3R - 127

REPORTS

DATE:

1999

BLAGG ENGINEERING, INC.
P.O. Box 87, Bloomfield, New Mexico 87413
Phone: (505)632-1199 Fax: (505)632-3903

April 19, 2000

Mr. William C. Olson - Hydrologist
State of New Mexico Oil Conservation Division
2040 South Pacheco
State Land Office Building
Santa Fe, NM 87505

RE: 1999 ANNUAL GROUNDWATER REPORTS
SAN JUAN COUNTY, NEW MEXICO

Dear Mr. Olson:

Blagg Engineering, Inc., on behalf of Cross Timbers Oil Company, respectfully submits the attached 1999 annual groundwater reports in which quarterly and/or annual sampling is currently being undertaken. This reporting adheres to the NMOCD's previously approved groundwater management plan.

A total of seven (7) well sites, listed on the following page, are associated with this correspondence. All work performed on the these well sites have been incorporated into individual packets. Pit and/or landfarm closure documentation was included in the previous submitted reports.

The summary, conclusions, and/or recommendations made within these reports are based on information made available from the enclosed material. Any site specific inquiries should be examined within the individual packets.

If you have questions, please call and contact either myself or Jeffrey C. Blagg. Thank you for your cooperation and assistance.

Sincerely,
BLAGG ENGINEERING, INC.

Nelson Velez
Staff Geologist

Reviewed by:

Jeffrey C. Blagg, P.E
President

Attachments: Individual Well site packets

cc: Denny Foust, Environmental Geologist, NMOCD District III Office. Aztec, NM
Nina Hutton. Environmental & Safety Manager, Cross Timbers Oil Company, Ft. Worth, TX

NV/nv

PREV-99.CVL

Cross Timbers Oil Co. 1999 Annual Groundwater Reports

1.	Abrams J # 1	Unit I, Sec. 29, T29N, R10W
2.	Bergin GC # 1E	Unit F, Sec. 21, T29N, R11W
3.	Bruington GC # 1	Unit E, Sec. 14, T29N, R11W
4.	Rowland GC # 1	Unit P, Sec. 25, T30N, R12W
5.	State GC BS # 1	Unit F, Sec. 21, T29N, R11W
6.	Sullivan GC D # 1	Unit B, Sec. 26, T29N, R11W
7.	Valdez A # 1E	Unit G, Sec. 24, T29N, R11W

CROSS TIMBERS OIL COMPANY

GROUNDWATER REMEDIATION REPORT

1999

STATE GC BS #1
(F) SECTION 21, T29N, R11W, NMPM
SAN JUAN COUNTY, NEW MEXICO

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APR 27 2000

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

PREPARED FOR:
MR. WILLIAM C. OLSON
NEW MEXICO OIL CONSERVATION DIVISION

FEBRUARY 2000

PREPARD BY:
BLAGG ENGINEERING, INC.

Consulting Petroleum / Reclamation Services
P.O. Box 87
Bloomfield, New Mexico 87413

Cross Timber Oil Company (CTOC)
State GC BS # 1 - Separator Pit
Se/4 Nw/4 Sec. 21, T29N, R11W

Groundwater Monitor Well Sampling Procedures:

Groundwater samples were collected from site monitor wells (MW's) following USEPA: 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 USEPA Method 8021. Additional groundwater was collected and place in laboratory supplied 500 ml plastic containers and analyzed for general water quality per USEPA 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 1999 quarterly sampling events are summarized in the following tables. MW #4R BTEX constituents appears to satisfactorily meet the New Mexico Water Quality Control Commission's (NMWQCC) requirements for groundwater during all sampling events in 1999. All other monitor wells have met closure for BTEX based on the previously approved groundwater management plan.

All MW's were sampled for general water quality analysis on May 13, 1999 to addressed the attached NMOCD letter, dated April 21, 1999 (refer to section 1). The results reveal dramatic decreases in the chloride levels in all MW's compared to the June 10, 1996 sampling event. Blagg Engineering, Inc. (BEI) believes that the most recent results are more indicative of the groundwater quality based on consistency of the analyses in relations to all pertinent constituents in the MW's except MW #3. BEI suspects MW #3, because of it's position relative to the other existing MW's (low lying area near cattail swamp or marsh), may be displaying a totally different water quality not associated with the impact apparently created by the now abandoned earthen pit.

Summary and/or Recommendations:

Based on the enclosed documentation, the groundwater within the separator pit area appears to have been remediated by natural attenuation resulting from pit closure activities conducted in February, 1994. Following the previously approved groundwater management plan, quarterly sampling of MW #4R for BTEX will continue until four (4) consecutive sampling events of below NMWQCC standards has been achieved. In addition, MW #3 and #5R will be sampled concurrently on the last quarterly event to substantiate minimized and delineated down gradient contamination.

BEI recommends sampling MW #3, #4R, and #5R for chlorides to validate the May 13, 1999 sampling event for that constituent. BEI also proposes to install a new MW to be located north of MW #3 (see Site Map - Figure 1) to confirm water quality for total dissolved solids (TDS) level only. If the proposed new MW and MW #3 TDS levels are statistically equivalent, then permanent closure (addressing NMOCD's aforementioned letter) will be will be requested for TDS analysis.

CROSS TIMBERS GROUNDWATER MONITOR WELL LABORATORY RESULT

SUBMITTED BY BLAGG ENGINEERING, INC.

STATE GC BS #1 - SEPARATOR PIT
UNIT K, SEC. 23, T29N, R11W

REVISED DATE: DECEMBER 3, 1999

FILENAME: (ST-4Q-99.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 8020 (PPB) Benzene	Toluene	Ethyl Benzene	Total Xylene
05-Jun-96	MW #1	5.60	8.43	4660	3200	6.8		ND	ND	ND	ND
13-May-99		5.77		4275	8550	7.5		NA	NA	NA	NA
05-Jun-96	MW #2	5.57	8.43	5120	4400	6.7		57.2	ND	277	2804
11-Sep-96		6.36			3800	7.4		17.3	19.7	177	197.23
23-Jun-97		5.82	8.42		4000	7.6		8.6	3.6	4.8	26.5
22-Sep-97		5.50			2900	7.4		0.4	4.4	ND	14.8
18-Dec-97		5.29			3300	6.9		ND	0.7	2.7	11.2
30-May-98		5.27			3200	7.2		1.2	1.9	2.7	5.5
13-May-99		6.15		4860	9740	7.6		NA	NA	NA	NA
05-Jun-96	MW #3	5.75	8.62	13000	6500	7.0		ND	ND	ND	ND
13-May-99		6.40		8050	16200	7.5		NA	NA	NA	NA
23-Jun-97	MW #4	6.74	8.95	4119	3800	7.2		26.4	86.5	186	1062
26-Jun-98	MW #4R	5.56	10.00		2600	7.7		17.1	10.2	8.7	47.0
13-May-99		4.87		4700	9450	7.3		3.9	4.5	2.9	8.3
25-Aug-99		3.35			3200	7.0		8.6	2.0	0.5	2.6
30-Nov-99		4.22			3300	7.1		10.5	0.8	7.5	8.2
18-Dec-97	MW #5	6.45	9.00	1870	3200	6.9		ND	0.4	ND	0.6
13-May-99	MW #5R	7.65		4790	9600	7.3		NA	NA	NA	NA

GENERAL WATER QUALITY

CROSS TIMBERS OIL COMPANY

STATE GC BS #1

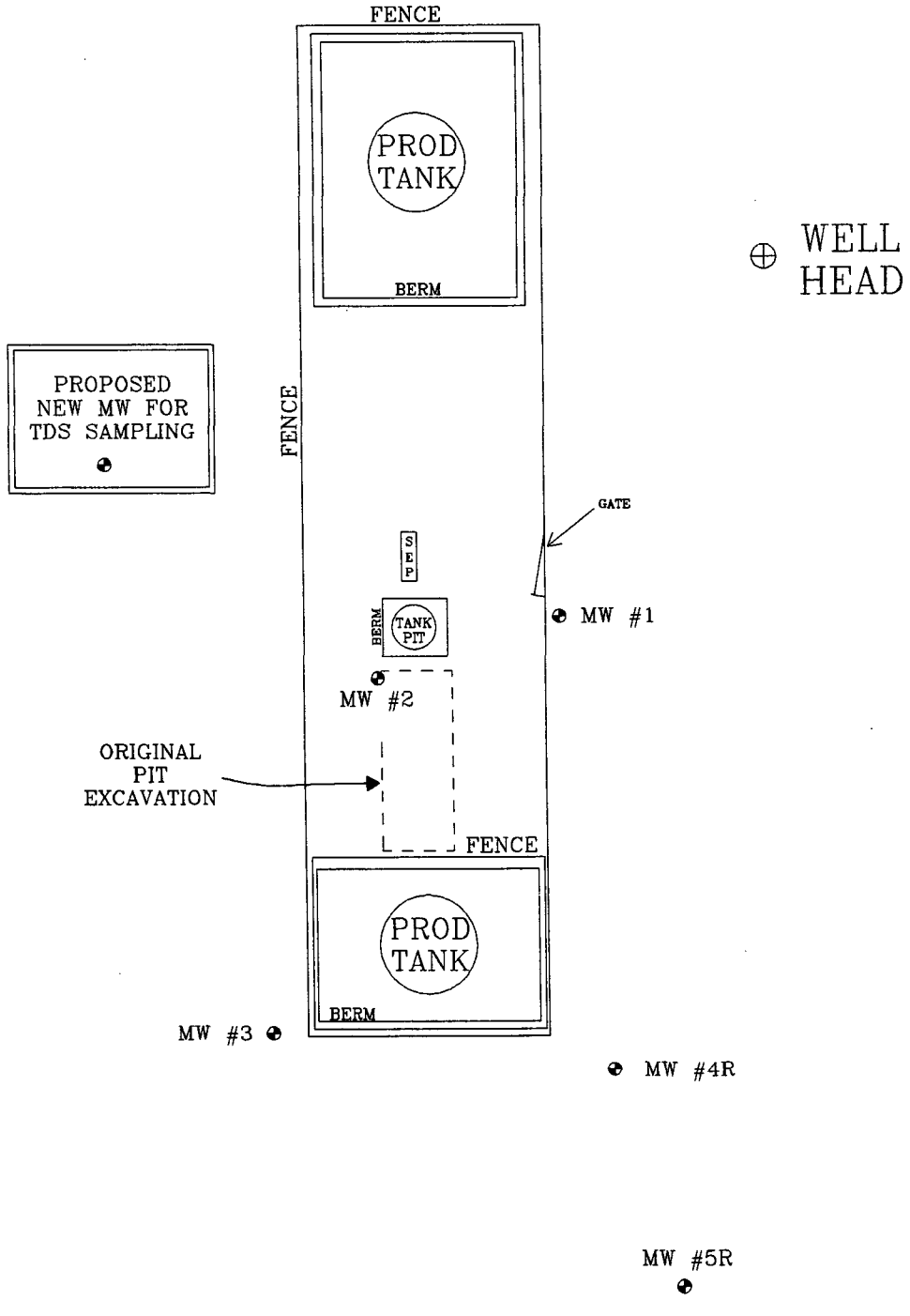
SAMPLE DATE : May 13, 1999

PARAMETERS	MW # 1	MW # 2	MW # 3	MW # 4R	MW # 5R	Units
LAB pH	7.46	7.58	7.50	7.32	7.31	s. u.
LAB CONDUCTIVITY @ 25 C	8,550	9,740	16,200	9,450	9,600	umhos / cm
TOTAL DISSOLVED SOLIDS @ 180 C	4,275	4,860	8,050	4,700	4,790	mg / L
TOTAL DISSOLVED SOLIDS (Calc)	4,264	4,841	8,004	4,669	4,755	mg / L
SODIUM ABSORPTION RATIO	8.7	12.2	25.2	11.1	11.7	ratio
TOTAL ALKALINITY AS CaCO3	364	568	876	316	332	mg / L
TOTAL HARDNESS AS CaCO3	1,445	1,325	1,295	1,350	1,320	mg / L
BICARBONATE as HCO3	364	568	876	316	332	mg / L
CARBONATE AS CO3	< 1	< 1	< 1	< 1	< 1	mg / L
HYDROXIDE AS OH	< 1	< 1	< 1	< 1	< 1	mg / L
NITRATE NITROGEN	< 0.1	< 0.1	< 0.1	0.7	3.1	mg / L
NITRITE NITROGEN	0.029	0.015	0.007	0.024	0.094	mg / L
CHLORIDE	15.5	50.0	56.5	17.0	13.5	mg / L
FLUORIDE	1.25	1.52	1.69	1.31	1.26	mg / L
PHOSPHATE	0.3	0.2	0.1	< 0.1	< 0.1	mg / L
SULFATE	2,690	2,910	4,840	2,990	3,040	mg / L
IRON	0.553	0.038	0.029	0.207	0.001	mg / L
CALCIUM	504	446	428	494	480	mg / L
MAGNESIUM	45.2	51.3	55.0	28.1	29.3	mg / L
POTASSIUM	26.5	17.5	11.0	6.0	6.0	mg / L
SODIUM	760	1020	2,080	940	980	mg / L
CATION / ANION DIFFERENCE	0.20	0.14	0.14	0.02	0.13	%

GENERAL WATER QUALITY
CROSS TIMBERS OIL COMPANY
STATE GC BS #1
SAMPLE DATE : June 10, 1996

PARAMETERS	MW # 1	MW # 2	MW # 3	MW # 4 06/23/97	MW # 5 12/18/97	Units
LAB pH	7.1	6.9	7.3	6.97	7.14	s. u.
LAB CONDUCTIVITY @ 25 C	5,640	6,230	12,800	8,330	3,780	umhos / cm
TOTAL DISSOLVED SOLIDS @ 180 C	4,660	5,120	13,000	4,150	1,888	mg / L
TOTAL DISSOLVED SOLIDS (Calc)	4,510	4,790	9,190	4,119	1,870	mg / L
SODIUM ABSORPTION RATIO				9.3	0.3	ratio
TOTAL ALKALINITY AS CaCO3	549	1,240	1,150	528	530	mg / L
TOTAL HARDNESS AS CaCO3	2,020	2,040	2,030	1,350	1,632	mg / L
BICARBONATE as HCO3	549	1,240	1,150	528	530	mg / L
CARBONATE AS CO3	NA	NA	NA	< 1	< 1	mg / L
HYDROXIDE AS OH	NA	NA	NA	< 1	< 1	mg / L
NITRATE NITROGEN	NA	NA	NA	< 0.1	4.0	mg / L
NITRITE NITROGEN	NA	NA	NA	< 0.001	0.305	mg / L
CHLORIDE	35.0	175	430	22.9	848	mg / L
FLUORIDE	NA	NA	NA	2.40	1.50	mg / L
PHOSPHATE	NA	NA	NA	1.7	< 0.1	mg / L
SULFATE	2,780	2,380	5,180	2,480	48.9	mg / L
IRON	NA	NA	NA	NA	NA	mg / L
CALCIUM	769	615	494	438	560	mg / L
MAGNESIUM	24.6	122	193	62.0	56.6	mg / L
POTASSIUM	12.0	19.0	13.0	6.2	5.4	mg / L
SODIUM	560	730	2,200	785	23.8	mg / L
CATION / ANION DIFFERENCE	3.57	4.26	2.28	0.25	0.01	%

FIGURE 1



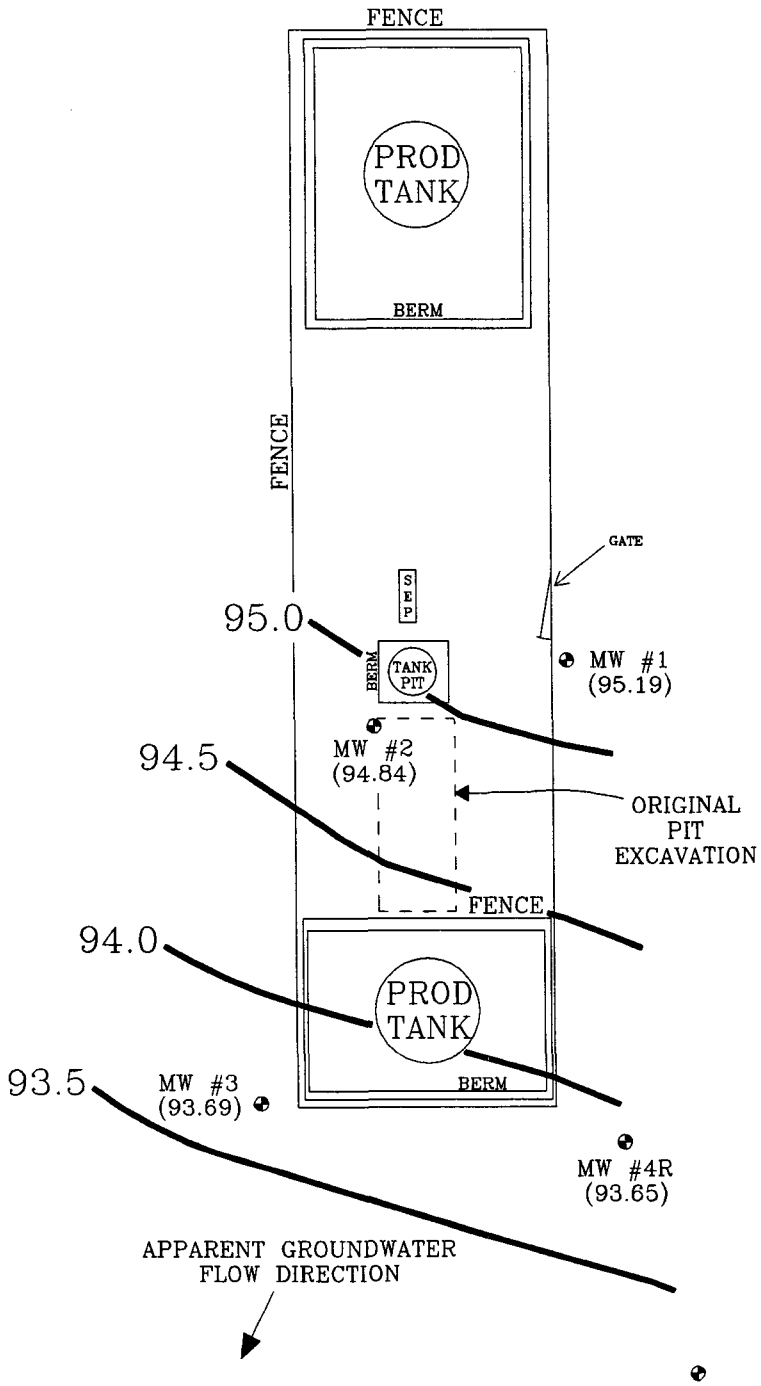
MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND ARE NOT TO SCALE.

ONE INCH = 50 FEET

0 50 100 FT.

AMOCO PRODUCTION COMPANY STATE GC BS 1 NE/4 NW/4 SEC. 23, T29N, R11W 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: 1/4ly Monitor. DRAWN BY: NJV FILENAME: 05-13-SM.SKD REVISED: 2/02/00 NJV	SITE MAP 05/99

FIGURE 2
(2nd 1/4, 1999)



Top of Well Elevation	
MW #1	(100.96)
MW #2	(100.99)
MW #3	(100.09)
MW #4R	(98.52)
MW #5R	(100.93)

◕ MW #1 (95.19) Groundwater Elevation as of 5/13/99.

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 ARE NOT TO SCALE.

ONE INCH = 50 FEET

0 50 100 FT.

AMOCO PRODUCTION COMPANY

STATE GC BS 1

NE/4 NW/4 SEC. 23, T29N, R11W

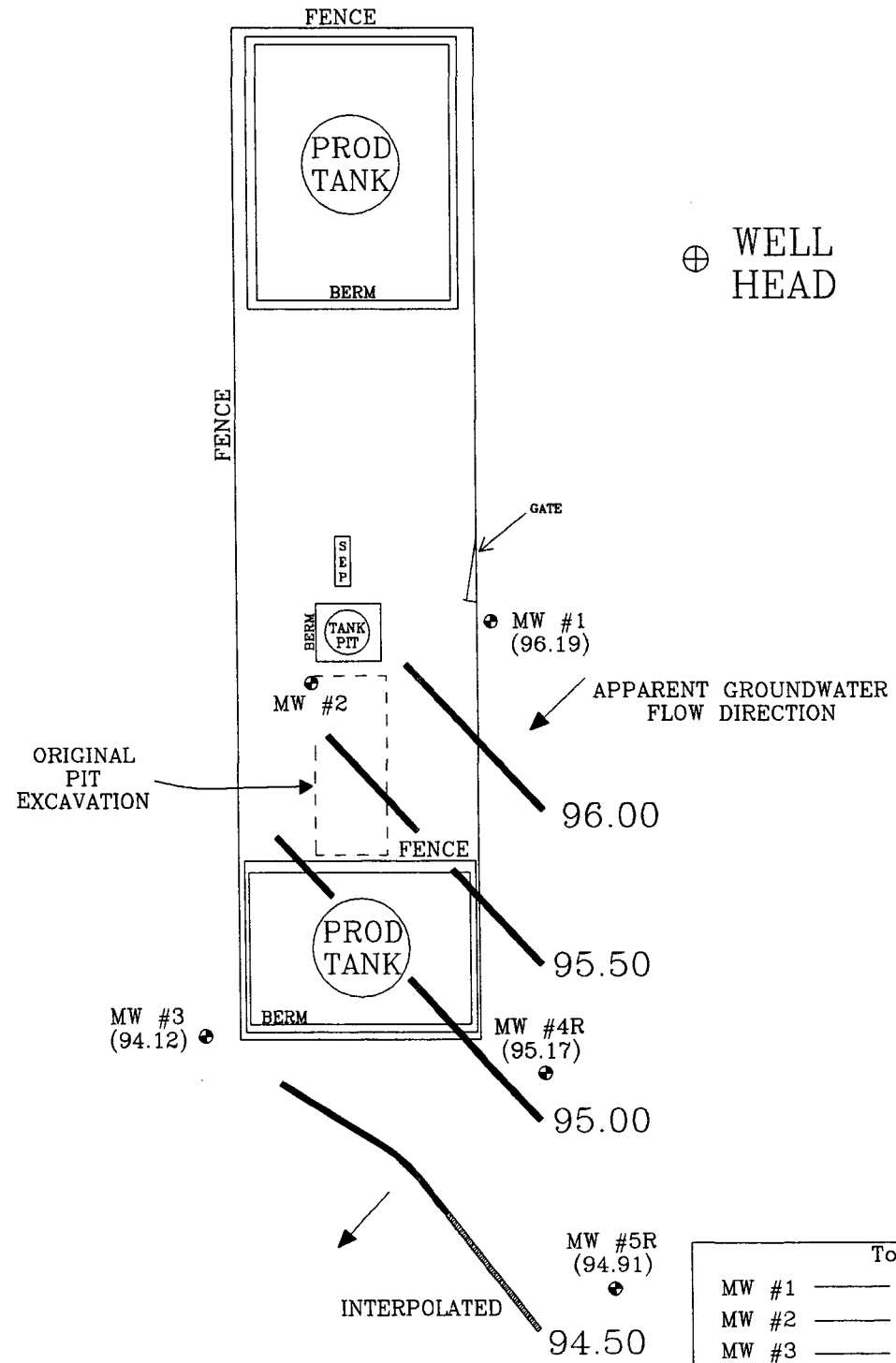
SAN JUAN COUNTY, NEW MEXICO

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

PROJECT: 1/4ly Monitor.
DRAWN BY: NJV
FILENAME: 05-13-GW.SKD
REVISED: 06/15/99 NJV

GROUNDWATER GRADIENT MAP
05/99

FIGURE 3
(3rd 1/4, 1999)



Top of Well Elevation	
MW #1	(100.96)
MW #2	(100.99)
MW #3	(100.09)
MW #4R	(98.52)
MW #5R	(100.93)

MW #1 (96.19) Groundwater Elevation as of 8/25/99.

ONE INCH = 50 FEET

0 50 100 FT.

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 ARE NOT TO SCALE.

AMOCO PRODUCTION COMPANY

STATE GC BS 1

NE/4 NW/4 SEC. 23, T29N, R11W

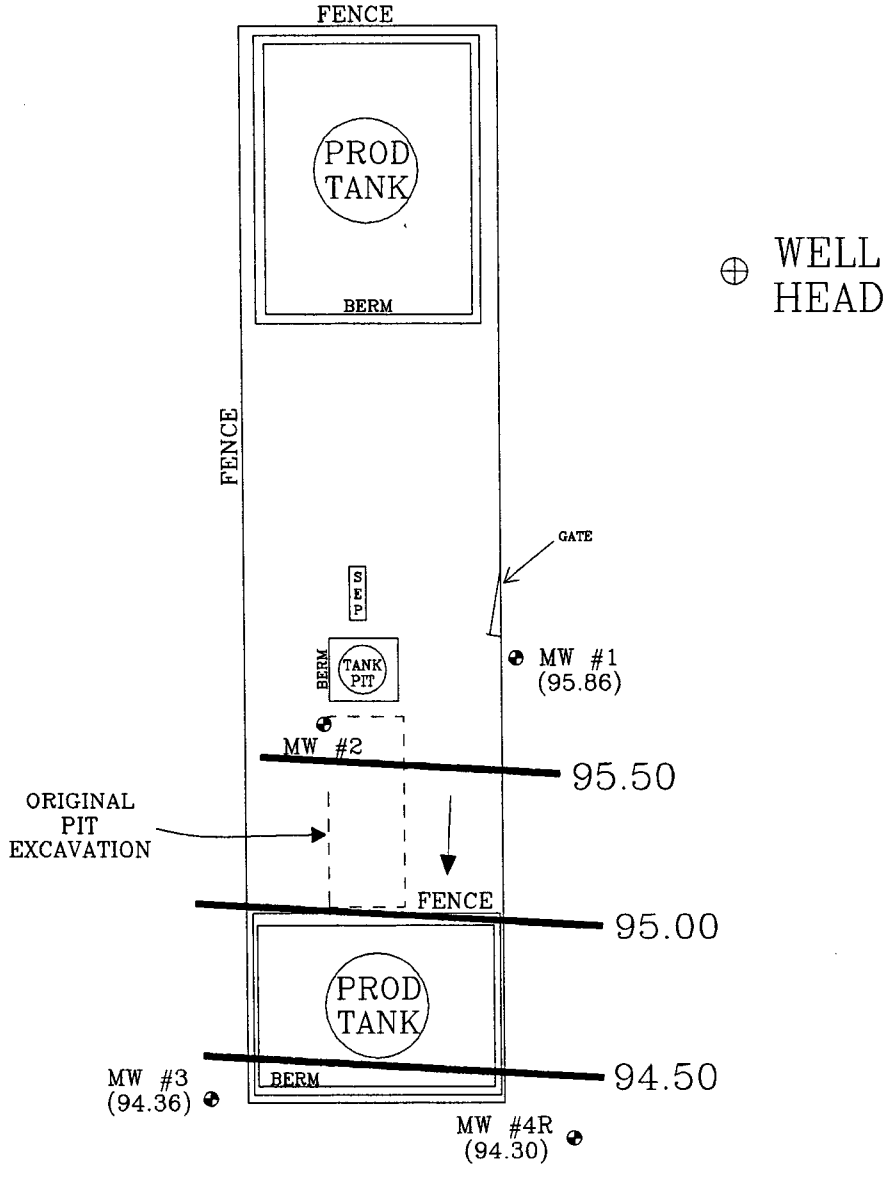
SAN JUAN COUNTY, NEW MEXICO

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

PROJECT: 1/4ly Monitor.
DRAWN BY: NJV
FILENAME: 08-25-GW.SKD
REVISED: 12/03/99 NJV

GROUNDWATER GRADIENT MAP 08/99

FIGURE 4
(4th 1/4, 1999)



⊕ WELL HEAD

Top of Well Elevation	
MW #1	(100.96)
MW #2	(100.99)
MW #3	(100.09)
MW #4R	(98.52)
MW #5R	(100.93)

◕ MW #1 (95.86) Groundwater Elevation as of 11/3/99.

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 ARE NOT TO SCALE.

ONE INCH = 50 FEET

0 50 100 FT.

AMOCO PRODUCTION COMPANY

STATE GC BS 1

NE/4 NW/4 SEC. 23, T29N, R11W

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: 1/4ly Monitor.
DRAWN BY: NJV
FILENAME: 11-30-GW.SKD
REVISED: 12/03/99 NJV

GROUNDWATER GRADIENT MAP
11/99

BLAGG ENGINEERING, INC.

MONITOR WELL SAMPLING DATA

CLIENT : CROSS TIMBERS OIL CO.

CHAIN-OF-CUSTODY # : 6663

STATE GC BS # 1 - SEPARATOR PIT
UNIT K, SEC. 23, T29N, R11W

LABORATORY (S) USED : ENVIROTECH, INC.

Date : May 13, 1999

Filename : 05-13-99.WK4

SAMPLER : N J V

PROJECT MANAGER : N J V

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING TIME	pH	CONDUCT (umhos)	VOLUME PURGED (gal.)	FREE PRODUCT (ft)
1	100.96	95.19	5.77	8.43	1400	-	-	1.50	-
2	100.99	94.84	6.15	8.42	1430	-	-	1.25	-
3	100.09	93.69	6.40	8.62	1500	-	-	1.25	-
4R	98.52	93.65	4.87	10.00	1530	-	-	2.50	-
5R	100.93	93.28	7.65	10.00	1600	-	-	1.25	-

NOTES : Volume of water purged from well prior to sampling: V = pi X r2 X h X 7.48 gal./ft3) X 3 (wellbores).

(i.e. 2" MW r = (1/12) ft. h = 1 ft.) (i.e. 4" MW r = (2/12) ft. h = 1 ft.)

Ideally a minimum of three (3) wellbore volumes:

1.25 " well diameter = 0.19 gallons per foot of water (or 24 oz.).

2 bails per foot - small teflon bailer.

3 bails per foot - 3 / 4 " teflon bailer.

2.00 " well diameter = 0.49 gallons per foot of water.

4.00 " well diameter = 1.95 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

Poor recovery for MW # 1, 2, & 3 . Collected BTEX sample for MW # 4R only . Collected anion / cation samples for MW #'s listed above .

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW #4R	Date Reported:	05-15-99
Chain of Custody:	6663	Date Sampled:	05-13-99
Laboratory Number:	F246	Date Received:	05-14-99
Sample Matrix:	Water	Date Analyzed:	05-14-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**3.9**	**1**	**0.2**
Toluene	**4.5**	**1**	**0.2**
Ethylbenzene	**2.9**	**1**	**0.2**
p,m-Xylene	**7.7**	**1**	**0.2**
o-Xylene	**0.6**	**1**	**0.1**
Total BTEX	**19.6**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**100 %**
	Bromofluorobenzene	**100 %**

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **State GC BS #1.**

Analyst

Review

5796 U.S. Highway 64 • Farmington, NM 87401 • Tel 505 • 632 • 0615 • Fax 505 • 632 • 1865

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW #2	Date Reported:	05-16-99
Laboratory Number:	F244	Date Sampled:	05-13-99
Chain of Custody:	6663	Date Received:	05-14-99
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	05-14-99
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		Units
pH	**7.58**	s.u.		
Conductivity @ 25° C	**9,740**	umhos/cm		
Total Dissolved Solids @ 180C	**4,860**	mg/L		
Total Dissolved Solids (Calc)	**4,841**	mg/L		
SAR	**12.2**	ratio		
Total Alkalinity as CaCO3	**568**	mg/L		
Total Hardness as CaCO3	**1,325**	mg/L		
Bicarbonate as HCO3	**568**	mg/L	9.31	meq/L
Carbonate as CO3	**<1**	mg/L	0.00	meq/L
Hydroxide as OH	**<1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**<0.1**	mg/L	0.00	meq/L
Nitrite Nitrogen	**0.015**	mg/L	0.00	meq/L
Chloride	**50.0**	mg/L	1.41	meq/L
Fluoride	**1.52**	mg/L	0.08	meq/L
Phosphate	**0.2**	mg/L	0.01	meq/L
Sulfate	**2,910**	mg/L	60.59	meq/L
Iron	**0.038**	mg/L		
Calcium	**446**	mg/L	22.26	meq/L
Magnesium	**51.3**	mg/L	4.22	meq/L
Potassium	**17.5**	mg/L	0.45	meq/L
Sodium	**1,020**	mg/L	44.37	meq/L
Cations			71.29	meq/L
Anions			71.39	meq/L
Cation/Anion Difference			**0.14%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983. Water And Waste Water", 18th ed., 1992.

Comments: **State GC BS #1.**

Analyst

Review

5796 U.S. Highway 64 • Farmington, NM 87401 • Tel 505 • 632 • 0615 • Fax 505 • 632 • 1865

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW #3	Date Reported:	05-16-99
Laboratory Number:	F245	Date Sampled:	05-13-99
Chain of Custody:	6663	Date Received:	05-14-99
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	05-14-99
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		Units
pH	**7.50**	s.u.		
Conductivity @ 25° C	**16,200**	umhos/cm		
Total Dissolved Solids @ 180C	**8,050**	mg/L		
Total Dissolved Solids (Calc)	**8,004**	mg/L		
SAR	**25.2**	ratio		
Total Alkalinity as CaCO3	**876**	mg/L		
Total Hardness as CaCO3	**1,295**	mg/L		
Bicarbonate as HCO3	**876**	mg/L	14.36	meq/L
Carbonate as CO3	**<1**	mg/L	0.00	meq/L
Hydroxide as OH	**<1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**<0.1**	mg/L	0.00	meq/L
Nitrite Nitrogen	**0.007**	mg/L	0.00	meq/L
Chloride	**56.5**	mg/L	1.59	meq/L
Fluoride	**1.69**	mg/L	0.09	meq/L
Phosphate	**0.1**	mg/L	0.00	meq/L
Sulfate	**4,840**	mg/L	100.77	meq/L
Iron	**0.029**	mg/L		
Calcium	**428**	mg/L	21.36	meq/L
Magnesium	**55.0**	mg/L	4.53	meq/L
Potassium	**11.0**	mg/L	0.28	meq/L
Sodium	**2,080**	mg/L	90.48	meq/L
Cations			116.64	meq/L
Anions			116.81	meq/L
Cation/Anion Difference			**0.14%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983. Water And Waste Water", 18th ed., 1992.

Comments: **State GC BS #1.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW #4R	Date Reported:	05-16-99
Laboratory Number:	F246	Date Sampled:	05-13-99
Chain of Custody:	6663	Date Received:	05-14-99
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	05-14-99
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		Units
pH	**7.32**	s.u.		
Conductivity @ 25° C	**9,450**	umhos/cm		
Total Dissolved Solids @ 180C	**4,700**	mg/L		
Total Dissolved Solids (Calc)	**4,669**	mg/L		
SAR	**11.1**	ratio		
Total Alkalinity as CaCO3	**316**	mg/L		
Total Hardness as CaCO3	**1,350**	mg/L		
Bicarbonate as HCO3	**316**	mg/L	5.18	meq/L
Carbonate as CO3	**<1**	mg/L	0.00	meq/L
Hydroxide as OH	**<1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**0.7**	mg/L	0.01	meq/L
Nitrite Nitrogen	**0.024**	mg/L	0.00	meq/L
Chloride	**17.0**	mg/L	0.48	meq/L
Fluoride	**1.31**	mg/L	0.07	meq/L
Phosphate	**<0.1**	mg/L	0.00	meq/L
Sulfate	**2,990**	mg/L	62.25	meq/L
Iron	**0.207**	mg/L		
Calcium	**494**	mg/L	24.65	meq/L
Magnesium	**28.1**	mg/L	2.31	meq/L
Potassium	**6.0**	mg/L	0.15	meq/L
Sodium	**940**	mg/L	40.89	meq/L
Cations			68.01	meq/L
Anions			67.99	meq/L
Cation/Anion Difference			**0.02%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983. Water And Waste Water", 18th ed., 1992.

Comments: **State GC BS #1.**

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW #5R	Date Reported:	05-16-99
Laboratory Number:	F247	Date Sampled:	05-13-99
Chain of Custody:	6663	Date Received:	05-14-99
Sample Matrix:	Water	Date Extracted:	N/A
Preservative:	Cool	Date Analyzed:	05-14-99
Condition:	Cool & Intact		

Parameter	Analytical Result	Units		Units
pH	**7.31**	s.u.		
Conductivity @ 25° C	**9,600**	umhos/cm		
Total Dissolved Solids @ 180C	**4,790**	mg/L		
Total Dissolved Solids (Calc)	**4,755**	mg/L		
SAR	**11.7**	ratio		
Total Alkalinity as CaCO3	**332**	mg/L		
Total Hardness as CaCO3	**1,320**	mg/L		
Bicarbonate as HCO3	**332**	mg/L	5.44	meq/L
Carbonate as CO3	**<1**	mg/L	0.00	meq/L
Hydroxide as OH	**<1**	mg/L	0.00	meq/L
Nitrate Nitrogen	**3.1**	mg/L	0.05	meq/L
Nitrite Nitrogen	**0.094**	mg/L	0.00	meq/L
Chloride	**13.5**	mg/L	0.38	meq/L
Fluoride	**1.26**	mg/L	0.07	meq/L
Phosphate	**<0.1**	mg/L	0.00	meq/L
Sulfate	**3,040**	mg/L	63.29	meq/L
Iron	**0.001**	mg/L		
Calcium	**480**	mg/L	23.95	meq/L
Magnesium	**29.3**	mg/L	2.41	meq/L
Potassium	**6.0**	mg/L	0.15	meq/L
Sodium	**980**	mg/L	42.63	meq/L
Cations			69.15	meq/L
Anions			69.23	meq/L
Cation/Anion Difference			**0.13%**	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983. Water And Waste Water", 18th ed., 1992.

Comments: **State GC BS #1.**

Analyst

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CHAIN OF CUSTODY RECORD

6663

Client / Project Name	Project Location
BLAGG / CROSS TIMBERS	STATE GC B5 #1

Sampler:	Client No.
NJV	403410

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	ANION/CATION	BTEX (8021)					Remarks
												ANION/CATION SAMPLES PRESERV. - COOL
MW #1	5/13/99		F243	WATER	1	✓						
MW #2	5/13/99		F244	WATER	1	✓						
MW #3	5/13/99		F245	WATER	1	✓						
MW #4R	5/13/99		F246	WATER	3	✓	✓					BTEX - PRESERV. HgCl2 & COOL
MW #5R	5/13/99		F247	WATER	1	✓						

ANALYSIS / PARAMETERS

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Mehon Vel	5/13/99	1620	J. C. Blagg	5/13/99	1620
J. C. Blagg	5/14/99	0718	Allen P. Cheek	5.14.99	0718
Relinquished by: (Signature)			Received by: (Signature)		

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Sample Receipt	Y	N	N/A
Received Intact	✓		
Cool - Ice/Blue Ice	✓		

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	N/A	Project #:	N/A
Sample ID:	05-14-BTEX QA/QC	Date Reported:	05-14-99
Laboratory Number:	F237	Date Sampled:	N/A
Sample Matrix:	Soil	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	05-14-99
Condition:	N/A	Analysis:	BTEX

Calibration and Detection Limits (ug/L)	I-Cal RF:	C-Cal RF:	%Diff. Accept. Range 0 - 15%	Blank Conc	Detect. Limit
Benzene	4.5104E-002	4.5212E-002	0.2%	ND	0.2
Toluene	2.2820E-002	2.2861E-002	0.2%	ND	0.2
Ethylbenzene	3.1405E-002	3.1471E-002	0.2%	ND	0.2
p,m-Xylene	3.1037E-002	3.1115E-002	0.3%	ND	0.2
o-Xylene	2.9125E-002	2.9175E-002	0.2%	ND	0.1

Duplicate Conc. (ug/Kg)	Sample	Duplicate	%Diff.	Accept Range	Detect. Limit
Benzene	128	128	0.0%	0 - 30%	8.8
Toluene	1,500	1,500	0.0%	0 - 30%	8.4
Ethylbenzene	650	649	0.1%	0 - 30%	7.6
p,m-Xylene	5,340	5,340	0.0%	0 - 30%	10.8
o-Xylene	1,910	1,930	1.0%	0 - 30%	5.2

Spike Conc. (ug/Kg)	Sample	Amount Spiked	Spiked Sample	% Recovery	Accept Range
Benzene	128	50.0	177	100%	39 - 150
Toluene	1,500	50.0	1,550	100%	46 - 148
Ethylbenzene	650	50.0	698	100%	32 - 160
p,m-Xylene	5,340	100.0	5,430	100%	46 - 148
o-Xylene	1,910	50.0	1,960	100%	46 - 148

ND - Parameter not detected at the stated detection limit.

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.
Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **QA/QC for samples F237 - F238, F241 and F246.**

Analyst

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BLAGG ENGINEERING, INC.

MONITOR WELL SAMPLING DATA

CLIENT : CROSS TIMBERS OIL CO.

CHAIN-OF-CUSTODY # : 6702

STATE GC BS # 1 - SEPARATOR PIT
UNIT K, SEC. 23, T29N, R11W

LABORATORY (S) USED : ENVIROTECH, INC.

Date : *August 25, 1999*

Filename : *08-25-99.WK4*

SAMPLER : N J V

PROJECT MANAGER : N J V

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING TIME	pH	CONDUCT (umhos)	VOLUME PURGED (gal.)	FREE PRODUCT (ft)
1	100.96	96.19	4.77	8.43	-	-	-	-	-
2			-	8.42	-	-	-	-	-
3	100.09	94.12	5.97	8.62	-	-	-	-	-
4R	98.52	95.17	3.35	10.00	1330	7.0	3,200	3.25	-
5R	100.93	94.91	6.02	10.00	-	-	-	-	-

NOTES : Volume of water purged from well prior to sampling: V = pi X r2 X h X 7.48 gal./ft3) X 3 (wellbores).

(i.e. 2" MW r = (1/12) ft. h = 1 ft.) (i.e. 4" MW r = (2/12) ft. h = 1 ft.)

Ideally a minimum of three (3) wellbore volumes:

1.25 " well diameter = 0.19 gallons per foot of water (or 24 oz.).

2 bails per foot - small teflon bailer.

3 bails per foot - 3 / 4 " teflon bailer.

2.00 " well diameter = 0.49 gallons per foot of water.

4.00 " well diameter = 1.95 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

Collected BTEX sample for MW # 4R only.

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW # 4 R	Date Reported:	08-27-99
Chain of Custody:	6702	Date Sampled:	08-25-99
Laboratory Number:	G002	Date Received:	08-26-99
Sample Matrix:	Water	Date Analyzed:	08-26-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**8.6**	**1**	**0.2**
Toluene	**2.0**	**1**	**0.2**
Ethylbenzene	**0.5**	**1**	**0.2**
p,m-Xylene	**1.4**	**1**	**0.2**
o-Xylene	**1.2**	**1**	**0.1**
Total Xylene	**2.6**		
Total BTEX	**13.7**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**96 %**
	Bromofluorobenzene	**96 %**

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **State GC BS # 1.**

Analyst

Review

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CHAIN OF CUSTODY RECORD

Client / Project Name	Project Location	ANALYSIS / PARAMETERS
BLAGG/CROSS TIMBERS	STATE GC B5 #1	
Sampler: NJV	Client No. 403410	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX (8021)						Remarks
MW #4R	8/25/99	1330	G002	WATER	2	✓						PRESERV. - $HgCl_2$ & COOL

	Date	Time		Date	Time
Relinquished by: (Signature) Nelson Velez	8/26/99	0714	Received by: (Signature) Adrian P. Espinoza	8.26.99	0714
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

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Sample Receipt	Y	N	N/A
Received Intact	✓		
Cool - Ice/Blue Ice	✓		

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	N/A	Project #:	N/A
Sample ID:	08-26-PM-BTEX QA/QC	Date Reported:	08-27-99
Laboratory Number:	F994	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	08-26-99
Condition:	N/A	Analysis:	BTEX

Calibration and Detection Limits (ug/L)	I-Cal RF:	C-Cal RF:	%Diff. Accept. Range 0 - 15%	Blank Conc	Detect. Limit
Benzene	3.6219E-001	3.6335E-001	0.32%	ND	0.2
Toluene	2.7867E-002	2.7872E-002	0.02%	ND	0.2
Ethylbenzene	4.1931E-002	4.1981E-002	0.12%	ND	0.2
p,m-Xylene	3.6569E-002	3.6576E-002	0.02%	ND	0.2
o-Xylene	3.1955E-002	3.2051E-002	0.30%	ND	0.1

Duplicate Conc. (ug/L)	Sample	Duplicate	%Diff.	Accept Limit
Benzene	1.5	1.4	6.7%	0 - 30%
Toluene	2.1	2.0	4.8%	0 - 30%
Ethylbenzene	0.2	0.2	0.0%	0 - 30%
p,m-Xylene	2.8	2.8	0.0%	0 - 30%
o-Xylene	0.7	0.7	0.0%	0 - 30%

Spike Conc. (ug/L)	Sample	Amount Spiked	Spiked Sample	% Recovery	Accept Limits
Benzene	1.5	50.0	51.5	100%	39 - 150
Toluene	2.1	50.0	52.1	100%	46 - 148
Ethylbenzene	0.2	50.0	50.2	100%	32 - 160
p,m-Xylene	2.8	100.0	103	100%	46 - 148
o-Xylene	0.7	50.0	50.7	100%	46 - 148

ND - Parameter not detected at the stated detection limit.

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.
Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **QA/QC for samples F994 - F998 and G000 - G004.**

Analyst

Review

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BLAGG ENGINEERING, INC.

MONITOR WELL SAMPLING DATA

CLIENT : CROSS TIMBERS OIL CO.

CHAIN-OF-CUSTODY # : 7446

STATE GC BS # 1 - SEPARATOR PIT
UNIT K, SEC. 23, T29N, R11W

LABORATORY (S) USED : ENVIROTECH, INC.

Date : November 30, 1999

Filename : 11-30-99.WK4

SAMPLER : N J V

PROJECT MANAGER : N J V

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING TIME	pH	CONDUCT (umhos)	VOLUME PURGED (gal.)	FREE PRODUCT (ft)
1	100.96	95.86	5.10	8.43	-	-	-	-	-
2			-	8.42	-	-	-	-	-
3	100.09	94.36	5.73	8.62	-	-	-	-	-
4R	98.52	94.30	4.22	10.00	1340	7.1	3,300	3.00	-
5R	100.93	93.89	7.04	10.00	-	-	-	-	-

NOTES : Volume of water purged from well prior to sampling: V = pi X r2 X h X 7.48 gal./ft3) X 3 (wellbores).

(i.e. 2" MW r = (1/12) ft. h = 1 ft.) (i.e. 4" MW r = (2/12) ft. h = 1 ft.)

Ideally a minimum of three (3) wellbore volumes:

1.25 " well diameter = 0.19 gallons per foot of water (or 24 oz.).

2 bails per foot - small teflon bailer.

3 bails per foot - 3 / 4 " teflon bailer.

2.00 " well diameter = 0.49 gallons per foot of water.

4.00 " well diameter = 1.95 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

Collected BTEX sample for MW # 4R only .

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW # 4R	Date Reported:	12-01-99
Chain of Custody:	7446	Date Sampled:	11-30-99
Laboratory Number:	G517	Date Received:	11-30-99
Sample Matrix:	Water	Date Analyzed:	12-01-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**10.5**	**1**	**0.2**
Toluene	**0.8**	**1**	**0.2**
Ethylbenzene	**7.5**	**1**	**0.2**
p,m-Xylene	**5.2**	**1**	**0.2**
o-Xylene	**3.0**	**1**	**0.1**
Total Xylene	**8.2**		
Total BTEX	**27.0**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**96 %**
	Bromofluorobenzene	**96 %**

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **State GC BS # 1.**

Analyst

Review

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CHAIN OF CUSTODY RECORD

7446

Client / Project Name	Project Location	ANALYSIS / PARAMETERS
BLAGG/CROSS TIMBERS	STATE GC B5 #1	
Sampler: NJV	Client No. 403410	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX (8021)						Remarks
MW #4R	11/30/99	1340	G517	WATER	2	✓						PRESERV. - $HgCl_2$ & COOL

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Nelson Velez	11/30/99	1355	Dawn L. Applewhite	11.30.99	1355
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.

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Sample Receipt	Y	N	N/A
Received Intact	✓		
Cool - Ice/Blue Ice	✓		

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	N/A	Project #:	N/A
Sample ID:	12-01-BTEX QA/QC	Date Reported:	12-01-99
Laboratory Number:	G512	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	12-01-99
Condition:	N/A	Analysis:	BTEX

Calibration and Detection Limits (ug/L)	I-Cal RF:	C-Cal RF:	%Diff. Accept. Range 0 - 15%	Blank Conc	Detect. Limit
Benzene	1.5148E-001	1.5197E-001	0.32%	ND	0.2
Toluene	1.3889E-001	1.3892E-001	0.02%	ND	0.2
Ethylbenzene	4.5310E-002	4.5364E-002	0.12%	ND	0.2
p,m-Xylene	1.6102E-002	1.6105E-002	0.02%	ND	0.2
o-Xylene	1.5199E-002	1.5244E-002	0.30%	ND	0.1

Duplicate Conc. (ug/L)	Sample	Duplicate	%Diff.	Accept Limit
Benzene	8.7	8.8	1.1%	0 - 30%
Toluene	7.6	7.9	3.9%	0 - 30%
Ethylbenzene	ND	ND	0.0%	0 - 30%
p,m-Xylene	7.6	7.9	3.9%	0 - 30%
o-Xylene	1.3	1.3	0.0%	0 - 30%

Spike Conc. (ug/L)	Sample	Amount Spiked	Spiked Sample	% Recovery	Accept Limits
Benzene	8.7	50.0	58.7	100%	39 - 150
Toluene	7.6	50.0	57.6	100%	46 - 148
Ethylbenzene	ND	50.0	50.0	100%	32 - 160
p,m-Xylene	7.6	100.0	108	100%	46 - 148
o-Xylene	1.3	50.0	51.3	100%	46 - 148

ND - Parameter not detected at the stated detection limit.

* - Administrative level set at 80 - 120.

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.
Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **QA/QC for samples G512 - G517.**

Analyst

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

April 21, 1999

CERTIFIED MAIL
RETURN RECEIPT NO: Z-274-520-641

Ms. Nina Hutton
Cross Timbers Oil Company
810 Houston St., Suite 2000
Fort Worth, Texas 76102-6298

RE: SAN JUAN BASIN GROUND WATER MONITORING REPORTS

Dear Ms. Hutton:

The New Mexico Oil Conservation Division (OCD) has reviewed Cross Timbers Oil Company's (CTOC) February 11, 1999 "CROSS TIMBERS OIL CO. GROUNDWATER MONITORING (AMOCO) 1996-1998 REPORTS, SAN JUAN COUNTY, NEW MEXICO" which was submitted on behalf of CTOC by their consultant Blagg Engineering, Inc. This document contains the results of CTOC's investigation, remediation and monitoring of ground water contamination related to the disposal of oilfield wastes in unlined pits at 7 sites in the San Juan Basin.

Based upon a review of the above referenced documents, the OCD has the following comments and requirements:

1. The downgradient and/or lateral extent of chloride and/or total dissolved solids contamination at the sites listed below has not been completely defined. The OCD requires that CTOC completely define the extent of these contaminants at each site pursuant to the previously approved ground water management plan for these sites.

   - Bergin GC #1E — Unit F, Sec. 21, T29N, R11W
   - Rowland GC #1 — Unit P, Sec. 25, T30N, R12W
   - State GC BS #1 — Unit F, Sec. 21, T29N, R11W
   - Sullivan GC D#1 — Unit B, Sec. 26, T29N, R11W

2. The downgradient and/or lateral extent of benzene, toluene, ethylbenzene, xylene (BTEX), chloride and/or total dissolved solids contamination at the sites listed below has not been completely defined. The OCD requires that CTOC completely define the extent of these contaminants at each site pursuant to the previously approved ground water management plan for these sites.

   - Bruington GC #1 — Unit E, Sec. 14, T29N, R11W
   - Valdez A #1E — Unit G, Sec. 24, T29N, R11W

3. A review of the sampling data shows that during some samplings only ground water from the monitor wells at the source is sampled and there is no downgradient monitoring to show that contaminated ground water is contained. In order to effectively monitor contaminant migration, the OCD requires that the ground water monitoring plan be modified to include additional ground water sampling of all monitor wells at each site on an annual basis. During the annual sampling event ground water from all monitor wells will be sampled and analyzed for BTEX, TDS, polynuclear aromatic hydrocarbons (PAH) and New Mexico Water Quality Control Commission (WQCC) cations and anions and metals using EPA approved methods and quality assurance/quality control procedures. Specific analytes may be dropped from the annual sampling event for certain sites if that analyte has not been found to be above WQCC standard in the sites source areas and the reasons for dropping those analytes are included in the annual reports. This sampling requirement will also be added to the ground water monitoring plan for all future ground water sampling at all CTOC sites with contaminated ground water.

4. CTOC recently purchased a number of well sites in the San Juan Basin from Amoco. Some of these sites were found to have ground water contamination which was discovered by Amoco during pit closure activities. The OCD does not have a listing of status of these sites. Please provide the OCD with a listing of all CTOC well sites in the San Juan Basin at which the presence of ground water was discovered during pit assessment or closure activities and the status of each site.

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

Sincerely,

William C. Olson
Hydrologist
Environmental Bureau

xc: Denny Foust, OCD Aztec District Office
Nelson Velez, Blagg Engineering, Inc.