1R - 220

GENERAL CORRESPONDENCE

YEAR(S):

1995 →

Analytical**Technologies,**Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **509350**

September 28, 1995

New Mexico Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87505

Project Name/Number: LOVINGTON #6

Attention: Mark Ashley

On **09/15/95**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 8310 analyses were performed by Analytical Technologies, Inc., 5550 Morehouse Drive, San Diego, CA.

Metals analyses were performed by Analytical Technologies, Inc., 11 East Olive Road, Pensacola, FL.

All other analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jt

Enclosure

Analytical Technologies, Inc.

CLIENT : NMOCD
PROJECT # : (NONE)
PROJECT NAME : LOVINGTON #6

DATE RECEIVED : 09/15/95
REPORT DATE : 09/28/95

ATI ID: 509350

	ATI SD & PENSACOLA ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	509350-01	9509130910	AQUEOUS	09/13/95
02	509350-02	9509130915	AQUEOUS	09/13/95
03	509350-03	9509130917	AQUEOUS	09/13/95

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	3

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 50972402

TEST : EPA METHOD 502.2

CLIENT	: ANALYTICAL TECHNOLOGIES, INC-NM	DATE SAMPLED	: 09/13/95
PROJECT #	: 509350	DATE RECEIVED	: 09/16/95
PROJECT NAME	: NMOCD	DATE EXTRACTED	: N/A
CLIENT I.D.	: 509350-02	DATE ANALYZED	: 09/19/95
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 25

COMPOUNDS	RESULTS
VINYL CHLORIDE	<12.5
BENZENE	660
CARBON TETRACHLORIDE	<12.5
1,2-DICHLOROETHANE	<12.5
TRICHLOROETHYLENE (TCE)	<12.5
PARA-DICHLOROBENZENE	<12.5
1,1-DICHLOROETHYLENE	<12.5
1,1,1-TRICHLOROETHANE	<12.5
CIS-1,2-DICHLOROETHYLENE	<12.5
1,2-DICHLOROPROPANE	<12.5
ETHYLBENZENE	68
CHLOROBENZENE	<12.5
ORTHO-DICHLOROBENZENE	<12.5
TETRACHLOROETHYLENE	<12.5
TOLUENE	360
TRANS-1,2-DICHLOROETHYLENE	<12.5
META,PARA-XYLENE (TOTAL)	46
O-XYLENE/STYRENE	20
CHLOROMETHANE	<125
BROMOMETHANE	<50
CHLOROETHANE	<50
DIBROMOMETHANE	<12.5
1,1-DICHLOROPROPENE	<12.5
1,3-DICHLOROPROPANE	<12.5
1,2,3-TRICHLOROPROPANE	<12.5
2,2-DICHLOROPROPANE	<12.5
CHLOROFORM	<12.5
BROMOFORM	<12.5
BROMODICHLOROMETHANE	<12.5
CHLORODIBROMOMETHANE	<12.5
DICHLOROMETHANE	<50
ORTHO-CHLOROTOLUENE	<12.5
PARA-CHLOROTOLUENE	<12.5
META-DICHLOROBENZENE	<12.5
1,1-DICHLOROETHANE	<12.5
1,1,2-TRICHLOROETHANE	<12.5
1,1,1,2-TETRACHLOROETHANE	<12.5
1,1,2,2-TETRACHLOROETHANE	<12.5
BROMOBENZENE	<12.5
DICHLORODIFLUOROMETHANE	<125
TRICHLOROFLUOROMETHANE	<12.5

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Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 50972402

TEST : EPA METHOD 502.2

COMPOUNDS	RESULTS
BROMOCHLOROMETHANE	<12.5
1,2-DIBROMOETHANE	<12.5
ISO-PROPYLBENZENE	<12.5
N-PROPYLBENZENE	<12.5
1,3,5-TRIMETHYLBENZENE	<12.5
1,2,4-TRIMETHYLBENZENE	<12.5
TERT-BUTYLBENZENE	<12.5
SEC-BUTYLBENZENE	38
P-ISOPROPYLTOLUENE	<12.5
N-BUTYLBENZENE	<12.5
1,2-DIBROMO-3-CHLOROPROPANE	<12.5
1,2,4-TRICHLOROBENZENE	<12.5
NAPHTHALENE	<12.5
1,2,3-TRICHLOROBENZENE	<12.5
HEXACHLOROBUTADIENE	<12.5
TRANS-1,3-DICHLOROPROPENE	<12.5
CIS-1,3-DICHLOROPROPENE	<12.5
SURROGATE PERCENT RECOVERIES	
1-CHLORO-2-FLUOROBENZENE (PID) %	90
BROMOFLUOROBENZENE (HALL) %	113

Analytical Technologies, Inc. GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : EPA METHOD 502.2

		ATI I.D.	: 509724
CLIENT	: ANALYTICAL TECHNOLOGIES, INC-NM	DATE EXTRACTED	: 09/19/95
PROJECT #	: 509350	DATE ANALYZED	: 09/19/95
PROJECT NAME	: NMOCD	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
VINYL CHLORIDE	<0.5
BENZENE	<0.5
CARBON TETRACHLORIDE	<0.5
1,2-DICHLOROETHANE	<0.5
TRICHLOROETHYLENE (TCE)	<0.5
PARA-DICHLOROBENZENE	<0.5
1,1-DICHLOROETHYLENE	<0.5
1,1,1-TRICHLOROETHANE	<0.5
CIS-1,2-DICHLOROETHYLENE	<0.5
1,2-DICHLOROPROPANE	<0.5
ETHYLBENZENE	<0.5
CHLOROBENZENE	<0.5
ORTHO-DICHLOROBENZENE	<0.5
TETRACHLOROETHYLENE	<0.5
TOLUENE	<0.5
TRANS-1,2-DICHLOROETHYLENE	<0.5
META,PARA-XYLENE (TOTAL)	<0.5
O-XYLENE/STYRENE	<0.5
CHLOROMETHANE	<5
BROMOMETHANE	<2
CHLOROETHANE	<2
DIBROMOMETHANE	<0.5
1,1-DICHLOROPROPENE	<0.5
1,3-DICHLOROPROPANE	<0.5
1,2,3-TRICHLOROPROPANE	<0.5
2,2-DICHLOROPROPANE	<0.5
CHLOROFORM	<0.5
BROMOFORM	<0.5
BROMODICHLOROMETHANE	<0.5
CHLORODIBROMOMETHANE	<0.5
DICHLOROMETHANE	<2
ORTHO-CHLOROTOLUENE	<0.5
PARA-CHLOROTOLUENE	<0.5
META-DICHLOROBENZENE	<0.5
1,1-DICHLOROETHANE	<0.5
1,1,2-TRICHLOROETHANE	<0.5
1,1,1,2-TETRACHLOROETHANE	<0.5
1,1,2,2-TETRACHLOROETHANE	<0.5
BROMOBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<5
TRICHLOROFLUOROMETHANE	<0.5
BROMOCHLOROMETHANE	<0.5
1,2-DIBROMOETHANE	<0.5

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Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

ATI I.D. : 509724

TEST : EPA METHOD 502.2

COMPOUNDS	RESULTS
ISO-PROPYLBENZENE	<0.5
N-PROPYLBENZENE	<0.5
1,3,5-TRIMETHYLBENZENE	<0.5
1,2,4-TRIMETHYLBENZENE	<0.5
TERT-BUTYLBENZENE	<0.5
SEC-BUTYLBENZENE	<0.5
P-ISOPROPYLTOLUENE	<0.5
N-BUTYLBENZENE	<0.5
1,2-DIBROMO-3-CHLOROPROPANE	<0.5
1,2,4-TRICHLOROBENZENE	<0.5
NAPHTHALENE	<0.5
1,2,3-TRICHLOROBENZENE	<0.5
HEXACHLOROBUTADIENE	<0.5
TRANS-1,3-DICHLOROPROPENE	<0.5
CIS-1,3-DICHLOROPROPENE	<0.5

SURROGATE PERCENT RECOVERIES

1-CHLORO-2-FLUOROBENZENE (PID) %	91
BROMOFLUOROBENZENE (HALL) %	96

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 509724

TEST : EPA METHOD 502.2

CLIENT : ANALYTICAL TECHNOLOGIES, INC-NM
PROJECT # : 509350
PROJECT NAME : NMOCD
REF I.D. : 50949919

DATE ANALYZED : 09/19/95
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHYLENE	<0.5	10	8.6	86	10	100	15
TRICHLOROETHENE	<0.5	10	8.2	82	9.3	93	13
TETRACHLOROETHENE	<0.5	10	9.4	94	9.9	99	5
BENZENE	<0.5	10	10	100	10	100	0
BROMODICHLOROMETHANE	<0.5	10	9.2	92	10	100	8
CHLOROFORM	<0.5	10	9.4	94	9.9	99	5
1,1,1-TRICHLOROETHANE	<0.5	10	9.7	97	9.4	94	3
TOLUENE	<0.5	10	10	100	11	110	10
CHLOROBENZENE	<0.5	10	10	100	11	110	10
N-BUTYLBENZENE	<0.5	10	11	110	10	100	10

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

Analytical Technologies, Inc.

DATE: 09-25-95

ION BALANCE

ATI ACCESSION NUMBER: 50972401
SAMPLE IDENTIFICATION: 509350-01
CLIENT: ATI--Albuquerque,NM

ANIONS	RESULT MG/L	FACTOR ME/L	TOTAL	
ALKALINITY (AS CACO3)	180.000	0.02000	3.60000	
CHLORIDE	3400.000	0.02821	95.91400	
FLUORIDE	1.060	0.05264	0.05580	
NITRATE AS N	NA	0.01613	0.00000	
SULFATE	460.000	0.02082	9.57720	
		TOTAL ANIONS		109.147

CATIONS	RESULT	FACTOR	TOTAL	
ALUMINUM	<0.06	0.11119	0.00000	
CALCIUM	390.000	0.04990	19.461	
POTASSIUM	26.000	0.02558	0.66508	
MAGNESIUM	90.000	0.08229	7.40610	
SODIUM	1900.000	0.04350	82.65000	
COPPER	<0.010	0.03147	0.00000	
IRON	<0.020	0.05372	0.00000	
MANGANESE	0.070	0.03640	0.00255	
ZINC	0.030	0.03059	0.00092	
		TOTAL CATIONS		110.1856
		%RPD (<10%)		-0.95
TOTAL ANIONS/CATIONS	(CALCULATED)	6375.160		
TOTAL DISSOLVED SOLIDS	(ANALYZED)	6300	%RPD (<15%)	1.19
ELECTRICAL COND.		9560	TDS/EC RATIO (0.65+/-0.1)	0.65900

Analytical Technologies, Inc.

ANALYTICAL SCHEDULE

Client : ANALYTICAL TECHNOLOGIES, INC.
Project # : 509350
Project Name: NMOCD

ATI I.D.: 509146

Analysis	Technique/Description
EPA 8310 (POLYNUCLEAR AROMATIC HYDROCARBONS)	HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY RESULTS

Test : EPA 8310 (POLYNUCLEAR AROMATIC HYDROCARBONS)
Client : ANALYTICAL TECHNOLOGIES, INC. ATI I.D. : 509146
Project # : 509350
Project Name: NMOCD

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
1	509350-03	WATER	13-SEP-95	18-SEP-95	20-SEP-95	1.00

Parameter	Units	1
NAPHTHALENE	UG/L	2.8
1-METHYLNAPHTHALENE	UG/L	3.5
2-METHYLNAPHTHALENE	UG/L	2.1
ACENAPHTHYLENE	UG/L	2.2
ACENAPHTHENE	UG/L	<1.0
FLUORENE	UG/L	<0.10
PHENANTHRENE	UG/L	<0.050
ANTHRACENE	UG/L	<0.050
FLUORANTHENE	UG/L	<0.10
PYRENE	UG/L	<0.10
BENZO(a)ANTHRACENE	UG/L	<0.10
CHRYSENE	UG/L	<0.10
BENZO(b)FLUORANTHENE	UG/L	<0.10
BENZO(k)FLUORANTHENE	UG/L	<0.10
BENZO(a)PYRENE	UG/L	<0.10
DIBENZO(a,h)ANTHRACENE	UG/L	<0.20
BENZO(g,h,i)PERYLENE	UG/L	<0.10
INDENO(1,2,3-cd)PYRENE	UG/L	<0.10
SURROGATES		
2-CHLOROANTHRACENE	%	75

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - QUALITY CONTROL

REAGENT BLANK

Test : EPA 8310 (POLYNUCLEAR AROMATIC HYDROCARBONS)
Blank I.D. : 36791
Client : ANALYTICAL TECHNOLOGIES, INC.
Project # : 509350
Project Name: NMOCD

ATI I.D. : 509146
Date Extracted: 18-SEP-95
Date Analyzed : 20-SEP-95
Dil. Factor : 1.00

Parameters	Units	Results
NAPHTHALENE	UG/L	<0.50
1-METHYLNAPHTHALENE	UG/L	<1.0
2-METHYLNAPHTHALENE	UG/L	<1.0
ACENAPHTHYLENE	UG/L	<1.0
ACENAPHTHENE	UG/L	<1.0
FLUORENE	UG/L	<0.10
PHENANTHRENE	UG/L	<0.050
ANTHRACENE	UG/L	<0.050
FLUORANTHENE	UG/L	<0.10
PYRENE	UG/L	<0.10
BENZO(a)ANTHRACENE	UG/L	<0.10
CHRYSENE	UG/L	<0.10
BENZO(b)FLUORANTHENE	UG/L	<0.10
BENZO(k)FLUORANTHENE	UG/L	<0.10
BENZO(a)PYRENE	UG/L	<0.10
DIBENZO(a,h)ANTHRACENE	UG/L	<0.20
BENZO(g,h,i)PERYLENE	UG/L	<0.10
INDENO(1,2,3-cd)PYRENE	UG/L	<0.10
SURROGATES		
2-CHLOROANTHRACENE	%	80

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - QUALITY CONTROL

MSMSD

Test : EPA 8310 (POLYNUCLEAR AROMATIC HYDROCARBONS)
MSMSD # : 78598
Client : ANALYTICAL TECHNOLOGIES, INC.

Project # : 509350
Project Name: NMOCD

ATI I.D. : 509146
Date Extracted: 18-SEP-95
Date Analyzed : 20-SEP-95
Sample Matrix : WATER
REF I.D. : REAGENT WATER

Parameters	Units	Sample Result	Conc Spike	Spiked Sample	% Rec	Dup Spike	Dup % Rec	RPD
ACENAPHTHYLENE	UG/L	<1.0	20	18	90	17	85	6
PHENANTHRENE	UG/L	<0.050	1.0	0.88	88	0.90	90	2
PYRENE	UG/L	<0.10	1.0	0.91	91	0.91	91	0
BENZO(k)FLUORANTHENE	UG/L	<0.10	1.0	0.99	99	0.95	95	4
DIBENZO(a,h)ANTHRACENE	UG/L	<0.20	2.0	2.1	105	2.0	100	5

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Spiked Sample Result - Duplicate Spike Result)*100/Average Result

Analytical Technologies, Inc. GENERAL CHEMISTRY RESULTS

ATI I.D. : 509724

CLIENT : ANALYTICAL TECHNOLOGIES, INC-NM
PROJECT # : 509350
PROJECT NAME : NMOCD

DATE RECEIVED : 09/16/95
REPORT DATE : 09/28/95

PARAMETER	UNITS	01
CARBONATE (CACO3)	MG/L	<1
BICARBONATE (CACO3)	MG/L	180
HYDROXIDE (CACO3)	MG/L	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	180
BROMIDE (EPA 300.0)	MG/L	8.0
CHLORIDE (EPA 325.2)	MG/L	3400
CONDUCTIVITY, (UMHOS/CM)		9560
FLUORIDE (EPA 340.2)	MG/L	1.06
PH (EPA 150.1)	UNITS	7.3
SULFATE (EPA 375.2)	MG/L	460
T. DISSOLVED SOLIDS (160.1)	MG/L	6300

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : ANALYTICAL TECHNOLOGIES, INC-NM
PROJECT # : 509350
PROJECT NAME : NMOCD

ATI I.D. : 509724

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	50967901	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		277	276	0.4	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		277	276	0.4	NA	NA	NA
BROMIDE	MG/L	50950101	46	49	6	158	100	112
CHLORIDE	MG/L	50973001	41	41	0	91	50	100
CONDUCTIVITY(UMHOS/CM)		50972401	9560	9620	0.6	NA	NA	NA
FLUORIDE	MG/L	50972401	1.06	1.05	0.9	2.04	1.00	98
PH	UNITS	50970001	7.8	7.7	1	NA	NA	NA
SULFATE	MG/L	50972401	460	480	4	860	400	100
TOTAL DISSOLVED SOLIDS	MG/L	50967601	1400	1300	7	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 509463
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 509350
Project Name: NMOCO
Project Location: N/S
Test: Group of Single Metals
Matrix: WATER
QC Level: II

Lab Id: 001
Client Sample Id: 509350-01

Sample Date/Time: 13-SEP-95 0910
Received Date: 16-SEP-95

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
SILVER (6010)	MG/L	ND	0.01		A6W204	JR
ALUMINUM (6010)	MG/L	ND	0.06		L6W204	JR
ARSENIC (6010)	MG/L	ND	0.05		R6W204	JR
BORON (6010)	MG/L	1.2	0.09		O6W204	JR
BARIUM (6010)	MG/L	0.17	0.01		B6W204	JR
BERYLLIUM (6010)	MG/L	ND	0.004		Y6W204	JR
CALCIUM (6010)	MG/L	390	1		I6W204	JR
CADMIUM (6010)	MG/L	ND	0.005		C6W204	JR
COBALT (6010)	MG/L	ND	0.01		T6W204	JR
CHROMIUM (6010)	MG/L	ND	0.01		H6W204	JR
COPPER (6010)	MG/L	0.01	0.01		F6W204	JR
IRON (6010)	MG/L	ND	0.02		N6W204	JR
POTASSIUM (6010)	MG/L	26	2		X6W204	JR
MAGNESIUM (6010)	MG/L	90	0.2		J6W204	JR
MANGANESE (6010)	MG/L	0.07	0.01		G6W204	JR
MOLYBDENUM (6010)	MG/L	ND	0.01		D6W204	JR
SODIUM (6010)	MG/L	1900	1	+	16W204	JR
NICKEL (6010)	MG/L	ND	0.02		E6W204	JR
LEAD (6010)	MG/L	ND	0.05		P6W204	JR
ANTIMONY (6010)	MG/L	ND	0.06		36W204	JR
SELENIUM (6010)	MG/L	ND	0.1		S6W204	JR
SILICON (6010)	MG/L	19	0.5	+	26W204	JR
THALLIUM (6010)	MG/L	ND	0.1		46W204	JR
VANADIUM (6010)	MG/L	0.04	0.01		V6W204	JR
ZINC (6010)	MG/L	0.03	0.02		56W204	JR

Comments:

Analytical Technologies, Inc.

"Method Report Summary"

Accession Number: 509463
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 509350
Project Name: NMOCO
Project Location: N/S
Test: Group of Single Metals

Client Sample Id:	Parameter:	Unit:	Result:
509350-01	BORON (6010)	MG/L	1.2
	BARIUM (6010)	MG/L	0.17
	CALCIUM (6010)	MG/L	390
	COPPER (6010)	MG/L	0.01
	POTASSIUM (6010)	MG/L	26
	MAGNESIUM (6010)	MG/L	90
	MANGANESE (6010)	MG/L	0.07
	SODIUM (6010)	MG/L	1900
	SILICON (6010)	MG/L	19
	VANADIUM (6010)	MG/L	0.04
	ZINC (6010)	MG/L	0.03

Analytical Technologies, Inc.

"Metals Quality Control Report"

Parameter:	SILVER	ALUMINUM	ARSENIC	BORON	BARIUM	BERYLLIUM
Batch Id:	A6W204	L6W204	R6W204	O6W204	B6W204	Y6W204
Blank Result:	<0.01	<0.06	<0.05	<0.09	<0.01	<0.004
Anal. Method:	6010	6010	6010	6010	6010	6010
Prep. Method:	3010	3010	3010	3010	3010	3010
Analysis Date:	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95
Prep. Date:	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95
Sample Duplication						
Sample Dup:	509463-1	509463-1	509463-1	509463-1	509463-1	509463-1
Rept Limit:	<0.01	<0.06	<0.05	<0.09	<0.01	<0.004
Sample Result:	1.9	2.0	2.0	3.1	2.1	1.9
Dup Result:	1.9	2.0	2.0	3.1	2.1	1.9
Sample RPD:	0	0	0	0	0	0
Max RPD:	20	20	20	20	20	20
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A
Matrix Spike						
Sample Spiked:	509463-1	509463-1	509463-1	509463-1	509463-1	509463-1
Rept Limit:	<0.01	<0.06	<0.05	<0.09	<0.01	<0.004
Sample Result:	<0.01	<0.06	<0.05	1.2	0.17	<0.004
Spiked Result:	1.9	2.0	2.0	3.1	2.1	1.9
Spike Added:	2.0	2.0	2.0	2.0	2.0	2.0
% Recovery:	95	100	100	95	97	95
% Rec Limits:	75-125	75-125	75-125	75-125	75-125	75-125
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A
ICV						
ICV Result:	4.8	5.0	5.0	4.9	4.8	5.0
True Result:	5.0	5.0	5.0	5.0	5.0	5.0
% Recovery:	96	100	100	98	96	100
% Rec Limits:	90-110	90-110	90-110	90-110	90-110	90-110
LCS						
LCS Result:	2.0	2.1	2.1	2.1	2.1	2.1
True Result:	2.0	2.0	2.0	2.0	2.0	2.0
% Recovery:	100	105	105	105	105	105
% Rec Limits:	80-120	80-120	80-120	80-120	80-120	80-120

Analytical Technologies, Inc.

"Metals Quality Control Report"

Parameter:	CALCIUM	CADMIUM	COBALT	CHROMIUM	COPPER	IRON
Batch Id:	I6W204	C6W204	T6W204	H6W204	F6W204	N6W204
Blank Result:	<1	<0.005	<0.01	<0.01	<0.01	<0.02
Anal. Method:	6010	6010	6010	6010	6010	6010
Prep. Method:	3010	3010	3010	3010	3010	3010
Analysis Date:	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95
Prep. Date:	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95
Sample Duplication						
Sample Dup:	509463-1	509463-1	509463-1	509463-1	509463-1	509463-1
Rept Limit:	<1	<0.005	<0.01	<0.01	<0.01	<0.02
Sample Result:	410	1.9	1.9	1.9	2.0	1.9
Dup Result:	410	1.9	1.9	1.9	2.0	1.9
Sample RPD:	0	0	0	0	0	0
Max RPD:	20	20	20	20	20	20
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A
Matrix Spike						
Sample Spiked:	509463-1	509463-1	509463-1	509463-1	509463-1	509463-1
Rept Limit:	<1	<0.005	<0.01	<0.01	<0.01	<0.02
Sample Result:	390	<0.005	<0.01	<0.01	0.01	<0.02
Spiked Result:	410	1.9	1.9	1.9	2.0	2.0
Spike Added:	20F	2.0	2.0	2.0	2.0	2.0
% Recovery:	100	95	95	95	100	100
% Rec Limits:	75-125	75-125	75-125	75-125	75-125	75-125
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A
ICV						
ICV Result:	9.7	4.8	4.9	4.9	4.8	5.3
True Result:	10	5.0	5.0	5.0	5.0	5.0
% Recovery:	97	96	98	98	96	106
% Rec Limits:	90-110	90-110	90-110	90-110	90-110	90-110
LCS						
LCS Result:	21	2.0	2.1	2.1	2.1	2.1
True Result:	20	2.0	2.0	2.0	2.0	2.0
% Recovery:	105	100	105	105	105	105
% Rec Limits:	80-120	80-120	80-120	80-120	80-120	80-120

Analytical Technologies, Inc.

"Metals Quality Control Report"

Parameter:	POTASSIUM	MAGNESIUM	MANGANESE	MOLYBDENUM	SODIUM	NICKEL
Batch Id:	X6W204	J6W204	G6W204	D6W204	16W204	E6W204
Blank Result:	<2	<0.2	<0.01	<0.01	<0.2	<0.02
Anal. Method:	6010	6010	6010	6010	6010	6010
Prep. Method:	3010	3010	3010	3010	3010	3010
Analysis Date:	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95
Prep. Date:	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95
Sample Duplication						
Sample Dup:	509463-1	509463-1	509463-1	509463-1	509463-1	509463-1
Rept Limit:	<2	<0.2	<0.01	<0.01	<1+	<0.02
Sample Result:	48	110	2.0	1.9	1900	1.8
Dup Result:	48	110	2.0	1.9	2000	1.8
Sample RPD:	0	0	0	0	5	0
Max RPD:	20	20	20	20	20	20
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A
Matrix Spike						
Sample Spiked:	509463-1	509463-1	509463-1	509463-1	509463-1	509463-1
Rept Limit:	<2	<0.2	<0.01	<0.01	<1+	<0.02
Sample Result:	26	90	0.07	<0.01	1900	<0.02
Spiked Result:	48	110	2.0	1.9	1900	1.8
Spike Added:	20	20F	2.0	2.0	20F	2.0
% Recovery:	110	100	97	95	0	90
% Rec Limits:	75-125	75-125	75-125	75-125	75-125	75-125
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A
ICV						
ICV Result:	48	5.1	4.9	4.7	9.7	4.9
True Result:	50	5.0	5.0	5.0	10	5.0
% Recovery:	96	102	98	94	97	98
% Rec Limits:	90-110	90-110	90-110	90-110	90-110	90-110
LCS						
LCS Result:	21	21	2.1	2.1	24	2.1
True Result:	20	20	2.0	2.0	20	2.0
% Recovery:	105	105	105	105	120	105
% Rec Limits:	80-120	80-120	80-120	80-120	80-120	80-120

Analytical Technologies, Inc.

"Metals Quality Control Report"

Parameter:	LEAD	ANTIMONY	SELENIUM	SILICON	THALLIUM	VANADIUM
Batch Id:	P6W204	36W204	S6W204	26W204	46W204	V6W204
Blank Result:	<0.05	<0.06	<0.1	<0.1	<0.1	<0.01
Anal. Method:	6010	6010	6010	6010	6010	6010
Prep. Method:	3010	3010	3010	3010	3010	3010
Analysis Date:	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95
Prep. Date:	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95	18-SEP-95
Sample Duplication						
Sample Dup:	509463-1	509463-1	509463-1	509463-1	509463-1	509463-1
Rept Limit:	<0.05	<0.06	<0.1	<0.5+	<0.1	<0.01
Sample Result:	1.8	2.0	2.0	22	1.7	2.0
Dup Result:	1.8	2.0	2.0	20	1.8	2.0
Sample RPD:	0	0	0	10	6	0
Max RPD:	20	20	20	20	20	20
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A
Matrix Spike						
Sample Spiked:	509463-1	509463-1	509463-1	509463-1	509463-1	509463-1
Rept Limit:	<0.05	<0.06	<0.1	<0.5+	<0.1	<0.01
Sample Result:	<0.05	<0.06	<0.1	19	<0.1	0.04
Spiked Result:	1.8	2.0	2.0	22	1.7	2.0
Spike Added:	2.0	2.0	2.0	2.0F	2.0	2.0
% Recovery:	90	100	100	150	85	98
% Rec Limits:	75-125	75-125	75-125	75-125	75-125	75-125
Dry Weight%	N/A	N/A	N/A	N/A	N/A	N/A
ICV						
ICV Result:	4.8	5.2	4.7	4.7	4.8	4.8
True Result:	5.0	5.0	5.0	5.0	5.0	5.0
% Recovery:	96	104	94	94	96	96
% Rec Limits:	90-110	90-110	90-110	90-110	90-110	90-110
LCS						
LCS Result:	2.0	2.0	2.0	2.0	2.0	2.1
True Result:	2.0	2.0	2.0	2.0	2.0	2.0
% Recovery:	100	100	100	100	100	105
% Rec Limits:	80-120	80-120	80-120	80-120	80-120	80-120

Analytical Technologies, Inc.

"Metals Quality Control Report"

Parameter:	ZINC
Batch Id:	56W204
Blank Result:	<0.02
Anal. Method:	6010
Prep. Method:	3010
Analysis Date:	18-SEP-95
Prep. Date:	18-SEP-95

Sample Duplication

Sample Dup:	509463-1
Rept Limit:	<0.02
Sample Result:	2.0
Dup Result:	2.0
Sample RPD:	0
Max RPD:	20
Dry Weight%	N/A

Matrix Spike

Sample Spiked:	509463-1
Rept Limit:	<0.02
Sample Result:	0.03
Spiked Result:	2.0
Spike Added:	2.0
% Recovery:	99
% Rec Limits:	75-125
Dry Weight%	N/A

ICV

ICV Result:	4.9
True Result:	5.0
% Recovery:	98
% Rec Limits:	90-110

LCS

LCS Result:	2.1
True Result:	2.0
% Recovery:	105
% Rec Limits:	80-120

Analytical Technologies, Inc.

"Quality Control Comments"

Batch Id:	Comments:
A6W204	ANALYST: JR
A6W204	The results reported under "Sample Duplication" are the MS/MSD.
L6W204	ANALYST: JR
L6W204	The results reported under "Sample Duplication" are the MS/MSD.
R6W204	ANALYST: JR
R6W204	The results reported under "Sample Duplication" are the MS/MSD.
O6W204	ANALYST: JR
O6W204	The results reported under "Sample Duplication" are the MS/MSD.
B6W204	ANALYST: JR
B6W204	The results reported under "Sample Duplication" are the MS/MSD.
Y6W204	ANALYST: JR
Y6W204	The results reported under "Sample Duplication" are the MS/MSD.
I6W204	ANALYST: JR
I6W204	The results reported under "Sample Duplication" are the MS/MSD.
C6W204	ANALYST: JR
C6W204	The results reported under "Sample Duplication" are the MS/MSD.
T6W204	ANALYST: JR
T6W204	The results reported under "Sample Duplication" are the MS/MSD.
H6W204	ANALYST: JR
H6W204	The results reported under "Sample Duplication" are the MS/MSD.
F6W204	ANALYST: JR
F6W204	The results reported under "Sample Duplication" are the MS/MSD.
N6W204	ANALYST: JR
N6W204	The results reported under "Sample Duplication" are the MS/MSD.
X6W204	ANALYST: JR
X6W204	The results reported under "Sample Duplication" are the MS/MSD.
J6W204	ANALYST: JR
J6W204	The results reported under "Sample Duplication" are the MS/MSD.
G6W204	ANALYST: JR
G6W204	The results reported under "Sample Duplication" are the MS/MSD.
D6W204	ANALYST: JR
D6W204	The results reported under "Sample Duplication" are the MS/MSD.
16W204	ANALYST: JR
16W204	The results reported under "Sample Duplication" are the MS/MSD.
E6W204	ANALYST: JR
E6W204	The results reported under "Sample Duplication" are the MS/MSD.
P6W204	ANALYST: JR
P6W204	The results reported under "Sample Duplication" are the MS/MSD.
36W204	ANALYST: JR
36W204	The results reported under "Sample Duplication" are the MS/MSD.
S6W204	ANALYST: JR
S6W204	The results reported under "Sample Duplication" are the MS/MSD.
26W204	ANALYST: JR
26W204	The results reported under "Sample Duplication" are the MS/MSD.
46W204	ANALYST: JR
46W204	The results reported under "Sample Duplication" are the MS/MSD.
V6W204	ANALYST: JR
V6W204	The results reported under "Sample Duplication" are the MS/MSD.
56W204	ANALYST: JR
56W204	The results reported under "Sample Duplication" are the MS/MSD.

Analytical Technologies, Inc.

----- Common Footnotes Metals -----

N/A = NOT APPLICABLE.
N/S = NOT SUBMITTED.
N/C = SAMPLE AND DUPLICATE RESULTS ARE AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RPD IS "NOT CALCULABLE" AND NO CONTROL LIMITS APPLY.
N/D = NOT DETECTED.
DISS. OR D = DISSOLVED
T & D = TOTAL AND DISSOLVED
R = REACTIVE
T = TOTAL
G = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE RESULT IS AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "IN CONTROL".
Q = THE ANALYTICAL (POST-DIGESTION) SPIKE IS REPORTED DUE TO PERCENT RECOVERY BEING OUTSIDE ACCEPTANCE LIMITS ON THE MATRIX (PRE-DIGESTION) SPIKE.
# = ELEVATED REPORTING LIMIT DUE TO INSUFFICIENT SAMPLE.
+ = ELEVATED REPORTING LIMIT DUE TO DILUTION INTO CALIBRATION RANGE.
* = ELEVATED REPORTING LIMIT DUE TO MATRIX INTERFERENCE. (DILUTION PRIOR TO ANALYSIS)
@ = ADJUSTED REPORTING LIMIT DUE TO SAMPLE MATRIX. (DILUTION PRIOR TO DIGESTION)
P = ANALYTICAL (POST DIGESTION) SPIKE.
I = DUPLICATE INJECTION.
& = AUTOMATED
F = SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.
N/C+ = NOT CALCULABLE
N/C* = NOT CALCULABLE; SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.
H = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".
A = SAMPLE AND DUPLICATE RESULTS ARE "OUT OF CONTROL".
Z = THE SAMPLE RESULT FOR THE SPIKE IS BELOW THE REPORTING LIMIT. HOWEVER, THIS RESULT IS REPORTED FOR ACCURATE QC CALCULATIONS.
NH= SAMPLE AND / OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL". SAMPLE IS NON-HOMOGENEOUS.
J = (FLORIDA DEP 'J' FLAG) - MATRIX SPIKE AND POST SPIKE RECOVERY IS OUT OF THE ACCEPTABLE RANGE. SEE OUT OF CONTROL EVENTS FORM.
S = METHOD OF STANDARD ADDITIONS (MSA) WAS PERFORMED ON THIS SAMPLE.

FROM ANALYSIS REPORT:
RL= REPORTING LIMIT BASED ON METHOD DETECTION LIMIT STUDIES.
Q= QUALIFIER (FOOTNOTE)

FROM QUALITY CONTROL REPORT:
RPD= RELATIVE PERCENT DEVIATION.
RPT LIMIT= REPORTING LIMIT BASED ON METHOD DETECTION LIMIT STUDIES.

NOTE: THE UNITS REPORTED ON THE QUALITY CONTROL REPORT ARE REPORTED ON AN AS RUN BASIS.

SW-846, 3rd Edition, September 1986 and Revision 1, July 1992.
EPA 600/4-79-020, Revised March 1983.
NIOSH Manual of Analytical Methods, 3rd Edition.

GJ = GARY JACOBS
JLH = JAMES L. HERED
JL = JOHN LOHR
JR = JOHN REED
JMP = JACQUELINE M. PRICE

Analytical**Technologies,**Inc. Albuquerque, NM

Chain of Custody

DATE _____ PAGE ___ OF ___

NETWORK PROJECT MANAGER: ~~LETITIA KRAKOWSKI~~ Kim McNeill

COMPANY: **Analytical Technologies, Inc.**

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: KMcNeill

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
509350-03	9/13	0917	AQ	01

ANALYSIS REQUEST

TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	632/632 MOD	619/619 MOD	610/8310 + 1 methyl naphthalene + 2 methyl naphthalene	8240 (TCLP 1311) ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS

PROJECT INFORMATION

PROJECT NUMBER: 509350
PROJECT NAME: NMOCD
QC LEVEL: (STD.) IV
QC REQUIRED: MS MSD BLANK
TAT: STANDARD (RUSH!)

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	2
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y/Y
LAB NUMBER	509146

DUE DATE: 9/20
RUSH SURCHARGE: 25
CLIENT DISCOUNT: Quote %

Cooler ABQ 48 = 3.9°C

SAMPLES SENT TO:

SAN DIEGO	X
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
PHOENIX	
FIBERQUANT	

RELINQUISHED BY: 1.
Signature: KMcNeill Time: 530
Printed Name: KMcNeill Date: 9/18
Analytical Technologies, Inc. Albuquerque

RECEIVED BY: (LAB) 1.
Signature: Time:
Printed Name: Date:
Company:

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date
Company:

RECEIVED BY: (LAB) 2.
Signature: Time: 08:50
Printed Name: LISA J Tucker Date: 9-16-15
Company: ATI-SD

Analytical**Technologies,**Inc. Albuquerque, NM

Chain of Custody 5094G3

DATE 9/15 PAGE 1 OF 1

NETWORK PROJECT MANAGER: ~~LETITIA KRAKOWSKI~~ Kim McNeill

COMPANY: **Analytical Technologies, Inc.**

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: KMcNeill

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	632/632 MOD	619/619 MOD	610/8310	metals by 6010: Al,Sb,As,Ba,Be,B,	Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,	~~8240 TCLP 1311 ZHE~~ Mo,Ni,K,Se,Si	Ag,Na,Tl,V,Zn	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
509350-01	9/13	0910	AQ										X	X	X	X															

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NUMBER: 509350		TOTAL NUMBER OF CONTAINERS	
PROJECT NAME: NMOCD		CHAIN OF CUSTODY SEALS	
QC LEVEL: (STD.) IV		INTACT?	
QC REQUIRED: MS MSD BLANK		RECEIVED GOOD COND./COLD	
TAT: STANDARD (RUSH)		LAB NUMBER	

DUE DATE: 9/20/95
RUSH SURCHARGE: 25
CLIENT DISCOUNT: Quote %

Sent on Mitch's approval
IWO# IM922 HMR

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	X
PORTLAND	
PHOENIX	
FIBERQUANT	

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: KMcNeill Time: 5'0	Signature: Time:
Printed Name: KMcNeill Date: 9/15/95	Printed Name: Date
Analytical Technologies, Inc. Albuquerque	Company:
RECEIVED BY: (LAB) 1.	**RECEIVED BY: (LAB) 2.**
Signature: Linda Kitt Time: 0935	Signature: Time:
Printed Name: Linda Kitt Date: 9/16/95	Printed Name: Date:
Company: ATI/Pensacola	Company:

Analytical**Technologies,**Inc. Albuquerque, NM

Chain of Custody

DATE _____ PAGE ___ OF ___

NETWORK PROJECT MANAGER: ~~LETITIA KRAKOWSKI~~ Kim McNeill

COMPANY: **Analytical Technologies, Inc.**

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: KMcNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	Gen chem	632/632 MOD	619/619 MOD	610/8310			8240 (TCLP 1311) ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
509350-01	9/13	0910	AQ	1						X						8021 - may have high levels of aromatics														1
-02	↓	0915	↓	2												X														3

PROJECT INFORMATION

PROJECT NUMBER: 509350
PROJECT NAME: NMOCD
QC LEVEL: (STD.) IV
QC REQUIRED: MS MSD BLANK
TAT: STANDARD (RUSH)

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	4
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	BLUE
LAB NUMBER	509724

DUE DATE: 9/20
RUSH SURCHARGE: 25
CLIENT DISCOUNT: Quote %

Gen chem: F, Bromide, Bicarbonate Carbonate, Chloride, Sulfate TDS, cation/anion (will send results to you) pH, Conductiv.

SAMPLES SENT TO:

SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
PHOENIX	X
FIBERQUANT	

RELINQUISHED BY: 1.
Signature: KMcNeill Time: 520
Printed Name: KMcNeill Date: 9/18
Analytical Technologies, Inc. Albuquerque

RECEIVED BY: (LAB) 1.
Signature: Time:
Printed Name: Date:
Company:

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date
Company:

RECEIVED BY: (LAB) 2.
Signature: Heather L Oschger Time: 1042
Printed Name: Heather L Oschger Date: 9/16/95
Company:

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

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CHAIN OF CUSTODY

DATE: 9/13/95 PAGE 1 OF 1

ATI LAB I.D. 509350

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: MARK ASHLEY

COMPANY: NMOCD
ADDRESS: 2040 South Pacheco
SANTA FE, NM 87505
PHONE: (505)-827-7156
FAX: (505)-827-8177

BILL TO: SAME
COMPANY:
ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	GENERAL CHEM 9/15/95	502.2 9/15/95	Chlorinated Hydrocarbons (601/~~8010~~) 502.2	Aromatic Hydrocarbons (602/~~8020~~) 5	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/~~8310~~)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
9509130910	9/13	0910	H20	-01					✓																							1
9509130910	"	0910	"																											✓		1
9509130915	"	0915	"	-02							✓	✓																				3
9509130917	"	0917	"	-03																✓												2

PROJECT INFORMATION

PROJ. NO.:
PROJ. NAME: Lovington #6
P.O. NO.:
SHIPPED VIA:

SAMPLE RECEIPT

NO. CONTAINERS	7
CUSTODY SEALS	Y / N / NA
RECEIVED INTACT	Y
RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☑ 2 WEEK

Comments: 9/15/95 9/15/95

SAMPLED & RELINQUISHED BY: 1.

Signature: Time: 5:06 pm
Printed Name: Patricia W. Sanchez Date: 9/15/95
Company: NMOCD Phone: (505)-827-7156

RELINQUISHED BY: 2.

Signature: Time:
Printed Name: Date:
Company:

RELINQUISHED BY: 3.

Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: 1.

Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: 2.

Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY:(LAB) 3.

Signature: Time: 1630
Printed Name: Andrew Parker Date: 9/15
Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

AnalyticalTechnologies, Inc., Albuquerque, NM

San Diego ▪ Phoenix ▪ Seattle ▪ Pensacola ▪ Ft. Collins ▪ Portland ▪ Albuquerque

CHAIN OF CUSTODY

DATE:_____ PAGE_____ OF_____

ATI LAB I.D.

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: _____

ADDRESS: _____

_____

PHONE: _____

FAX: _____

BILL TO: _____

COMPANY: _____

ADDRESS: _____

_____

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID

Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)			Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:		NO. CONTAINERS	/
PROJ. NAME:		CUSTODY SEALS	Y / N / NA
P.O. NO.:		RECEIVED INTACT	
SHIPPED VIA:		RECEIVED COLD	/

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐ 2 WEEK

Comments:

SAMPLED & RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
Signature:	Time:	Signature:	Time:	Signature:	Time:
Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
Company:	Phone:	Company:		Company:	

RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY:(LAB) 3.	
Signature:	Time:	Signature:	Time:	Signature:	Time:
Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
Company:		Company:		Analytical Technologies, Inc.	

Analytical**Technologies,** Inc.
2709-D Pan American Freeway, NE Albuquerque, NM 87107

FAX TRANSMITTAL SHEET

DELIVER TO: MARK ASHLEY **PHONE NUMBER:** _____

FAX NUMBER: _____

COMPANY: _____

NUMBER OF PAGES BEING SENT: 5 (INCLUDING THIS PAGE)

FROM: **DATE:** 9/20

TIME: 4:00 p

_____ H. Mitchell Rubenstein, Ph.D., Lab Manager
__X__ Kimberly D. McNeill, Project Manager
_____ Andrew Parker
_____ Peggy Norton
_____

FAX NUMBER: (505) 344-4413

COMMENTS: Prelims for most of the Gen chem.

If you did not receive all pages of this transmission or if you experience Fax Transmission problems, Please call **(505) 344-3777**, as soon as possible after receipt.

CLIENT : ANALYTICAL TECHNOLOGIES, INC-NM DATE RECEIVED : 09/16/95
PROJECT # : 509350
PROJECT NAME : NMOCD REPORT DATE : 09/20/95
ATI I.D. : 509724

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	509350-01	AQUEOUS	09/13/95
02	509350-02	AQUEOUS	09/13/95

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 509724

CLIENT : ANALYTICAL TECHNOLOGIES, INC-NM
PROJECT # : 509350
PROJECT NAME : NMOCD

DATE RECEIVED : 09/16/95
REPORT DATE : 09/20/95

PARAMETER	UNITS	01
CARBONATE (CACO3)	MG/L	<1
BICARBONATE (CACO3)	MG/L	180
HYDROXIDE (CACO3)	MG/L	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	180
BROMIDE (EPA 300.0)	MG/L	8.0
CHLORIDE (EPA 325.2)	MG/L	3400
CONDUCTIVITY, (UMHOS/CM)		9560
FLUORIDE (EPA 340.2)	MG/L	1.06
PH (EPA 150.1)	UNITS	7.3
SULFATE (EPA 375.2)	MG/L	
T. DISSOLVED SOLIDS (160.1)	MG/L	

PRELIMINARY

509724-2

M502

*** DIL. FACTOR : 25 ***

01	VINYL CHLORIDE	01		UG/L	(0.5
02	BENZENE	02	1600	UG/L	(0.5
03	CARBON TETRACHLORIDE	03		UG/L	(0.5
04	1,2-DICHLOROETHANE	04		UG/L	(0.5
05	TRICHLOROETHYLENE (TCE)	05		UG/L	(0.5
06	PARA-DICHLOROBENZENE	06		UG/L	(0.5
07	1,1-DICHLOROETHYLENE	07		UG/L	(0.5
08	1,1,1-TRICHLOROETHANE	08		UG/L	(0.5
09	CIS-1,2-DICHLOROETHYLENE	09		UG/L	(0.5
10	1,2-DICHLOROPROPANE	10		UG/L	(0.5
11	ETHYLBENZENE	11	108	UG/L	(0.5
12	CHLOROBENZENE	12		UG/L	(0.5
13	ORTHO-DICHLOROBENZENE	13		UG/L	(0.5
14	TETRACHLOROETHYLENE	14		UG/L	(0.5
15	TOLUENE	15	3600	UG/L	(0.5
16	TRANS-1,2-DICHLOROETHYLENE	16		UG/L	(0.5
17	META,PARA-XYLENE (TOTAL)	17	46	UG/L	(0.5
18	O-XYLENE/STYRENE	18	20	UG/L	(0.5
19	CHLOROMETHANE	19		UG/L	(5
20	BROMOMETHANE	20		UG/L	(2
21	CHLOROETHANE	21		UG/L	(2
22	DIBROMOMETHANE	22		UG/L	(0.5
23	1,1-DICHLOROPROPENE	23		UG/L	(0.5
24	1,3-DICHLOROPROPANE	24		UG/L	(0.5
25	1,2,3-TRICHLOROPROPANE	25		UG/L	(0.5
26	2,2-DICHLOROPROPANE	26		UG/L	(0.5
27	CHLOROFORM	27		UG/L	(0.5
28	BROMOFORM	28		UG/L	(0.5
29	BROMODICHLOROMETHANE	29		UG/L	(0.5
30	CHLORODIBROMOMETHANE	30		UG/L	(0.5
31	DICHLOROMETHANE	31		UG/L	(2
32	ORTHO-CHLOROTOLUENE	32		UG/L	(0.5
33	PARA-CHLOROTOLUENE	33		UG/L	(0.5
34	META-DICHLOROBENZENE	34		UG/L	(0.5
35	1,1-DICHLOROETHANE	35		UG/L	(0.5
36	1,1,2-TRICHLOROETHANE	36		UG/L	(0.5
37	1,1,1,2-TETRACHLOROETHANE	37		UG/L	(0.5
38	1,1,2,2-TETRACHLOROETHANE	38		UG/L	(0.5
39	BROMOBENZENE	39		UG/L	(0.5
40	DICHLORODIFLUOROMETHANE	40		UG/L	(5
41	TRICHLOROFLUOROMETHANE	41		UG/L	(0.5
42	BROMOCHLOROMETHANE	42		UG/L	(0.5
43	1,2-DIBROMOETHANE	43		UG/L	(0.5
44	ISO-PROPYLBENZENE	44		UG/L	(0.5
45	N-PROPYLBENZENE	45		UG/L	(0.5
46	1,3,5-TRIMETHYLBENZENE	46		UG/L	(0.5
47	1,2,4-TRIMETHYLBENZENE	47		UG/L	(0.5
48	TERT-BUTYLBENZENE	48		UG/L	(0.5
49	SEC-BUTYLBENZENE	49	32	UG/L	(0.5
50	P-ISOPROPYLTOLUENE	50		UG/L	(0.5
51	N-BUTYLBENZENE	51		UG/L	(0.5
52	1,2-DIBROMO-3-CHLOROPROPANE	52		UG/L	(0.5
53	1,2,4-TRICHLOROBENZENE	53		UG/L	(0.5
54	NAPHTHALENE	54		UG/L	(0.5
55	1,2,3-TRICHLOROBENZENE	55		UG/L	(0.5
56	HEXACHLOROBUTADIENE	56		UG/L	(0.5
57	TRANS-1,3-DICHLOROPROPENE	57		UG/L	(0.5
58	CIS-1,3-DICHLOROPROPENE	58		UG/L	(0.5
59	1-CHLORO-2-FLUOROBENZENE (PID) %	59	90	%	
60	BROMOFLUOROBENZENE (HALL) %	60	CA 113	%	

DATE ANALYZED: 9/19/95 ANALYST INITIALS: CA

PRELIMINARY

PRELIMINARY

AnalyticalTechnologies,Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 9/13/95 PAGE 1 OF 1

ATI LAB I.D. 509350

PROJECT MANAGER: MARK ASHLEY

COMPANY: NMOCD
ADDRESS: 2040 South Pacheco
SANTA FE, NM 87505
PHONE: (505)-827-7156
FAX: (505)-827-8177

BILL TO: SAME
COMPANY:
ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	GENERAL CHEM		Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
9509130910	9/13	0910	H2O	-01					✓																								1
9509130910	"	0910	"																											✓			1
9509130915	"	0915	"	-02							✓	✓																					3
9509130917	"	0917	"	-03																✓													2

502.2

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:		NO. CONTAINERS	7
PROJ. NAME: Lovington #6		CUSTODY SEALS	Y/N/NA
P.O. NO.:		RECEIVED INTACT	Y
SHIPPED VIA:		RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☑ 2 WEEK

Comments: 9/15/95 9/15/95

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2	RELINQUISHED BY: 3.
Signature: Time: 5:06 pm	Signature: Time:	Signature: Time:
Printed Name: Patricio W. Sanchez Date: 9/15/95	Printed Name: Date:	Printed Name: Date:
Company: NMOCD Phone: (505)-827-7156	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 1630
Printed Name: Date:	Printed Name: Date:	Printed Name: Andrea Balet Date: 9/15
Company:	Company:	Analytical Technologies, Inc.

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

Analytical Technologies, Inc.

FAX TRANSMITTAL SHEET

DELIVER TO: Mark Ashley

DATE: 9/20/95

TIME: 8⁰⁰ AM

SENT FROM: Kim McNeill

FAX PHONE NUMBER USED: (505) 827-8177

NUMBER OF PAGES SENT: 3

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FAX NUMBER: (505) 344-4413

COMMENTS: Preliminaries for metals. I will send ~~the~~ more data to you as I receive it.

IF YOU DID NOT RECEIVE ALL PAGES OF THIS TRANSMISSION OR IF YOU EXPERIENCE FAX TRANSMISSION PROBLEMS, PLEASE CALL (505) 344-3777, AS SOON AS POSSIBLE AFTER RECEIPT.

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CHAIN OF CUSTODY

DATE: 9/13/95 PAGE 1 OF 1

ATI LAB I.D. 5091350

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: MARK ASHLEY

COMPANY: NMOCD
ADDRESS: 2040 South Pacheco
SANTA FE, NM 87505
PHONE: (505)-827-7156
FAX: (505)-827-8177

BILL TO: SAME
COMPANY:
ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	GENERAL CHEM	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	RCRA Metals by Total Digestion	Polynuclear Aromatics (610/8310)	NUMBER OF CONTAINERS
9509130910	9/13	0910	H2O	-01	✓					1
9509130910	"	0910	"					✓		1
9509130915	"	0915	"	-02		✓	✓			3
9509130917	"	0917	"	-03					✓	2

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:		NO. CONTAINERS	7
PROJ. NAME: Lovington #6		CUSTODY SEALS	(Y) N/A
P.O. NO.:		RECEIVED INTACT	Y
SHIPPED VIA:		RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐24hr ☐48hr ☐72hr ☐1 WEEK (NORMAL) ☒2 WEEK

Comments: PWS 9/15/95 PWS 9/15/95

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 5:06 pm	Signature: Time:	Signature: Time:
Printed Name: Patricia W. Sanchez Date: 9/15/95	Printed Name: Date:	Printed Name: Date:
Company: NMOCD Phone: (505)-827-7156	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 1630
Printed Name: Date:	Printed Name: Date:	Printed Name: Andrew Lodge Date: 9/15
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

SEP 20 '95 07:09AM ATI ALBUQUERQUE P.2/3

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

"PRELIMINARY RESULTS ONLY - SINGLE"

Accession: 509463
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 509350
Project Name: MMOCO
Project Location: M/S
Test: Group of Single Metals
Matrix: WATER
QC Level: II

Lab Id: 001
Client Sample Id: 509350-01
Sample Date/Time: 13-SEP-95 0910
Received Date: 16-SEP-95

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
SILVER (6010)	MG/L	ND	0.01		A6W204	JR
ALUMINUM (6010)	MG/L	ND	0.06		L6W204	JR
ARSENIC (6010)	MG/L	ND	0.05		R6W204	JR
BORON (6010)	MG/L	1.2	0.09		O6W204	JR
BARIUM (6010)	MG/L	0.17	0.01		B6W204	JR
BERYLLIUM (6010)	MG/L	ND	0.004		Y6W204	JR
CALCIUM (6010)	MG/L	390	1		I6W204	JR
CADMIUM (6010)	MG/L	ND	0.005		C6W204	JR
COBALT (6010)	MG/L	ND	0.01		T6W204	JR
CHROMIUM (6010)	MG/L	ND	0.01		H6W204	JR
COPPER (6010)	MG/L	0.01	0.01		F6W204	JR
IRON (6010)	MG/L	ND	0.02		N6W204	JR
POTASSIUM (6010)	MG/L	26	2		X6W204	JR
MAGNESIUM (6010)	MG/L	90	0.2		J6W204	JR
MANGANESE (6010)	MG/L	0.07	0.01		G6W204	JR
MOLYBDENUM (6010)	MG/L	ND	0.01		D6W204	JR
SODIUM (6010)	MG/L	1900	1	+	16W204	JR
NICKEL (6010)	MG/L	ND	0.02		E6W204	JR
LEAD (6010)	MG/L	ND	0.05		P6W204	JR
ANTIMONY (6010)	MG/L	ND	0.06		36W204	JR
SELENIUM (6010)	MG/L	ND	0.1		S6W204	JR
SILICON (6010)	MG/L	19	0.5	+	26W204	JR
THALLIUM (6010)	MG/L	ND	0.1		46W204	JR
VANADIUM (6010)	MG/L	0.04	0.01		V6W204	JR
ZINC (6010)	MG/L	0.03	0.02		56W204	JR

Comments:

Analytical Technologies, Inc.

FAX TRANSMITTAL SHEET

DELIVER TO: Mark Ashley

DATE: 9/20

TIME: 3:00

SENT FROM: Kim McNeill

FAX PHONE NUMBER USED: (505) 827-8177

NUMBER OF PAGES SENT: 3

HARD COPY TO FOLLOW

FAX NUMBER: (505) 344-4413

COMMENTS: 8310 / 610 results for Lovington #6

IF YOU DID NOT RECEIVE ALL PAGES OF THIS TRANSMISSION OR IF YOU EXPERIENCE FAX TRANSMISSION PROBLEMS, PLEASE CALL (505) 344-3777, AS SOON AS POSSIBLE AFTER RECEIPT.

GAS CHROMATOGRAPHY RESULTS

Test : EPA 8310 (POLYNUCLEAR AROMATIC HYDROCARBONS)
Client : ANALYTICAL TECHNOLOGIES, INC. ATI I.D. : 509146
Project # : 509350
Project Name: NMOCD

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
1	509350-03	WATER	13-SEP-95	18-SEP-95	20-SEP-95	1.00

Parameter	Units	1
NAPHTHALENE	UG/L	2.8
1-METHYLNAPHTHALENE	UG/L	3.5
2-METHYLNAPHTHALENE	UG/L	2.1
ACENAPHTHYLENE	UG/L	2.2
ACENAPHTHENE	UG/L	<1.0
FLUORENE	UG/L	<0.10
PHENANTHRENE	UG/L	<0.050
ANTHRACENE	UG/L	<0.050
FLUORANTHENE	UG/L	<0.10
PYRENE	UG/L	<0.10
BENZO(a)ANTHRACENE	UG/L	<0.10
CHRYSENE	UG/L	<0.10
BENZO(b)FLUORANTHENE	UG/L	<0.10
BENZO(k)FLUORANTHENE	UG/L	<0.10
BENZO(a)PYRENE	UG/L	<0.10
DIBENZO(a,h)ANTHRACENE	UG/L	<0.20
BENZO(g,h,i)PERYLENE	UG/L	<0.10
INDENO(1,2,3-cd)PYRENE	UG/L	<0.10
SURROGATES		
2-CHLOROANTHRACENE	%	75

Analytical**Technologies,**Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 9/13/95 PAGE 1 OF 1

ATI LAB ID: 509350

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: MARK ASHLEY

COMPANY: NMOCD
ADDRESS: 2040 South Pacheco
SANTA FE, NM 87505
PHONE: (505)-827-7156
FAX: (505)-827-8177

BILL TO: SAME
COMPANY:
ADDRESS:

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
9509130910	9/13	0910	H2O	-01
9509130910	"	0910	"	-02
9509130915	"	0915	"	-03
9509130917	"	0917	"	-04

ANALYSIS REQUEST

Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	GENERAL CHEM	Chlorinated Hydrocarbons (601/8010) 502.2	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal	The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)	NUMBER OF CONTAINERS
				✓	✓	✓												✓		1
					✓	✓						✓								3
																				2

SEP 20 '95 02:12PM ATI ALBUQUERQUE P.3/3

PROJECT INFORMATION

PROJ. NO.:
PROJ. NAME: Lovington #6
P.O. NO.:
SHIPPED VIA:

SAMPLE RECEIPT

NO. CONTAINERS	7
CUSTODY SEALS	Y / N / NA
RECEIVED INTACT	Y
RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments: 9/15/95 9/15/95

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 5:00 pm	Signature: Time:	Signature: Time:
Printed Name: Patricia W. Sanchez Date: 9/15/95	Printed Name: Date:	Printed Name: Date:
Company: NMOCD Phone: (505)-827-7156	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 1630
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: 9/15
Company:	Company:	Company: Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

Analytical**Technologies,**Inc.
2709-D Pan American Freeway, NE Albuquerque, NM 87107

FAX TRANSMITTAL SHEET

DELIVER TO: Mark Ashley

PHONE NUMBER: 827 7156

FAX NUMBER: 827-8177

COMPANY: NMOCD

NUMBER OF PAGES BEING SENT: 3 (INCLUDING THIS PAGE)

FROM:

DATE: 9/21

TIME: 12 noon

	H. Mitchell Rubenstein, Ph.D., Lab Manager
X	Kimberly D. McNeill, Project Manager
	Andrew Parker
	Peggy Norton

FAX NUMBER: (505) 344-4413

COMMENTS: Last of your preliminary results - TDS & Sulfate.

If you did not receive all pages of this transmission or if you experience Fax Transmission problems, Please call **(505) 344-3777**, as soon as possible after receipt.

Analytical**Technologies**, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 9/13/95 PAGE 1 OF 1

ATI LAB I.D. 509350

PROJECT MANAGER: MARK ASHLEY

COMPANY: NMOCD
ADDRESS: 2040 South Pacheco
SANTA FE, NM 87505
PHONE: (505)-827-7156
FAX: (505)-827-8177

BILL TO: SAME
COMPANY:
ADDRESS:

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
9509130910	9/13	0910	H20	-01
9509130910	"	0910	"	
9509130915	"	0915	"	-02
9509130917	"	0917	"	-03

ANALYSIS REQUEST

	NUMBER OF CONTAINERS
GENERAL CHEM	1
RCRA Metals by Total Digestion	1
Chlorinated Hydrocarbons (601/8010) 502.2	3
Aromatic Hydrocarbons (602/8020)	
Polynuclear Aromatics (610/8310)	2

Petroleum Hydrocarbons (418.1); (MOD 8015) Gas/Diesel; Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020); BTXE/MTBE (8020); SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.; Pesticides/PCB (608/8080); Herbicides (615/8150); Base/Neutral/Acid Compounds GC/MS (625/8270); Volatile Organics GC/MS (624/8240); SDWA Primary Standards - Arizona; SDWA Secondary Standards - Arizona; SDWA Primary Standards - Federal; SDWA Secondary Standards - Federal; The 13 Priority Pollutant Metals; RCRA Metals by TCLP (1311)

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:		NO. CONTAINERS:	4
PROJ. NAME:	Lovington #6	CUSTODY SEALS:	Y / N / NA
P.O. NO.:		RECEIVED INTACT:	Y
SHIPPED VIA:		RECEIVED COLD:	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments: 9/15/95 9/15/95

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature:	Signature:	Signature:
Time: 5:06 pm	Time:	Time:
Printed Name: Patricia W. Saenz	Printed Name:	Printed Name:
Date: 9/15/95	Date:	Date:
Company: NMOCD	Company:	Company:
Phone: (505)-827-7156		

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY (LAB) 3.
Signature:	Signature:	Signature: Time: 1630
Printed Name:	Printed Name:	Printed Name: Date: 9/15
Date:	Date:	
Company:	Company:	Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 509724

CLIENT : ANALYTICAL TECHNOLOGIES, INC-NM
PROJECT # : 509350
PROJECT NAME : NMOCD

DATE RECEIVED : 09/16/95
REPORT DATE : 09/20/95

PARAMETER	UNITS	01
CARBONATE (CACO3)	MG/L	<1
BICARBONATE (CACO3)	MG/L	180
HYDROXIDE (CACO3)	MG/L	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	180
BROMIDE (EPA 300.0)	MG/L	8.0
CHLORIDE (EPA 325.2)	MG/L	3400
CONDUCTIVITY, (UMHOS/CM)		9560
FLUORIDE (EPA 340.2)	MG/L	1.06
PH (EPA 150.1)	UNITS	7.3
SULFATE (EPA 375.2)	MG/L	460
T. DISSOLVED SOLIDS (160.1)	MG/L	6200

PRELIMINARY

RICE OBSPOSAL
9-15-93

ASCE DISPOSAL
CONTAMINATED SOILS
FROM LOUISVILLE KY
9/13/95

AFTER ~2" OF RAIN

RICE DISPOSAL
CONTAMINATED SOILS
FROM LOCATION #1
9-15-95

AFTER ~)" OF RAIN


RICE ENGINEERING CORPORATION
ABO SWD SYSTEM
WELL NO. F-31
SE/4 NW/4, SEC. 31-T16S-R37E
DISPOSAL ORDER NO. SWD-644
CAUTION
CAUTION

9-15-95

LOCATION #6

EXCAVATION COVERED
DURING RAIN

9-15-95

LOVINGTON #6

EXCAVATION COVERED
DURING RAIN
9-15-95

LOVINGTON #1
EXCAVATION CONTROL
DURING ROAD
9-15-95

LOVELETON #6

EXCAVATION COVERED

OVERNIGHT RAIN

9-15-95

LOVINGTON #6

EXCAVATION COVERED

DURING RAIN

9-15-95

ASCE DISPOSAL
SWD PIT
9-15-95

RICE DISPOSAL
SWD PIT
9-15-95

JUNE 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)
06/01/96	8	14,400	30	Ground water recovered with submersible pump						
06/02/96	8	14,400	30	"			"			
06/03/96	8	14,400	30	"			"			
06/04/96	8	14,400	30	"			"			
06/05/96	8	14,400	30	"			"			
06/06/96	8	14,400	30	"			"			
06/07/96	8	14,400	30	582	1070	N/A	N/A	N/A	N/A	N/A
06/08/96	8	14,400	30	"			"			
06/09/96	8	14,400	30	"			"			
06/10/96	8	14,400	30	"			"			
06/11/96	8	14,400	30	"			"			
06/12/96	8	14,400	30	Ground water recovered with submersible pump						
06/13/96	8	14,400	30	384	1250	N/A	N/A	N/A	N/A	N/A
06/14/96	8	14,400	30	Ground water recovered with submersible pump						
06/15/96	8	14,400	30	"			"			
06/16/96	8	14,400	30	"			"			
06/17/96	8	14,400	30	"			"			
06/18/96	8	14,400	30	"			"			
06/19/96	8	14,400	30	"			"			
06/20/96	8	14,400	30	"			"			
06/21/96	8	14,400	30	388	1214	N/A	N/A	N/A	N/A	N/A
06/22/96	8	14,400	30	Ground water recovered with submersible pump						
06/23/96	8	14,400	30	"			"			
06/24/96	8	14,400	30	"			"			
06/25/96	8	14,400	30	"			"			
06/26/96	8	14,400	30	"			"			
06/27/96	8	14,400	30	"			"			
06/28/96	8	14,400	30	"			"			
06/29/96	8	14,400	30	"			"			
06/30/96	8	14,400	30	"			"			
JUN 96				AVERAGE ANALYTICAL RESULT						
TOTALS	240	432,000	30	451	1178	N/A	N/A	N/A	N/A	N/A

JULY 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)
07/01/96	8	14,400	30	Ground water recovered with submersible pump						
07/02/96	8	14,400	30	"			"			
07/03/96	8	14,400	30	"			"			
07/04/96	8	14,400	30	"			"			
07/05/96	8	14,400	30	"			"			
07/06/96	8	14,400	30	"			"			
07/07/96	8	14,400	30	"			"			
07/08/96	8	14,400	30	"			"			
07/09/96	8	14,400	30	"			"			
07/10/96	8	14,400	30	"			"			
07/11/96	8	14,400	30	"			"			
07/12/96	8	14,400	30	"			"			
07/13/96	8	14,400	30	"			"			
07/14/96	8	14,400	30	"			"			
07/15/96	8	14,400	30	"			"			
07/16/96	8	14,400	30	"			"			
07/17/96	8	14,400	30	"			"			
07/18/96	8	14,400	30	"			"			
07/19/96	8	14,400	30	"			"			
07/20/96	8	14,400	30	"			"			
07/21/96	8	14,400	30	"			"			
07/22/96	8	14,400	30	"			"			
07/23/96	8	14,400	30	"			"			
07/24/96	8	14,400	30	"			"			
07/25/96	8	14,400	30	358	1116	N/A	N/A	N/A	N/A	N/A
07/26/96	8	14,400	30	Ground water recovered with submersible pump						
07/27/96	8	14,400	30	"			"			
07/28/96	8	14,400	30	"			"			
07/29/96	8	14,400	30	"			"			
07/30/96	8	14,400	30	"			"			
07/31/96	8	14,400	30	"			"			
JUL 96 TOTALS	248	446,400	30	AVERAGE ANALYTICAL RESULT						
				358	1116	N/A	N/A	N/A	N/A	N/A

AUGUST 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)
08/01/96	8	14,400	30	Ground water recovered with submersible pump						
08/02/96	8	14,400	30	342	946	N/A	N/A	N/A	N/A	N/A
08/03/96	8	14,400	30	Ground water recovered with submersible pump						
08/04/96	8	14,400	30	"			"			
08/05/96	8	14,400	30	"			"			
08/06/96	8	14,400	30	"			"			
08/07/96	8	14,400	30	"			"			
08/08/96	8	14,400	30	"			"			
08/09/96	8	14,400	30	"			"			
08/10/96	8	14,400	30	"			"			
08/11/96	8	14,400	30	"			"			
08/12/96	8	14,400	30	"			"			
08/13/96	8	14,400	30	"			"			
08/14/96	8	14,400	30	"			"			
08/15/96	8	14,400	30	"			"			
08/16/96	8	14,400	30	360	1005	N/A	N/A	N/A	N/A	N/A
08/17/96	8	14,400	30	Ground water recovered with submersible pump						
08/18/96	8	14,400	30	"			"			
08/19/96	8	14,400	30	"			"			
08/20/96	8	14,400	30	"			"			
08/21/96	8	14,400	30	"			"			
08/22/96	8	14,400	30	"			"			
08/23/96	8	14,400	30	"			"			
08/24/96	8	14,400	30	"			"			
08/25/96	8	14,400	30	"			"			
08/26/96	8	14,400	30	"			"			
08/27/96	8	14,400	30	"			"			
08/28/96	8	14,400	30	"			"			
08/29/96	8	14,400	30	"			"			
08/30/96	8	14,400	30	379	760	N/A	N/A	N/A	N/A	N/A
08/31/96	8	14,400	30	Ground water recovered with submersible pump						
AUG 96 TOTALS	248	446,400	30	AVERAGE ANALYTICAL RESULT						
				360	904	N/A	N/A	N/A	N/A	N/A

SEPTEMBER 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)
09/01/96	8	14,400	30	Ground water recovered with submersible pump						
09/02/96	8	14,400	30	"			"			
09/03/96	8	14,400	30	"			"			
09/04/96	8	14,400	30	"			"			
09/05/96	8	14,400	30	"			"			
09/06/96	8	14,400	30	"			"			
09/07/96	8	14,400	30	"			"			
09/08/96	8	14,400	30	"			"			
09/09/96	8	14,400	30	"			"			
09/10/96	8	14,400	30	"			"			
09/11/96	8	14,400	30	"			"			
09/12/96	8	14,400	30	"			"			
09/13/96	8	14,400	30	356	952	N/A	N/A	N/A	N/A	N/A
09/14/96	8	14,400	30	Ground water recovered with submersible pump						
09/15/96	8	14,400	30	"			"			
09/16/96	8	14,400	30	"			"			
09/17/96	0	0	0	Recovery well shut-in.						
09/18/96	0	0	0	"	"					
09/19/96	0	0	0	"	"					
09/20/96	0	0	0	"	"					
09/21/96	0	0	0	"	"					
09/22/96	0	0	0	"	"					
09/23/96	0	0	0	"	"					
09/24/96	0	0	0	"	"					
09/25/96	0	0	0	"	"					
09/26/96	0	0	0	"	"					
09/27/96	0	0	0	"	"					
09/28/96	0	0	0	"	"					
09/29/96	0	0	0	"	"					
09/30/96	0	0	0	"	"					
SEP 96				AVERAGE ANALYTICAL RESULT						
TOTALS	128	230,400	30	356	952	N/A	N/A	N/A	N/A	N/A

OCTOBER 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)
10/01/96	0	0	0	Recovery well shut-in.						
10/02/96	0	0	0	"	"					
10/03/96	0	0	0	"	"					
10/04/96	0	0	0	Gauged MW-1, MW-2, MW-3 and COL-6						
10/05/96	0	0	0	"	"					
10/06/96	0	0	0	"	"					
10/07/96	0	0	0	"	"					
10/08/96	0	0	0	"	"					
10/09/96	0	0	0	"	"					
10/10/96	0	0	0	"	"					
10/11/96	0	0	0	"	"					
10/12/96	0	0	0	"	"					
10/13/96	0	0	0	"	"					
10/14/96	0	0	0	"	"					
10/15/96	0	0	0	"	"					
10/16/96	0	0	0	Gauged MW-1, MW-2, MW-3 and COL-6						
10/17/96	0	0	0	"	"					
10/18/96	0	0	0	"	"					
10/19/96	0	0	0	"	"					
10/20/96	0	0	0	"	"					
10/21/96	0	0	0	"	"					
10/22/96	0	0	0	"	"					
10/23/96	0	0	0	"	"					
10/24/96	0	0	0	"	"					
10/25/96	0	0	0	"	"					
10/26/96	0	0	0	"	"					
10/27/96	0	0	0	"	"					
10/28/96	0	0	0	"	"					
10/29/96	0	0	0	"	"					
10/30/96	0	0	0	"	"					
10/31/96	0	0	0	Recovery well shut-in.						
OCT 96				AVERAGE ANALYTICAL RESULT						
TOTALS	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NOVEMBER 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)
11/01/96	0	0	0	Recovery well shut-in.						
11/02/96	0	0	0	"	"					
11/03/96	0	0	0	"	"					
11/04/96	0	0	0	"	"					
11/05/96	0	0	0	"	"					
11/06/96	0	0	0	"	"					
11/07/96	0	0	0	"	"					
11/08/96	0	0	0	"	"					
11/09/96	24	28,800	20	Ground water recovered with submersible pump						
11/10/96	24	28,800	20	"			"			
11/11/96	24	28,800	20	"			"			
11/12/96	24	28,800	20	"			"			
11/13/96	24	28,800	20	"			"			
11/14/96	24	28,800	20	"			"			
11/15/96	24	28,800	20	"			"			
11/16/96	24	28,800	20	"			"			
11/17/96	24	28,800	20	"			"			
11/18/96	24	28,800	20	"			"			
11/19/96	24	28,800	20	"			"			
11/20/96	24	28,800	20	"			"			
11/21/96	24	28,800	20	"			"			
11/22/96	0	0	0	Recovery well shut-in for groundwater monitoring event						
11/23/96	0	0	0	"			"			
11/24/96	0	0	0	"			"			
11/25/96	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/26/96	0	0	0	Recovery well shut-in for groundwater monitoring event						
11/27/96	0	0	0	"			"			
11/28/96	24	28,800	20	Ground water recovered with submersible pump						
11/29/96	24	28,800	20	"			"			
11/30/96	24	28,800	20	"			"			
NOV 96 TOTALS	384	460,800	20	AVERAGE ANALYTICAL RESULT						
				N/A	N/A	N/A	N/A	N/A	N/A	N/A

DECEMBER 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)
12/01/96	24	~~28,800~~ 43,200	20	Ground water recovered with submersible pump						
12/02/96	24	28,800	20	"			"			
12/03/96	24	28,800	20	"			"			
12/04/96	24	28,800	20	"			"			
12/05/96	24	28,800	20	"			"			
12/06/96	24	28,800 ok	20	"			"			
12/07/96	24	28,800	20	"			"			
12/08/96	24	28,800	20	"			"			
12/09/96	24	28,800	20	"			"			
12/10/96	24	28,800	20	"			"			
12/11/96	24	28,800	20	"			"			
12/12/96	24	28,800	20	"			"			
12/13/96	24	28,800	20	"			"			
12/14/96	24	28,800	20	"			"			
12/15/96	24	28,800	20	"			"			
12/16/96	24	28,800	20	"			"			
12/17/96	24	28,800	20	"			"			
12/18/96	24	28,800	20	"			"			
12/19/96	24	28,800	20	"			"			
12/20/96	24	28,800	20	"			"			
12/21/96	24	28,800	20	"			"			
12/22/96	24	28,800	20	"			"			
12/23/96	24	28,800	20	"			"			
12/24/96	24	28,800	20	"			"			
12/25/96	24	28,800	20	"			"			
12/26/96	24	28,800	20	"			"			
12/27/96	24	28,800	20	"			"			
12/28/96	24	28,800	20	"			"			
12/29/96	24	28,800	20	"			"			
12/30/96	24	28,800	20	"			"			
12/31/96	24	28,800 ✓	20	Ground water recovered with submersible pump						
DEC 96 TOTALS	744	892,800	20	AVERAGE ANALYTICAL RESULT						
				N/A	N/A	N/A	N/A	N/A	N/A	N/A

APPENDIX C.3

ANALYTICAL RESULTS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
RICE ENGINEERING & OPERATING
ATTN: WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/25/96
Reporting Date: 12/02/96
Project Number: NOT GIVEN
Project Name: ABO SWD/E-TECH SERVICE
Project Location: LEA CO., NM

Sampling Date: 11/25/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (ppb)	TOLUENE (ppb)	ETHYL BENZENE (ppb)	TOTAL XYLENES (ppb)
ANALYSIS DATE		11/26/96	11/26/96	11/26/96	11/26/96
H2717-1	MW-1	<1	<1	<1	<3
H2717-2	MW-2	1.3	<1	<1	<3
H2717-3	MW-3	<1	<1	<1	<3
Quality Control		94.8	89.3	90.3	270
True Value QC		100	100	100	300
% Accuracy		94.8	89.3	90.3	90.0
Relative Percent Difference		5.0	1.5	1.6	2.2

METHOD: EPA SW 846-8020, 5030, Gas Chromatography

Burgess J. A. Cooke, Ph. D.

12/2/96
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
RICE ENGINEERING & OPERATING
ATTN: WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/25/96
Reporting Date: 12/02/96
Project Number: NOT GIVEN
Project Name: ABO SWD/E-TECH SERVICE
Project Location: LEA CO., NM

Analysis Date: 11/26/96
Sampling Date: 11/25/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID		TDS (mg/L)
H2717-1	MW-1		782
H2717-2	MW-2		408
H2717-3	MW-3		424
Quality Control			NR
True Value QC			NR
% Accuracy			NR
Relative Percent Difference			1.7

METHOD: EPA 600/4-79-020, 160.1

Chemist

12/2/96
Date

H2717.XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401
PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
RICE ENGINEERING & OPERATING
ATTN: WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/25/96
Reporting Date: 12/06/96
Project Number: NOT GIVEN
Project Name: ABO SWD/E-TECH SERV.
Project Location: LEA CO., NM

Sampling Date: 11/25/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC/WL

LAB NUMBER	SAMPLE ID	Na ppm	Ca ppm	Mg ppm	K ppm	Cl ppm	SO4 ppm	CO3 ppm	HCO3 ppm
ANALYSIS DATE:		12/6/96	12/2/96	12/2/96	11/27/96	11/26/96	11/27/96	12/6/96	12/6/96
H2717-1	MW-1	190	37.6	16.0	0.80	94.0	217	0	268
H2717-2	MW-2	26.8	66.4	25.8	0.50	52.0	90.8	0	200
H2717-3	MW-3	34.1	69.6	17.5	0.60	52.0	80.8	0	205
Quality Control		NR	NR	NR	NR	205	52.4	NR	NR
True Value QC		NR	NR	NR	NR	200	50.0	NR	NR
% Accuracy		NR	NR	NR	NR	102	105	NR	NR
Relative Percent Difference		NR	1.1	2.0	NR	1.0	0.3	NR	NR
METHODS: EPA 600/4-79-02						352.3	375.4		
Std. Methods		3111B	3111B	3111B	3111B			2320B	2320B

Wei Li

Wei Li, Chemist

12-6-96

Date

ARDINAL LABORATORIES

PHONE: (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

Chain of Custody Record

Project I.D. ABO SWD

Project Location Lea Co. N.M

Sampled By Bill D. Smith

Client Name E-TECH SERVICE / RICE ENG.

Address P.O. Box 5115 Midland TX 79710

Telephone (915) 520-9893

Send Report to RICE ENG. HOPPRATING

H2717-1,23

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: BTEX	TDS	Major Cations	Anions				Remarks (Type sample, preservation, etc.)
	11-25	1200		✓	MW-1	3	✓	✓	✓					Results to
	11-25	1315		✓	MW-2	3	✓	✓	✓					RICE Eng. - Hobbs
	11-25	1330		✓	MW-3	3	✓	✓	✓					attn. Wes Root
														all cool/intact
														Groundwater

Released by: (Signature)	Date	Time	Received by: (Signature)	Remarks:	Shipped/Delivered
Bill D. Smith	11-25	1500	Burgett & Cooke		
Released by: (Signature)	Date	Time	Received by: (Signature)		

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

ANALYTICAL RESULTS FOR
RICE ENG. CORP.
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 04/19/96
Reporting Date: 04/23/98
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: CITY OF LOVINGTON, WELL #6

Sampling Date: 04/19/96
Sample Type: GROUNDWATER
Sample Condition: INTACT & COOL
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (ppb)	TOLUENE (ppb)	ETHYLBENZENE (ppb)	TOTAL XYLENES (ppb)
ANALYSIS DATE		4/22/96	4/22/96	4/22/96	4/22/96
H2500-1	WELL #6	<1.0	<1.0	<1.0	<3.0
Quality Control		94.5	93.5	92.2	275
True Value QC		100	100	100	300
% Accuracy		94.5	93.5	92.2	91.7
Relative Percent Difference		5.5	6.5	7.8	8.3

METHOD: EPA SW 846-8020, 5030, Gas Chromatography

Burgess J. A. Cooke, Ph. D.

4/23/96
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

ANALYTICAL RESULTS FOR
RICE ENG. CORP.
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 04/19/96
Reporting Date: 04/26/96
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: CITY OF LOVINGTON, WELL #6

Analysis Date: 04/22 & 25/96
Sampling Date: 04/19/96
Sample Type: GROUNDWATER
Sample Condition: INTACT & COOL
Sample Received By: BC
Analyzed By: MR

LAB NUMBER	SAMPLE ID	Cl (mg/L)	TDS (mg/L)
H2500-1	WELL #6	530	1205
Quality Control		60.0	NR
True Value QC		60.0	NR
% Accuracy		100	NR
Relative Percent Difference		1.6	0
METHOD: EPA 600/4-79-020		325.3	160.1

Mario Rodriguez
Mario Rodriguez, Chemist

04/26/96
Date

H2500.XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

ANALYTICAL RESULTS FOR
RICE ENG. CORP.
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 04/19/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: CITY OF LOVINGTON, WELL #6
Sample ID: WELL #6
Lab Number: H2500-1

Analysis Date: 04/22/96
Sampling Date: 04/19/96
Sample Type: GROUNDWATER
Sample Condition: INTACT & COOL
Sample Received By: BC
Analyzed By: BC

VOLATILES - 8260 (ppm)		Detection Limit	Sample Result H2500-1	Method Blank	QC	%IA	True Value QC
31	Toluene	0.002	<0.002	<0.002	0.102	102	0.100
32	1,1,2-Trichloroethane	0.002	<0.002	<0.002	0.107	107	0.100
33	1,3-Dichloropropane	0.002	<0.002	<0.002	0.103	103	0.100
34	2-Hexanone	0.002	<0.002	<0.002	0.095	95	0.100
35	Dibromochloromethane	0.002	<0.002	<0.002	0.106	106	0.100
36	1,2-Dibromoethane	0.002	<0.002	<0.002	0.104	104	0.100
37	Tetrachloroethene	0.002	<0.002	<0.002	0.104	104	0.100
38	Chlorobenzene	0.002	<0.002	<0.002	0.099	99	0.100
39	1,1,1,2-Tetrachloroethane	0.002	<0.002	<0.002	0.101	101	0.100
40	Ethylbenzene	0.002	<0.002	<0.002	0.102	102	0.100
41	m, p - Xylene	0.004	<0.004	<0.004	0.202	101	0.200
42	Bromoform	0.002	<0.002	<0.002	0.098	98	0.100
43	Styrene	0.002	<0.002	<0.002	0.103	103	0.100
44	o-Xylene	0.002	<0.002	<0.002	0.102	102	0.100
45	1,1,2,2-Tetrachloroethane	0.002	<0.002	<0.002	0.106	106	0.100
46	1,2,3-Trichloropropane	0.002	<0.002	<0.002	0.108	108	0.100
47	Isopropylbenzene	0.002	<0.002	<0.002	0.102	102	0.100
48	Bromobenzene	0.002	<0.002	<0.002	0.101	101	0.100
49	2-Chlorotoluene	0.002	<0.002	<0.002	0.103	103	0.100
50	n-propylbenzene	0.002	<0.002	<0.002	0.105	105	0.100
51	4-Chlorotoluene	0.002	<0.002	<0.002	0.102	102	0.100
52	1,3,5-Trimethylbenzene	0.002	<0.002	<0.002	0.101	101	0.100
53	tert-Butylbenzene	0.002	<0.002	<0.002	0.101	101	0.100
54	1,2,4-Trimethylbenzene	0.002	<0.002	<0.002	0.103	103	0.100
55	1,3-Dichlorobenzene	0.002	<0.002	<0.002	0.102	102	0.100
56	sec-Butylbenzene	0.002	<0.002	<0.002	0.102	102	0.100
57	1,4 Dichlorobenzene	0.002	<0.002	<0.002	0.093	93	0.100
58	4-Isopropyltoluene	0.002	<0.002	<0.002	0.098	98	0.100
59	1,2-Dichlorobenzene	0.002	<0.002	<0.002	0.098	98	0.100
60	n-Butylbenzene	0.002	<0.002	<0.002	0.101	101	0.100

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

ANALYTICAL RESULTS FOR
RICE ENG. CORP.
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 04/19/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: CITY OF LOVINGTON, WELL #6
Sample ID: WELL #6
Lab Number: H2500-1

Analysis Date: 04/22/96
Sampling Date: 04/19/96
Sample Type: GROUNDWATER
Sample Condition: INTACT & COOL
Sample Received By: BC
Analyzed By: BC

VOLATILES - 8260 (ppm)		Detection Limit	Sample Result H2500-1	Method Blank	QC	%IA	True Value QC
1	Dichlorodifluoromethane	0.002	<0.002	<0.002	0.082	82	0.100
2	Chloromethane	0.002	<0.002	<0.002	0.088	88	0.100
3	Vinyl chloride	0.002	<0.002	<0.002	0.085	85	0.100
4	Bromomethane	0.002	<0.002	<0.002	0.108	108	0.100
5	Chloroethane	0.002	<0.002	<0.002	0.089	89	0.100
6	Acetone	0.002	<0.002	<0.002	0.099	99	0.100
7	1,1-Dichloroethene	0.002	<0.002	<0.002	0.085	85	0.100
8	Trichlorofluoromethane	0.002	<0.002	<0.002	0.095	95	0.100
9	Carbon Disulfide	0.002	*0.006	0.006	0.104	104	0.100
10	Methylene chloride	0.002	<0.002	0.003	0.103	103	0.100
11	trans-1,2-Dichloroethene	0.002	<0.002	<0.002	0.099	99	0.100
12	1,1-Dichloroethane	0.002	<0.002	<0.002	0.080	80	0.100
13	Vinyl Acetate	0.002	<0.002	<0.002	0.105	105	0.100
14	2-Butanone	0.002	<0.002	<0.002	0.086	86	0.100
15	cis-1,2-Dichloroethene	0.002	<0.002	<0.002	0.116	116	0.100
16	2,2-Dichloropropane	0.002	<0.002	<0.002	0.111	111	0.100
17	Chloroform	0.002	<0.002	0.004	0.105	105	0.100
18	Bromochloromethane	0.002	<0.002	<0.002	0.109	109	0.100
19	1,1,1-Trichloroethane	0.002	<0.002	<0.002	0.108	108	0.100
20	1,2-Dichloroethane	0.002	<0.002	<0.002	0.098	98	0.100
21	1,1-Dichloropropene	0.002	<0.002	<0.002	0.101	101	0.100
22	Benzene	0.002	<0.002	<0.002	0.108	108	0.100
23	Carbon tetrachloride	0.002	<0.002	<0.002	0.106	106	0.100
24	Trichloroethene	0.002	<0.002	<0.002	0.101	101	0.100
25	Dibromomethane	0.002	<0.002	<0.002	0.093	93	0.100
26	Bromodichloromethane	0.002	<0.002	<0.002	0.103	103	0.100
27	trans-1,3-Dichloropropene	0.002	<0.002	<0.002	0.098	98	0.100
28	4-methyl-2-pentanone	0.002	<0.002	<0.002	0.100	100	0.100
29	1,2-Dichloropropane	0.002	<0.002	<0.002	0.103	103	0.100
30	cis-1,3-Dichloropropene	0.002	<0.002	<0.002	0.101	101	0.100

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
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PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

ANALYTICAL RESULTS FOR
ENVIRONMENTAL SPILL CONTROL, INC.
ATTN: JUSTIN HUTCHINS
1203 W. DUNHAM
HOBBS, NM 88240
FAX TO: 505-397-5085

Receiving Date: 04/18/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: RICE ABO SWD
Project Location: S31, T16S, R37E, LEA CO.

Sampling Date: 04/17/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (ppb)	TOLUENE (ppb)	ETHYLBENZENE (ppb)	TOTAL XYLENES (ppb)
ANALYSIS DATE		4/22/96	4/22/96	4/22/96	4/22/96
H2497-1	MW-1	<1.0	<1.0	<1.0	<3.0
H2497-4	MW-2	<1.0	<1.0	<1.0	<3.0
H2497-7	MW-3	<1.0	<1.0	<1.0	<3.0
Quality Control		94.5	93.5	92.2	275
True Value QC		100	100	100	300
% Accuracy		94.5	93.5	92.2	91.7
Relative Percent Difference		5.5	6.5	7.8	8.3

METHOD: EPA SW 846-8020, 5030, Gas Chromatography

Burgess J. A. Cooke, Ph. D.

4/23/96
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

ANALYTICAL RESULTS FOR
ENVIRONMENTAL SPILL CONTROL, INC.
ATTN: JUSTIN HUTCHINS
1203 W. DUNHAM
HOBBS, NM 88240
FAX TO: 505-397-5085

Receiving Date: 04/18/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: RICE ABO SWD
Project Location: S31, T16S, R37E, LEA CO.

Sampling Date: 04/17/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: MR

LAB NUMBER	SAMPLE ID	Calcium (mg/L)	Chloride (mg/L)	Sulfates (mg/L)	pH (s.u.)
ANALYSIS DATE		4/22/96	4/17/96	4/22/96	4/19/96
H2497-3	MW-1	57.9	250	123.4	7.88
H2497-6	MW-2	71.7	46	57.4	7.96
H2497-9	MW-3	76.1	52	54.3	7.87
Quality Control		5.10	60.0	19.1	7.00
True Value QC		5.00	60.0	20.0	7.00
% Accuracy		102	100	96.0	100
Relative Percent Difference		0	1.6	1.2	0
METHODS:	EPA 600/4-79-020,	200.7	325.3	375.4	150.1
	Standard Method	-	-	-	-

LAB NUMBER	SAMPLE ID	Bicarbonates (mg/L)	Carbonates (mg/L)	Sodium (mg/L)	Magnesium (mg/L)
ANALYSIS DATE		4/19/96	4/19/96	4/22/96	4/22/96
H2497-3	MW-1	200	0	223.9	12.0
H2497-6	MW-2	160	0	35.4	16.1
H2497-9	MW-3	140	0	31.5	16.4
0	0				
Quality Control		NR	NR	4.58	5.48
True Value QC		NR	NR	5.00	5.00
% Accuracy		NR	NR	91.6	190.6
Relative Percent Difference		0	0	1.5	2.5
METHODS:	EPA 600/4-79-020,	-	-	200.7	200.7
	Standard Method	2320 B	2320B	-	-

Mario Rodriguez, Chemist

04/23/96
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

ANALYTICAL RESULTS FOR
ENVIRONMENTAL SPILL CONTROL, INC.
ATTN: JUSTIN HUTCHINS
1203 W. DUNHAM
HOBBS, NM 88240
FAX TO: 505-397-5085

Receiving Date: 04/18/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: RICE ABO SWD
Project Location: S31, T16S, R37E, LEA CO.

Analysis Date: 04/22/96
Sampling Date: 04/17/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: MR

LAB NUMBER	SAMPLE ID	TDS (mg/L)
H2497-2	MW-1	865
H2497-5	MW-2	394
H2497-8	MW-3	389
Quality Control		NR
True Value QC		NR
% Accuracy		NR
Relative Percent Difference		0

METHOD: EPA 600/4-79-020, 160.1

Mario Rodriguez, Chemist

04/23/96
Date

Environmental Analytical Services

ARDINAL LABORATORIES

118 S. Commercial Ave.
Farmington, NM 87401
505-326-4669
FAX 505-326-4535

101 E. Marland
Hobbs, NM 88240
505-393-2326
FAX 505-393-2476

Chain of Custody Record

Project I.D. RICE - ABO SWD

Project Location [illegible]

Sampled By JUSTIN HUTCHINS

Client Name ENVIRONMENTAL SPILL CONTROL, INC.

Address ~~T23S R37E DUNIGAN~~ P.O. BOX 5890 HOBBS, NM 88240

Telephone (505) 392-6167 fax (505) 397-5085

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: BTEX	MAJOR ANIONS/CATIONS	TDS				Remarks (Type sample, preservation, etc.)
1#	4/17/96	2:25 pm		✓	MW-1	1-40mL	✓						H_2O, ICE
2#	4/17/96	2:30 pm		✓	MW-1	1-LTR		✓					H_2O, ICE
3#	4/17/96	2:35 pm		✓	MW-1	1-LTR		✓					H_2O, ICE
4#	4/17/96	2:50 pm		✓	MW-2	1-40mL	✓						H_2O, ICE
5#	4/17/96	2:55 pm		✓	MW-2	1-LTR		✓					H_2O, ICE
6#	4/17/96	3:00 pm		✓	MW-2	1-LTR		✓					H_2O, ICE
7#	4/17/96	3:10 pm		✓	MW-3	1-40mL	✓						H_2O, ICE
8#	4/17/96	3:15 pm		✓	MW-3	1-LTR		✓					H_2O, ICE
9#	4/17/96	3:20 pm		✓	MW-3	1-LTR		✓					H_2O, ICE

Released by: (Signature)	Date	Time	Received by: (Signature)
Justin Hutchins	4/17/96	4:12 pm	Sandy Sanders
Released by: (Signature)	Date	Time	Received by: (Signature)

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 the 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. In no event shall Cardinal 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

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ANALYTICAL RESULTS FOR
RICE ENG. CORP.
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 04/19/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: CITY OF LOVINGTON, WELL #6
Sample ID: WELL #6
Lab Number: H2500-1

Analysis Date: 04/22/96
Sampling Date: 04/19/96
Sample Type: GROUNDWATER
Sample Condition: INTACT & COOL
Sample Received By: BC
Analyzed By: BC

VOLATILES - 8260 (ppm)		Detection Limit	Sample Result H2500-1	Method Blank	QC	%IA	True Value QC
61	1,2-dibromo-3-chloropropane	0.002	<0.002	<0.002	0.108	108	0.100
62	1,2,4-Trichlorobenzene	0.002	<0.002	<0.002	0.098	98	0.100
63	Naphthalene	0.002	<0.002	<0.002	0.104	104	0.100
64	1,2,3-Trichlorobenzene	0.002	<0.002	<0.002	0.099	99	0.100
65	Hexachlorobutadiene	0.002	<0.002	<0.002	0.092	92	0.100
66	2-Chloroethoxyethene	0.002	<0.002	<0.002	0.094	94	0.100
67	Methyl Iodide	0.002	<0.002	<0.002	0.098	98	0.100

		% Recovery	Relative Percent Difference
68	Dibromofluoromethane	110	1
69	Toluene-D8	104	5
70	4-Bromofluorobenzene	107	1

METHODS: EPA SW-846-8260

*Present in blank at comparable concentrations.

Burgess J.A. Cooke, Ph. D.

4/23/96
Date

" H-2500

Environmental Analytical Services

ARDINAL LABORATORIES

118 S. Commercial Ave.
Farmington, NM 87401
505-326-4669
FAX 505-326-4535

101 E. Marland
Hobbs, NM 88240
505-393-2326
FAX 505-393-2476

Chain of Custody Record

Project I.D. _____

Project Location Sec. 31 T.16S R.37E Lea.Co, N.M

Sampled By Glynn Parker

Client Name Rice Eng. Corp.

Address 122 W. Taylor Hobbs, N.M. 88240

Telephone (505) 393-9174 Fax (505) 397-1471

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: Cl	TDS	BTEX	VOC				Remarks (Type sample, preservation, etc.)
	4/19/96	10:15 AM			City of Lovington Well #6	4	X	X	X	X				

Released by: (Signature)	Date	Time	Received by: (Signature)
Glynn Parker	4/19/96	11:01 AM	Sandy Rounds
Released by: (Signature)	Date	Time	Received by: (Signature)

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PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
RICE ENGINEERING & OPERATING
ATTN: WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/25/96
Reporting Date: 12/02/96
Project Number: NOT GIVEN
Project Name: ABO SWD/E-TECH SERVICE
Project Location: LEA CO., NM

Sampling Date: 11/25/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (ppb)	TOLUENE (ppb)	ETHYL BENZENE (ppb)	TOTAL XYLENES (ppb)
ANALYSIS DATE		11/26/96	11/26/96	11/26/96	11/26/96
H2717-1	MW-1	<1	<1	<1	<3
H2717-2	MW-2	1.3	<1	<1	<3
H2717-3	MW-3	<1	<1	<1	<3
Quality Control		94.8	89.3	90.3	270
True Value QC		100	100	100	300
% Accuracy		94.8	89.3	90.3	90.0
Relative Percent Difference		5.0	1.5	1.6	2.2

METHOD: EPA SW 846-8020, 5030, Gas Chromatography

Burgess J. A. Cooke, Ph. D.

12/2/96
Date

H2717B.XLS

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PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
RICE ENGINEERING & OPERATING
ATTN: WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/25/96
Reporting Date: 12/02/96
Project Number: NOT GIVEN
Project Name: ABO SWD/E-TECH SERVICE
Project Location: LEA CO., NM

Analysis Date: 11/26/96
Sampling Date: 11/25/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID		TDS (mg/L)
H2717-1	MW-1		782
H2717-2	MW-2		408
H2717-3	MW-3		424
Quality Control			NR
True Value QC			NR
% Accuracy			NR
Relative Percent Difference			1.7

METHOD: EPA 600/4-79-020, 160.1

Chemist

12/2/96
Date

H2717XLS

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PHONE (806) 796-2800 • 5262 34th ST. • LUBBOCK, TX 79407

ANALYTICAL RESULTS FOR
RICE ENGINEERING & OPERATING
ATTN: WESLEY ROOT
122 W. TAYLOR
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/25/96
Reporting Date: 12/06/96
Project Number: NOT GIVEN
Project Name: ABO SWD/E-TECH SERV.
Project Location: LEA CO., NM

Sampling Date: 11/25/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC/WL

LAB NUMBER	SAMPLE ID	Na ppm	Ca ppm	Mg ppm	K ppm	Cl ppm	SO4 ppm	CO3 ppm	HCO3 ppm
ANALYSIS DATE:		12/6/96	12/2/96	12/2/96	11/27/96	11/26/96	11/27/96	12/6/96	12/6/96
H2717-1	MW-1	190	37.6	16.0	0.80	94.0	217	0	268
H2717-2	MW-2	26.8	66.4	25.8	0.50	52.0	90.8	0	200
H2717-3	MW-3	34.1	69.6	17.5	0.60	52.0	80.8	0	205
Quality Control		NR	NR	NR	NR	205	52.4	NR	NR
True Value QC		NR	NR	NR	NR	200	50.0	NR	NR
% Accuracy		NR	NR	NR	NR	102	105	NR	NR
Relative Percent Difference		NR	1.1	2.0	NR	1.0	0.3	NR	NR
METHODS: EPA 600/4-79-02						352.3	375.4		
Std. Methods		3111B	3111B	3111B	3111B			2320B	2320B

Wei Li

Wei Li, Chemist

12-6-96

Date

Chain of Custody Record

ARDINAL LABORATORIES
PHONE: (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

Send Report to RICE ENG. &OPERATING

H2717-1,2,3

Project I.D. ABO Swd
Project Location Lea Co. N.M
Sampled By BILL D. Smith
Client Name E-TECH SERVICE / RICE ENG-
Address PO-BOX 51151 Midland TX 79710
Telephone (915) 520-9893

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	BTEX	TDS	Major Cations / Anions					Remarks (Type sample, preservation, etc.)
	1-25	1700		✓	MW-1	3	✓	✓	✓					Results to
	1-25	1715		✓	MW-2	3	✓	✓	✓					RICE Eng- HOBBS
	1-25	1730		✓	MW-3	3	✓	✓	✓					attn- Wes Root
														all cool/intact
														Groundwater

Released by: (Signature)	Date	Time	Received by: (Signature)	Remarks:	Shipped/Delivered
Bill D. Smith	1-25	1900	[signature]		

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

June 19, 1997

CERTIFIED MAIL
RETURN RECEIPT NO. P-410-431-184

Mr. Wes Root
Rice Engineering Corporation
122 West Taylor
Hobbs, New Mexico 88240

RE: PIPELINE LEAK UNIT "L" CONTAMINATION INVESTIGATION LOVINGTON, NEW MEXICO

Dear Mr. Root:

The New Mexico Oil Conservation Division (OCD) has reviewed Rice Engineering Corporation's (REC) April 19, 1997 "SUBSURFACE INVESTIGATION, JUNCTION L-31 SPILL SITE, ABO SALT WATER DISPOSAL SYSTEM, NORTHWEST 1/4 OF THE SOUTHEAST 1/4, SECTION 31, TOWNSHIP 16 SOUTH, RANGE 37 EAST, LEA COUNTY NEW MEXICO". This document contains the results of REC's investigation of the extent of contamination related to a leak at the Unit "L" pipeline which contaminated City of Lovington municipal well #6.

The investigation actions as contained in the above referenced document are satisfactory. The OCD noted that the report shows that ground water contaminants are still present in Lovington municipal well #6 in concentrations above New Mexico Water Quality Control Commission (WQCC) ground water standards. Therefore, the OCD requires that REC provide the OCD with a long term ground water monitoring and remediation work plan. The work plan will be submitted to the OCD Santa Fe Office by July 18, 1997. Please provide an additional copy of the work plan to the OCD Hobbs Office.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs Office
Robert Gallegos, NMED Drinking Water & Community Services
Bob Carter, City of Lovington

P 430 441 384

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TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, April 1995

RICE *Operating Company*
122 West Taylor
HOBBS, NEW MEXICO 88240
(505) 393-9174

March 17,1997

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

RE: Pipeline Leak Unit "L" Contamination Investigation
SE 1/4 of Section 31, T16S, R37E, Lea County
Lovington, New Mexico

Dear Mr. Anderson:

As we discussed on Friday, March 14, 1997, I have had more difficulty than I originally anticipated in gathering the required information on the above listed site. The approved work plan was implemented in April 1996 by Environmental Spill Control, Inc.. However Environmental Spill Control failed to provide written documentation of the work to Rice Operating before they laid off all of their employees on May 1, 1996.

I will submit the required investigation report to Mr. Wayne Price with the NMOCD Hobbs Office by Friday, March 21, 1997. In addition, a copy will be mailed to your attention, NMOCD, Sante Fe, New Mexico. In addition to the required investigation report, I will include a report covering the subsequent monitoring well and recovery well operations to date.

Thank you for your patience and the professional manner in which all members of your staff have worked with me regarding this matter. Please contact me at (505) 393-9174, fax (505) 397-1471 if you have any questions.

Sincerely,
Rice Operating Company

F. Wesley Root
Operations Manager

cc. Mr. Bill Olson, NMOCD Santa Fe Office
Mr. Wayne Price, NMOCD Hobbs Office
File

Bill Olson

From: Wayne Price
Sent: Monday, February 10, 1997 2:37 PM
To: Bill Olson
Cc: Jerry Sexton
Subject: Rice Engr. - Ground Water Contamination field report

Re: Produced Water Line Hobbs sec 5-Ts19s-R38e

Dear Bill,

I checked the pumping system at the above re: location. System is running. Pump rates on flow meter are one full rev/30 sec. I will have to check with REC to determine actual flow.

Bill Olson

From: Wayne Price
Sent: Monday, February 10, 1997 4:01 PM
To: Bill Olson
Subject: FW: Rice Engr. - Ground Water Contamination field report

---

From: Wayne Price
To: Bill Olson
Cc: Jerry Sexton
Subject: Rice Engr. - Ground Water Contamination field report
Date: Monday, February 10, 1997 2:37PM

Bill the actual flow is 16-20 gpm.

Re: Produced Water Line Hobbs sec 5-Ts19s-R38e

Dear Bill,

I checked the pumping system at the above re: location. System is running. Pump rates on flow meter are one full rev/30 sec. I will have to check with REC to determine actual flow.

SUBSURFACE INVESTIGATION

Junction L-31 Spill Site
ABO Salt Water Disposal System
Northwest (east) 1/4 of the Southeast 1/4
Section 31, Township 16 South, Range 37 East
Lea County, New Mexico

Prepared by:

F. Wesley Root

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

April 19, 1997

RICE *Operating Company*
122 West Taylor
HOBBS, NEW MEXICO 88240
(505) 393-9174

April 19, 1997

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

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

Dear Mr. Anderson:

Rice Operating Company

This Subsurface Investigation was initiated in April 1996 by Rice Operating Company to define hydrogeologic conditions and assess the extent of contamination within the soil and ground water at the above listed site.

The site is situated in a rural part of Lea County, New Mexico and is surrounded by unimproved pasture land. Adjacent land use is restricted to cattle ranching and crude oil production with the nearest population center (the city of Lovington) located approximately 5 miles northwest of the site. A crude oil refinery, Lovington Refinery, operated by Navaho Refining Company is located approximately 1/2 of a mile west of the site. The location of the site is shown on the topographic map in Appendix A.

Summary of Previous Activities

Release

On or about September 13, 1995, a pipeline leak was discovered in junction box L-31 on the ABO Salt Water Disposal System operated by Rice Operating Company. The leak was immediately repaired by Rice personnel on September 13, 1995. The quantity of produced water released by the leak is unknown and no free-standing fluids were observed during repair. However, the backfill contained in the pipeline ditch was saturated with produced water.

The leak site is located approximately 30 feet southeast of the City of Lovington Municipal Water Supply Well No. 6 (COL-6) in section 31 of township 16 south, range 37 east, Lea County. Well

No. 6 is connected to a 6-inch pipeline that crosses the ABO System pipeline where the release occurred. Apparently the produced water release saturated the near surface soils and migrated along the ditch line until it reached the municipal water well. At this point the water traveled downward along the surface casing and entered the well bore, thereby contaminating the well.

Water samples were obtained from Municipal Well No. 6 by both Rice Operating Company and the City of Lovington to characterize the nature and magnitude of contaminants present. The samples were submitted to Cardinal laboratories for benzene, toluene, ethylbenzene, and xylenes (BTEX), polynuclear aromatic hydrocarbons (PAH), chloride, and heavy metal analysis. Analytical results recorded elevated levels of BTEX and chloride in the ground water while PAH and heavy metals concentrations measured well below New Mexico Water Quality Control Commission (WQCC) Human Health Standards for groundwater.

Initial Soil Abatement

Initial abatement operations of both the adversely impacted soils and ground water were initiated by Rice Operating Company in September 1995. During these operations, two areas were excavated to delineate the extent of soil impact. The impacted soils located north of junction box L-31 in an area approximately 10 feet wide by 12 feet long were removed to a depth of 8 feet below ground surface. In addition, the area along the pipeline right-of-way between the junction box and the City of Lovington Municipal Water Well No. 6 (approximately 4 feet wide by 30 feet long by 3 feet deep) was removed.

During the excavation, soil samples were collected and submitted to Cardinal laboratories for BTEX, total petroleum hydrocarbon (TPH), and chloride analysis. The total BTEX concentration of the sample obtained from the bottom of the excavation was 0.088 parts per million (ppm) while TPH levels ranged from 4,546 ppm in the near surface soils to 888 ppm in the sample obtained the floor of the excavation at a depth of 8 feet. Chloride levels also decreased with depth from 7,880 ppm in the near surface soils to 440 ppm at the bottom of the excavation.

The analytical results demonstrated that soil contaminant levels decreased rapidly with depth. In Rice Operatings' opinion, any heavily impacted soils that could have provided a source of groundwater contamination were removed during the abatement operations.

Initial Ground Water Abatement

Ground water recovery operations during the 4th quarter of 1995 were performed using the existing well pump to recover the contaminated water. The well was pumped at rates ranging from approximately 125 gallons per minute (gal/min) in October to 25 gal/min in December 1995. The recovered water was placed in our ABO SWD System pipeline and disposed of by subsurface injection. During these recovery operations water samples of the effluent were collected approximately three times a week.

Analytical results of water samples collected from the City of Lovington Municipal Water Well No. 6 during the 4th quarter of 1995 showed a marked decrease in chloride, BTEX , and TDS

(total dissolved solid) concentrations. Benzene levels declined from 1.26 ppm in October to below method detection limits (< 0.001 ppm) in December while total BTEX levels declined from 1.71 ppm in October to below method detection limits in December 1995. Initial chloride and TDS levels were 12,200 ppm and 15,700 ppm, respectively. By December this levels had declined to 480 ppm chloride and 1,100 ppm TDS.

In Rice Operating's' opinion, the significant decline in contaminant levels indicate that a majority of the contaminated groundwater has been removed from the aquifer by the recovery operations.

Subsurface Investigation

Scope of Services

The Subsurface Investigation was conducted to assess site subsurface conditions and delineate the extent of groundwater impact, if present. The following Scope of Services were performed during the investigation:

- Conducted a preliminary literature search to aid in classifying the general geology and hydrology of the site area.
- Drilled three soil borings and installed three monitor wells to assess subsurface conditions.
- Visually inspected soil samples obtained during drilling operations to determine soil lithology and document any observed soil contamination .
- Performed a head space analysis of the soil samples to screen for volatile organic compounds from petroleum and non-petroleum sources.
- Collected representative soil samples from MW-1, MW-2, and MW-3 at the vadose zone / aquifer boundary for laboratory analysis.
- Prepared drilling logs and well construction diagrams of the soil borings/monitor wells (MW-1, MW-2 and MW-3).
- Gauged, and developed the monitor wells to remove fines and restore the natural hydraulic properties of the aquifer.
- Collected representative water samples from MW-1, MW-2, and MW-3 for laboratory analysis.
- Prepared a report documenting the results of this investigation.

General Setting

The site is located in the Great Plains physiographic province. An elevated plateau region, the province is characterized by flat, treeless terrain which forms an irregular erosional surface that slopes gradually toward the southeast. Shallow playa depressions and sand dunes are typical features in certain parts of the province. The region is generally devoid of major drainage systems. Surface drainage in the site area slopes toward the southeast.

The area has a semiarid climate, with precipitation generally measuring between 11 to 20 inches a year. Rainfall in the site area averages approximately 15 inches per year. Temperatures typically range from the low to high 90's (degrees F) in the summer and from the low to mid-50's in the winter. Low humidity and strong southeasterly breezes commonly accompany higher summer temperatures, resulting in high surface evaporation rates.

Oil and gas production is extensive in the site area. Collectively, oil fields in the Permian Basin region contain more than 12 billion barrels of oil in place, making them the single largest oil play in the southern mid-continent area.

The oil fields are particularly well developed in the site area where Permian age reservoirs have been producing oil and gas since the 1930's. Many of the fields are in secondary phases of production and some of the world's largest enhanced oil recovery (EOR) projects utilizing injected water and carbon dioxide as hydrocarbon displacement agents are currently operating in the region.

Surface Bodies of Water and Water Wells

A field survey of the facility and surrounding area identified no bodies of water, streams, or other watercourses within one mile of the site. Six municipal water supply wells are located within one mile of the site. No groundwater discharge sites (seeps, springs, marshes, or swamps) were identified within one mile of the site.

The six municipal wells are operated by the City of Lovington and are completed in the Ogallala Formation which is the primary water producing zone in the site area.

Soil Boring/Monitor Well Installation

On April 9 and April 10, 1996, Environmental Spill Control, Inc. (ESC) drilled three soil borings to assess subsurface conditions and delineate the extent of potential contamination. The borings were drilled to a total depth of approximately 90 feet using a truck mounted air rotary rig. All three borings were converted to 2-inch diameter schedule 40 PVC monitor wells (MW-1, MW-2, and MW-3). Prior to drilling, line location operations were performed to ensure that the monitor well locations were clear of subsurface lines or obstructions.

The three monitor wells were placed in a triangular configuration around the release location and orientated so that one boring was located upgradient and two borings were located downgradient

relative to regional ground water flow. The locations of the monitor wells are shown on the potentiometric surface maps in Appendix A.

Monitor well construction was designed to screen the entire thickness of the water bearing zone penetrated with the top of the screen set approximately five feet above the water table to monitor for free-floating hydrocarbons. A four foot thick bentonite plug was set immediately above the screened interval to prevent potential groundwater contamination by migration down the well bore.

The screened interval in the three monitor wells extends from approximately 70 feet below ground surface to a total depth of approximately 90 feet. A complete description of the construction of each individual monitor well is illustrated by construction diagrams included in Appendix C.

Site Geology

The site is located within the Permian Basin, a large depositional basin that formed during the Permian-age. The Permian Basin contains two smaller basins, the Delaware Basin to the west and the Midland Basin to the east. The Delaware Basin and the Midland Basin are separated by a north-south trending structural high known as the Central Basin Platform. The site is situated on the northern margin of the Delaware Basin west of the Central Basin Platform. In the site area, geologic formations at depth (Cretaceous-age and older) dip gradually toward the south into the Delaware Basin and generally increase in thickness basinward. These formations are unconformally overlain by Tertiary age and younger rocks which dip gradually toward the southeast.

The geologic formation that outcrops in the site area is the Ogallala Formation of Tertiary age. The Ogallala Formation is often covered by a thin layer of wind-deposited (eolian) dune sands composed of reworked Recent or Quaternary age alluvium. The thickness of the Ogallala Formation is primarily controlled by the paleotopography of the sub-Ogallala erosional surface and when present, generally ranges from approximately 100 to 300 feet. The formation attains its greatest thickness along paleovalleys and thins along paleodivide areas.

The subsurface sediments encountered during drilling consisted of four general units; an upper unit composed of interbedded limestones and calcareous sands (caliche); a second unit composed of fine-grained sand; a third unit composed of calcareous sandstone; and a forth unit consisting of silty, fine-grained sands

The upper caliche unit consists of gray to light brown interbedded limestones and calcareous sands and extends from ground surface to the top of the underlying sand zone. Thickness of the upper unit ranges from approximately 19 feet to 25 feet

The second unit consists of light brown, silty, fine-grained sand. This unit was present across the entire site and varied in thickness from 10 feet to 13 feet.

The second unit was underlain by a 2 to 5 foot thick layer of brown , fine-grained, calcareous sandstone. The unit was encountered at depths ranging from 32 to 35 feet below ground surface.

Below the sandstone unit, a forth unit consisting of a sequence of light brown, silty, fine-grained sands was encountered at a depth of 38 to 40 feet. The unit was present across the entire site and extents to a depth of at least 91 feet (maximum depth penetrated). This unit is the first water-bearing zone encountered during drilling operations. Ground water was encountered at a depth of approximately 77 feet below ground surface

A complete description of the soils encountered during drilling operations is illustrated by well logs included in Appendix C.

Site Hydrology

The primary source of ground water in the site area is the High Plains Aquifer. The High Plains Aquifer is composed of hydraulically connected portions of the Quaternary Alluvium, Ogallala Formation, and underlying Cretaceous to Triassic-age units. The contact between the Tertiary-age Ogallala formation and the underlying sediments is an erosional unconformity that slopes regionally to the southeast. In the site area, the unconformity is marked by an irregular thickness of permeable Cretaceous-age sands and shales of the Trinity Group. Where present, the top of the shales generally represents the lower limit of the aquifer.

Based on a review of the published data available for the site area, the depth to the water table is approximately 70 to 80 feet below ground surface. This datum represents the upper surface of the saturated portion of the High Plains Aquifer which is estimated to be 180 feet thick. Regional ground water flow is toward east-southeast with a hydraulic gradient of approximately 0.0032 (from Gutentag and Weeks, 1980).

After the monitor wells were installed and surveyed, the wells were gauged for depth to groundwater and free-floating hydrocarbon thickness. The groundwater gauging data is presented in Table 2, Appendix B.

The potentiometric surface map constructed from the gauging data shows ground water flowing towards the City of Lovington Well No. 6 from all directions. This is not representative of the regional flow direction of the aquifer, which flows toward the east-southeast. The map portrays the cone of depression created by the recovery operations since the City of Lovington Well No. 6 was being pumped at a rate of 30 gall/min during the gauging event.

Soil Sampling and Analytical Results

During drilling operations, grab samples of the drill cuttings were used to determine lithology and selected soil samples were collected from the borings using a driven split spoon sampler when warranted. The samples were field screened with a Century 128 organic vapor analyzer (OVA) using the Field Vapor Headspace Method described in the New Mexico Oil Conservation

Division's Guidelines for Remediation of Leaks, Spills, and Releases. All OVA readings measured less than one ppm. No visual evidence of hydrocarbon contamination was observed during drilling operations.

Soil samples were collected from MW-1, MW-2, and MW-3 at the vadose zone / aquifer boundary for laboratory analysis. The samples were submitted to Cardinal laboratories for BTEX and TPH analysis. Analytical results recorded TPH levels ranging from 39 ppm to 53 ppm with BTEX concentrations reported as below method detection limits (<0.001 ppm). These results are well below any levels that could potentially leach out and cause ground water contamination that would exceed WQCC standards.

A summary of the analytical results is presented in Table 1, Appendix B. The laboratory reports and chains-of-custody are included in Appendix D.

Groundwater Sampling and Analytical Results

Water samples were collected from monitor wells MW-1, MW-2, MW-3, on April 17, 1996 by ESC. A sample was collected from the City of Lovington Well No. 6 (COL-6) on April 19, 1996. The samples were analyzed for BTEX, major cations / anions, and chlorides.

The wells were gauged prior to sampling in order to determine the depth to groundwater and to calculate the volume of water in the well bore. Monitor wells MW-1, MW-2, and MW-3 were developed prior to sampling by surge bailing using a manual bailer to remove fines and to ensure that water samples represented aquifer conditions. Approximately 25 gallons of water was removed from each of the monitor wells during development. The monitor wells were allowed to recover to near static water levels before sampling.

After development, groundwater samples were obtained from the monitoring wells using a dedicated disposable bailer. COL-6 was not developed before sampling since the well was pumping at average rate of 30 gal/min. A grab sample was obtained from a sampling port on the discharge line. The groundwater samples were transported on ice to the laboratory for analysis using EPA approved methods.

The groundwater samples collected from MW-1, MW-2, MW-3, and COL-6 recorded BTEX levels below the method detection limits (<0.003 ppm). TDS results recorded levels ranging from 389 milligrams per liter (mg/l) to 1,205 mg/l. Concentrations in all three monitor wells were below the WQCC standard of 1,000 mg/l. Chloride concentrations ranged from 46 mg/l to 530 mg/l with the level in MW-1 and COL-6 exceeding the WQCC standard of 250 mg/l.

The results indicate that the groundwater beneath the site area contains little or no dissolved hydrocarbon contamination.

A summary of the water analytical results is presented in Tables 3, 4, and 5. The laboratory reports and chains-of-custody are included in Appendix E.

Summary of Investigation

- The subsurface geology of the site consists of four general units, with the vadose zone containing the upper three units. The vadose zone consists of an interbedded limestone and calcareous sand (caliche) overlying a fine-grained sand that is underlain by a calcareous sandstone. Ground water beneath the site is confined to the saturated portion of the forth unit consisting of silty, fine-grained sands.

- The depth to the water table is approximately 77 feet below ground surface with groundwater movement beneath the site flowing toward the east-southeast.

- Soil analytical results indicate that the extent of contamination has been delineated, remaining impacted soils are confined to the near surface, and these soils pose little or no risk of adversely affecting the water table beneath the site.

- Water analytical results from MW-1, MW-3, and MW-2 indicate that the extent of contamination has been delineated, consists primarily of a dissolved chloride plume, and is confined to the area immediately around the City of Lovington Well No. 6.

- The significantly lower contaminant concentrations in the City of Lovington Municipal Well No. 6 (COL-6) indicate recovery operations are successfully removing the contamination introduced into the aquifer.

Please contact me at (505) 393-9174, fax (505) 397-1471 if you have any questions.

Sincerely,
Rice Operating Company

F. Wesley Root

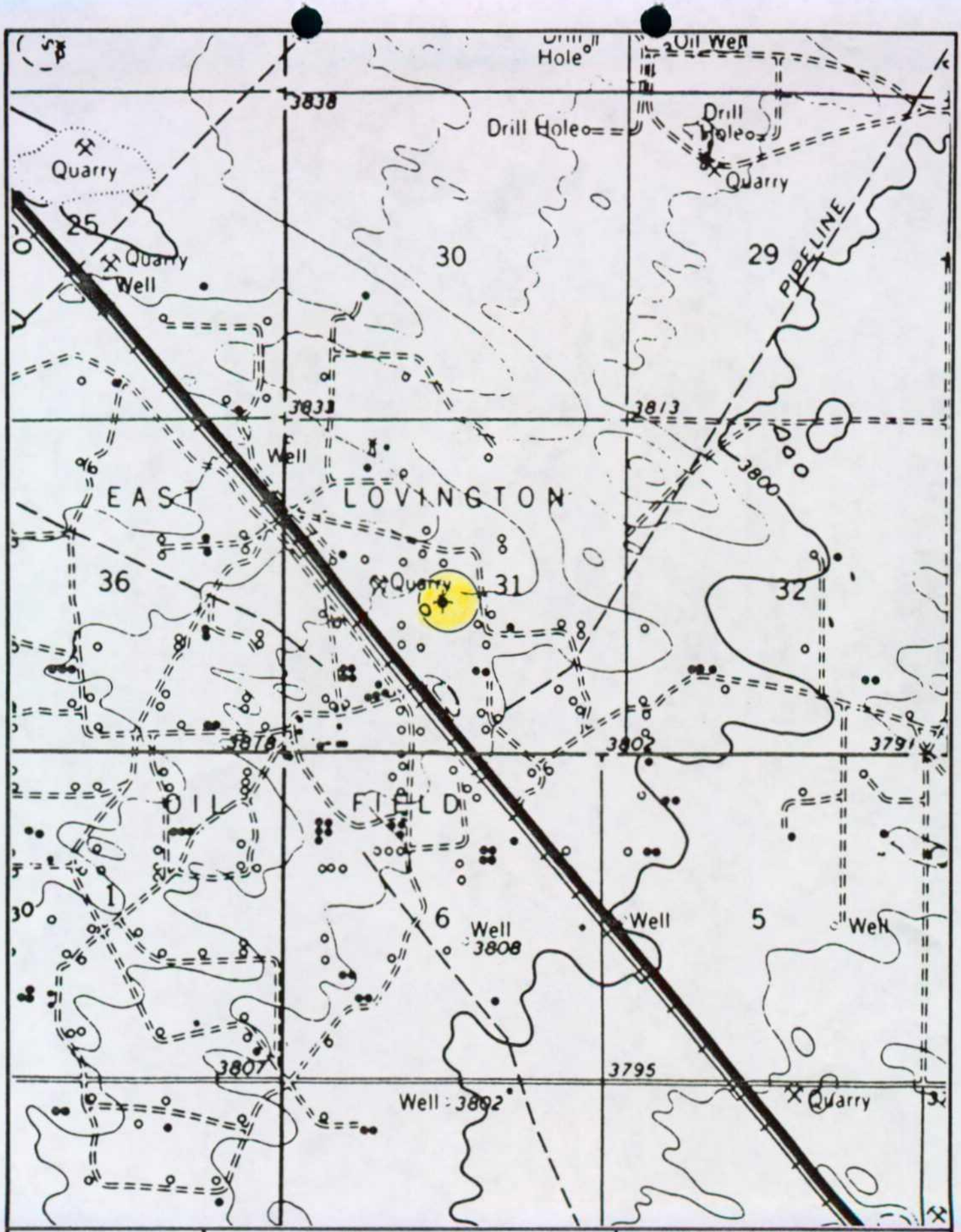
F. Wesley Root
Operations Manager

Attachments: Appendices A through E

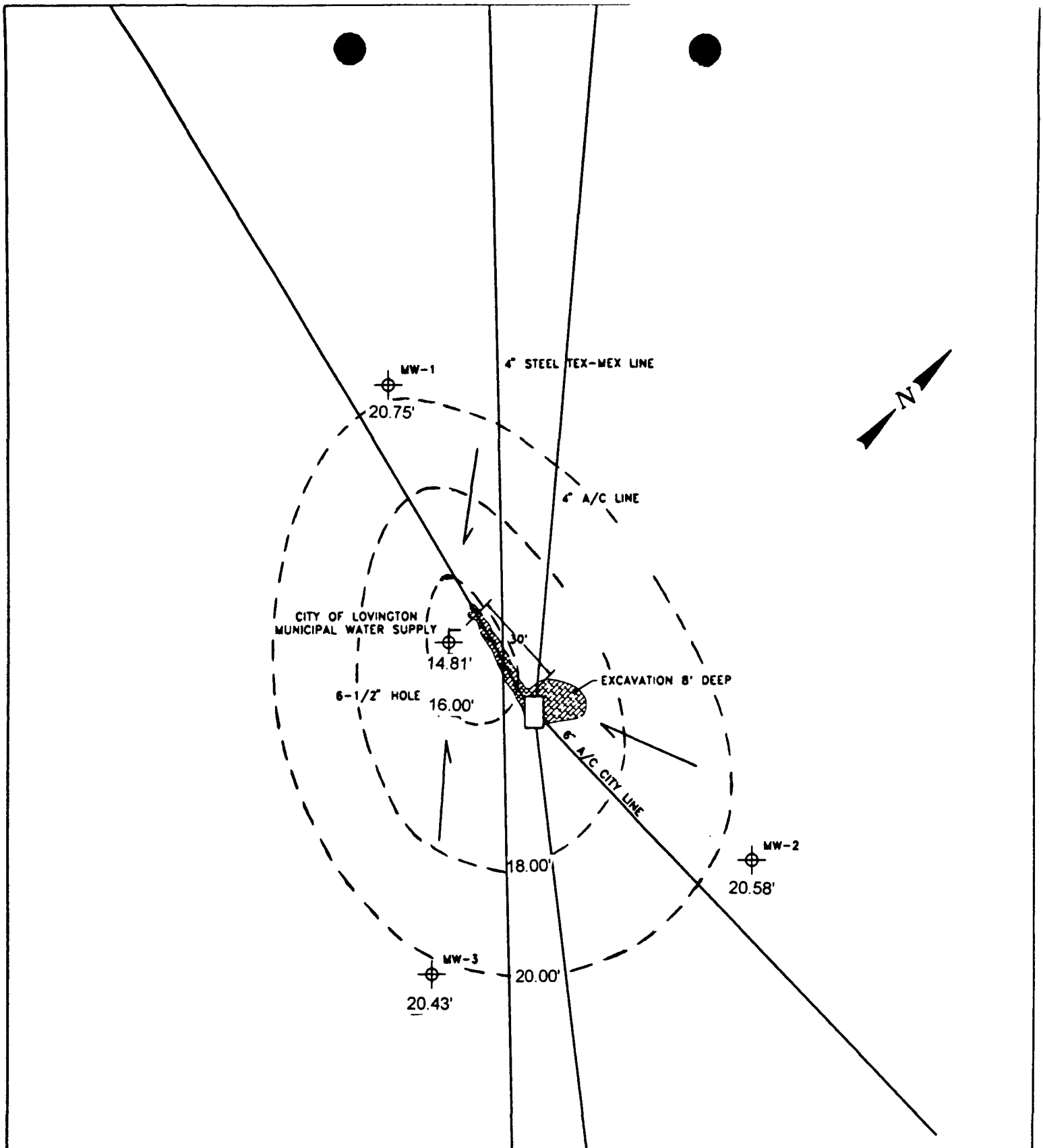
cc.
Mr. Wayne Price, NMOCD Hobbs Office
File

APPENDIX A

FIGURES



Rice Operating Company 122 W. Taylor Hobbs, NM 88240 Ph: (505) 393-9174 FAX 397-1471	**Map Legend** Approximate Site Location City of Lovington Water Well Scale: 1 inch = 2,000 feet	**SITE LOCATION MAP** Jct L-31 Spill Site, ABO SWD System Sec 31-T16S-R37E, Lea Co. NM REF: USGS Topographic Map



POTENTIOMETRIC SURFACE MAP OF THE TOP OF THE WATER TABLE

LEGEND

Map was constructed from April 17, 1996 gauging data
Contour interval = 2.00 feet
Elevations based on bench mark of 100.00 feet from top of casing on MW-1.

ENVIRONMENTAL SPILL CONTROL, Inc.
PHONE (505) 392-6187
FAX (505) 397-3095

RICE ENGINEERING

ABO SWD SYSTEM
JCT. L-31
UNIT L SEC. 31, T16S, R37E
LEA Co., NEW MEXICO

DATE 4-18-96	DRAWN M.F.C.	REV. DATE	DIV
SCALE: 1" = 40'		JOB #	
DRAWING 1 OF 1		FILE:	

APPENDIX B

TABLES

TABLE 1
SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS
TOTAL PETROLEUM HYDROCARBONS (TPH); BENZENE, TOLUENE, ETHYLBENZENE, XYLENES (BTEX)
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Sample Name	Sample Depth	Date Sampled	OVA (ppm)	TPH (ppm)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)	Chloride (ppm)	pH (ppm)
NMOCD Standards			**10**	**<100 - 5,000**	**10**	**N/A**	**N/A**	**N/A**	**50**	**N/A**	**N/A**
MW-1	75' -76'	04/17/96	< 1	39	<0.001	<0.001	<0.001	<0.001	<0.001	N/A	N/A
MW-2	75' -76'	04/17/96	< 1	40	<0.001	<0.001	<0.001	<0.001	<0.001	N/A	N/A
MW-3	75' - 76'	04/19/96	< 1	53	<0.001	<0.001	<0.001	<0.001	<0.001	N/A	N/A
S-6	8'	09/25/95	N/A	889	0.008	0.007	0.020	0.053	0.088	440	7.23

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

Total petroleum hydrocarbon (TPH) and Benzene, toluene, eythlbenzene, and xylene (BTEX) analyses were conducted using EPA Methods 418.1and 8020, respectively.

Results presented in bold print exceed NMOCD Recommended Remediation Levels (Guidelines for Remediation of Leaks, Spills, & Releases).

Organic vapor analyizer (OVA) readings were obtained using the headspace method as defined by NMOCD Remediation Guidelines.

S-6 = Soil from bottom of excavation. All results are reported in milligrams per liter (mg/l): parts per million (ppm).

TABLE 2
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-2	04/17/96	79.25	20.58	99.83	97.2	0.00
MW-3	04/17/96	79.50	20.43	99.93	97.4	0.00
COL-6	04/17/96	85.50	14.81	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))

COL-6 = City of Lovington Well No. 6. Water measurements not representative of static conditions since COL-6 had been pumping continuously prior to sampling (Created cone of depression). All measurements are in feet.

TABLE 3
SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS
VOLATILE ORGANIC COMPOUNDS (VOCs)
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Well Name	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	Total BTEX (ppm)
NMWQCC	**Standards**	**0.010**	**0.750**	**0.750**	**0.620**	**N/A**
MW-1	04/17/96	<0.001	<0.001	<0.001	<0.003	<0.003
MW-2	04/17/96	<0.001	<0.001	<0.001	<0.003	<0.003
MW-3	04/17/96	<0.001	<0.001	<0.001	<0.003	<0.003
COL-6	04/19/96	<0.001	<0.001	<0.001	<0.003	<0.003

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

Benzene, toluene, eythlbenzene, and xylene (BTEX) analysis was conducted using EPA Method 8020.

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).

TABLE 4
SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs)
LINE JCT L-31 SPILL SITE, ABO SWD SYSTEM

Well Name	Date Sampled	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene
NMWQCC Standards		Total naphthalene plus monomethylnaphthalenes < or = 0.03 ppm							
MW-1	04/17/96	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-2	04/17/96	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-3	04/17/96	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COL-6	09/22/95	0.016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico. No PAH analysis on MW-1, MW-2, & MW-3 was performed since COL-6 contained little or no PAH concentrations.

Polynuclear aromatic hydrocarbon (PAH)analyses were conducted using EPA Method SW 846-8270 / EPA Method 625.

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.

TABLE 4 (continued)
SUMMARY OF WATER SAMPLE ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs)
JCT L-31 SPILL SITE, ABO SWD SYSTEM

Well Name	Date Sampled	Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Dibenz (a, h) anthracene	benzo (g, h, i) perylene	Indeno (1,2,3-cd) pyrene
NMWQCC	Standards	Total naphthalene plus monomethylnaphthalenes < or = 0.03 ppm							
MW-1	04/17/96	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-2	04/17/96	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MW-3	04/17/96	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
COL-6	09/22/95	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004

Analysis was performed by Cardinal Laboratories in Hobbs, New Mexico. No PAH analysis on MW-1, MW-2, & MW-3 was performed since COL-6 contained little or no PAH concentrations.

Polynuclear aromatic hydrocarbon (PAH)analyses were conducted using EPA Method SW 846-8270 / EPA Method 625.

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.

TABLE 5
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 (SO4)	Magnesium (Mg)	Carbonate (CO3)	Bicarbonate (HCO3)
NMWQCC	**Standards**	**1,000 mg/l**		**250 mg/l**	**N/A**	**N/A**	**600 mg/l**	**N/A**	**N/A**	**N/A**
MW-1	04/17/96	865	7.88	**250**	223.9	57.9	123.4	12.0	0	200
MW-2	04/17/96	394	7.96	46	35.4	71.7	57.4	16.1	0	160
MW-3	04/17/96	389	7.87	52	31.5	76.1	54.3	16.4	0	140
COL-6	04/17/96	**1,231**	N/A	**545**	N/A	N/A	N/A	N/A	N/A	N/A
COL-6	04/19/96	**1,205**	N/A	**530**	N/A	N/A	N/A	N/A	N/A	N/A

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

Analyses were conducted using EPA Methods 160.1 - TDS, 352.3 - chloride, 3111B - major cation/anions, 375.4 - sulfate, and 2320B - C03, HCO3.

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.

APPENDIX C

DRILLING LOGS

Company Drilled for: Rice Engineering Corperation

Location: ABO SWD System (JCT L-31)
Sec. 31, T16S, R37E
Lea Co., New Mexico

ENVIRONMENTAL SPILL CONTROL, Inc.
PHONE (505) 392-6167
FAX (505) 397-5085

Drilling Log

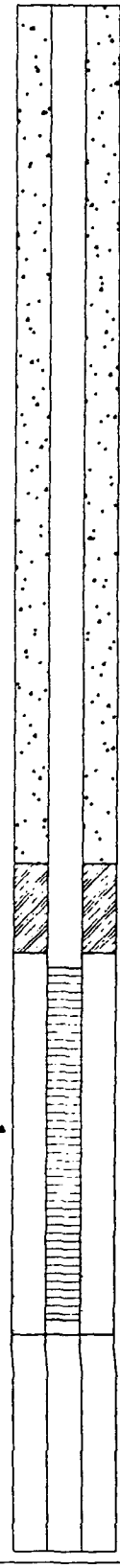
Well/Bore Number:	Date Drilled:	Driller:	Logged By:
MW-1	4-9-96	AH	F. Wesly Root

Drilling Method:	Depth of Boring:	Depth of Well:	Length of Casing:	Length of Screen:
Air Rotary	90 Feet	90 Feet	65 Feet	25 Feet

Bore Diameter:	Casing Diameter:	Screen Diameter:	Slot Size:	Well Material:
6 Inch	2 Inch	2 Inch	0.02 Inch	Sch 40 PVC

Depth	Lithology	Sample Type	OVA (PPM)	Remarks
0	Ground Surface			
	Dark gray-brown loam			
	Tan and white indurated calcareous silt (caliche)			
5		Cuttings	<1	
10	Light brown and pink, silty, calcareous fine-grained sand (caliche)	Cuttings	<1	
15		Cuttings	<1	
20	Light gray sandy limestone			
	Light brown silty fine-grained sand (SM)	Cuttings	<1	
25		Cuttings	<1	
30		Cuttings	<1	
	Brown fine-grained calcareous sandstone			
35	Light brown silty fine-grained sand (SM)	Cuttings	<1	
40	Brown fine-grained calcareous sandstone			
	Light brown silty fine-grained sand (SM)	Cuttings	<1	
45		Cuttings	<1	
50	Brown fine-grained calcareous sandstone			
	Light brown silty fine-grained sand (SM)	Cuttings	<1	
55		Cuttings	<1	
60		Cuttings	<1	
65	Brown fine-grained calcareous sandstone			
	Light brown silty fine-grained sand (SW - SM)	Cuttings	<1	
70		Cuttings	<1	
75		Split Spoon	<1	• Benzene <0.001 ppm • TPH 39 ppm • BTEX <0.001 ppm
80		Cuttings	<1	
85				
90	Bottom of boring @ 90'			
95				
100				
105				

Well Design



Depth: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105

- Non-Shrinking Grout
- Bentonite
- Sand
- Casing
- Screen
- ▲ Water on rods
- △ Static water level
- • Laboratory Analysis

Company Drilled for: Rice Engineering Corperation

Location: ABO SWD System (JCT L-31)
Sec. 31, T16S, R37E
Lea Co., New Mexico

ENVIRONMENTAL SPILL CONTROL, Inc.
PHONE (505) 392-6167
FAX (505) 397-5085

Drilling Log

Well/Bore Number:	Date Drilled:	Driller:	Logged By:
MW-2	4-10-96	AH	F. Wesly Root

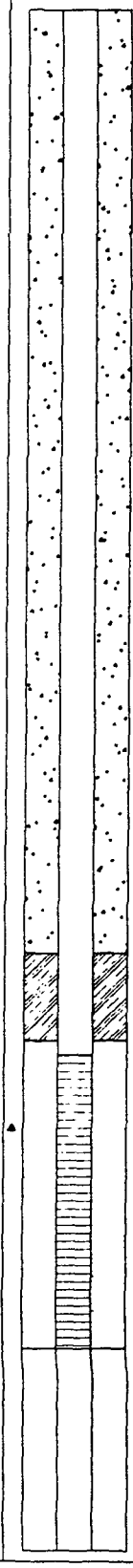
Drilling Method:	Depth of Boring:	Depth of Well:	Length of Casing:	Length of Screen:
Air Rotary	91 Feet	91 Feet	71 Feet	20 Feet

Bore Diameter:	Casing Diameter:	Screen Diameter:	Slot Size:	Well Material:
6 Inch	2 Inch	2 Inch	0.02 Inch	Sch 40 PVC

Depth	Lithology	Sample Type	OVA (PPM)
0	Ground Surface		
	Dark gray-brown loam		
	Light gray and white indurated calcareous silt (caliche)		
5		Cuttings	<1
	Light brown calcareous fine-grained sand (caliche)		
10		Cuttings	<1
15		Cuttings	<1
	Light gray sandy limestone		
20	Light brown slightly calcareous sand (SM)	Split Spoon	<1
25	Light brown silty fine-grained sand (SM)	Cuttings	<1
30		Cuttings	<1
35		Cuttings	<1
40	Brown fine-grained calcareous sandstone	Cuttings	<1
	Light brown slightly calcareous sand (SM)		
45	Light brown silty fine-grained sand (SW - SM)	Cuttings	<1
50		Cuttings	<1
55		Cuttings	<1
60		Cuttings	<1
65		Cuttings	<1
70		Cuttings	<1
75		Split Spoon	<1
80		Split Spoon	<1
	Bottom of boring @ 91'		
85			
90			
95			
100			
105			

Remarks:
- Benzene <0.001 ppm
- TPH 40 ppm
- BTEX <0.001 ppm

Well Design



Depth: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105

Company Drilled for: Rice Engineering Corperation

Location: ABO SWD System (JCT L-31)
Sec. 31, T16S, R37E
Lea Co., New Mexico

ENVIRONMENTAL SPILL CONTROL, Inc.
PHONE (505) 392-6167
FAX (505) 397-5085

Drilling Log

Well/Bore Number:	Date Drilled:	Driller:	Logged By:
MW-3	4-10-96	AH	F. Wesly Root

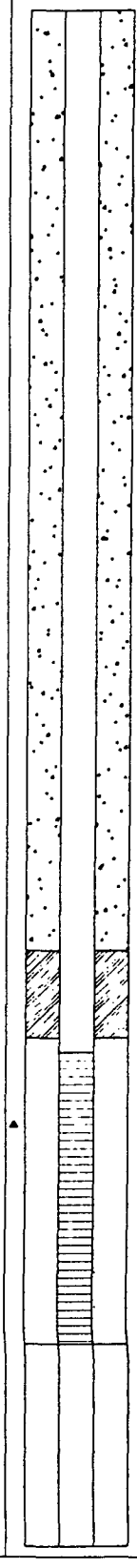
Drilling Method:	Depth of Boring:	Depth of Well:	Length of Casing:	Length of Screen:
Air Rotary	91 Feet	91 Feet	71 Feet	20 Feet

Bore Diameter:	Casing Diameter:	Screen Diameter:	Slot Size:	Well Material:
6 Inch	2 Inch	2 Inch	0.02 Inch	Sch 40 PVC

Depth	Lithology	Sample Type	OVA (PPM)
0	Ground Surface		
	Dark gray-brown loam		
5	Tan and white indurated calcareous silt (caliche)	Cuttings	<1
10	Tan and white, silty, calcareous, fine-grained sand (caliche)	Cuttings	<1
15		Cuttings	<1
20	Light brown slightly calcareous fine-grained sand (SM)	Cuttings	<1
25	Light brown silty fine-grained sand (SM)	Cuttings	<1
30		Cuttings	<1
35	Brown fine-grained calcareous sandstone	Cuttings	<1
40	Light brown silty fine-grained sand (SM)	Cuttings	<1
45		Cuttings	<1
50	Brown fine-grained calcareous sandstone	Cuttings	<1
55	Light brown silty fine-grained sand (SW - SM)	Cuttings	<1
60		Cuttings	<1
65		Cuttings	<1
70		Cuttings	<1
75		Split Spoon	<1
80		Cuttings	<1
85			
90			
95	Bottom of boring @ 91'		
100			
105			

Remarks:
- Benzene <0.001 ppm
- TPH 53 ppm
- BTEX <0.001 ppm

Well Design



Depth: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105

APPENDIX D

SOIL
ANALYTICAL RESULTS

ARDINAL LABORATORIES

118 S. Commercial Ave.
Farmington, NM 87401
505-326-4669
FAX 505-326-4535

101 E. Marland
Hobbs, NM 88240
505-393-2326
FAX 505-393-2476

#2189

Chain of Custody Record

Project I.D. City of Lovington Well #6
Project Location Abo SWD System
Sampled By Dave Abbott
Client Name Rice Engineering
Address 122 West Taylor
Telephone 393-9174

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: PAH	Metals (called by Monday 9/25)	pH	BTEX	Chlorides	TPH	TDS	Remarks (Type sample, preservation, etc.)
1	9/22	11:00		✓	Municipal Well #6	1		✓						for Dave Abbott
2	9-25		X		Soil around Well 6	1			X	X	X	X		

Released by: (Signature)	Date	Time	Received by: (Signature)
Dave Abbott	9/22	11:00	Alyssa Loss
John L. Moody Jr	9/25		

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 the 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. In no event shall Cardinal 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

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

TPH/BTEX ANALYSIS REPORT

Company: Rice Engineering
Address: 122 W. Taylor
City, State: Hobbs, NM 88240

Date: 10/2/95
Lab #: H2189

Project Name: City of Lovington Well #6
Location: Abo SWD System
Sampled by: JM Date: 9/25/95 Time: not given
Analyzed by: MI Date: 9/26-27/95 Time: various
Sample Type: Soil Sample Condition: Intact Units: ppm

Samp #	Field Code	TRPHC	BENZENE	TOLUENE	ETHYL BENZENE	PARA-XYLENE	META-XYLENE	ORTHO-XYLENE
1	Soil Around Well 6	888.6	0.008	0.007	0.020	<0.001	0.011	0.042
	QC Recovery	413	0.940	0.860	0.821	0.769	0.848	0.834
	QC Spike	405	0.872	0.858	0.856	0.844	0.854	0.844
	Accuracy	101.9%	108 %	100 %	96 %	91 %	99 %	99 %
	Air Blank	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Methods - GAS CHROMOTOGRAPHY; INFRARED SPECTROSCOPY
- EPA SW-846; 8020, 418.1, 3510, 3540 or 3550

Mitch Irvin

Mitch Irvin

10-1-95

Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

CHEMICAL ANALYSIS OF SOIL

Company : Rice Engineering
City, St.: 122 W. Taylor, Hobbs, NM
Proj.Name: City of Lovington Well #6
Location : Abo SWD System

Date : 10/2/95
Lab #: H2189
Date Received: 9/25/95
Date Analyzed: 9/29/95

Sample 1 : Soil Around Well 6

Units: ppm

PARAMETER	RESULT 1
pH	7.23
Chloride	440

Methods: 600/4-79-020-150.1, 325.3

Mitch Irvin

Mitch Irvin

10-1-95

Date

Environmental Analytical Services

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101 E. Marland
Hobbs, NM 88240
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FAX 505-393-2476

#H-2492

Chain of Custody Record

4-2492

Project I.D. RICE ENGINEERING ARO SOLID SYSTEM
Project Location 31, T16S, R37E, Lea Co. NM
Sampled By F. Wesley Root
Client Name Western Environmental Services
Address 1533 Cordoba, Hobbs, NM
Telephone 505-392-6167

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: BTEX	Analysis Required: TPH	Remarks (Type sample, preservation, etc.)
1*	4/9/96	1:10 PM		✓	MW-1 75-76'	1 8oz	✓	✓	Soil, ICE
2*	4/9/96	11:25 AM		✓	MW-2 75-76'	1 8oz	✓	✓	Soil, ICE
3*	4/10/96	3:20 PM		✓	MW-3 75-76'	1 8oz	✓	✓	Soil, ICE

Released by: (Signature)	Date	Time	Received by: (Signature)
F. Wesley Root	4/12/96	13:50	Sean J. Rance
Released by: (Signature)	Date	Time	Received by: (Signature)

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TPH/BTEX ANALYSIS REPORT

Company: Western Environmental Services
Address: 1533 Cordoba
State: Hobbs, New Mexico 88240
Project Name: Rice Engineering, ABO SWD System
Location: Hobbs, Lea County, NM
Sampled by: FWR Date: 04/12/96
Analyzed by: GAP Date: 04/13/96

Date: 04/15/96
Lab #: H2492

Sample Type: Soil Units: mg/kg Sample Condition: cool, intact

Samp #	Field Code	TRPHC	BENZENE	TOLUENE	ETHYL BENZENE	PARA-XYLENE	META-XYLENE	ORTHO-XYLENE
1	MW-1, 75-76'	39	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2	MW-2, 75,76'	40	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
3	MW-3, 75-76'	53	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	QC Recovery	210	99.2	102	103	104	108	105
	QC Spike	216	102	104	100	103	104	104
	Accuracy	103%	97.3%	98.1%	103.0%	100.9%	103.8%	101.0%
	Blank	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Methods - GAS CHROMOTOGRAPHY; INFRARED SPECTROSCOPY
- EPA SW-846: 8020, 418.1, 3510, 3540 or 3550

Gayle Potter
Gayle A. Potter

4-15-96
Date

APPENDIX E

WATER
ANALYTICAL RESULTS

ARDINAL LABORATORIES

#2189

Chain of Custody Record

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Project I.D. City of Lovington Well #6
Project Location Abo SWD System
Sampled By Dave Abbott
Client Name Rice Engineering
Address 122 West Taylor
Telephone 393-9174

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: PAH	Metals (called by J. Moody 9/25)	pH	BTEX	Chlorides	TPH	TDS	Remarks (Type sample, preservation, etc.)
1	9/22	11:00		✓	Municipal Well #6	1		✓						for Dave Abbott
2	9-25		X		Soil around well 6	1			X	X	X	X		

Released by: (Signature)	Date	Time	Received by: (Signature)
Dave Abbott	9/22	11:00	Alya Ross
John L. Moody Jr	9/25		

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FINAL ANALYSIS REPORT

Company:	Rice Engineering	Date:	10/2/95
Address:	122 W. Taylor	Lab #:	H2189-1
City, State:	Hobbs, NM 88240		
Project Name:	City of Lovington Well #6		
Location:	Abo SWD System		
Sampled by:	DA	Date:	9/22/95
Sample Type:	Water	Sample Condition:	Intact
Sample ID:	Municipal Well #6	Units:	ppm

POLYNUCLEAR AROMATIC HYDROCARBONS

PARAMETER	RESULT
Acenapthene	<0.004
Acenaphthylene	<0.004
Anthracene	<0.004
Benzo(a)anthracene	<0.004
Benzo(a)pyrene	<0.004
Benzo(b)flouranthene	<0.004
Benzo(k)flouranthene	<0.004
Benzo(ghi)perylene	<0.004
Chrysene	<0.004
Dibenz(a,h)anthracene	<0.004
Flouranthene	<0.004
Fluorene	<0.004
Indeno(1,2,3-cd)pyrene	<0.004
Naphthalene	0.016
Phenanthrene	<0.004
Pyrene	<0.004

METHODS- EPA SW 846-8270

Mitch Irvin

Mitch Irvin

10-1-95

Date

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METALS ANALYSIS REPORT

Company:	Rice Engineering	Date:	9/27/95
Address:	122 W. Taylor	Lab #:	H2189-1
City, State:	Hobbs, NM		
Project Name:	City of Lovington		
Location:	Abo SWD System		
Sampled by:	JM	Date:	9/25/95
Sample Type:	Water	Sample Condition:	Intact
Sample ID:	Municipal Well #6	Units:	ppm

PARAMETER	RESULT
Silver	<0.01
Arsenic	<0.01
Barium	0.21
Cadmium	<0.01
Chromium	<0.01
Mercury	<0.001
Lead	0.03
Selenium	<0.01

METHODS: -EPA 600/4-91-010,200.7, 245.1

Mitch Irvin

Mitch Irvin

09/27/95

Date

Environmental Analytical Services

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#H-2496

Chain of Custody Record

Project I.D. # H-2496
Project Location Sec. 31 T. 16S R. 37E Lea. Co, N.M.
Sampled By Glynn Parker
Client Name Rice Eng. Corp.
Address 122 W. Taylor Hobbs, N.M. 88240
Telephone (505) 393-9174 Fax (505) 397-1471

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: Cl	Analysis Required: TDS	Remarks (Type sample, preservation, etc.)
	4/17/96	11:15AM			City of Lovington Well #6	1	X	X	

Released by: (Signature)	Date	Time	Received by: (Signature)
Glynn Parker	4-17-96	11:45AM	Jean L. Gaines
Released by: (Signature)	Date	Time	Received by: (Signature)

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ANALYTICAL RESULTS FOR
RICE ENG. CORP.
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 04/18/96
Reporting Date: 04/22/96
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: CITY OF LOVINGTON, WELL #6

Analysis Date: 04/17 &19/96
Sampling Date: 04/17/96
Sample Type: GROUNDWATER
Sample Condition: INTACT & COOL
Sample Received By: BC
Analyzed By: MR

LAB NUMBER	SAMPLE ID	Cl (mg/L)	TDS (mg/L)
H2496-1	WELL #6	545	1231
Quality Control		60.0	NR
True Value QC		60.0	NR
% Accuracy		100.0	NR
Relative Percent Difference		1.6	0
METHOD: EPA 600/4-79-020		325.3	160.1

Mario Rodriguez
Mario Rodriguez, Chemist

04/22/96
Date

Environmental Analytical Services

" H-2500

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Hobbs, NM 88240
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FAX 505-393-2476

Chain of Custody Record

Project I.D. _____

Project Location Sec. 31 T.16S R.37E Lea.Co, N.M

Sampled By Glynn Parker

Client Name Rice Eng. Corp.

Address 122 W. Taylor Hobbs, N.M. 88240

Telephone (505) 393-9174 Fax (505) 397-1471

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: Cl	TDS	BTEX	VOC				Remarks (Type sample, preservation, etc.)
	4/14/94 10:35AM				City of Lovington Well #6	4	X	X	X	X				

Released by: (Signature)	Date	Time	Received by: (Signature)
Glynn Parker	4/14/94	11:00 AM	Sandy Rounds
Released by: (Signature)	Date	Time	Received by: (Signature)

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ANALYTICAL RESULTS FOR
RICE ENG. CORP.
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 04/19/96
Reporting Date: 04/23/98
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: CITY OF LOVINGTON, WELL #6

Sampling Date: 04/19/96
Sample Type: GROUNDWATER
Sample Condition: INTACT & COOL
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (ppb)	TOLUENE (ppb)	ETHYLBENZENE (ppb)	TOTAL XYLENES (ppb)
ANALYSIS DATE		4/22/96	4/22/96	4/22/96	4/22/96
H2500-1	WELL #6	<1.0	<1.0	<1.0	<3.0
Quality Control		94.5	93.5	92.2	275
True Value QC		100	100	100	300
% Accuracy		94.5	93.5	92.2	91.7
Relative Percent Difference		5.5	6.5	7.8	8.3

METHOD: EPA SW 846-8020, 5030, Gas Chromatography

Burgess J. A. Cooke, Ph. D.

4/23/96
Date

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ANALYTICAL RESULTS FOR
RICE ENG. CORP.
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 04/19/96
Reporting Date: 04/26/96
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: CITY OF LOVINGTON, WELL #6

Analysis Date: 04/22 & 25/96
Sampling Date: 04/19/96
Sample Type: GROUNDWATER
Sample Condition: INTACT & COOL
Sample Received By: BC
Analyzed By: MR

LAB NUMBER	SAMPLE ID	Cl (mg/L)	TDS (mg/L)
H2500-1	WELL #6	530	1205
Quality Control		60.0	NR
True Value QC		60.0	NR
% Accuracy		100	NR
Relative Percent Difference		1.6	0
METHOD: EPA 600/4-79-020		325.3	160.1

Mario Rodriguez, Chemist

04/26/96
Date

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ANALYTICAL RESULTS FOR
RICE ENG. CORP.
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 04/19/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: CITY OF LOVINGTON, WELL #6
Sample ID: WELL #6
Lab Number: H2500-1

Analysis Date: 04/22/96
Sampling Date: 04/19/96
Sample Type: GROUNDWATER
Sample Condition: INTACT & COOL
Sample Received By: BC
Analyzed By: BC

VOLATILES - 8260 (ppm)		Detection Limit	Sample Result H2500-1	Method Blank	QC	%IA	True Value QC
1	Dichlorodifluoromethane	0.002	<0.002	<0.002	0.082	82	0.100
2	Chloromethane	0.002	<0.002	<0.002	0.088	88	0.100
3	Vinyl chloride	0.002	<0.002	<0.002	0.085	85	0.100
4	Bromomethane	0.002	<0.002	<0.002	0.108	108	0.100
5	Chloroethane	0.002	<0.002	<0.002	0.089	89	0.100
6	Acetone	0.002	<0.002	<0.002	0.099	99	0.100
7	1,1-Dichloroethene	0.002	<0.002	<0.002	0.085	85	0.100
8	Trichlorofluoromethane	0.002	<0.002	<0.002	0.095	95	0.100
9	Carbon Disulfide	0.002	*0.006	0.006	0.104	104	0.100
10	Methylene chloride	0.002	<0.002	0.003	0.103	103	0.100
11	trans-1,2-Dichloroethene	0.002	<0.002	<0.002	0.099	99	0.100
12	1,1-Dichloroethane	0.002	<0.002	<0.002	0.080	80	0.100
13	Vinyl Acetate	0.002	<0.002	<0.002	0.105	105	0.100
14	2-Butanone	0.002	<0.002	<0.002	0.086	86	0.100
15	cis-1,2-Dichloroethene	0.002	<0.002	<0.002	0.116	116	0.100
16	2,2-Dichloropropane	0.002	<0.002	<0.002	0.111	111	0.100
17	Chloroform	0.002	<0.002	0.004	0.105	105	0.100
18	Bromochloromethane	0.002	<0.002	<0.002	0.109	109	0.100
19	1,1,1-Trichloroethane	0.002	<0.002	<0.002	0.108	108	0.100
20	1,2-Dichloroethane	0.002	<0.002	<0.002	0.098	98	0.100
21	1,1-Dichloropropene	0.002	<0.002	<0.002	0.101	101	0.100
22	Benzene	0.002	<0.002	<0.002	0.108	108	0.100
23	Carbon tetrachloride	0.002	<0.002	<0.002	0.106	106	0.100
24	Trichloroethene	0.002	<0.002	<0.002	0.101	101	0.100
25	Dibromomethane	0.002	<0.002	<0.002	0.093	93	0.100
26	Bromodichloromethane	0.002	<0.002	<0.002	0.103	103	0.100
27	trans-1,3-Dichloropropene	0.002	<0.002	<0.002	0.098	98	0.100
28	4-methyl-2-pentanone	0.002	<0.002	<0.002	0.100	100	0.100
29	1,2-Dichloropropane	0.002	<0.002	<0.002	0.103	103	0.100
30	cis-1,3-Dichloropropene	0.002	<0.002	<0.002	0.101	101	0.100

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ANALYTICAL RESULTS FOR
RICE ENG. CORP.
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 04/19/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: CITY OF LOVINGTON, WELL #6
Sample ID: WELL #6
Lab Number: H2500-1

Analysis Date: 04/22/96
Sampling Date: 04/19/96
Sample Type: GROUNDWATER
Sample Condition: INTACT & COOL
Sample Received By: BC
Analyzed By: BC

VOLATILES - 8260 (ppm)		Detection Limit	Sample Result H2500-1	Method Blank	QC	%IA	True Value QC
31	Toluene	0.002	<0.002	<0.002	0.102	102	0.100
32	1,1,2-Trichloroethane	0.002	<0.002	<0.002	0.107	107	0.100
33	1,3-Dichloropropane	0.002	<0.002	<0.002	0.103	103	0.100
34	2-Hexanone	0.002	<0.002	<0.002	0.095	95	0.100
35	Dibromochloromethane	0.002	<0.002	<0.002	0.106	106	0.100
36	1,2-Dibromoethane	0.002	<0.002	<0.002	0.104	104	0.100
37	Tetrachloroethene	0.002	<0.002	<0.002	0.104	104	0.100
38	Chlorobenzene	0.002	<0.002	<0.002	0.099	99	0.100
39	1,1,1,2-Tetrachloroethane	0.002	<0.002	<0.002	0.101	101	0.100
40	Ethylbenzene	0.002	<0.002	<0.002	0.102	102	0.100
41	m, p - Xylene	0.004	<0.004	<0.004	0.202	101	0.200
42	Bromoform	0.002	<0.002	<0.002	0.098	98	0.100
43	Styrene	0.002	<0.002	<0.002	0.103	103	0.100
44	o-Xylene	0.002	<0.002	<0.002	0.102	102	0.100
45	1,1,2,2-Tetrachloroethane	0.002	<0.002	<0.002	0.106	106	0.100
46	1,2,3-Trichloropropane	0.002	<0.002	<0.002	0.108	108	0.100
47	Isopropylbenzene	0.002	<0.002	<0.002	0.102	102	0.100
48	Bromobenzene	0.002	<0.002	<0.002	0.101	101	0.100
49	2-Chlorotoluene	0.002	<0.002	<0.002	0.103	103	0.100
50	n-propylbenzene	0.002	<0.002	<0.002	0.105	105	0.100
51	4-Chlorotoluene	0.002	<0.002	<0.002	0.102	102	0.100
52	1,3,5-Trimethylbenzene	0.002	<0.002	<0.002	0.101	101	0.100
53	tert-Butylbenzene	0.002	<0.002	<0.002	0.101	101	0.100
54	1,2,4-Trimethylbenzene	0.002	<0.002	<0.002	0.103	103	0.100
55	1,3-Dichlorobenzene	0.002	<0.002	<0.002	0.102	102	0.100
56	sec-Butylbenzene	0.002	<0.002	<0.002	0.102	102	0.100
57	1,4 Dichlorobenzene	0.002	<0.002	<0.002	0.093	93	0.100
58	4-Isopropyltoluene	0.002	<0.002	<0.002	0.098	98	0.100
59	1,2-Dichlorobenzene	0.002	<0.002	<0.002	0.098	98	0.100
60	n-Butylbenzene	0.002	<0.002	<0.002	0.101	101	0.100

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ANALYTICAL RESULTS FOR
RICE ENG. CORP.
ATTN: GLYNN PARKER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: 505-397-1471

Receiving Date: 04/19/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: CITY OF LOVINGTON, WELL #6
Sample ID: WELL #6
Lab Number: H2500-1

Analysis Date: 04/22/96
Sampling Date: 04/19/96
Sample Type: GROUNDWATER
Sample Condition: INTACT & COOL
Sample Received By: BC
Analyzed By: BC

VOLATILES - 8260 (ppm)		Detection Limit	Sample Result H2500-1	Method Blank	QC	%IA	True Value QC
61	1,2-dibromo-3-chloropropane	0.002	<0.002	<0.002	0.108	108	0.100
62	1,2,4-Trichlorobenzene	0.002	<0.002	<0.002	0.098	98	0.100
63	Naphthalene	0.002	<0.002	<0.002	0.104	104	0.100
64	1,2,3-Trichlorobenzene	0.002	<0.002	<0.002	0.099	99	0.100
65	Hexachlorobutadiene	0.002	<0.002	<0.002	0.092	92	0.100
66	2-Chloroethoxyethene	0.002	<0.002	<0.002	0.094	94	0.100
67	Methyl Iodide	0.002	<0.002	<0.002	0.098	98	0.100

		% Recovery	Relative Percent Difference
68	Dibromofluoromethane	110	1
69	Toluene-D8	104	5
70	4-Bromofluorobenzene	107	1

METHODS: EPA SW-846-8260

*Present in blank at comparable concentrations.

Burgess J.A. Cooke, Ph. D.

4/23/96
Date

Environmental Analytical Services

ARDINAL LABORATORIES

118 S. Commercial Ave.
Farmington, NM 87401
505-326-4669
FAX 505-326-4535

101 E. Marland
Hobbs, NM 88240
505-393-2326
FAX 505-393-2476

Chain of Custody Record

Project I.D. RICE - ABO SWD

Project Location [illegible]

Sampled By JUSTIN HUTCHINS

Client Name ENVIRONMENTAL SPILL CONTROL, INC.

Address ~~T2S3 W DUNCAN~~ P.O. BOX 5890 HOBBS, NM 88240

Telephone (505) 392-6167 fax (505) 397-5085

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: BTEX	Major Anions/Cations	TDS	Remarks (Type sample, preservation, etc.)
1#	4/17/96	2:25 pm		✓	MW-1	1-40mL	✓			H_2O, ICE
2#	4/17/96	2:30 pm		✓	MW-1	1-LTR		✓		H_2O, ICE
3#	4/17/96	2:35 pm		✓	MW-1	1-LTR		✓		H_2O, ICE
4#	4/17/96	2:50 pm		✓	MW-2	1-40mL	✓			H_2O, ICE
5#	4/17/96	2:55 pm		✓	MW-2	1-LTR		✓		H_2O, ICE
6#	4/17/96	3:00 pm		✓	MW-2	1-LTR		✓		H_2O, ICE
7#	4/17/96	3:10 pm		✓	MW-3	1-40mL	✓			H_2O, ICE
8#	4/17/96	3:15 pm		✓	MW-3	1-LTR		✓		H_2O, ICE
9#	4/17/96	3:20 pm		✓	MW-3	1-LTR		✓		H_2O, ICE

Released by: (Signature)	Date	Time	Received by: (Signature)
Justin Hutchins	4/17/96	4:12 pm	Brian S. Davis
Released by: (Signature)	Date	Time	Received by: (Signature)

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 the 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. In no event shall Cardinal 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

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

ANALYTICAL RESULTS FOR
ENVIRONMENTAL SPILL CONTROL, INC.
ATTN: JUSTIN HUTCHINS
1203 W. DUNHAM
HOBBS, NM 88240
FAX TO: 505-397-5085

Receiving Date: 04/18/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: RICE ABO SWD
Project Location: S31, T16S, R37E, LEA CO.

Sampling Date: 04/17/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (ppb)	TOLUENE (ppb)	ETHYLBENZENE (ppb)	TOTAL XYLENES (ppb)
ANALYSIS DATE		4/22/96	4/22/96	4/22/96	4/22/96
H2497-1	MW-1	<1.0	<1.0	<1.0	<3.0
H2497-4	MW-2	<1.0	<1.0	<1.0	<3.0
H2497-7	MW-3	<1.0	<1.0	<1.0	<3.0
Quality Control		94.5	93.5	92.2	275
True Value QC		100	100	100	300
% Accuracy		94.5	93.5	92.2	91.7
Relative Percent Difference		5.5	6.5	7.8	8.3

METHOD: EPA SW 846-8020, 5030, Gas Chromatography

Burgess J. A. Cooke, Ph. D.

4/23/96
Date

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ANALYTICAL RESULTS FOR
ENVIRONMENTAL SPILL CONTROL, INC.
ATTN: JUSTIN HUTCHINS
1203 W. DUNHAM
HOBBS, NM 88240
FAX TO: 505-397-5085

Receiving Date: 04/18/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: RICE ABO SWD
Project Location: S31, T16S, R37E, LEA CO.

Sampling Date: 04/17/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: MR

LAB NUMBER	SAMPLE ID	Calcium (mg/L)	Chloride (mg/L)	Sulfates (mg/L)	pH (s.u.)
ANALYSIS DATE		4/22/96	4/17/96	4/22/96	4/19/96
H2497-3	MW-1	57.9	250	123.4	7.88
H2497-6	MW-2	71.7	46	57.4	7.96
H2497-9	MW-3	76.1	52	54.3	7.87
Quality Control		5.10	60.0	19.1	7.00
True Value QC		5.00	60.0	20.0	7.00
% Accuracy		102	100	96.0	100
Relative Percent Difference		0	1.6	1.2	0
METHODS:	EPA 600/4-79-020,	200.7	325.3	375.4	150.1
	Standard Method	-	-	-	-

LAB NUMBER	SAMPLE ID	Bicarbonates (mg/L)	Carbonates (mg/L)	Sodium (mg/L)	Magnesium (mg/L)
ANALYSIS DATE		4/19/96	4/19/96	4/22/96	4/22/96
H2497-3	MW-1	200	0	223.9	12.0
H2497-6	MW-2	160	0	35.4	16.1
H2497-9	MW-3	140	0	31.5	16.4
0	0				
Quality Control		NR	NR	4.58	5.48
True Value QC		NR	NR	5.00	5.00
% Accuracy		NR	NR	91.6	190.6
Relative Percent Difference		0	0	1.5	2.5
METHODS:	EPA 600/4-79-020,	-	-	200.7	200.7
	Standard Method	2320 B	2320B	-	-

Mario Rodriguez
Mario Rodriguez, Chemist

04/23/96
Date

CARDINAL LABORATORIES

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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

ANALYTICAL RESULTS FOR
ENVIRONMENTAL SPILL CONTROL, INC.
ATTN: JUSTIN HUTCHINS
1203 W. DUNHAM
HOBBS, NM 88240
FAX TO: 505-397-5085

Receiving Date: 04/18/96
Reporting Date: 04/23/96
Project Number: NOT GIVEN
Project Name: RICE ABO SWD
Project Location: S31, T16S, R37E, LEA CO.

Analysis Date: 04/22/96
Sampling Date: 04/17/96
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: MR

LAB NUMBER	SAMPLE ID	TDS (mg/L)
H2497-2	MW-1	865
H2497-5	MW-2	394
H2497-8	MW-3	389
Quality Control		NR
True Value QC		NR
% Accuracy		NR
Relative Percent Difference		0

METHOD: EPA 600/4-79-020, 160.1

Mario Rodriguez, Chemist

04/23/96
Date

H2497-2.XLS

Bill Olson

From: Wayne Price
Sent: Monday, April 21, 1997 12:02 PM
To: Bill Olson
Cc: Jerry Sexton
Subject: Rice Engr. Lovington Water Well
Importance: High

Dear Bill,

Wes Root has hand delivered our copy of the investigation results, also this weekend he Fed-Ex your copy. Wes told me to tell you he apologias for the delay.

Bill Olson

From: Wayne Price
Sent: Tuesday, April 15, 1997 11:37 AM
To: Bill Olson
Cc: Jerry Sexton
Subject: Rice Engr. Lovington water well contamination case.
Importance: High

Telephone Memoranda: 4/14/97

Per your request I called Wes Root with Rice Engr. and notified him that the information requested for the above mentioned site is delinquent and is required in Santa Fe by next Monday.

cc: Wes Root fax# 397-1471

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☑ Telephone ☐ Personal	Time 1103	Date 1/9/97

Originating Party	Other Parties
Wes Root - Rice Engineering	Bill Olson - Environmental Bureau (voice mail)

Subject

Lovington #6

Discussion

Report will be submitted by approx. Jan 15th 1997

Conclusions or Agreements

Distribution
file

Signed Bill Olson

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

November 7, 1996

CERTIFIED MAIL
RETURN RECEIPT NO. P-269-269-212

Mr. Wes Root
Rice Engineering Corporation
122 West Taylor
Hobbs, New Mexico 88240

RE: NOTICE OF VIOLATION
PIPELINE LEAK UNIT "L" CONTAMINATION INVESTIGATION
LOVINGTON, NEW MEXICO

Dear Mr. Root:

On January 24, 1996, the New Mexico Oil Conservation Division (OCD) conditionally approved Rice Engineering Corporation's (REC) December 12, 1995 "PIPELINE LEAK UNIT "L", S31,T16S,R37E, LEA COUNTY NEW MEXICO". This document contained REC's work plan for investigating the extent of contamination related to a leak at the Unit "L" pipeline which contaminated City of Lovington municipal well #6. The OCD's January 24, 1996 conditional approval required that REC provide the OCD with a report on the investigation by March 29, 1996. To date the OCD has no record of REC either implementing the required work plan or submitting the required investigation report.

Failure to conduct the required investigations and to submit the required reports is a violation of the New Mexico Water Quality Control Commission (WQCC) regulations and the New Mexico Water Quality Act. The OCD requires that REC provide the OCD, by December 2, 1996, with the investigation report required in the OCD's January 24, 1996 work plan approval. Failure to comply could subject REC to issuance of a compliance order and imposition of penalties pursuant to 74-6-10. NMSA 1978 as amended.

If you have any questions, please call me at (505) 827-7152.

Sincerely,

Roger C. Anderson
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs Office
Robert Gallegos, NMED Drinking Water & Community Services
Bob Carter, City of Lovington

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PS Form **3800**, April 1995

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

January 24, 1996

CERTIFIED MAIL
RETURN RECEIPT NO. Z-765-962-542

Mr. Dave Abbott
Rice Engineering Corporation
122 West Taylor
Hobbs, New Mexico 88240

RE: CONTAMINATION INVESTIGATION
PIPELINE LEAK UNIT "L"
LOVINGTON, NEW MEXICO

Dear Mr. Abbott:

The New Mexico Oil Conservation Division (OCD) has completed a review of Rice Engineering Corporation's (REC) December 12, 1995 "PIPELINE LEAK UNIT "L", S31,T16S,R37E, LEA COUNTY NEW MEXICO". This document contains REC's work plan for investigating the extent of contamination related to the leak at the Unit "L" pipeline adjacent to the City of Lovington municipal well #6.

The above referenced investigation work plan is approved with the following conditions:

1. Since ground water at the site was contaminated in excess of New Mexico Water Quality Control Commission ground water standards, each borehole will be drilled into the water table and completed as follows:

   a. A minimum of fifteen feet of well screen will be installed, with at least five feet of well screen above the water table and ten feet of well screen below the water table.

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

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

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

2. REC will develop each monitor well upon completion using EPA approved procedures.

3. All wastes generated will be disposed of only upon prior approval by the OCD.

4. REC will sample ground water from the monitor wells and from the top of the water table in City of Lovington municipal well #6. Ground water samples will be sampled and analyzed for concentrations of benzene, toluene, ethylbenzene, xylene (BTEX), total dissolved solids and major cations and anions using EPA approved methods.

5. REC will submit a report on the investigation/remediation to the OCD by March 29, 1996. The report will contain:

   a. A description of all activities which occurred during the investigation, conclusions and recommendations.

   b. A summary of all soil and ground water laboratory analytic results including copies of the laboratory analyses.

   c. A water table elevation map using the water table elevation of the ground water in all monitor wells.

   d. A geologic log and as built well completion diagram for each borehole and/or monitor well.

   e. The recommended disposition of contaminated soils stockpiled at the site.

   f. The laboratory analytical results for all past soil and ground water samples referenced in the work plan.

   g. Any available geologic or drilling logs for the City of Lovington municipal well #6.

6. REC will notify the OCD at least one week in advance of all scheduled activities such that an OCD representative has the opportunity to witness the events and/or split samples.

7. All documents submitted for approval will be submitted to the OCD Santa Fe Office with copies provided to the OCD Hobbs District Office.

Please be advised that OCD approval does not relieve REC of liability if contamination exists which is beyond the scope of the work plan, or if the activities fail to adequately determine the extent of contamination related to REC's activities. In addition, OCD approval does not relieve REC of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs Office
Robert Gallegos, NMED Drinking Water & Community Services
Bob Carter, City of Lovington

Z 765 962 542

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PS Form **3800**, March 1993

Fold at line over top of envelope to the right of the return address

RICE Engineering Corporation

122 WEST TAYLOR TELEPHONE (505) 393-9174

HOBBS, NEW MEXICO 88240

December 12, 1995

DEC 3 1995

New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505

Attn: Mr. Bill Olson

RE: PIPELINE LEAK UNIT L, S31, T16S, R37E, LEA COUNTY, NEW MEXICO

Dear Mr. Olson:

Rice Engineering has completed initial soil abatement and groundwater recovery operations on our ABO Salt Water Disposal System near junction box L-31, Section 31, T16S, R37E, Lea County, New Mexico. On September 13, 1995, we initiated abatement operations in response to a produced water release. These operations included excavation of the hydrocarbon-affected soils along the pipeline right-of-way and pumping of contaminated groundwater from a municipal water supply well adjacent to the release site.

Two areas containing visible surface soil staining were identified as containing hydrocarbon-affected soils from the produced water release, an area north of the junction box and an area extending along the pipeline right-of-way to the City of Lovington Municipal Water Well No. 6.

Excavation operations at the two moderately stained areas extended to a maximum depth of eight feet in the area northeast of the junction box. Impacted soils were removed to a depth of approximately four feet in an area extending approximately 30 feet along the pipeline northwest of the junction box. Excavation operations generated approximately 160 cubic yards of hydrocarbon-affected soil, which were staged on a plastic liner pending disposal/remediation operations in accordance with New Mexico Oil Commission Division (NMOCD) regulations.

Benzene, toluene, ethyl-benzene, and total xylenes (BTEX), and chlorides were determined based on product knowledge to be the compound-specific analyses appropriate for the site. In addition, total petroleum hydrocarbons (TPH) analysis was used as a screening method to assist delineation of the impacted area.

Soil analytical results from the excavations show contaminant levels decreased rapidly with depth. Total petroleum hydrocarbon (TPH) levels ranged from 4,546 parts per million (ppm) in the near surface soils around Well No. 6 to 888 ppm at a depth of approximately eight feet where competent rock (caliche) was encountered. Chloride concentrations also decreased with depth from 7,880 ppm in the near surface soils to 440 ppm at the bottom of the excavation.

Physical inspection of the municipal water well shows the current well construction consists of only 6 to 10 feet of surface casing with at least a portion of the remaining well bore left uncased. This condition would provide a near surface potential migratory pathway for contaminants to enter the well bore.

Pumping data and analytical results from the groundwater recovery operations we have performed to date show contaminant levels in the groundwater have significantly decreased with time. Analytical results of groundwater samples obtained when recovery operations began on October 4, 1995, recorded total dissolved solids (TDS), Chloride, and total BTEX levels of 15,720 ppm, 12,200 ppm, and 1,714 ppm, respectively. We pumped the well for 55 days, recovered approximately 95,000 barrels of water, and monitored TDS, Chloride, and BTEX levels three times a week during the recovery operations. The analytical results show a steady decline in concentration levels over time with TDS, Chloride, and BTEX levels apparently stabilizing at approximately 800 ppm, 300 ppm, and < 0.001 ppm, respectively. A table of the recovery data and graphs of the analytical results vs time are enclosed.

These operations appear to confirm our initial finding that the source of the hydrocarbon impacted soils and the contamination found in the City of Lovington Municipal Water Supply Well No. 6 was the pipeline leak. Our findings indicate that the produced water release saturated the near surface soil north of the junction box and migrated along the pipe case until it reached the City of Lovington Municipal Water Well No. 6 located approximately 30 feet northwest of the Junction Box. At this point, any excess fluids remaining from the release apparently migrated downward along the surface casing and entered the well bore, thereby contaminating the well.

Based on the results of our groundwater recovery operations, we believe the extent of groundwater contamination is limited to an area very near the municipal water well and that we have recovered a majority of the contaminant plume.

Please find attached a plat detailing the site (including proposed boring locations) and a revised work plan to delineate the soil impact for your approval. We will implement the approved work plan as soon as a drilling rig is available.

Please contact this office at your earliest convenience, if you have any further questions or comments.

Yours Very Truly,

RICE ENGINEERING CORPORATION

Dave Abbott
Division Engineer

DA/pf

cc: LBG - REC - Midland
TM - GB
All Parties
Gary McCaslin - NMED - Roswell
Don Byers - NMED - Hobbs
Jerry Sexton - NMOCD - Hobbs
Wayne Price - NMOCD - Hobbs
Bob Carter - City Manager - Lovington

PUMP RECOVERY VOLUMES & WATER QUALITY RESULTS

Date	Time Pumped (hours)	Volume Recovered (bbls)	Total Volume (bbls)	Avg Pump Rate (bbls/hr)	TDS (ppm)	Chlorides (ppm)	BTEX (ppm)	Benzene (ppm)	Toluene (ppm)	E-benzene (ppm)	Xylenes (ppm)	Silver (ppm)	Arsenic (ppm)	Barium (ppm)	Cadmium (ppm)	Chromium (ppm)	Mercury (ppm)	Lead (ppm)	Selenium (ppm)
09/22/95	0	0	0	0								<0.01	<0.01	0.21	<0.01	<0.01	<0.001	0.03	<0.01
10/04/95	0	0.1	0	0	15720	12200	1.714	1.262	0.258	0.065	0.129	<0.01	<0.01	0.19	<0.01	<0.01	<0.001	<0.01	<0.01
10/05/95	8	1,428	1,428	178.5	12710	9900	0.969												
10/06/95	8	1,428	2,856	178.5	10597	4660													
10/07/95	8	1,428	4,284	178.5															
10/08/95	24	3,428	7,712	142.8															
10/09/95	24	3,142	10,854	130.9	6270	4160	0.264	0.171	0.073	0.011	0.009								
10/10/95	12	1,714	12,568	142.8	6560	2490	0.274	0.055	0.085	0.059	0.075								
10/10/95	12	1,714	14,282	142.8	5490	1950	0.232	0.117	0.072	0.020	0.023								
10/11/95	24	3,412	17,694	142.2	4930	1740	0.330	0.191	0.098	0.024	0.017								
10/12/95	24	3,380	21,074	140.8	4480	1450	0.211	0.121	0.061	0.016	0.013								
10/13/95	24	3,425	24,499	142.7	4240	1600	0.009	<0.001	<0.001	<0.001	0.009								
10/14/95	24	3,290	27,789	137.1															
[redacted]/15/95	24	3,376	31,165	140.7															
[redacted]/16/95	24	3,390	34,555	141.3	3710	1320	0.117	0.072	0.032	0.013	<0.001								
10/17/95	24	3,415	37,970	142.3	3450	1150	0.032	0.016	0.004	0.012	<0.001								
10/18/95	24	3,404	41,374	141.8	3320	1080	0.004	0.004	<0.001	<0.001	<0.001								
10/19/95	24	3,340	44,714	139.2	3020	960	<0.001	<0.001	<0.001	<0.001	<0.001								
10/20/95	24	3,000	47,714	125.0	3370	1040	<0.001	<0.001	<0.001	<0.001	<0.001								
10/21/95	24	3,000	50,714	125.0															
10/22/95	24	3,000	53,714	125.0															
10/23/95	24	3,000	56,714	125.0															
10/24/95	24	3,000	59,714	125.0															
10/25/95	24	3,000	62,714	125.0	2191	980	<0.001	<0.001	<0.001	<0.001	<0.001								
10/26/95	24	1,200	63,914	50.0	4940	1400	0.019	0.014	0.005	<0.001	<0.001								
10/27/95	24	1,200	65,114	50.0															
10/28/95	24	1,200	66,314	50.0	4940	1390	<0.001	<0.001	<0.001	<0.001	<0.001								
10/29/95	24	1,200	67,514	50.0	4760	1320	<0.001	<0.001	<0.001	<0.001	<0.001								
10/30/95	24	1,200	68,714	50.0	3820	1363	0.007	0.007	<0.001	<0.001	<0.001								
10/31/95	24	1,200	69,914	50.0	3120	810	0.010	0.007	0.003	<0.001	<0.001								
11/01/95	24	1,200	71,114	50.0	2740	743	0.005	0.005	<0.001	<0.001	<0.001								
11/02/95	24	1,200	72,314	50.0	833	260	0.006	0.006	<0.001	<0.001	<0.001								
11/03/95	24	1,200	73,514	50.0	3010	870	<0.001	<0.001	<0.001	<0.001	<0.001								
11/04/95	24	1,200	74,714	50.0															
[redacted]/05/95	24	1,200	75,914	50.0															
[redacted]/06/95	24	1,200	77,114	50.0															
11/07/95	24	1,200	78,314	50.0	2890	690	<0.001	<0.001	<0.001	<0.001	<0.001								
11/08/95	24	1,200	79,514	50.0	2850	252	<0.001	<0.001	<0.001	<0.001	<0.001								
11/09/95	24	1,200	80,714	50.0															
11/10/95	24	800	81,514	33.3	2660	730	<0.001	<0.001	<0.001	<0.001	<0.001								
11/11/95	24	800	82,314	33.3															
11/12/95	24	800	83,114	33.3															
11/13/95	24	800	83,914	33.3	2720	670	<0.001	<0.001	<0.001	<0.001	<0.001								
11/14/95	24	800	84,714	33.3															
11/15/95	24	800	85,514	33.3	738	312	<0.001	<0.001	<0.001	<0.001	<0.001								
11/16/95	24	800	86,314	33.3															
11/17/95	24	800	87,114	33.3	772	228													
11/18/95	24	800	87,914	33.3															
11/19/95	24	800	88,714	33.3															
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PUMP RECOVERY VOLUMES & WATER QUALITY RESULTS

Date	Time Pumped (hours)	Volume Recovered (bbls)	Total Volume (bbls)	Avg Pump Rate (bbls/hr)	TDS (ppm)	Chlorides (ppm)	BTEX (ppm)	Benzene (ppm)	Toluene (ppm)	E-benzene (ppm)	Xylenes (ppm)	Silver (ppm)	Arsenic (ppm)	Barium (ppm)	Cadmium (ppm)	Chromium (ppm)	Mercury (ppm)	Lead (ppm)	Selenium (ppm)
11/24/95	24	800	92,714	33.3															
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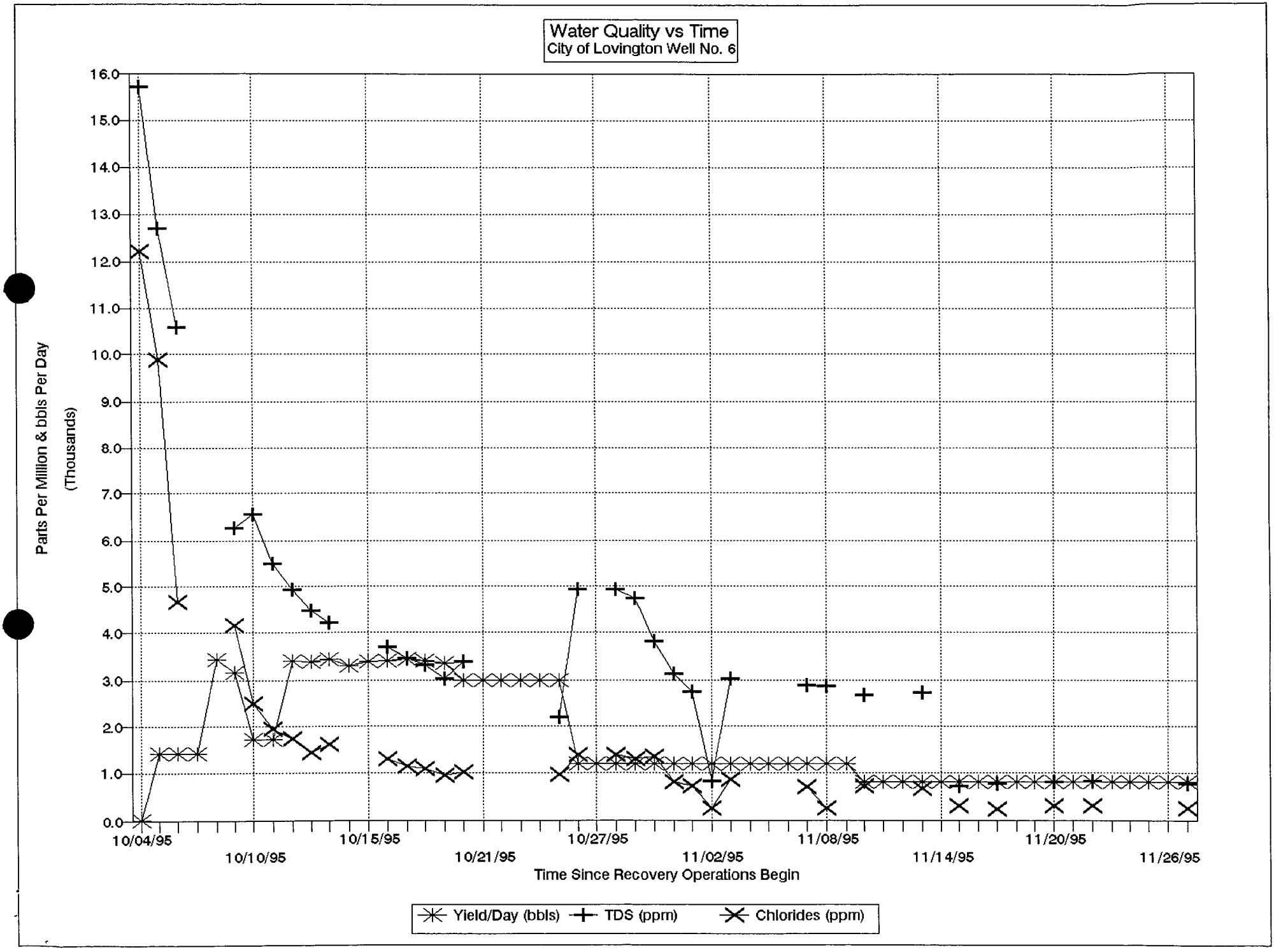
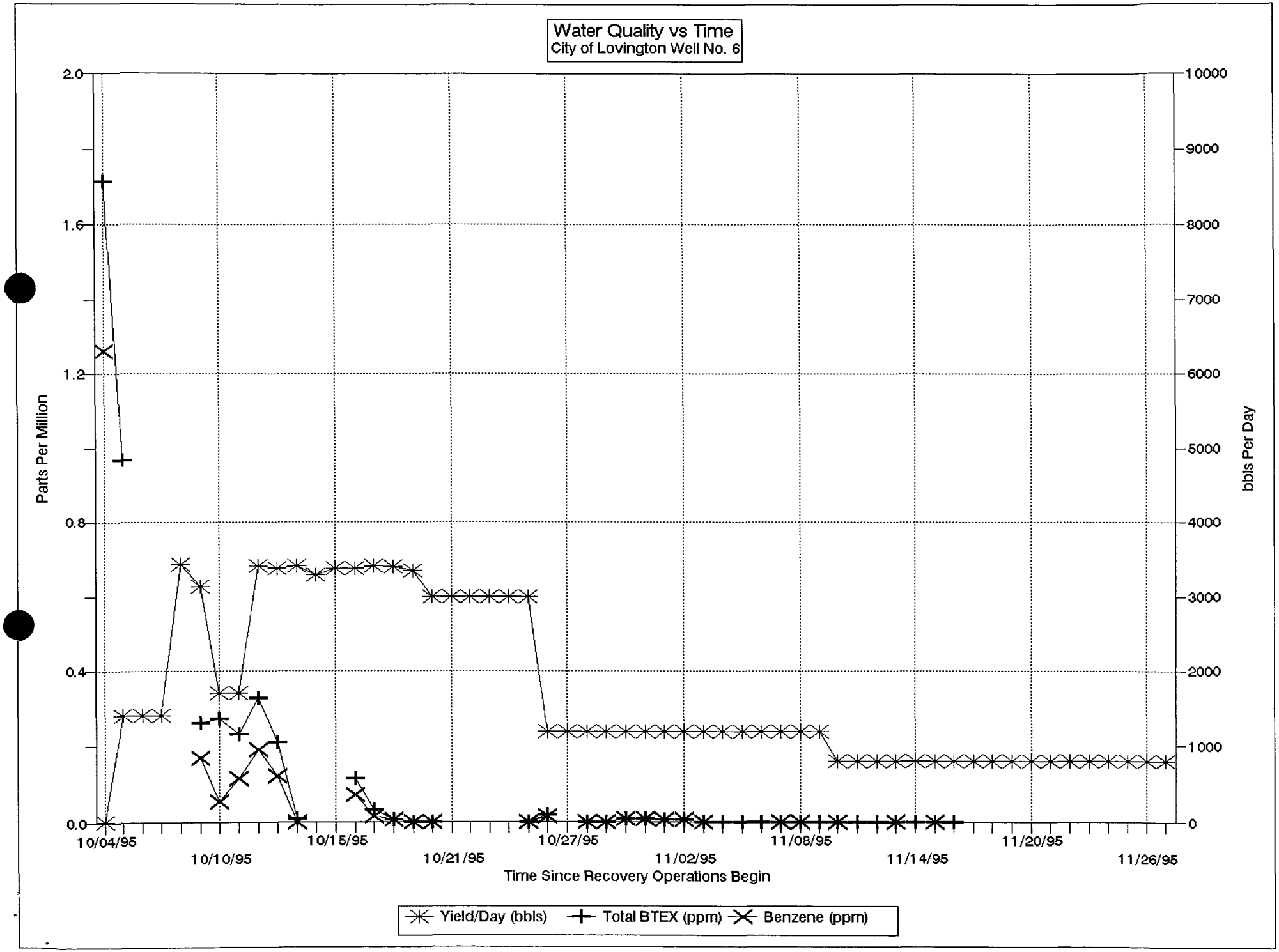
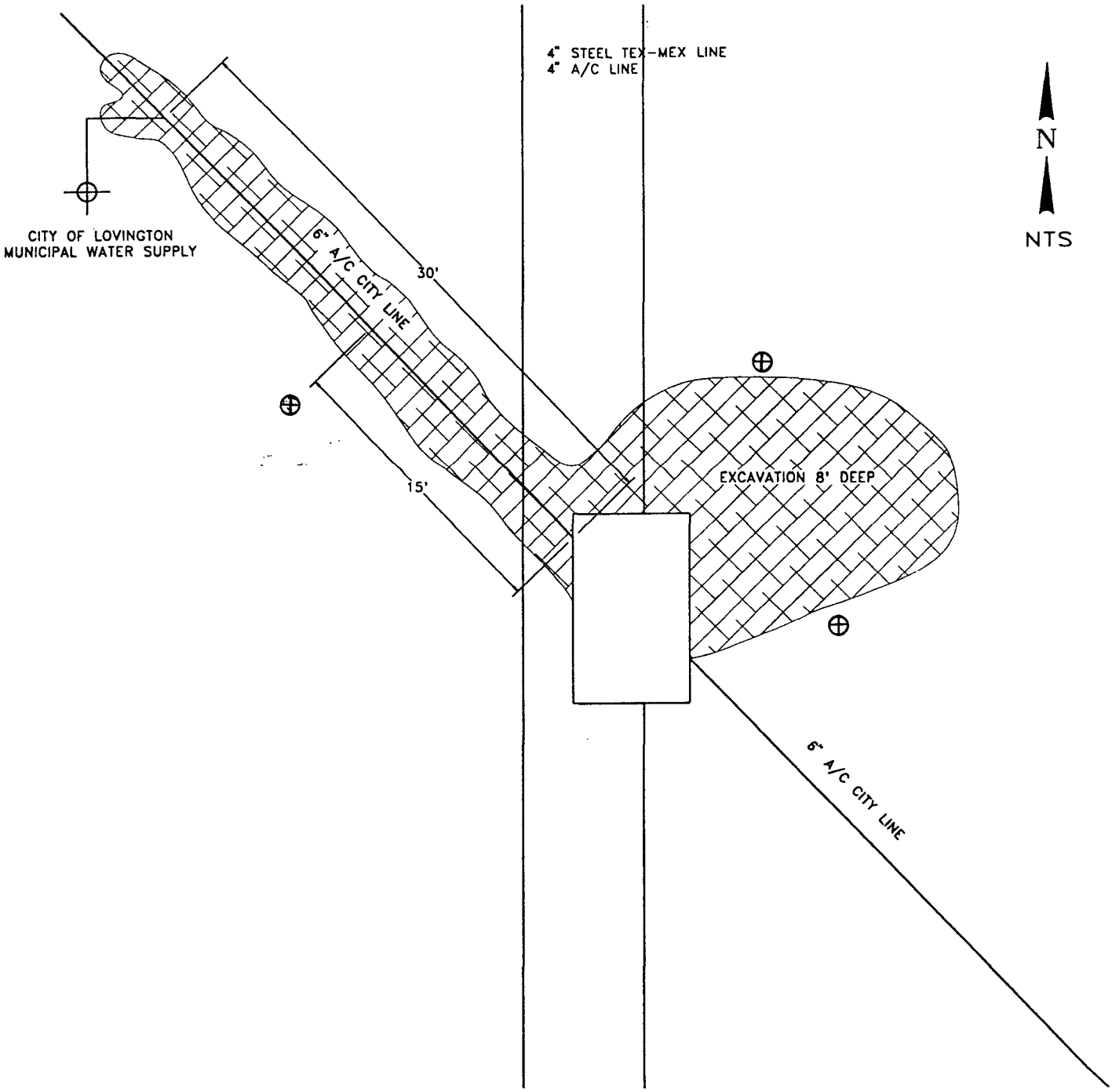

Water Quality vs Time
City of Lovington Well No. 6
Parts Per Million & bbls Per Day
(Thousands)
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
10/04/95
10/10/95
10/15/95
10/21/95
10/27/95
11/02/95
11/08/95
11/14/95
11/20/95
11/26/95
Time Since Recovery Operations Begin
Yield/Day (bbls)
TDS (ppm)
Chlorides (ppm)


Water Quality vs Time
City of Lovington Well No. 6
Parts Per Million
bbls Per Day
2.0
1.6
1.2
0.8
0.4
0.0
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
10/04/95
10/10/95
10/15/95
10/21/95
10/27/95
11/02/95
11/08/95
11/14/95
11/20/95
11/26/95
Time Since Recovery Operations Begin
Yield/Day (bbls)
Total BTEX (ppm)
Benzene (ppm)

ABO SWD SYSTEM
JCT. L-31
UNIT L SEC. 31, T16S, R37E
LEA Co., NEW MEXICO



⊕ LOCATIONS OF PROPOSED SOIL BORINGS

12/15/95
DA
cc: File
L86

ENVIRONMENTAL
SPILL CONTROL, INC.

NM GENERAL CONTRACTORS LIC. #55535
TX DRILLING LIC. #5005M
NM DRILLING LIC. #WD 1349

P.O. BOX 5890 ★ HOBBS, NM 88241
PHONE (505) 392-6167 ★ FAX (505) 397-5085

Dec. 15, 1995

Rice Engineering Corporation
122 West Taylor
Hobbs, New Mexico 88240

Attn: Mr. Dave Abbott

Re: Work Plan For Subsurface Investigation (Revised December 9,1995)
Junction L-31 Leak Site
ABO Salt Water Disposal System
Lea County, New Mexico

Dear Mr. Abbott:

Environmental Spill Control, Incorporated ("ESC") is pleased to present this revised work plan to conduct a subsurface investigation at the aforementioned site. The purpose of this investigation is to assess the magnitude and areal extent of potential soil impact created by a produced water release from the pipeline leak at the L-31 Junction box of the ABO SWD System.

WORK PLAN

1) Drill 3 borings offsetting the junction L-31 leak site to delineate the extent of impact. During drilling operations, monitor the drill cuttings and collect split spoon samples on five foot centers to obtain samples for laboratory analysis and to aid in characterizing subsurface conditions.

2) Soil and cutting samples will be screened for volatile organics using an organic vapor analyzer (OVA). During drilling operations, total petroleum hydrocarbon (TPH) analysis will be performed on the split-spoon samples using a MEGA TPH analyzer.

3) Drilling of each boring will be terminated when two consecutive split-spoon samples record OVA readings of less than 100 parts per million (ppm) and TPH levels of less than 100 ppm.

4) Two soil samples from each soil boring will be submitted for laboratory analysis, including one from the sampled interval exhibiting the highest OVA reading and/or TPH level, and the sample obtained from the bottom of the boring (total depth). Should groundwater be encountered during drilling, the soil sample immediately above the water zone will be submitted to the laboratory for analysis. The samples will be submitted to Cardinal Laboratories in Hobbs, New Mexico for benzene, ethylbenzene, tolulene, and total xylenes (BTEX), TPH and Chloride analysis.

5) Prepare a written report summarizing the finding of this investigation.

STANDARD OPERATING PROCEDURES

Drilling Operations

The borings will be drilled using an air rotary rig and a 4 3/4 inch bit. The drilling equipment will be decontaminated between each boring using a high-pressure steam cleaner. An environmental geologist will be on site to describe the soils encountered, prepare boring logs, and to obtain soil samples for analysis.

Decontamination

A steam sprayer will be used for decontamination of all sampling equipment (split-spoon; between each sample) and drilling equipment (drill pipe, bit, etc.; between each boring location). Unless obvious impact is observed during drilling operations, the decontamination/rinsate water will be allowed run off on to the ground surface.

Health and Safety Plan

A site specific Health and Safety plan will be prepared in accordance with OSHA standards for use by all on-site personnel prior to beginning the investigation. Level D personal protective equipment (PPE) will be used, which includes the following: hard hat, safety glasses, steel toed boots, ear plugs, nitrile gloves for handling sampling equipment. All of our employees meet the 40 hour HAZWOPER training required per 29 CFR 1910.120.

Soil Sample Collection and Analyses

Soil will be removed from the sampling devices using disposable nitrile gloves and/or properly decontaminated sampling trowels.

·The soil sample obtained from each interval will be split into three sets of soil samples. One sample will be field screened with a flame ionization detector (FID) organic vapor analyzer (OVA), Foxboro Model 128 OVA using the head space procedure described in Unlined Surface Impoundment Closure Guidelines published by the New Mexico Oil Conservation Division (NMOCD). The OVA detects volatile organic compounds from petroleum and non-petroleum sources.

·The second sample will be analyzed for TPH levels with a General Analysis Corporation (GAC) MEGA TPH analyzer using EPA Method 418.1.

·The third sample from selected intervals will placed in a glass jar with a teflon-lined lid, custody sealed, stored at 4°C as per EPA protocol (EPA 600/4-82-029), and transported to the laboratory. Samples submitted to the laboratory will be analyzed for BTEX using EPA Method 8020, TPH using EPA Method 418.1, and Chlorides using EPA Method

A chain-of-custody which documents sample collection times and delivery to the laboratory will be completed for each set of samples.

Report Preparation

A letter report will be prepared that will include the following sections: Report Summary, Soil Boring Operations, Analytical Results, Conclusions, Drilling Logs, and Laboratory Analyses.

ESC appreciates the opportunity to be of service to your company. If you have any questions or desire further information, please contact us at any time.

Best regards,

ENVIRONMENTAL SPILL CONTROL, INC.

F. Wesley Root

F. Wesley Root
Division Manager
Hydrology/Geology

cc: Mr. Jimmy Curtis
Mr. Allen Hodge

FROM: Wayne Price

TO: Bill Olson - N.M.O.C.D

CC: Jerry Sexton
Wayne Price

OIL CONSERVATION DIVISION
RECEIVED
95 NO 29 AM 8 52

DATE: 11-29-95
TIME: 09:31

SUBJECT: Lovington well #6/ Rice Engr. meeting:
PRIORITY: 4
ATTACHMENTS:

Dear Bill,

Per your request, here are the minutes of the meeting held by the NMED at the NMED Hobbs office on 11/28/95 @ 1:30 pm.

NMED personnel present: Garrison McCaslin, Tom Burk, Art Mason, Don Byers
Rice Engr. personnel: Dave Abbot, Glen Parker, Allen Hodge (Environmental Spill Control).
NMOCD Personnel: Jerry Sexton, Wayne Price

Garrison McCaslin NMED District IV MGR. from the Roswell office indicated that his office was seeking additional information concerning the ground water contamination of the city of Lovington's well #6. Mr. Garrison pointed out that the NMED's primary concern is one of safe drinking water for the city of Lovington. He also noted that the Rice Engr. line leak and resultant clean-up activities appears to lie in the regulatory jurisdiction of the NMOCD.

Mr. McCaslin was recently in receipt of the NMOCD file on this issue and indicated after reviewing the file that his office was unaware of the amount of work that has occured as of to date, and praised all parties involved for doing such an expeditious job ensuring that the city of Lovinton's drinking water was safe to drink.

Mr. McCaslin said that the city of Lovinton now has implemented a plan for improving their water supply and now has the protocol for emergency situations. He indicated there would not be any enforcement actions or N.O.V's issued.

He did recommend that all parties involved continue to communicate and emphasized copying everyone on pertinent info.

Dave Abbott of Rice Engr. gave a brief overview of what caused the problem and presented the most recent water well data. Mr. Abbott indicated from historical data that the most recent results indicate they are approaching background levels of the aquifer. He pointed out this probably indicates that the impact to ground water from the spill is minimal since the well is begining to clean up so fast. Jerry Sexton agreed indicating other ground water cases in the area have taken over a year or more of pumping to obtain the same type of results.

Dave Abbott also indicated his company has begun to develop S.O.P.'s in order to prevent these type of accidents from occurring.

Mr. Abbott also indicated his company is working with the city of Lovington,

and the preliminary plans is to P&A the well and drill them a new one.

There was an open discussion about the problem of Lovington having it's drinking water well field located in an active oil patch and close to a major refinery.

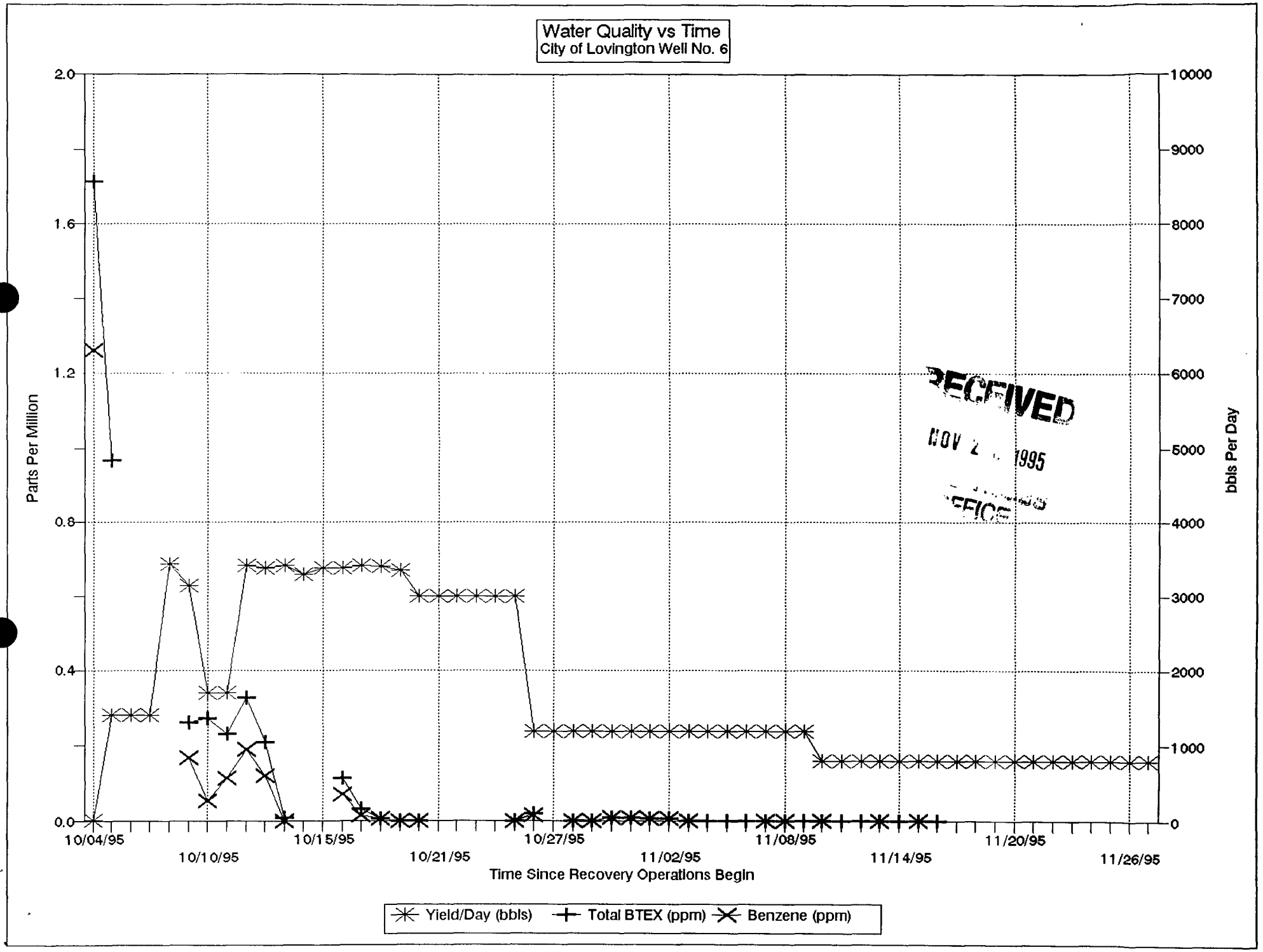
meeting ended at @ 2:45pm.

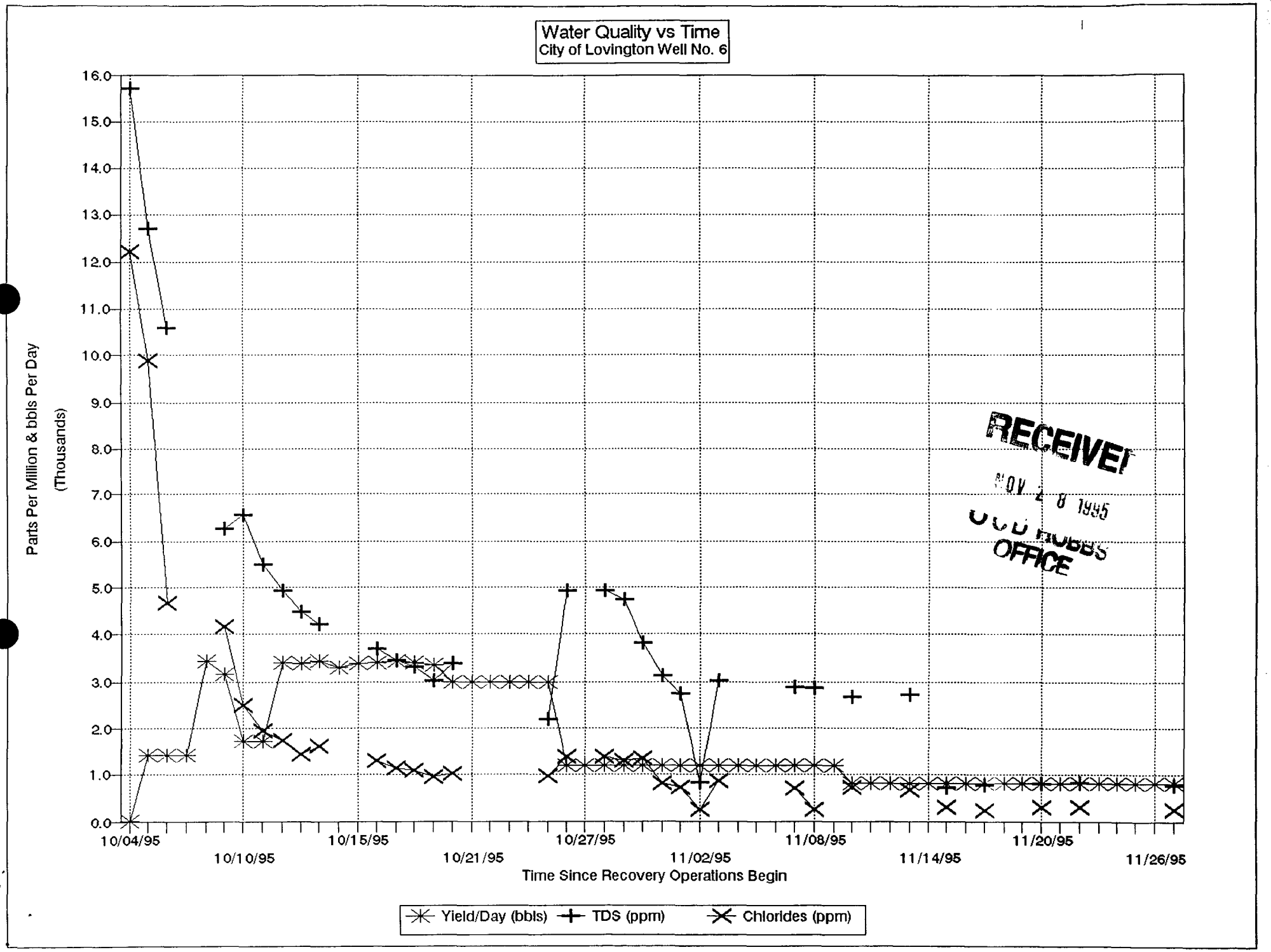
==========

cc: Bill Olson

Recent well data 9 pages

cc: Bill Olson




Water Quality vs Time
City of Lovington Well No. 6
Parts Per Million & bbls Per Day
(Thousands)
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
10/04/95
10/10/95
10/15/95
10/21/95
10/27/95
11/02/95
11/08/95
11/14/95
11/20/95
11/26/95
Time Since Recovery Operations Begin
Yield/Day (bbls)
TDS (ppm)
Chlorides (ppm)
RECEIVED
NOV 28 1995
OCD HOBBS
OFFICE

PUMP RECOVERY VOLUMES & WATER QUALITY RESULTS

Date	Time Pumped (hours)	Volume Recovered (bbls)	Total Volume (bbls)	Avg Pump Rate (bbls/hr)	TDS (ppm)	Chlorides (ppm)	BTEX (ppm)	Benzene (ppm)	Toluene (ppm)	E-benzene (ppm)	Xylenes (ppm)	Silver (ppm)	Arsenic (ppm)	Barium (ppm)	Cadmium (ppm)	Chromium (ppm)	Mercury (ppm)	Lead (ppm)	Selenium (ppm)
09/22/95	0	0	0	0								<0.01	<0.01	0.21	<0.01	<0.01	<0.001	0.03	<0.01
10/04/95	0	0.1	0	0	15720	12200	1.714	1.262	0.258	0.065	0.129	<0.01	<0.01	0.19	<0.01	<0.01	<0.001	<0.01	<0.01
10/05/95	8	1,428	1,428	178.5	12710	9900	0.969												
10/06/95	8	1,428	2,856	178.5	10597	4660													
10/07/95	8	1,428	4,284	178.5															
10/08/95	24	3,428	7,712	142.8															
10/09/95	24	3,142	10,854	130.9	6270	4160	0.264	0.171	0.073	0.011	0.009								
10/10/95	12	1,714	12,568	142.8	6560	2490	0.274	0.055	0.085	0.059	0.075								
10/10/95	12	1,714	14,282	142.8	5490	1950	0.232	0.117	0.072	0.020	0.023								
10/11/95	24	3,412	17,694	142.2	4930	1740	0.330	0.191	0.098	0.024	0.017								
10/12/95	24	3,380	21,074	140.8	4480	1450	0.211	0.121	0.061	0.016	0.013								
10/13/95	24	3,425	24,499	142.7	4240	1600	0.009	<0.001	<0.001	<0.001	0.009								
10/14/95	24	3,290	27,789	137.1															
10/15/95	24	3,376	31,165	140.7															
10/16/95	24	3,390	34,555	141.3	3710	1320	0.117	0.072	0.032	0.013	<0.001								
10/17/95	24	3,415	37,970	142.3	3450	1150	0.032	0.016	0.004	0.012	<0.001								
10/18/95	24	3,404	41,374	141.8	3320	1080	0.004	0.004	<0.001	<0.001	<0.001								
10/19/95	24	3,340	44,714	139.2	3020	960	<0.001	<0.001	<0.001	<0.001	<0.001								
10/20/95	24	3,000	47,714	125.0	3370	1040	<0.001	<0.001	<0.001	<0.001	<0.001								
10/21/95	24	3,000	50,714	125.0															
10/22/95	24	3,000	53,714	125.0															
10/23/95	24	3,000	56,714	125.0															
10/24/95	24	3,000	59,714	125.0															
10/25/95	24	3,000	62,714	125.0	2191	980	<0.001	<0.001	<0.001	<0.001	<0.001								
10/26/95	24	1,200	63,914	50.0	4940	1400	0.019	0.014	0.005	<0.001	<0.001								
10/27/95	24	1,200	65,114	50.0															
10/28/95	24	1,200	66,314	50.0	4940	1390	<0.001	<0.001	<0.001	<0.001	<0.001								
10/29/95	24	1,200	67,514	50.0	4760	1320	<0.001	<0.001	<0.001	<0.001	<0.001								
10/30/95	24	1,200	68,714	50.0	3820	1363	0.007	0.007	<0.001	<0.001	<0.001								
10/31/95	24	1,200	69,914	50.0	3120	810	0.010	0.007	0.003	<0.001	<0.001								
11/01/95	24	1,200	71,114	50.0	2740	743	0.005	0.005	<0.001	<0.001	<0.001								
11/02/95	24	1,200	72,314	50.0	833	260	0.006	0.006	<0.001	<0.001	<0.001								
11/03/95	24	1,200	73,514	50.0	3010	870	<0.001	<0.001	<0.001	<0.001	<0.001								
11/04/95	24	1,200	74,714	50.0															
11/05/95	24	1,200	75,914	50.0															
11/06/95	24	1,200	77,114	50.0															
11/07/95	24	1,200	78,314	50.0	2890	690	<0.001	<0.001	<0.001	<0.001	<0.001								
11/08/95	24	1,200	79,514	50.0	2850	252	<0.001	<0.001	<0.001	<0.001	<0.001								
11/09/95	24	1,200	80,714	50.0															
11/10/95	24	800	81,514	33.3	2660	730	<0.001	<0.001	<0.001	<0.001	<0.001								
11/11/95	24	800	82,314	33.3															
11/12/95	24	800	83,114	33.3															
11/13/95	24	800	83,914	33.3	2720	670	<0.001	<0.001	<0.001	<0.001	<0.001								
11/14/95	24	800	84,714	33.3															
11/15/95	24	800	85,514	33.3	738	312	<0.001	<0.001	<0.001	<0.001	<0.001								
11/16/95	24	800	86,314	33.3															
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11/27/95	24	800	95,114	33.3	783	268													

Bill Olson

From: Wayne Price
Sent: Wednesday, November 29, 1995 9:31 AM
To: Bill Olson
Cc: Wayne Price; Jerry Sexton
Subject: Lovington well #6/ Rice Engr. meeting:
Importance: High

Dear Bill,

Per your request, here are the minutes of the meeting held by the NMED at the NMED Hobbs office on 11/28/95 @ 1:30 pm.

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Rice Engr. personnel: Dave Abbot, Glen Parker, Allen Hodge (Environmental Spill Control).
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Mr. Abbott also indicated his company is working with the city of Lovington, and the preliminary plans is to P&A the well and drill them a new one.

There was an open discussion about the problem of Lovington having it's drinking water well field located in an active oil patch and close to a major refinery.

meeting ended at @ 2:45pm.

Bill Olson

From: Wayne Price
Sent: Tuesday, November 28, 1995 10:49 AM
To: Jerry Sexton
Cc: Bill Olson; Wayne Price
Subject: Lovington well#6/Rice Engr.
Importance: High

Dear Jerry,

Bill Olson called this morning and corrected my memo to you yesterday.

A sampling and work plan was actually due on Sept. 29, 1995. Rice has not submitted this plan and is past due. If this plan is not submitted by this friday then they will be sent a notice of violation from Santa Fe. Bill has requested we inform them at the meeting today.

Also, a minor error in my memo yesterday, should have been dated 11/27/95 not 11/11.

Bill Olson

From: Wayne Price
Sent: Monday, November 27, 1995 3:36 PM
To: Roger Anderson
Cc: Bill Olson; Wayne Price
Subject: Lovington Well #6 contamination meeting
Importance: High

Dear Roger,

Tom Burk with the NMED and his boss Gary McCaslin and other personnel is having a meeting with Rice Engr. tomorrow in Hobbs concerning the recent ground water contamination. Mr. Burk has invited someone from our office to attend.

Please read my attachment; Please advise!

Thanks


LWP-JS.LOV

NMOCD Inter-Correspondence

To: Jerry Sexton-District I Supervisor

From: Wayne Price-Environmental Engineer District I

Date: Nov 27, 1995

Reference: Lovington well #6/ Rice Engr.

Subject: Telephone call from Tom Burk(NMED) and your request to copy NMOCD file.

Comments:

Jerry,

Per your request I have copied the file (attached). Also Tom Burk called and notified us that the NMED is having a meeting with Rice Engr. at the NMED Hobbs, office at 1:30 tomorrow.

I would like to attend this meeting if ok with you. Bill Olson is out on vacation and has requested I keep the Santa Fe office notified of any significate events.

To bring you up to speed, Bill Olson has requested from Rice a work plan for containing and remediating contaminated ground water, a monitor plan and schedule. This plan is due Dec. 22, 1995.

cc: Bill Olson-NMOCD Hydrogeologist Santa Fe

attachments-1 complete NMOCD Hobbs file on Lovington well #6

RICE Engineering Corporation

122 WEST TAYLOR TELEPHONE (505) 393-9174

HOBBS, NEW MEXICO 88240

November 10, 1995

Attn: Mr. Bill Olson
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505

RE: PIPELINE LEAK UNIT 'L' SEC 31, T16S, R37E,
LEA COUNTY, NEW MEXICO

Dear Mr. Olson:

Please find enclosed for your review a summary of water volumes and lab analysis along with a chronology of the City of Lovington Well #6. Since our phone conversation of 10/30/95, the reduced pump rate has significantly increased the TDS and chlorides concentration of the recovered water, then on 11/02/95, we saw a decrease in concentrations. I will contact you and advise you of the status of this project if there are any radical change in the lab analysis at this recovery rate of 1,200 Bbls/day.

We are currently researching the Hydrology and background water quality associated with the Ogalala in this area. This should be accomplished by 11/27/95. As always, should you have any further questions or comments, please contact our office at your earliest convenience.

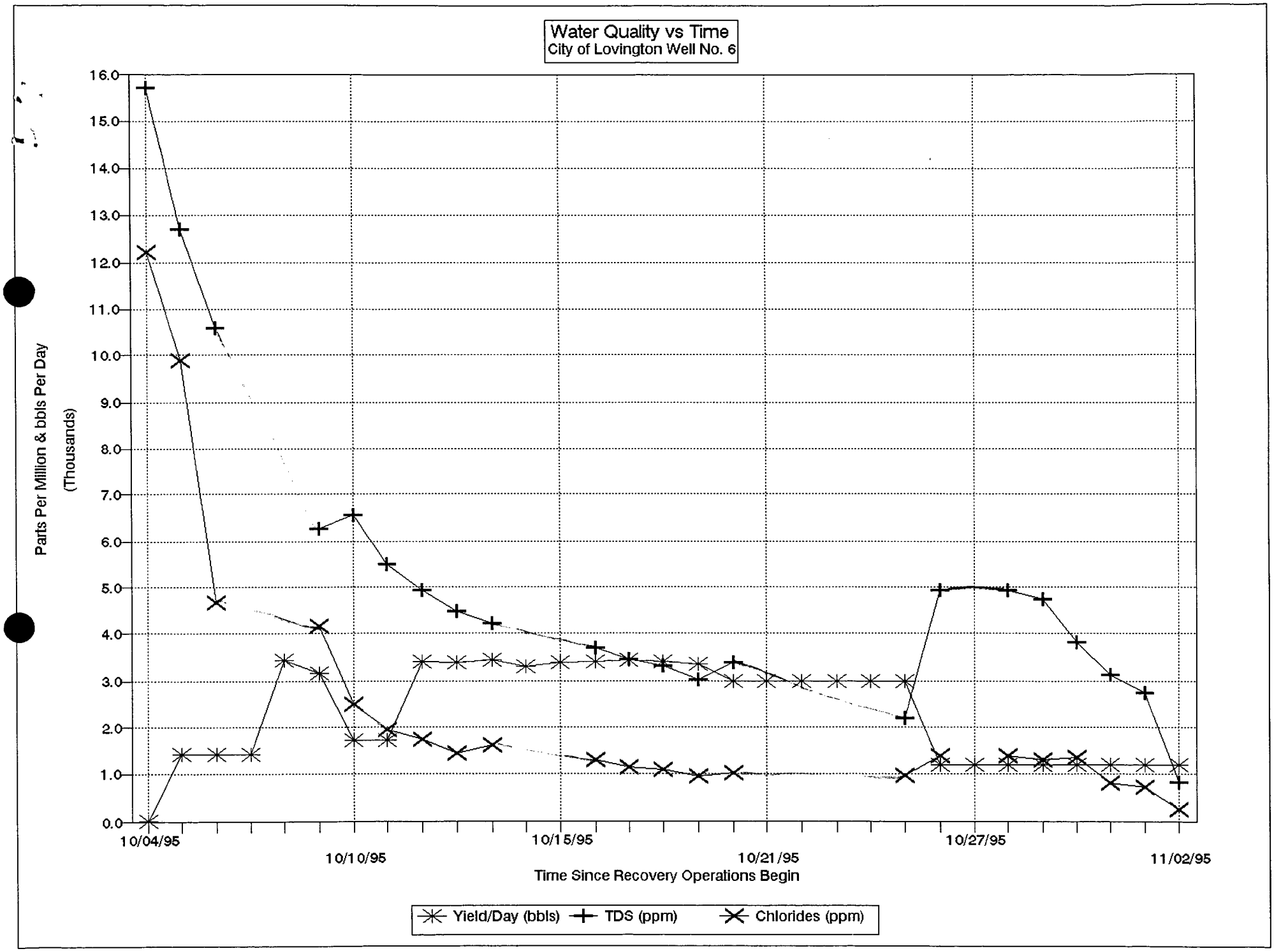
Sincerely,

RICE ENGINEERING CORPORATION

Dave Abbott
Division Engineer

DA/pf

cc: LBG - Midland
Jerry Sexton - NMOCD - Hobbs
Wayne Price - NMOCD - Hobbs
File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(Thousands)
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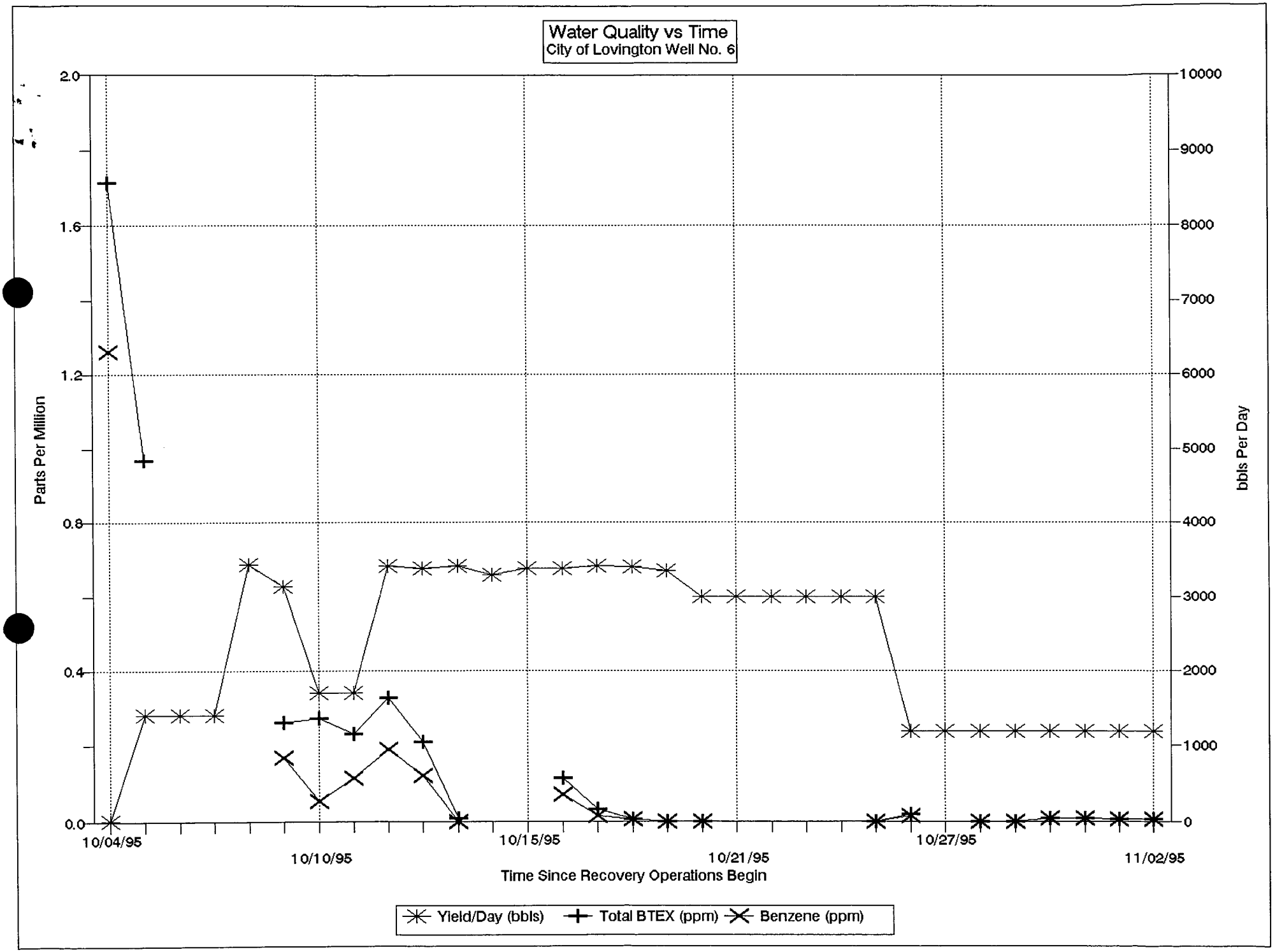
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
10/04/95
10/10/95
10/15/95
10/21/95
10/27/95
11/02/95
Time Since Recovery Operations Begin
Yield/Day (bbls)
TDS (ppm)
Chlorides (ppm)


Water Quality vs Time
City of Lovington Well No. 6
Parts Per Million
bbls Per Day
2.0
1.6
1.2
0.8
0.4
0.0
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
10/04/95
10/10/95
10/15/95
10/21/95
10/27/95
11/02/95
Time Since Recovery Operations Begin
Yield/Day (bbls)
Total BTEX (ppm)
Benzene (ppm)

Date	Time Pumped (hours)	Volume Recovered (bbls)	Total Volume (bbls)	Avg Pump Rate (bbls/hr)	TDS (ppm)	Chlorides (ppm)	BTEX (ppm)	Benzene (ppm)	Toluene (ppm)	E-benzene (ppm)	Xylenes (ppm)
09/22/95	0	0	0	0							
09/22/95	0	0	0	0							
10/04/95	0	0.1	0	0	15720	12200	1.714	1.262	0.258	0.065	0.129
10/05/95	8	1,428	1,428	178.5	12710	9900	0.969				
10/06/95	8	1,428	2,856	178.5	10597	4660					
10/07/95	8	1,428	4,284	178.5							
10/08/95	24	3,428	7,712	142.8							
10/09/95	24	3,142	10,854	130.9	6270	4160	0.264	0.171	0.073	0.011	0.009
10/10/95	12	1,714	12,568	142.8	6560	2490	0.274	0.055	0.085	0.059	0.075
10/10/95	12	1,714	14,282	142.8	5490	1950	0.232	0.117	0.072	0.020	0.023
10/11/95	24	3,412	17,694	142.2	4930	1740	0.330	0.191	0.098	0.024	0.017
10/12/95	24	3,380	21,074	140.8	4480	1450	0.211	0.121	0.061	0.016	0.013
10/13/95	24	3,425	24,499	142.7	4240	1600	0.009	<0.001	<0.001	<0.001	0.009
10/14/95	24	3,290	27,789	137.1							
10/15/95	24	3,376	31,165	140.7							
10/16/95	24	3,390	34,555	141.3	3710	1320	0.117	0.072	0.032	0.013	<0.001
10/17/95	24	3,415	37,970	142.3	3450	1150	0.032	0.016	0.004	0.012	<0.001
10/18/95	24	3,404	41,374	141.8	3320	1080	0.004	0.004	<0.001	<0.001	<0.001
10/19/95	24	3,340	44,714	139.2	3020	960	<0.001	<0.001	<0.001	<0.001	<0.001
10/20/95	24	3,000	47,714	125.0	3370	1040	<0.001	<0.001	<0.001	<0.001	<0.001
10/21/95	24	3,000	50,714	125.0							
10/22/95	24	3,000	53,714	125.0							
10/23/95	24	3,000	56,714	125.0							
10/24/95	24	3,000	59,714	125.0							
10/25/95	24	3,000	62,714	125.0	2191	980	<0.001	<0.001	<0.001	<0.001	<0.001
10/26/95	24	1,200	63,914	50.0	4940	1400	0.019	0.014	0.005	<0.001	<0.001
10/27/95	24	1,200	65,114	50.0							
10/28/95	24	1,200	66,314	50.0	4940	1390	<0.001	<0.001	<0.001	<0.001	<0.001
10/29/95	24	1,200	67,514	50.0	4760	1320	<0.001	<0.001	<0.001	<0.001	<0.001
10/30/95	24	1,200	68,714	50.0	3820	1363	0.007	0.007	<0.001	<0.001	<0.001
10/31/95	24	1,200	69,914	50.0	3120	810	0.010	0.007	0.003	<0.001	<0.001
11/01/95	24	1,200	71,114	50.0	2740	743	0.005	0.005	<0.001	<0.001	<0.001
11/02/95	24	1,200	72,314	50.0	833	260	0.006	0.006	<0.001	<0.001	<0.001

Bill Olson

From: Wayne Price
To: Bill Olson
Cc: Wayne Price; Jerry Sexton
Subject: Rice Engr. report Lovington well # 6
Date: Friday, October 06, 1995 11:50AM
Priority: High

Dear Bill,

Dave Abbott with Rice Engr. Called me this morning and faxed over to me a progress report. Per Dave, they are beginning to pump water out of Lov. #6, this water is going into their SWD.

I will forward this info to you, plus their press release for your files.

FROM: Wayne Price

TO: Bill Olson

CC: Jerry Sexton
Wayne Price

DATE: 10-06-95
TIME: 11:50

SUBJECT: Rice Engr. report Lovington well # 6
PRIORITY: 4
ATTACHMENTS:

Dear Bill,

Dave Abbott with Rice Engr. Called me this morning and faxed over to me a progress report. Per Dave, they are beginning to pump water out of Lov. #6, this water is going into their SWD.

I will forward this info to you, plus their press release for your files.

==========

RICE ENGINEERING CORPORATION

122 W. TAYLOR HOBBS NEW MEXICO

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

DATE: 10-6-95 **TIME:** 9:55

TO: NMOCD **ATTN:** WAYNE PRICE

FROM: DAVE ABBOTT

SUBJECT: LOVINGTON WELL #6

NUMBER OF PAGES:(PLUS COVER PAGE) 5

DETAILS: FOR YOUR REVIEW, ALSO WE HAVE STARTED PUMPING THE WELL AND SHUT IT IN OVERNIGHT 10-5-95, THE SHUT IN THE WELL OVERNIGHT. WE ARE CATCHING SAMPLES FOR LAB ANALYSIS, EVERY DAY, AND SHOULD GET A GOOD BASE LINE OF INFORMATION. PLEASE CALL IF YOU HAVE ANY QUESTIONS.

THANKS
DAVE

IF YOU DO NOT RECEIVE ALL PAGES INCLUDED, PLEASE CALL THE OFFICE PHONE NUMBER LISTED AT THE TOP OF THIS PAGE.

ARDINAL LABORATORIES
PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-[illegible]
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

DA-927-95

METALS ANALYSIS REPORT

[redacted]

Date: 9/27/95
[illegible]-1

Date: 9/26/95

Sample Type: Water

Sample ID: Municipal Well #6

Units: ppm

PARAMETER	RESULT
Silver	<0.01
Arsenic	<0.01
Barium	0.21
Cadmium	<0.01
Chromium	<0.01
Mercury	<0.001
Lead	0.03
Selenium	<0.01

METHODS: -EPA 600/4-91-010,200.7, 245.1

Mitch Irvin

Mitch Irvin

09/27/95
Date

CARDINAL LABORATORIES

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

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

PHONE (505) [illegible] • [illegible]

FINAL ANALYSIS REPORT

[redacted]

Date: 10/2/95
Lab #: H2189-1

Location: [illegible]

Sampled by: DA
Sample Type: Water

Date: 9/22/95
Sample Condition: Intact

Sample ID: Municipal Well #6

Units: ppm

POLYNUCLEAR AROMATIC HYDROCARBONS

PARAMETER	RESULT
Acenapthene	<0.004
Acenaphthylene	<0.004
Anthracene	<0.004
Benzo(a)anthracene	<0.004
Benzo(a)pyrene	<0.004
Benzo(b)flouranthene	<0.004
Benzo(k)flouranthene	<0.004
Benzo(ghi)perylene	<0.004
Chrysene	<0.004
Dibenz(a,h)anthracene	<0.004
Flouranthene	<0.004
Fluorene	<0.004
Indeno(1,2,3-cd)pyrene	<0.004
Naphthalene	0.016
Phenanthrene	<0.004
Pyrene	<0.004

METHODS- EPA SW 846-8270

Mitch Irvin

Mitch Irvin

10-1-95

Date

CARDINAL LABORATORIES
(915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
• MIDLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM

TPH/BTEX ANALYSIS REPORT

[redacted] Date: 10/2/95

[redacted]

Sampled by: JM Date: 9/2[illegible]/95 Time: not given
Analyzed by: MI Date: 9/2[illegible]/95
Sample Type: Soil Sample Condition: Intact

Samp #	Field Code	TRPHC	BENZENE	TOLUENE	ETHYL	PARA-	META-	ORTHO-	XYLENE
1	Soil Around Well 6	888.6	0.008	0.007	0.020	<0.001	0.011	0.042	0.032
QC Recovery		413	0.940	0.860	0.821	0.769	0.848	0.834	0.783
[illegible]		405	0.872	0.858	[illegible]	[illegible]	[illegible]	0.844	0.732
[illegible]		[illegible]	[illegible]	100 %	96 %	[illegible]	[illegible]	[illegible]	[illegible]
Air Blank		[illegible]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

RECEIVED
OCT 6 19[illegible]
OCD HOBBS OFFICE

[illegible]GRAPHY; INFRARED SPECTROSCOPY
[illegible] 8020, 418.1, 3510, 3540 or 3550

Mitch Irvin

10-1-95
Date

ORDINAL LABORATORIES

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

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

PHONE (505) [illegible] • 115 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

CHEMICAL ANALYSIS OF SOIL

[redacted]

Date : 10/2/95
Lab #: 82189

Date Analyzed: 9/29/95

PARAMETER	RESULT 1
pH	7.23
Chloride	440

RECEIVED
OCT 6
OCD HOBBS
OFFICE

Methods: 600/4-79-020-150.1, 325.3

Mitch Irvin

Mitch Irvin

10-1-95

Date

ROUGH DRAFT

PRESS RELEASE

In co-operation with the city of Lovington officials Rice Engineering is working to expedite the clean up of impacted ground-water in municipal well number 6. The New Mexico Oil Conservation Division has approved a plan to recover the impacted water from well number 6 by means of pumping. It will then be plugged according to regulatory guidelines, to ensure there will be no future impacts by foreign fluid or vapors. Another well would then be drilled to replace well number six (6). This would also keep the well bore outside of the areas oil and gas extraction activities. All our efforts have concentrated on a long term solution for all interested parties and because of mutual co-operation it should be accomplished in a short amount of time.

RICE ENGINEERING CORPORATION

Dave Abbott

Division Engineer

RICE ENGINEERING CORPORATION

122 W. TAYLOR HOBBS NEW MEXICO

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

DATE: 9/28/95 TIME: 3:00 P.M.

TO: NMOCD ATTN: Bill Olson

FROM: Dave Abbott

SUBJECT: Lovington Well #6

NUMBER OF PAGES: (PLUS COVER PAGE) 1

DETAILS: Lab Analysis - Metals

For Your Information, Also please be advised we will probably begin pumping procedures, Monday morning 10-2-95, into our gathering system. Please call me if you need any further information.

Dave

IF YOU DO NOT RECEIVE ALL PAGES INCLUDED, PLEASE CALL THE OFFICE PHONE NUMBER LISTED AT THE TOP OF THIS PAGE.

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

DA-9-27-95

METALS ANALYSIS REPORT

[redacted]: Rice
[redacted]: 122
[redacted]: Hob
[redacted]:
[redacted]:
Sampled by: JA
Sample Type: Water

Date: 9/27/95
Lab #: H2189-1

Date: 9/25/95
Sample Condition: Intact

Sample ID: Municipal Well #6

Units: ppm

PARAMETER	RESULT
Silver	<0.01
Arsenic	<0.01
Barium	0.21
Cadmium	<0.01
Chromium	<0.01
Mercury	<0.001
Lead	0.03
Selenium	<0.01

METHODS: -EPA 600/4-91-010,200.7, 245.1

Mitch Irvin

09/27/95
Date

cc: JERRY SEXTON
BILL OLSON

OIL CONSERVATION DIVISION
RECEIVED
'95 SEP 21 PM 8 52

NEW MEXICO OIL CONSERVATION COMMISSION
FIELD TRIP REPORT

INSPECTION	CLASSIFICATION	FACILITY	HOURS	QUARTER HOURS

Name WAYNE PRICE Date 9/22/95 Miles _____ District I

Time of Departure 7 AM Time of Return 4 PM Car No. G 047

In the space below indicate the purpose of the trip and the duties performed, listing wells or leases visited and any action taken.

Signature Wayne Price

REF: LOVINGTON CITY WELL # 6

WITNESSED RICO ENGR (DAVE ABBOTT)

TAKE SAMPLE FROM WELL # 6 FOR PAH'S

COLLECTED SAMPLE FOR NMOCD RESULTS ATTACHED!

Mileage		Per Diem		Hours	
UIC		UIC		UIC	
RFA		RFA		RFA	
Other		Other		Other	

TYPE INSPECTION PERFORMED

H = Housekeeping
P = Plugging
C = Plugging Cleanup
T = Well Test
R = Repair/Workover
F = Waterflow
M = Mishap or Spill
W = Water Contamination
O = Other

INSPECTION CLASSIFICATION

U = Underground Injection Control - Any inspection of or related to injection project, facility, or well or resulting from injection into any well. (SWD, 2ndry injection and production wells, water flows or pressure tests, surface injection equipment, plugging, etc.)
R = Inspections relating to Reclamation Fund Activity
O = Other - Inspections not related to injection or The Reclamation Fund
E = Indicates some form of enforcement action taken in the field (show immediately below the letter U, R or O)

NATURE OF SPECIFIC WELL OR FACILITY INSPECTED

D = Drilling
P = Production
I = Injection
C = Combined prod. inj. operations
S = SWD
U = Underground Storage
G = General Operation
F = Facility or location
M = Meeting
O = Other

CC: JERRY SEXTON
BILL OLSON

ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
HOBBS, NEW MEXICO

WATER ANALYSIS REPORT FORM

WELL OWNERSHIP: City of Lovington NM WELL #: 6

LAND STATUS: STATE ____ FEDERAL ____ FEE V

WELL LOCATION: Unit Letter S½ Section 31 Township 16S Range 37E

QUARTER/QUARTER - FOOTAGE LOCATION: ____

WELL TYPE: SHALLOW - OGALLALA Top of water ≈ 60-70' DEPTH ≈ 198 feet

WELL USE: PUBLIC WATER SUPPLY

SAMPLE NUMBER: #1 TAKEN BY: WAYNE PRICE

DATE: ≈ 11:00 AM 9/22/95

Specific Conductance:	11,000	mh
Total dissolved solids:		PPM
Chlorides:	4615	PPM
Sulfates:		PPM

Ortho-phosphates: Very Low ____ Low ____ Med ____ Hi ____

Sulfides: None ____ Low ____ Med ____ Hi ____

OTHER:

PH	≈ 7 to 8

DATE ANALYZED: 9/22/95 BY: Wayne Price
OIL CONSERVATION DIVISION

REMARKS: RAW BTEX ON WATER SAMPLE HEAD SPACE USING PID ≈ 90-100 PPM

WATER HAS MODERATE to STRONG CRUDE OIL + GAS SMELL

VISUAL: CLEAR to SLIGHT HAZE NOTED TSS IN WATER

PURGED WELL ≈ 3-5 MINS

OIL CONSERVATION DIVISION
2040 S. Pacheco
Santa Fe, New Mexico 87505

September 19, 1995

CERTIFIED MAIL
RETURN RECEIPT NO. Z-765-962-416

Mr. Dave Abbott
Rice Engineering Corporation
122 West Taylor
Hobbs, New Mexico 88240

RE: PIPELINE LEAK UNIT "L"
LOVINGTON, NEW MEXICO

Dear Mr. Abbott:

The New Mexico Oil Conservation Division (OCD) has completed a review of Rice Engineering Corporation's (REC) September 18, 1995 "PIPELINE LEAK UNIT "L", S31,T16S,R37E, LEA COUNTY NEW MEXICO". This document contains REC's plan to postpone implementing REC's September 15, 1995 site investigation work plan for the leak at the Unit "L" until REC conducts a laboratory analysis of ground water from the adjacent City of Lovington municipal well #6.

The above sampling plan is approved with the following conditions:

1. Ground water from the municipal well and from REC's pipe line will be sampled and analyzed for concentrations of benzene, toluene, ethylbenzene, xylene (BTEX), major cations and anions, heavy metals and polynuclear aromatic hydrocarbons using EPA approved methods.

2. REC will submit a sampling report to the OCD by September 29, 1995. The report will contain:

   a. A description of all activities which occurred.

   b. The laboratory analytical results of water quality sampling.

   c. A copy of a geologic log and as built well completion diagram for the well.

   d. The estimated volume of the leak, volume of material excavated during the leak investigations, the disposition of the excavated soils and the results of samples which show the remediation level achieved in the excavations.

   e. A work plan for investigating the vertical extent of contamination related to the leak.

3. REC will notify Wayne Price of the OCD Hobbs District Office at least 24 hours in advance of the sampling event such that the OCD has the opportunity to witness the event and/or split samples.

4. All documents will be submitted to the OCD Santa Fe Office with copies provided to the OCD Hobbs District Office.

The OCD would like to note that preliminary results of samples taken from the Lovington municipal well #6 by the City of Lovington show the ground water to be contaminated with hydrocarbon related constituents in excess of New Mexico Water Quality Control Commission ground water standards. The OCD also obtained samples from the well on September 13, 1995 and will supply REC with a copy the analyses when they become available.

Please be advised that OCD approval does not relieve REC of liability for investigating the extent of contamination related to the leak from REC's pipeline. In addition, OCD approval does not relieve REC of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price , OCD Hobbs Office
Robert Gallegos, NMED Drinking Water & Community Services
Bob Carter, City of Lovington

Z 765 962 416

Receipt for Certified Mail

No insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

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Postage	$
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Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, March 1993

Fold at line over top of envelope to the right of the return address

DATE: 9/19/95

To BILL OLSON - NMOCD

From

WAYNE PRICE - ENVIRONMENTAL ENGR. - NM.O.C.D. DISTRICT I

Energy & Minerals Department

Telephone Number 505-393-6161 FAX # 505-393-0720

- ☒ For Your Files
- ☐ Prepare a Reply for My Signature
- ☐ For Your Review and Return
- ☐ For Your Information
- ☐ For Your Handling
- ☐ For Your Approval
- ☒ As Per Your Request
- ☐ For Your Signature
- ☐ Please Advise
- ☐ For Your Attention

ANALYTICAL RESULTS FOR LOVINGTON COOP WELL #6

City of Lovington

Phone 505/396-2884 P. O. Box 1269
LOVINGTON, NEW MEXICO 88260

FAX 505/396-6328

TELECOPY COVER SHEET
FAX 505-396-6328

RECEIVED
SEP 15 1995
OCD HOBBS
OFFICE

DATE 9-15-95

TIME 11:00

PLEASE DELIVER THE FOLLOWING TO:

Wayne Price TELECOPY NUMBER 505-393-0720

FROM: Charles Kelley

NUMBER OF PAGES INCLUDING COVER SHEET: 3

IF ALL PAGES WERE NOT RECEIVED OR IF ANY MATERIAL CANNOT BE READ, CONTACT BOB CARTER OR JUANICE ROBINSON AT 505-396-2884.

REMARKS:

CAPITOL OF LEA COUNTY - RICH IN OIL, CATTLE, COTTON AND PEOPLE

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX [illegible]
PHONE [illegible] • 101 E. MARLAND • HOBBS, NM [illegible]
PHONE [illegible] • 110 S. COMMERCIAL AVE. • FARMINGTON, NM [illegible]

TENTATIVELY IDENTIFIABLE COMPOUNDS Page One

Company: City of Lovington
Address: P.O. Box 1268
City, State: Lovington, NM 88261
Project Name: City of Lovington
Location: Lovington, NM
Sampled by: not given
Sample Type: Water

Date: 9/15/95
Lab #: H2176

Date: not given
Sample Condition: Intact

Sample ID: Well #6

PARAMETER	RESULT	UNITS
Benzene	210.12	ppb
Toluene	[illegible]	ppb
Ethylbenzene	[illegible]	ppb
m & p-xylene	[illegible]	ppb
o-xylene	[illegible]	ppb

RECEIVED
SEP 15 1995
OCD HOBBS
OFFICE

METHOD: VOLATILES - EPA 8260/502.2

Mitch Irvin

9-16-95
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4559 • 115 E. COMMERCIAL AVE. • FARMINGTON, NM 87401

TPH/BTEX ANALYSIS REPORT

Company: City of Lovington
Address: P.O. Box 1268
City, State: Lovington, NM 88261

Date: 9/15/95
Lab #: 42176

Project Name: City of Lovington
Location: Lovington, NM
Sampled By: not given
Analyzed By: NG
Sample Type: Water, Soil

Date: not given Time: not given
Date: 9/14/95
Sample Condition: Intact

Units: ppm

Samp #	Field Code	TRPHC	BENZENE	TOLUENE	ETHYL BENZENE	PARA-XYLENE	META-XYLENE	ORTHO-XYLENE	MTBE
1	Well #5	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
3	Well #7	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
4	Well #6 (Soil)	7,476	***	***	***	***	***	***	***
	QC	413	0.810	0.873	0.961	0.988	0.926	0.981	0.816
	QC Spike	405	0.878	0.873	0.867	0.862	0.853	0.867	0.830
	Accuracy	101.9%	92.1%	100.0%	110.8%	114.6%	113.2%	113.2%	98.3
	Air Blank	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

RECEIVED
SEP 15 1995
OCD HOBBS OFFICE

Methods = GAS CHROMOTOGRAPHY, INFRARED SPECTROSCOPY
= EPA SW-846; 8020, 418.1, 3510, 3540 OR 3550

Mitch Irvin

9-15-95
Date

RICE Engineering Corporation
122 WEST TAYLOR TELEPHONE (505) 393-9174
HOBBS, NEW MEXICO 88240

September 18, 1995

New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505
Fax: (505) 827-8177
Phone: (505) 827-7154

Attention: Mr. Bill Olson

Re: Pipeline Leak Unit "L", S31, T16S, R37E, Lea County, New Mexico

Dear Mr. Olson:

In looking at the historical events of this leak it is one of those few that has it's own site specific exceptions, however we would like to postpone the site work plan until we conduct lab analysis of the municipal water well. This should enable us to see if the Aquifer has been impacted by produced water prior to beginning any investigating of vertical travel by produced water into the Aquifer by bore holes and or monitor wells. If you should have any further questions, please contact this office at your earliest convenience.

Sincerely,

RICE ENGINEERING CORPORATION

Dave Abbott
Division Engineer

DA/cp

cc: LBG
GB
Apache Corp.
Hawkins Oil & Gas Co.
Amerada/Monument
Penroc Oil
NMOCD - Hobbs Office
File

821-0117

RICE ENGINEERING CORPORATION

122 W. TAYLOR HOBBS NEW MEXICO

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

DATE: 9-18-95 TIME: _____

TO: NMOCD- ATTN: Bill Olson

FROM: Dave Abbott

SUBJECT: Pipeline Leak, Lea Co. N. M.

NUMBER OF PAGES: (PLUS COVER PAGE) 1

DETAILS: _____

IF YOU DO NOT RECEIVE ALL PAGES INCLUDED, PLEASE CALL THE OFFICE PHONE NUMBER LISTED AT THE TOP OF THIS PAGE.

RICE *Engineering Corporation*

122 WEST TAYLOR TELEPHONE (505) 393-9174

HOBBS, NEW MEXICO 88240

September 15, 1995

New Mexico Oil Conservation Division (505) 827-7154
2040 S. Pacheco
Santa Fe, NM 87505

Attention: Mr. Bill Olson

Re: Pipeline Leak Unit L, S31, T16S, R37E, Lea County, New Mexico

Dear Mr. Olson:

On or about September 13, 1995, a pipeline leak was discovered and repaired. The quantity of produced water is hard to quantify, although the ditch line under our existing ditch line was saturated, no free standing fluids were observed. In our initial excavation, it was determined that produced water may have permeated beyond the ditch line. The significance of the produced water in this ditch line is that it is located adjacent to the City of Lovington's municipal water well. At this point and time we are still awaiting lab analysis of the water samples. Once analytical results are back, we will provide copies of them for your review. Because of the site being rocky it will become necessary to drill a bore hole to help delineate the direction of the produced water spill.

Please find attached a plat detailing the site and a submitted work plan for your approval. As of this date, we have had inclement weather conditions and have ceased our initial investigation. We will implement the approved work plan as early as weather conditions permit. Weather reports indicate that the weather may clear late Monday afternoon, September 18, 1995, allowing us to begin the approved work plan at that time.

The first monitor well will be approximately 15 feet to the northwest, between the municipal water well and the leak source. One soil sample will be collected prior to entering caliche, (estimated to be at 3 feet), one sample at the bottom of the caliche, one sample exiting the caliche, and one sample at the water table which is estimated to be approximately at 60 feet. If impacted soil is present, then we will begin radially drilling additional soil borings and/or monitor wells as necessary to determine the direction and size of the plume.

Please contact this office at your earliest convenience, if you have any further questions or comments.

Sincerely,

RICE ENGINEERING CORPORATION

Dave Abbott
Division Engineer

DA/cp

cc: LBG - Midland
GB

RICE Engineering Corporation
122 WEST TAYLOR TELEPHONE (505) 393-9174
HOBBS, NEW MEXICO 88240

September 15, 1995

New Mexico Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87505

Attn: Bill Olson

RE: Work Plan For Subsurface Investigation
Junction L-31 Leak Site
ABO SWD System
Lea County, New Mexico

Dear Mr. Olson:

Rice Engineering Corporation is presenting this workplan to conduct subsurface investigation operations around the pipe line leak and municipal water well located at the aforementioned site. The purpose of this investigation is characterize and delineate the extent of potential soil and ground water impact resulting from the pipe line leak, if present.

Investigation Objectives

1. Determine the physical framework and soil lithology of the vadose zone and upper portion of the aquifer.

2. Assess the magnitude and areal extent (both vertical and horizontal) of the impacted soils, if present.

3. Verify whether the existing municipal water well is acting as potential migratory pathway for near surface fluids or vapors.

WORK PLAN
(Initial Scope of Work)

1) Drill an 80 foot boring offsetting the junction L-31 leak site to characterize the aquifer system. During drilling operations, monitor the drill cuttings and selectively collect split spoon samples to identify water bearing units, possible confining beds, and the extent produced water of impacted soils. Soil and cutting samples will be screened for volatile organics using an organic vapor analyzer (OVA). Selected split-spoon samples will be collected for laboratory analysis, including one from the sampled interval exhibiting the highest OVA reading and/or TPH level, and one immediately above the first water zone encountered (Approximately 55 to 65 feet). The samples will be submitted to Cardinal Laboratories in Hobbs, New Mexico for benzene, ethylbenzene, tolulene, and total xylenes (BTEX), (PAH) and Chloride analysis.

2) Complete the boring as a 4 inch PVC monitor well. The well is expected to be screened from 55 to 75 feet to access the extent of impact in the water zone. Actual well construction will be designed to set the screen 5 feet above the ground water and penetrate at least 20 feet into the aquifer. The well will be completed with a locking well cover.

3) Gauge, develop, and sample the monitor well. The well will be sampled for BTEX, TPH and Chlorides. Development water generated during sampling will be captured and stored on site in a labeled tank pending disposal.

4) Based on the findings during the initial scope of work the following additional tasks can be performed.

   A) Complete two additional monitor wells to assess the magnitude of the impacted ground water plume, if present.

   B) Complete several additional soil borings to delineate the extent of soil impact.

GENERAL PROCEDURES

Drilling and Well Construction

Decontamination

A steam sprayer will be used for decontamination of all sampling equipment (Split-spoon; between each sample) and drilling equipment (drill pipe, bit, etc.; between each boring location). Unless obvious impact is observed during drilling operations, the decontamination/rinsate water will be allowed run off on to the ground surface.

Health and Safety Plan

A site specific Health and Safety plan will be prepared in accordance with OSHA standards for use by all on-site personnel prior to beginning the investigation. Level D personal protective equipment (PPE) will be used, which includes the following: hard hat, safety glasses, steel toed boots, ear plugs, nitrile gloves for handling sampling equipment. All of our employees meet the 40 hour HAZWOPER training required per 20 CFR 1910.120.

Water/Soil Sample Collection and Analyses

Groundwater samples from each monitor well will be collected with a new disposable bailer and placed in glass containers, sealed with QA/QC seals, and transported on ice to the laboratory for analysis. The soil samples collected or analysis will be placed in a glass jar with a teflon-lined lid, sealed with QA/QC seals, and preserved at 4 degrees centigrade in accordance with EPA requirements.

A Chain-of-custody which documents sample collection times and delivery to the laboratory will be completed for each set of samples.

Report Preparation

A Report will be prepared that will include the following sections: Report Summary, Site Characterization, Groundwater Assessment, Waste Management and Disposition, Conclusions, and QA/QC Procedures.

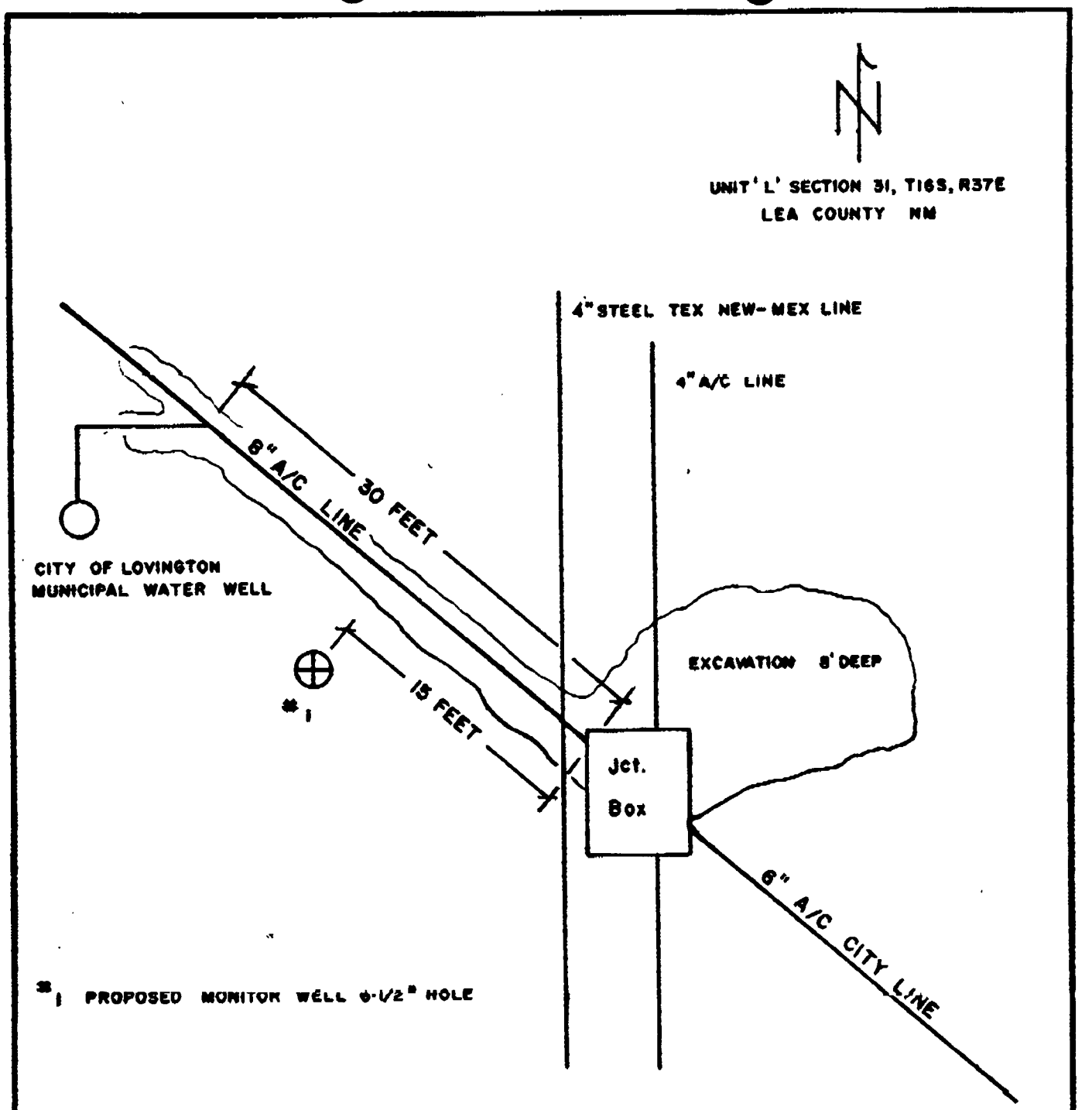
If you have any questions or desire further information, please contact us at any time.

Best regards,

RICE ENGINEERING CORPORATION

Dave Abbott
Division Engineer

cc: LBG
GB



DWN	SRT 9-95		APPROVED		ABO SWD SYSTEM JCT. L-31	SCALE NONE
					Rice Engineering Corporation Hobbs, New Mexico	DWG. NO.

RICE ENGINEERING CORPORATION

122 W. TAYLOR HOBBS NEW MEXICO

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

DATE: 9/18/95 **TIME:** 10:50 A.M.

TO: NMOCD **ATTN:** Bill Olson

FROM: Dave Abbott

SUBJECT: Pipeline leak

NUMBER OF PAGES:(PLUS COVER PAGE)

DETAILS:

For you Approval, please let me know if you need anything further

Dave

IF YOU DO NOT RECEIVE ALL PAGES INCLUDED, PLEASE CALL THE OFFICE PHONE NUMBER LISTED AT THE TOP OF THIS PAGE.

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☑ Telephone ☐ Personal | Time 0820 | Date 9/15/95

Originating Party	Other Parties
Dave Abbott - Rice Engineering	Bill Olson - Envir. Bureau

Subject

ABO SWD System Leak (Lovington Water Supply)

Discussion

Update on recent investigation work
- hand dug line, leak at junction box approx 20' from Lovington well
- Lovington water line crosses under ABO system pipeline
- appears that water followed SWD pipe trench to water line trench and followed water line toward well. Saturated soil in trench stopped about 5 feet from Lovington water well
- repaired leak in SWD junction box, No estimate of volume, but no leak when walked line about 1 month ago
- 6 1/2" of rain last night, can't work at moment, covered trenches with plastic to keep out rainwater

Conclusions or Agreements

- Concerned about safety with number of people visiting the site, limiting site to people that have proper safety training
- He will fax work plan to me today for investigating extent of contamination

Distribution

File
Jerry Sexton - OCD Hobbs
Wayne Price - OCD Hobbs
Barbara Giesler - NMED Drinking Water Program

Signed Bill Olson

Daily News-Sun

HOBBS, NEW MEXICO, SEPTEMBER 14, 1995 50¢ DAI

ING SOUTHEAST NEW MEXICO AND WEST TEXAS THURSDA

Trucking deregulation impact a mixed bag

By DANIEL RUSSELL
Of the News-Sun Staff

State legislators of the Revenue Stabilization and Tax Policy Committee spent their first day in Hobbs reviewing the impact of changes in trucking regulations and studying proposed changes in the motor vehicle code.

Carlos Jaramillo, director of the Motor Transportation Division of the State Corporation Commission, told the panel, which included local Rep. Don Whitaker, the deregulation of the trucking industry has affected rural areas and shipping rates.

Jaramillo said the carriers are lowering many of their rates, such as in Albuquerque and Santa Fe. But, in rural areas where there is less profit, carriers are more reluctant to deliver.

"They are not forced to make a special trip to th rural area," said Jaramillo.

Answering questions from the committee, Jaramill explained the purpose of the SCC regulating the truck ing industry is to protect the public, provide safet regulations and to make sure carriers have prope insurance.

Several, including the committee chairman Rej Jerry W. Sandel, D-San Juan, questioned if the cuttin of rates has resulted in carriers cutting costs by nc replacing equipment and failing to obtain proper insu ance. Sandel said House Bill 70 from the last legisl

Please See TRUCKING, Page 5

Pipeline break contaminates Lovington well

No ill effects reported from tainted wate

Staff and Wire Reports

LOVINGTON — No ill effects

said. "We immediately pulled 16 ple and traced it back to a well

Bill Ross/News-Sun Photo

...ıary Miracles" to the crowd attending the United Way of Lea ...ɒon Wednesday at the Fletcher Center in Hobbs. Testman is a ...Up with People," which performed at the luncheon. The group, ... touring troupes of 150 performers. For more about the group,

...ns up for auction

Pipeline break contaminates Lovington well

No ill effects reported from tainted water

Staff and Wire Reports

LOVINGTON — No ill effects among the public have been reported from a broken oilfield waste line that contaminated a municipal water well and forced a purge that sent 4 million gallons of water cascading down city streets.

City Manager Bob Carter said water service was restored on Wednesday and that it was "business as usual" by early this morning. The contaminated well, located about five miles south of town, was closed and the town's 3,800 customers faced no serious health hazards, he said.

The well became contaminated by a broken underground pipeline running from a nearby oilfield to a disposal well. Carter said the broken pipeline carried brine water separated from oil to be injected into the 12,000- to 14,000-feet deep well.

"It broke right where it intersected with our water line," Carter said. "The waste water seeped along our pipeline and into our water well."

Carter said this morning that the City of Lovington had determined with about "90 percent" surety which company's pipeline had contaminated the town's water supply, and that once they had been determined for sure who was responsible, the city would try to hold the company monetarily liable for all damages incurred from the incident.

"We started getting calls about mid-morning Tuesday," Carter said. The problem was first noticed by Lovington residents on Monday evening.

"People said their water had a bad odor, a kind of gas smell," Carter said. "We immediately pulled 16 san ples and traced it back to a well fiv miles from town."

Carter said the water wasn't cont minated by bacteria.

Although a caller to the News-Su indicated several Lovington residen had become ill as a result of drinkin the city's water this week, Davi Palmer, an administrator at Nor-Le Hospital in Lovington, said his sta had seen "no patients" since the inc dent with any physical symptom that could be associated with th water contamination. Valerie Bank a spokesperson at the Lovingto Clinic, also reported no cases in th last few days of illness related to th water problem.

Carter said crews were working t replace the line and to purge th well, one of 14 serving th Southeastern New Mexico commun ty.

With the well closed, Carter sai municipal officials opened all of th town's fire hydrants and bega dumping 4 million gallons of wate from seven storage tanks. Carte said the runoff from the purg caused no more problems t Lovington motorists than a "littl rain" usually does.

The process purged contaminate water from city lines.

Water pressure was restored afte about an hour. The process was per formed in sequence, leaving som customers without water for 15 to 2 minutes, Carter said.

"While some tanks were being emptied, other tanks were being filled," he said. "All our lines have been thoroughly flushed. The wate was OK; it just smelled bad."

McKibben: Inmates don't need air conditioning

HOBBS (AP) — State Sen. Billy McKibben thinks it's a good idea to eliminate evapora-

"I wouldn't be for air conditioning the ...

Perot promises 3rd party, '96 candidate

By JOHN KING
AP Political Writer

ASHINGTON — Shaking the American cal system anew, Ross Perot is pledging rm a new party that will nominate a 1996 idential candidate and use the ballot of independent voters to sway congres- l races.

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He said he had no candidate in mind. When asked about retired Gen. Colin Powell, who is considering a 1996 run as a Republican or independent, Perot said: "Certainly we want people of that stature and quality."

Others who have voiced interest in an independent or third-party candidacy include retiring Democratic Sen. Bill Bradley of New Jersey and former Connecticut Gov. Lowell Weicker, a former Republican senator who founded a new party and went on to win the governorship.


Ross Perot

State leaders of United We Stand America said they took Perot at his word, but nothing precluded them from drafting the Texas billionaire as the new party's candidate.

"It might be Colin Powell, it could be Sam Nunn, it could be Bill Bradley, it could be Ross himself," said Don Torgersen, the Illinois United We Stand executive director. "He certainly didn't preclude a candidacy," said Steve Bost, the Maine executive director.

Speaking on CNN's "Larry King Live," Perot said: "We are going to start the process of creating a political party for the independent voters. It will not be owned by the special interests."

Perot said he was leaving open the slim possibility that the effort could stop at the end of the year — if polls now showing 60 percent of Americans open to the idea of a third party suddenly shift and indicate growing satisfaction with Democrats or Republicans.

The new venture would be named the Independence Party, or the Reform Party in states such as California, where a conflict prevents use of the Independence name.

If the new party qualifies nationally, Perot said it would open its presidential nominating process to anyone with the backing of 10 percent of party members.

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The organization then would choose a presidential nominee through a convention

Please See PEROT, Page 5

chool valuation cheduled

creditation panel visit Hobbs schools

By HELENA RODRIGUEZ
Of the News-Sun Staff

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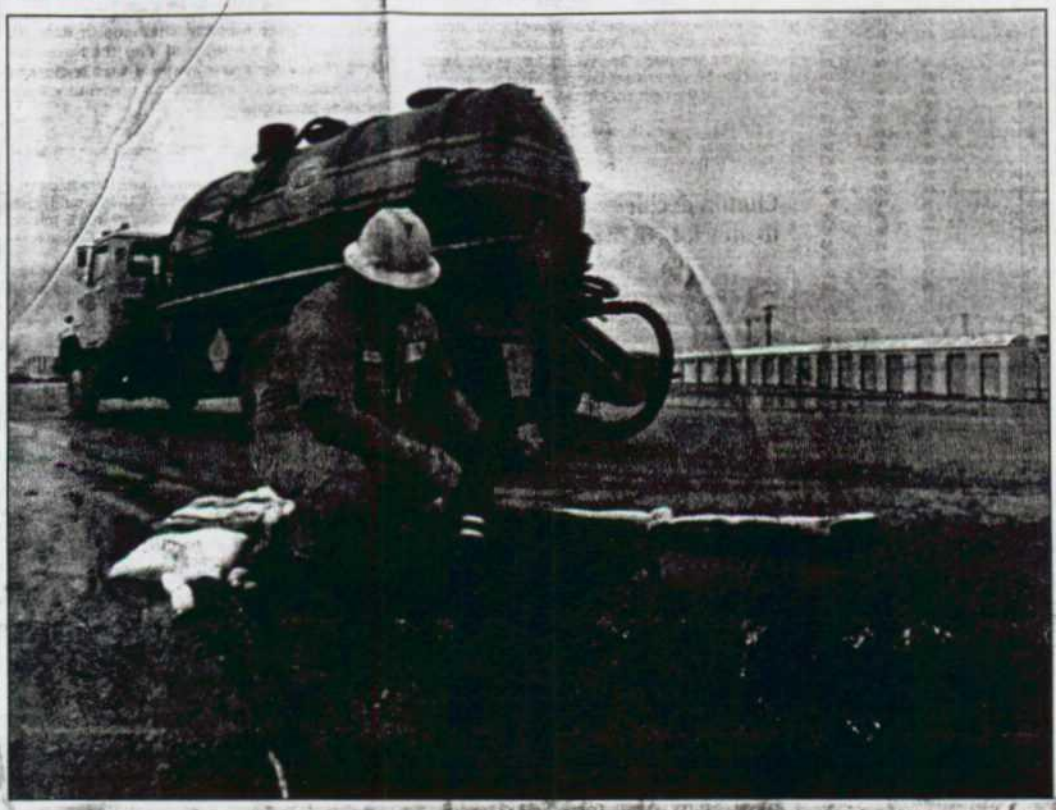
CLEANING UP


Bill Ross/News-Sun Photos

Jeffrey Speer, above, uses a suction hose to pump a water and oil mixture into a Gold Star Service Co. tank truck. A break in a flow-line owned by Shell spilled an estimated 30 barrels of oil and 42,000 gallons of water in the Broadway Place area Monday. Below, Pride Petroleum employee Francisco Martinez uses a squeegee to keep the oil moving toward a suction hose. Pride Petroleum was one of the many contractors helping clean up the oil spill.

Pipeline break spills 30 barrels of oil

Spill along Broadway Place blocks traffic for several hours Monday morning in Hobbs

By DANIEL RUSSELL
Of the News-Sun Staff

A flow line break that spilled oil onto Broadway Place blocked the road to traffic for several hours Monday morning.

The flow line, near the 1500 block of Broadway Place at a satellite well/collection facility is owned by Shell Pipeline Co. The break spilled an estimated 30 barrels or 1,260 gallons of oil and 42,000 gallons of water.

The spill flowed onto private property along Broadway Place and then it flowed down Cecil to near Marland. Most of the oil was contained to the gutter areas of the streets.

Charles Mann, senior field supervisor with Shell Pipeline, said once notified, the company's top priority was getting the well shut down because it was continuing to pump oil out of the leaking flow line.

He said efforts will now be focused on cleaning up the entire spill before determining the reason for the flow line break.

Vacuum truck crews were busy slurping up pooled oil in the gutters Monday morning while other trucks were placing absorbent material on other areas. The absorbent material, an organic peat that absorbs only oil and not water, was then picked up.

All contaminated soils also will be hauled off. Booms and dirt berms were built to facilitate pooling the oil and prevent it from going down into the drainage system.

Steamers were then used to finish cleaning the streets, which were reopened to traffic around 4 p.m.

The city was first notified of the leak at 7:12 a.m. and the Hobbs Fire Department, the New Mexico State Police, Hobbs City Police and Street Department all responded.

Hobbs Emergency Management/Safety Director David Weston said although flow lines have broken in the past, it is uncommon for that much fluid to reach the city streets.

Lovington well pact reached

Local firm agrees to clean up well site

By SCOTT FREEMAN
Of the News-Sun Staff

LOVINGTON — A settlement ha been reached regarding the contam nation of the city water supply by a oil field pipeline on Sept. 11, the ci commission learned last night.

Lovington city manager Bob Carte told the News-Sun this morning th Rice Engineering of Hobbs has agree to help clean up the site but took r responsibility for the accident.

The accident caused the City Lovington to purge one of its wat wells and temporarily shut down i water supply two days later.

Dave Abbot of Rice Engineerin today said the company would relea an official statement regarding t accident Wednesday afternoon.

The contamination occurred at ci water well No. 6, located about fi miles south of Lovington just east State Highway 18 across from t Navajo Oil Refinery. The well, one 14 serving the community, h remained closed since the accident.

Later testing revealed the town 3,300 customers faced no health thre from the contamination. "An emergency purge of the city water supply sent four million gallons of water rushing down t city's streets on Sept. 13. No ill effec from the populace were reported area health officials.

• WELL MAP: See site of contamina ed well. • PAGE

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Please See PEROT, Page 5

School evaluation scheduled

Accreditation panel to visit Hobbs schools

By HELENA RODRIGUEZ
Of the News-Sun Staff

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Please See SCHOOLS, Page 5

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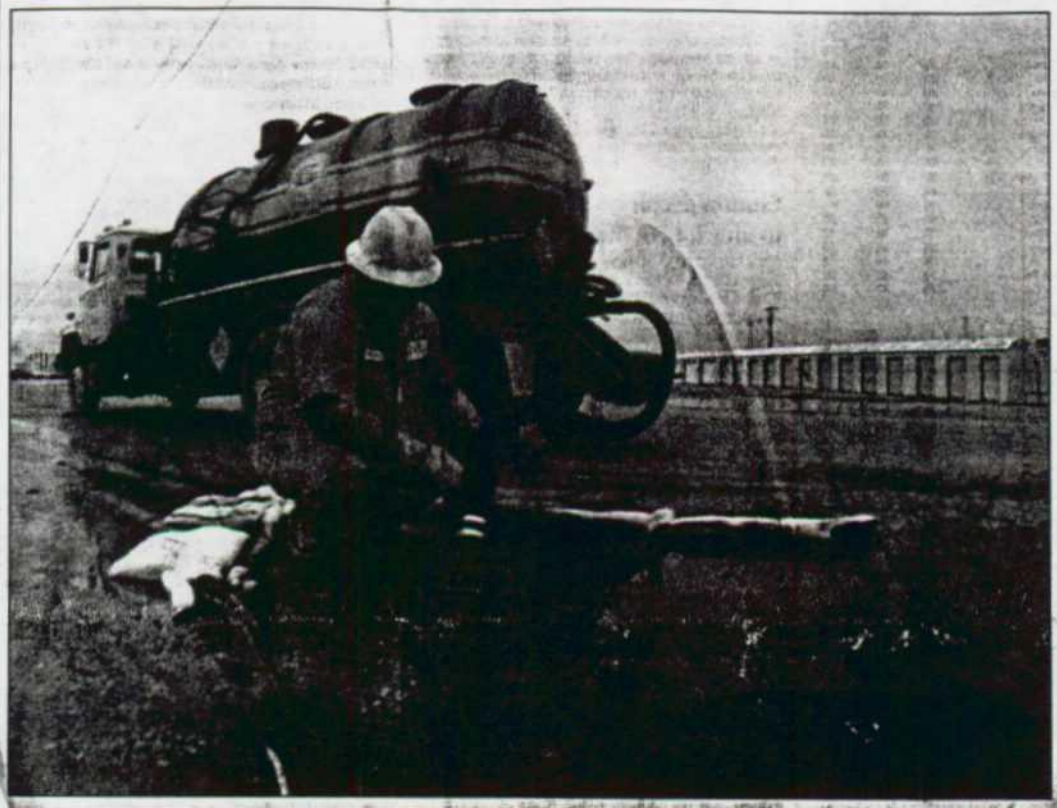
Governor treated by acupuncturist

A Santa Fe acupuncturist

CLEANING UP



Bill Ross/News-Sun Photos

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"It's hard to tell how long it's going to be," he said, adding that everything will be restored to its original state.

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He said some oil may have gotten into the storm drainage system, but none has entered the city's sewer system.

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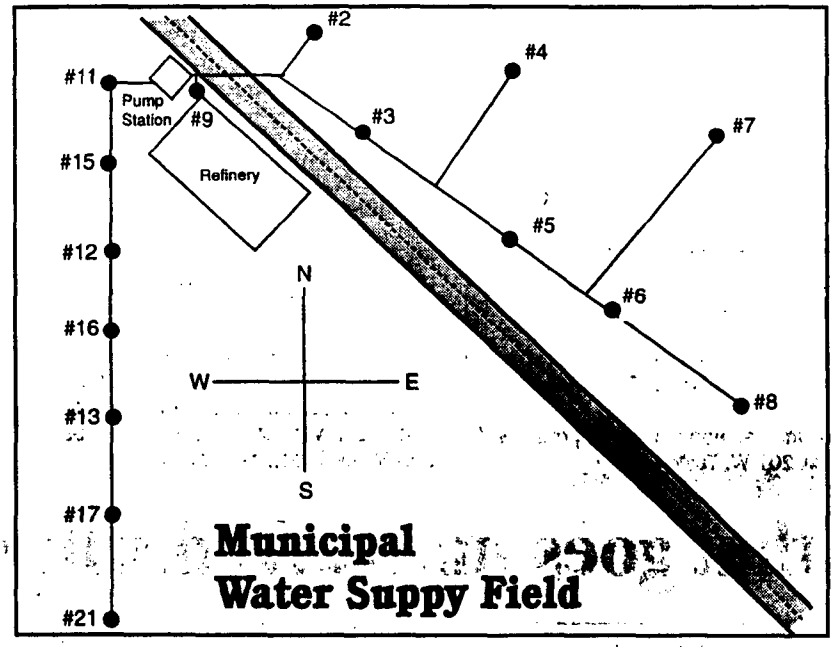
Mayor Troy J. Harris said se citizens complained about the but later thanked the city fo quick action to solve the proble

One year later, Simpson closing arguments to begin



Map supplied by City of Lovington

A settlement has been reached regarding the contamination of the Lovington water supply by an oil field pipeline on Sept. 11. The contaminated well site is well #6, located just east of State Highway 18, about five miles south of Lovington. The refinery on the map is owned by Navajo Refining.

er puzzles don't fit in the cases,
hey stand on top of them.
vis has no special plans for the
les after she's done with them.
t's going to be put back in the
and put in the closet so some-
else can work it," she said.
vis and her husband, W.
three grown daughters, three
ddaughters and son grandsons
"yes, I buy puzzles for the
dsons," she said.

odney King case

g King with their batons after
3, 1991, traffic stop.
next year, a state court jury
ted Koon, Powell and two other
officers on charges of assault
excessive use of force. The ver-
et off three days of rioting in Los
es.

Governor

Continued from Page

committee had about the cuts — that we just ... said.

The telecommunications company

in the case Oct. 18.

... contend Johnson

CORRECTION

The pipeline that broke and caused an oil spill in Hobbs early ... Mobil was owned by ... Western, ... as indicated in ... yesterday's newspaper.

Shell Pipeline is a separate business and is not connected in any way to the leak that occurred.

To all of those special people who touched our hearts during our time of grief with their gifts of food, flow-

Oil-Field Pipe Break Pollutes Water Well

Lovington Purges 4 Million Gallons

By Fritz Thompson
Journal Staff Writer

Water service in Lovington was back to normal Wednesday after a broken oil-field waste line contaminated one of the city's water wells and brought about a purge that sent some 4 million gallons cascading down the streets.

City Manager Bob Carter said the contaminated well was shut down and the city's 3,800 customers faced no serious health hazards.

"We started getting calls about mid-morning Tuesday," he said. "People said their water had a bad odor, a kind of gas smell. We immediately pulled 16 samples and traced it back to a well five miles from town."

After the well was shut down, Carter said, the city opened all its fire hydrants and began dumping about 4 million gallons of water from seven storage tanks. The process also purged water from city lines.

"Some customers were without water for about 15 or 20 minutes," Carter said. The process was in sequence, he said, "and while some tanks were being emptied other tanks were being filled."

> ***"People said their water had a bad odor, a kind of gas smell. We immediately pulled 16 samples and traced it back to a well five miles from town."***
>
> **BOB CARTER, CITY MANAGER**

Water pressure was restored after about an hour, Carter said.

David Parker, administrator at Nor Lea General Hospital in Lovington, said no one reported to the emergency room complaining of ill effects from the water.

Carter said the well was contaminated by a broken pipeline running underground from a nearby oil field to a disposal well. The oil-field line carried brine water that had been separated from the oil and was being injected into a 12,000 to 14,000-deep well, he said.

"It broke right where it intersected with our water line," Carter said. "The waste water seeped along our pipeline and into our water well."

The city well is 140 feet deep.

Carter said the water was not contaminated by bacteria. "The main complaint was the gas odor," he said. "But you could let it sit half a second and the smell would be gone — the minute it hit the air it would disappear."

He said crews are working to replace the water line and to purge the well. "We might bring it back into service and we might not," he said. The city has 14 wells.

Carter said he has not calculated the cost of the break and repair work. He said the city might seek restitution from oil field companies "but we're not pointing any fingers right now."

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> ***"People said their water had a bad odor, a kind of gas smell. We immediately pulled 16 samples and traced it back to a well five***

DATE: 9/13/95 TIME: 9:10 AM

9509130910 GEN. CHEM.
9509130910 RCRA METALS.

9509130915 } 601/602
9509130915 }
9509130915 }

9509130917 } 610
9509130917 }

- SAMPLING at City of Lexington No. 6 water supply well

Pat Sanchez - OCC
Field Notes

Mark Ashley - OCD Field Notes

may have solvents present.

Sump is a two stage trap. Water goes to city, oily sludge is picked up by Sam's [illegible] disposed of at CRI. Cleaned out 3 times since 1981

Lube Oil has spills around dirt, + absorbent on ground

A Chemical drums don't have containment. Corrosion inhib. [illegible]

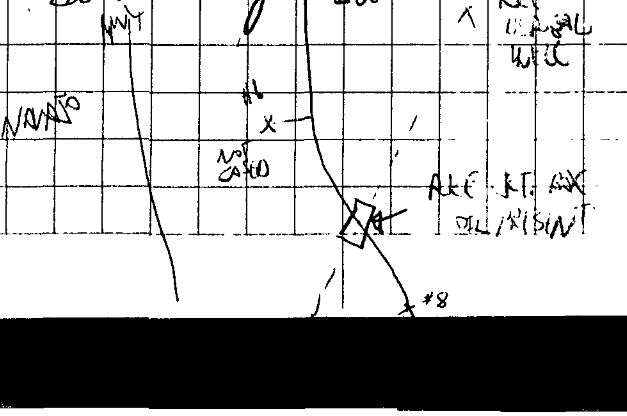
A Diesel tank has no containment.

A Used oil drum needs containment. Batteries to 1st interstate.

9-13-95 Lovington Well #6 8:35 AM

Sample their well.

(w) 396-2044 Jerry, Bob Carter, Wayne, Mark, Pat, Bill Drewry



601/602 | 8270 | [illegible]

Rice vacuumed out the cellar and exposed a 1-2 GPM leak at a dresser coupling.
Rice is going to fix leak.
#6 well is shut-in due to apparent contamination from cellar. They (Covington) received numerous complaints from residents.

9-12-95 Well #6 2:45 PM
F-31
Dave Abbott (Rice)
KBIM ch. 10
"No comment" right now

Sam Burk (EO) was here too.

Bob Carter, to Clayton 3:10 PM
CD wants Rice to clean up well & then abandon the well, they own land & water.
16 samples were taken in [illegible] & sent to City of Hobbs for analysis, everything OK. bacteria
Sampled 4:30 PM 9-12-95 & sent to [illegible].

S-T-R

OPERATOR	TYPE	FACILITY	TWP	RGE	SEC	UNIT L	COUNTY	OVS	OVR	WVS	WVR	DATE
RICE ENGINEERING	LK	ABO SWD SYSTEM-TEXAC	16S	36E	36		LEA	0	0	450	450	1/1/93
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	16S	36E	36	P	LEA	0	0	260	130	8/9/92
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	16S	36E	36	P	LEA	0	0	400	200	8/8/92
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	16S	37E	31	J	LEA	0	0	180	0	5/15/93
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	16S	37E	31	O	LEA			65	15	2/2/94
RICE ENGINEERING	PIPELINE	ABO CALICHE TEX ST.O	16S	37E	31	O	LEA	0	0	70	60	6/24/92
RICE ENGINEERING	LK	EXXON K--4 JCT K-28	17S	35E	28	K	LEA	0	0	350	200	6/26/93
RICE ENGINEERING	PIPELINE	VACCUM SWD SYS. JCT	17S	35E	28	K	LEA	0	2	0	10	7/22/93
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	36E	01	D	LEA	0	0	30	30	7/17/92
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	36E	01	D	LEA	0	0	600	0	8/2/92
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	36E	06		LEA			40	40	7/13/94
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	37E	06		LEA	0	0		75	1/24/93
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	37E	06	B	LEA	0	0	400	240	5/30/92
RICE ENGINEERING	PIPELINE	ABO300 W.ORYX CAYLOR	17S	37E	06	L	LEA	0	0	0	0	3/3/92
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	37E	1	A	LEA	0	0	0	500	10/19/92
RICE ENGINEERING	FLOWLINE	ABO SWD SYSTEM	17S	37E	6	C	LEA	86	86	0	0	11/28/92
RICE ENGINEERING	PIPELINE	VACUUM SWD SYSTEM	18S	35E	06	K	LEA			10	10	1/7/94
RICE ENGINEERING	PIPELINE	HOBBS SWD SYSTEM	18S	38E	29		LEA	0	0	30	25	4/22/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	18S	38E	29	I	LEA			15	10	6/28/94
RICE ENGINEERING	PIPELINE	HOBBS SWD SYSTEM	18S	38E	30		LEA			10	5	7/16/94
RICE ENGINEERING	TANK	HOBBS EAST SWK SYS.	18S	39E	29		LEA	0	0	60	55	2/21/93
RICE ENGINEERING	FLOWLINE	HOBBS EAST SWD #F-30	18S	39E	30	F	LEA	0	0	20	0	12/1/92
RICE ENGINEERING	PIPELINE	LAGUNA GATUNA;J.K-25	19S	32E	25	K	LEA	1	0	20	0	4/20/92
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	19S	36E	25	G	LEA	0	0	30	30	5/22/93
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	19S	36E	34	J	LEA			15	10	11/11/93
RICE ENGINEERING	IL	EME SWD SYSTEM	19S	37E	07	G	LEA			10	6	4/20/94
RICE ENGINEERING	RO	EME SWD SYSTEM	19S	37E	07	O	LEA	40	35			12/9/94
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	19S	37E	18		LEA			20	20	12/9/93
RICE ENGINEERING	TANK	EME SWD JCT K-18	19S	37E	18	O	LEA	0	0	30	25	11/25/92
RICE ENGINEERING	PIPELINE	EME SWD SYS. JCT F-2	19S	37E	29	F	LEA	0	0	50	20	7/23/93
RICE ENGINEERING	TANK	EME SWD K-33	19S	37E	33	K	LEA	100	0	600	400	12/11/92
RICE ENGINEERING	VALVE	EME SWD SYSTEM WELL	19S	37E	33	K	LEA	0	0	0	0	6/12/93
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	19S	37E	34	O	LEA			55	50	7/15/94
RICE ENGINEERING	PIPELINE	HOBBS SWD SYSTEM	19S	38E	05		LEA					4/29/94
RICE ENGINEERING	TANK	HOBBS SWD SYSTEM	19S	38E	15	E	LEA	1	0	200	100	4/17/92
RICE ENGINEERING	LK	HOBBS SWD SYS.WELL E	19S	38E	15	E	LEA	25	0	600	500	1/16/93
RICE ENGINEERING	TANK	HOBBS SWD SYS. E-15	19S	38E	15	L	LEA	0	0	300	250	2/19/93
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	20S	36E	02	A	LEA	80	60	100	100	12/16/93
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	20S	36E	02	I	LEA			50	50	3/16/94
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	20S	36E	1		LEA			15	12	10/19/93
RICE ENGINEERING	TANK	E-M-E SWD SYSTEM	20S	37E	02	E	LEA			15		6/1/94
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	20S	37E	03	B	LEA			180	170	12/7/94
RICE ENGINEERING	PIPELINE	NM 057346	20S	37E	06		LEA			35		7/26/94

OPERATOR	TYPE	FACILITY	TWP	RGE	SEC	UNIT L	COUNTY	OVS	OVR	WVS	WVR	DATE
RICE ENGINEERING	PIPELINE	NM-057346	20S	37E	06		LEA			35	0	7/26/94
RICE ENGINEERING	TL	EME SWD SYS WELL G8	20S	37E	08	G	LEA	5		160	140	11/17/93
RICE ENGINEERING	TANK	EME SWD SYSTEM #M5	20S	37E	5	M	LEA	0	0	50	25	10/26/92
RICE ENGINEERING	TANK	EME SWD SYSTEM #M-9	20S	37E	9	M	LEA	100	40	0	0	11/23/92
RICE ENGINEERING	TANK	ENE SWD SYSTEM #M9	20S	37E	9	M	LEA	25	10	35	15	10/19/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	36E	01	H	LEA	0	0	70	70	7/14/92
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	21S	36E	10	M	LEA			40	30	4/21/94
RICE ENGINEERING	TANK	E-M-E SWD SYSTEM	21S	36E	21	L	LEA			100	520	9/10/94
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	36E	24	P	LEA					3/2/94
RICE ENGINEERING	SW	E-M-E SWD SYS PUMP	21S	36E	32		LEA	100	80			8/8/94
RICE ENGINEERING	FU	EME SWD SYS.-PUMP ST	21S	36E	32	F	LEA	0	0	200	180	7/28/93
RICE ENGINEERING	LK	FMF SWD SSSTEM PUMP	21S	36E	32	F	LEA	0	0	100	80	4/6/93
RICE ENGINEERING	FU	EME SWD SYSTEM CORP/	21S	36E	32	F	LEA	0	0	80	80	7/20/93
RICE ENGINEERING	PIPELINE	CHEV.LENRD C-ENDOFLB	21S	36E	36	N	LEA	0	0	0	100	12/13/91
RICE ENGINEERING	PIPELINE	CHEV LENARD C	21S	36E	36	N	LEA	0	0	0	300	12/7/91
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	04	A	LEA	0	0	550	250	8/15/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	08		LEA	10	5	110	100	4/5/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	15	F	LEA			30	30	12/18/93
RICE ENGINEERING	17	TEXACO WIMBERLYL JCT	21S	37E	17	J	LEA	0	0	35	20	6/25/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	19	N	LEA	0	0	60	30	5/26/92
RICE ENGINEERING	VALVE	BLINEBRY DRINKARD SWD SYS	21S	37E	21		LEA	0	0	30	30	4/30/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	21	K	LEA	1	0	0	0	2/21/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	21	M	LEA	0	0	540	240	7/25/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	23	F	LEA	0	0	340	170	4/27/92
RICE ENGINEERING	IL	BLINEBRY DRINKARD SWD SYS	21S	37E	26		LEA	0	0	75	75	8/25/92
RICE ENGINEERING	GB	BLINEBRY DRINKARD SWD SYS	21S	37E	26	I	LEA			30	25	4/9/94
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	26	I	LEA	10	5	60	30	3/25/91
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	29	M	LEA	0	0	380	180	8/1/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	29	N	LEA	0	0	200	200	1/13/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	29	N	LEA	0	0	30	20	5/20/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	30	E	LEA	0	0	40	30	7/3/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	30	M	LEA	0	0	2000	1000	7/28/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	30	O	LEA	0	0	0	0	6/17/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	30	P	LEA	0	0	500	500	7/14/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	32	F	LEA					9/27/94
RICE ENGINEERING	HE	OXY-"OWEN";BLIN,DRIN	21S	37E	35	J	LEA	440	220	0	0	12/24/91
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	22S	35E	06	K	LEA	20				9/22/94
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	36E	01	B	LEA	0	0	50	25	1/3/92
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	22S	36E	06	K	LEA				15	11/28/94
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	36E	12	N	LEA	0	0	120	60	5/26/92
RICE ENGINEERING	PIPELINE	JCT.H31 BLINE,DRINK	22S	37E	03	H	LEA	130	0	0	0	12/5/91
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	37E	11	I	LEA	30	25	60	50	4/4/92
RICE ENGINEERING	TANK	BLINEBRY DRINKARD SWD SYS	22S	37E	18	N	LEA	75	50	750	700	12/15/94

OPERATOR	TYPE	FACILITY	TWP	RGE	SEC	UNIT_L	COUNTY	OVS	OVR	WVS	WVR	DATE
RICE ENGINEERING	TANK	BLINEBRY DRINKARD SWD SYS	22S	37E	18	N	LEA	0	0	0	300	12/10/91
RICE ENGINEERING	RO	BLINEBRY DRINKARD SWD SYS	22S	37E	20	B	LEA					12/15/94
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	37E	20	I	LEA	50	50	0	0	2/4/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	37E	21		LEA	20	0	40	0	5/6/92
RICE ENGINEERING	TANK	BLINEBRY DRINKARD SWD SYS	22S	37E	22	A	LEA	0	0	90	90	9/1/92
RICE ENGINEERING	TANK	BLINEBRY DRINKARD SWD SYS	22S	37E	22	N	LEA	10	10			12/15/94
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	37E	26	A	LEA			40	0	7/26/94
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	38E	30	K	LEA				25	12/6/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	38E	32	M	LEA	0	0	145	70	9/28/92
RICE ENGINEERING	PU	BLINEBRY DRINKARD SWD SYS	23S	37E	11	H	LEA	25	15			10/20/94
RICE ENGINEERING	PIPELINE	JUSTIS SWD SYSTEM	24S	37E	01	D	LEA	0	0	100	65	2/21/93
RICE ENGINEERING	PIPELINE	JUS.CHEV.PLA.KNIGHT	24S	37E	23	L	LEA	1	0	0	0	2/11/92
RICE ENGINEERING	PIPELINE	JUSTIS SWD	24S	37E	26		LEA	0	0	25	0	11/6/92
RICE ENGINEERING	PIPELINE	JUSTIS SWD	24S	37E	26		LEA	0	0	5	0	11/8/92
RICE ENGINEERING	PIPELINE	JUSTIS SWD SYSTEM	25S	37E	01	F	LEA	0	0	40	40	7/19/92
RICE ENGINEERING	GB	JUSTIS SWD SYSTEM	25S	37E	01	L	LEA	10	8	30	25	11/1/94
RICE ENGINEERING	PIPELINE	JUSTIS SWD SYSTEM	25S	37E	01	L	LEA	0	0	200	100	1/13/93
RICE ENGINEERING	TANK	JUSTIS SWD JCT D-1	25S	37E	1	D	LEA	0	0	25	20	12/17/92
RICE ENGINEERING	PIPELINE	JUSTIS SWD SYSTEM	25S	37E	11	K	LEA	30	20	0	0	5/13/93
RICE ENGINEERING	GP	JUSTIS SWD SYSTEM	25S	37E	12	E	LEA	0	0	0	0	4/19/93
RICE ENGINEERING	RO	JUSTIS SWD SYSTEM	25S	37E	25	P	LEA	0	0	25	10	7/12/93
RICE ENGINEERING	PIPELINE	JUS.ARCO JHFED CAR	25S	37E	26	B	LEA	1	0	0	0	2/7/92
RICE ENGINEERING	LK	JUSTIS SWD SYSTEM	25S	38E	30	D	LEA	0	0	20	0	5/24/93
RICE ENGINEERING	PIPELINE	JUSTIC SWD SYSTEM	25S	38E	30	D	LEA	0	0	5	0	7/14/92

OPERATOR	TYPE	FACILITY	TWP	RGE	SEC	UNIT L	COUNTY	OVS	OVR	WVS	WVR	DATE
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	26	I	LEA	10	5	60	30	3/25/91
RICE ENGINEERING	PIPELINE	JCT.H31 BLINE,DRINK	22S	37E	03	H	LEA	130	0	0	0	12/5/91
RICE ENGINEERING	PIPELINE	CHEV LENARD C	21S	36E	36	N	LEA	0	0	0	300	12/7/91
RICE ENGINEERING	TANK	BLINEBRY DRINKARD SWD SYS	22S	37E	18	N	LEA	0	0	0	300	12/10/91
RICE ENGINEERING	PIPELINE	CHEV.LENRD C-ENDOFLB	21S	36E	36	N	LEA	0	0	0	100	12/13/91
RICE ENGINEERING	HE	OXY-"OWEN";BLIN,DRIN	21S	37E	35	J	LEA	440	220	0	0	12/24/91
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	36E	01	B	LEA	0	0	50	25	1/3/92
RICE ENGINEERING	PIPELINE	JUS.ARCO JHFED CAR	25S	37E	26	B	LEA	1	0	0	0	2/7/92
RICE ENGINEERING	PIPELINE	JUS.CHEV.PLA.KNIGHT	24S	37E	23	L	LEA	1	0	0	0	2/11/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	21	K	LEA	1	0	0	0	2/21/92
RICE ENGINEERING	PIPELINE	ABO300 W.ORYX CAYLOR	17S	37E	06	L	LEA	0	0	0	0	3/3/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	37E	11	I	LEA	30	25	60	50	4/4/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	08		LEA	10	5	110	100	4/5/92
RICE ENGINEERING	TANK	HOBBS SWD SYSTEM	19S	38E	15	E	LEA	1	0	200	100	4/17/92
RICE ENGINEERING	PIPELINE	LAGUNA GATUNA;J.K-25	19S	32E	25	K	LEA	1	0	20	0	4/20/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	23	F	LEA	0	0	340	170	4/27/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	37E	21		LEA	20	0	40	0	5/6/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	36E	12	N	LEA	0	0	120	60	5/26/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	19	N	LEA	0	0	60	30	5/26/92
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	37E	06	B	LEA	0	0	400	240	5/30/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	30	O	LEA	0	0	0	0	6/17/92
RICE ENGINEERING	PIPELINE	ABO CALICHE TEX ST.O	16S	37E	31	O	LEA	0	0	70	60	6/24/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	30	E	LEA	0	0	40	30	7/3/92
RICE ENGINEERING	PIPELINE	JUSTIC SWD SYSTEM	25S	38E	30	D	LEA	0	0	5	0	7/14/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	36E	01	H	LEA	0	0	70	70	7/14/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	30	P	LEA	0	0	500	500	7/14/92
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	36E	01	D	LEA	0	0	30	30	7/17/92
RICE ENGINEERING	PIPELINE	JUSTIS SWD SYSTEM	25S	37E	01	F	LEA	0	0	40	40	7/19/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	21	M	LEA	0	0	540	240	7/25/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	30	M	LEA	0	0	2000	1000	7/28/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	29	M	LEA	0	0	380	180	8/1/92
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	36E	01	D	LEA	0	0	600	0	8/2/92
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	16S	36E	36	P	LEA	0	0	400	200	8/8/92
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	16S	36E	36	P	LEA	0	0	260	130	8/9/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	04	A	LEA	0	0	550	250	8/15/92
RICE ENGINEERING	IL	BLINEBRY DRINKARD SWD SYS	21S	37E	26		LEA	0	0	75	75	8/25/92
RICE ENGINEERING	TANK	BLINEBRY DRINKARD SWD SYS	22S	37E	22	A	LEA	0	0	90	90	9/1/92
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	38E	32	M	LEA	0	0	145	70	9/28/92
RICE ENGINEERING	TANK	ENE SWD SYSTEM #M9	20S	37E	9	M	LEA	25	10	35	15	10/19/92
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	37E	1	A	LEA	0	0	0	500	10/19/92
RICE ENGINEERING	TANK	EME SWD SYSTEM #M5	20S	37E	5	M	LEA	0	0	50	25	10/26/92
RICE ENGINEERING	PIPELINE	JUSTIS SWD	24S	37E	26		LEA	0	0	25	0	11/6/92
RICE ENGINEERING	PIPELINE	JUSTIS SWD	24S	37E	26		LEA	0	0	5	0	11/8/92

OPERATOR	TYPE	FACILITY	TWP	RGE	SEC	UNIT L	COUNTY	OVS	OVR	WVS	WVR	DATE
RICE ENGINEERING	TANK	EME SWD SYSTEM #M-9	20S	37E	9	M	LEA	100	40	0	0	11/23/92
RICE ENGINEERING	TANK	EME SWD JCT K-18	19S	37E	18	O	LEA	0	0	30	25	11/25/92
RICE ENGINEERING	FLOWLINE	ABO SWD SYSTEM	17S	37E	6	C	LEA	86	86	0	0	11/28/92
RICE ENGINEERING	FLOWLINE	HOBBS EAST SWD #F-30	18S	39E	30	F	LEA	0	0	20	0	12/1/92
RICE ENGINEERING	TANK	EME SWD K-33	19S	37E	33	K	LEA	100	0	600	400	12/11/92
RICE ENGINEERING	TANK	JUSTIS SWD JCT D-1	25S	37E	1	D	LEA	0	0	25	20	12/17/92
RICE ENGINEERING	LK	ABO SWD SYSTEM-TEXAC	16S	36E	36		LEA	0	0	450	450	1/1/93
RICE ENGINEERING	PIPELINE	JUSTIS SWD SYSTEM	25S	37E	01	L	LEA	0	0	200	100	1/13/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	29	N	LEA	0	0	200	200	1/13/93
RICE ENGINEERING	LK	HOBBS SWD SYS.WELL E	19S	38E	15	E	LEA	25	0	600	500	1/16/93
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	37E	06		LEA	0	0		75	1/24/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	37E	20	I	LEA	50	50	0	0	2/4/93
RICE ENGINEERING	TANK	HOBBS SWD SYS. E-15	19S	38E	15	L	LEA	0	0	300	250	2/19/93
RICE ENGINEERING	PIPELINE	JUSTIS SWD SYSTEM	24S	37E	01	D	LEA	0	0	100	65	2/21/93
RICE ENGINEERING	TANK	HOBBS EAST SWK SYS.	18S	39E	29		LEA	0	0	60	55	2/21/93
RICE ENGINEERING	LK	FMF SWD SSSTEM PUMP	21S	36E	32	F	LEA	0	0	100	80	4/6/93
RICE ENGINEERING	GP	JUSTIS SWD SYSTEM	25S	37E	12	E	LEA	0	0	0	0	4/19/93
RICE ENGINEERING	PIPELINE	HOBBS SWD SYSTEM	18S	38E	29		LEA	0	0	30	25	4/22/93
RICE ENGINEERING	VALVE	BLINEBRY DRINKARD SWD SYS	21S	37E	21		LEA	0	0	30	30	4/30/93
RICE ENGINEERING	PIPELINE	JUSTIS SWD SYSTEM	25S	37E	11	K	LEA	30	20	0	0	5/13/93
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	16S	37E	31	J	LEA	0	0	180	0	5/15/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	29	N	LEA	0	0	30	20	5/20/93
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	19S	36E	25	G	LEA	0	0	30	30	5/22/93
RICE ENGINEERING	LK	JUSTIS SWD SYSTEM	25S	38E	30	D	LEA	0	0	20	0	5/24/93
RICE ENGINEERING	VALVE	EME SWD SYSTEM WELL	19S	37E	33	K	LEA	0	0	0	0	6/12/93
RICE ENGINEERING	17	TEXACO WIMBERLYL JCT	21S	37E	17	J	LEA	0	0	35	20	6/25/93
RICE ENGINEERING	LK	EXXON K--4 JCT K-28	17S	35E	28	K	LEA	0	0	350	200	6/26/93
RICE ENGINEERING	RO	JUSTIS SWD SYSTEM	25S	37E	25	P	LEA	0	0	25	10	7/12/93
RICE ENGINEERING	FU	EME SWD SYSTEM CORP/	21S	36E	32	F	LEA	0	0	80	80	7/20/93
RICE ENGINEERING	PIPELINE	VACCUM SWD SYS. JCT	17S	35E	28	K	LEA	0	2	0	10	7/22/93
RICE ENGINEERING	PIPELINE	EME SWD SYS. JCT F-2	19S	37E	29	F	LEA	0	0	50	20	7/23/93
RICE ENGINEERING	FU	EME SWD SYS.-PUMP ST	21S	36E	32	F	LEA	0	0	200	180	7/28/93
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	20S	36E	1		LEA			15	12	10/19/93
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	19S	36E	34	J	LEA			15	10	11/11/93
RICE ENGINEERING	TL	EME SWD SYS WELL G8	20S	37E	08	G	LEA	5		160	140	11/17/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	38E	30	K	LEA				25	12/6/93
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	19S	37E	18		LEA			20	20	12/9/93
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	20S	36E	02	A	LEA	80	60	100	100	12/16/93
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	15	F	LEA			30	30	12/18/93
RICE ENGINEERING	PIPELINE	VACUUM SWD SYSTEM	18S	35E	06	K	LEA			10	10	1/7/94
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	16S	37E	31	O	LEA			65	15	2/2/94
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	36E	24	P	LEA					3/2/94
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	20S	36E	02	I	LEA			50	50	3/16/94

OPERATOR	TYPE	FACILITY	TWP	RGE	SEC	UNIT L	COUNTY	OVS	OVR	WVS	WVR	DATE
RICE ENGINEERING	GB	BLINEBRY DRINKARD SWD SYS	21S	37E	26	I	LEA			30	25	4/9/94
RICE ENGINEERING	IL	EME SWD SYSTEM	19S	37E	07	G	LEA			10	6	4/20/94
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	21S	36E	10	M	LEA			40	30	4/21/94
RICE ENGINEERING	PIPELINE	HOBBS SWD SYSTEM	19S	38E	05		LEA					4/29/94
RICE ENGINEERING	TANK	E-M-E SWD SYSTEM	20S	37E	02	E	LEA			15		6/1/94
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	18S	38E	29	I	LEA			15	10	6/28/94
RICE ENGINEERING	PIPELINE	ABO SWD SYSTEM	17S	36E	06		LEA			40	40	7/13/94
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	19S	37E	34	O	LEA			55	50	7/15/94
RICE ENGINEERING	PIPELINE	HOBBS SWD SYSTEM	18S	38E	30		LEA			10	5	7/16/94
RICE ENGINEERING	PIPELINE	NM-057346	20S	37E	06		LEA			35	0	7/26/94
RICE ENGINEERING	PIPELINE	NM 057346	20S	37E	06		LEA			35		7/26/94
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	22S	37E	26	A	LEA			40	0	7/26/94
RICE ENGINEERING	SW	E-M-E SWD SYS PUMP	21S	36E	32		LEA	100	80			8/8/94
RICE ENGINEERING	TANK	E-M-E SWD SYSTEM	21S	36E	21	L	LEA			100	520	9/10/94
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	22S	35E	06	K	LEA	20				9/22/94
RICE ENGINEERING	PIPELINE	BLINEBRY DRINKARD SWD SYS	21S	37E	32	F	LEA					9/27/94
RICE ENGINEERING	PU	BLINEBRY DRINKARD SWD SYS	23S	37E	11	H	LEA	25	15			10/20/94
RICE ENGINEERING	GB	JUSTIS SWD SYSTEM	25S	37E	01	L	LEA	10	8	30	25	11/1/94
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	22S	36E	06	K	LEA				15	11/28/94
RICE ENGINEERING	PIPELINE	EME SWD SYSTEM	20S	37E	03	B	LEA			180	170	12/7/94
RICE ENGINEERING	RO	EME SWD SYSTEM	19S	37E	07	O	LEA	40	35			12/9/94
RICE ENGINEERING	TANK	BLINEBRY DRINKARD SWD SYS	22S	37E	18	N	LEA	75	50	750	700	12/15/94
RICE ENGINEERING	RO	BLINEBRY DRINKARD SWD SYS	22S	37E	20	B	LEA					12/15/94
RICE ENGINEERING	TANK	BLINEBRY DRINKARD SWD SYS	22S	37E	22	N	LEA	10	10			12/15/94

9-13-95 COL #6

EXCAVATION OF WATER LINE

9-13-95 C.O.L #6

CELLAR WITH LEAK

9-13-95

REPAIRED PIPE

[illegible] 14+81 [illegible] 024

9-13-95

REMOVED LEAKING SECTION

<#1L, 2EH> 14:02 NNY 28AU 024

9-13-95

EXCAVATION OF WATER LINE

<[illegible] 14481 NNN-13HJ 824

9-13-95

EXCAVATION OF WATER LINE.

#6 PUMP HOUSE & WELL IN BACKGROUND.