

3R - 379

REPORTS

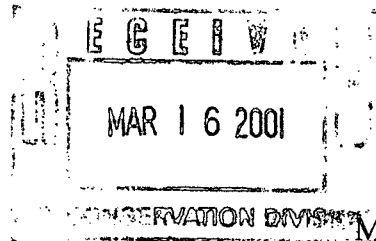
DATE:

MAR 13, 2001

BLAGG ENGINEERING, INC.

P.O. Box 87, Bloomfield, New Mexico 87413

Phone: (505)632-1199 Fax: (505)632-3903



Mr. William C. Olson, Hydrologist
New Mexico Oil Conservation Division-NMOCD
Environmental Bureau
1220 St. Francis Drive
Santa Fe, New Mexico 87505

**Re: BP Amoco (formerly Amoco Production Company)
Groundwater Monitoring Report
Gallegos Canyon Unit (GCU) Com H # 180, Unit J, Sec. 28, T29N, R12W, NMPM
San Juan County, New Mexico**

Dear Mr. Olson:

BP Amoco has retained Blagg Engineering, Inc. (BEI) to conduct environmental monitoring of groundwater at the GCU Com H # 180.

The last BEI correspondence concerning the above reference well site was a letter dated, September 3, 1996. Historical BTEX (benzene, toluene, ethylbenzene, and total xylenes) laboratory results for the site was summarized along with numerous other well site data as an attachment to the letter. Since June, 1996, BP Amoco has followed its NMOCD approved groundwater work plan and continues groundwater monitoring on an annual basis. No permanent closure is requested at this time.

If you have any questions concerning the enclosed documentation, please contact either myself or Jeffrey C. Blagg at the address or phone number listed above. Thank you for your cooperation and assistance.

Respectfully submitted:
Blagg Engineering, Inc.

Nelson J. Velez
Staff Geologist

Attachment: Groundwater Report

cc: Mr. Denny Foust, Environmental Geologist, NMOCD District III Office, Aztec, NM
Mr. Buddy Shaw, Environmental Coordinator, BP Amoco, Farmington, NM (without lab reports)

NJV/njv

GCU180.CVL.WPD

BP Amoco - GCU Com H # 180 - Separator Pit Nw/4 Se/4 Sec. 28, T29N, R12W

Site Assessment Date: 4/29/92 (Documentation Included)

Monitor Well Installation Date: 1/93, 6/17/97 (MW #4), 6/9/00 (MW #1R)

Monitor Well Sampling Dates: (See following summary table)

Groundwater Monitor Well Sampling Procedures:

Groundwater samples were collected from site monitor wells (*Figure 1*) 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 8020 or 8021. The samples were preserved cool and with either mercuric chloride or hydrochloric acid 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 and Flow Direction Information:

The BTEX results for the 1996 through 2000 sampling events are summarized in the following table. Since June, 1996, BP Amoco has followed its NMOCD approved groundwater work plan, dated October 2, 1996, and continues annual groundwater monitoring at the site.

MW #'s 2 and 3 BTEX data demonstrate levels below 25% of the New Mexico Water Quality Control Commission's (NMWQCC) groundwater allowable concentrations in all thirteen (13) sampling events between January, 1993 and June, 1996 [except benzene in MW #3- June, 1994 (4.8 ppb) and December, 1994 (6.9 ppb)]. MW #4 BTEX data from the June 23, 1997 sampling event also categorized as above and sampling was terminated until future information suggest otherwise. Benzene within MW # 1 has exceeded NMWQCC standards since January, 1993, but has also been decreasing up to the present. The total xylenes from MW #1 has been fluctuating above and below the NMWQCC standard since January, 1993. During two (2) sampling events, dated December 16, 1994 and March 15, 1995, MW #1 had all BTEX constituents below NMWQCC standards. However, based on the previous and subsequent sampling events, it appears highly unlikely that those values truly reflective the hydrocarbon contamination that probably existed in that monitor well.

Based on the enclosed site monitor well information, groundwater flow has been determined to be in the southwest direction. The groundwater gradient maps are displayed on *Figures 2 through Figure 4*.

Summary and/or Recommendations:

Based on the aforementioned and enclosed documentation, the soil and groundwater contamination at the separator pit area (MW #1) continues to exceed NMWQCC regulatory standards. However, since the initiation of monitoring MW #1, the trend of the BTEX levels has continued to decrease over time, suggesting that the soil and groundwater hydrocarbon contamination may be remediating by natural attenuation. Therefore, it is suggested to continue annual monitoring of MW #1 to evaluate the decreasing trend observed in the BTEX values.

All aspects of the BP Amoco's groundwater work plan dated October 22, 1996 and approved by NMOCD with lettered dated February 7, 1997, has been adhered to.

AMOCO GROUNDWATER MONITOR WELL LABORATORY RESULTS

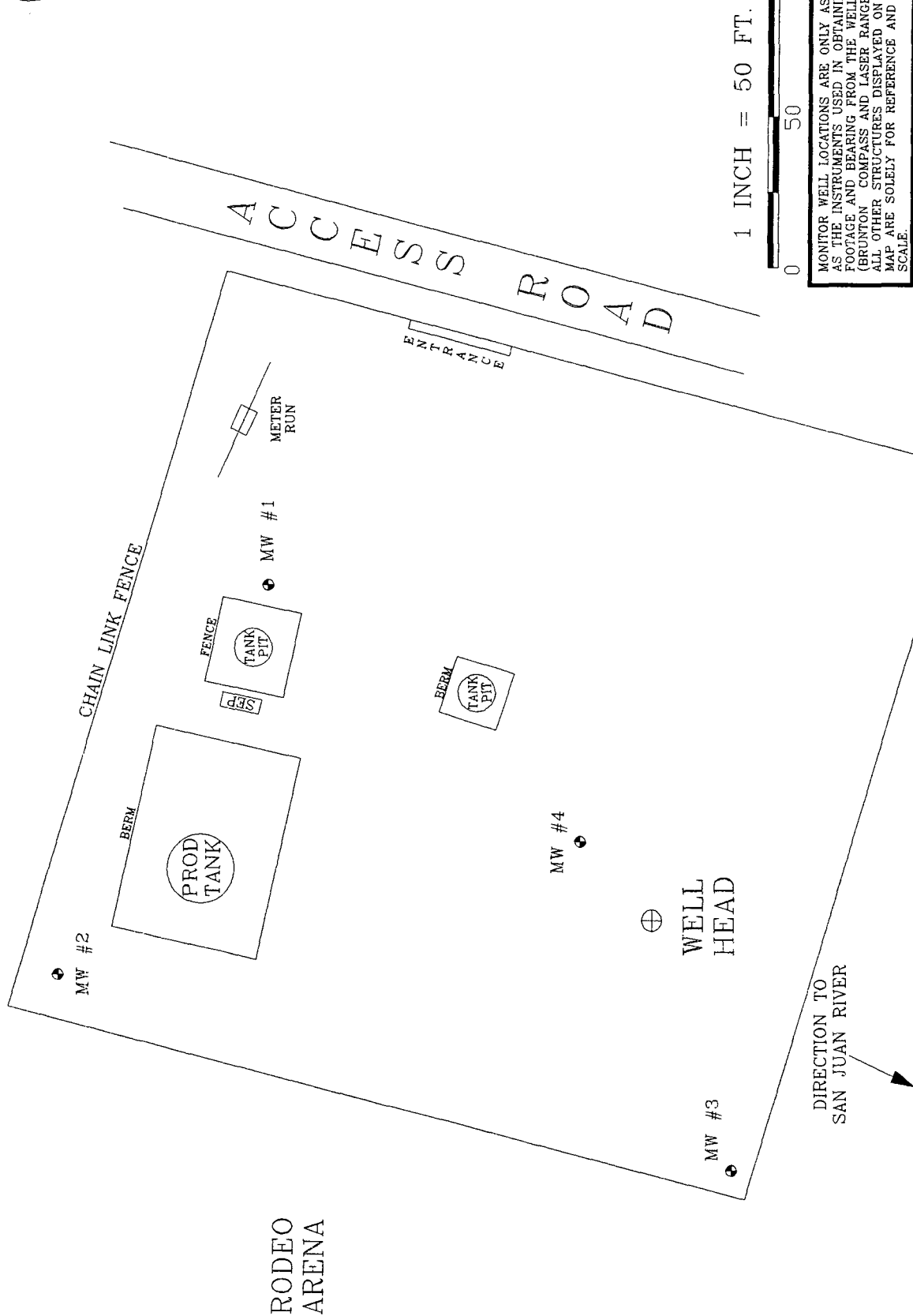
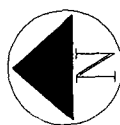
SUBMITTED BY BLAGG ENGINEERING, INC.

GCU COM H #180
UNIT J, SEC. 28, T29N, R12W

REVISED DATE: JULY 10, 2000
FILENAME: (GH-2Q-00.WK4) NJV

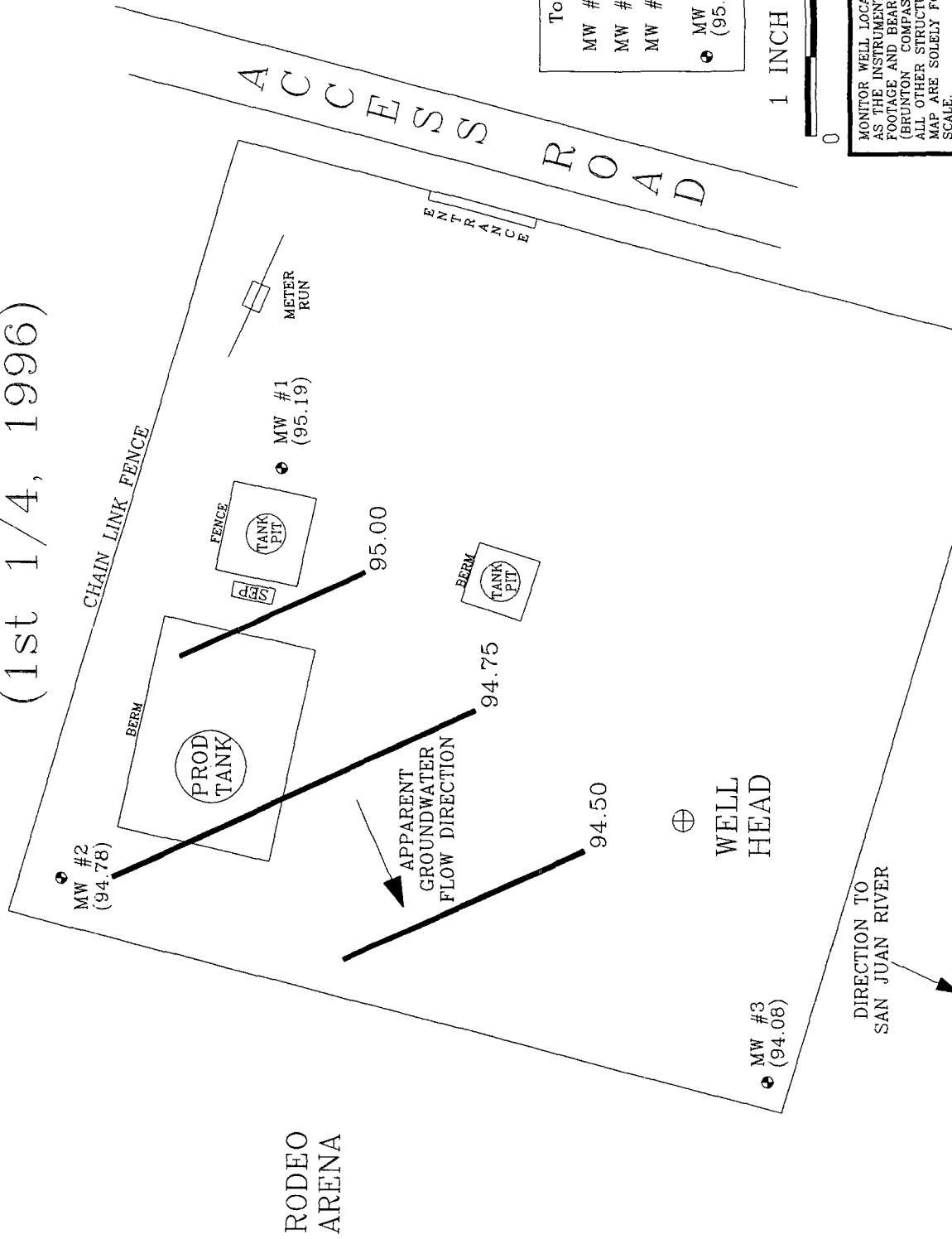
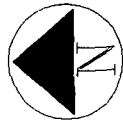
SAMPLE DATE	MONITOR WELL No:	D.T.W. (ft)	T.D. (ft)	TDS mg/L	COND. (umhos/cm)	pH	PRODUCT (ft)	BTEX EPA METHOD 8021 (PPB)			
								Benzene	Toluene	Ethyl Benzene	Total Xylene
12-Jan-93	MW #1	5.04	8.63	4,460	4,800	6.9		5500	24.5	39.0	884.9
07-Jun-93		3.67	8.63		3,800	7.1		2440	24.4	73.0	810.8
01-Sep-93		5.35	8.65		3,800	7.4		6700	43.0	224	942.9
01-Dec-93		5.11			5,400	7.5		2180	45.1	135	738.8
08-Mar-94		4.98			5,000	7.2		3810	41.9	211	964.4
28-Jun-94		4.04			5,000	7.2		6089	22.5	350	1561.6
21-Sep-94		5.51			5,000	7.2		3652	15.2	266	1143.5
16-Dec-94		5.25			4,100	7.5		1.8	ND	1.4	9.8
15-Mar-95		4.64			5,000	7.3		ND	ND	12.5	27.9
15-Jun-95		3.35			4,700	7.3		4382.1	16.1	269.6	1244.5
11-Sep-95		5.16			4,000	7.5		1020	25.4	162	803.4
07-Dec-95		4.77			3,900	7.3		1910	21.1	184	869
05-Mar-96		4.63			3,200	7.2		2360	19.2	178	985
03-Jun-96		4.81			4,300	7.2		3010	36.8	231	1020
23-Jun-97		3.45			2,500	8.3		692	2.9	135	171.3
12-Jun-98		3.35			1,400	8.0		278	3.8	48.7	123
28-May-99		3.33			400	7.4		227	336	15.6	117.5
13-Jun-00	MW #1R	4.96	10.00		2,300	7.5		230	ND	170	1106.9
12-Jan-93	MW #2	5.38	8.92		4,300	6.8		0.9	0.4	ND	1.4
07-Jun-93		4.18	8.88		2,600	6.6		ND	ND	ND	ND
01-Sep-93		5.50	8.81		2,700	7.2		ND	0.4	ND	2
08-Mar-94		5.28			4,600	7.1		ND	1.1	ND	ND
28-Jun-94		4.66			4,900	7.0		ND	1.0	ND	ND
21-Sep-94		5.95			5,100	7.1		1.3	1.4	ND	6.0
16-Dec-94		5.63			3,300	7.1		1.1	ND	0.2	1.0
15-Mar-95		4.99			4,800	7.0		2.3	ND	ND	ND
15-Jun-95		3.96			3,300	7.1		2.1	1.9	0.8	5.3
11-Sep-95		5.58			3,400	7.1		2.2	3.8	ND	3.9
07-Dec-95		5.52			3,200	7.1		ND	ND	ND	ND
05-Mar-96		5.35			2,800	7.2		ND	ND	ND	ND
03-Jun-96		5.50			4,800	7.0		ND	ND	ND	ND
12-Jan-93	MW #3	5.16	9.75			7.3		ND	1.2	0.6	6.5
07-Jun-93		4.23	9.67		7,000	7.4		ND	ND	ND	0.5
01-Sep-93		6.04	9.74		7,400	7.3		ND	ND	ND	0.5
08-Mar-94		5.49			13,800	7.3		ND	1.4	ND	0.8
28-Jun-94		4.75			12,100	7.3		4.8	ND	2.0	4.7
21-Sep-94		6.02			12,000	7.2		0.7	1.3	ND	4.2
16-Dec-94		5.20			8,300	7.6		6.9	ND	ND	ND
15-Mar-95		4.45			12,800	7.4		ND	ND	ND	ND
15-Jun-95		3.94			11,500	7.2		1.0	1.0	ND	2.2
11-Sep-95		4.58	9.74		7,800	7.6		ND	ND	ND	0.6
07-Dec-95		5.59			8,400	7.4		ND	ND	ND	ND
05-Mar-96		5.51			5,000	7.5		ND	ND	ND	ND
03-Jun-96		5.55			13,900	7.2		ND	0.57	2.16	19.61
23-Jun-97	MW #4	5.32	10.00	4,972	3,400	7.0		ND	ND	ND	0.4

FIGURE 1



AMOCO PRODUCTION COMPANY GCU COM H #180 NW/4 SE/4 SEC. 28, T29N, R12W 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: H180-SM.SKD	SITE MAP 12/99
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FIGURE 2
(1st 1/4, 1996)



Top of Well Elevation	
MW #1	(99.82)
MW #2	(100.13)
MW #3	(99.59)
● MW #1 Groundwater Elevation as of 3/5/96.	

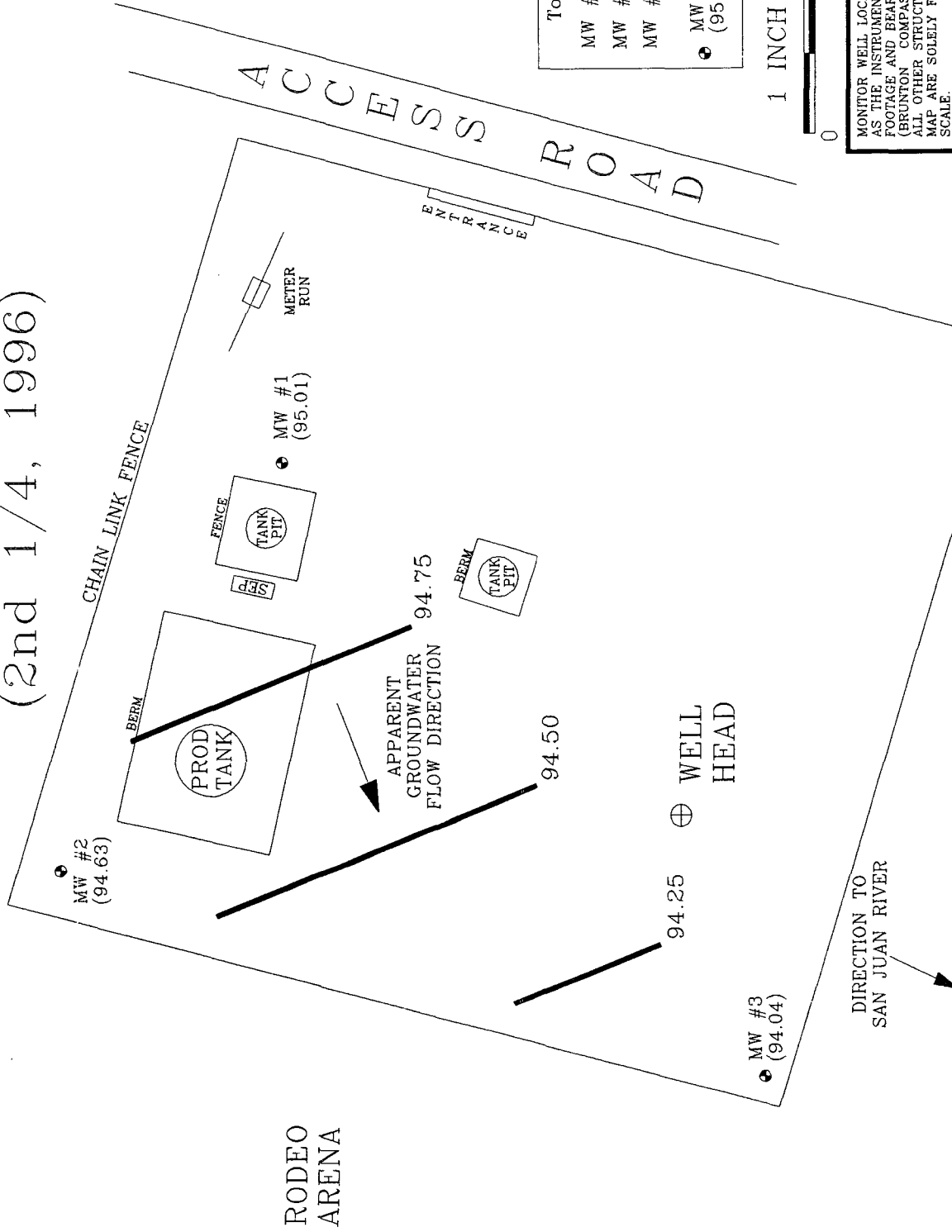
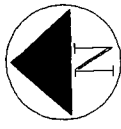
1 INCH = 50 FT.



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.

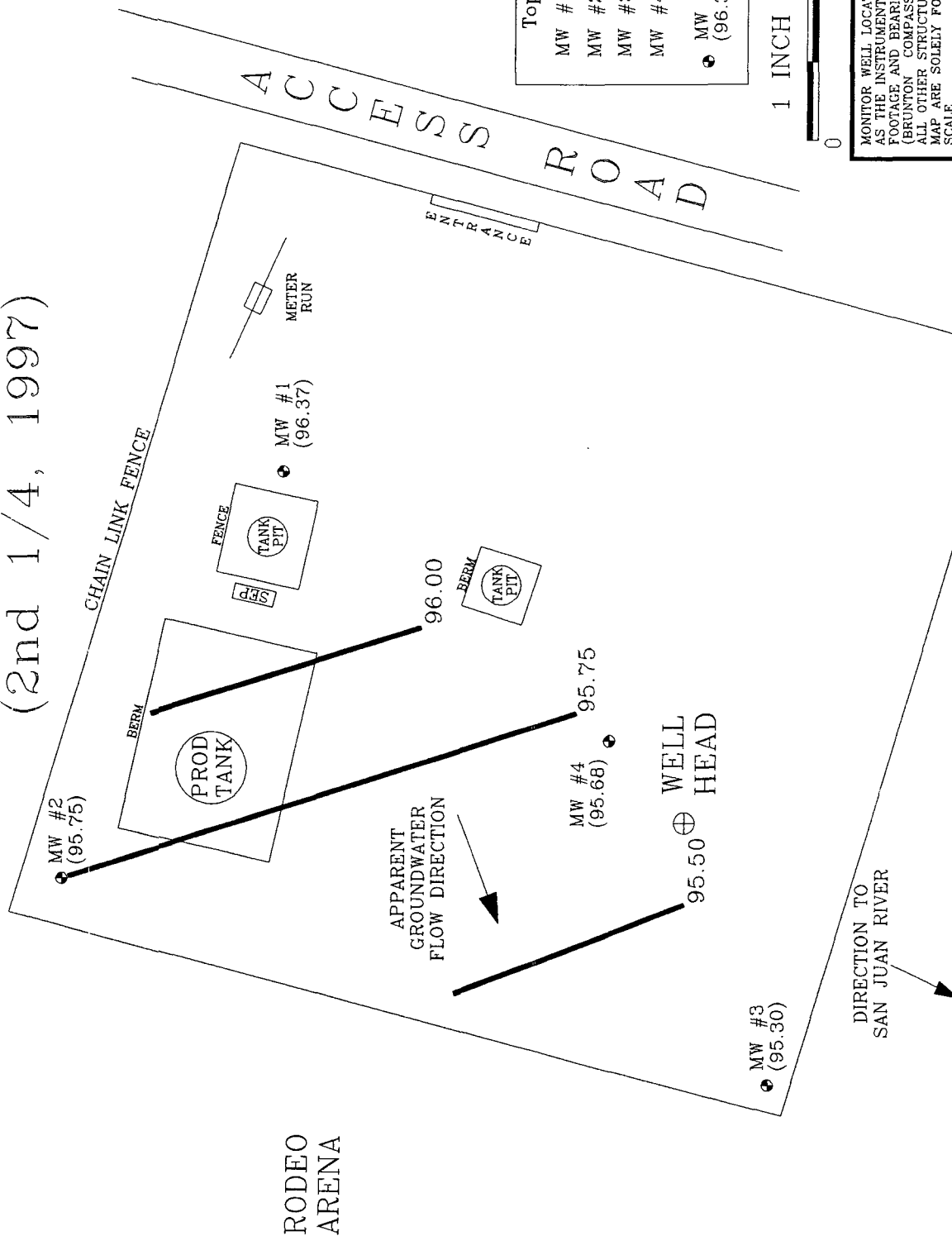
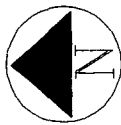
AMOCO PRODUCTION COMPANY GCU COM H #180 NW/4 SE/4 SEC. 28, T29N, R12W SAN JUAN COUNTY, NEW MEXICO	BLAGG ENGINEERING, INC. CONSULTING PETROLEUM / RECLAMATION SERVICES P.O. BOX 87 BLOOMFIELD, NEW MEXICO 87413 PHONE: (505) 632-1199		PROJECT: MW SAMPLING DRAWN BY: NUJ FILENAME: 03-05-96.SKD	GROUNDWATER GRADIENT MAP 03/96
	DIRECTION TO SAN JUAN RIVER			

FIGURE 3
(2nd 1/4, 1996)



AMOCO PRODUCTION COMPANY GCU COM H #180 NW/4 SE/4 SEC. 28, T29N, R12W 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: 06-03-96.SKD	GROUNDWATER GRADIENT MAP 06/96
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FIGURE 4
(2nd 1/4, 1997)



Top of Well Elevation	
MW #1	(99.82)
MW #2	(100.13)
MW #3	(99.59)
MW #4	(101.00)
● MW #1 Groundwater Elevation as of 6/23/97.	

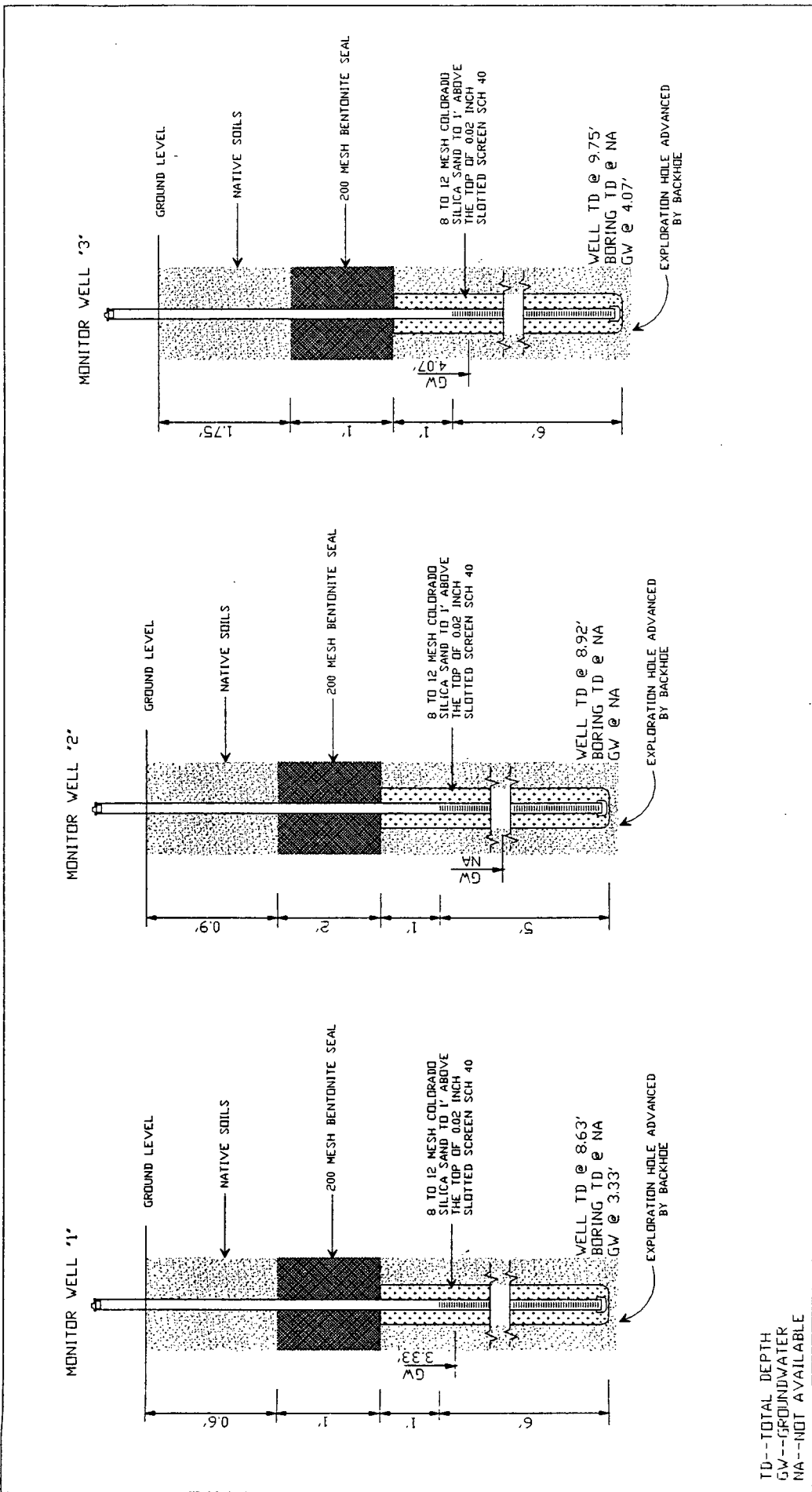
MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND ARE NOT TO SCALE.

AMOCO PRODUCTION COMPANY
GCU COM H #180
NW/4 SE/4 SEC. 28, T29N, R12W
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: 06-23-97.SKD

GROUNDWATER
GRADIENT
MAP
06/97



TEMPORARY MONITOR WELL DETAILS AMOCO PRODUCTION COMPANY GCU 180-C4060 (J) 28-T29N-R12W	ENVIROTECH INC. ENVIRONMENTAL SCIENTISTS 5796 U.S. HIGHWAY 64-3014 FARMINGTON, NEW MEXICO 87401 PHONE: (505) 632-0615	ENGINEER: M. LANE DRAFTER: P. YOUNG DATE: 3-29-93 MONITOR WELLS: 1,2,3 SHEET: #1
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MONITOR WELL #1R

AMOCO PRODUCTION COMPANY
GCU COM H #180
MONITOR WELL CONSTRUCTION & COMPLETION
INSTALLED WITH MOBILE DRILL RIG

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

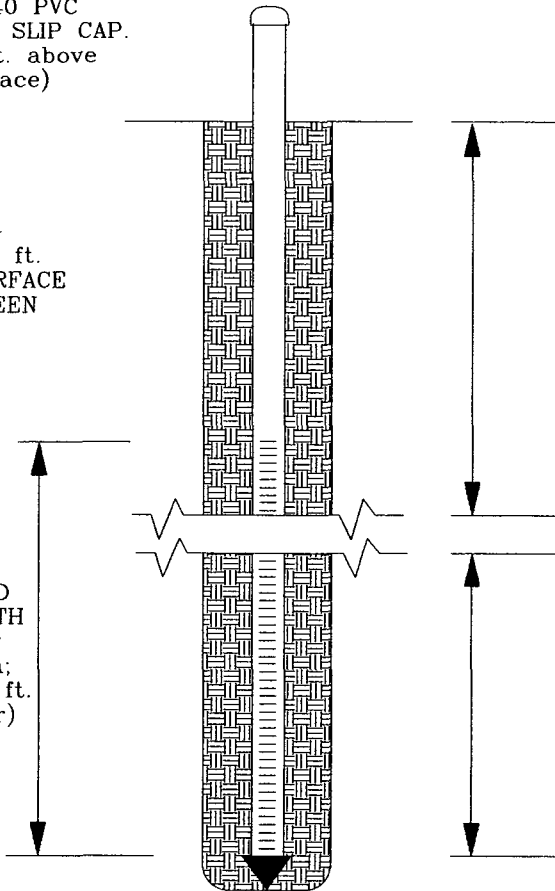
MONITOR WELL SCHEMATIC
DRAFTED BY: NJV
DATE: JUN. '00
FILENAME: MW-1R

2" DIA. SCH. 40 PVC
WELL CASING WITH SLIP CAP.
(approx. 1.00 ft. above
ground surface)

TOTAL CASING
LENGTH = 10.00 ft.
FROM GROUND SURFACE
TO TOP OF SCREEN

0.02 INCH SLOTTED
SCREEN SCH 40 WITH
POINTED END CAP
(5 ft. total length;
top of screen 0.04 ft.
above groundwater)

TOTAL DEPTH = 9.00 ft.
FROM GROUND SURFACE



BACK FILL WITH
CLEAN NATIVE
SOIL TO SURFACE

WATER TABLE
APPROX. 3.96 ft. FROM
GROUND SURFACE
(measured 6/13/00)

4.96 ft. SCREEN INTERVAL
DRIVEN OR SET INTO
EXISTING SOIL CONDITION

MONITOR WELL #4

AMOCO PRODUCTION COMPANY
GCU COM H #180
MONITOR WELL CONSTRUCTION & COMPLETION
INSTALLED WITH MOBILE DRILL RIG

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

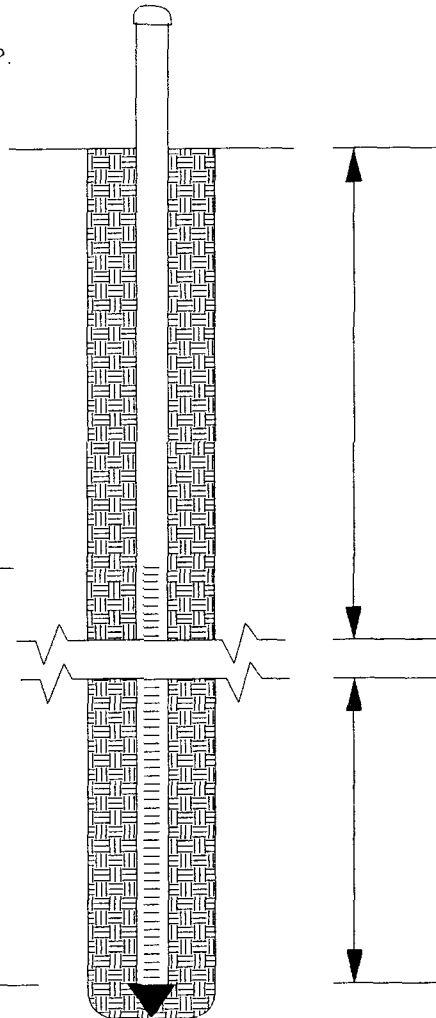
MONITOR WELL SCHEMATIC
DRAFTED BY: NJV
DATE: JUN. '97
FILENAME: MW-4

2" DIA. SCH. 40 PVC
WELL CASING WITH SLIP CAP.
(approx. 1.50 ft. above
ground surface)

TOTAL CASING
LENGTH = 10.00 ft.
FROM GROUND SURFACE
TO TOP OF SCREEN

0.02 INCH SLOTTED
SCREEN SCH 40 WITH
POINTED END CAP
(5 ft. total length;
top of screen 0.32 ft.
above groundwater)

TOTAL DEPTH = 8.50 ft.
FROM GROUND SURFACE



BACK FILL WITH
CLEAN NATIVE
SOIL TO SURFACE

WATER TABLE
APPROX. 3.82 ft. FROM
GROUND SURFACE
(measured 6/23/97)

4.68 ft. SCREEN INTERVAL
DRIVEN OR SET INTO
EXISTING SOIL CONDITION

BLAGG ENGINEERING, Inc.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

LOCATION NAME: GCU COM H # 180
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: N49E, 35 FEET FROM WELL HEAD.

BORING #..... BH - 1
MW #..... 4
PAGE #..... 1
DATE STARTED 6/17/97
DATE FINISHED 6/17/97
OPERATOR..... JCB
PREPARED BY NJV

DEPTH
FEET

INTERVAL

LITHOLOGY
INTERVAL

MW
SCHEMATIC

FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APPROX. 1.50 FT. ABOVE GROUND SURFACE.

DARK YELLOWISH BROWN SAND, NON COHESIVE, SLIGHTLY MOIST, FIRM
TO LOOSE, NO APPARENT HYDROCARBON ODOR DETECTED PHYSICALLY
(0.0 - 3.5 FT. INTERVAL).

▼ GW DEPTH ON 6/23/97 = 3.82 FT. (APPROX.) FROM GROUND SURFACE.

DARK YELLOWISH BROWN SAND AND GRAVEL, NON COHESIVE, SATURATED, FIRM
TO LOOSE, NO APPARENT HYDROCARBON ODOR DETECTED PHYSICALLY
(3.5 - 10.0 FT. INTERVAL).

NOTES:  - SAND.

 - SAND AND GRAVEL.

TOS - TOP OF SCREEN FROM GROUND SURFACE.

TD - TOTAL DEPTH OF MONITOR WELL FROM GROUND SURFACE.

GW - GROUND WATER.

DRAWING: BH-1

DATE: 6/25/97

DWN BY: NJV

BLAGG ENGINEERING, INC.**MONITOR WELL SAMPLING DATA**CLIENT : AMOCO PRODUCTION CO.

CHAIN-OF-CUSTODY # : _____

GCU COM H # 180

LABORATORY (S) USED : ANALYTICA

UNIT J, SEC. 28, T29N, R12W

Date : March 5, 1996SAMPLER : REOFilename : 03-05-96.WK4PROJECT MANAGER : REO

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING	pH TIME	CONDUCT (umhos)	VOLUME PURGED (gal.)	FREE PRODUCT (ft)
1	99.82	95.19	4.63	8.65	1030	7.2	3,200	0.50	-
2	100.13	94.78	5.35	8.81	1015	7.2	2,800	1.50	-
3	99.59	94.08	5.51	9.74	0950	7.5	5,000	1.00	-

NOTES : Volume of water purged from well prior to sampling: $V = \pi \times r^2 \times h \times 7.48 \text{ gal./ft}^3 \times 3 \text{ (wellbores)}$.(i.e. 2" MW $r = (1/12) \text{ ft.}$ $h = 1 \text{ ft.}$) (i.e. 4" MW $r = (2/12) \text{ ft.}$ $h = 1 \text{ ft.}$)

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".MW # 1 & 3 - poor recovery . Collected BTEX samples from all MW's listed above .MW # 1 - sheen observed in first bail .

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID: GCU Com H180
Sample ID: MW - 1
Lab ID: 2813
Sample Matrix: Water
Preservative: Cool, HgCl₂
Condition: Intact

Report Date: 03/08/96
Date Sampled: 03/05/96
Date Received: 03/05/96
Date Analyzed: 03/06/96

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	2,360	40.0
Toluene	19.2	10.0
Ethylbenzene	178	10.0
m,p-Xylenes	985	20.0
o-Xylene	ND	10.0

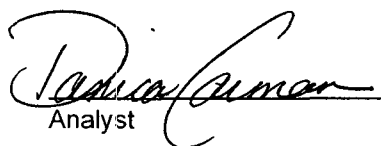
Total BTEX	3,550
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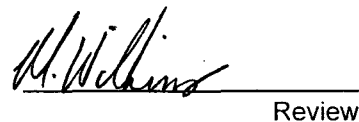
ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Trifluorotoluene	104	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:


Analyst


Review

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID: GCU Com H180
Sample ID: MW - 2
Lab ID: 2814
Sample Matrix: Water
Preservative: Cool, HgCl₂
Condition: Intact

Report Date: 03/08/96
Date Sampled: 03/05/96
Date Received: 03/05/96
Date Analyzed: 03/06/96

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.20
Toluene	ND	0.20
Ethylbenzene	ND	0.20
m,p-Xylenes	ND	0.40
o-Xylene	ND	0.20

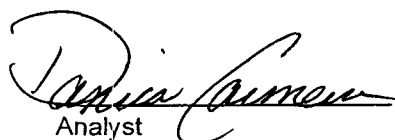
Total BTEX	ND
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ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Trifluorotoluene	101	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:


Analyst


Review

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID: GCU Com H180
Sample ID: MW - 3
Lab ID: 2815
Sample Matrix: Water
Preservative: Cool, HgCl₂
Condition: Intact

Report Date: 03/08/96
Date Sampled: 03/05/96
Date Received: 03/05/96
Date Analyzed: 03/06/96

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.20
Toluene	ND	0.20
Ethylbenzene	ND	0.20
m,p-Xylenes	ND	0.40
o-Xylene	ND	0.20

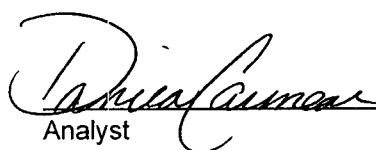
Total BTEX	ND
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ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Trifluorotoluene	97	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:


Analyst


Review

3807 S. CARLTON • FARMINGTON, NM 87401 • (505) 326-2395

PROJECT MANAGER:

Analytica Lab I.D.:

Company:

Address:

Phone:

Fax:

Bill To:

Company:

Address:

Sample ID	Date	Time	Matrix	Lab ID
MW-1	3-5	1030	water	
MW-2	3-5	1015	"	
MW-3	3-5	0950	"	
Project Information		Sample Receipt		
Proj. #:	AM010	No. Containers:		
Proj. Name:	GC4 COM	Custody Seals: Y / N / NA		
R-ONE:	H 180	Received intact:		
Shipped Via:	DEL'D	Received Cold:		
Required Turnaround Time (Prior Authorization Required for Rush)				

[illegible]

Please Fill Out Thoroughly.

Shaded areas
for lab use only.

White/Yellow: Analytica
Pink: Client

ANALYTICA

ENVIRONMENTAL LABORATORY

March 8, 1996

Bob O'Neill
Blagg Engineering, Inc.
PO Box 87
Bloomfield, NM 87413

Dear Mr. O'Neill:

Enclosed are the results for the analysis of the aqueous samples received on March 5, 1996 from the GCU Com H180 site. The samples were received cool and intact. Analysis for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) was performed on the samples, as per the chain of custody.

Analysis was performed on the samples according to EPA Method 602, using a Hewlett-Packard 5890 gas chromatograph equipped with an OI Analytical purge and trap (model 4560) and a photoionization detector. Detectable levels of btex analytes were found in the samples as reported.

Quality control reports appear at the end of the analytical package and can be identified by title. Should you have any questions regarding the analysis, feel free to call.

Sincerely,


Danica Carman
Chemist

PURGEABLE AROMATICS

Quality Control Report

Method Blank Analysis

Sample Matrix: Water
Lab ID: MB35130

Report Date: 03/08/96
Date Analyzed: 03/06/96

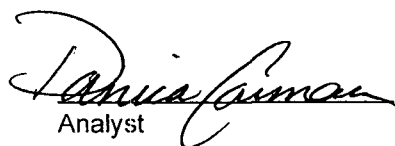
Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.20
Toluene	ND	0.20
Ethylbenzene	ND	0.20
m,p-Xylenes	ND	0.40
o-Xylene	ND	0.20

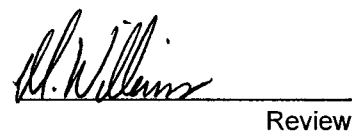
ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Trifluorotoluene	104	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:


Analyst


Review

Purgeable Aromatics

Duplicate Analysis

Lab ID: 2813Dup
Sample Matrix: Water
Preservative: Cool, HgCl₂
Condition: Intact

Report Date: 03/08/96
Date Sampled: 03/05/96
Date Received: 03/05/96
Date Analyzed: 03/06/96

Target Analyte	Original Conc. (ug/L)	Duplicate Conc. (ug/L)	Acceptance Range (ug/L)
Benzene	2,360	2,380	1,942 - 2,797
Toluene	19.2	19.7	15.0 - 23.9
Ethylbenzene	178	180	117 - 241
m,p-Xylenes	985	987	NE
o-Xylene	ND	ND	NE

ND - Analyte not detected at the stated detection limit.

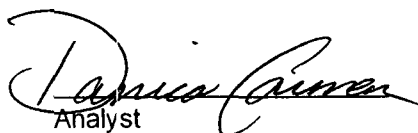
NA - Not applicable or not calculated.

NE - Duplicate acceptance range not established by the EPA.

	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Quality Control:	Trifluorotoluene	104	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:


Analyst


Review

Purgeable Aromatics

Matrix Spike Analysis

Lab ID: 2817Spk
Sample Matrix: Water
Preservative: Cool, HCl
Condition: Intact

Report Date: 03/08/96
Date Sampled: 03/05/96
Date Received: 03/05/96
Date Analyzed: 03/06/96

Target Analyte	Spike Added (ug/L)	Original Conc. (ug/L)	Spiked Sample Conc. (ug/L)	% Recovery	Acceptance Limits (%)
Benzene	10	ND	9.64	96%	39 - 150
Toluene	10	ND	9.51	94%	46 - 148
Ethylbenzene	10	ND	8.66	86%	32 - 160
m,p-Xylenes	20	ND	18.8	94%	NE
o-Xylene	10	ND	9.40	94%	NE

ND - Analyte not detected at the stated detection limit.

NA - Not applicable or not calculated.

NE - Spike acceptance range not established by the EPA.

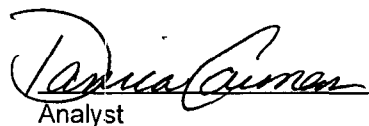
Quality Control: Surrogate
Trifluorotoluene

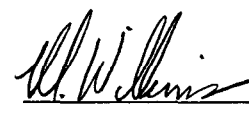
Percent Recovery
100

Acceptance Limits
88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:


Analyst


Review

BLAGG ENGINEERING, INC.**MONITOR WELL SAMPLING DATA**CLIENT : **AMOCO PRODUCTION CO.**

CHAIN-OF-CUSTODY # : _____

GCU COM H # 180

LABORATORY (S) USED : **ANAITAS**

UNIT J, SEC. 28, T29N, R12W

Date : June 3, 1996

SAMPLER : **R E O**

Filename : 06-03-96.WK4

PROJECT MANAGER : **R E O**

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING	pH TIME	CONDUCT (umhos)	VOLUME PURGED (gal.)	FREE PRODUCT (ft)
1	99.82	95.01	4.81	8.65	1410	7.2	4,300	0.50	-
2	100.13	94.63	5.50	8.81	1350	7.0	4,800	1.50	-
3	99.59	94.04	5.55	9.74	1325	7.2	13,900	1.00	-

NOTES : Volume of water purged from well prior to sampling: $V = \pi \times r^2 \times h \times 7.48 \text{ gal./ft}^3 \times 3 \text{ (wellbores)}$.(i.e. 2" MW $r = (1/12) \text{ ft.}$ $h = 1 \text{ ft.}$) (i.e. 4" MW $r = (2/12) \text{ ft.}$ $h = 1 \text{ ft.}$)

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 ".

MW # 1 & 3 - poor recovery . Collected BTEX samples from all MW's listed above .

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID: GCU Com H 180
 Sample ID: MW - 1
 Lab ID: 3763
 Sample Matrix: Water
 Preservative: Cool, HgCl₂
 Condition: Intact

Report Date: 06/11/96
 Date Sampled: 06/03/96
 Date Received: 06/03/96
 Date Analyzed: 06/10/96

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	3,010	100
Toluene	36.8	25.0
Ethylbenzene	231	25.0
m,p-Xylenes	1,020	50.0
o-Xylene	ND	25.0

Total BTEX	4,300
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ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Trifluorotoluene	106	88 - 110%
	Bromofluorobenzene	114	86 - 115%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:


 Analyst


 Review

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID: GCU Com H 180
 Sample ID: MW - 2
 Lab ID: 3764
 Sample Matrix: Water
 Preservative: Cool, HgCl₂
 Condition: Intact

Report Date: 06/11/96
 Date Sampled: 06/03/96
 Date Received: 06/03/96
 Date Analyzed: 06/10/96

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	1.00
o-Xylene	ND	0.50

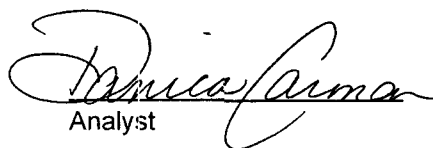
Total BTEX	ND
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ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Trifluorotoluene	106	88 - 110%
	Bromofluorobenzene	111	86 - 115%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:


 Analyst


 Review

PURGEABLE AROMATICSBlagg Engineering, Inc.

Project ID: GCU Com H 180
Sample ID: MW - 3
Lab ID: 3765
Sample Matrix: Water
Preservative: Cool, HgCl₂
Condition: Intact

Report Date: 06/11/96
Date Sampled: 06/03/96
Date Received: 06/03/96
Date Analyzed: 06/10/96

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.50
Toluene	0.57	0.50
Ethylbenzene	2.16	0.50
m,p-Xylenes	17.7	1.00
o-Xylene	1.91	0.50

Total BTEX	22.3
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ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Trifluorotoluene	108	88 - 110%
	Bromofluorobenzene	111	86 - 115%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209,
Oct. 1984.

Comments:
Analyst
Review



PROJECT MANAGER:
Analytica Lab I.D.:

Phone: _____
Fax: _____

BLAG	632-1199	SAME
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CHAIN OF CUSTODY

[illegible]



June 11, 1996

Bob O'Neill
Blagg Engineering, Inc.
PO Box 87
Bloomfield, NM 87413

Dear Bob:

Enclosed are the results for the analyses aqueous samples received on June 3, 1996. The samples were from the GCU Com H 180 site and were received cool and intact. Analysis for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) was performed on the aqueous samples, as per the chain of custody.

BTEX analysis was performed on the aqueous samples according to EPA Method 602, using a Hewlett-Packard 5890 gas chromatograph equipped with an OI Analytical purge and trap (model 4560) and a photoionization detector. Detectable levels of BTEX analytes were found in one of the samples.

Quality control reports appear at the end of the analytical package and can be identified by title. Should you have any questions regarding the analysis, feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Denise A. Bohemier".

Denise A. Bohemier
Lab Director

PURGEABLE AROMATICS

Quality Control Report

Method Blank Analysis

Sample Matrix: Water
Lab ID: MB35226

Report Date: 06/11/96
Date Analyzed: 06/10/96

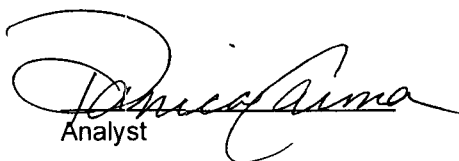
Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	1.00
o-Xylene	ND	0.50

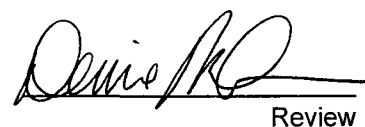
ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Trifluorotoluene	96	88 - 110%
	Bromofluorobenzene.	97	86 - 115%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209,
Oct. 1984.

Comments:


Analyst


Review

Purgeable Aromatics

Duplicate Analysis

Lab ID: 3763Dup
Sample Matrix: Water
Preservative: Cool, HgCl₂
Condition: Intact

Report Date: 06/11/96
Date Sampled: 06/03/96
Date Received: 06/03/96
Date Analyzed: 06/10/96

Target Analyte	Original Conc. (ug/L)	Duplicate Conc. (ug/L)	Acceptance Range (ug/L)
Benzene	3,010	3,190	2,540 - 3,660
Toluene	36.8	27.7	25.5 - 39.0
Ethylbenzene	231	249	157 - 322
m,p-Xylenes	1,020	1,080	NE
o-Xylene	ND	ND	NE

ND - Analyte not detected at the stated detection limit.

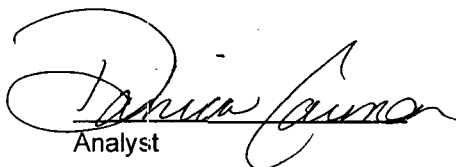
NA - Not applicable or not calculated.

NE - Duplicate acceptance range not established by the EPA.

	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
Quality Control:	Trifluorotoluene	105	88 - 110%
	Bromofluorobenzene	112	86 - 115%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:


Analyst


Review

Purgeable Aromatics

Matrix Spike Analysis

Lab ID: 3764Spk
Sample Matrix: Water
Preservative: Cool, HgCl₂
Condition: Intact

Report Date: 06/11/96
Date Sampled: 06/03/96
Date Received: 06/03/96
Date Analyzed: 06/10/96

Target Analyte	Spike Added (ug/L)	Original Conc. (ug/L)	Spiked Sample Conc. (ug/L)	% Recovery	Acceptance Limits (%)
Benzene	10	ND	9.48	95%	39 - 150
Toluene	10	ND	9.48	93%	46 - 148
Ethylbenzene	10	ND	9.45	95%	32 - 160
m,p-Xylenes	20	ND	18.9	93%	NE
o-Xylene	10	ND	9.53	95%	NE

ND - Analyte not detected at the stated detection limit.

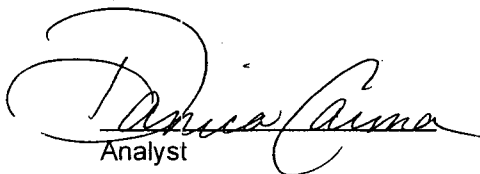
NA - Not applicable or not calculated.

NE - Spike acceptance range not established by the EPA.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Trifluorotoluene	105	88 - 110%
	Bromofluorobenzene	113	86 - 115%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:


Analyst


Review

BLAGG ENGINEERING, INC.**MONITOR WELL SAMPLING DATA**CLIENT : AMOCO PRODUCTION CO.CHAIN-OF-CUSTODY # : 5114

GCU COM H # 180

LABORATORY (S) USED : ENVIROTECH, INC.

UNIT J, SEC. 28, T29N, R12W

Date : June 23, 1997SAMPLER : N J VFilename : 06-23-97.WK4PROJECT MANAGER : N J V

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING	pH TIME	CONDUCT (umhos)	VOLUME PURGED (gal.)	FREE PRODUCT (ft)
1	99.82	96.37	3.45	8.65	1,500	8.3	2,500	1.00	-
2	100.13	95.75	4.38	-	-	-	-	-	-
3	99.59	95.30	4.29	-	-	-	-	-	-
4	101.00	95.68	5.32	10.00	1,530	7.0	3,400	2.25	-

NOTES : Volume of water purged from well prior to sampling: $V = \pi \times r^2 \times h \times 7.48 \text{ gal./ft}^3 \times 3 \text{ (wellbores)}$.(i.e. 2" MW $r = (1/12) \text{ ft.}$ $h = 1 \text{ ft.}$) (i.e. 4" MW $r = (2/12) \text{ ft.}$ $h = 1 \text{ ft.}$)

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 ".MW # 1 - poor recovery . Collected BTEX samples for both MW #'s 1 & 4 .MW # 4 installed by BEI on 6 / 17 / 97 . 5 ft. casing , 5 ft. screen , TD @ 8.5 ft. below ground surface . Collected anion / cation from MW # 4 only .

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020 AROMATIC VOLATILE ORGANICS

Client:	Blagg / Amoco	Project #:	04034-10
Sample ID:	MW #1	Date Reported:	06-25-97
Chain of Custody:	5114	Date Sampled:	06-23-97
Laboratory Number:	B486	Date Received:	06-24-97
Sample Matrix:	Water	Date Analyzed:	06-24-97
Preservative:	HgCl ₂ & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	692	10	1.8
Toluene	2.9	10	1.7
Ethylbenzene	135	10	1.5
p,m-Xylene	167	10	2.2
o-Xylene	4.3	10	1.0
Total BTEX	1,000		

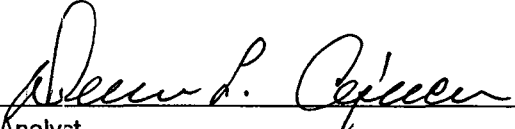
ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	99 %
	Bromofluorobenzene	100 %

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: GCU COM H #180.


Analyst


Review

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020 AROMATIC VOLATILE ORGANICS

Client:	Blagg / Amoco	Project #:	04034-10
Sample ID:	MW #4	Date Reported:	06-25-97
Chain of Custody:	5114	Date Sampled:	06-23-97
Laboratory Number:	B487	Date Received:	06-24-97
Sample Matrix:	Water	Date Analyzed:	06-24-97
Preservative:	HgCl ₂ & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	ND	1	0.2
Toluene	ND	1	0.2
Ethylbenzene	ND	1	0.2
p,m-Xylene	0.3	1	0.2
o-Xylene	0.1	1	0.1
Total BTEX	0.4		

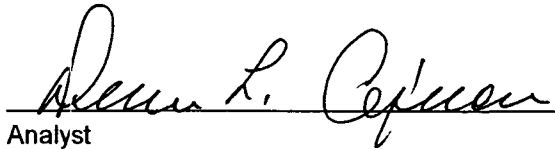
ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	96 %
	Bromofluorobenzene	99 %

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: GCU COM H #180.


Analyst


Review

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

CATION / ANION ANALYSIS

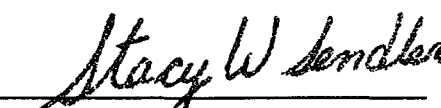
Client:	Blagg / Amoco	Project #:	04034-10
Sample ID:	MW #4	Date Reported:	06-24-97
Laboratory Number:	B487	Date Sampled:	06-23-97
Sample Matrix:	Water	Date Received:	06-24-97
Preservative:	Cool	Date Analyzed:	06-24-97
Condition:	Cool & Intact	Chain of Custody:	5114

Parameter	Analytical Result	Units	Units
pH	6.71	s.u.	
Conductivity @ 25° C	9,970	umhos/cm	
Total Dissolved Solids @ 180C	4,985	mg/L	
Total Dissolved Solids (Calc)	4,972	mg/L	
SAR	9.9	ratio	
Total Alkalinity as CaCO3	504	mg/L	
Total Hardness as CaCO3	1,668	mg/L	
Bicarbonate as HCO3	504	mg/L	8.26 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	<0.001	mg/L	0.00 meq/L
Chloride	100	mg/L	2.82 meq/L
Fluoride	2.90	mg/L	0.15 meq/L
Phosphate	<0.1	mg/L	0.00 meq/L
Sulfate	3,010	mg/L	62.67 meq/L
Calcium	536	mg/L	26.75 meq/L
Magnesium	80.1	mg/L	6.59 meq/L
Potassium	6.9	mg/L	0.18 meq/L
Sodium	930	mg/L	40.46 meq/L
Cations			73.97 meq/L
Anions			73.90 meq/L
Cation/Anion Difference			0.09%

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

Comments: GCU COM H #180.


Analyst


Review

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

QUALITY ASSURANCE / QUALITY CONTROL DOCUMENTATION

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020 AROMATIC VOLATILE ORGANICS QUALITY ASSURANCE REPORT

Client:	QA/QC	Project #:	N/A
Sample ID:	Laboratory Blank	Date Reported:	06-25-97
Laboratory Number:	06-24-BTEX.BLANK	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	06-24-97
Condition:	N/A	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.2
Toluene	ND	0.2
Ethylbenzene	ND	0.2
p,m-Xylene	ND	0.2
o-Xylene	ND	0.1

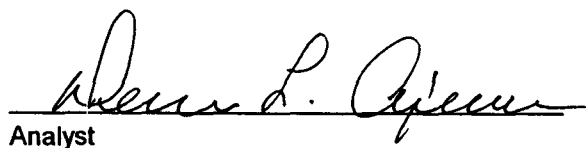
ND - Parameter not detected at the stated detection limit.

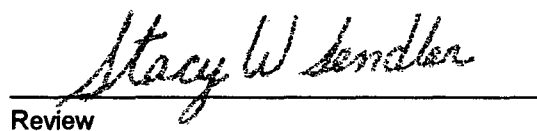
Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	96 %
	Bromofluorobenzene	99 %

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: QA/QC for samples B486 - B493.


Analyst


Review

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020 AROMATIC VOLATILE ORGANICS QUALITY ASSURANCE REPORT

Client:	QA/QC	Project #:	N/A
Sample ID:	Matrix Duplicate	Date Reported:	06-25-97
Laboratory Number:	B487	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	HgCl and Cool	Date Analyzed:	06-24-97
Condition:	Cool and Intact	Analysis Requested:	BTEX-8020

Parameter	Sample Result (ug/L)	Duplicate Result (ug/L)	Percent Diff.	Det. Limit (ug/L)	Dilution Factor
Benzene	ND	ND	0.0%	0.2	1
Toluene	ND	ND	0.0%	0.2	1
Ethylbenzene	ND	ND	0.0%	0.2	1
p,m-Xylene	0.3	0.3	0.0%	0.2	1
o-Xylene	0.1	0.1	0.0%	0.1	1

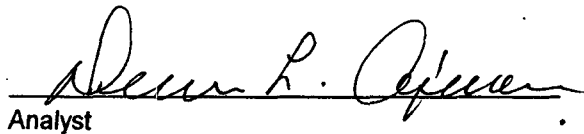
ND - Parameter not detected at the stated detection limit.

QA/QC Acceptance Criteria:	Parameter	Maximum Difference
	8020 Compounds	30 %

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: QA/QC for samples B486 - B493.


Analyst


Review

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8020 AROMATIC VOLATILE ORGANICS QUALITY ASSURANCE REPORT

Client: QA/QC
Sample ID: Matrix Spike
Laboratory Number: B487
Sample Matrix: Water
Preservative: Cool
Condition: Cool and Intact

Project #: N/A
Date Reported: 06-25-97
Date Sampled: N/A
Date Received: N/A
Date Analyzed: 06-24-97

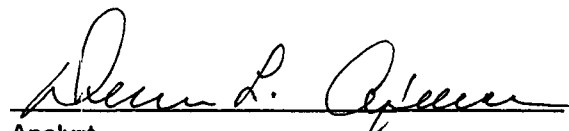
Parameter	Sample Result (ug/L)	Spike Added (ug/L)	Spiked Sample Result (ug/L)	Det. Limit (ug/L)	Percent Recovery	SW-846 % Rec. Accept. Range
Benzene	ND	50.0	50.2	0.2	100%	39-150
Toluene	ND	50.0	50.1	0.2	100%	46-148
Ethylbenzene	ND	50.0	51.3	0.2	102%	32-160
p,m-Xylene	0.3	100	100	0.2	100%	46-148
o-Xylene	0.1	50.0	50.8	0.1	101%	46-148

ND - Parameter not detected at the stated detection limit.

References: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1994.

Comments: QA/QC for samples B486 - B493.


Analyst


Review

BLAGG ENGINEERING, INC.**MONITOR WELL SAMPLING DATA**CLIENT : AMOCO PRODUCTION CO.CHAIN-OF-CUSTODY # : 6021

GCU COM H # 180

LABORATORY (S) USED : ENVIROTECH, INC.

UNIT J, SEC. 28, T29N, R12W

Date : June 12, 1998SAMPLER : N J VFilename : 06-12-98.WK4PROJECT 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	99.82	96.47	3.35	8.65	1120	8.0	1,400	1.00	-
2	TOP OF CASING FOUND DESTROYED - JUNE 1998								
3	99.59	95.30	4.29	-	-	-	-	-	-
4	101.00	95.71	5.29	10.00	-	-	-	-	-

NOTES : Volume of water purged from well prior to sampling: $V = \pi \times r^2 \times h \times 7.48 \text{ gal./ft}^3 \times 3 \text{ (wellbores)}$
(i.e. 2" MW $r = (1/12) \text{ ft}$. $h = 1 \text{ ft}$.) (i.e. 4" MW $r = (2/12) \text{ ft}$. $h = 1 \text{ ft}$.)

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".MW # 1 - poor recovery . Collected BTEX samples from MW # 1 only .Inadequate information for groundwater contour map .

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021 AROMATIC VOLATILE ORGANICS

Client:	Blagg / AMOCO	Project #:	04034-10
Sample ID:	MW #1	Date Reported:	06-16-98
Chain of Custody:	6021	Date Sampled:	06-12-98
Laboratory Number:	D410	Date Received:	06-14-98
Sample Matrix:	Water	Date Analyzed:	06-16-98
Preservative:	HgCl ₂ & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	278	1	0.2
Toluene	3.8	1	0.2
Ethylbenzene	48.7	1	0.2
p,m-Xylene	123	1	0.2
o-Xylene	ND	1	0.1

Total BTEX 453

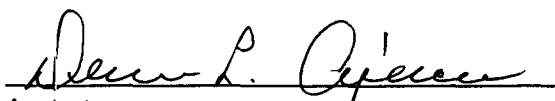
ND - Parameter not detected at the stated detection limit.

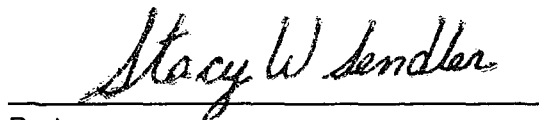
Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	100 %
	Bromofluorobenzene	100 %

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: GCU Com H #180.


Analyst


Review

6021

ENVIROTECH INC.

5796 U.S. Highway 64
Farmington, New Mexico 87401
(505) 632-0615

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:	06-16-BTEX QA/QC	Date Reported:	06-16-98
Laboratory Number:	D409	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	06-16-98
Condition:	N/A	Analysis:	BTEX

Calibration and Detection Limits (ug/L)	I-Cal RF	C-Cal RF	%Diff	Blank Conc	Detect. Limit
		Accept. Range 0 - 15%			
Benzene	5.4370E-02	5.4424E-02	0.10%	ND	0.2
Toluene	2.9051E-02	2.9138E-02	0.30%	ND	0.2
Ethylbenzene	2.6516E-02	2.6730E-02	0.81%	ND	0.2
p,m-Xylene	1.8915E-02	1.9048E-02	0.70%	ND	0.2
o-Xylene	2.1590E-02	2.1720E-02	0.60%	ND	0.1

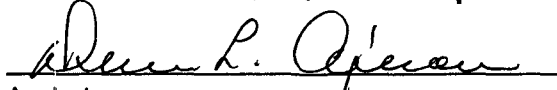
Duplicate Conc. (ug/L)	Sample	Duplicate	%Diff.	Accept Limit
Benzene	ND	ND	0.0%	0 - 30%
Toluene	ND	ND	0.0%	0 - 30%
Ethylbenzene	ND	ND	0.0%	0 - 30%
p,m-Xylene	0.8	0.8	0.0%	0 - 30%
o-Xylene	ND	ND	0.0%	0 - 30%

Spike Conc. (ug/L)	Sample	Amount Spiked	Spiked Sample	% Recovery	Accept Limits
Benzene	ND	50.0	50.0	100%	39 - 150
Toluene	ND	50.0	50.0	100%	46 - 148
Ethylbenzene	ND	50.0	50.0	100%	32 - 160
p,m-Xylene	0.8	100.0	101	100%	46 - 148
o-Xylene	ND	50.0	50.0	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 D409- D416.


Analyst


Review

BLAGG ENGINEERING, INC.**MONITOR WELL SAMPLING DATA**CLIENT : AMOCO PRODUCTION CO.CHAIN-OF-CUSTODY # : 6690

GCU COM H # 180

LABORATORY (S) USED : ENVIROTECH, INC.

UNIT J, SEC. 28, T29N, R12W

Date : May 28, 1999SAMPLER : N J VFilename : 05-28-99.WK4PROJECT 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	99.82	96.49	3.33	8.65	1150	7.4	400	1.00	-
2	TOP OF CASING FOUND DESTROYED - JUNE 1998								
3	99.59	95.33	4.26	-	-	-	-	-	-
4	101.00	95.67	5.33	-	-	-	-	-	-

NOTES : Volume of water purged from well prior to sampling: $V = \pi \times r^2 \times h \times 7.48 \text{ gal./ft}^3 \times 3 \text{ (wellbores)}$
(i.e. 2" MW $r = (1/12) \text{ ft}$. $h = 1 \text{ ft}$.) (i.e. 4" MW $r = (2/12) \text{ ft}$. $h = 1 \text{ ft}$.)

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".

MW # 1 - poor recovery . Collected BTEX samples from MW # 1 only .

Inadequate information for groundwater contour map .

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021 AROMATIC VOLATILE ORGANICS

Client:	Blagg / AMOCO	Project #:	403410
Sample ID:	MW #1	Date Reported:	06-02-99
Chain of Custody:	6690	Date Sampled:	05-28-99
Laboratory Number:	F427	Date Received:	05-28-99
Sample Matrix:	Water	Date Analyzed:	06-01-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	227	1	0.2
Toluene	336	1	0.2
Ethylbenzene	15.6	1	0.2
p,m-Xylene	89.9	1	0.2
o-Xylene	27.6	1	0.1

Total BTEX 696

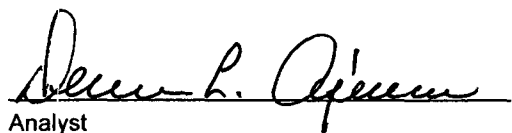
ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	95 %
	Bromofluorobenzene	95 %

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: GCU Com H #180.


Analyst


Review

6690

[illegible]

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:	06-01-PM-BTEX QA/QC	Date Reported:	06-02-99
Laboratory Number:	F424	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	06-01-99
Condition:	N/A	Analysis:	BTEX

Calibration and Detection Limits (ug/L)	I-Cal RF	C-Cal RF	%Diff	Blank Conc	Detect Limit
		Accept. Range 0 - 15%			
Benzene	1.6360E-002	1.6412E-002	0.32%	ND	0.2
Toluene	1.7563E-002	1.7566E-002	0.02%	ND	0.2
Ethylbenzene	7.1313E-003	7.1398E-003	0.12%	ND	0.2
p,m-Xylene	8.5740E-003	8.5758E-003	0.02%	ND	0.2
o-Xylene	7.9281E-003	7.9520E-003	0.30%	ND	0.1

Duplicate Conc. (ug/L)	Sample	Duplicate	%Diff	Accept Limit
Benzene	221	213	3.5%	0 - 30%
Toluene	10.6	10.3	2.8%	0 - 30%
Ethylbenzene	11.1	10.9	1.8%	0 - 30%
p,m-Xylene	17.7	17.8	0.6%	0 - 30%
o-Xylene	4.9	4.8	2.0%	0 - 30%

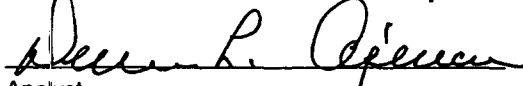
Spike Conc. (ug/L)	Sample	Amount Spiked	Spiked Sample	% Recovery	Accept Limits
Benzene	221	50.0	274	101%	39 - 150
Toluene	10.6	50.0	60.9	100%	46 - 148
Ethylbenzene	11.1	50.0	61.4	100%	32 - 160
p,m-Xylene	17.7	100.0	118	100%	46 - 148
o-Xylene	4.9	50.0	55.0	100%	46 - 148

ND - Parameter not detected at the stated detection limit.

* - Administrative Limits 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 F424 - F430 and F435.


Analyst


Review

BLAGG ENGINEERING, INC.
MONITOR WELL SAMPLING DATA

CLIENT : BP AMOCO

CHAIN-OF-CUSTODY # : 10595

GCU COM H # 180

LABORATORY (S) USED : ON - SITE TECH.

UNIT J, SEC. 28, T29N, R12W

Date : June 13, 2000

SAMPLER : N J V

Filename : 06-13-00.WK4

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)
1R			4.96	10.00	1135	7.5	2,300	2.50	-
2	TOP OF CASING FOUND DESTROYED - JUNE 1998								
3	99.59	95.33	4.26	-	-	-	-	-	-
4	101.00	95.67	5.33	-	-	-	-	-	-

NOTES : Volume of water purged from well prior to sampling: $V = \pi \times r^2 \times h \times 7.48 \text{ gal./ft}^3 \times 3 \text{ (wellbores)}$.
(i.e. 2" MW $r = (1/12) \text{ ft}$. $h = 1 \text{ ft}$.) (i.e. 4" MW $r = (2/12) \text{ ft}$. $h = 1 \text{ ft}$.)

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".

MW # 1R drilled & installed on 6 / 9 / 00 . Developed on 6 / 12 / 00 . Poor recovery (0.30 ft. / 5 min.)

Collected BTEX samples from MW # 1R only . Inadequate info. for groundwater contour map .

OFF: (505) 325-5667
FAX: (505) 327-1496



LAB: (505) 325-1556
FAX: (505) 327-1496

ANALYTICAL REPORT

Date: 27-Jun-00

Client:	Blagg Engineering	Client Sample Info:	GCU Com H #180
Work Order:	0006032	Client Sample ID:	MW #1R
Lab ID:	0006032-01A	Matrix:	AQUEOUS
Project:	BP Amoco - GCU Com H #180	Collection Date:	6/13/2000 11:35:00 AM
		COC Record:	10595

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
AROMATIC VOLATILES BY GC/PID		SW8021B		Analyst: DC		
Benzene	230	2.5		µg/L	5	6/23/2000
Toluene	ND	2.5		µg/L	5	6/23/2000
Ethylbenzene	170	2.5		µg/L	5	6/23/2000
m,p-Xylene	1100	5		µg/L	5	6/23/2000
o-Xylene	6.9	2.5		µg/L	5	6/23/2000

Qualifiers:	PQL - Practical Quantitation Limit	S - Spike Recovery outside accepted recovery limits
	ND - Not Detected at Practical Quantitation Limit	R - RPD outside accepted recovery limits
	J - Analyte detected below Practical Quantitation Limit	E - Value above quantitation range
	B - Analyte detected in the associated Method Blank	Surrogate - Surrogate

1 of 1

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

On Site Technologies, LTD.

Date: 27-Jun-00

CLIENT: Blagg Engineering
Work Order: 0006032
Project: BP Amoco - GCU Com H #180

QC SUMMARY REPORT

Method Blank

Sample ID: MB1	Batch ID: GC-1_000618	Test Code: SW8021B	Units: µg/L	Analysis Date: 6/18/2000	Prep Date:
Client ID:	0006032	Run ID: GC-1_000618A		SeqNo: 28759	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Benzene	ND	0.5			
Ethylbenzene	ND	0.5			
m,p-Xylene	ND	1			
Methyl tert-Butyl Ether	ND	1			
o-Xylene	ND	0.5			
Toluene	.0732	0.5			J

Sample ID: MB1	Batch ID: GC-1_000623	Test Code: SW8021B	Units: µg/L	Analysis Date: 6/23/2000	Prep Date:
Client ID:	0006032	Run ID: GC-1_000623A		SeqNo: 29251	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Benzene	.0328	0.5			J
Ethylbenzene	.0553	0.5			J
m,p-Xylene	.1081	1			J
Methyl tert-Butyl Ether	ND	1			
o-Xylene	.0693	0.5			J
Toluene	.0934	0.5			J

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 27-Jun-00

CLIENT: Blagg Engineering
 Work Order: 0006032
 Project: BP Amoco - GCU Com H #180

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: 0006034-02AMS		Batch ID: GC-1_000618		Test Code: SW8021B		Units: µg/L		Analysis Date: 6/18/2000		Prep Date:	
Client ID: 0006032		Run ID: GC-1_000618A		SeqNo: 28760							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	4968	50	4000	419.3	113.7%	73	126				
Ethylbenzene	4553	50	4000	128.6	110.6%	88	113				
m,p-Xylene	8680	100	8000	278.6	105.0%	83	112				
Methyl tert-Butyl Ether	10220	100	4000	5312	122.7%	81	125				S
o-Xylene	4463	50	4000	11.62	111.3%	93	110				
Toluene	4498	50	4000	23.21	111.9%	76	126				

Sample ID: 0006034-02AMSD		Batch ID: GC-1_000618		Test Code: SW8021B		Units: µg/L		Analysis Date: 6/18/2000		Prep Date:	
Client ID: 0006032		Run ID: GC-1_000618A		SeqNo: 28761							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	4478	50	4000	419.3	101.5%	73	126	4968	10.4%	6	R
Ethylbenzene	4106	50	4000	128.6	99.4%	88	113	4553	10.3%	5	R
m,p-Xylene	7836	100	8000	278.6	94.5%	83	112	8680	10.2%	7	R
Methyl tert-Butyl Ether	9378	100	4000	5312	101.7%	81	125	10220	8.6%	9	
o-Xylene	4038	50	4000	11.62	100.7%	93	110	4463	10.0%	6	R
Toluene	4058	50	4000	23.21	100.9%	76	126	4498	10.3%	6	R

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Blagg Engineering
Work Order: 0006032
Project: BP Amoco - GCU Com H #180

QC SUMMARY REPORT
 Sample Matrix Spike

Sample ID: 0006034-10AMS		Batch ID: GC-1_000623		Test Code: SW8021B		Units: µg/L		Analysis Date: 6/23/2000		Prep Date:	
Client ID: 0006032		Run ID: 0006032		PQL		GC-1_000623A		SeqNo: 29252			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	3604	25	2000	1556	102.4%	73	126				
Ethylbenzene	2481	25	2000	508.7	98.6%	88	113				
m,p-Xylene	4360	50	4000	560.3	95.0%	83	112				
Methyl tert-Butyl Ether	9709	50	2000	7623	104.3%	81	125				
o-Xylene	2043	25	2000	11.82	101.5%	93	110				
Toluene	2060	25	2000	12.97	102.4%	76	126				

Sample ID: 0006034-10AMS		Batch ID: GC-1_000623		Test Code: SW8021B		Units: µg/L		Analysis Date: 6/23/2000		Prep Date:	
Client ID: 0006032		Run ID: 0006032		PQL		GC-1_000623A		SeqNo: 29253			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	3495	25	2000	1556	96.9%	73	126	3604	3.1%	6	
Ethylbenzene	2407	25	2000	508.7	94.9%	88	113	2481	3.0%	5	
m,p-Xylene	4238	50	4000	560.3	92.0%	83	112	4360	2.8%	7	
Methyl tert-Butyl Ether	9633	50	2000	7623	100.5%	81	125	9709	0.8%	9	
o-Xylene	1992	25	2000	11.82	99.0%	93	110	2043	2.5%	6	
Toluene	2004	25	2000	12.97	99.6%	76	126	2060	2.8%	6	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 27-Jun-00

CLIENT: Blagg Engineering
Work Order: 0006032
Project: BP Amoco - GCU Com H #180

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS WATER		Batch ID: GC-1_000618		Test Code: SW8021B		Units: µg/L		Analysis Date: 6/18/2000		Prep Date:	
Client ID:		0006032		Run ID:		GC-1_000618A		SeqNo: 28758			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	41.57	0.5	40	0	103.9%	89	112				
Ethylbenzene	41.32	0.5	40	0	103.3%	93	112				
m,p-Xylene	78.76	1	80	0	98.4%	88	108				
Methyl tert-Butyl Ether	41.71	1	40	0	104.3%	87	115				
o-Xylene	41.67	0.5	40	0	104.2%	93	112				
Toluene	41.5	0.5	40	0.0732	103.6%	92	111				

Sample ID: LCS WATER		Batch ID: GC-1_000623	Test Code: SW8021B	Units: µg/L	Analysis Date: 6/23/2000		Prep Date:				
Client ID:		0006032	Run ID:	GC-1_000623A	SeqNo:	29250					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	40.49	0.5	40	0.0328	101.1%	89	112				
Ethylbenzene	39.96	0.5	40	0.0553	99.8%	93	112				
m,p-Xylene	75.89	1	80	0.1081	94.7%	88	108				
Methyl tert-Butyl Ether	41.85	1	40	0	104.6%	87	115				
o-Xylene	40.3	0.5	40	0.0693	100.6%	93	112				
Toluene	40.41	0.5	40	0.0934	100.8%	92	111				

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 27-Jun-00

CLIENT: Blagg Engineering
 Work Order: 0006032
 Project: BP Amoco - GCU Com H #180

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV1 BTEX_0004		Batch ID: GC-1_000618	Test Code: SW8021B	Units: µg/L		Analysis Date: 6/18/2000		Prep Date:	
Client ID: 0006032		Run ID: GC-1_000618A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	SeqNo: 28755
Analyte	Result								
Benzene	21.11		0.5	20	0	105.5%	85	115	
Ethylbenzene	20.86		0.5	20	0	104.3%	85	115	
m,p-Xylene	39.72		1	40	0	99.3%	85	115	
Methyl tert-Butyl Ether	21.2		1	20	0	106.0%	85	115	
o-Xylene	21.01		0.5	20	0	105.0%	85	115	
Toluene	20.95		0.5	20	0	104.8%	85	115	
1,4-Difluorobenzene	90.2		0	100	0	90.2%	80	105	
4-Bromochlorobenzene	84.81		0	100	0	84.8%	78	108	
Fluorobenzene	88.54		0	100	0	88.5%	78	108	

Sample ID: CCV2 BTEX_0004		Batch ID: GC-1_000618	Test Code: SW8021B	Units: µg/L		Analysis Date: 6/18/2000		Prep Date:	
Client ID: 0006032		Run ID: GC-1_000618A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	SeqNo: 28756
Analyte	Result								
Benzene	21.22		0.5	20	0	106.1%	85	115	
Ethylbenzene	20.88		0.5	20	0	104.4%	85	115	
m,p-Xylene	39.93		1	40	0	99.8%	85	115	
Methyl tert-Butyl Ether	22.52		1	20	0	112.6%	85	115	
o-Xylene	21.12		0.5	20	0	105.6%	85	115	
Toluene	21.03		0.5	20	0	105.1%	85	115	
1,4-Difluorobenzene	89.71		0	100	0	89.7%	80	105	
4-Bromochlorobenzene	84.41		0	100	0	84.4%	78	108	
Fluorobenzene	88.62		0	100	0	88.6%	78	108	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Blagg Engineering
Work Order: 0006032
Project: BP Amoco - GCU Com H #180

QC SUMMARY REPORT
 Continuing Calibration Verification Standard

Sample ID: CCV3 BTEX_0004		Batch ID: GC-1_000618	Test Code: SW8021B	Units: µg/L		Analysis Date: 6/18/2000		Prep Date:	
Client ID: 0006032		Run ID: GC-1_000618A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	SeqNo: 28757
Analyte	Result								
Benzene	42.5	0.5	0	40	0	106.3%	85	115	
Ethylbenzene	42.22	0.5	0	40	0	105.5%	85	115	
m,p-Xylene	80.24	1	0	80	0	100.3%	85	115	
Methyl tert-Butyl Ether	44.61	1	0	40	0	111.5%	85	115	
o-Xylene	42.68	0.5	0	40	0	106.7%	85	115	
Toluene	42.52	0.5	0	40	0	106.3%	85	115	
1,4-Difluorobenzene	89.3	0	0	100	0	89.3%	80	105	
4-Bromochlorobenzene	84.12	0	0	100	0	84.1%	78	108	
Fluorobenzene	88.14	0	0	100	0	88.1%	78	108	

Sample ID: CCV1 BTEX_0004		Batch ID: GC-1_000623	Test Code: SW8021B	Units: µg/L		Analysis Date: 6/23/2000		Prep Date:	
Client ID: 0006032		Run ID: GC-1_000623A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	SeqNo: 29247
Analyte	Result								
Benzene	20.96	0.5	0	20	0	104.8%	85	115	
Ethylbenzene	20.79	0.5	0	20	0	103.9%	85	115	
m,p-Xylene	39.54	1	0	40	0	98.8%	85	115	
Methyl tert-Butyl Ether	21.29	1	0	20	0	106.5%	85	115	
o-Xylene	20.89	0.5	0	20	0	104.4%	85	115	
Toluene	20.95	0.5	0	20	0	104.7%	85	115	
1,4-Difluorobenzene	89.35	0	0	100	0	89.4%	80	105	
4-Bromochlorobenzene	84.87	0	0	100	0	84.9%	78	108	
Fluorobenzene	87.81	0	0	100	0	87.8%	78	108	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

CLIENT: Blagg Engineering
Work Order: 0006032
Project: BP Amoco - GCU Com H #180

QC SUMMARY REPORT
 Continuing Calibration Verification Standard

Sample ID: CCV2 BTEX_0004		Batch ID: GC-1_000623	Test Code: SW8021B	Units: µg/L		Analysis Date: 6/23/2000			Prep Date:				
Client ID:	0006032	Run ID:	GC-1_000623A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Analyte	Result												
Benzene	21.08			0.5	20	0	105.4%	85	115				
Ethylbenzene	20.84			0.5	20	0	104.2%	85	115				
m,p-Xylene	39.7			1	40	0	99.3%	85	115				
Methyl tert-Butyl Ether	22.3			1	20	0	111.5%	85	115				
o-Xylene	21.05			0.5	20	0	105.2%	85	115				
Toluene	21.08			0.5	20	0	105.4%	85	115				
1,4-Difluorobenzene	89.65			0	100	0	89.7%	80	105				
4-Bromochlorobenzene	84.1			0	100	0	84.1%	78	108				
Fluorobenzene	87.84			0	100	0	87.8%	78	108				

Sample ID: CCV3 BTEX_0004		Batch ID: GC-1_000623	Test Code: SW8021B	Units: µg/L		Analysis Date: 6/23/2000		Prep Date:				
Client ID: 0006032		Run ID: GC-1_000623A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Analyte	Result											
Benzene	42.7	0.5	40	0	106.7%	85	115					
Ethylbenzene	41.88	0.5	40	0	104.7%	85	115					
m,p-Xylene	79.61	1	80	0	99.5%	85	115					
Methyl tert-Butyl Ether	44.54	1	40	0	111.4%	85	115					
o-Xylene	42.28	0.5	40	0	105.7%	85	115					
Toluene	42.6	0.5	40	0	106.5%	85	115					
1,4-Difluorobenzene	89.71	0	100	0	89.7%	80	105					
4-Bromochlorobenzene	83.17	0	100	0	83.2%	78	108					
Fluorobenzene	87.65	0	100	0	87.7%	78	108					

CLIENT: Blagg Engineering
Work Order: 0006032
Project: BP Amoco - GCU Com H #180
Test No: SW8021B

QC SUMMARY REPORT SURROGATE RECOVERIES

Aromatic Volatiles by GC/PID

Sample ID	14FBZ	4BCBZ	FLBZ
0006026-07A	86.2	83.6	86
0006028-04A	89.9	83.7	89.5
0006028-14A	89.9	83.4	88.9
0006030-01A	90.2	84.6	89.5
0006030-02A	88.9	84.9	87.6
0006030-03A	90.8	83.8	89.8
0006030-04A	90.3	83.3	89.5
0006030-05A	90.2	84.1	89.3
0006030-06A	87.9	85.1	86.4
0006031-01A	89.2	82.6	89.3
0006031-02A	86.6	81.8	89
0006031-03A	89.8	83.3	89.1
0006032-01A	84.9	84.7	85.6
0006033-01A	87.8	82.8	87.3
0006034-01A	90.4	83.7	89.4
0006034-02A	88.4	86.2	87.4
0006034-02AMS	89.5	84.5	88
0006034-02AMSD	89.6	84.7	88.2
0006034-03A	94.1	85.8	88.3
0006034-04A	88	83.2	87
0006034-05A	88.7	85.4	87
0006034-06A	90.4	84.3	89.2
0006034-07A	88.1	86	86.7
0006034-08A	88.5	85.2	86.4
0006034-09A	88.2	85.2	87
0006034-10A	88.7	84.9	87.4
0006034-10AMS	88.6	85	87.3

Acronym

Surrogate

QC Limits

14FBZ	=	1,4-Difluorobenzene	80-105
4BCBZ	=	4-Bromochlorobenzene	78-108
FLBZ	=	Fluorobenzene	78-108

* Surrogate recovery outside acceptance limits

CLIENT: Blagg Engineering
Work Order: 0006032
Project: BP Amoco - GCU Com H #180
Test No: SW8021B

QC SUMMARY REPORT SURROGATE RECOVERIES

Aromatic Volatiles by GC/PID

Sample ID	14FBZ	4BCBZ	FLBZ
0006034-10AMSD	88.8	85.8	87
0006034-11A	89.8	85	88.5
0006034-12A	90.3	84.8	88.3
0006034-13A	89.6	84.3	88
0006034-14A	89.6	84.6	88.2
0006034-15A	89.4	85.3	87.5
0006034-16A	88.2	85	87.1
0006034-17A	88.3	84.3	86.8
0006034-18A	89.9	84.1	88
0006034-19A	89	84.5	87.3
0006034-20A	88.5	84.7	86.8
0006034-21A	89.8	85.2	88.8
0006036-01A	89.4	83.4	88.4
CCV1 BTEX_00040	89.4	84.9	87.8
CCV2 BTEX_00040	89.6	84.1	87.8
CCV3 BTEX_00040	89.7	83.2	87.6
LCS WATER	89.4	84.4	87.4
MBI	90.3	83.7	88.4

Acronym	Surrogate	QC Limits
14FBZ	= 1,4-Difluorobenzene	80-105
4BCBZ	= 4-Bromochlorobenzene	78-108
FLBZ	= Fluorobenzene	78-108

* Surrogate recovery outside acceptance limits

ptl

94060

JOB No: 92140
PAGE No: 1 of 2

DATE STARTED: 4/29/92
DATE FINISHED: _____
ENVIRO. SPCLT: RB
OPERATOR: DB
ASSISTANT: LT

LOCATION: LSE: Gallinas Canyon 180 WELL: 1 QD: NW 1/4, SE 1/4
SEC: 28 TWP: T29N RNG: R12W PM: NMPM CNTY: ST ST: NM PIT: SEP PIT
LAND USE: Industrial site adjacent to McGee Park Coliseum
SURFACE CONDITIONS: 12' w x 6' Fiberglass tank buried on site.

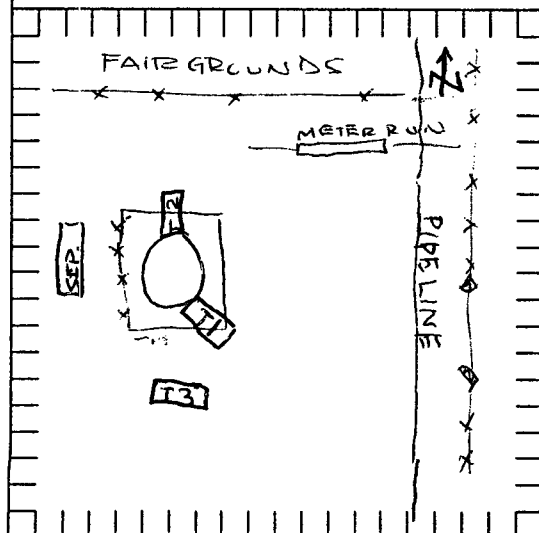
FIELD NOTES & REMARKS: Immed. pit site heavily contaminated w/ free product in ground water. T1+T2 shows dark/black layer @ 3' to GW depth. T3+4 show gray/black layer @ 5' to GW. All 4 Test pits have strong H₂S gas smell when dark soils are uncovered by backhoe. I would recommend this site for TCLP analysis

SAMPLE INVENTORY:		
SAMPL ID:	SAMPL TYPE:	LABORATORY ANALYSIS:
T1-3'	SOIL	Head
T1-GW	WATER	Head
T1-GW	WATER	8020
T1-2GW	WATER	TPH/418.1

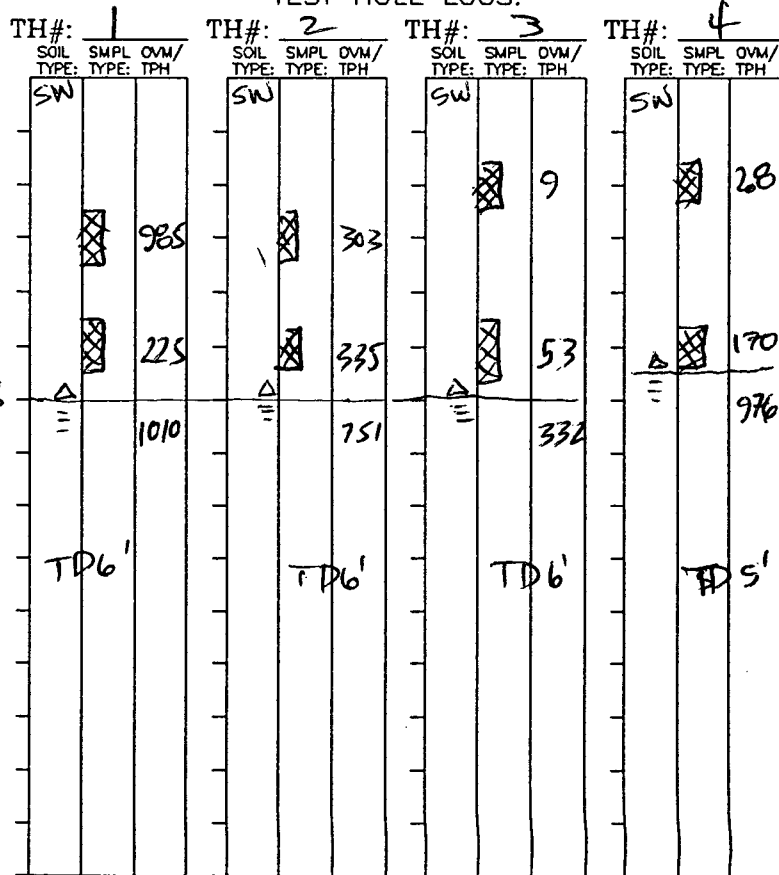
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SCALE

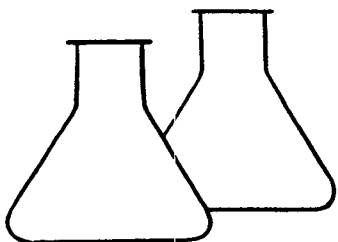
SITE DIAGRAM



TEST HOLE LOGS:



SOIL TYPE: C - Clay, M - SILT, S - Sand, G - Gravel Plasticity: L - None, H - Plastic Grading: P - Poor, W - Well



ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 418.1 TOTAL PETROLEUM HYDROCARBONS

Client: AMOCO
Sample ID: T-1 @ 3'
Laboratory Number: 0285
Sample Matrix: Soil
Preservative: Cool
Condition: Cool & Intact

Project #: 92140
Date Reported: 06-16-92
Date Sampled: 04-29-92
Date Received: NA
Date Analyzed: 05-19-92
Analysis Needed: TPH

Parameter	Concentration (mg/kg)	Det. Limit (mg/kg)
Total Petroleum Hydrocarbons	1,800	5.0

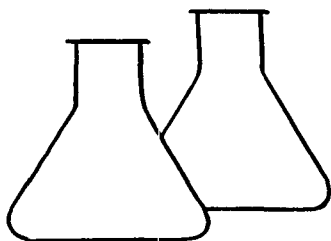
Method: Method 418.1, Petroleum Hydrocarbons, Total Recoverable, Chemical Analysis of Water and Waste, USEPA Storet No.4551, 1978

ND - Parameter not detected at the stated detection limit.

Comments: Gallegos Canyon 180 Separator Pit 1 94060

Tony Triano
Analyst

Hal P.
Review



ENVIROTECH LABS

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PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020 AROMATIC VOLATILE ORGANICS HEADSPACE EXTRACTION

Client:	AMOCO	Project #:	92140
Sample ID:	T1 @ 3'	Date Reported:	08-20-92
Laboratory Number:	0281	Date Sampled:	04-29-92
Sample Matrix:	Soil	Date Received:	04-29-92
Preservative:	NA	Date Analyzed:	06-18-92
Condition:	Cool & Intact	Analysis Requested:	BTEX

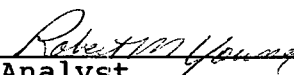
Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	3,230	1.6
Toluene	3,130	1.6
Ethylbenzene	1,480	1.6
p,m-Xylene	70,800	12.0
o-Xylene	1,080	1.6

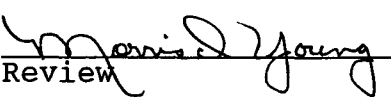
Method: Method 3810, Headspace, Test Methods for Evaluating
Solid Waste, SW-846, USEPA, Sept. 1986

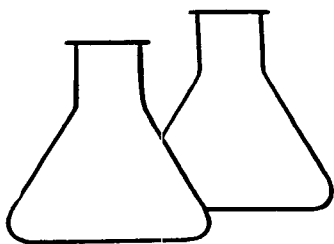
Method 8020, Aromatic Volatile Organics, Test Methods for
Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: GCU Com H 180---Separator Pit 1---94060


Analyst


Review



ENVIROTECH LABS

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PHONE: (505) 632-0615 • FAX: (505) 632-1865

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

Client: Amoco
Sample ID: T1-2 @GW
Laboratory Number: 0288
Analysis Requested: 418.1
Sample Matrix: Water
Condition: Received on Ice

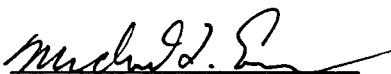
Report Date: 5-4-92
Date Sampled: 4-29-92
Date Received: 4-29-92
Date Extracted: 5-1-92
Date Analyzed: 5-1-92
Preservative: Cool

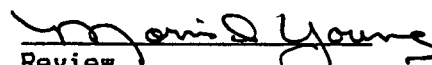
Parameter	Concentration (mg/l)	Det. Limit (mg/l)
Total Recoverable Petroleum Hydrocarbons	2280	10.0

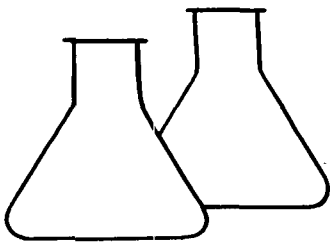
Method: Method 418.1, Petroleum Hydrocarbons, Total Recoverable, Chemical Analysis of Water and Waste, USEPA Storet No. 4551, 1978

ND - Parameter not detected at the stated detection limit.

Comments: Gallegos Canyon 180 - Separator Pit #1 94060


Analyst


Review



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PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020 AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	T1 @ GW	Date Reported:	10-26-92
Laboratory Number:	0283	Date Sampled:	04-29-92
Sample Matrix:	Water	Date Received:	04-29-92
Preservative:	HgCl & Cool	Date Analyzed:	05-29-92
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	26,400	100
Toluene	25,600	400
Ethylbenzene	590	150
p,m-Xylene	6,200	400
o-Xylene	1,220	150

SURROGATE RECOVERIES:	Parameter	Percent Recovery
	Trifluorotoluene	83.6 %
	Bromfluorobenzene	99.8 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

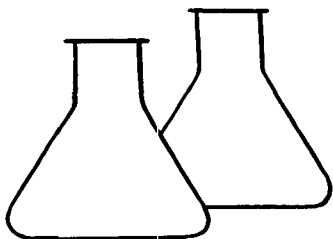
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: GCU Com H 180--Separator Pit 1--94060
This report was inadvertently reported as
Laboratory Number #0282 for BTEX Analysis.

Robert M. Young
Analyst

Imorris D. Young
Review



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EPA METHOD 8020 AROMATIC VOLATILE ORGANICS HEADSPACE EXTRACTION

Client:	AMOCO	Project #:	92140
Sample ID:	T1 @ GW	Date Reported:	08-20-92
Laboratory Number:	0282	Date Sampled:	04-29-92
Sample Matrix:	Water	Date Received:	04-29-92
Preservative:	Cool	Date Analyzed:	06-18-92
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	303	1.6
Toluene	382	1.6
Ethylbenzene	250	1.6
p,m-Xylene	2,390	12.0
o-Xylene	372	1.6

Method: Method 3810, Headspace, Test Methods for Evaluating
Solid Waste, SW-846, USEPA, Sept. 1986

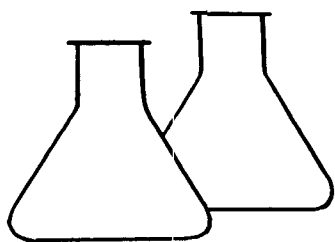
Method 8020, Aromatic Volatile Organics, Test Methods for
Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: GCU Com H 180---Separator Pit 1---94060

Robert M. Young
Analyst

Moni S. Young
Review



ENVIROTECH LABS

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PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020 AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	T2 @ GW	Date Reported:	08-12-92
Laboratory Number:	0284	Date Sampled:	04-29-92
Sample Matrix:	Water	Date Received:	04-29-92
Preservative:	HgCl & Cool	Date Analyzed:	05-29-92
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	11,100	20
Toluene	870	80
Ethylbenzene	ND	30
p,m-Xylene	10,700	80
o-Xylene	1,500	30

SURROGATE RECOVERIES:	Parameter	Percent Recovery
	Trifluorotoluene	76.1 %
	Bromfluorobenzene	101.3 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

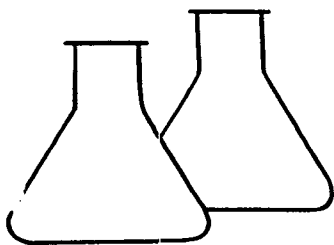
Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Gallegos Canyon 180--Separator Pit 1--94060

Robert M. Young
Analyst

Marissa Young
Review



ENVIROTECH LABS

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PHONE: (505) 632-0615 • FAX: (505) 632-1865

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

Client: Amoco
Sample ID: T3-4 @GW
Laboratory Number: 0289
Analysis Requested: 418.1
Sample Matrix: Water
Condition: Received on Ice

Report Date: 5-4-92
Date Sampled: 4-29-92
Date Received: 4-29-92
Date Extracted: 5-1-92
Date Analyzed: 5-1-92
Preservative: Cool

Parameter	Concentration (mg/l)	Det. Limit (mg/l)
Total Recoverable Petroleum Hydrocarbons	17.6	10.0

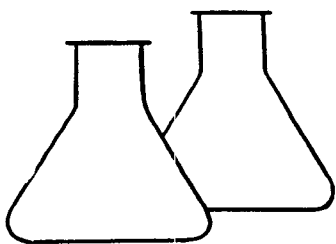
Method: Method 418.1, Petroleum Hydrocarbons, Total Recoverable, Chemical Analysis of Water and Waste, USEPA Storet No. 4551, 1978

ND - Parameter not detected at the stated detection limit.

Comments: Gallegos Canyon 180 - Separator Pit #1 94060

Michael L. En
Analyst

Married Young
Review



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EPA METHOD 418.1 TOTAL PETROLEUM HYDROCARBONS

Client: AMOCO
Sample ID: T-5 @ 5'
Laboratory Number: 0286
Sample Matrix: Soil
Preservative: Cool
Condition: Cool & Intact

Project #: 92140
Date Reported: 06-16-92
Date Sampled: 04-29-92
Date Received: NA
Date Analyzed: 05-19-92
Analysis Needed: TPH

Parameter -----	Concentration (mg/kg) -----	Det. Limit (mg/kg) -----
Total Petroleum Hydrocarbons	700	5.0

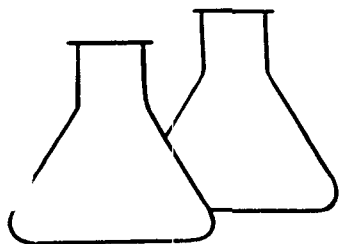
Method: Method 418.1, Petroleum Hydrocarbons, Total Recoverable, Chemical Analysis of Water and Waste, USEPA Storet No.4551, 1978

ND - Parameter not detected at the stated detection limit.

Comments: Gallegos Canyon 180 Separator Pit 1 94060

Tony Tristano
Analyst

Karl P.
Review



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EPA METHOD 418.1 TOTAL PETROLEUM HYDROCARBONS

Client: AMOCO
Sample ID: T-6 @ 5'
Laboratory Number: 0287
Sample Matrix: Soil
Preservative: Cool
Condition: Cool & Intact

Project #: 92140
Date Reported: 06-16-92
Date Sampled: 04-29-92
Date Received: NA
Date Analyzed: 05-19-92
Analysis Needed: TPH

Parameter	Concentration (mg/kg)	Det. Limit (mg/kg)
Total Petroleum Hydrocarbons	25.6	5.0

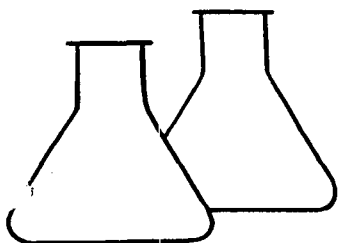
Method: Method 418.1, Petroleum Hydrocarbons, Total Recoverable, Chemical Analysis of Water and Waste, USEPA Storet No.4551, 1978

ND - Parameter not detected at the stated detection limit.

Comments: Gallegos Canyon 180 Separator Pit 1 94060

Tony Tristano
Analyst

Karl P.
Review



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TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

Client: Amoco
Sample ID: T5-6 @GW
Laboratory Number: 0290
Analysis Requested: 418.1
Sample Matrix: Water
Condition: Received on Ice

Report Date: 5-4-92
Date Sampled: 4-29-92
Date Received: 4-29-92
Date Extracted: 5-4-92
Date Analyzed: 5-4-92
Preservative: Cool

Parameter	Concentration (mg/l)	Det. Limit (mg/l)
Total Recoverable Petroleum Hydrocarbons	252	10.0

Method: Method 418.1, Petroleum Hydrocarbons, Total Recoverable, Chemical Analysis of Water and Waste, USEPA Storet No. 4551, 1978

ND - Parameter not detected at the stated detection limit.

Comments: Gallegos Canyon 180 - Separator Pit #1 94060

Analyst

Review

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CHAIN OF CUSTODY RECORD

Client/Project Name		Project Location		SEP PIT 1		94060		ANALYSIS/PARAMETERS		Remarks	
AMOCO/92140		Gulfcoast Canyon		Chain of Custody Tape No.		180					
Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BETX HEAD	8020	TPH/PHB			
T1C 3'	4/29/92	0830	0281	SOL	1	✓					
T1C GW	4/29/92	0830	0282	WATER	1	✓					
T1C GW	4/29/92	0830	0283	WATER	2		✓				
T2C GW	4/29/92	0900	0284	WATER	2		✓				
T1C 3'	4/29/92	0900	0285	SOL	1			✓			
T5C 5'	4/29/92	1030	0286	SOL	1			✓			
T6C 5'	4/29/92	1045	0287	SOL	1			✓			
T1-2 - GW	4/29/92	0845	0288	WATER	1			✓			
T 3-4 - GW	4/29/92	1020	0289	WATER	1			✓			
Relinquished by: (Signature)		Date		Time	Received by: (Signature)		Date		Time		
Larry Benally		4/29/92		1516	Michael J. Z. Z...		4-29-92		1516		
Relinquished by: (Signature)					Received by: (Signature)						
Relinquished by: (Signature)					Received by: (Signature)						

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[illegible]

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