

Cross Timbers Operating Company (CTOC)
Sullivan Frame A # 1 - Blow/Reserve Pit
D Nw/4 Nw/4 Sec. 30, T29N, R10W

Bill also
approved pit
12/26/01, probable
the pit

Site Assessment Date:

June 4, 1992

(Documentation Included)

Pit closure Date:

November 1, 1994

(Documentation Included)

Monitor Well Installation Date:

October 13, 1999

Monitor Well Sampling Date:

November 3, 1999

Groundwater Monitor Well Sampling Procedures:

Groundwater samples were collected from site monitor wells (MW's) following US EPA: SW-846 protocol. The samples were collected using new disposable bailers and placed in new laboratory supplied 40 ml glass vials with teflon septa caps. Samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) per US EPA Method 8021. Additional groundwater was collected and placed in laboratory supplied 500 ml plastic containers and analyzed for general water quality per US EPA Method 600/4-79-020. The samples were preserved cool (BTEX samples also preserved with mercuric chloride) and hand delivered to a qualified laboratory for testing. Waste generated during monitor well sampling and development was disposed of utilizing the separator tank pit located on the well site.

Water Quality Information:

BTEX and general chemistry results for the three (3) quarterly sampling events are summarized in the following tables. All MW BTEX constituents satisfactorily meet the New Mexico Water Quality Control Commission's (NMWQCC) allowable concentrations for groundwater. The general water quality results for chloride and total dissolved solids (TDS) also met NMWQCC standards for groundwater or was close to the normal levels seen within the San Juan basin. The general water quality results also disclosed excessive sulfate and fluoride levels within all MW's during the November 3, 1999 sampling event.

Summary:

Based on the determined groundwater gradient (figures 2, 3, and 4), MW #3 appears to be positioned to sufficiently substantiate and delineate the source area. However, the gradient is relatively flat, therefore capable of switching directions to the north or west very easily.

In accordance with the attached correspondence (refer to letter dated May 11, 2001 - RE: CTOC, 2000 Annual Groundwater Reports, San Juan County, NM, Permanent Closure Requested) and the NMOCD previously approved groundwater management plan (GMP), specifically Section 2.0, CTOC respectfully request permanent closure for the site blow/reserve pit.

This document contains all pertinent information detailed in section 5.0 (Reporting) of the GMP. Upon receiving permanent closure notification from NMOCD, CTOC will conduct plug and abandonment of all sampling points as addressed in Section 6.0 of the GMP.

Finally, CTOC request the NMOCD to contact Pamco, Inc. as to their highly probable subsurface soil and groundwater impact derived from their Lechner #2 earthen pit (actively discharging prior to and during CTOC's monitor well installations), located up gradient of CTOC's abandoned pit being investigated (see figures 3 and 4).

CROSS TIMBERS GROUNDWATER MONITOR WELL LAB RESULTS
 SUBMITTED BY BLAGG ENGINEERING, INC.

SULLIVAN FRAME A #1 - BLOW PIT
UNIT D, SEC. 30, T29N, R10W

REVISED: JULY 10, 2000

FILENAME: (A1-2Q-00.WK4) NJV

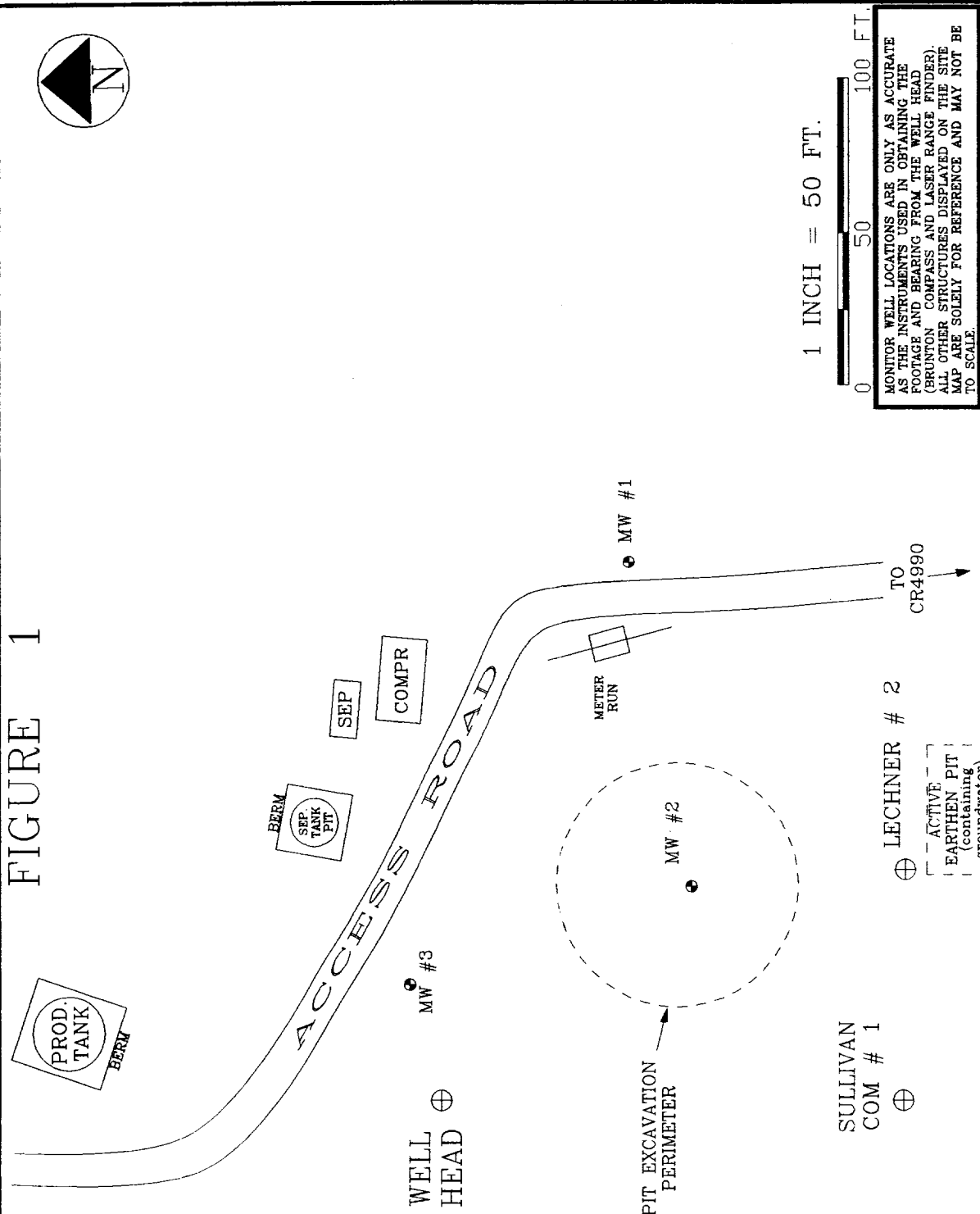
SAMPLE DATE	MONITOR WELL No:	D.T.W. (ft)	T.D. (ft)	TDS mg/L	COND. umhos	pH	PRODUCT (in)	BTEX EPA METHOD 8021 (PPB)			
								Benzene	Toluene	Ethyl Benzene	Total Xylene
03-Nov-99	MW #1	4.68	15.00	4,220	8,450	7.3		ND	ND	ND	ND
22-Feb-00		5.21			-	-		-	-	-	-
14-Mar-00		5.15			2,600	7.5		-	-	-	-
29-Jun-00		5.29			-	-		-	-	-	-
03-Nov-99	MW #2	6.34	15.00	5,100	10,220	7.0		9.9	3.7	1.0	1.8
22-Feb-00		6.60			2,100	7.3		ND	ND	ND	ND
14-Mar-00		6.73			2,300	7.3		-	-	-	-
29-Jun-00		6.88			4,700	7.2		4	ND	ND	ND
03-Nov-99	MW #3	3.41	13.00	12,320	24,650	7.3		ND	ND	ND	ND
22-Feb-00		3.83			-	-		-	-	-	-
14-Mar-00		4.01			4,000	7.5		-	-	-	-
29-Jun-00		4.28			4,100	7.6		ND	ND	ND	ND

GENERAL WATER QUALITY
CROSS TIMBERS OPERATING COMPANY
SULLIVAN FRAME A # 1

SAMPLING DATES : 11 / 3 / 99 , 3 / 14 / 00 , & 6 / 29 / 00 .

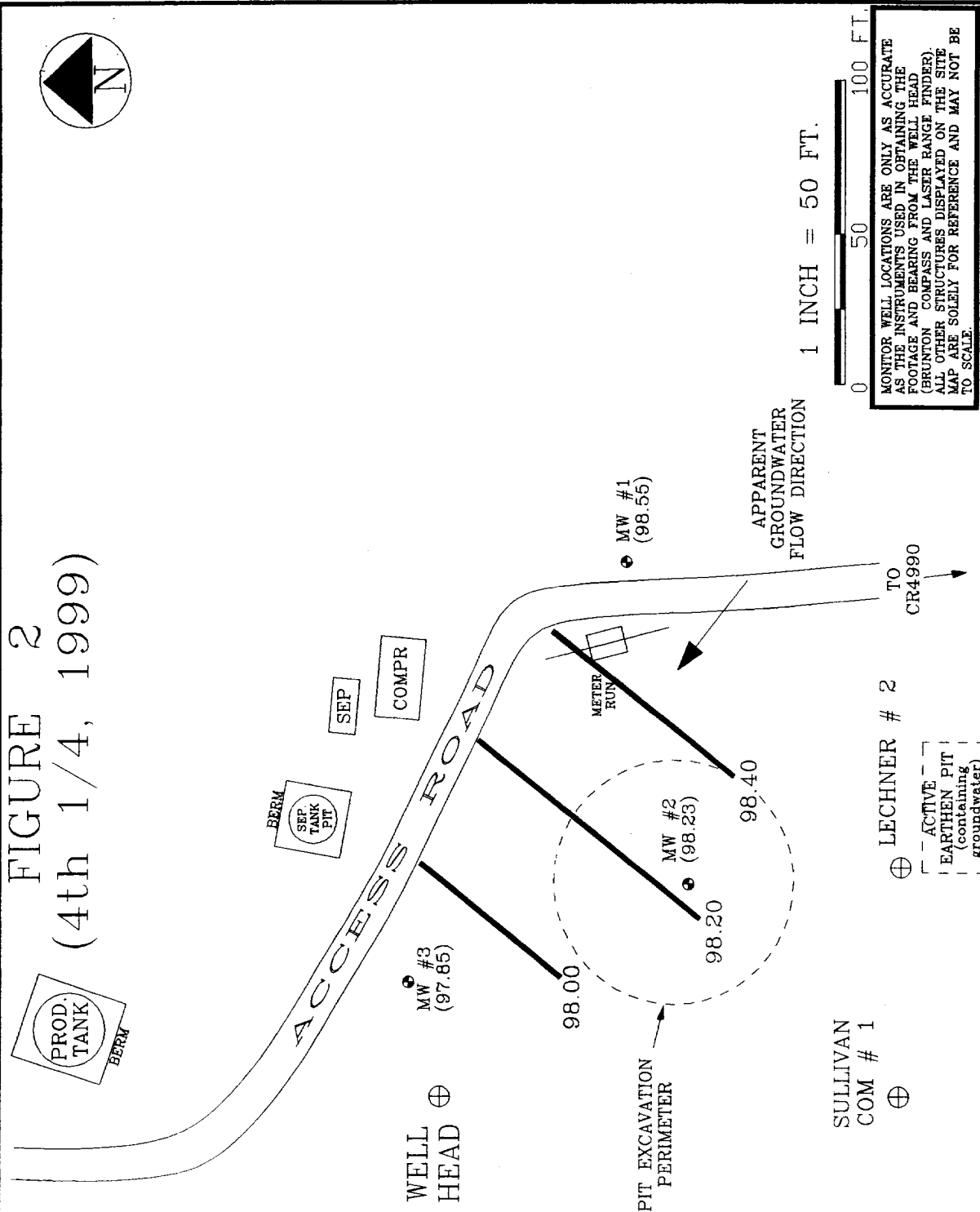
PARAMETERS	MW # 1	MW # 2	MW # 3	Units
LAB pH	7.31	7.00	7.34	s. u.
LAB CONDUCTIVITY @ 25 C	8,450	10,220	24,650	umhos / cm
TOTAL DISSOLVED SOLIDS @ 180 C	4,220	5,100	12,320	mg / L
03/14/00	2,080	2,080	3,440	mg / L
06/29/00	-	-	3,010	mg / L
TOTAL DISSOLVED SOLIDS (Calc)	4,198	5,047	12,192	mg / L
SODIUM ABSORPTION RATIO	31.8	32.7	73.5	ratio
TOTAL ALKALINITY AS CaCO ₃	780	512	528	mg / L
TOTAL HARDNESS AS CaCO ₃	305	415	497	mg / L
BICARBONATE as HCO ₃	780	512	528	mg / L
CARBONATE AS CO ₃	< 1	< 1	< 1	mg / L
HYDROXIDE AS OH	< 1	< 1	< 1	mg / L
NITRATE NITROGEN	< 0.1	< 0.1	< 0.1	mg / L
NITRITE NITROGEN	0.012	0.012	0.003	mg / L
CHLORIDE	13.2	410	1.9	mg / L
03/14/00	-	5.5	-	mg / L
06/29/00	-	42.4	-	mg / L
FLUORIDE	2.48	2.44	7.80	mg / L
PHOSPHATE	1.6	2.4	0.4	mg / L
SULFATE	2,320	2,640	7,920	mg / L
IRON	< 0.001	< 0.001	< 0.001	mg / L
CALCIUM	90.6	107	118	mg / L
MAGNESIUM	19.10	36.0	49.2	mg / L
POTASSIUM	2.51	7.61	6.12	mg / L
SODIUM	1,275	1,531	3,768	mg / L
CATION / ANION DIFFERENCE	0.30	0.04	0.01	%

FIGURE 1



CROSS TIMBERS OPERATING CO. SULLIVAN FRAME A #1 NW/4 NW/4 SEC. 30, T29N, R10W SAN JUAN COUNTY, NEW MEXICO	BLAGG ENGINEERING, INC. CONSULTING PETROLEUM / RECLAMATION SERVICES P.O. BOX 87 BLOOMFIELD, NEW MEXICO 87413 PHONE: (505) 632-1199	PROJECT: MW INSTALL. DRAWN BY: NJV FILENAME: SFA1-SM.SKD REVISED: 12/4/99 NJV	SITE MAP 11/99
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FIGURE 2
(4th 1/4, 1999)

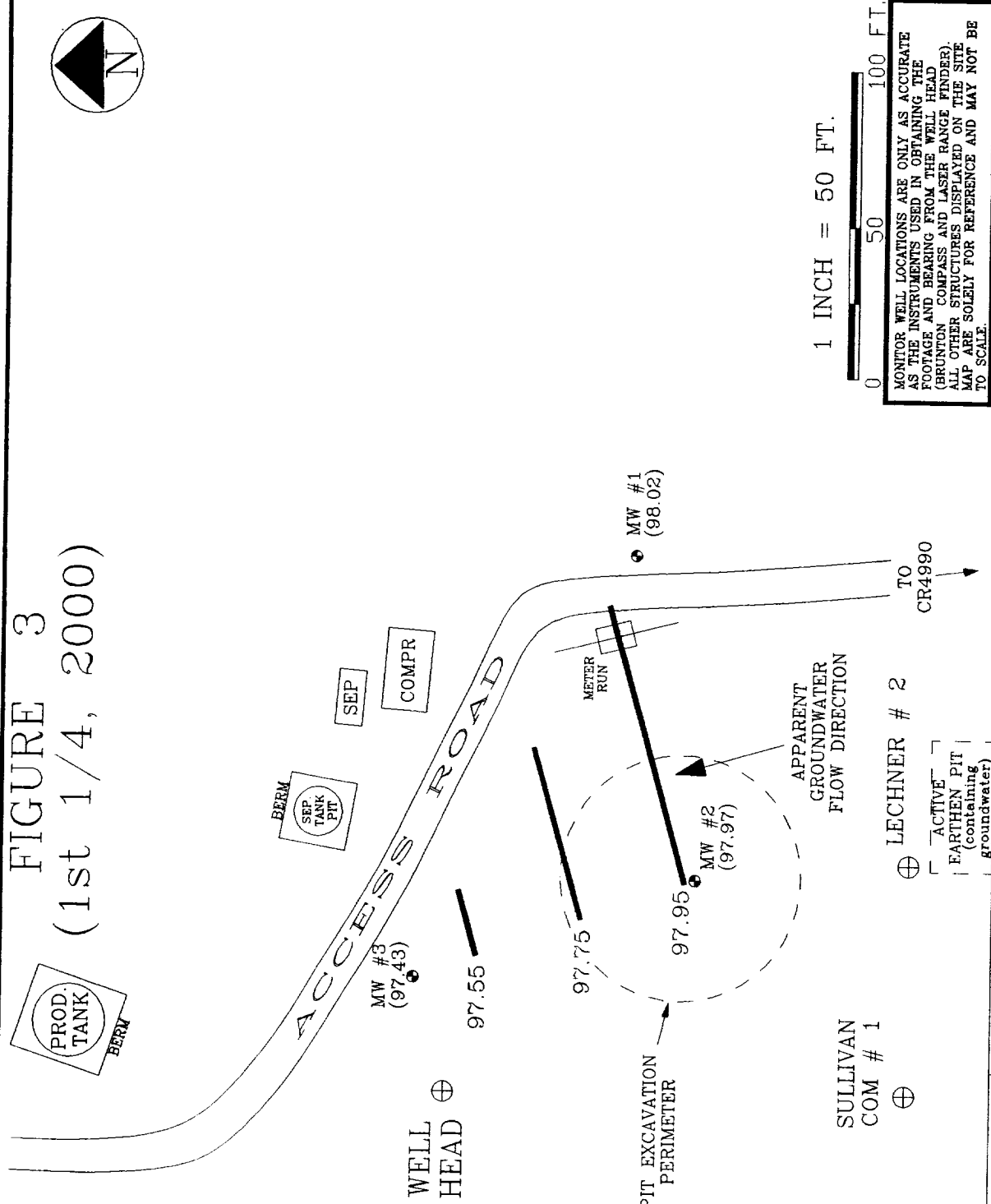


MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

CROSS TIMBERS OPERATING CO.	PROJECT: MW SAMPLING	GROUNDWATER GRADIENT
SULLIVAN FRAME A #1	DRAWN BY: NJV	MAP
NW/4 NW/4 SEC. 30, T29N, R10W SAN JUAN COUNTY, NEW MEXICO	FILENAME: SFA1-GW.SKD REVISED: 11/17/99 NJV	11/99

BLAGG ENGINEERING, INC.
 CONSULTING PETROLEUM / RECLAMATION SERVICES
 P.O. BOX 87
 BLOOMFIELD, NEW MEXICO 87413
 PHONE: (505) 632-1199

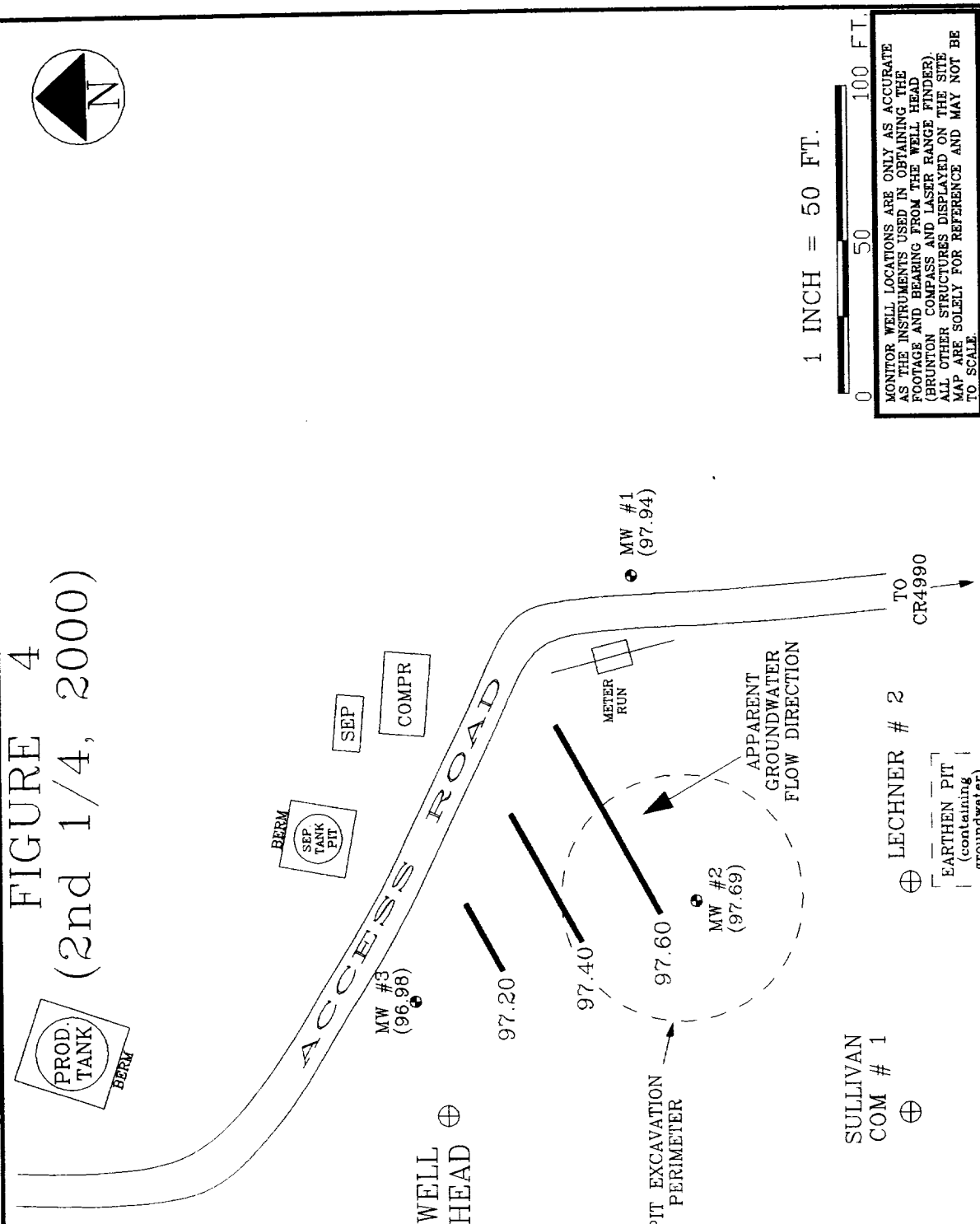
FIGURE 3
(1st 1/4, 2000)



Top of Well Elevation	
MW #1	(103.23)
MW #2	(104.57)
MW #3	(101.26)
● MW #1 Groundwater Elevation as of 2/22/00.	
	(98.02)

CROSS TIMBERS OPERATING CO. SULLIVAN FRAME A #1 NW/4 NW/4 SEC. 30, T29N, R10W SAN JUAN COUNTY, NEW MEXICO	BLAGG ENGINEERING, INC. CONSULTING PETROLEUM / RECLAMATION SERVICES P.O. BOX 87 BLOOMFIELD, NEW MEXICO 87413 PHONE: (505) 632-1199		PROJECT: MW SAMPLING	GROUNDWATER GRADIENT MAP 02/00
			DRAWN BY: NJV FILENAME: 02-22-GW.SKD REVISED: 04/04/01 NJV	

FIGURE 4
(2nd 1/4, 2000)



Top of Well Elevation	
MW #1	(103.23)
MW #2	(104.57)
MW #3	(101.26)
MW #1 Groundwater Elevation as of 8/29/00	
●	(97.94)

MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

CROSS TIMBERS OPERATING CO. SULLIVAN FRAME A #1 NW/4 NW/4 SEC. 30, T29N, R10W SAN JUAN COUNTY, NEW MEXICO	BLAGG ENGINEERING, INC. CONSULTING PETROLEUM / RECLAMATION SERVICES P.O. BOX 87 BLOOMFIELD, NEW MEXICO 87413 PHONE: (505) 632-1199	PROJECT: MW SAMPLING DRAWN BY: NJV FILENAME: 06-29-GW.SKD REVISED: 04/04/01 NJV	GROUNDWATER GRADIENT MAP 06/00

80109

District I

P.O. Box 1980, Hobbs, NM

District II

P.O. Drawer DD, Artesia, NM 88211

District III

J Rio Brazos Rd, Aztec, NM 87410

State of New Mexico

Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

SUBMIT 1 COPY TO
APPROPRIATE
DISTRICT OFFICE
AND 1 COPY TO
SANTA FE OFFICE**PIT REMEDIATION AND CLOSURE REPORT**Operator: Amoco Production Company Telephone: (505) - 326-9200Address: 200 Amoco Court, Farmington, New Mexico 87401Facility Or: SULLIVAN FRAME A #1
Well NameLocation: Unit or Qtr/Qtr Sec D sec 30 T 29N R 10W County SAN JUANPit Type: Separator Dehydrator Other RESERVE ?Land Type: BLM , State , Fee X, Other Pit Location: Pit dimensions: length 40', width 40', depth ~6'
Attach diagram)Reference: wellhead X, other Footage from reference: 105Direction from reference: 55 Degrees X East North
of
 West South X**Depth To Ground Water:**(Vertical distance from
contaminants to seasonal
high water elevation of
ground water)Less than 50 feet (20 points)
50 feet to 99 feet (10 points)
Greater than 100 feet (0 Points) 20**Wellhead Protection Area:**(Less than 200 feet from a private
domestic water source, or; less than
1000 feet from all other water sources)Yes (20 points)
No (0 points) 0**Distance To Surface Water:**(Horizontal distance to perennial
lakes, ponds, rivers, streams, creeks,
irrigation canals and ditches)Less than 200 feet (20 points)
200 feet to 1000 feet (10 points)
Greater than 1000 feet (0 points) 0RANKING SCORE (TOTAL POINTS): 20

Date Remediation Started: 9-30-94 Date Completed: 10-17-94

Remediation Method: Excavation X Approx. cubic yards 300
(Check all appropriate sections) Landfarmed Insitu Bioremediation

Other SOIL - Rm THROUGH ROCK CRUSHER

Remediation Location: Onsite Offsite X PAUL VELASQUEZ CRUSHER
(ie. landfarmed onsite, name and location of offsite facility) NEAR GARCA GC B#1 (J-21-29-10)

General Description Of Remedial Action:

Excavation - ALLOW WATER TO Aerate - DISSIPATION OF

CONTAMINATES IN WATER.

PIT CLOSURE SUBMITTED TO UMCOED & DENIED - 12/5/96 LETTER CORRESPONDENCE (ATTACHED)

Ground Water Encountered: No Yes X Depth 5'

Final Pit: Sample location see Attached Documents

Closure Sampling:
(if multiple samples, attach sample results and diagram of sample locations and depths)

Sample depth 5'

Sample date 9/30, 10/17 Sample time

Sample Results

Benzene(ppm)

Total BTEX(ppm)

Field headspace(ppm)

TPH

Ground Water Sample: Yes X No (If yes, attach sample results)

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF

DATE 10/25/94

SIGNATURE B. Shaw

PRINTED NAME
AND TITLE

Buddy D. Shaw
Environmental Coordinator

5796 US HWY. 64, FARMINGTON, NM 87401
(505) 632-0615

1360

JOB No: 92140
PAGE No: 1 of 1

DATE STARTED: 6-4-92
DATE FINISHED: 6-4-92
ENVIRO. SPCLT: J.W.
OPERATOR: G.S.
ASSISTANT: T.C.

LAND USE: River Bottom (marshy) Pasture LEASE FEE
SURFACE CONDITIONS: EARTHED Pit

FIELD NOTES & REMARKS: ~~Pit~~ is located approx 50' south and 100' East of well head. Pit has been abandoned but is still visible. Could not dig test hole in pit, too soft, seems to be drilling mud. Recovered a sample for testing T PH. Pit is located approx. 5' above surrounding ground level.

SAMPLE INVENTORY:		
SAMPL ID:	SAMPL TYPE:	LABORATORY ANALYSIS:

[illegible]

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0 5' 10' FEET

SITE DIAGRAM



TEST HOLE LOGS:

TH# 1
SOIL SMPL OVM/
TYPE: TYPE: IPH

TH# 2
SOIL SMPL OVM/
TYPE TYPE TPH

TH# 3

TH # 4
SCH. SMPL. QWA/
TYPE. TYPE. TRM

1-
2-
3-
4-
5-
6-
7-
8-
9-
10-
12-
14-
16-
18-
20-

- BOX TYPE: C - Chap. M - SE, 3 - 2nd, C - Ground ~~Passage 1 - 1st, M - 2nd~~ ~~Ground 3 - 1st, M - 2nd~~

TRAVEL NOTES		CALLOUT: <u>9-29-99</u>	ONSITE: <u>9-30-99 0830</u>
			<u>10-17-99 1130 AFS,</u>

OFF: (505) 325-8786



LAB: (505) 325-5667

AROMATIC VOLATILE ORGANICS

Attn: *R. E. O'Neill*
Company: *Blagg Engineering*
Address: *P.O. Box 87*
City, State: *Bloomfield, NM 87413*

Date: *10/4/94*
Lab ID: *2055*
Sample ID: *3377*
Job No. *2-1000*

Project Name: *Sullivan Frame A #1*
Project Location: *Pit Water @ 5' - Reserve Pit*
Sampled by: *REO* Date: *9/30/94*
Analyzed by: *DLA* Date: *10/4/94*
Sample Matrix: *Water*

Time: *8:40*

Aromatic Volatile Organics

Component	Measured Concentration ug/L	Detection Limit Concentration ug/L
<i>Benzene</i>	<i>123.3</i>	<i>0.2</i>
<i>Toluene</i>	<i>26.4</i>	<i>0.2</i>
<i>Ethylbenzene</i>	<i>19.3</i>	<i>0.2</i>
<i>m,p-Xylene</i>	<i>549.2</i>	<i>0.2</i>
<i>o-Xylene</i>	<i>25.6</i>	<i>0.2</i>
	<i>TOTAL 743.9 ug/L</i>	

ND - Not Detectable

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: *[Signature]*

Date: *10/4/94*

P. O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-8786



LAB: (505) 325-5667

AROMATIC VOLATILE ORGANICS

Attn: *R. E. O'Neill*
Company: *Blagg Engineering*
Address: *P.O. Box 87*
City, State: *Bloomfield, NM 87413*

Date: 10/19/94
Lab ID: 2155
Sample ID: 3640
Job No. 2-1000

Project Name: *Sullivan Frame A #1*
Project Location: *Reserve Pit Water*
Sampled by: REO Date: 10/17/94
Analyzed by: DLA Date: 10/19/94
Sample Matrix: *Water*

Time: 11:30

Aromatic Volatile Organics

Component	Measured Concentration ug/L	Detection Limit Concentration ug/L
<i>Benzene</i>	0.9	0.2
<i>Toluene</i>	4.1	0.2
<i>Ethylbenzene</i>	0.5	0.2
<i>m,p-Xylene</i>	7.5	0.2
<i>o-Xylene</i>	1.5	0.2
	TOTAL 14.6 ug/L	

ND - Not Detectable

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: *JKH*

Date: *10/19/94*

P. O. BOX 2606 • FARMINGTON, NM 87499

— TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT —

AFTER PUMPING THE PIT

OFF: (505) 325-8786



LAB: (505) 325-5667

AROMATIC VOLATILE ORGANICS

Attn: *R. E. O'Neill*
Company: *Blagg Engineering*
Address: *P.O. Box 87*
City, State: *Bloomfield, NM 87413*

Date: *11/1/94*
Lab ID: *2244*
Sample ID: *3808*
Job No. *2-1000*

Project Name: *Sullivan Frame A #1*
Project Location: *Reserve Pit Water*
Sampled by: *REO* Date: *10/31/94*
Analyzed by: *DLA* Date: *11/1/94*
Sample Matrix: *Water*

Time: *8:00*

Aromatic Volatile Organics

Component	Measured Concentration ug/L	Detection Limit Concentration ug/L
<i>Benzene</i>	<i>1.2</i>	<i>0.2</i>
<i>Toluene</i>	<i>0.4</i>	<i>0.2</i>
<i>Ethylbenzene</i>	<i>ND</i>	<i>0.2</i>
<i>m,p-Xylene</i>	<i>1.0</i>	<i>0.2</i>
<i>o-Xylene</i>	<i>ND</i>	<i>0.2</i>
	<i>TOTAL 2.6 ug/L</i>	

ND - Not Detectable

Method - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography

Approved by: *[Signature]*
Date: *11/2/94*

P. O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

ON SITE
TECHNOLOGIES, LTD.

657 W. Maple • P. O. Box 2606 • Farmington NM 87499
LAB: (505) 325-5667 • FAX: (505) 325-6256

Date: 9-30-99

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6210

Purchase Order No.:		Reference No.:	
Name		Title	
Company		Company	
Address		Mailing Address	
City, State, Zip		City, State, Zip	
Telephone No.		Telephone No.	

Special Instructions:			
SULLIVAN FRAME A #1 RESERVE PIT			
Sampler: R. E. O'NEILL			

SEND INVOICE TO	NAME	COMPANY	ADDRESS	CITY, STATE, ZIP	DEPT.
	R. E. O'NEILL	BIGG ENGINEERING	P.O. BOX 87	BLOOMFIELD, N.M.	87413

DATE/TIME SAMPLED	COMPOSITE/ GRAB	PRESERVATIVES	Number of Containers	REPORT RESULTS TO
9/30 0840		Hg/112-100	2	ANALYSIS REQUESTED

Relinquished by: R. E. O'Neill	Date/Time 9/30 1410	Received by: <i>[Signature]</i>	Date/Time 9/30 1410
Relinquished by:	Date/Time	Received by:	Date/Time
Relinquished by:	Date/Time	Received by:	Date/Time

Method of Shipment:	Rush	5 Working Days	10 Working Days	Sampling Location:
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Authorized by: R. E. O'Neill	Date 9-30-94
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(Client Signature Must Accompany Request)

ON SITE
TECHNOLOGIES, LTD.

657 W. Maple • P. O. Box 2606 • Farmington NM 87499
LAB: (505) 325-5667 • FAX: (505) 325-6256

Date: 10-31-94

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