09/09/97	24	31,680	22	"	"	"	"	"	"	"
09/10/97	24	31,680	22	"	"	"	"	"	"	"
09/11/97	24	31,680	22	"	"	"	"	"	"	"
09/12/97	24	31,680	22	"	"	"	"	"	"	"
09/13/97	24	31,680	22	"	"	"	"	"	"	"
09/14/97	24	31,680	22	"	"	"	"	"	"	"
09/15/97	24	31,680	22	"	"	"	"	"	"	"
09/16/97	24	31,680	22	"	"	"	"	"	"	"
09/17/97	24	31,680	22	"	"	"	"	"	"	"
09/18/97	24	31,680	22	"	"	"	"	"	"	"
09/19/97	24	31,680	22	"	"	"	"	"	"	"
09/20/97	24	31,680	22	"	"	"	"	"	"	"
09/21/97	24	31,680	22	"	"	"	"	"	"	"
09/22/97	24	31,680	22	"	"	"	"	"	"	"
09/23/97	24	31,680	22	"	"	"	"	"	"	"
09/24/97	24	31,680	22	"	"	"	"	"	"	"
09/25/97	24	31,680	22	"	"	"	"	"	"	"
09/26/97	24	31,680	22	"	"	"	"	"	"	"
09/27/97	24	31,680	22	"	"	"	"	"	"	"
09/28/97	24	31,680	22	"	"	"	"	"	"	"
09/29/97	24	31,680	22	156	544	N/A	N/A	N/A	N/A	N/A
09/30/97	24	31,680	22	Ground water recovered with submersible pump						
SEP 97				AVERAGE PUMP RATE & ANALYTICAL RESULT						
TOTALS	720	950,400	22.0	156	544	N/A	N/A	N/A	N/A	N/A

OCTOBER 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
10/01/97	24	31,680	22	Ground water recovered with submersible pump						
10/02/97	24	31,680	22	"	"	"	"	"	"	"
10/03/97	24	31,680	22	"	"	"	"	"	"	"
10/04/97	24	31,680	22	"	"	"	"	"	"	"
10/05/97	24	31,680	22	"	"	"	"	"	"	"
10/06/97	24	31,680	22	"	"	"	"	"	"	"
10/07/97	24	31,680	22	"	"	"	"	"	"	"
10/08/97	24	31,680	22	"	"	"	"	"	"	"
10/09/97	24	31,680	22	"	"	"	"	"	"	"
10/10/97	24	31,680	22	"	"	"	"	"	"	"
10/11/97	24	31,680	22	"	"	"	"	"	"	"
10/12/97	24	31,680	22	"	"	"	"	"	"	"
10/13/97	24	31,680	22	"	"	"	"	"	"	"
10/14/97	24	31,680	22	"	"	"	"	"	"	"
10/15/97	24	31,680	22	"	"	"	"	"	"	"
10/16/97	24	31,680	22	"	"	"	"	"	"	"
10/17/97	24	31,680	22	"	"	"	"	"	"	"
10/18/97	24	31,680	22	"	"	"	"	"	"	"
10/19/97	24	31,680	22	"	"	"	"	"	"	"
10/20/97	24	31,680	22	"	"	"	"	"	"	"
10/21/97	24	31,680	22	"	"	"	"	"	"	"
10/22/97	24	31,680	22	"	"	"	"	"	"	"
10/23/97	24	31,680	22	"	"	"	"	"	"	"
10/24/97	24	31,680	22	"	"	"	"	"	"	"
10/25/97	24	31,680	22	"	"	"	"	"	"	"
10/26/97	24	31,680	22	"	"	"	"	"	"	"
10/27/97	24	31,680	22	"	"	"	"	"	"	"
10/28/97	24	31,680	22	"	"	"	"	"	"	"
10/29/97	24	31,680	22	"	"	"	"	"	"	"
10/30/97	24	31,680	22	140	617	N/A	N/A	N/A	N/A	N/A
10/31/97	24	31,680	22	Ground water recovered with submersible pump						
OCT 97				AVERAGE PUMP RATE & ANALYTICAL RESULT						
TOTALS	744	982,080	22.0	140	617	N/A	N/A	N/A	N/A	N/A

NOVEMBER 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
11/01/97	24	31,680	22	Ground water recovered with submersible pump						
11/02/97	24	31,680	22	"			"			
11/03/97	24	31,680	22	"			"			
11/04/97	24	31,680	22	"			"			
11/05/97	24	31,680	22	"			"			
11/06/97	24	31,680	22	"			"			
11/07/97	24	31,680	22	"			"			
11/08/97	24	31,680	22	"			"			
11/09/97	24	31,680	22	"			"			
11/10/97	24	31,680	22	"			"			
11/11/97	24	31,680	22	"			"			
11/12/97	24	31,680	22	"			"			
11/13/97	24	31,680	22	"			"			
11/14/97	24	31,680	22	"			"			
11/15/97	24	31,680	22	"			"			
11/16/97	24	31,680	22	"			"			
11/17/97	24	31,680	22	"			"			
11/18/97	24	31,680	22	"			"			
11/19/97	24	31,680	22	"			"			
11/20/97	24	31,680	22	"			"			
11/21/97	24	31,680	22	"			"			
11/22/97	24	31,680	22	"			"			
11/23/97	24	31,680	22	"			"			
11/24/97	24	31,680	22	"			"			
11/25/97	24	31,680	22	140	621	N/A	N/A	N/A	N/A	N/A
11/26/97	24	31,680	22	Ground water recovered with submersible pump						
11/27/97	24	31,680	22	"			"			
11/28/97	24	31,680	22	"			"			
11/29/97	24	31,680	22	"			"			
11/30/97	24	31,680	22	"			"			
NOV 97			AVERAGE PUMP RATE & ANALYTICAL RESULT							
TOTALS	720	950,400	22.0	140	621	N/A	N/A	N/A	N/A	N/A

DECEMBER 1997
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
12/01/97	24	31,680	22	Ground water recovered with submersible pump						
12/02/97	24	31,680	22	"	"	"	"	"	"	"
12/03/97	24	31,680	22	"	"	"	"	"	"	"
12/04/97	24	31,680	22	"	"	"	"	"	"	"
12/05/97	0	0	0	Recovery well shut-in for groundwater monitoring event						
12/06/97	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/07/97	0	0	0	Recovery well shut-in						
12/08/97	0	0	0	"	"	"	"	"	"	"
12/09/97	0	0	0	"	"	"	"	"	"	"
12/10/97	0	0	0	"	"	"	"	"	"	"
12/11/97	0	0	0	"	"	"	"	"	"	"
12/12/97	0	0	0	"	"	"	"	"	"	"
12/13/97	0	0	0	"	"	"	"	"	"	"
12/14/97	0	0	0	"	"	"	"	"	"	"
12/15/97	0	0	0	"	"	"	"	"	"	"
12/16/97	0	0	0	"	"	"	"	"	"	"
12/17/97	0	0	0	"	"	"	"	"	"	"
12/18/97	0	0	0	"	"	"	"	"	"	"
12/19/97	0	0	0	"	"	"	"	"	"	"
12/20/97	0	0	0	"	"	"	"	"	"	"
12/21/97	0	0	0	"	"	"	"	"	"	"
12/22/97	0	0	0	"	"	"	"	"	"	"
12/23/97	0	0	0	165	565	N/A	N/A	N/A	N/A	N/A
12/24/97	0	0	0	"	"	"	"	"	"	"
12/25/97	0	0	0	"	"	"	"	"	"	"
12/26/97	0	0	0	"	"	"	"	"	"	"
12/27/97	0	0	0	"	"	"	"	"	"	"
12/28/97	0	0	0	"	"	"	"	"	"	"
12/29/97	0	0	0	"	"	"	"	"	"	"
12/30/97	0	0	0	"	"	"	"	"	"	"
12/31/97	0	0	0	Recovery well shut-in						
DEC 97				AVERAGE PUMP RATE & ANALYTICAL RESULT						
TOTALS	96	126,720	22.0	165	565	N/A	N/A	N/A	N/A	N/A

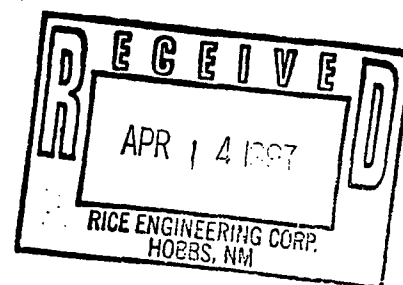
APPENDIX B.3

ANALYTICAL RESULTS



PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240



ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: WES ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 04/03/97
Reporting Date: 04/07/97
Project Number: 129
Project Name: ABO SWD (E-TECH)
Project Location: LEA CO., NM

Sampling Date: 04/03/97
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: AH
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		04/05/97	04/05/97	04/05/97	04/05/97
H2896-8	MW-1	<0.001	<0.001	<0.001	<0.003
H2896-9	MW-2	0.002	<0.001	<0.001	<0.003
H2896-10	MW-3	0.507	0.002	0.002	0.009
H2896-11	C.W.	0.001	<0.001	<0.001	<0.003
Quality Control		0.107	0.105	0.110	0.331
True Value QC		0.100	0.100	0.100	0.300
% Accuracy		107	105	110	110
Relative Percent Difference		3.2	4.4	4.1	5.7

METHOD: EPA SW 846-8260

Bryant A. Cook
Chemist

4/7/97
Date

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. Cardinal shall be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



PHONE (915) 873-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

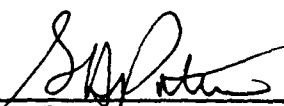
ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: WES ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 04/03/97
Reporting Date: 04/09/97
Project Number: 129
Project Name: ABO SWD (E-TECH)
Project Location: HOBBS, NM

Sampling Date: 04/03/97
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: AH
Analyzed By: AH/BC

LAB NUMBER	SAMPLE ID	Na (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Conductivity (umhos/cm)	T-Alkalinity (mgCaCO3/L)
ANALYSIS DATE:		04/09/97	04/04/97	04/04/97	04/04/97	04/04/97	04/04/97
H2896-8	MW-1	250	83	25	0.6	1890	284
H2896-9	MW-2	52	64	24	0.1	850	152
H2896-10	MW-3	63	69	18	<0.1	773	192
H2896-11	C.W.	166	88	29	1.9	1581	184
Quality Control		NR	NR	NR	NR	1413	NR
True Value QC		NR	NR	NR	NR	1413	NR
% Accuracy		NR	NR	NR	NR	100	NR
Relative Percent Difference		NR	NR	NR	NR	0	NR
METHODS:		SM3500-Ca-D	3500-Mg E		8049	120.1	310.1

		Cl ⁻ (mg/L)	SO4 (mg/L)	CO3 (mg/L)	HCO3 (mg/L)	pH (s.u.)	TDS (mg/L)
ANALYSIS DATE:		04/04/97	04/04/97	04/04/97	04/04/97	04/04/97	04/04/97
H2896-8	MW-1	258	200	0	346	7.44	1042
H2896-9	MW-2	92	87	0	185	7.25	617
H2896-10	MW-3	58	106	0	234	7.36	515
H2896-11	C.W.	276	126	0	224	7.65	780
Quality Control		480	105	NR	NR	7.00	NR
True Value QC		500	100	NR	NR	7.00	NR
% Accuracy		96.0	105	NR	NR	100	NR
Relative Percent Difference		0	4.8	NR	NR	0	0.2
METHODS:		SM4500-Cl-B	375.4	310.1	310.1	150.1	160.1


Gayle A. Potter, Chemist

04/10/97
Date

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PHONE 15051391-2125 • 101 E MARLAND • CBB5 "M 39440

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page of

[illegible]



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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

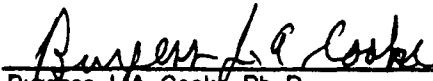
ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: WES ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 07/02/97
Reporting Date: 07/08/97
Project Number: NOT GIVEN
Project Name: ABO
Project Location: HOBBS, NM

Sampling Date: 07/02/97
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC/AH

LAB NUMBER	SAMPLE ID	TDS (mg/L)	CI (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE:		07/08/97	07/03/97	07/03/97	07/03/97	07/03/97	07/03/97
H3038-1	MW-1	1066	250	<0.001	<0.001	<0.001	<0.003
H3038-2	MW-2	464	96	<0.001	<0.001	<0.001	<0.003
H3038-3	MW-3	454	58	<0.001	<0.001	<0.001	<0.003
H3038-4	CITY WELL	836	246	<0.001	<0.001	<0.001	<0.003
Quality Control		NR	200	0.112	0.113	0.114	0.339
True Value QC		NR	200	0.100	0.100	0.100	0.300
% Accuracy		NR	100	112	113	114	113
Relative Percent Difference		NR	0	4.4	0.9	0.9	2.4

METHODS: TDS- EPA 600/4-79-020, 160.1; CI-EPA 600/4-79-020, 325.3 BTEX-EPA SW-846-8020


Burgess J.A. Cooke, Ph. D.

7/8/97
Date

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page of

Company Name: E-TECH SERVICES				Project Manager:				Address: P.O. Box 51151				City: Midland State: TX Zip: 79710-1151				Phone #: (915) 550-4913				Fax #: " "				Project #:				Project Name: ABO				Project Location: HOBBS			
BILL TO				PO #:				Company: Rice Eng.				Attn: Wes Root				Address:				City: HOBBS				State: N.M. Zip:				Phone #:				Fax #:			
LAB ID. #		Sample ID.		COMP(G) OR GRAB(G) # CONTAINERS		MATRIX						PRESERVATION			SAMPLING		ANALYSIS REQUEST																		
						GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID:	ICE/COOL	OTHER:	DATE	TIME																			
H-3038-1		MW-1		4		✓						✓			7.2.97 4:45		BTEX																		
-2		MW-2		4		✓						✓			7.2.97 5:15		TAS																		
-3		MW-3		4		✓						✓			7.2.97 5:45		Chlorides																		
-4		City Well		4		✓						✓			7.2.97 6:10																				

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Sampler Relinquished:	Date: 7-24-97	Received By:	Phone Result: <input type="checkbox"/> Yes <input type="checkbox"/> No	Additional Fax #: _____
Relinquished By: <i>Scott A. Smith</i>	Time: 7:00	Received By: (Lab Staff) <i>Benjamin A. Cash</i>	Fax Results: <input type="checkbox"/> Yes <input type="checkbox"/> No	REMARKS:
	Date: 7/24/97			
	Time: 1:00 PM			
Delivered By: (Circle One)		Sample Condition	CHECKED BY:	
UPS - Fed Ex - Bus - Other:		Cool <input type="checkbox"/> Yes <input type="checkbox"/> No	(Initials)	
		Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		



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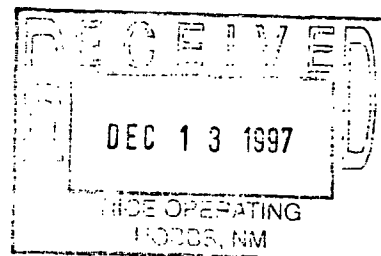
ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: F. WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 12/08/97
Reporting Date: 12/11/97
Project Number: NOT GIVEN
Project Name: JCT. L-31
Project Location: ABO SYSTEM, LEA CO. NM

Sampling Date: 12/06/97
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		12/09/97	12/09/97	12/09/97	12/09/97
H3356-1	MW-2	<0.002	<0.002	<0.002	<0.006
H3356-2	MW-1	<0.002	<0.002	<0.002	<0.006
H3356-3	MW-3	<0.002	<0.002	<0.002	<0.006
Quality Control		0.104	0.096	0.093	0.288
True Value QC		0.100	0.100	0.100	0.300
% Accuracy		104	95.8	93.1	96.0
Relative Percent Difference		4.8	3.9	0.3	0.7

METHOD: EPA SW 846-8260, gc/ms



Bryana J. Cook
Chemist

12/11/97
Date

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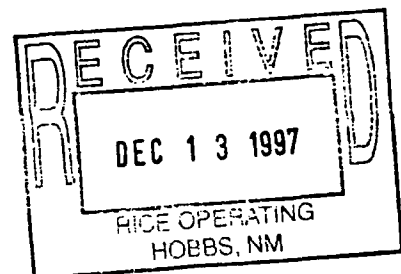
ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: F. WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 12/08/97
Reporting Date: 12/11/97
Project Number: NOT GIVEN
Project Name: JCT. L-31
Project Location: ABO SYSTEM, LEA CO. NM

Sampling Date: 12/06/97
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	TDS (mg/L)	Cl (mg/L)
ANALYSIS DATE:		12/09/97	12/09/97
H3356-1	MW-2	857	180
H3356-2	MW-1	449	80
H3356-3	MW-3	364	48
Quality Control		NR	500
True Value QC		NR	500
% Recovery		NR	100
Relative Percent Difference		0.3	4.0

METHODS: EPA 600/4-79-02	160.1	325.3
--------------------------	-------	-------



[Signature]
Chemist

12/11/97
Date

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

[illegible]

† Cardinal cannot accept verbal changes. Please fax written changes to 915-873-7020.



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

December 19, 1997

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

The following report contains analytical results for samples received at Southern Petroleum Laboratories (SPL) on December 10, 1997. The samples were assigned to Certificate of Analysis No.(s) 9712600 and analyzed for all parameters as listed on the chain of custody.

Any data flag or quality control exception associated with this report will be footnoted in the analytical results 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

A handwritten signature in cursive script that reads "Electa Brown". The signature is written over a horizontal line.

Electa Brown
Client Services Representative



HOUSTON LABORATORY

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

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 97-12-600

Approved for Release by:

A handwritten signature in cursive script, reading "Electa Brown", is written over a horizontal line.

Electa Brown, Client Services Representative

A handwritten date "12/19/97" is written in cursive script over a horizontal line.

Date

Greg Grandits
Laboratory Director

Idelis Williams
Quality Assurance Officer

The attached analytical data package may not be reproduced except in full without the express written approval of this laboratory.

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

Certificate of Analysis No. H9-9712600-07

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

DATE: 12/19/97

PROJECT: Hobbs SWD System
SITE: West Co Road Lea Co, NM
SAMPLED BY: Rice Operating
SAMPLE ID: MW-3PROJECT NO:
MATRIX: WATER
DATE SAMPLED: 12/06/97
DATE RECEIVED: 12/10/97**ANALYTICAL DATA**

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	µg/L
TOLUENE	ND	1.0 P	µg/L
ETHYLBENZENE	ND	1.0 P	µg/L
TOTAL XYLENE	ND	1.0 P	µg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		µg/L

Surrogate	% Recovery
1,4-Difluorobenzene	93
4-Bromofluorobenzene	97

Method 8020A ***
Analyzed by: VHZ
Date: 12/12/97

ND - Not detected.

(P) - Practical Quantitation Limit

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.

SPL, Inc., - Project Manager

QUALITY CONTROL
DOCUMENTATION



* SPL BATCH QUALITY CONTROL REPORT **

METHOD 8020/602

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054

PHONE (713) 660-0901

Matrix: Aqueous

Batch Id: VARD971212120700

Units: µg/L

LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits (**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
Benzene	ND	50	53	106	61 - 119
Toluene	ND	50	55	110	65 - 125
EthylBenzene	ND	50	53	106	70 - 118
O Xylene	ND	50	52	104	72 - 117
M & P Xylene	ND	100	110	110	72 - 116

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits (***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
BENZENE	ND	20	19	95.0	17	85.0	11.1	21	32 - 164
TOLUENE	ND	20	19	95.0	18	90.0	5.41	20	38 - 159
ETHYLBENZENE	ND	20	19	95.0	18	90.0	5.41	19	52 - 142
O XYLENE	ND	20	19	95.0	18	90.0	5.41	18	53 - 143
M & P XYLENE	ND	40	38	95.0	36	90.0	5.41	17	53 - 144

Analyst: VHZ

Sequence Date: 12/13/97

SPL ID of sample spiked: 9712274-06A

Sample File ID: D_L7332.TX0

Method Blank File ID:

Blank Spike File ID: D_L7374.TX0

Matrix Spike File ID: D_L7329.TX0

Matrix Spike Duplicate File ID: D_L7330.TX0

* = Values Outside QC Range. * = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = $[(<1> - <2>) / <3>] \times 100$ LCS % Recovery = $(<1> / <3>) \times 100$ Relative Percent Difference = $|(<4> - <5> | / [(<4> + <5>) \times 0.5] \times 100$

(**) = Source: SPL-Houston Historical Data (1st Q '97)

(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID):

9712600-04A	9712600-05A	9712600-06A	9712600-07A
9712274-01A	9712274-02A	9712274-07A	9712334-01A
9712334-03A	9712336-02A	9712336-04A	9712336-01A
9712336-05A	9712336-03A	9712405-01A	9712405-03A
9712274-06A	9712600-01A	9712600-02A	9712600-03A

CHAIN OF CUSTODY
AND
SAMPLE RECEIPT CHECKLIST

Date: 12-6-97
Page 1 of 1

CHAIN OF CUSTODY RECORD NO.

SITE ADDRESS: Jct. L-31

ABO SWD System, Lea Co. NM

WIC #:

CONSULTANT NAME & ADDRESS: Rice Operating Company

122 West Taylor, Hobbs, NM 88240

CONSULTANT CONTACT: F. Wesley Root

PHONE 505-393-9174 FAX: 505-397-1471

SAMPLED BY: J. Brian

CHECK ONE BOX ONLY CT/DI

QUARTERLY MONITORING ☒ 5401

SITE INVESTIGATION ☐ 5441

SOIL FOR DISPOSAL ☐ 5442

WATER FOR DISPOSAL ☐ 5443

AIR SAMPLER - SYS O+M ☐ 5452

WATER SAMPLE - SYS O+M ☐ 5453

OTHER ☐

ANALYSIS REQUEST:
(CHECK APPROPRIATE BOX)

OTHER

REMARKS

NO OF CONTAINERS

CONTAINER SIZE

BTEX 802 ☐ WITH MTBE ☐
☒ 802X

BTXGAS HYDROCARBONS PIDED ☐ WITH MTBE ☐

VOL 824PPL ☐ 824TOTAL ☐ NBS (+15) ☐

PINAPAH 8310 ☐ 9100 ☐ 610 ☐

SEMI-VOL 825PPL ☐ 827OTAL ☐ NBS (+25) ☐

TPHAR 4181 ☐ SALSOC ☐ ☐ ☐

TPHGC 8015 MOD GAS ☐ 8015 MOD DIESEL ☐

TCP METALS ☐ VOL ☐ SEMI-VOL ☐ PEST ☐ HERB ☐

EP TOX METALS ☐ PESTICIDES ☐ HERBICIDES ☐

REACTIVITY ☐ CORROSIVITY ☐ IGNITABILITY ☐

SAMPLE ID

DATE

TIME

COMP

GRAB

MATRIX

H₂O

SOIL

AIR

SLUDGE

OTHER

METHOD PRESERVED

HCl

HNO₃

H₂SO₄

NONE

OTHER

ICE

MW-1

12-6-97

18:00

☒

☒

☒

☒

1

40mL

☒

MW-3

12-6-97

18:20

☒

☒

☒

☒

1

40mL

☒

RELINQUISHED BY: (SIGNATURE)

DATE

TIME

RECEIVED BY: (SIGNATURE)

DATE

TIME

BILL NO.:

LABORATORY:

RELINQUISHED BY: (SIGNATURE)

DATE

TIME

RECEIVED BY: (SIGNATURE)

DATE

TIME

CONTACT:

PHONE:

FAX:

RELINQUISHED BY: (SIGNATURE)

DATE

TIME

RECEIVED BY: (SIGNATURE)

DATE

TIME

TURN AROUND TIME (CHECK ONE)

7 DAYS ☐

14 DAYS ☐ (NORMAL)

48 HOURS ☐

OTHER ☐

SITE ADDRESS West Co. Road
Hobbs SWD System, Lea Co, NM
WIC # _____
CONSULTANT NAME & ADDRESS Rice Operating Company
122 West Taylor, Hobbs, NM 88240
CONSULTANT CONTACT F. Wesley Root
PHONE 505-393-7124 FAX 505-397-1471
SAMPLED BY A. Brion

CHECK ONE BOX ONLY CT/DT				ANALYSIS REQUEST: (CHECK APPROPRIATE BOX)		OTHER	REMARKS
QUARTERLY MONITORING <input checked="" type="checkbox"/> 3401							
SITE INVESTIGATION <input type="checkbox"/> 3441							
SOIL FOR DISPOSAL <input type="checkbox"/> 3442							
WATER FOR DISPOSAL <input type="checkbox"/> 3443							
AIR SAMPLER - SYS O-M <input type="checkbox"/> 3462							
WATER SAMPLE - SYS O-M <input type="checkbox"/> 3463							
OTHER _____ <input type="checkbox"/>							
NO OF CONTAINERS				CONTAINER SIZE			
				BTEX 802 <input type="checkbox"/> 8020 <input checked="" type="checkbox"/> WITH MTBE <input type="checkbox"/>			
				BTEX GAS HYDROCARBONS PROFILE <input type="checkbox"/> WITH MTBE <input type="checkbox"/>			
				VOL 824PPL <input type="checkbox"/> 824TAL <input type="checkbox"/> NBS (119) <input type="checkbox"/>			
				PNA-PH 8310 <input type="checkbox"/> 9100 <input type="checkbox"/> 610 <input type="checkbox"/>			
				SEMI-VOL 852APPL <input type="checkbox"/> 852TOTAL <input type="checkbox"/> NBS (125) <input type="checkbox"/>			
				TPH-R 4181 <input type="checkbox"/> SURFAC <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
				TPH-GC 8015 MOD GAS <input type="checkbox"/> 8015 MOD DIESEL <input type="checkbox"/>			
				TCLP METALS <input type="checkbox"/> VOL <input type="checkbox"/> SEMI-VOL <input type="checkbox"/> PEST <input type="checkbox"/> HERB <input type="checkbox"/>			
				PEP TOX METALS <input type="checkbox"/> PESTICIDES <input type="checkbox"/> HERBICIDES <input type="checkbox"/>			
				REACTIVITY <input type="checkbox"/> CORROSIVITY <input type="checkbox"/> IGNITABILITY <input type="checkbox"/>			

[illegible]

RUSH

RELINQUISHED BY: (SIGNATURE) <i>[Signature]</i>	DATE 12/8/97	TIME 1730	RECEIVED BY: (SIGNATURE) <i>[Signature]</i>	DATE 12/10/97	TIME 1000	BILL NO: _____
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	LABORATORY: _____
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	CONTACT: _____ PHONE: _____ FAX: _____
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	TURN AROUND TIME (CHECK ONE)
						7 DAYS <input type="checkbox"/> 14 DAYS <input type="checkbox"/> (NORMAL)
						48 HOURS <input type="checkbox"/> OTHER <input type="checkbox"/> _____

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN OF CUSTODY WITH INVOICE AND RESULTS

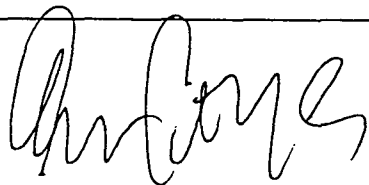
SPL Houston Environmental Laboratory

Sample Login Checklist

Date: 12/10/97	Time: 1000
----------------	------------

SPL Sample ID: 9712600

		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:	19° C	
10	Method of sample delivery to SPL:	SPL Delivery	
		Client Delivery	
		FedEx Delivery (airbill #)	3283607585
		Other:	
11	Method of sample disposal:	SPL Disposal	/
		HOLD	
		Return to Client	

Name: 	Date: 12/10/97
---	----------------

APPENDIX C

**1996 GROUNDWATER RECOVERY
AND
MONITORING OPERATIONS**

Appendix C

1996 Groundwater Recovery and Monitoring Operations

C.1 Figures

April 17, 1996 Potentiometric Surface Map

May 6, 1996 Potentiometric Surface Map

September 19, 1996 Potentiometric Surface Map

October 3, 1996 Potentiometric Surface Map

October 16, 1996 Potentiometric Surface Map

November 25, 1996 Potentiometric Surface Map

C.2 Tables

Summary of Groundwater Measurements 1996

Summary of Water Sample Analytical Results 1996

Summary of Recovery System Operations 1996

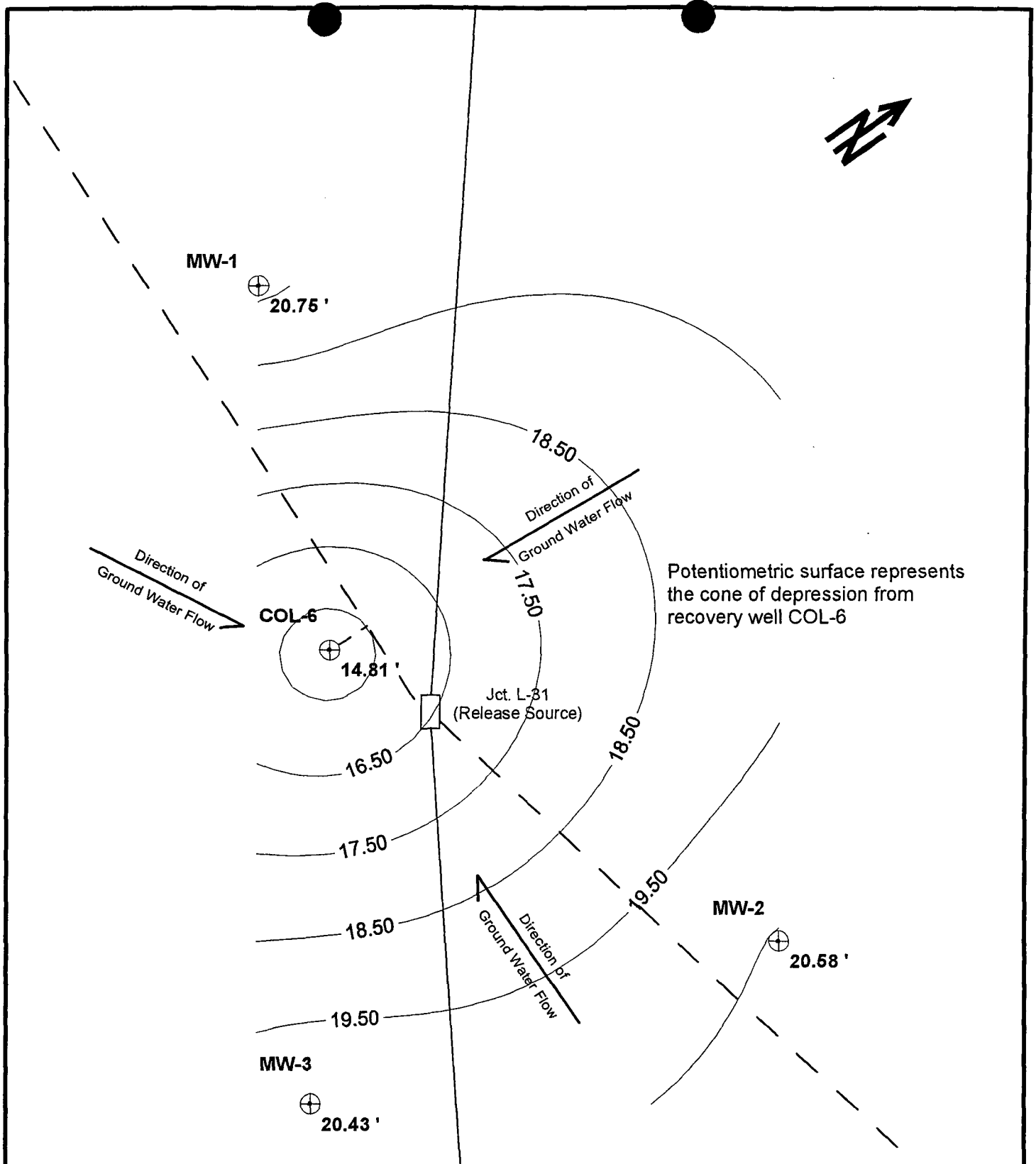
C.3 Analytical Results

April 17, 1996 Groundwater Monitoring Event

November 25, 1996 Groundwater Monitoring Event

APPENDIX C.1

FIGURES



POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

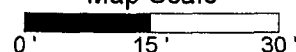
Jct. L-31 Release Site
31-T16S-R37E, Abo SWD System
Lea County, New Mexico

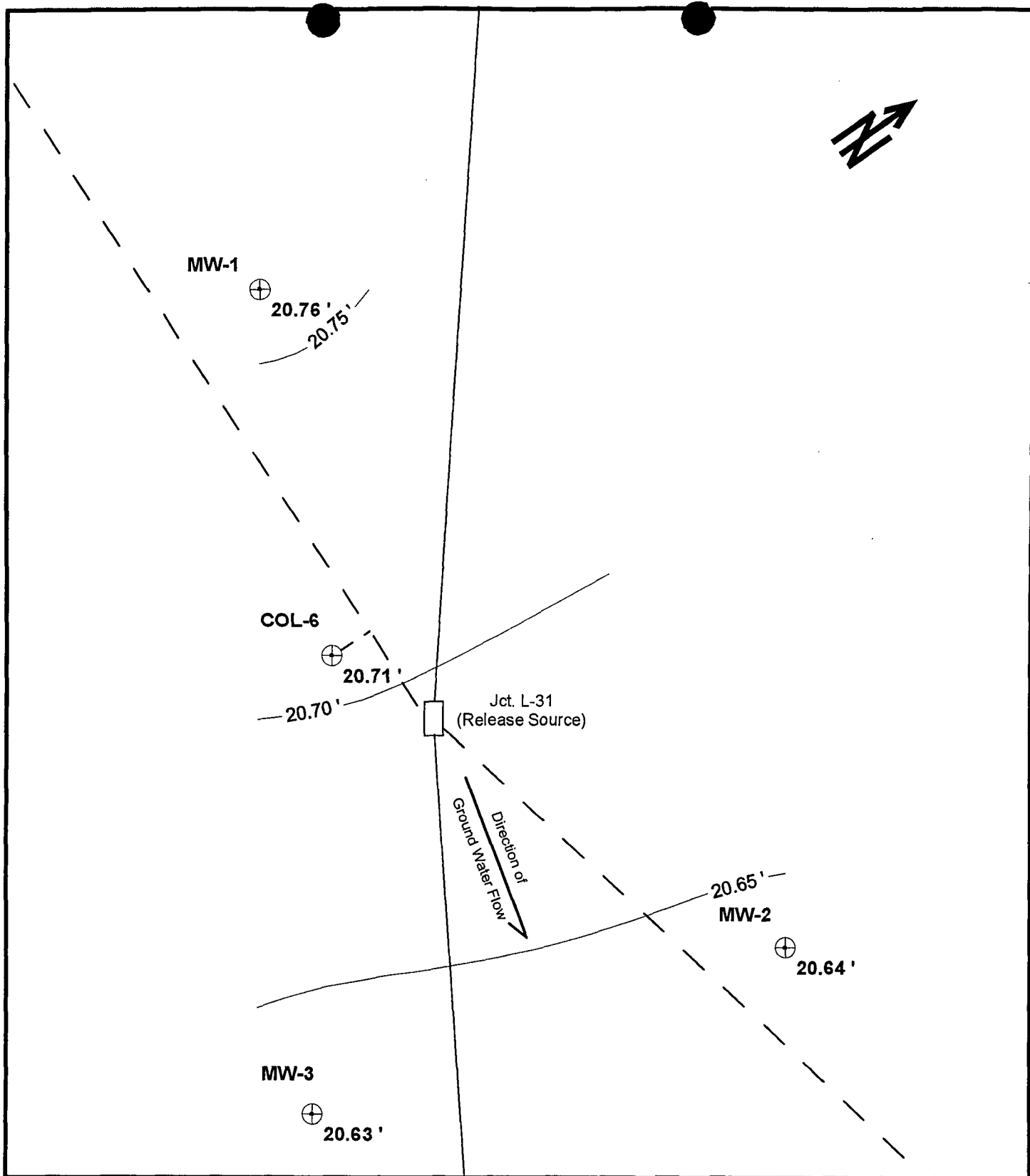
Rice Operating Company
 122 W. Taylor
 Hobbs, NM 88240

Legend

Contour interval = 1.0 feet
 Constructed from gauging measurements obtained on 4/17/96
 Relative BM = 100 feet, top of casing on MW-1
 — Rice Operating 4" AC pipeline
 - - - City of Lovington 6" AC pipeline

Map Scale





POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

Jct. L-31 Release Site
31-T16S-R37E, Abo SWD System
Lea County, New Mexico

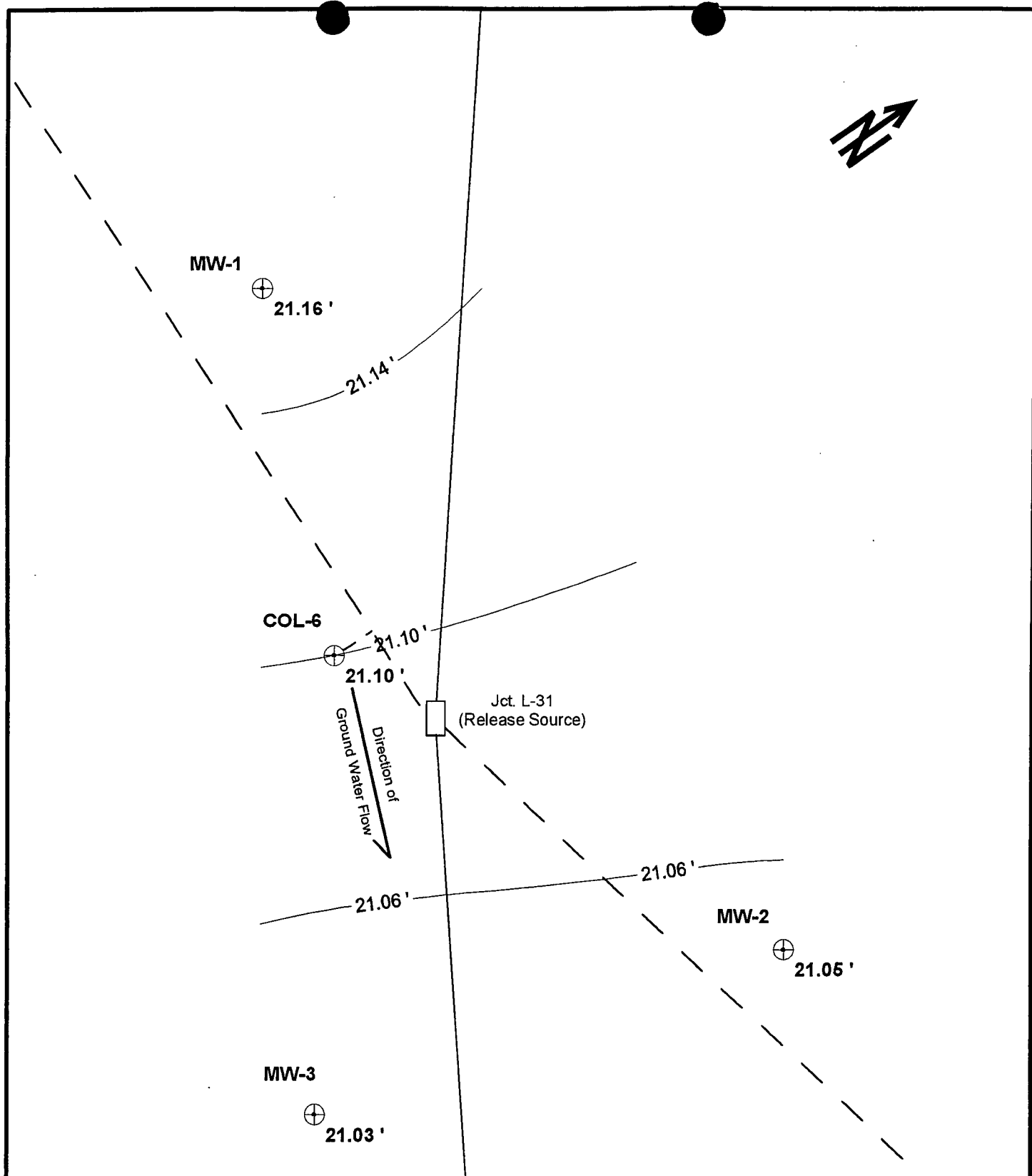
Rice Operating Company
 122 W. Taylor
 Hobbs, NM 88240

Legend

Contour interval = 0.05 feet
 Constructed from gauging measurements obtained on 5/06/96
 Relative BM = 100 feet, top of casing on MW-1
 ——— Rice Operating 4" AC pipeline
 - - - City of Lovington 6" AC pipeline

Map Scale

0' 15' 30'



POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

Jct. L-31 Release Site
31-T16S-R37E, Abo SWD System
Lea County, New Mexico

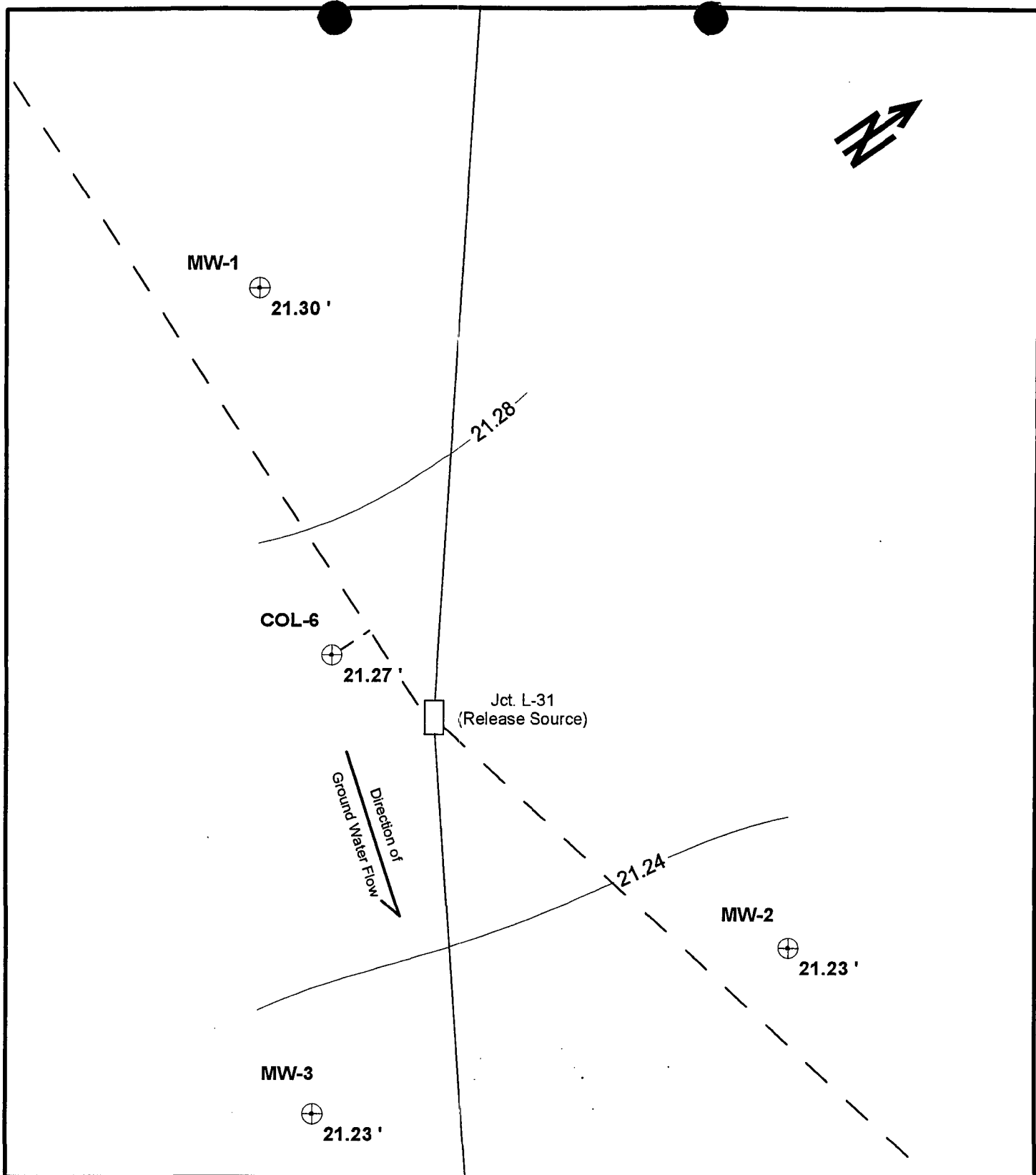
Rice Operating Company
 122 W. Taylor
 Hobbs, NM 88240

Legend

Contour interval = 0.04 feet
 Constructed from gauging measurements obtained on 10/3/96
 Relative BM = 100 feet, top of casing on MW-1
 ——— Rice Operating 4" AC pipeline
 - - - City of Lovington 6" AC pipeline

Map Scale

0' 15' 30'



POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

Jct. L-31 Release Site
31-T16S-R37E, Abo SWD System
Lea County, New Mexico

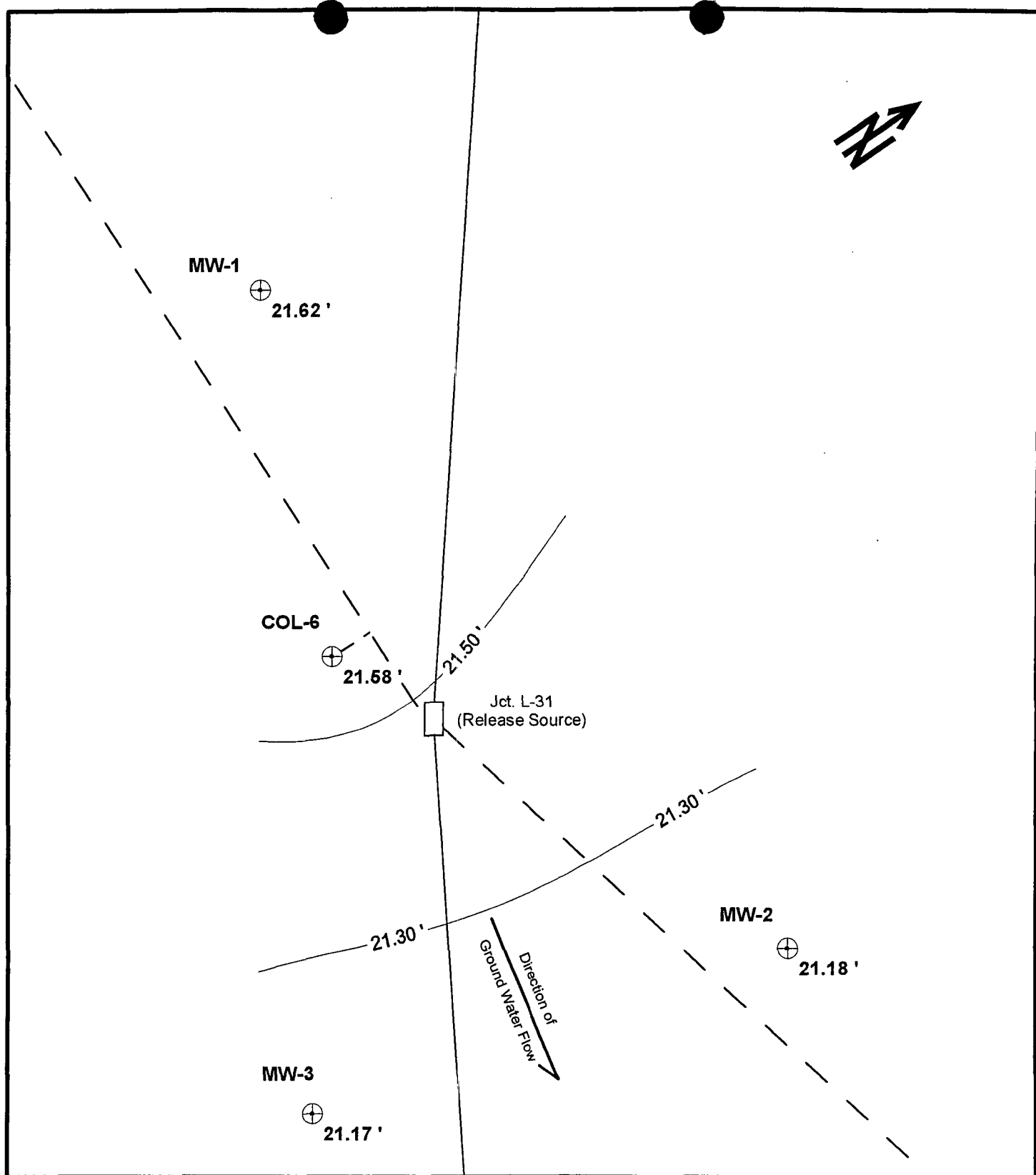
Rice Operating Company
 122 W. Taylor
 Hobbs, NM 88240

Legend

Contour interval = 0.04 feet
 Constructed from gauging measurements obtained on 10/16/96
 Relative BM = 100 feet, top of casing on MW-1
 ——— Rice Operating 4" AC pipeline
 - - - City of Lovington 6" AC pipeline

Map Scale

0' 15' 30'



POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

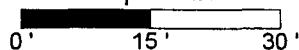
Jct. L-31 Release Site
31-T16S-R37E, Abo SWD System
Lea County, New Mexico

Rice Operating Company
 122 W. Taylor
 Hobbs, NM 88240

Legend

Contour interval = 0.20 feet
 Constructed from gauging measurements obtained on 11/25/96
 Relative BM = 100 feet, top of casing on MW-1
 ——— Rice Operating 4" AC pipeline
 - - - City of Lovington 6" AC pipeline

Map Scale



APPENDIX C.2

TABLES

1996

**SUMMARY OF GROUNDWATER MEASUREMENTS
JCT L-31 SPILL SITE, ABO SWD SYSTEM**

Well Name	Date Gauged	Depth to Water*	Water Elevation**	Casing Elevation**	Surface Elevation**	LNAPL Thickness
MW-1	04/17/96	79.25	20.75	100.00	97.6	0.00
MW-1	05/06/96	79.24	20.76	100.00	97.6	0.00
MW-1	09/19/96	79.20	20.80	100.00	97.6	0.00
MW-1	10/03/96	78.84	21.16	100.00	97.6	0.00
MW-1	10/16/96	78.70	21.30	100.00	97.6	0.00
MW-1	11/25/96	78.38	21.62	100.00	97.6	0.00
MW-2	04/17/96	79.14	20.69	99.83	97.2	0.00
MW-2	05/06/96	79.19	20.64	99.83	97.2	0.00
MW-2	09/19/96	79.10	20.73	99.83	97.2	0.00
MW-2	10/03/96	78.78	21.05	99.83	97.2	0.00
MW-2	10/16/96	78.60	21.23	99.83	97.2	0.00
MW-2	11/25/96	78.65	21.18	99.83	97.2	0.00
MW-3	04/17/96	79.32	20.61	99.93	97.4	0.00
MW-3	05/06/96	79.30	20.63	99.93	97.4	0.00
MW-3	09/19/96	79.20	20.73	99.93	97.4	0.00
MW-3	10/03/96	78.90	21.03	99.93	97.4	0.00
MW-3	10/16/96	78.70	21.23	99.93	97.4	0.00
MW-3	11/25/96	78.76	21.17	99.93	97.4	0.00
COL-6	04/02/96	85.50	14.81	100.31	97.6	0.00
COL-6	04/17/96	79.67	20.64	100.31	97.6	0.00
COL-6	05/06/96	79.60	20.71	100.31	97.6	0.00
COL-6	09/19/96	80.00	20.31	100.31	97.6	0.00
COL-6	10/03/96	79.21	21.10	100.31	97.6	0.00
COL-6	10/16/96	79.04	21.27	100.31	97.6	0.00
COL-6	11/25/96	78.73	21.58	100.31	97.6	0.00

* Well casings are marked to provide consistent reference points for gauging operations.

** Calculated from survey plat performed by Rice Operating Company.

Correction equation for the water elevation suppression effect caused by the presence of LNAPLs.

Corrected water elevation = Elevation - (Depth to water - (Specific gravity * LNAPL thickness))

where specific gravity = 0.82 for crude oil

COL-6 = City of Lovington Well No. 6. All measurements are in feet.

1996
SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS
BTEX, TDS, AND CHLORIDES
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Well Name	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)	TDS (mg/l)	Chloride (mg/l)
NMWQCC	Standards	0.010	0.750	0.750	0.620	N/A	1,000	250
MW-1	04/17/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	865	250
MW-1	11/25/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	782	94
MW-2	04/17/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	394	46
MW-2	11/25/96	0.0013	<0.0010	<0.0010	<0.0030	<0.0030	408	52
MW-3	04/17/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	389	52
MW-3	11/25/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	424	52
COL-6	03/22/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	863	282
COL-6	04/19/96	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	1205	530
COL-6	11/25/96	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico.

Samples labeled (SPL) were analyzed by Southern Petroleum Laboratories, Houston, Texas.

Benzene, toluene, ethylbenzene, and xylene (BTEX); total dissolved solids (TDS); and chloride analyses were conducted using EPA Methods 8020, 160.1, and 352.3, respectively.

Results presented in bold print exceed NMWQCC human health standards for ground water.

COL-6 = City of Lovington Well No. 6.

All results are reported in milligrams per liter (mg/l); parts per million (ppm).

1996
SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS
WATER QUALITY DATA
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Well Name	Date Sampled	Total Dissolved Solids (TDS)	pH (S. U.)	Chloride (Cl)	Sodium (Na)	Calcium (Ca)	Sulfate (SO ₄)	Potassium (K)	Magnesium (Mg)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)
NMWQCC Standards		1,000 mg/l	6 to 9	250 mg/l	N/A	N/A	600 mg/l	N/A	N/A	N/A	N/A
MW-1	04/17/96	865	7.88	250	223.9	57.9	123.4	N/A	12.0	0	200
MW-1	11/25/96	782	N/A	94	190.0	37.6	217.0	0.8	16.0	0	268
MW-2	04/17/96	394	7.96	46	35.4	71.7	57.4	N/A	16.1	0.0	160.0
MW-2	11/25/96	408	N/A	52	26.8	66.4	90.8	0.5	25.8	0.0	200.0
MW-3	04/17/96	389	7.87	52	31.5	76.1	54.3	N/A	16.4	0.0	140
MW-3	11/25/96	424	N/A	52	34.1	69.6	90.8	0.6	17.5	0.0	205
COL-6	04/17/96	1,231	N/A	545	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COL-6	11/25/96	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico.

COL-6 = City of Lovington Well No. 6

All results are reported in milligrams per liter (mg/l); parts per million (ppm).

Results presented in bold print exceed NMWQCC human health standards for ground water.

1996

**QUARTERLY SUMMARY OF RECOVERY SYSTEM OPERATIONS
GROUNDWATER RECOVERY VOLUMES
JCT L-31 SPILL SITE, ABO SWD SYSTEM**

Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Avg. Analytical Result		Description
				Chloride (ppm)	TDS (ppm)	
JAN 1996	744	1,087,200	24.4	572	936	
FEB 1996	696	1,252,800	30.0	369	990	
MAR 1996	584	1,051,200	30.0	359	916	
1ST QTR	2,024	3,391,200	27.9	433	948	
APR 1996	240	432,000	30.0	521	1,134	Groundwater Monitoring Event
MAY 1996	200	360,000	30.0	549	1,127	
JUN 1996	240	432,000	30.0	451	1,178	
2ND QTR	680	1,224,000	30.0	507	1,146	
JUL 1996	248	446,400	30.0	358	1,116	
AUG 1996	248	446,400	30.0	360	904	
SEP 1996	128	230,400	30.0	356	952	
3RD QTR	624	1,123,200	30.0	358	991	
OCT 1996	0	0	0.0	N/A	N/A	Groundwater Monitoring Event
NOV 1996	384	460,800	20.0	N/A	N/A	
DEC 1996	744	892,800	20.0	N/A	N/A	
4TH QTR	1,128	1,353,600	20.0	N/A	N/A	
1996			RATE & ANALYTICAL AVERAGES			
TOTALS	4,456	7,092,000	26.5	433	1,028	

JANUARY 1996
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
01/01/96	24	33,120	23	Ground water recovered with submersible pump						
01/02/96	24	33,120	23	"	"	"	"	"	"	"
01/03/96	24	33,120	23	N/A	N/A	<0.001	<0.001	<0.001	<0.002	<0.002
01/04/96	24	33,120	23	1655	574	N/A	N/A	N/A	N/A	N/A
01/05/96	24	33,120	23	Ground water recovered with submersible pump						
01/06/96	24	33,120	23	"	"	"	"	"	"	"
01/07/96	24	33,120	23	"	"	"	"	"	"	"
01/08/96	24	33,120	23	"	"	"	"	"	"	"
01/09/96	24	33,120	23	"	"	"	"	"	"	"
01/10/96	24	33,120	23	"	"	"	"	"	"	"
01/11/96	24	33,120	23	"	"	"	"	"	"	"
01/12/96	24	33,120	23	442	1172	N/A	N/A	N/A	N/A	N/A
01/13/96	24	33,120	23	Ground water recovered with submersible pump						
01/14/96	24	33,120	23	"	"	"	"	"	"	"
01/15/96	24	33,120	23	"	"	"	"	"	"	"
01/16/96	24	33,120	23	"	"	"	"	"	"	"
01/17/96	24	33,120	23	414	1038	N/A	N/A	N/A	N/A	N/A
01/18/96	24	33,120	23	404	959	N/A	N/A	N/A	N/A	N/A
01/19/96	24	33,120	23	388	940	N/A	N/A	N/A	N/A	N/A
01/20/96	24	33,120	23	Ground water recovered with submersible pump						
01/21/96	24	33,120	23	"	"	"	"	"	"	"
01/22/96	24	33,120	23	"	"	"	"	"	"	"
01/23/96	24	33,120	23	"	"	"	"	"	"	"
01/24/96	24	33,120	23	"	"	"	"	"	"	"
01/25/96	24	33,120	23	"	"	"	"	"	"	"
01/26/96	24	43,200	30	348	900	N/A	N/A	N/A	N/A	N/A
01/27/96	24	43,200	30	Ground water recovered with submersible pump						
01/28/96	24	43,200	30	"	"	"	"	"	"	"
01/29/96	24	43,200	30	"	"	"	"	"	"	"
01/30/96	24	43,200	30	350	971	N/A	N/A	N/A	N/A	N/A
01/31/96	24	43,200	30	Ground water recovered with submersible pump						
JAN 96				AVERAGE ANALYTICAL RESULT						
TOTALS	744	1,087,200	24	572	936	<0.001	<0.001	<0.001	<0.002	<0.002

FEBRUARY 1996
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
02/01/96	24	43,200	30	Ground water recovered with submersible pump						
02/02/96	24	43,200	30	"			"			
02/03/96	24	43,200	30	"			"			
02/04/96	24	43,200	30	"			"			
02/05/96	24	43,200	30	"			"			
02/06/96	24	43,200	30	374	1153	N/A	N/A	N/A	N/A	N/A
02/07/96	24	43,200	30	Ground water recovered with submersible pump						
02/08/96	24	43,200	30	"			"			
02/09/96	24	43,200	30	"			"			
02/10/96	24	43,200	30	"			"			
02/11/96	24	43,200	30	"			"			
02/12/96	24	43,200	30	"			"			
02/13/96	24	43,200	30	"			"			
02/14/96	24	43,200	30	"			"			
02/15/96	24	43,200	30	"			"			
02/16/96	24	43,200	30	"			"			
02/17/96	24	43,200	30	"			"			
02/18/96	24	43,200	30	"			"			
02/19/96	24	43,200	30	"			"			
02/20/96	24	43,200	30	"			"			
02/21/96	24	43,200	30	"			"			
02/22/96	24	43,200	30	368	921	N/A	N/A	N/A	N/A	N/A
02/23/96	24	43,200	30	365	896	N/A	N/A	N/A	N/A	N/A
02/24/96	24	43,200	30	Ground water recovered with submersible pump						
02/25/96	24	43,200	30	"			"			
02/26/96	24	43,200	30	"			"			
02/27/96	24	43,200	30	"			"			
02/28/96	24	43,200	30	"			"			
02/29/96	24	43,200	30	"			"			
FEB 96				AVERAGE ANALYTICAL RESULT						
TOTALS	696	1,252,800	30	369	990	N/A	N/A	N/A	N/A	N/A

TABLE 6: MARCH 1996
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
03/01/96	24	43,200	30	Ground water recovered with submersible pump						
03/02/96	24	43,200	30	"			"			
03/03/96	24	43,200	30	"			"			
03/04/96	24	43,200	30	"			"			
03/05/96	24	43,200	30	"			"			
03/06/96	24	43,200	30	410	996	N/A	N/A	N/A	N/A	N/A
03/07/96	24	43,200	30	Ground water recovered with submersible pump						
03/08/96	24	43,200	30	"			"			
03/09/96	24	43,200	30	"			"			
03/10/96	24	43,200	30	"			"			
03/11/96	24	43,200	30	"			"			
03/12/96	24	43,200	30	"			"			
03/13/96	24	43,200	30	"			"			
03/14/96	24	43,200	30	"			"			
03/15/96	24	43,200	30	"			"			
03/16/96	24	43,200	30	"			"			
03/17/96	24	43,200	30	"			"			
03/18/96	24	43,200	30	"			"			
03/19/96	24	43,200	30	"			"			
03/20/96	24	43,200	30	"			"			
03/21/96	24	43,200	30	"			"			
03/22/96	8	14,400	30	282	863	<0.001	<0.001	<0.001	<0.003	<0.003
03/23/96	8	14,400	30	Ground water recovered with submersible pump						
03/24/96	8	14,400	30	"			"			
03/25/96	8	14,400	30	"			"			
03/26/96	8	14,400	30	"			"			
03/27/96	8	14,400	30	"			"			
03/28/96	8	14,400	30	"			"			
03/29/96	8	14,400	30	384	890	N/A	N/A	N/A	N/A	N/A
03/30/96	8	14,400	30	Ground water recovered with submersible pump						
03/31/96	8	14,400	30	"			"			
MAR 96				AVERAGE ANALYTICAL RESULT						
TOTALS	584	1,051,200	30	359	916	<0.001	<0.001	<0.001	<0.003	<0.003

APRIL 1996
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
04/01/96	8	14,400	30	Ground water recovered with submersible pump						
04/02/96	8	14,400	30	470	1014	N/A	N/A	N/A	N/A	N/A
04/03/96	8	14,400	30	472	1044	N/A	N/A	N/A	N/A	N/A
04/04/96	8	14,400	30	Ground water recovered with submersible pump						
04/05/96	8	14,400	30	"	"	"	"	"	"	"
04/06/96	8	14,400	30	"	"	"	"	"	"	"
04/07/96	8	14,400	30	"	"	"	"	"	"	"
04/08/96	8	14,400	30	"	"	"	"	"	"	"
04/09/96	8	14,400	30	"	"	"	"	"	"	"
04/10/96	8	14,400	30	458	1175	N/A	N/A	N/A	N/A	N/A
04/11/96	8	14,400	30	476	1228	N/A	N/A	N/A	N/A	N/A
04/12/96	8	14,400	30	475	1399	N/A	N/A	N/A	N/A	N/A
04/13/96	8	14,400	30	Ground water recovered with submersible pump						
04/14/96	8	14,400	30	"	"	"	"	"	"	"
04/15/96	8	14,400	30	480	844	N/A	N/A	N/A	N/A	N/A
04/16/96	8	14,400	30	Ground water monitoring event						
04/17/96	8	14,400	30	545	1231	N/A	N/A	N/A	N/A	N/A
04/18/96	8	14,400	30	490	1168	N/A	N/A	N/A	N/A	N/A
04/19/96	8	14,400	30	530	1205	<0.001	<0.001	<0.001	<0.003	<0.003
04/20/96	8	14,400	30	Ground water recovered with submersible pump						
04/21/96	8	14,400	30	"	"	"	"	"	"	"
04/22/96	8	14,400	30	580	1153	N/A	N/A	N/A	N/A	N/A
04/23/96	8	14,400	30	600	1214	N/A	N/A	N/A	N/A	N/A
04/24/96	8	14,400	30	584	1098	N/A	N/A	N/A	N/A	N/A
04/25/96	8	14,400	30	540	1047	N/A	N/A	N/A	N/A	N/A
04/26/96	8	14,400	30	610	1093	N/A	N/A	N/A	N/A	N/A
04/27/96	8	14,400	30	Ground water recovered with submersible pump						
04/28/96	8	14,400	30	"	"	"	"	"	"	"
04/29/96	8	14,400	30	500	1096	N/A	N/A	N/A	N/A	N/A
04/30/96	8	14,400	30	Ground water recovered with submersible pump						
APR 96				AVERAGE ANALYTICAL RESULT						
TOTALS	240	432,000	30	521	1134	<0.001	<0.001	<0.001	<0.003	<0.003

MAY 1996
SUMMARY OF RECOVERY SYSTEM OPERATIONS
WATER VOLUME, CHLORIDE, TDS, AND BTEX ANALYSIS
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Groundwater Recovery Operations				Analytical Results of Groundwater Recovered from Pumping Well						
Date	Time Pumped (hours)	Volume Recovered (gal)	Avg Pump Rate (GPM)	Chloride Level (ppm)	TDS Level (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylene (ppm)	Total BTEX (ppm)
05/01/96	8	14,400	30	620	1076	N/A	N/A	N/A	N/A	N/A
05/02/96	0	0	0	Recovery well shut-in for ground water gauging event						
05/03/96	0	0	0	"			"			
05/04/96	0	0	0	"			"			
05/05/96	0	0	0	"			"			
05/06/96	0	0	0	Gauged MW-1, MW-2, MW-3, and COL-6						
05/07/96	0	0	0	680	1139	N/A	N/A	N/A	N/A	N/A
05/08/96	8	14,400	30	Ground water recovered with submersible pump						
05/09/96	8	14,400	30	481	1123	N/A	N/A	N/A	N/A	N/A
05/10/96	8	14,400	30	Ground water recovered with submersible pump						
05/11/96	8	14,400	30	"			"			
05/12/96	8	14,400	30	"			"			
05/13/96	8	14,400	30	"			"			
05/14/96	8	14,400	30	"			"			
05/15/96	8	14,400	30	"			"			
05/16/96	8	14,400	30	"			"			
05/17/96	8	14,400	30	480	1270	N/A	N/A	N/A	N/A	N/A
05/18/96	8	14,400	30	Ground water recovered with submersible pump						
05/19/96	8	14,400	30	"			"			
05/20/96	8	14,400	30	"			"			
05/21/96	8	14,400	30	"			"			
05/22/96	8	14,400	30	"			"			
05/23/96	8	14,400	30	"			"			
05/24/96	8	14,400	30	470	1072	N/A	N/A	N/A	N/A	N/A
05/25/96	8	14,400	30	Ground water recovered with submersible pump						
05/26/96	8	14,400	30	"			"			
05/27/96	8	14,400	30	"			"			
05/28/96	8	14,400	30	"			"			
05/29/96	8	14,400	30	"			"			
05/30/96	8	14,400	30	560	1080	N/A	N/A	N/A	N/A	N/A
05/31/96	8	14,400	30	Ground water recovered with submersible pump						
MAY 96				AVERAGE ANALYTICAL RESULT						
TOTALS	200	360,000	30	549	1127	N/A	N/A	N/A	N/A	N/A