

DEPARTMENT OF NATURAL RESOURCES
Environmental Protection Division

MEMORANDUM

CON 12-15
DOC# 35704

DATE: 8-19-91

TO: Kanab spill file, FO #3

FROM: C. Corell *C. Corell* *ZAL*

RE: Soil gas survey/investigation

The Uncontrolled Sites section of the DNR conducted a limited soil gas survey at Kanab on 8-14-91. The purpose of the survey was to determine if a soil gas surveys using Kanab's HNu vapor monitor would be feasible in mapping out the soil and groundwater contamination at the site.

Six soil probes were advanced using a Geoprobe (see site map) and soil gas readings were taken through the probe with the HNu, OVM (from FO #3), and an OVA (US). Soil gas samples were collected in glass bulbs and later analyzed with a portable gas chromatograph supplied by DNR US. The portable field equipment readings were for total organic vapors while the GC could separate the different fractions and measured each separately.

Probe #	Depth (ft)	HNu Reading (ppm)	OVM Reading (ppm)	OVA Reading (ppm)
1	7	4	-	3
2	19	13	27	-
3	18	2	0	2
4	6	*	0	-
5	21	0	0	0
6	21**	0	0	0

- Reading not taken

* Only slight deflection, less than 1 ppm

** The probe pushed very easily in this boring. The rods were loose in the hole even after all seven were installed so the gas seal around the rods was questionable.

All probes were driven until resistance prevented advancement or until seven rods (21 feet) were installed. The possibility of a cobble deflecting or breaking the probe increased with the depth of the probe. Schilling and Lundberg said that 21 feet was all the deeper they wanted to probe during this test. They said that 35 feet would be a maximum depth for the Geoprobe, even in ideal conditions.

The field equipment did a good job finding the "hot spots" but the GC did not identify any of the fractions in any of the samples as being petroleum related. Keith Schilling and Cal Lundberg felt that the GC was operating properly, however.

The GC has a limited library of chemicals (20) that it refers to when trying to identify organic vapors. If a fraction is identified as "methyl ketone", for example, it is because the fraction matches the template for methyl ketone better than any of the other chemicals in the library. It will also label fractions as "unknown" if there is nothing in the library that matches close enough.

The age of the spill (three years) and the porosity of the soil contributed to the non-conclusive data obtained by the GC, according to Schilling and Lundberg. The sand-gravel-cobble soil is so porous that the contaminants can volatilize through it and not be trapped in the pore spaces. These soil conditions would make it very difficult, if not impossible, to map out the soil contamination.

The GC is used primarily for mapping groundwater contamination. The volatile components migrate up into the soil above the contaminated groundwater where they can be measured in the field as opposed to waiting for laboratory analysis of the water samples. The laboratory analysis is much more accurate but the soil gas measurements give much quicker results. Since the groundwater is about 50 feet deep (beyond the limits of the Geoprobe), soil gas surveys at Kaneb would not be useful.

cc: -Bob Drustrup, SWS, AQ&SWPB, EPD, DNR, Des Moines

County Road

Property Line

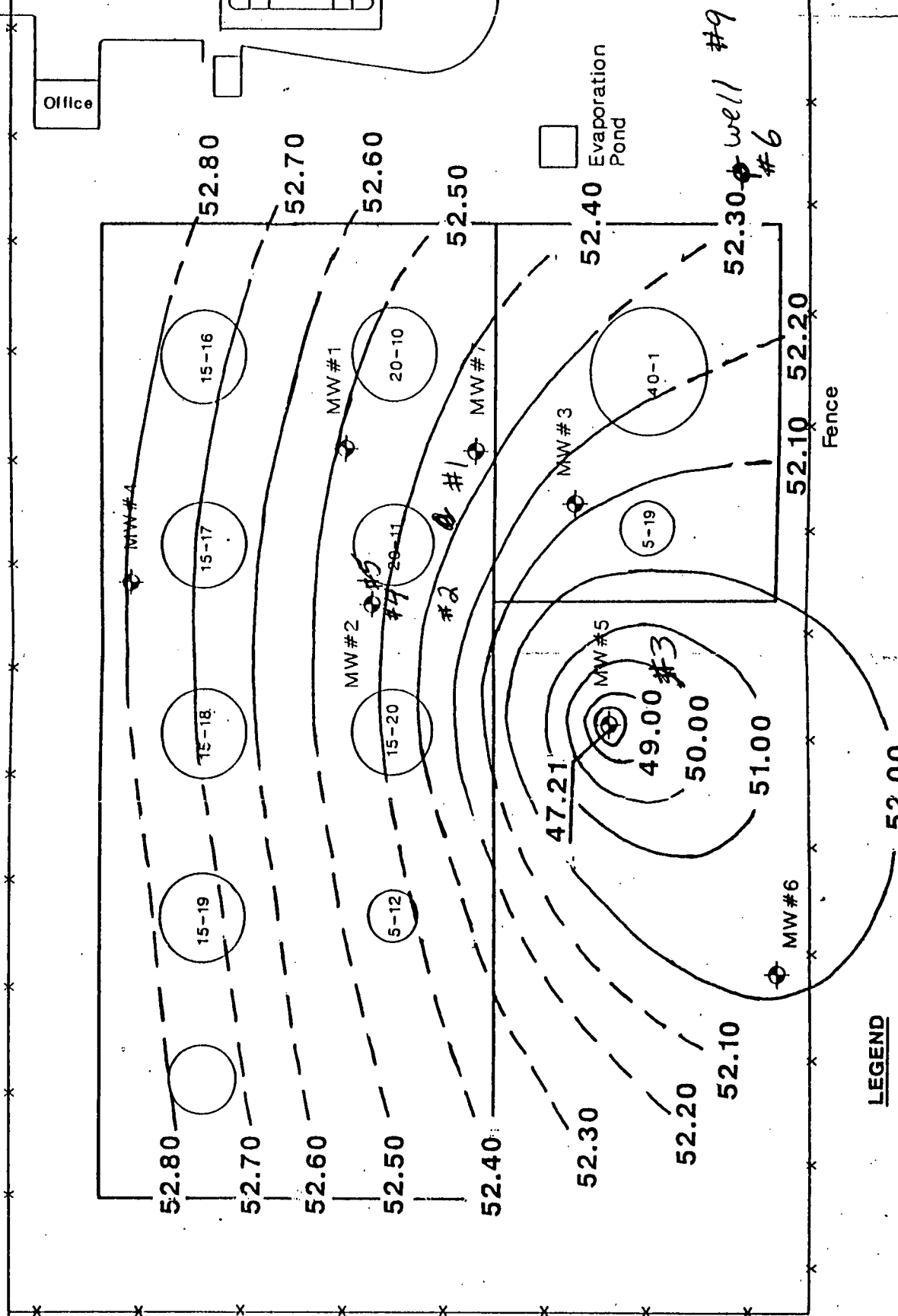
Office

Evaporation Pond

LEGEND

Monitor Well

KANEB





Kaneb Pipe Line Company

Suite 550, 100 North Broadway • Wichita, Kansas 67202 • (316) 262-1408

Mack E. Brown
Vice President
Engineering and Operations

RECEIVED

AUG 08 1991

IOWA DEPARTMENT OF
NATURAL RESOURCES

AUGUST 5, 1991

BARBARA LYNCH, FIELD OFFICE SUPERVISOR
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
FIELD OFFICE #3
P. O. BOX 4086
SPENCER, IOWA 51301

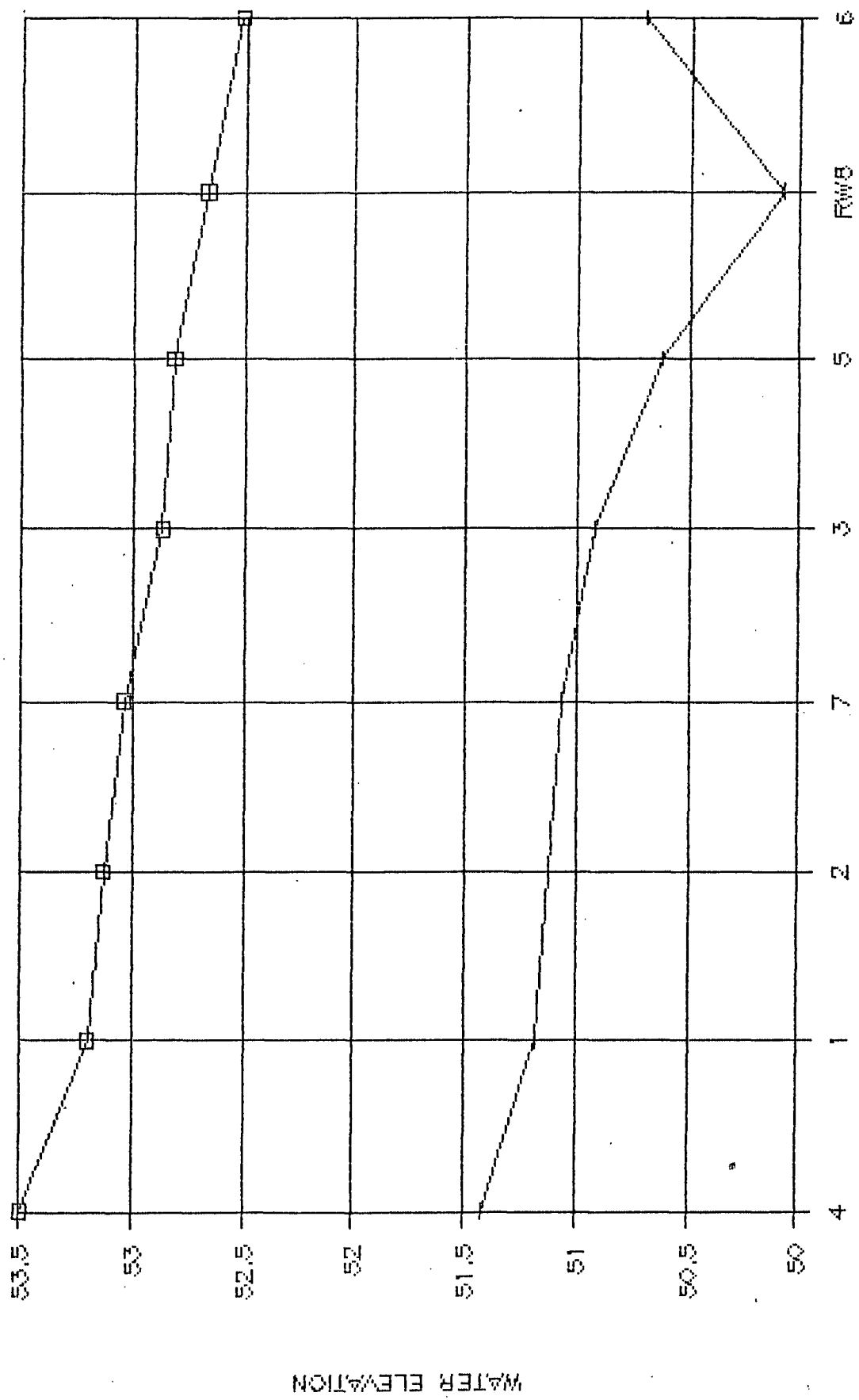
DEAR BARBARA:

ATTACHED IS A GRAPH SHOWING THE WATER ELEVATIONS JULY 31,
1991, THE LABORATORY TESTS RESULTS OF THE WATER SAMPLES TAKEN
JULY 8TH, 1991, AND THE DAILY WATER ELEVATIONS TAKEN DURING
JULY, 1991.

YOURS TRULY,

MACK E. BROWN

KANEB MILFORD TEST WELL DATA



H2O ELEV 6/6/88
 H2O ELEV 7-31-91



MANGOLD ENVIRONMENTAL TESTING

1715 N. LAKE AVE. • P.O. BOX 1093 • STORM LAKE, IOWA 50588
712-732-7786

August 01, 1991

Mack Brown
KANEB Pipeline Company
100 N. Broadway Suite 550
Wichita, KS 67202

Date Sampled: July 08, 1991
Date Received: July 09, 1991
Sample Type: Water - Grab
Sample Location: Well #2
RE: Milford, Iowa

Collected By: unknown
Account No.: M200

Lab ID No.: 34120

ANALYSIS

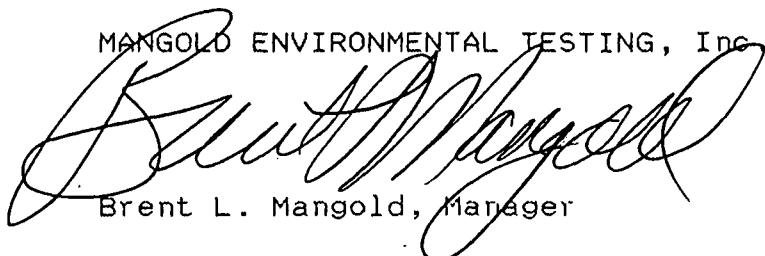
Benzene	0.007	mg/L	07/11/91/hk
Toluene	<0.002	mg/L	07/11/91/hk
Xylenes, Total	0.010	mg/L	07/11/91/hk
Total Hydrocarbons	0.35	mg/L	07/11/91/hk
Ethyl Benzene	<0.002	mg/L	07/11/91/hk

Sample introduction performed in reference to EPA Method 5030 (purge and trap). Analysis performed in reference to EPA Method 8020 for volatile organics using flame ionization detection. (Iowa Method OA-1, Revision 1/10/90).

Method Detection Limits: Benzene 0.002 mg/L; Toluene 0.002 mg/L; Xylenes, Total 0.002 mg/L; Ethyl Benzene 0.002 mg/L; Total Hydrocarbons 0.10 mg/L.

Prepared and submitted by:

MANGOLD ENVIRONMENTAL TESTING, Inc



Brent L. Mangold, Manager



MANGOLD ENVIRONMENTAL TESTING

1715 N. LAKE AVE. • P.O. BOX 1093 • STORM LAKE, IOWA 50588
712-732-7786

August 01, 1991

Mack Brown
KANEB Pipeline Company
100 N. Broadway Suite 550
Wichita, KS 67202

Date Sampled: July 08, 1991
Date Received: July 09, 1991
Sample Type: Water - Grab
Sample Location: Well #6
RE: Milford, Iowa

Collected By: unknown
Account No.: M200

Lab ID No.: 34121

ANALYSIS

Benzene	<0.002	mg/L	07/11/91/hk
Toluene	<0.002	mg/L	07/11/91/hk
Xylenes, Total	<0.002	mg/L	07/11/91/hk
Total Hydrocarbons	<0.10	mg/L	07/11/91/hk
Ethyl Benzene	<0.002	mg/L	07/11/91/hk

Sample introduction performed in reference to EPA Method 5030 (purge and trap). Analysis performed in reference to EPA Method 8020 for volatile organics using flame ionization detection. (Iowa Method OA-1, Revision 1/10/90).

Method Detection Limits: Benzene 0.002 mg/L; Toluene 0.002 mg/L; Xylenes, Total 0.002 mg/L; Ethyl Benzene 0.002 mg/L; Total Hydrocarbons 0.10 mg/L.

Prepared and submitted by:

MANGOLD ENVIRONMENTAL TESTING, Inc.

Brent L. Mangold, Manager



MANGOLD ENVIRONMENTAL TESTING

1715 N. LAKE AVE. • P.O. BOX 1093 • STORM LAKE, IOWA 50588
712-732-7786

August 01, 1991

Mack Brown
KANE Pipeline Company
100 N. Broadway Suite 550
Wichita, KS 67202

Date Sampled: July 08, 1991
Date Received: July 09, 1991
Sample Type: Water - Grab
Sample Location: Well #9
RE: Milford, Iowa

Collected By: unknown
Account No.: M200

Lab ID No.: 34122

ANALYSIS

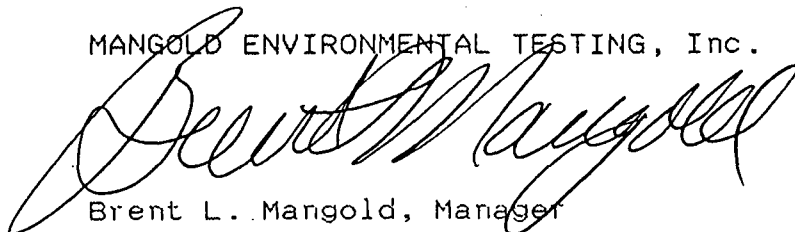
Benzene	<0.002	mg/L	07/12/91/hk
Toluene	<0.002	mg/L	07/12/91/hk
Xylenes, Total	0.004	mg/L	07/12/91/hk
Total Hydrocarbons	<0.10	mg/L	07/12/91/hk
Ethyl Benzene	<0.002	mg/L	07/12/91/hk

Sample introduction performed in reference to EPA Method 5030 (purge and trap). Analysis performed in reference to EPA Method 8020 for volatile organics using flame ionization detection. (Iowa Method OA-1, Revision 1/10/90).

Method Detection Limits: Benzene 0.002 mg/L; Toluene 0.002 mg/L; Xylenes, Total 0.002 mg/L; Ethyl Benzene 0.002 mg/L; Total Hydrocarbons 0.10 mg/L.

Prepared and submitted by:

MANGOLD ENVIRONMENTAL TESTING, Inc.



Brent L. Mangold, Manager



MANGOLD ENVIRONMENTAL TESTING

1715 N. LAKE AVE. • P.O. BOX 1093 • STORM LAKE, IOWA 50588
712-732-7786

August 01, 1991

Mack Brown
KANEB Pipeline Company
100 N. Broadway Suite 550
Wichita, KS 67202

Date Sampled: July 08, 1991
Date Received: July 09, 1991
Sample Type: Water - Grab
Sample Location: Air Stripper Influent
RE: Milford, Iowa

Collected By: unknown
Account No.: M200

Lab ID No.: 34118

ANALYSIS

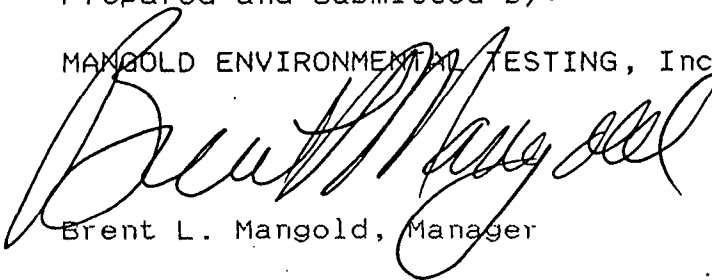
Benzene	0.052	mg/L	07/11/91/hk
Toluene	0.061	mg/L	07/11/91/hk
Xylenes, Total	0.21	mg/L	07/11/91/hk
Total Hydrocarbons	0.84	mg/L	07/11/91/hk
Ethyl Benzene	<0.002	mg/L	07/11/91/hk

Sample introduction performed in reference to EPA Method 5030 (purge and trap). Analysis performed in reference to EPA Method 8020 for volatile organics using flame ionization detection. (Iowa Method OA-1, Revision 1/10/90).

Method Detection Limits: Benzene 0.002 mg/L; Toluene 0.002 mg/L; Xylenes, Total 0.002 mg/L; Ethyl Benzene 0.002 mg/L; Total Hydrocarbons 0.10 mg/L.

Prepared and submitted by:

MANGOLD ENVIRONMENTAL TESTING, Inc.


Brent L. Mangold, Manager



MANGOLD ENVIRONMENTAL TESTING

1715 N. LAKE AVE. • P.O. BOX 1093 • STORM LAKE, IOWA 50588
712-732-7786

August 01, 1991

Mack Brown
KANE Pipeline Company
100 N. Broadway Suite 550
Wichita, KS 67202

Date Sampled: July 08, 1991
Date Received: July 09, 1991
Sample Type: Water - Grab
Sample Location: Air Stripper Effluent
RE: Milford, Iowa

Collected By: unknown
Account No.: M200

Lab ID No.: 34119

ANALYSIS

Benzene	<0.002	mg/L	07/12/91/hk
Toluene	<0.002	mg/L	07/12/91/hk
Xylenes, Total	<0.002	mg/L	07/12/91/hk
Total Hydrocarbons	<0.10	mg/L	07/12/91/hk
Ethyl Benzene	<0.002	mg/L	07/12/91/hk

Sample introduction performed in reference to EPA Method 5030 (purge and trap). Analysis performed in reference to EPA Method 8020 for volatile organics using flame ionization detection. (Iowa Method OA-1, Revision 1/10/90).

Method Detection Limits: Benzene 0.002 mg/L; Toluene 0.002 mg/L; Xylenes, Total 0.002 mg/L; Ethyl Benzene 0.002 mg/L; Total Hydrocarbons 0.10 mg/L.

Prepared and submitted by:

MANGOLD ENVIRONMENTAL TESTING, Inc.

Brent L. Mangold, Manager

05-Aug-91

MIFORD TERMINAL TEST WELL DATA

DATE	WELL NO.	CASING ELEV	DEPTH TO WATER			EIGHTS OF INCH	DEPTH TO WATER	WATER ELEV	WELL NO.	WATER ELEV	WATER ELEV	WATER ELEV	WATER ELEV	WELL NO.	LEVEL ABOVE	LEVEL ABOVE	LEVEL ABOVE	LEVEL ABOVE			
			FEET	INCHES	WELL WATER										WELL WATER	WELL WATER	WELL WATER	#8	#8	#8	#8
																		(FT.)	(FT.)	(FT.)	(FT.)
X 7-01-91	1	103.03	52	3	4	52.29	50.74	11	4		50.94	11	4				1.31				
	2	102.54	51	10	4	51.88	50.67	11	1			50.74	11	1			1.11				
	3	102.63	52	1	4	52.13	50.51	11	2		50.67	11	2		1.04						
	4	102.77	51	10	0	51.83	50.94	11	7			50.61	11	7			0.98				
	5	100.17	49	11	0	49.92	50.25	11	3			50.51	11	3			0.88				
	6	101.30	51	0	0	51.00	50.30	11	5		50.25	11	5		0.63						
	7	103.15	52	6	4	52.54	50.61	11	RWB	49.63			11	RWB	PUMP						
	PUMP WELL RWB	100.57	50	11	2	50.94	49.63	11	RW9			50.40	11	RW9			0.77				
	RW9	103.67	53	3	2	53.27	50.40	11	6	50.30			11	6	0.67						
7-02-91	1	103.03	52	3	2	52.27	50.76	11	4			50.98	11	4			1.37				
	2	102.54	51	10	2	51.85	50.69	11	1			50.76	11	1			1.15				
	3	102.63	52	1	2	52.10	50.53	11	2		50.69	11	2		1.08						
	4	102.77	51	9	4	51.79	50.98	11	7			50.65	11	7			1.04				
	5	100.17	49	11	0	49.92	50.25	11	3			50.53	11	3			0.92				
	6	101.30	50	11	6	50.98	50.32	11	5		50.25	11	5		0.65						
	7	103.15	52	6	0	52.50	50.65	11	RWB	49.61			11	RWB	PUMP						
	PUMP WELL RWB	100.57	50	11	4	50.96	49.61	11	RW9			50.42	11	RW9			0.81				
	RW9	103.67	53	3	0	53.25	50.42	11	6	50.32			11	6	0.71						
7-03-91	1	103.03	52	3	2	52.27	50.76	11	4			50.96	11	4			1.33				
	2	102.54	51	10	2	51.85	50.69	11	1			50.76	11	1			1.13				
	3	102.63	52	1	2	52.10	50.53	11	2		50.69	11	2		1.06						
	4	102.77	51	9	6	51.81	50.96	11	7			50.65	11	7			1.02				
	5	100.17	49	11	0	49.92	50.25	11	3			50.53	11	3			0.90				
	6	101.30	50	11	6	50.98	50.32	11	5		50.25	11	5		0.63						
	7	103.15	52	6	0	52.50	50.65	11	RWB	49.63			11	RWB	PUMP						
	PUMP WELL RWB	100.57	50	11	2	50.94	49.63	11	RW9			50.42	11	RW9			0.79				
	RW9	103.67	53	3	0	53.25	50.42	11	6	50.32			11	6	0.69						
7-05-91	1	103.03	52	2	4	52.21	50.82	11	4			51.02	11	4			1.33				
	2	102.54	51	9	4	51.79	50.75	11	1			50.82	11	1			1.13				
	3	102.63	52	0	4	52.04	50.59	11	2		50.75	11	2		1.06						
	4	102.77	51	9	0	51.75	51.02	11	7			50.69	11	7			1.00				
	5	100.17	49	10	0	49.83	50.34	11	3			50.59	11	3			0.90				
	6	101.30	50	11	0	50.92	50.38	11	5		50.33	11	5		0.65						
	7	103.15	52	5	4	52.46	50.69	11	RWB	49.69			11	RWB	PUMP						
	PUMP WELL RWB	100.57	50	10	4	50.88	49.69	11	RW9			50.44	11	RW9			0.75				
	RW9	103.67	53	2	6	53.23	50.44	11	6	50.38			11	6	0.69						
7-06-91	1	103.03	52	1	4	52.13	50.91	11	4			51.08	11	4			1.33				
	2	102.54	51	8	4	51.71	50.83	11	1			50.91	11	1			1.15				
	3	102.63	51	11	4	51.96	50.67	11	2		50.83	11	2		1.08						
	4	102.77	51	8	2	51.69	51.08	11	7			50.78	11	7			1.02				
	5	100.17	49	9	0	49.75	50.42	11	3			50.67	11	3			0.92				
	6	101.30	50	10	0	50.83	50.47	11	5		50.42	11	5		0.67						
	7	103.15	52	4	4	52.38	50.78	11	RWB	49.75			11	RWB	PUMP						
	PUMP WELL RWB	100.57	50	9	6	50.81	49.75	11	RW9			50.50	11	RW9			0.75				
X	RW9	103.67	53	2	0	53.17	50.50	11	6	50.47			11	6	0.71						

05-Aug-91

NIFORD TERMINAL TEST WELL DATA

DATE	WELL NO.	CASING OF ELEV	DEPTH TO WATER			EIGHTS OF INCH	DEPTH TO WATER ELEV	WELL NO.	WATER ELEV	WATER ELEV	WATER ELEV	WATER ELEV	WATER ELEV	WELL NO.	LEVEL ABOVE #8	LEVEL ABOVE #8	LEVEL ABOVE #8	LEVEL ABOVE #8
			FEET	INCHES	WELL LEVEL (FT.)										WELL LEVEL (FT.)	WELL LEVEL (FT.)	WELL LEVEL (FT.)	
X 7-08-91	1	103.03	52	2	0	52.17	50.86	4			51.06		4				1.33	
	2	102.54	51	9	4	51.79	50.75	1				50.86	1				1.13	
	3	102.63	52	0	0	52.00	50.63	2		50.75			2		1.02			
	4	102.77	51	8	4	51.71	51.06	7				50.73	7				1.00	
	5	100.17	49	9	4	49.79	50.38	3				50.63	3				0.90	
	6	101.30	50	10	4	50.88	50.43	5		50.37			5		0.65			
	7	103.15	52	5	0	52.42	50.73	RWB	49.73				RWB		PUMP			
PUMP WELL	RWB	100.57	50	10	0	50.83	49.73	RW9				50.50	RW9				0.77	
	RW9	103.67	53	2	0	53.17	50.50	6	50.43				6	0.69				
7-09-91	1	103.03	52	1	6	52.15	50.88	4			51.08		4				1.35	
	2	102.54	51	9	0	51.75	50.79	1				50.88	1				1.15	
	3	102.63	52	0	0	52.00	50.63	2		50.79			2		1.06			
	4	102.77	51	8	2	51.69	51.08	7				50.75	7				1.02	
	5	100.17	49	9	4	49.79	50.38	3				50.63	3				0.90	
	6	101.30	50	10	4	50.88	50.43	5		50.37			5		0.65			
	7	103.15	52	4	6	52.40	50.75	RWB	49.73				RWB		PUMP			
PUMP WELL	RWB	100.57	50	10	0	50.83	49.73	RW9				50.50	RW9				0.77	
	RW9	103.67	53	2	0	53.17	50.50	6	50.43				6	0.69				
7-10-91	1	103.03	52	1	0	52.08	50.95	4			51.10		4				1.33	
	2	102.54	51	8	4	51.71	50.83	1				50.95	1				1.17	
	3	102.63	51	11	2	51.94	50.69	2		50.83			2		1.06			
	4	102.77	51	8	0	51.67	51.10	7				50.80	7				1.02	
	5	100.17	49	9	0	49.75	50.42	3				50.69	3				0.92	
	6	101.30	50	10	0	50.83	50.47	5		50.42			5		0.65			
	7	103.15	52	4	2	52.35	50.80	RWB	49.77				RWB		PUMP			
PUMP WELL	RWB	100.57	50	9	4	50.79	49.77	RW9				50.55	RW9				0.77	
	RW9	103.67	53	1	4	53.13	50.55	6	50.47				6	0.69				
7-11-91	1	103.03	52	1	0	52.08	50.95	4			51.10		4				1.31	
	2	102.54	51	8	2	51.69	50.85	1				50.95	1				1.15	
	3	102.63	51	11	2	51.94	50.69	2		50.85			2		1.06			
	4	102.77	51	8	0	51.67	51.10	7				50.82	7				1.02	
	5	100.17	49	9	2	49.77	50.40	3				50.69	3				0.90	
	6	101.30	50	10	2	50.85	50.45	5		50.39			5		0.60			
	7	103.15	52	4	0	52.33	50.82	RWB	49.79				RWB		PUMP			
PUMP WELL	RWB	100.57	50	9	2	50.77	49.79	RW9				50.57	RW9				0.77	
	RW9	103.67	53	1	2	53.10	50.57	6	50.45				6	0.65				
7-12-91	1	103.03	52	1	0	52.08	50.95	4			51.10		4				1.31	
	2	102.54	51	8	2	51.69	50.85	1				50.95	1				1.15	
	3	102.63	51	11	4	51.96	50.67	2		50.85			2		1.06			
	4	102.77	51	8	0	51.67	51.10	7				50.82	7				1.02	
	5	100.17	49	9	0	49.75	50.42	3				50.67	3				0.88	
	6	101.30	50	10	0	50.83	50.47	5		50.42			5		0.63			
	7	103.15	52	4	0	52.33	50.82	RWB	49.79				RWB		PUMP			
PUMP WELL	RWB	100.57	50	9	2	50.77	49.79	RW9				50.57	RW9				0.77	
	RW9	103.67	53	1	2	53.10	50.57	6	50.47				6	0.67				

DATE	WELL NO.	CASING ELEV	DEPTH TO WATER			DEPTH TO WATER ELEV		WELL NO.	WATER ELEV	WATER ELEV	WATER ELEV	WATER ELEV	WATER ELEV	WELL NO.	LEVEL ABOVE #8 WELL WATER (FT.)	LEVEL ABOVE #8 WELL WATER (FT.)	LEVEL ABOVE #8 WELL WATER (FT.)	LEVEL ABOVE #8 WELL WATER (FT.)
			TOP OF	FEET	INCHES													
			OF															
			EIGHTS															
			OF															
			INCH															
X 7-13-91	1	103.03	52	1	4	52.13	50.91	4			51.12		4			1.39		
	2	102.54	51	8	4	51.71	50.83	1				50.91	1				1.17	
	3	102.63	51	11	4	51.96	50.67	2		50.83			2		1.10			
	4	102.77	51	7	6	51.65	51.12	7				50.80	7				1.06	
	5	100.17	49	9	2	49.77	50.40	3				50.67	3				0.94	
	6	101.30	50	10	2	50.85	50.45	5		50.39			5		0.67			
	7	103.15	52	4	2	52.35	50.80	RWB	49.73				RWB		PUMP			
PUMP WELL	RWB	100.57	50	10	0	50.83	49.73	RW9				50.55	RW9				0.81	
	RW9	103.67	53	1	4	53.13	50.55	6	50.45				6	0.71				
7-15-91	1	103.03	52	0	6	52.06	50.97	4			51.19		4			1.33		
	2	102.54	51	7	6	51.65	50.89	1				50.97	1				1.11	
	3	102.63	51	11	0	51.92	50.71	2		50.89			2		1.04			
	4	102.77	51	7	0	51.58	51.19	7				50.84	7				0.98	
	5	100.17	49	8	6	49.73	50.44	3				50.71	3				0.86	
	6	101.30	50	10	0	50.83	50.47	5		50.44			5		0.58			
	7	103.15	52	3	6	52.31	50.84	RWB	49.86				RWB		PUMP			
PUMP WELL	RWB	100.57	50	8	4	50.71	49.86	RW9				50.59	RW9				0.73	
	RW9	103.67	53	1	0	53.08	50.59	6	50.47				6	0.61				
7-16-91	1	103.03	52	0	2	52.02	51.01	4			51.23		4			1.37		
	2	102.54	51	7	4	51.63	50.92	1				51.01	1				1.15	
	3	102.63	51	10	6	51.90	50.73	2		50.92			2		1.06			
	4	102.77	51	6	4	51.54	51.23	7				50.88	7				1.02	
	5	100.17	49	8	4	49.71	50.46	3				50.73	3				0.88	
	6	101.30	50	9	0	50.75	50.55	5		50.46			5		0.60			
	7	103.15	52	3	2	52.27	50.88	RWB	49.86				RWB		PUMP			
PUMP WELL	RWB	100.57	50	8	4	50.71	49.86	RW9				50.63	RW9				0.77	
	RW9	103.67	53	0	4	53.04	50.63	6	50.55				6	0.69				
7-17-91	1	103.03	52	0	2	52.02	51.01	4			51.21		4			1.35		
	2	102.54	51	7	4	51.63	50.92	1				51.01	1				1.15	
	3	102.63	51	10	6	51.90	50.73	2		50.92			2		1.06			
	4	102.77	51	6	6	51.56	51.21	7				50.86	7				1.00	
	5	100.17	49	8	2	49.69	50.48	3				50.73	3				0.88	
	6	101.30	50	9	2	50.77	50.53	5		50.48			5		0.63			
	7	103.15	52	3	4	52.29	50.86	RWB	49.86				RWB		PUMP			
PUMP WELL	RWB	100.57	50	8	4	50.71	49.86	RW9				50.63	RW9				0.77	
	RW9	103.67	53	0	4	53.04	50.63	6	50.53				6	0.67				
7-18-91	1	103.03	52	0	0	52.00	51.03	4			51.23		4			1.35		
	2	102.54	51	7	0	51.58	50.96	1				51.03	1				1.15	
	3	102.63	51	10	4	51.88	50.76	2		50.96			2		1.08			
	4	102.77	51	6	4	51.54	51.23	7				50.90	7				1.02	
	5	100.17	49	8	2	49.69	50.48	3				50.76	3				0.88	
	6	101.30	50	9	0	50.75	50.55	5		50.48			5		0.60			
	7	103.15	52	3	0	52.25	50.90	RWB	49.88				RWB		PUMP			
PUMP WELL	RWB	100.57	50	8	2	50.69	49.88	RW9				50.63	RW9				0.75	
X	RW9	103.67	53	0	4	53.04	50.63	6	50.55				6	0.67				

"05-Aug-91 "

RIFORD TERMINAL TEST WELL DATA

DATE	WELL NO.	CASING ELEV	DEPTH TO WATER			DEPTH TO WATER	WELL NO.	WATER ELEV	WATER ELEV	WATER ELEV	WATER ELEV	WELL NO.	WATER LEVEL (FT.)	WATER LEVEL (FT.)	WATER LEVEL (FT.)	WATER LEVEL (FT.)
			EIGHTS OF INCH													
			TOP OF	FEET	INCHES											
X 7-19-91	1	103.03	52	0	0	52.00	51.03	4		51.25		4			1.35	
	2	102.54	51	7	2	51.60	50.94	1			51.03	1				1.13
	3	102.63	51	10	4	51.88	50.76	2		50.94		2		1.04		
	4	102.77	51	6	2	51.52	51.25	7			50.90	7				1.00
	5	100.17	49	8	2	49.69	50.48	3			50.76	3				0.86
	6	101.30	50	9	0	50.75	50.55	5		50.48		5		0.58		
	7	103.15	52	3	0	52.25	50.90	RWB	49.90			RWB		PUMP		
PUMP WELL	RWB	100.57	50	8	0	50.67	49.90	RW9			50.63	RW9				0.73
	RW9	103.67	53	0	4	53.04	50.63	6	50.55			6	0.65			
7-20-91	1	103.03	52	0	0	52.00	51.03	4		51.27		4			1.37	
	2	102.54	51	7	0	51.58	50.96	1			51.03	1				1.13
	3	102.63	51	10	2	51.85	50.78	2		50.96		2		1.06		
	4	102.77	51	6	0	51.50	51.27	7			50.88	7				0.98
	5	100.17	49	8	2	49.69	50.48	3			50.78	3				0.88
	6	101.30	50	9	0	50.75	50.55	5		50.48		5		0.58		
	7	103.15	52	3	2	52.27	50.88	RWB	49.90			RWB		PUMP		
PUMP WELL	RWB	100.57	50	8	0	50.67	49.90	RW9			50.65	RW9				0.75
	RW9	103.67	53	0	2	53.02	50.65	6	50.55			6	0.65			
7-22-91	1	103.03	51	11	4	51.96	51.07	4		51.27		4			1.35	
	2	102.54	51	6	4	51.54	51.00	1			51.07	1				1.15
	3	102.63	51	10	0	51.83	50.80	2		51.00		2		1.08		
	4	102.77	51	6	0	51.50	51.27	7			50.92	7				1.00
	5	100.17	49	7	6	49.65	50.52	3			50.80	3				0.88
	6	101.30	50	8	4	50.71	50.59	5		50.52		5		0.60		
	7	103.15	52	2	6	52.23	50.92	RWB	49.92			RWB		PUMP		
PUMP WELL	RWB	100.57	50	7	6	50.65	49.92	RW9			50.67	RW9				0.75
	RW9	103.67	53	0	0	53.00	50.67	6	50.59			6	0.67			
7-23-91	1	103.03	51	11	4	51.96	51.07	4		51.27		4			1.35	
	2	102.54	51	6	6	51.56	50.98	1			51.07	1				1.15
	3	102.63	51	10	0	51.83	50.80	2		50.98		2		1.06		
	4	102.77	51	6	0	51.50	51.27	7			50.94	7				1.02
	5	100.17	49	7	6	49.65	50.52	3			50.80	3				0.88
	6	101.30	50	8	4	50.71	50.59	5		50.52		5		0.60		
	7	103.15	52	2	4	52.21	50.94	RWB	49.92			RWB		PUMP		
PUMP WELL	RWB	100.57	50	7	6	50.65	49.92	RW9			50.67	RW9				0.75
	RW9	103.67	53	0	0	53.00	50.67	6	50.59			6	0.67			
7-24-91	1	103.03	51	11	4	51.96	51.07	4		51.29		4			1.35	
	2	102.54	51	6	4	51.54	51.00	1			51.07	1				1.13
	3	102.63	51	10	0	51.83	50.80	2		51.00		2		1.06		
	4	102.77	51	5	6	51.48	51.29	7			50.94	7				1.00
	5	100.17	49	7	4	49.63	50.55	3			50.80	3				0.86
	6	101.30	50	8	4	50.71	50.59	5		50.54		5		0.60		
	7	103.15	52	2	4	52.21	50.94	RWB	49.94			RWB		PUMP		
PUMP WELL	RWB	100.57	50	7	4	50.63	49.94	RW9			50.69	RW9				0.75
	RW9	103.67	52	11	6	52.98	50.69	6	50.59			6	0.65			

DATE	WELL NO.	CASING ELEV	DEPTH TO WATER			DEPTH TO WATER ELEV	WELL NO.	WATER ELEV	WATER ELEV	WATER ELEV	WATER ELEV	WELL NO.	LEVEL ABOVE #8 WELL	LEVEL ABOVE #8 WELL	LEVEL ABOVE #8 WELL	LEVEL ABOVE #8 WELL
			FEET	INCHES	EIGHTS OF INCH								WATER	WATER	WATER	WATER
													(FT.)	(FT.)	(FT.)	(FT.)
X 7-25-91	1	103.03	51	11	2	51.94	51.09	4		51.31		4			1.37	
	2	102.54	51	6	4	51.54	51.00	1			51.09	1				1.15
	3	102.63	51	9	6	51.81	50.82	2		51.00		2		1.06		
	4	102.77	51	5	4	51.46	51.31	7			50.94	7				1.00
	5	100.17	49	7	4	49.63	50.55	3			50.82	3				0.88
	6	101.30	50	8	4	50.71	50.59	5		50.54		5		0.60		
	7	103.15	52	2	4	52.21	50.94	RWB	49.94			RWB		PUMP		
	PUMP WELL RWB	100.57	50	7	4	50.63	49.94	RWB			50.69	RWB				0.75
	RWB	103.67	52	11	6	52.98	50.69	6	50.59			6	0.65			
7-26-91	1	103.03	51	11	4	51.96	51.07	4		51.31		4			1.35	
	2	102.54	51	6	4	51.54	51.00	1			51.07	1				1.11
	3	102.63	51	9	6	51.81	50.82	2		51.00		2		1.04		
	4	102.77	51	5	4	51.46	51.31	7			50.94	7				0.98
	5	100.17	49	7	4	49.63	50.55	3			50.82	3				0.86
	6	101.30	50	8	2	50.69	50.61	5		50.54		5		0.58		
	7	103.15	52	2	4	52.21	50.94	RWB	49.96			RWB		PUMP		
	PUMP WELL RWB	100.57	50	7	2	50.60	49.96	RWB			50.69	RWB				0.73
	RWB	103.67	52	11	6	52.98	50.69	6	50.61			6	0.65			
7-27-91	1	103.03	51	11	0	51.92	51.11	4		52.33		4			2.37	
	2	102.54	51	6	0	51.50	51.04	1			51.11	1				1.15
	3	102.63	51	9	4	51.79	50.84	2		51.04		2		1.08		
	4	102.77	50	5	2	50.44	52.33	7			50.98	7				1.02
	5	100.17	49	7	2	49.60	50.57	3			50.84	3				0.88
	6	101.30	50	8	0	50.67	50.63	5		50.56		5		0.60		
	7	103.15	52	2	0	52.17	50.98	RWB	49.96			RWB		PUMP		
	PUMP WELL RWB	100.57	50	7	2	50.60	49.96	RWB			50.71	RWB				0.75
	RWB	103.67	52	11	4	52.96	50.71	6	50.63			6	0.67			
7-29-91	1	103.03	51	10	4	51.88	51.16	4		51.40		4			1.39	
	2	102.54	51	5	4	51.46	51.08	1			51.16	1				1.15
	3	102.63	51	9	0	51.75	50.88	2		51.08		2		1.08		
	4	102.77	51	4	4	51.38	51.40	7			51.00	7				1.00
	5	100.17	49	7	0	49.58	50.59	3			50.88	3				0.88
	6	101.30	50	7	6	50.65	50.65	5		50.58		5		0.58		
	7	103.15	52	1	6	52.15	51.00	RWB	50.00			RWB		PUMP		
	PUMP WELL RWB	100.57	50	6	6	50.56	50.00	RWB			50.75	RWB				0.75
	RWB	103.67	52	11	0	52.92	50.75	6	50.65			6	0.65			
7-30-91	1	103.03	51	10	0	51.83	51.20	4		51.42		4			1.37	
	2	102.54	51	5	2	51.44	51.10	1			51.20	1				1.15
	3	102.63	51	8	6	51.73	50.90	2		51.10		2		1.06		
	4	102.77	51	4	2	51.35	51.42	7			51.05	7				1.00
	5	100.17	49	6	4	49.54	50.63	3			50.90	3				0.86
	6	101.30	50	7	4	50.63	50.68	5		50.62		5		0.58		
	7	103.15	52	1	2	52.10	51.05	RWB	50.04			RWB		PUMP		
	PUMP WELL RWB	100.57	50	6	2	50.52	50.04	RWB			50.77	RWB				0.73
	RWB	103.67	52	10	6	52.90	50.77	6	50.68			6	0.63			

05-Aug-91

KIFORD TERMINAL TEST WELL DATA

DATE	WELL NO.	CASING ELEV	DEPTH TO WATER			EIGHTS OF INCH	DEPTH TO WATER	WATER ELEV	WELL NO.	WATER ELEV	WATER ELEV	WATER ELEV	WATER ELEV	WELL NO.	LEVEL	LEVEL	LEVEL	LEVEL						
			FEET	INCHES	INCH										WATER	ELEV	ELEV	ELEV	ELEV	WELL	ABOVE	ABOVE	ABOVE	ABOVE
																					#8	#8	#8	#8
															WELL	WELL	WELL	WELL						
															WATER	WATER	WATER	WATER						
															LEVEL	LEVEL	LEVEL	LEVEL						
															(FT.)	(FT.)	(FT.)	(FT.)						
X 7-31-91	1	103.03	51	10	2	51.85	51.18	11	4			51.42	11	4			1.35							
	2	102.54	51	5	0	51.42	51.12	11	1				51.18	11	1			1.11						
	3	102.63	51	8	4	51.71	50.92	11	2		51.12			11	2		1.06							
	4	102.77	51	4	2	51.35	51.42	11	7				51.07	11	7			1.00						
	5	100.17	49	6	4	49.54	50.63	11	3				50.92	11	3			0.86						
	6	101.30	50	7	2	50.60	50.70	11	5		50.62			11	5		0.56							
	7	103.15	52	1	0	52.08	51.07	11	RW8	50.07				11	RW8		PUMP							
PUMP WELL	RW8	100.57	50	6	0	50.50	50.07	11	RW9				50.82	11	RW9			0.75						
	RW9	103.67	52	10	2	52.85	50.82	11	6	50.70				11	6	0.63								

DEPARTMENT
OF
NATURAL RESOURCES

91 AUG 26 PM 3:23