

**3R -** 17

# **REPORTS**

**DATE:**

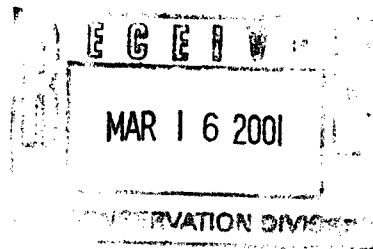
MAR. 13, 2001

17

**BLAGG ENGINEERING, INC.**

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

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



March 13, 2001

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) # 153E, Unit C, 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 # 153E.

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

GCU153E.CVL.WPD

# **BP Amoco - GCU # 153E - Separator & Dehydrator Pits**

## **Ne/4 Nw/4 Sec. 28, T29N, R12W**

**Pit Closure Dates (dehydrator pit):** 12/30/94 & 2/20/95 (Documentation Included)

**Monitor Well Installation Dates:** 6/27/95 (WP #3B - replaced MW #3A), 6/9/00 (MW #3R - replaced WP #3B)

**Monitor Well Sampling Dates:** (See following summary table)

### **Groundwater Monitor Well Sampling Procedures:**

Groundwater samples were collected from site monitor wells (*Figure 1, 1A & 1B*) 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 NMOC approved groundwater work plan, dated October 2, 1996, and continues annual groundwater monitoring at the site.

MW # 7A 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. Benzene level within MW # 2A has fluctuated above and below the NMWQCC standard since January, 1993, but has predominantly exceeded the standard. MW # 3A (*same location as WP # 3 and MW # 3R - see installation dates above as well as the enclosed monitor well details*) benzene level has exceeded NMWQCC standard since January, 1993, but has been decreasing significantly since June, 1997.

Based on the enclosed site monitor well information, groundwater flow has varied between due west (June, 1999 - *Figure 6*) and the south-southwest direction (June, 1996 - *Figure 3*). Based on the more available data represented on *Figure 2*, the predominant groundwater flow appears to be in the southwest direction. The remaining groundwater gradient maps are displayed on *Figures 3 through Figure 7*.

### **Summary and/or Recommendations:**

Based on the aforementioned and enclosed documentation, the groundwater contamination identified at the dehydrator pit and near the separator steel tank pit area (MW #'s 3A and 2A respectively) continues to exceed NMWQCC regulatory standards for BTEX. However, since the June, 1997 sampling event, the BTEX levels within MW # 3A has continued to decrease over time, suggesting that the groundwater hydrocarbon contamination may be remediating by natural attenuation in that vicinity. MW # 2A, being up gradient of MW # 3A for the majority of the groundwater flow direction data compiled, does not appear to show any detrimental effects on MW #3A, suggesting at worse, a steady state and isolated condition.

It is therefore suggested to continue annual monitoring of MW #'s 3R and 2A to evaluate the decreasing trend and steady state condition observed in the BTEX values.

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

**BP AMOCO GROUNDWATER MONITOR WELL LABORATORY RESULTS**  
**SUBMITTED BY BLAGG ENGINEERING, INC.**

**GCU # 153E**  
**UNIT C, SEC. 28, T29N, R12W**

REVISED DATE: MARCH 13, 2001  
 FILENAME: (15-2Q-00.WK4) NJV

| SAMPLE<br>DATE | MONITOR<br>WELL No: | D.T.W.<br>(ft) | T.D.<br>(ft) | TDS<br>(ft) | COND.<br>(umhos/cm) | pH  | PRODUCT<br>(ft) | BTEX EPA METHOD 8021 (PPB) |         |                  |                   |
|----------------|---------------------|----------------|--------------|-------------|---------------------|-----|-----------------|----------------------------|---------|------------------|-------------------|
|                |                     |                |              |             |                     |     |                 | Benzene                    | Toluene | Ethyl<br>Benzene | Total *<br>Xylene |
| 08-Mar-96      | MW #1A              | 14.95          | 20.00        | 4,460       | 3,200               | 7.2 |                 | ND                         | 0.73    | ND               | ND                |
| 12-Jan-93      | MW #2A              | 11.50          |              | 4,460       | 5,700               | 6.6 |                 | 11.5                       | 12.1    | ND               | 54.0              |
| 05-May-93      |                     | 10.34          |              |             | 3,400               | 6.6 |                 | 14.0                       | 6.9     | 10.9             | 20.1              |
| 01-Sep-93      |                     | 11.54          | 15.83        |             | 2,800               | 7.1 |                 | 700                        | 10.4    | 244              | 82.9              |
| 01-Dec-93      |                     | 11.42          |              |             | 4,800               | 7.0 |                 | 118                        | 1.6     | 76.0             | 44.7              |
| 08-Mar-94      |                     | 11.01          |              |             | 4,600               | 7.2 |                 | 24.1                       | 8.5     | 24.5             | 29.3              |
| 27-Jun-94      |                     | 11.14          |              |             | 4,000               | 6.9 |                 | 350                        | 13.2    | 126              | ND                |
| 21-Sep-94      |                     | 11.80          |              |             | 3,500               | 6.9 |                 | 328.7                      | 13.3    | 140.8            | 1.5               |
| 16-Dec-94      |                     | 11.55          |              |             | 3,800               | 7.1 |                 | 6.7                        | 9.6     | 1.1              | 8.7               |
| 15-Mar-95      |                     | 11.15          |              |             | 4,400               | 6.8 |                 | 1.7                        | 5.0     | ND               | 3.8               |
| 16-Jun-95      |                     | 10.82          |              |             | 4,000               | 6.9 |                 | 36.5                       | 5.4     | 17.6             | 7.2               |
| 11-Sep-95      |                     | 11.39          |              |             | 3,100               | 7.2 |                 | 239                        | 17.0    | 168              | 35.6              |
| 08-Dec-95      |                     | 11.44          |              |             | 3,800               | 6.8 |                 | 50.2                       | 9.99    | 10.3             | 5.84              |
| 08-Mar-96      |                     | 11.08          |              |             | 2,700               | 6.7 |                 | 1.08                       | ND      | 2.71             | 0.87              |
| 17-Jun-96      |                     | 11.30          |              |             | 2,700               | 6.9 |                 | 230                        | 10.2    | 77.7             | 32.54             |
| 25-Jun-97      |                     | 10.52          |              |             | 2,600               | 6.8 |                 | 522                        | 6.6     | 82.6             | 44.6              |
| 12-Jun-98      |                     | 10.59          |              |             | 2,400               | 7.3 |                 | 125                        | 7.3     | 22.7             | 44.7              |
| 28-May-99      |                     | 10.05          |              |             | 2,700               | 6.8 |                 | 185                        | 47.8    | 44.1             | 73.4              |
| 26-May-00      |                     | 10.10          |              |             | 3,500               | 7.0 |                 | 220                        | ND      | 96               | 15                |
| 12-Jan-93      | MW #3A              | 11.40          |              |             | 6,800               | 7.0 |                 | 706000                     | 6438000 | 3684000          | 13999000          |
| 05-May-93      |                     | 10.38          |              |             | 4,900               | 7.0 |                 | 8200                       | 2210    | 1070             | 4340              |
| 01-Sep-93      |                     | 11.44          | 16.00        |             | 5,400               | 7.1 |                 | 8300                       | 800     | 660              | 2750              |
| 01-Dec-93      |                     | 11.33          |              |             |                     |     | 0.02            |                            |         |                  |                   |
| 08-Mar-94      |                     | 11.03          |              |             |                     |     | 0.03            |                            |         |                  |                   |
| 27-Jun-94      |                     |                |              |             |                     |     | 0.02            |                            |         |                  |                   |
| 21-Sep-94      |                     |                |              |             |                     |     | 0.01            |                            |         |                  |                   |
| 16-Dec-94      |                     | 11.97          |              |             |                     |     | 0.48            |                            |         |                  |                   |
| 28-Jun-95      | WP #3B              | 11.73          | 15.00        |             | 6,500               | 7.4 |                 | 1946.7                     | 1734.5  | 434.3            | 3150              |
| 11-Sep-95      |                     | 12.14          |              |             | 8,400               | 7.8 |                 | 752                        | 102     | 427              | 1386              |
| 08-Dec-95      |                     | 12.15          |              |             | 4,800               | 6.2 |                 | 772                        | 70.1    | 208              | 2070              |
| 08-Mar-96      |                     | 11.78          |              |             | 4,000               | 6.1 |                 | 775                        | 156     | 259              | 2480              |
| 17-Jun-96      |                     | 11.77          |              |             | 4,800               | 6.4 |                 | 764                        | 196     | 184              | 1515              |
| 25-Jun-97      |                     | 11.25          |              |             | 3,400               | 6.3 |                 | 1940                       | 167     | 143              | 727               |
| 12-Jun-98      |                     | 11.22          |              |             | 3,700               | 6.6 |                 | 276                        | 68.4    | 85.3             | 457.8             |
| 28-May-99      |                     | 11.56          |              |             | 3,900               | 6.5 |                 | 178                        | 98.0    | 50.5             | 250.3             |
| 13-Jun-00      | MW #3R              | 10.88          | 20.00        |             | 7,600               | 7.0 |                 | 360                        | 16      | 720              | 1234              |
| 08-Mar-96      | MW #4A              | 10.59          | 13.05        |             | 3,600               | 7.4 |                 | ND                         | ND      | ND               | ND                |
| 08-Mar-96      | MW #5A              | 11.75          | 14.04        |             | 12,300              | 7.8 |                 | ND                         | 1.14    | ND               | ND                |

**BP AMOCO GROUNDWATER MONITOR WELL LABORATORY RESULTS**  
**SUBMITTED BY BLAGG ENGINEERING, INC.**

**GCU #153E**  
**UNIT C, SEC. 28, T29N, R12W**

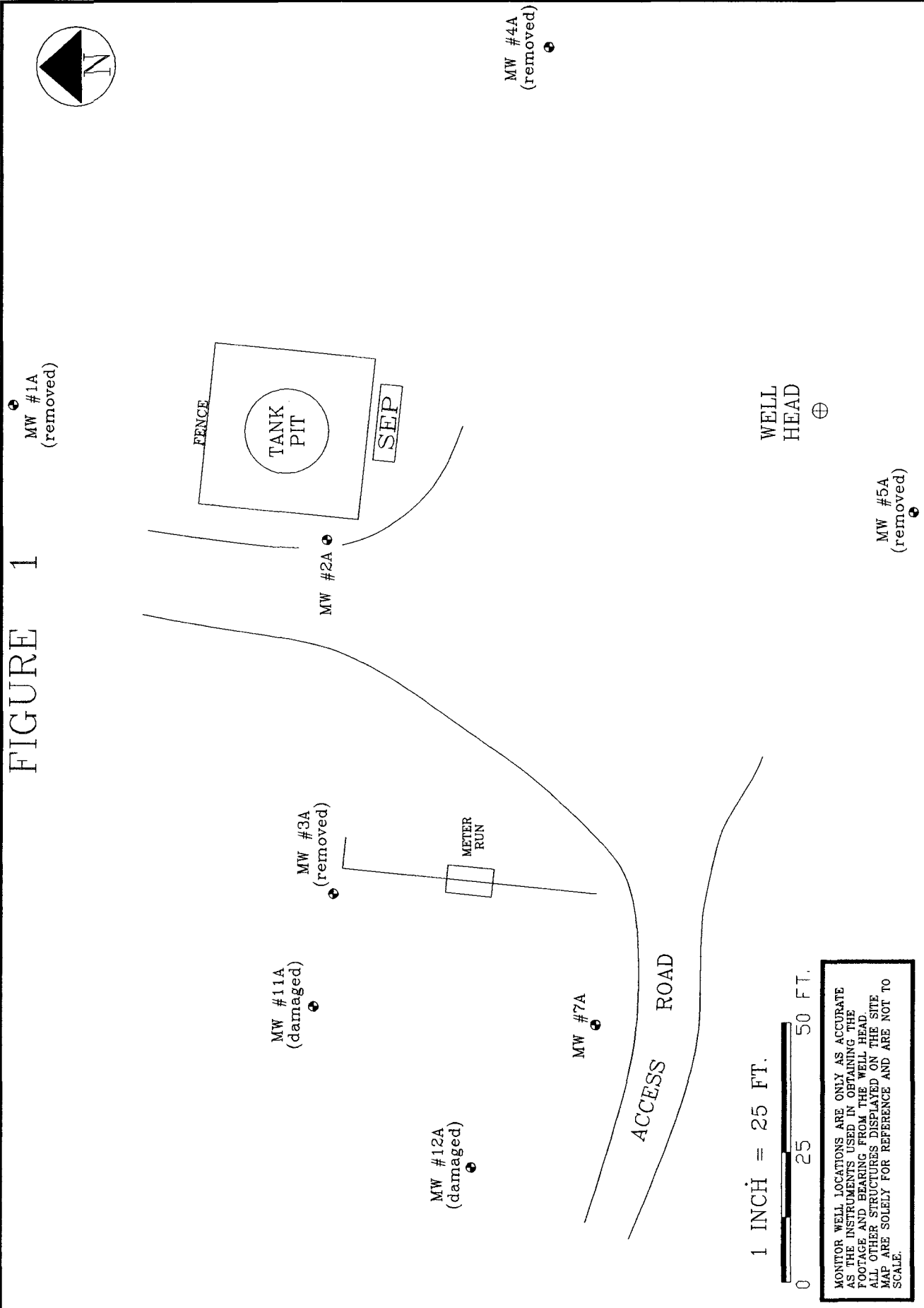
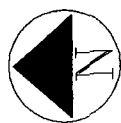
REVISED DATE: MARCH 13, 2001  
 FILENAME: (15-2Q-00.WK4) NJV

| SAMPLE<br>DATE | MONITOR<br>WELL No: | D.T.W.<br>(ft) | T.D.<br>(ft) | TDS<br>(ft) | COND.<br>(umhos/cm) | pH  | PRODUCT<br>(ft) | BTEX EPA METHOD 8021 (PPB) |         |                  |                 |
|----------------|---------------------|----------------|--------------|-------------|---------------------|-----|-----------------|----------------------------|---------|------------------|-----------------|
|                |                     |                |              |             |                     |     |                 | Benzene                    | Toluene | Ethyl<br>Benzene | Total<br>Xylene |
| 12-Jan-93      | MW #7A              | 12.42          |              |             | 12400               | 7.3 |                 | ND                         | 0.5     | ND               | 1.1             |
| 05-May-93      |                     | 10.56          |              |             | 10600               | 7.5 |                 | ND                         | ND      | ND               | 0.5             |
| 01-Sep-93      |                     | 11.90          | 16.60        |             | 10700               | 7.5 |                 | 0.2                        | ND      | ND               | 0.8             |
| 08-Mar-94      |                     | 11.10          |              |             | 16800               | 7.3 |                 | ND                         | ND      | ND               | ND              |
| 27-Jun-94      |                     | 11.23          |              |             | 13700               | 7.3 |                 | ND                         | ND      | ND               | ND              |
| 21-Sep-94      |                     | 12.30          |              |             | 13100               | 7.3 |                 | 0.8                        | 1       | ND               | 2.2             |
| 16-Dec-94      |                     | 11.69          |              |             | 9600                | 7.5 |                 | ND                         | ND      | ND               | ND              |
| 15-Mar-95      |                     | 11.21          |              |             | 18400               | 7.5 |                 | ND                         | ND      | ND               | ND              |
| 16-Jun-95      |                     | 10.88          |              |             | 12200               | 7.4 |                 | ND                         | ND      | ND               | ND              |
| 11-Sep-95      |                     | 11.64          |              |             | 11200               | 7.7 |                 | 1.1                        | 0.6     | 0.5              | 1.0             |
| 08-Dec-95      |                     | 11.50          |              |             | 10800               | 7.4 |                 | ND                         | ND      | ND               | ND              |
| 08-Mar-96      |                     | 11.18          |              |             | 8300                | 7.3 |                 | ND                         | ND      | ND               | ND              |
| 17-Jun-96      |                     | 11.28          |              |             | 9000                | 7.4 |                 | ND                         | ND      | ND               | ND              |
| 08-Mar-96      | MW #11A             | 12.10          | 20.17        |             | 3,100               | 6.9 |                 | ND                         | ND      | ND               | ND              |
| 08-Mar-96      | MW #12A             | 10.76          | 19.79        |             | 2,800               | 7.0 |                 | ND                         | ND      | ND               | ND              |

**DEHYDRATOR PIT GROUNDWATER LABORATORY RESULTS - EXCAVATED DEC. '94**  
**(refer to pit closure field report - pit perimeter diagram)**

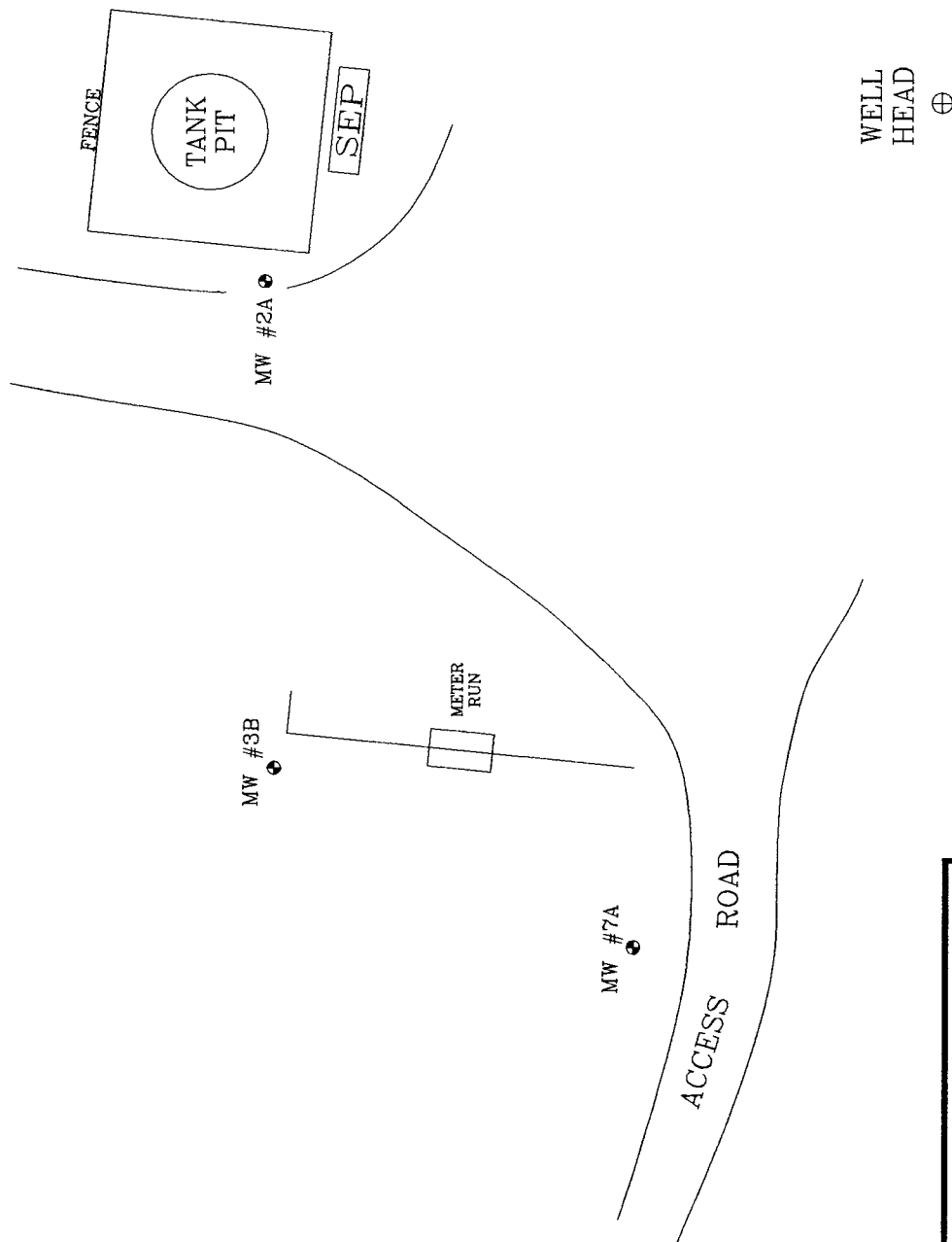
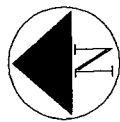
|           |                |  |  |  |  |  |  |      |      |     |       |
|-----------|----------------|--|--|--|--|--|--|------|------|-----|-------|
| 29-Dec-94 | PW1 @ GW (13') |  |  |  |  |  |  | 182  | 1108 | 96  | 1744  |
| 29-Dec-94 | PW2 @ GW (13') |  |  |  |  |  |  | 397  | 2268 | 228 | 3382  |
| 20-Feb-95 | PIT WATER      |  |  |  |  |  |  | 77.2 | 7.37 | ND  | 381.8 |
| 17-Mar-95 | PIT @ 3A       |  |  |  |  |  |  | 3.9  | ND   | ND  | ND    |

# FIGURE 1



|                                                                                                       |                                                                                                                                                |                                                                 |                   |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------------|
| AMOCO PRODUCTION COMPANY<br>GCU #153E<br>NE/4 NW/4 SEC. 28, T29N, R12W<br>SAN JUAN COUNTY, NEW MEXICO | BLAGG ENGINEERING, INC.<br>CONSULTING PETROLEUM / RECLAMATION SERVICES<br>P.O. BOX 87<br>BLOOMFIELD, NEW MEXICO 87413<br>PHONE: (605) 632-1189 | PROJECT: MW SAMPLING<br>DRAWN BY: NJV<br>FILENAME: 153E-SMA.SKD | SITE MAP<br>05/96 |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------------|

# FIGURE 1A



1 INCH = 25 FT.



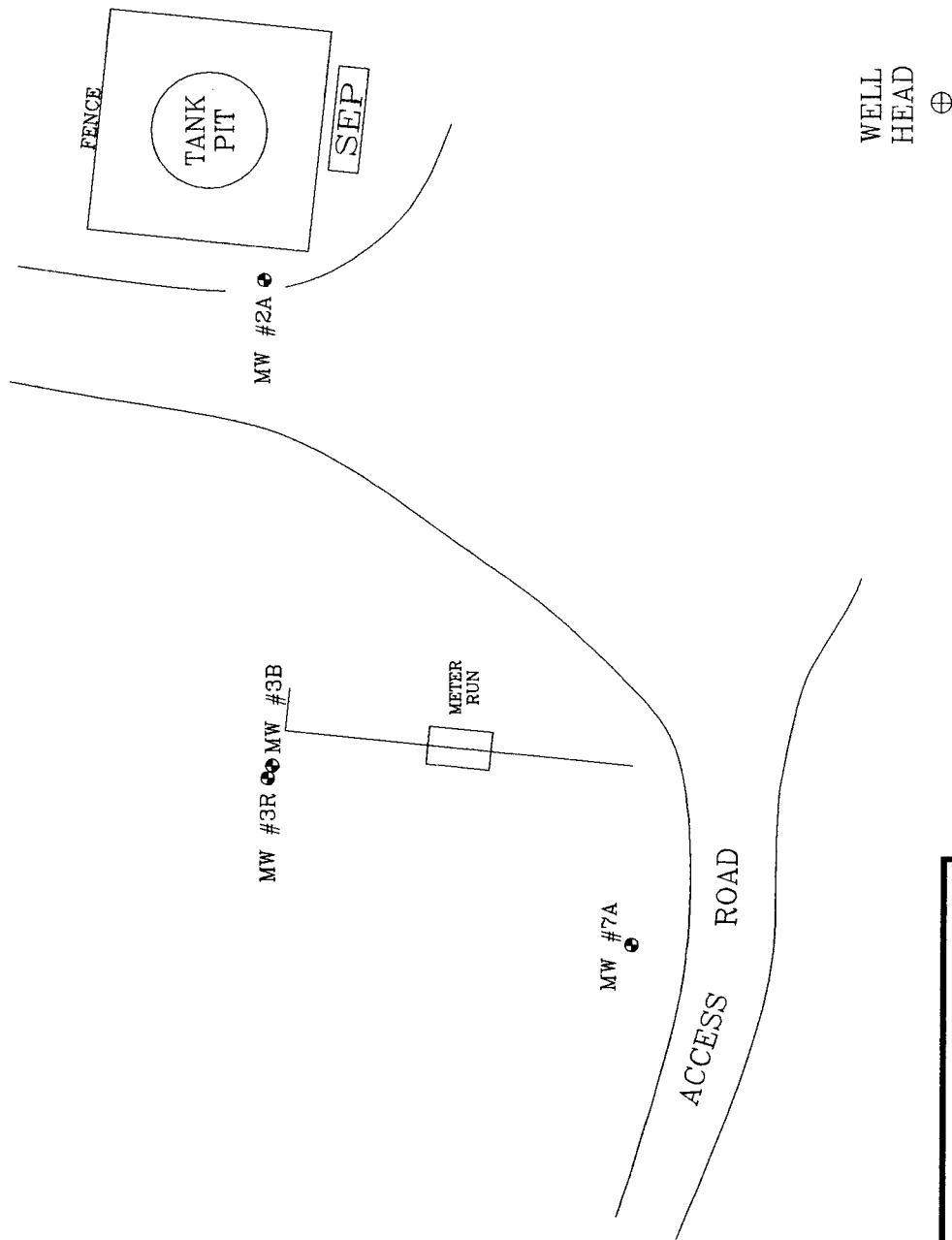
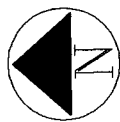
MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND ARE NOT TO SCALE.

AMOCO PRODUCTION COMPANY  
GCU #163E  
NE/4 NW/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) 632-1189

PROJECT: MW SAMPLING  
DRAWN BY: NJV  
FILENAME: SM-1A.SKD  
SITE MAP  
06/95

FIGURE 1B  
(present MW's on-site)



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 #153E  
NE/4 NW/4 SEC. 28, T29N, R12W  
SAN JUAN COUNTY, NEW MEXICO

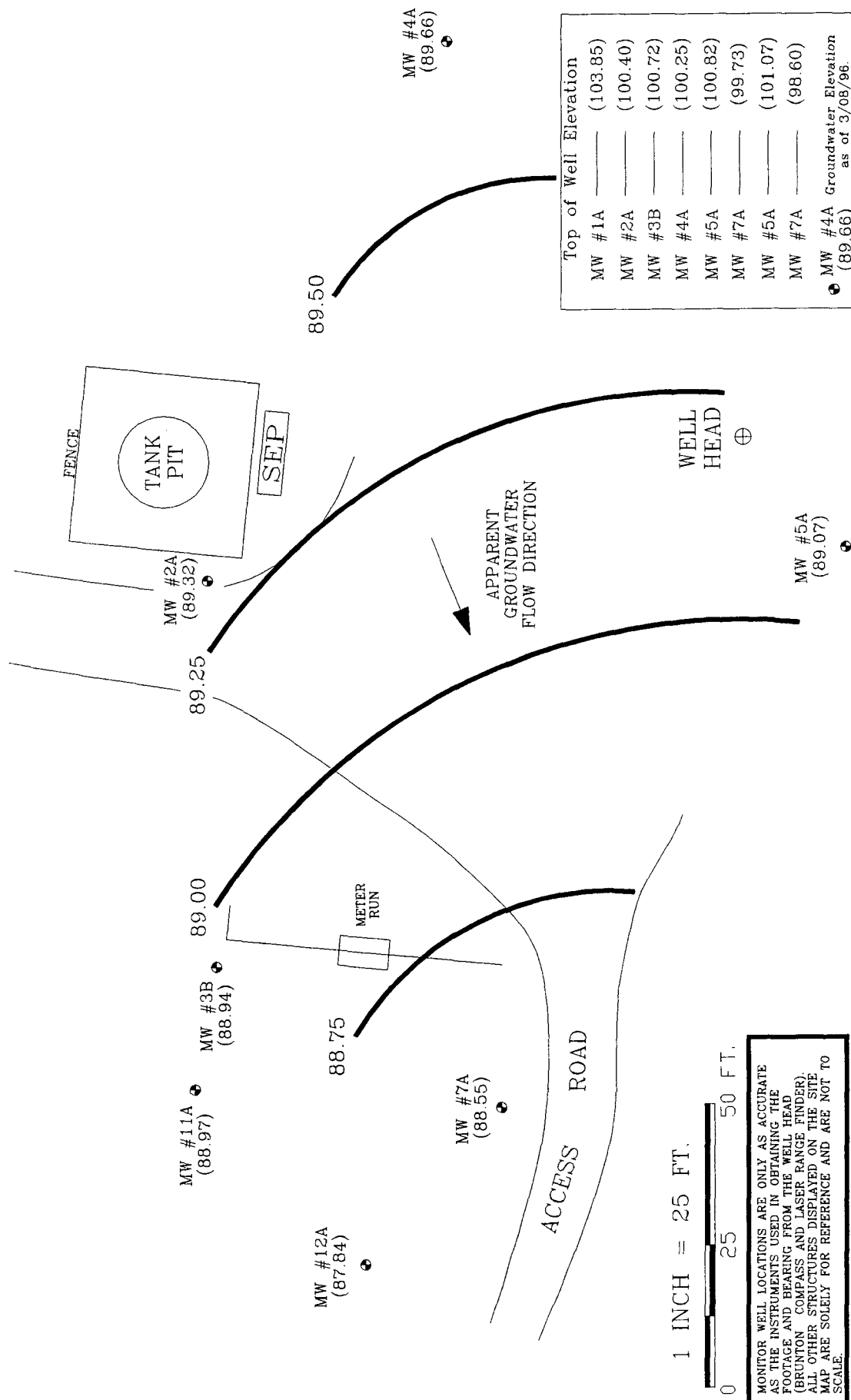
BLAGG ENGINEERING, INC.  
CONSULTING PETROLEUM / RECLAMATION SERVICES  
P.O. BOX 87  
BLOOMFIELD, NEW MEXICO 87413  
PHONE: (505) 632-1188

PROJECT: MW SAMPLING  
DRAWN BY: NJV  
FILENAME: SM-1B.SKD

SITE MAP  
06/00



WATER ELEVATION  
OMITTED WHEN  
DETERMINING GW  
GRADIENT



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.

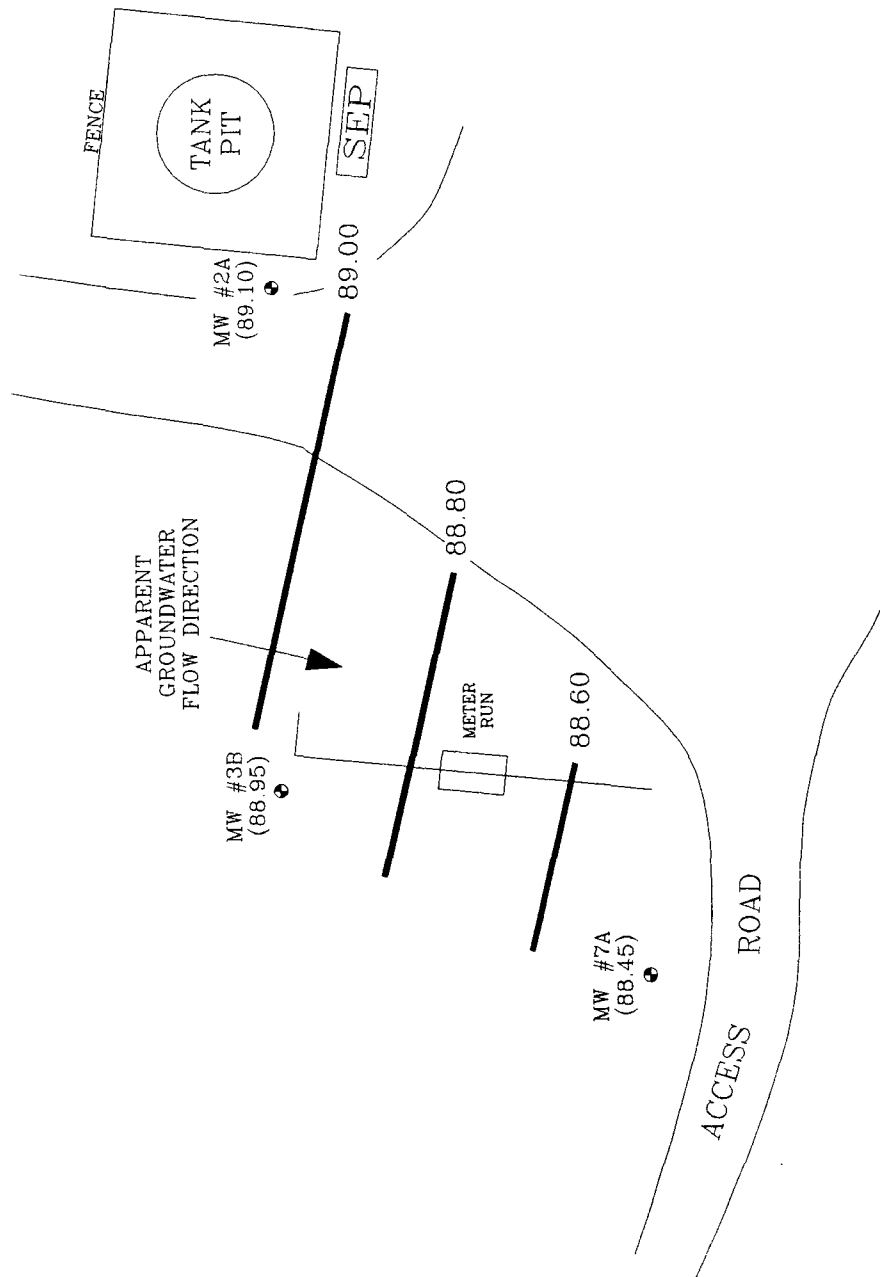
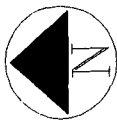
AMOCO PRODUCTION COMPANY  
GCU #153E  
NE/4 NW/4 SEC. 28, T29N, R12W  
SAN JUAN COUNTY, NEW MEXICO

**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: 03-08-GW.SKD

GROUNDWATER  
GRADIENT MAP  
03/96

FIGURE 3  
(2nd 1/4, 1996)



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.

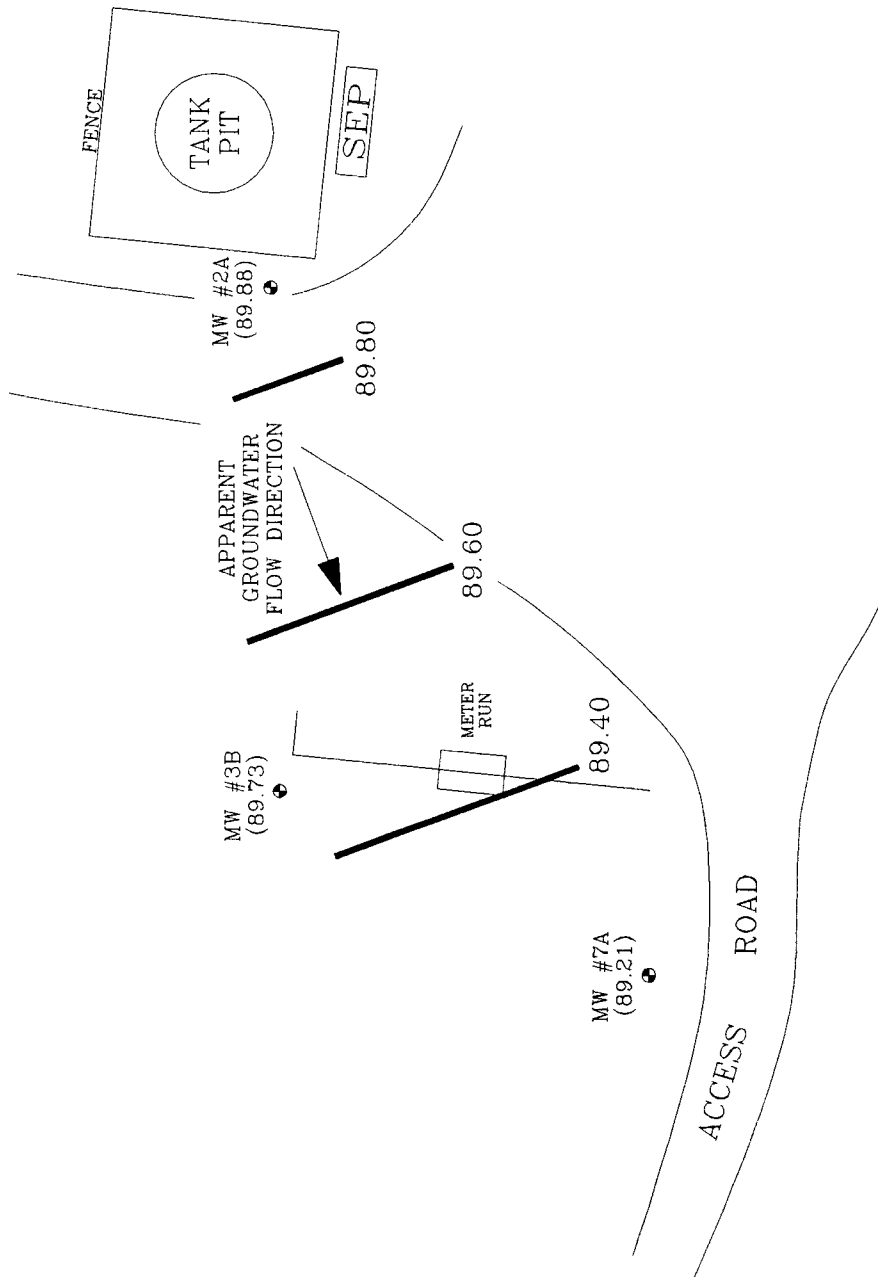
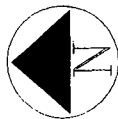
1 INCH = 25 FT.



| Top of Well Elevation                                 |          |
|-------------------------------------------------------|----------|
| MW #2A                                                | (100.40) |
| MW #3B                                                | (100.72) |
| MW #7A                                                | (99.73)  |
| ● MW #2A Groundwater Elevation (89.10) as of 6/17/96. |          |

|                                                                                                       |                                                                                                                                                |                                                                 |                                      |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------|
| AMOCO PRODUCTION COMPANY<br>GCU #153E<br>NE/4 NW/4 SEC. 28, T29N, R12W<br>SAN JUAN COUNTY, NEW MEXICO | BLAGG ENGINEERING, INC.<br>CONSULTING PETROLEUM / RECLAMATION SERVICES<br>P.O. BOX 87<br>BLOOMFIELD, NEW MEXICO 87413<br>PHONE: (505) 632-1189 | PROJECT: MW SAMPLING<br>DRAWN BY: NJV<br>FILENAME: 06-17-96.SKD | GROUNDWATER<br>GRADIENT MAP<br>06/96 |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------|

FIGURE 4  
(2nd 1/4, 1997)



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.

1 INCH = 25 FT.



Top of Well Elevation

MW #2A — (100.40)  
MW #3B — (100.72)  
MW #7A — (99.73)

● MW #2A Groundwater Elevation as of 6/25/97.

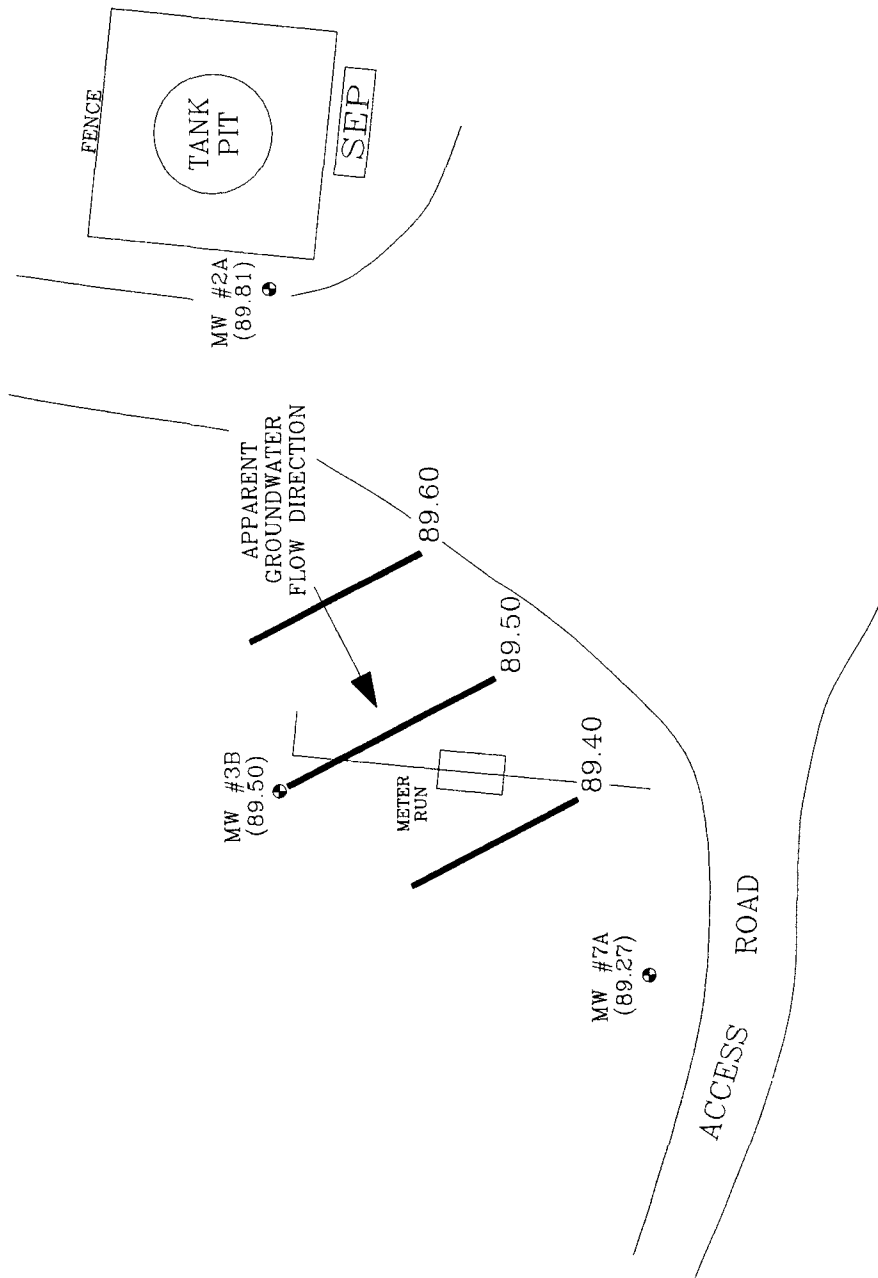
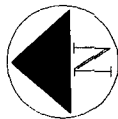
AMOCO PRODUCTION COMPANY  
GCU #153E  
NE/4 NW/4 SEC. 28, T29N, R12W  
SAN JUAN COUNTY, NEW MEXICO

BLAGG ENGINEERING, INC.  
CONSULTING PETROLEUM / RECLAMATION SERVICES  
P.O. BOX 87  
BLOOMFIELD, NEW MEXICO 87413  
PHONE: (505) 632-1189

PROJECT: MW SAMPLING  
DRAWN BY: NJV  
FILENAME: 06-25--97.SKD

GROUNDWATER  
GRADIENT MAP  
06/97

FIGURE 5  
(2nd 1/4, 1998)



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.

1 INCH = 25 FT.

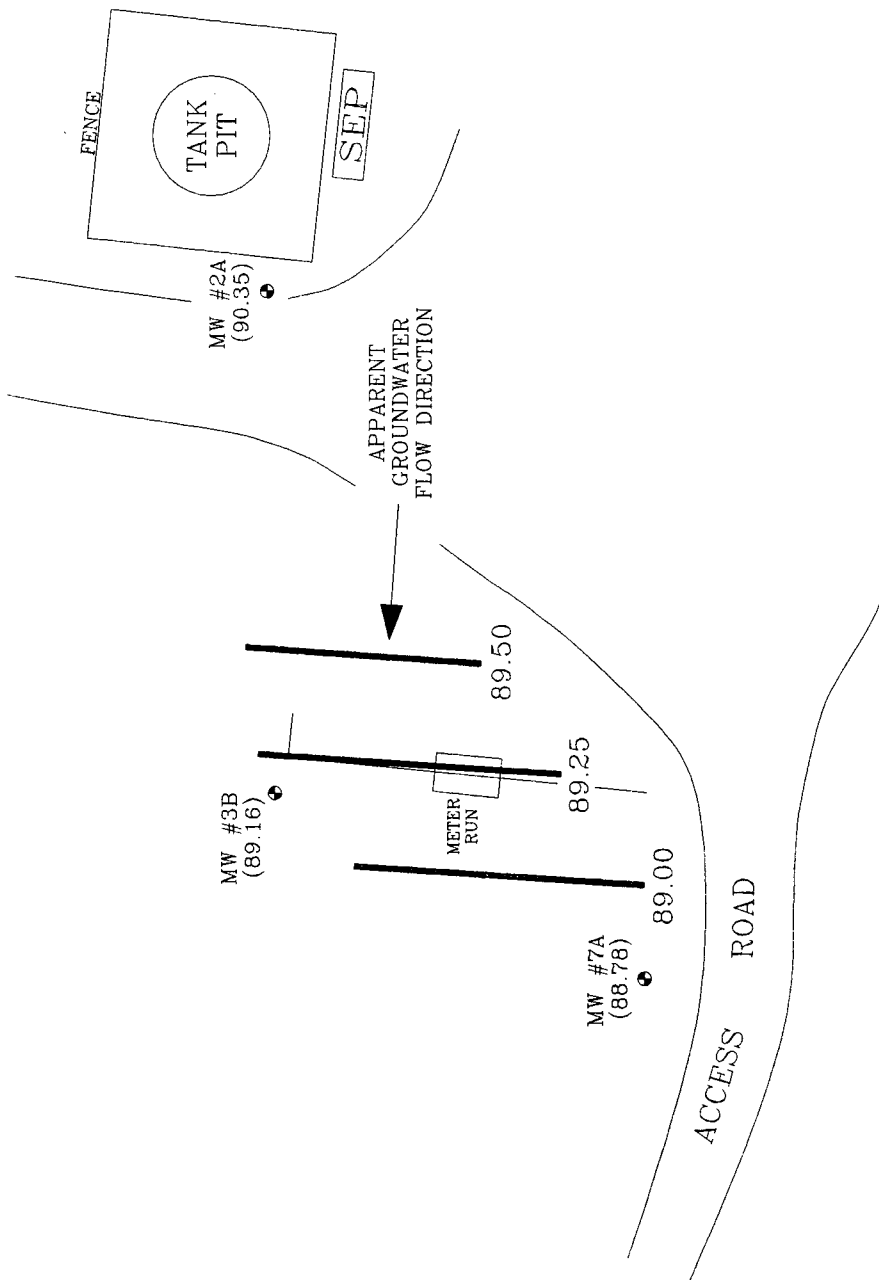
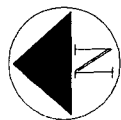


| Top of Well Elevation                                 |          |
|-------------------------------------------------------|----------|
| MW #2A                                                | (100.40) |
| MW #3B                                                | (100.72) |
| MW #7A                                                | (99.73)  |
| ● MW #2A Groundwater Elevation as of 6/12/98. (89.81) |          |

WELL HEAD ⊕

|                                                                                                       |                                                                                                                                                |                                                                 |                                      |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------|
| AMOCO PRODUCTION COMPANY<br>GCU #153E<br>NE/4 NW/4 SEC. 28, T29N, R12W<br>SAN JUAN COUNTY, NEW MEXICO | BLAGG ENGINEERING, INC.<br>CONSULTING PETROLEUM / RECLAMATION SERVICES<br>P.O. BOX 87<br>BLOOMFIELD, NEW MEXICO 87413<br>PHONE: (505) 632-1189 | PROJECT: MW SAMPLING<br>DRAWN BY: NJV<br>FILENAME: 06-12-98.SKD | GROUNDWATER<br>GRADIENT MAP<br>06/98 |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------|

FIGURE 6  
(2nd 1/4, 1999)



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

| Top of Well Elevation                       |          |
|---------------------------------------------|----------|
| MW #2A                                      | (100.40) |
| MW #3B                                      | (100.72) |
| MW #7A                                      | (99.73)  |
| MW #2A Groundwater Elevation as of 5/26/99. |          |
| •                                           | (90.35)  |

WELL HEAD  
⊕

1 INCH = 25 FT.

0 25 50 FT.

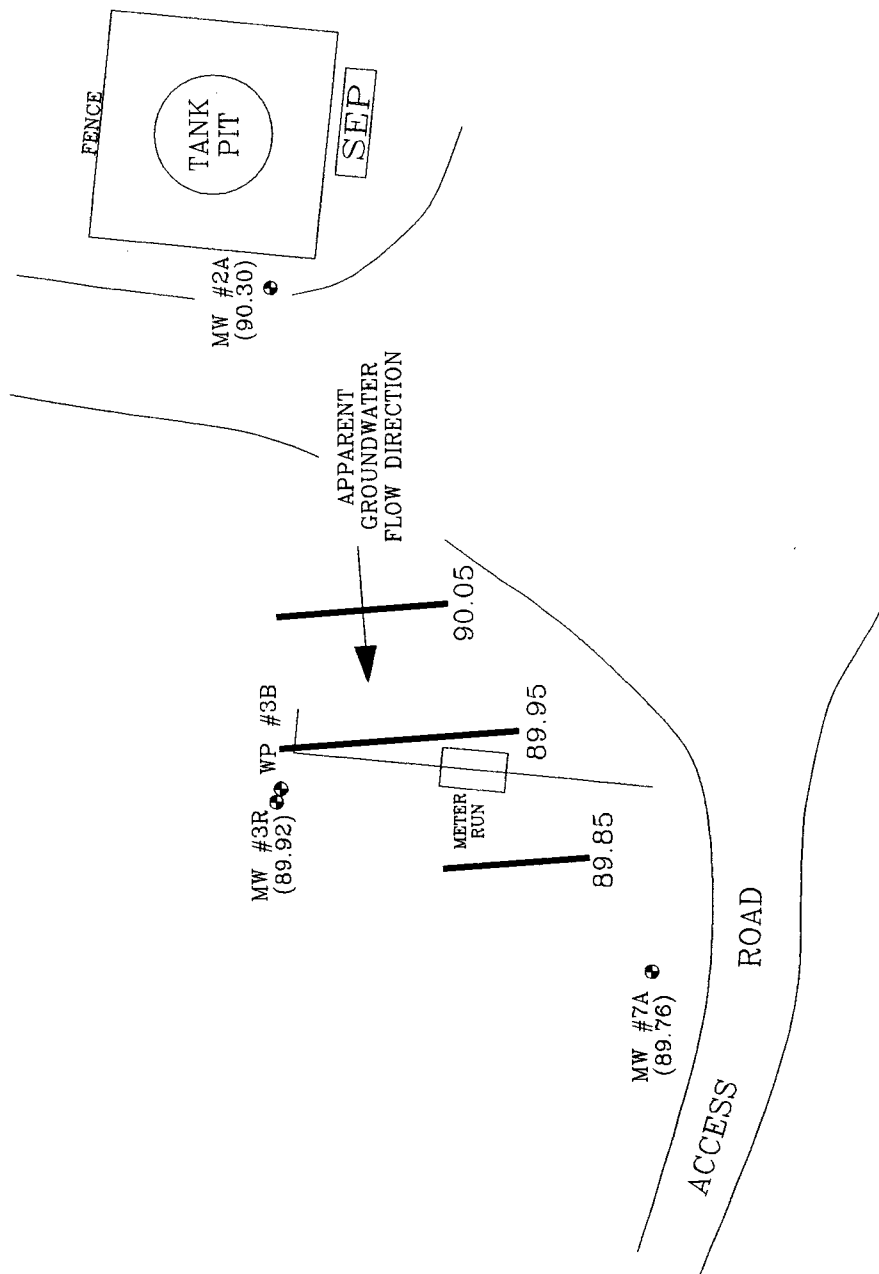
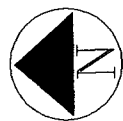
AMOCO PRODUCTION COMPANY  
GCU #153E  
NE/4 NW/4 SEC. 28, T29N, R12W  
SAN JUAN COUNTY, NEW MEXICO

BLAGG ENGINEERING, INC.  
CONSULTING PETROLEUM / RECLAMATION SERVICES  
P.O. BOX 87  
BLOOMFIELD, NEW MEXICO 87413  
PHONE: (505) 652-1189

PROJECT: MW SAMPLING  
DRAWN BY: NJV  
FILENAME: 05-28-99.SKD

GROUNDWATER  
GRADIENT MAP  
05/99

FIGURE 7  
(2nd 1/4, 2000)



| Top of Well Elevation                          |          |
|------------------------------------------------|----------|
| MW #2A                                         | (100.40) |
| MW #3R                                         | (100.80) |
| MW #7A                                         | (99.72)  |
| Groundwater elevation as of 5/26/00 & 6/13/00. |          |
| MW #2A                                         | (90.30)  |

WELL HEAD ⊕

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.

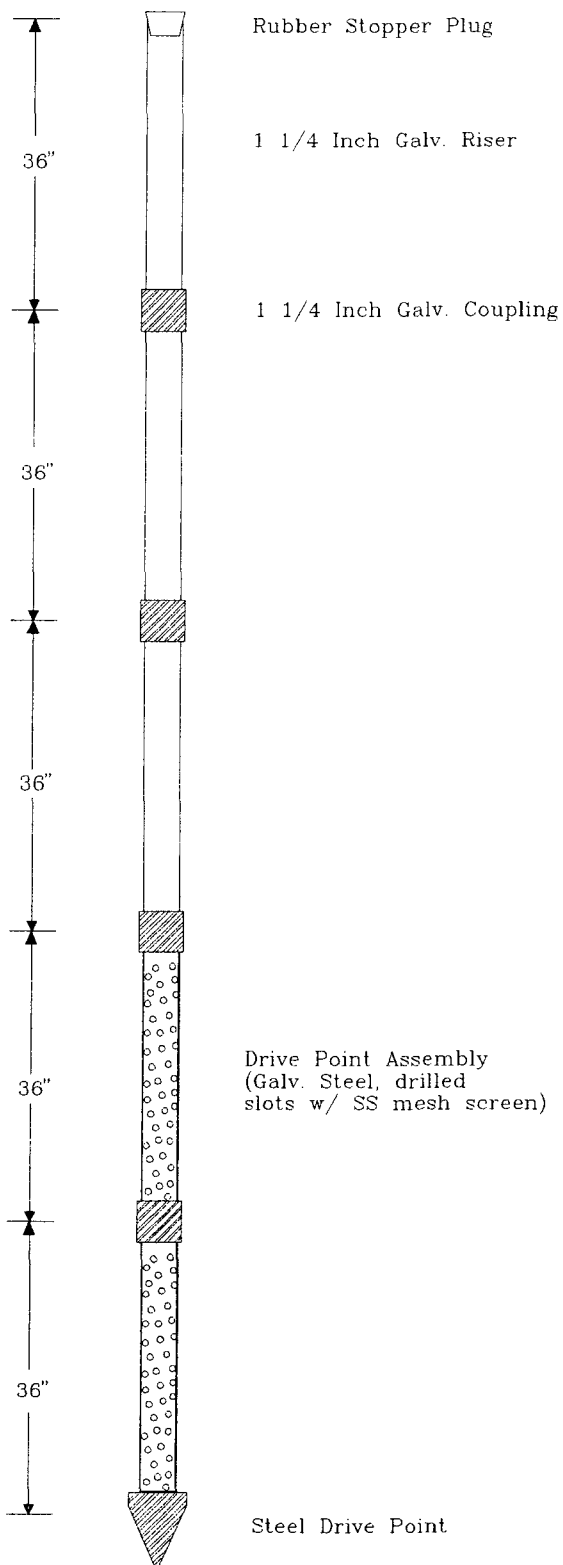
|                                                                                                       |                                                                                                                                                |                                                                 |                                      |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------|
| AMOCO PRODUCTION COMPANY<br>GCU #153E<br>NE/4 NW/4 SEC. 28, T29N, R12W<br>SAN JUAN COUNTY, NEW MEXICO | BLAGG ENGINEERING, INC.<br>CONSULTING PETROLEUM / RECLAMATION SERVICES<br>P.O. BOX 87<br>BLOOMFIELD, NEW MEXICO 87413<br>PHONE: (505) 632-1189 | PROJECT: MW SAMPLING<br>DRAWN BY: NJV<br>FILENAME: 06-13-00.SKD | GROUNDWATER<br>GRADIENT MAP<br>06/00 |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------|

# WELL POINT #3B (WP-3B)

AMOCO PRODUCTION COMPANY  
GCU # 153E  
DRIVE POINT MONITOR WELL  
CONSTRUCTION & COMPLETION

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

PROJECT: 1/4ly MW Samp.  
DRAFTED BY: NJV  
DATE: JUNE '95  
FILENAME: WP-3B



# MONITOR WELL #3R

TOC 2.00' A.G.S.

GROUND SURFACE

2 INCH SCHEDULE  
40 THREADED COUPLING  
PVC CASING

TOS 8.00' B.G.S.

▼ 8.88' 6/13/00

2 INCH SCHEDULE 40  
THREADED COUPLING  
PVC 0.020 INCH  
SLOTTED SCREEN

TD 18.00' B.G.S.

DRILLING TD 20.00' B.G.S.

TOC = TOP OF CASING  
TOS = TOP OF SCREEN  
TD = TOTAL DEPTH  
AGS = ABOVE GROUND SURFACE  
BGS = BELOW GROUND SURFACE

AMOCO PRODUCTION COMPANY

GCU # 153E

MONITOR WELL CONSTRUCTION & COMPLETION

INSTALLED WITH MOBILE 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: JUNE '00

FILENAME: MW-3R



**BLAGG ENGINEERING, INC.**  
MONITOR WELL SAMPLING DATA

CLIENT : AMOCO PRODUCTION CO.

CHAIN-OF-CUSTODY # : \_\_\_\_\_

GCU # 153E

LABORATORY (S) USED : ANAITAS

UNIT C, SEC. 28, T29N, R12W

Date : March 8, 1996

SAMPLER : REO

Filename : 03-08-96.WK3

PROJECT 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) |
|--------|-----------------|------------------|---------------------|------------------|----------|---------|-----------------|----------------------|-------------------|
| 1A     | 103.85          | 88.90            | 14.95               | 20.00            | 0935     | 7.2     | 3,200           | 1.00                 | -                 |
| 2A     | 100.40          | 89.32            | 11.08               | 15.83            | 0925     | 6.7     | 2,700           | 2.50                 | -                 |
| 3B     | 100.72          | 88.94            | 11.78               | 15.00            | 1110     | 6.1     | 4,000           | 4 bails              | -                 |
| 4A     | 100.25          | 89.66            | 10.59               | 13.05            | 0910     | 7.4     | 3,600           | 1.00                 | -                 |
| 5A     | 100.82          | 89.07            | 11.75               | 14.04            | 0845     | 7.8     | 12,300          | 1.00                 | -                 |
| 7A     | 99.73           | 88.55            | 11.18               | 16.60            | 1000     | 7.3     | 8,300           | 3.00                 | -                 |
| 11A    | 101.07          | 88.97            | 12.10               | 20.17            | 1050     | 6.9     | 3,100           | 3.00                 | -                 |
| 12A    | 98.60           | 87.84            | 10.76               | 19.79            | 1025     | 7.0     | 2,800           | 4.50                 | -                 |

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".

WELL # 3B, = 1.25" well point. Collected BTEX samples for both MW # 2A & 3B.

Resurveyed on June 20, 1996 (well elev. for #3B).



## PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID: GCU 153E  
Sample ID: MW - 1A  
Lab ID: 2864  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 03/25/96  
Date Sampled: 03/08/96  
Date Received: 03/08/96  
Date Analyzed: 03/14/96

| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(ug/L) |
|----------------|-------------------------|---------------------------|
| Benzene        | ND                      | 0.50                      |
| Toluene        | 0.73                    | 0.50                      |
| Ethylbenzene   | ND                      | 0.50                      |
| m,p-Xylenes    | ND                      | 1.00                      |
| o-Xylene       | ND                      | 0.50                      |

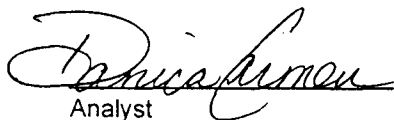
|            |      |
|------------|------|
| Total BTEX | 0.73 |
|------------|------|

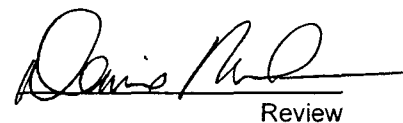
ND - Analyte not detected at the stated detection limit.

|                  |                  |                         |                          |
|------------------|------------------|-------------------------|--------------------------|
| Quality Control: | <u>Surrogate</u> | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                  | Trifluorotoluene | 95                      | 88 - 110%                |

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

Comments:

  
Analyst

  
Review



## PURGEABLE AROMATICS



## PURGEABLE AROMATICS

### Blagg Engineering, Inc.

Project ID: GCU 153E  
Sample ID: MW - 2A  
Lab ID: 2865  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 03/25/96  
Date Sampled: 03/08/96  
Date Received: 03/08/96  
Date Analyzed: 03/14/96

| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(ug/L) |
|----------------|-------------------------|---------------------------|
| Benzene        | 1.08                    | 0.50                      |
| Toluene        | ND                      | 0.50                      |
| Ethylbenzene   | 2.71                    | 0.50                      |
| m,p-Xylenes    | ND                      | 1.00                      |
| o-Xylene       | 0.87                    | 0.50                      |

|            |      |
|------------|------|
| Total BTEX | 4.66 |
|------------|------|

ND - Analyte not detected at the stated detection limit.

|                  |                    |                         |                          |
|------------------|--------------------|-------------------------|--------------------------|
| Quality Control: | <u>Surrogate</u>   | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                  | Trifluorotoluene   | 119                     | 88 - 110%                |
|                  | Bromofluorobenzene | 108                     | 86 - 115%                |

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

Comments: High toluene-d8 recovery is due to matrix interference at the d8 retention time.

  
Analyst

  
Review

**PURGEABLE AROMATICS**Blagg Engineering, Inc.

Project ID: GCU 153E  
Sample ID: MW - 4A  
Lab ID: 2867  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 03/25/96  
Date Sampled: 03/08/96  
Date Received: 03/08/96  
Date Analyzed: 03/14/96

| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(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 |
|------------|----|

ND - Analyte not detected at the stated detection limit.

|                         |                  |                         |                          |
|-------------------------|------------------|-------------------------|--------------------------|
| <b>Quality Control:</b> | <u>Surrogate</u> | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                         | Trifluorotoluene | 98                      | 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 153E  
Sample ID: MW - 5A  
Lab ID: 2868  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 03/25/96  
Date Sampled: 03/08/96  
Date Received: 03/08/96  
Date Analyzed: 03/14/96

| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(ug/L) |
|----------------|-------------------------|---------------------------|
| Benzene        | ND                      | 0.50                      |
| Toluene        | 1.14                    | 0.50                      |
| Ethylbenzene   | ND                      | 0.50                      |
| m,p-Xylenes    | ND                      | 1.00                      |
| o-Xylene       | ND                      | 0.50                      |

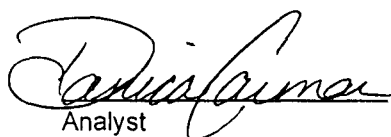
|            |      |
|------------|------|
| Total BTEX | 1.14 |
|------------|------|

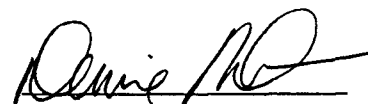
ND - Analyte not detected at the stated detection limit.

|                  |                  |                         |                          |
|------------------|------------------|-------------------------|--------------------------|
| Quality Control: | <u>Surrogate</u> | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                  | Trifluorotoluene | 107                     | 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 153E  
Sample ID: MW - 7A  
Lab ID: 2869  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 03/25/96  
Date Sampled: 03/08/96  
Date Received: 03/08/96  
Date Analyzed: 03/14/96

| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(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                      |

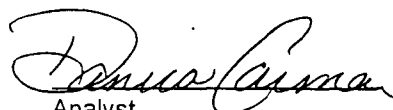
|            |    |
|------------|----|
| Total BTEX | ND |
|------------|----|

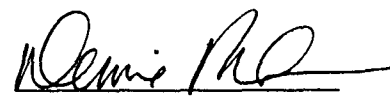
ND - Analyte not detected at the stated detection limit.

Quality Control: Surrogate      Percent Recovery      Acceptance Limits  
Trifluorotoluene      96      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 153E  
Sample ID: MW - 11A  
Lab ID: 2870  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 03/25/96  
Date Sampled: 03/08/96  
Date Received: 03/08/96  
Date Analyzed: 03/19/96

| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(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 |
|------------|----|

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 153E  
Sample ID: MW - 12A  
Lab ID: 2871  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 03/25/96  
Date Sampled: 03/08/96  
Date Received: 03/08/96  
Date Analyzed: 03/19/96

| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(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                      |

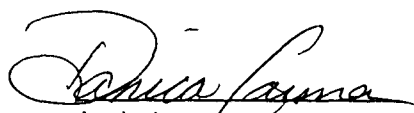
|            |    |
|------------|----|
| Total BTEX | ND |
|------------|----|

ND - Analyte not detected at the stated detection limit.

|                         |                  |                         |                          |
|-------------------------|------------------|-------------------------|--------------------------|
| <b>Quality Control:</b> | <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



**ENVIRONMENTAL LABORATORY**  
8807 S. CARLTON • FARMINGTON, NM 87401 • (505) 326-2395

**PROJECT MANAGER:**  
**Analytica Lab I.D.:**

Company:  
Address:

Phone: 632-1199

SAME

Bill To:  
Company:  
Address:

| Sample ID                                                        | Date    | Time | Matrix | Lab ID                    |
|------------------------------------------------------------------|---------|------|--------|---------------------------|
| MW - 1A                                                          | 3-8     | 0925 | WATR   |                           |
| MW - 2A                                                          | "       | 0925 | "      |                           |
| WP - 3B                                                          | "       | 1110 | "      |                           |
| MW - 4A                                                          | "       | 0910 | "      |                           |
| MW - 5A                                                          | "       | 0845 | "      |                           |
| MW - 7A                                                          | "       | 1000 | "      |                           |
| MW - 11A                                                         | "       | 1050 | "      |                           |
| MW - 12A                                                         | "       | 1025 | "      |                           |
| Project Information                                              |         |      |        | Sample Receipt            |
| Proj. #:                                                         | A14060  |      |        | No. Containers:           |
| Proj. Name:                                                      | 604153E |      |        | Custody Seals: Y / N / NA |
| P. O. No:                                                        |         |      |        | Received In tact:         |
| Shipped Via:                                                     | DEL'D   |      |        | Received Cold:            |
| Required Turnaround Time (Prior Authorization Required for Rush) |         |      |        |                           |

## CHAIN OF CUSTODY

[illegible]

|                     |                     |                  |                                                                                                                     |
|---------------------|---------------------|------------------|---------------------------------------------------------------------------------------------------------------------|
| Sampled By:         | Relinquished By:    | Relinquished By: | Please Fill Out Thoroughly.<br><br>Shaded areas<br>for lab use only.<br><br>White/Yellow: Analytica<br>Pink: Client |
| Signature           | Signature           | Signature        |                                                                                                                     |
| R. E. O'Neal 3-8-96 | A. E. O'Neal 3-8-96 |                  |                                                                                                                     |
| Time:               | Time:               | Time:            |                                                                                                                     |
| Company:            | Company:            | Company:         |                                                                                                                     |
| BEI                 | BEI                 |                  |                                                                                                                     |
| Received By:        | Received By:        | Received By:     |                                                                                                                     |
| Signature           | Signature           | Signature        |                                                                                                                     |
|                     |                     |                  |                                                                                                                     |
| Time:               | Time:               | Time:            |                                                                                                                     |
|                     |                     |                  |                                                                                                                     |
| Company:            | Company:            | Company:         |                                                                                                                     |
|                     |                     |                  |                                                                                                                     |



March 27, 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 8, 1996 from the Amoco GCU 153E 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 btx analytes found in the samples are 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,

A handwritten signature in dark ink, appearing to read "Denise A. Bohemier". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Denise A. Bohemier  
Lab Director

# PURGEABLE AROMATICS

## Quality Control Report

### Method Blank Analysis

Sample Matrix: Water  
Lab ID: MB35138

Report Date: 03/25/96  
Date Analyzed: 03/14/96

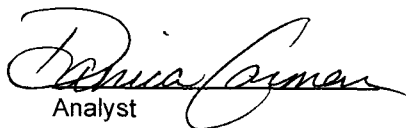
| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(ug/L) |
|----------------|-------------------------|---------------------------|
| Benzene        | ND                      | 0.50                      |
| Toluene        | ND                      | 0.50                      |
| Ethylbenzene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

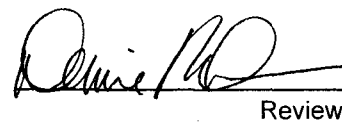
ND - Analyte not detected at the stated detection limit.

|                         |                  |                         |                          |
|-------------------------|------------------|-------------------------|--------------------------|
| <b>Quality Control:</b> | <u>Surrogate</u> | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                         | Trifluorotoluene | 99                      | 88 - 110%                |

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

**Comments:**

  
Analyst

  
Review

# PURGEABLE AROMATICS

## Quality Control Report

### Method Blank Analysis

Sample Matrix: Water  
Lab ID: MB35143

Report Date: 03/25/96  
Date Analyzed: 03/19/96

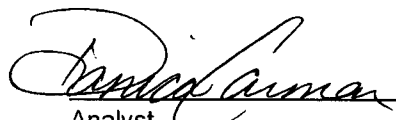
| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(ug/L) |
|----------------|-------------------------|---------------------------|
| Benzene        | ND                      | 0.50                      |
| Toluene        | ND                      | 0.50                      |
| Ethylbenzene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

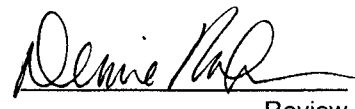
ND - Analyte not detected at the stated detection limit.

|                         |                  |                         |                          |
|-------------------------|------------------|-------------------------|--------------------------|
| <b>Quality Control:</b> | <u>Surrogate</u> | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                         | Trifluorotoluene | 96                      | 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: 2865Dup  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 03/25/96  
Date Sampled: 03/08/96  
Date Received: 03/08/96  
Date Analyzed: 03/14/96

| Target Analyte | Original Conc.<br>(ug/L) | Duplicate Conc.<br>(ug/L) | Acceptance<br>Range (ug/L) |
|----------------|--------------------------|---------------------------|----------------------------|
| Benzene        | 1.08                     | 1.06                      | 0 - 2.44                   |
| Toluene        | 0.00                     | 9.38                      | 2.89 - 6.5                 |
| Ethylbenzene   | 2.71                     | 2.50                      | 0.80 - 4.41                |
| m,p-Xylenes    | 0.00                     | 2.17                      | NE                         |
| o-Xylene       | 0.87                     | 0.90                      | 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 | 108                     | 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: 2866Dup  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 03/25/96  
Date Sampled: 03/08/96  
Date Received: 03/08/96  
Date Analyzed: 03/19/96

| Target Analyte | Original Conc.<br>(ug/L) | Duplicate Conc.<br>(ug/L) | Acceptance<br>Range (ug/L) |
|----------------|--------------------------|---------------------------|----------------------------|
| Benzene        | 775                      | 776                       | 634 - 916                  |
| Toluene        | 156                      | 161                       | 129 - 188                  |
| Ethylbenzene   | 259                      | 251                       | 168 - 343                  |
| m,p-Xylenes    | 2,100                    | 2,070                     | NE                         |
| o-Xylene       | 380                      | 379                       | NE                         |

ND - Analyte not detected at the stated detection limit.

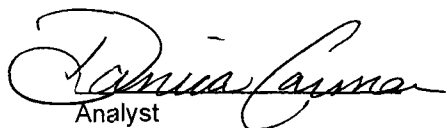
NA - Not applicable or not calculated.

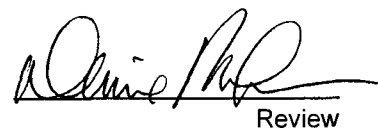
NE - Duplicate acceptance range not established by the EPA.

|                  |                  |                         |                          |
|------------------|------------------|-------------------------|--------------------------|
|                  | <u>Surrogate</u> | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
| Quality Control: | Trifluorotoluene | 101                     | 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: 2864Spk  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 03/25/96  
Date Sampled: 03/08/96  
Date Received: 03/08/96  
Date Analyzed: 03/14/96

| Target Analyte | Spike Added (ug/L) | Original Conc. (ug/L) | Spiked Sample Conc. (ug/L) | % Recovery | Acceptance Limits (%) |
|----------------|--------------------|-----------------------|----------------------------|------------|-----------------------|
| Benzene        | 10                 | ND                    | 10.6                       | 102%       | 39 - 150              |
| Toluene        | 10                 | 0.73                  | 11.0                       | 103%       | 46 - 148              |
| Ethylbenzene   | 10                 | ND                    | 10.3                       | 102%       | 32 - 160              |
| m,p-Xylenes    | 20                 | ND                    | 20.6                       | 102%       | NE                    |
| o-Xylene       | 10                 | ND                    | 10.3                       | 103%       | 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.

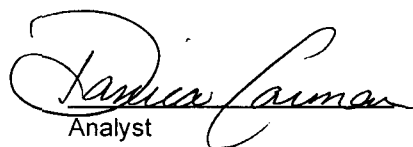
Quality Control: Surrogate  
Trifluorotoluene

Percent Recovery  
101

Acceptance Limits  
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: 2871Spk  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 03/25/96  
Date Sampled: 03/08/96  
Date Received: 03/08/96  
Date Analyzed: 03/19/96

| Target Analyte | Spike Added (ug/L) | Original Conc. (ug/L) | Spiked Sample Conc. (ug/L) | % Recovery | Acceptance Limits (%) |
|----------------|--------------------|-----------------------|----------------------------|------------|-----------------------|
| Benzene        | 10                 | ND                    | 9.34                       | 93%        | 39 - 150              |
| Toluene        | 10                 | ND                    | 9.76                       | 97%        | 46 - 148              |
| Ethylbenzene   | 10                 | ND                    | 9.65                       | 95%        | 32 - 160              |
| m,p-Xylenes    | 20                 | ND                    | 19.2                       | 95%        | NE                    |
| o-Xylene       | 10                 | ND                    | 9.69                       | 97%        | 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.

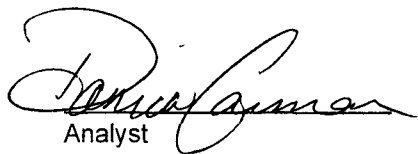
Quality Control: Surrogate  
Trifluorotoluene

Percent Recovery  
98

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 # : 2378GCU # 153ELABORATORY (S) USED : ANAITAS

UNIT C, SEC. 28, T29N, R12W

Date : June 17, 1996SAMPLER : REOFilename : 06-17-96.WK4PROJECT MANAGER : REO

| 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) |
|--------|-----------------|------------------|---------------------|------------------|---------------|-----|-----------------|----------------------|-------------------|
| 2A     | 100.40          | 89.10            | 11.30               | 15.83            | 1330          | 6.9 | 2,700           | 2.00                 | -                 |
| 3B     | 100.72          | 88.95            | 11.77               | 15.00            | 1315          | 6.4 | 4,800           | 2 bails              | -                 |
| 7A     | 99.73           | 88.45            | 11.28               | 16.60            | 1330          | 7.4 | 9,000           | 2.00                 | -                 |

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".WELL # 3B, = 1.25" well point . Collected BTEX samples for all MW's listed above .

**PURGEABLE AROMATICS****Blagg Engineering, Inc.**

Project ID: GCU 153 E  
Sample ID: MW - 2A  
Lab ID: 3956  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 07/01/96  
Date Sampled: 06/17/96  
Date Received: 06/17/96  
Date Analyzed: 06/28/96

| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(ug/L) |
|----------------|-------------------------|---------------------------|
| Benzene        | 230                     | 2.00                      |
| Toluene        | 10.2                    | 2.00                      |
| Ethylbenzene   | 77.7                    | 2.00                      |
| m,p-Xylenes    | 30.4                    | 4.00                      |
| o-Xylene       | 2.14                    | 2.00                      |

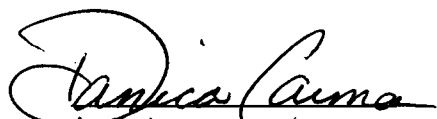
|            |     |
|------------|-----|
| Total BTEX | 351 |
|------------|-----|

ND - Analyte not detected at the stated detection limit.

|                         |                    |                         |                          |
|-------------------------|--------------------|-------------------------|--------------------------|
| <b>Quality Control:</b> | <u>Surrogate</u>   | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                         | Trifluorotoluene   | 101                     | 88 - 110%                |
|                         | Bromofluorobenzene | 105                     | 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 153 E  
Sample ID: WP - 3B  
Lab ID: 3957  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 07/01/96  
Date Sampled: 06/17/96  
Date Received: 06/17/96  
Date Analyzed: 06/28/96

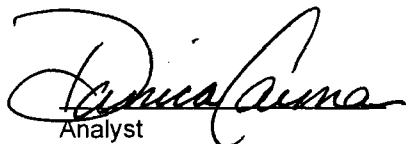
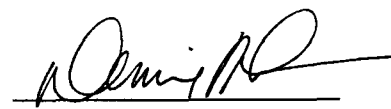
| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(ug/L) |
|----------------|-------------------------|---------------------------|
| Benzene        | 764                     | 125                       |
| Toluene        | 196                     | 125                       |
| Ethylbenzene   | 184                     | 125                       |
| m,p-Xylenes    | 1,290                   | 250                       |
| o-Xylene       | 225                     | 125                       |

|            |       |
|------------|-------|
| Total BTEX | 2,660 |
|------------|-------|

ND - Analyte not detected at the stated detection limit.

|                         |                    |                         |                          |
|-------------------------|--------------------|-------------------------|--------------------------|
| <b>Quality Control:</b> | <u>Surrogate</u>   | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                         | Trifluorotoluene   | 105                     | 88 - 110%                |
|                         | Bromofluorobenzene | 104                     | 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 153 E  
Sample ID: MW - 7A  
Lab ID: 3958  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 07/01/96  
Date Sampled: 06/17/96  
Date Received: 06/17/96  
Date Analyzed: 06/28/96

| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(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                      |

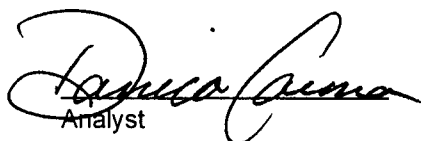
|            |    |
|------------|----|
| Total BTEX | ND |
|------------|----|

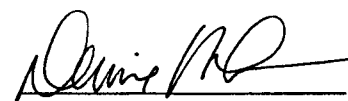
ND - Analyte not detected at the stated detection limit.

|                         |                    |                         |                          |
|-------------------------|--------------------|-------------------------|--------------------------|
| <b>Quality Control:</b> | <u>Surrogate</u>   | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                         | Trifluorotoluene   | 104                     | 88 - 110%                |
|                         | Bromofluorobenzene | 103                     | 86 - 115%                |

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

**Comments:**

  
Analyst

  
Review





July 1, 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 samples received June 17, 1996. The samples were from the GCU 153 E site. Analysis for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) was performed on the samples, as per the accompanying chain of custody form.

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,

A handwritten signature in black ink, appearing to read "Denise A. Bohemier". The signature is fluid and cursive, with a long horizontal line extending to the right.

Denise A. Bohemier  
Lab Director

# PURGEABLE AROMATICS

## Quality Control Report

### Method Blank Analysis

Sample Matrix: Water  
Lab ID: MB35244

Report Date: 07/01/96  
Date Analyzed: 06/28/96

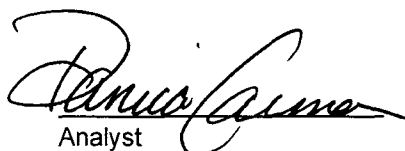
| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(ug/L) |
|----------------|-------------------------|---------------------------|
| Benzene        | ND                      | 0.50                      |
| Toluene        | ND                      | 0.50                      |
| Ethylbenzene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

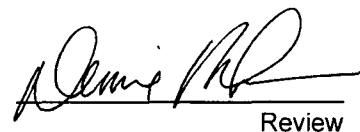
ND - Analyte not detected at the stated detection limit.

|                         |                    |                         |                          |
|-------------------------|--------------------|-------------------------|--------------------------|
| <b>Quality Control:</b> | <u>Surrogate</u>   | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                         | Trifluorotoluene   | 103                     | 88 - 110%                |
|                         | Bromofluorobenzene | 103                     | 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: 3956Dup  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 07/01/96  
Date Sampled: 06/17/96  
Date Received: 06/17/96  
Date Analyzed: 06/28/96

| Target Analyte | Original Conc.<br>(ug/L) | Duplicate Conc.<br>(ug/L) | Acceptance<br>Range (ug/L) |
|----------------|--------------------------|---------------------------|----------------------------|
| Benzene        | 230                      | 220                       | 183 - 267                  |
| Toluene        | 10.2                     | 9.19                      | 7.01 - 12.4                |
| Ethylbenzene   | 77.7                     | 77.7                      | 50.4 - 105                 |
| m,p-Xylenes    | 30.4                     | 27.8                      | NE                         |
| o-Xylene       | 2.14                     | 2.88                      | NE                         |

ND - Analyte not detected at the stated detection limit.

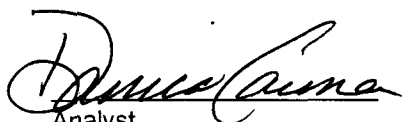
NA - Not applicable or not calculated.

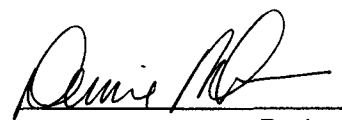
NE - Duplicate acceptance range not established by the EPA.

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

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

**Comments:** High toluene-d8 recovery is due to hydrocarbon interference at the d8 retention time.

  
Analyst

  
Review



## Purgeable Aromatics

### Matrix Spike Analysis

Lab ID: 3958Spk  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 07/01/96  
Date Sampled: 06/17/96  
Date Received: 06/17/96  
Date Analyzed: 06/28/96

| Target Analyte | Spike Added (ug/L) | Original Conc. (ug/L) | Spiked Sample Conc. (ug/L) | % Recovery | Acceptance Limits (%) |
|----------------|--------------------|-----------------------|----------------------------|------------|-----------------------|
| Benzene        | 10                 | ND                    | 10.1                       | 99%        | 39 - 150              |
| Toluene        | 10                 | ND                    | 9.57                       | 93%        | 46 - 148              |
| Ethylbenzene   | 10                 | ND                    | 9.97                       | 98%        | 32 - 160              |
| m,p-Xylenes    | 20                 | ND                    | 19.6                       | 96%        | NE                    |
| o-Xylene       | 10                 | ND                    | 9.79                       | 97%        | NE                    |

ND - Analyte not detected at the stated detection limit.

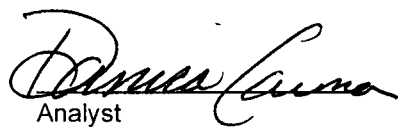
NA - Not applicable or not calculated.

NE - Spike acceptance range not established by the EPA.

|                         |                    |                         |                          |
|-------------------------|--------------------|-------------------------|--------------------------|
| <b>Quality Control:</b> | <u>Surrogate</u>   | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                         | Trifluorotoluene   | 110                     | 88 - 110%                |
|                         | Bromofluorobenzene | 106                     | 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 # : 5122

GCU # 153E

LABORATORY (S) USED : ENVIROTECH, INC.

UNIT C, SEC. 28, T29N, R12W

Date : June 25, 1997

SAMPLER : N J V

Filename : 06-25-97.WK3

PROJECT MANAGER : N J V

| WELL<br># | WELL<br>ELEV.<br>(ft) | WATER<br>ELEV.<br>(ft) | DEPTH TO<br>WATER<br>(ft) | TOTAL<br>DEPTH<br>(ft) | SAMPLING | pH<br>TIME | CONDUCT<br>(umhos) | VOLUME<br>PURGED<br>(gal.) | FREE<br>PRODUCT<br>(ft) |
|-----------|-----------------------|------------------------|---------------------------|------------------------|----------|------------|--------------------|----------------------------|-------------------------|
| 2A        | 100.40                | 89.88                  | 10.52                     | 15.83                  | 1345     | 6.8        | 2,600              | 2.60                       | -                       |
| 3B        | 100.72                | 89.47                  | 11.25                     | 15.00                  | 1405     | 6.3        | 3,400              | 0.75                       | -                       |
| 7A        | 99.73                 | 89.21                  | 10.52                     | -                      | -        | -          | -                  | -                          | -                       |

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".

WELL # 3B, = 1.25" well point . Collected BTEX samples for both MW # 2A & 3B .

# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8020 AROMATIC VOLATILE ORGANICS

|                    |                          |                     |          |
|--------------------|--------------------------|---------------------|----------|
| Client:            | Blagg / Amoco            | Project #:          | 04034-10 |
| Sample ID:         | MW #2A                   | Date Reported:      | 06-27-97 |
| Chain of Custody:  | 5122                     | Date Sampled:       | 06-25-97 |
| Laboratory Number: | B519                     | Date Received:      | 06-25-97 |
| Sample Matrix:     | Water                    | Date Analyzed:      | 06-26-97 |
| Preservative:      | HgCl <sub>2</sub> & Cool | Analysis Requested: | BTEX     |
| Condition:         | Cool & Intact            |                     |          |

| Parameter    | Concentration<br>(ug/L) | Dilution<br>Factor | Det.<br>Limit<br>(ug/L) |
|--------------|-------------------------|--------------------|-------------------------|
| Benzene      | 522                     | 10                 | 1.8                     |
| Toluene      | 6.6                     | 10                 | 1.7                     |
| Ethylbenzene | 82.6                    | 10                 | 1.5                     |
| p,m-Xylene   | 41.4                    | 10                 | 2.2                     |
| o-Xylene     | 3.2                     | 10                 | 1.0                     |
| Total BTEX   | 656                     |                    |                         |

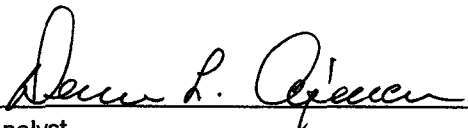
ND - Parameter not detected at the stated detection limit.

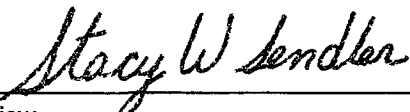
| Surrogate Recoveries: | Parameter          | Percent Recovery |
|-----------------------|--------------------|------------------|
|                       | Trifluorotoluene   | 97 %             |
|                       | Bromofluorobenzene | 100 %            |

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 #153E.

  
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 #3B                   | Date Reported:      | 06-27-97 |
| Chain of Custody:  | 5122                     | Date Sampled:       | 06-25-97 |
| Laboratory Number: | B520                     | Date Received:      | 06-25-97 |
| Sample Matrix:     | Water                    | Date Analyzed:      | 06-26-97 |
| Preservative:      | HgCl <sub>2</sub> & Cool | Analysis Requested: | BTEX     |
| Condition:         | Cool & Intact            |                     |          |

| Parameter    | Concentration<br>(ug/L) | Dilution<br>Factor | Det.<br>Limit<br>(ug/L) |
|--------------|-------------------------|--------------------|-------------------------|
| Benzene      | 1,940                   | 10                 | 1.8                     |
| Toluene      | 167                     | 10                 | 1.7                     |
| Ethylbenzene | 143                     | 10                 | 1.5                     |
| p,m-Xylene   | 562                     | 10                 | 2.2                     |
| o-Xylene     | 165                     | 10                 | 1.0                     |
| Total BTEX   | 2,980                   |                    |                         |

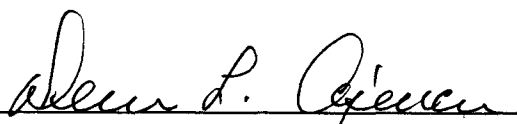
ND - Parameter not detected at the stated detection limit.

| Surrogate Recoveries: | Parameter          | Percent Recovery |
|-----------------------|--------------------|------------------|
|                       | Trifluorotoluene   | 100 %            |
|                       | 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 #153E.

  
Analyst

  
Review



# **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:      | 06-27-97 |
| Laboratory Number: | 06-26-BTEX.BLANK | Date Sampled:       | N/A      |
| Sample Matrix:     | Water            | Date Received:      | N/A      |
| Preservative:      | N/A              | Date Analyzed:      | 06-26-97 |
| Condition:         | N/A              | Analysis Requested: | BTEX     |

| Parameter    | Concentration<br>(ug/L) | Det.<br>Limit<br>(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                     |

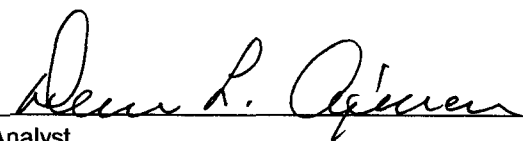
ND - Parameter not detected at the stated detection limit.

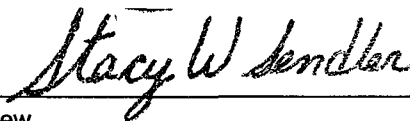
| Surrogate Recoveries: | Parameter          | Percent Recovery |
|-----------------------|--------------------|------------------|
|                       | Trifluorotoluene   | 100 %            |
|                       | Bromofluorobenzene | 100 %            |

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: QA/QC for samples B511 - B520.

  
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:      | 06-27-97  |
| Laboratory Number: | B511             | Date Sampled:       | N/A       |
| Sample Matrix:     | Water            | Date Received:      | N/A       |
| Preservative:      | HgCl and Cool    | Date Analyzed:      | 06-26-97  |
| 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      | 164                  | 164                     | 0.0%          | 0.2               | 1               |
| Toluene      | 0.6                  | 0.6                     | 0.0%          | 0.2               | 1               |
| Ethylbenzene | 59.0                 | 58.5                    | 0.8%          | 0.2               | 1               |
| p,m-Xylene   | 34.4                 | 34.4                    | 0.0%          | 0.2               | 1               |
| o-Xylene     | 0.7                  | 0.7                     | 0.0%          | 0.1               | 1               |

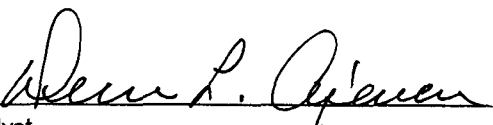
ND - Parameter not detected at the stated detection limit.

| 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 B511 - B520.

  
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: B511  
Sample Matrix: Water  
Preservative: Cool  
Condition: Cool and Intact

Project #: N/A  
Date Reported: 06-27-97  
Date Sampled: N/A  
Date Received: N/A  
Date Analyzed: 06-26-97

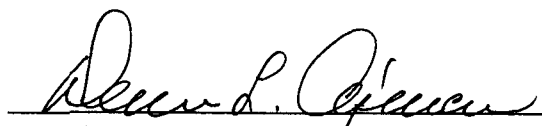
| Parameter    | Sample Result<br>(ug/L) | Spike Added<br>(ug/L) | Spiked Sample Result<br>(ug/L) | Det. Limit<br>(ug/L) | Percent Recovery | SW-846<br>% Rec. Accept. Range |
|--------------|-------------------------|-----------------------|--------------------------------|----------------------|------------------|--------------------------------|
| Benzene      | 164                     | 50.0                  | 214                            | 0.2                  | 100%             | 39-150                         |
| Toluene      | 0.6                     | 50.0                  | 50.4                           | 0.2                  | 100%             | 46-148                         |
| Ethylbenzene | 59.0                    | 50.0                  | 110                            | 0.2                  | 101%             | 32-160                         |
| p,m-Xylene   | 34.4                    | 100                   | 134                            | 0.2                  | 100%             | 46-148                         |
| o-Xylene     | 0.7                     | 50.0                  | 50.9                           | 0.1                  | 100%             | 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 B511 - B520.

  
Analyst

  
Review

**BLAGG ENGINEERING, INC.****MONITOR WELL SAMPLING DATA**CLIENT : AMOCO PRODUCTION CO.CHAIN-OF-CUSTODY # : 6023

GCU # 153E

LABORATORY (S) USED : ENVIROTECH, INC.

UNIT C, SEC. 28, T29N, R12W

Date : June 12, 1998SAMPLER : N J VFilename : 06-12-98.WK4PROJECT MANAGER : N J V

| WELL<br># | WELL<br>ELEV.<br>(ft) | WATER<br>ELEV.<br>(ft) | DEPTH TO<br>WATER<br>(ft) | TOTAL<br>DEPTH<br>(ft) | SAMPLING<br>TIME | pH  | CONDUCT<br>(umhos) | VOLUME<br>PURGED<br>(gal.) | FREE<br>PRODUCT<br>(ft) |
|-----------|-----------------------|------------------------|---------------------------|------------------------|------------------|-----|--------------------|----------------------------|-------------------------|
| 2A        | 100.40                | 89.81                  | 10.59                     | 15.83                  | 0930             | 7.3 | 2,400              | 2.60                       | -                       |
| 3B        | 100.72                | 89.50                  | 11.22                     | 15.00                  | 1025             | 6.6 | 3,700              | 0.75                       | -                       |
| 7A        | 99.73                 | 89.27                  | 10.46                     | -                      | -                | -   | -                  | -                          | -                       |

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".WELL # 3B, = 1.25" well point. Collected BTEX samples for both MW # 2A & 3B .

# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8021 AROMATIC VOLATILE ORGANICS

|                    |               |                     |          |
|--------------------|---------------|---------------------|----------|
| Client:            | Blagg / AMOCO | Project #:          | 04034-10 |
| Sample ID:         | MW #2A        | Date Reported:      | 06-16-98 |
| Chain of Custody:  | 6023          | Date Sampled:       | 06-12-98 |
| Laboratory Number: | D411          | Date Received:      | 06-14-98 |
| Sample Matrix:     | Water         | Date Analyzed:      | 06-16-98 |
| Preservative:      | HgCl2 & Cool  | Analysis Requested: | BTEX     |
| Condition:         | Cool & Intact |                     |          |

| Parameter    | Concentration<br>(ug/L) | Dilution<br>Factor | Det.<br>Limit<br>(ug/L) |
|--------------|-------------------------|--------------------|-------------------------|
| Benzene      | 125                     | 1                  | 0.2                     |
| Toluene      | 7.3                     | 1                  | 0.2                     |
| Ethylbenzene | 22.7                    | 1                  | 0.2                     |
| p,m-Xylene   | 43.9                    | 1                  | 0.2                     |
| o-Xylene     | 0.8                     | 1                  | 0.1                     |

**Total BTEX** 200

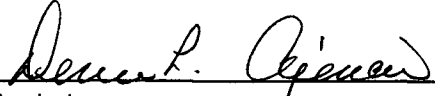
ND - Parameter not detected at the stated detection limit.

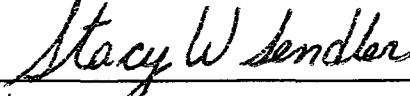
| Surrogate Recoveries: | Parameter          | Percent Recovery |
|-----------------------|--------------------|------------------|
|                       | Trifluorotoluene   | 97 %             |
|                       | Bromofluorobenzene | 97 %             |

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 #153E.

  
Analyst

  
Review

# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8021 AROMATIC VOLATILE ORGANICS

|                    |                          |                     |          |
|--------------------|--------------------------|---------------------|----------|
| Client:            | Blagg / AMOCO            | Project #:          | 04034-10 |
| Sample ID:         | MW #3B                   | Date Reported:      | 06-16-98 |
| Chain of Custody:  | 6023                     | Date Sampled:       | 06-12-98 |
| Laboratory Number: | D412                     | Date Received:      | 06-14-98 |
| Sample Matrix:     | Water                    | Date Analyzed:      | 06-16-98 |
| Preservative:      | HgCl <sub>2</sub> & Cool | Analysis Requested: | BTEX     |
| Condition:         | Cool & Intact            |                     |          |

| Parameter    | Concentration<br>(ug/L) | Dilution<br>Factor | Det.<br>Limit<br>(ug/L) |
|--------------|-------------------------|--------------------|-------------------------|
| Benzene      | 276                     | 1                  | 0.2                     |
| Toluene      | 68.4                    | 1                  | 0.2                     |
| Ethylbenzene | 85.3                    | 1                  | 0.2                     |
| p,m-Xylene   | 377                     | 1                  | 0.2                     |
| o-Xylene     | 80.8                    | 1                  | 0.1                     |

**Total BTEX** 887

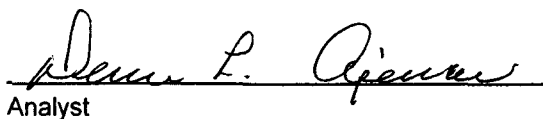
ND - Parameter not detected at the stated detection limit.

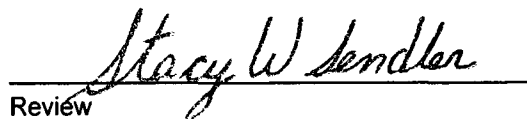
| Surrogate Recoveries: | Parameter          | Percent Recovery |
|-----------------------|--------------------|------------------|
|                       | Trifluorotoluene   | 99 %             |
|                       | Bromofluorobenzene | 99 %             |

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 #153E.

  
Analyst

  
Review

6023

**ENVIROTECH INC.**

# 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<br>Detection Limits (ug/L) | I-Cal RF   | C-Cal RF             | %Diff | Blank<br>Conc | Detect<br>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.

Devin L. O'Brien  
Analyst

Stacy W. Sandler  
Review

**BLAGG ENGINEERING, INC.****MONITOR WELL SAMPLING DATA**CLIENT : AMOCO PRODUCTION CO.CHAIN-OF-CUSTODY # : 6691GCU # 153ELABORATORY (S) USED : ENVIROTECH, INC.

UNIT C, SEC. 28, T29N, R12W

Date : May 28, 1999SAMPLER : N J VFilename : 05-28-99.WK4PROJECT MANAGER : N J V

| WELL<br># | WELL<br>ELEV.<br>(ft) | WATER<br>ELEV.<br>(ft) | DEPTH TO<br>WATER<br>(ft) | TOTAL<br>DEPTH<br>(ft) | SAMPLING<br>TIME | pH  | CONDUCT<br>(umhos) | VOLUME<br>PURGED<br>(gal.) | FREE<br>PRODUCT<br>(ft) |
|-----------|-----------------------|------------------------|---------------------------|------------------------|------------------|-----|--------------------|----------------------------|-------------------------|
| 2A        | 100.40                | 90.35                  | 10.05                     | 15.83                  | 1220             | 6.8 | 2,700              | 3.00                       | -                       |
| 3B        | 100.72                | 89.16                  | 11.56                     | 15.00                  | 1255             | 6.5 | 3,900              | 0.75                       | -                       |
| 7A        | 99.73                 | 88.78                  | 10.95                     | -                      | -                | -   | -                  | -                          | -                       |

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".WELL # 3B, = 1.25" well point . Collected BTEX samples for both MW # 2A & 3B .

# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8021 AROMATIC VOLATILE ORGANICS

Client: Blagg / AMOCO  
Sample ID: MW #2A  
Chain of Custody: 6691  
Laboratory Number: F428  
Sample Matrix: Water  
Preservative: HgCl<sub>2</sub> & Cool  
Condition: Cool & Intact

Project #: 403410  
Date Reported: 06-02-99  
Date Sampled: 05-28-99  
Date Received: 05-28-99  
Date Analyzed: 06-01-99  
Analysis Requested: BTEX

| Parameter    | Concentration<br>(ug/L) | Dilution<br>Factor | Det.<br>Limit<br>(ug/L) |
|--------------|-------------------------|--------------------|-------------------------|
| Benzene      | 185                     | 1                  | 0.2                     |
| Toluene      | 47.8                    | 1                  | 0.2                     |
| Ethylbenzene | 44.1                    | 1                  | 0.2                     |
| p,m-Xylene   | 57.7                    | 1                  | 0.2                     |
| o-Xylene     | 15.7                    | 1                  | 0.1                     |

Total BTEX 351

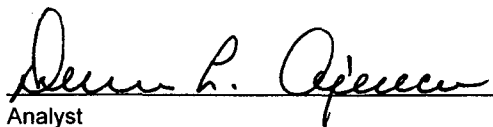
ND - Parameter not detected at the stated detection limit.

| Surrogate Recoveries: | Parameter          | Percent Recovery |
|-----------------------|--------------------|------------------|
|                       | Trifluorotoluene   | 98 %             |
|                       | Bromofluorobenzene | 98 %             |

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 #153E.

  
Analyst

  
Review



# ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

## EPA METHOD 8021 AROMATIC VOLATILE ORGANICS

Client: Blagg / AMOCO  
Sample ID: WP - 3B  
Chain of Custody: 6691  
Laboratory Number: F429  
Sample Matrix: Water  
Preservative: HgCl<sub>2</sub> & Cool  
Condition: Cool & Intact

Project #: 403410  
Date Reported: 06-02-99  
Date Sampled: 05-28-99  
Date Received: 05-28-99  
Date Analyzed: 06-01-99  
Analysis Requested: BTEX

| Parameter    | Concentration<br>(ug/L) | Dilution<br>Factor | Det.<br>Limit<br>(ug/L) |
|--------------|-------------------------|--------------------|-------------------------|
| Benzene      | 178                     | 1                  | 0.2                     |
| Toluene      | 98.0                    | 1                  | 0.2                     |
| Ethylbenzene | 50.5                    | 1                  | 0.2                     |
| p,m-Xylene   | 193                     | 1                  | 0.2                     |
| o-Xylene     | 57.3                    | 1                  | 0.1                     |

Total BTEX 577

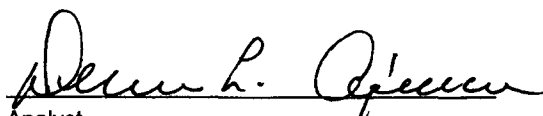
ND - Parameter not detected at the stated detection limit.

| Surrogate Recoveries: | Parameter          | Percent Recovery |
|-----------------------|--------------------|------------------|
|                       | Trifluorotoluene   | 101 %            |
|                       | Bromofluorobenzene | 101 %            |

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 #153E.

  
Analyst

  
Review

# CHAIN OF CUSTODY RECORD

[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<br>Detection Limits (ug/L) | I-Cal RF    | C-Cal RF             | %Diff | Blank<br>Conc | Detect<br>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%      |

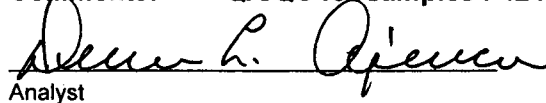
| Spike Conc. (ug/L) | Sample | Amount Spiked | Spiked Sample | % Recovery | Accept Limits |
|--------------------|--------|---------------|---------------|------------|---------------|
| Benzene            | 221    | 50.0          | 274           | 101%       | 39 - 150      |
| Toluene            | 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 # : 10591

10596

GCU # 153E

LABORATORY (S) USED : ON - SITE TECH.

UNIT C, SEC. 28, T29N, R12W

Date : May 26 & June 13, 2000

SAMPLER : N J V

Filename : 05-26-00.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) |
|--------|-----------------|------------------|---------------------|------------------|---------------|-----|-----------------|----------------------|-------------------|
| 2A     | 100.40          | 90.30            | 10.10               | 15.83            | 1000          | 7.0 | 3,500           | 3.00                 | -                 |
| 3B     | 100.72          | 88.88            | 11.84               | 15.00            |               |     |                 |                      | -                 |
| 3R     | 100.80          | 89.92            | 10.88               | 20.00            | 1245          | 7.0 | 7,600           | 4.50                 | -                 |
| 7A     | 99.72           | 89.76            | 9.96                | -                | -             | -   | -               | -                    | -                 |

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 # 3B = 1.25" well point - due to lack of any recovery during the 5 / 26 / 00 sampling event  
in MW # 3B, no sample was collected . Developed MW # 3R on 6 / 12 / 00 .

MW # 3R drilled & installed on 6 / 9 / 00 . 10' screen & casing intervals . Collected BTEX  
sample from MW # 2A on 5 / 26 / 00 & MW # 3R on 6 / 13 / 00 . Fair / poor recovery in MW # 3R .  
DTW from MW # 3R measured on 6 / 13 / 00 .

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



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

## ANALYTICAL REPORT

Date: 13-Jun-00

|                    |                      |                            |                       |
|--------------------|----------------------|----------------------------|-----------------------|
| <b>Client:</b>     | Blagg Engineering    | <b>Client Sample Info:</b> | GCU #153E             |
| <b>Work Order:</b> | 0005063              | <b>Client Sample ID:</b>   | MW #2A                |
| <b>Lab ID:</b>     | 0005063-01A          | <b>Matrix:</b>             | AQUEOUS               |
| <b>Project:</b>    | BP Amoco - GCU #153E | <b>Collection Date:</b>    | 5/26/2000 10:00:00 AM |
|                    |                      | <b>COC Record:</b>         | 10591                 |

| Parameter                    | Result | PQL     | Qual | Units | DF | Date Analyzed |
|------------------------------|--------|---------|------|-------|----|---------------|
| AROMATIC VOLATILES BY GC/PID |        | SW8021B |      |       |    | Analyst: DM   |
| Benzene                      | 220    | 5       |      | µg/L  | 10 | 5/30/2000     |
| Toluene                      | ND     | 0.5     |      | µg/L  | 1  | 6/2/2000      |
| Ethylbenzene                 | 96     | 0.5     |      | µg/L  | 1  | 6/2/2000      |
| m,p-Xylene                   | 15     | 1       |      | µg/L  | 1  | 6/2/2000      |
| o-Xylene                     | ND     | 0.5     |      | µg/L  | 1  | 6/2/2000      |

**Qualifiers:**

PQL - Practical Quantitation Limit  
ND - Not Detected at Practical Quantitation Limit  
J - Analyte detected below Practical Quantitation Limit  
B - Analyte detected in the associated Method Blank

S - Spike Recovery outside accepted recovery limits  
R - RPD outside accepted recovery limits  
E - Value above quantitation range  
Surr: - Surrogate

1 of 1

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- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

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



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

## ANALYTICAL REPORT

Date: 27-Jun-00

|                    |                      |                            |                       |
|--------------------|----------------------|----------------------------|-----------------------|
| <b>Client:</b>     | Blagg Engineering    | <b>Client Sample Info:</b> | GCU #153E             |
| <b>Work Order:</b> | 0006033              | <b>Client Sample ID:</b>   | MW #3R                |
| <b>Lab ID:</b>     | 0006033-01A          | <b>Matrix:</b>             | AQUEOUS               |
| <b>Project:</b>    | BP Amoco - GCU #153E | <b>Collection Date:</b>    | 6/13/2000 12:45:00 PM |
|                    |                      | <b>COC Record:</b>         | 10596                 |

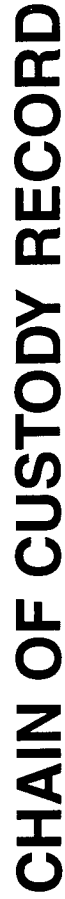
| Parameter                    | Result | PQL     | Qual | Units       | DF | Date Analyzed |
|------------------------------|--------|---------|------|-------------|----|---------------|
| AROMATIC VOLATILES BY GC/PID |        | SW8021B |      | Analyst: DC |    |               |
| Benzene                      | 360    | 10      |      | µg/L        | 20 | 6/18/2000     |
| Toluene                      | 16     | 10      |      | µg/L        | 20 | 6/18/2000     |
| Ethylbenzene                 | 720    | 10      |      | µg/L        | 20 | 6/18/2000     |
| m,p-Xylene                   | 1200   | 20      |      | µg/L        | 20 | 6/18/2000     |
| o-Xylene                     | 34     | 10      |      | µg/L        | 20 | 6/18/2000     |

**Qualifiers:**

PQL - Practical Quantitation Limit  
ND - Not Detected at Practical Quantitation Limit  
J - Analyte detected below Practical Quantitation Limit  
B - Analyte detected in the associated Method Blank

S - Spike Recovery outside accepted recovery limits  
R - RPD outside accepted recovery limits  
E - Value above quantitation range  
Surr: - Surrogate

1 of 1



50

Date: \_\_\_\_\_

Page: \_\_\_\_\_ of \_\_\_\_\_

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LAB: (505) 325-5667 • FAX: (505) 327-1496

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Date:

Page: \_\_\_\_\_ of \_\_\_\_\_

[illegible]



# On Site Technologies, LTD.

Date: 13-Jun-00

**CLIENT:** Blagg Engineering  
**Work Order:** 0005063  
**Project:** BP Amoco - GCU #153E

## QC SUMMARY REPORT

Method Blank

|                         |                       |                      |             |                          |            |          |           |             |      |          |      |
|-------------------------|-----------------------|----------------------|-------------|--------------------------|------------|----------|-----------|-------------|------|----------|------|
| Sample ID: MB1          | Batch ID: GC-1_000530 | Test Code: SW8021B   | Units: µg/L | Analysis Date: 5/30/2000 | Prep Date: |          |           |             |      |          |      |
| Client ID:              | 0005063               | Run ID: GC-1_000530A |             | SeqNo: 28214             |            |          |           |             |      |          |      |
| Analyte                 | Result                | PQL                  | SPK value   | SPK Ref Val              | %REC       | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Benzene                 | .1373                 |                      | 0.5         |                          |            |          |           |             |      |          | J    |
| Ethylbenzene            | ND                    |                      | 0.5         |                          |            |          |           |             |      |          |      |
| m,p-Xylene              | ND                    |                      | 1           |                          |            |          |           |             |      |          |      |
| Methyl tert-Butyl Ether | ND                    |                      | 1           |                          |            |          |           |             |      |          |      |
| o-Xylene                | .0429                 |                      | 0.5         |                          |            |          |           |             |      |          | J    |
| Toluene                 | .1473                 |                      | 0.5         |                          |            |          |           |             |      |          | J    |

|                         |                       |                    |              |                         |       |          |           |             |      |          |      |
|-------------------------|-----------------------|--------------------|--------------|-------------------------|-------|----------|-----------|-------------|------|----------|------|
| Sample ID: MB1          | Batch ID: GC-1_000602 | Test Code: SW8021B | Units: µg/L  | Analysis Date: 6/2/2000 |       |          |           | Prep Date:  |      |          |      |
| Client ID:              | 0005063               | Run ID:            | GC-1_000602A | SeqNo:                  | 28294 |          |           |             |      |          |      |
| Analyte                 | Result                | PQL                | SPK value    | SPK Ref Val             | %REC  | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Benzene                 | .0361                 |                    |              |                         |       |          |           |             |      |          | J    |
| Ethylbenzene            | ND                    |                    |              |                         |       |          |           |             |      |          |      |
| m,p-Xylene              | ND                    | 1                  |              |                         |       |          |           |             |      |          |      |
| Methyl tert-Butyl Ether | ND                    | 1                  |              |                         |       |          |           |             |      |          |      |
| o-Xylene                | ND                    |                    |              |                         |       |          |           |             |      |          |      |
| Toluene                 | .0798                 |                    |              |                         |       |          |           |             |      |          | 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: 13-Jun-00

CLIENT: Blagg Engineering

Work Order: 0005063

Project: BP Amoco - GCU #153E

## QC SUMMARY REPORT

Sample Matrix Spike

|                          |        |                       |           |                    |        |              |           |                          |      |            |      |
|--------------------------|--------|-----------------------|-----------|--------------------|--------|--------------|-----------|--------------------------|------|------------|------|
| Sample ID: 0005060-01AMS |        | Batch ID: GC-1_000530 |           | Test Code: SW8021B |        | Units: µg/L  |           | Analysis Date: 5/30/2000 |      | Prep Date: |      |
| Client ID:               |        | 0005063               |           | Run ID:            |        | GC-1_000530A |           | SeqNo: 28215             |      |            |      |
| Analyte                  | Result | PQL                   | SPK value | SPK Ref Val        | %REC   | LowLimit     | HighLimit | RPD Ref Val              | %RPD | RPDLimit   | Qual |
| Benzene                  | 1056   | 5                     | 400       | 641.6              | 103.5% | 73           | 126       |                          |      |            |      |
| Ethylbenzene             | 418.3  | 5                     | 400       | 12.55              | 101.4% | 88           | 113       |                          |      |            |      |
| m,p-Xylene               | 781    | 10                    | 800       | 14.48              | 95.8%  | 83           | 112       |                          |      |            |      |
| Methyl tert-Butyl Ether  | 435.9  | 10                    | 400       | 13.34              | 105.6% | 81           | 125       |                          |      |            |      |
| o-Xylene                 | 407.4  | 5                     | 400       | 2.036              | 101.4% | 93           | 110       |                          |      |            |      |
| Toluene                  | 410.1  | 5                     | 400       | 0.698              | 102.3% | 76           | 126       |                          |      |            |      |

|                           |        |                       |           |                    |        |              |           |                          |      |          |            |  |
|---------------------------|--------|-----------------------|-----------|--------------------|--------|--------------|-----------|--------------------------|------|----------|------------|--|
| Sample ID: 0005060-01AMSD |        | Batch ID: GC-1_000530 |           | Test Code: SW8021B |        | Units: µg/L  |           | Analysis Date: 5/30/2000 |      |          | Prep Date: |  |
| Client ID:                |        | 0005063               |           | Run ID:            |        | GC-1_000530A |           | SeqNo: 28216             |      |          |            |  |
| Analyte                   | Result | PQL                   | SPK value | SPK Ref Val        | %REC   | LowLimit     | HighLimit | RPD Ref Val              | %RPD | RPDLimit | Qual       |  |
| Benzene                   | 1049   | 5                     | 400       | 641.6              | 101.7% | 73           | 126       | 1056                     | 0.7% | 6        |            |  |
| Ethylbenzene              | 416.1  | 5                     | 400       | 12.55              | 100.9% | 88           | 113       | 418.3                    | 0.5% | 5        |            |  |
| m,p-Xylene                | 778.3  | 10                    | 800       | 14.48              | 95.5%  | 83           | 112       | 781                      | 0.4% | 7        |            |  |
| Methyl tert-Butyl Ether   | 439.5  | 10                    | 400       | 13.34              | 106.5% | 81           | 125       | 435.9                    | 0.8% | 9        |            |  |
| o-Xylene                  | 406.1  | 5                     | 400       | 2.036              | 101.0% | 93           | 110       | 407.4                    | 0.3% | 6        |            |  |
| Toluene                   | 408.4  | 5                     | 400       | 0.698              | 101.9% | 76           | 126       | 410.1                    | 0.4% | 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

CLIENT: Blagg Engineering

Work Order: 0005063

Project: BP Amoco - GCU #153E

## QC SUMMARY REPORT

Sample Matrix Spike

|                          |        |                       |  |                    |      |             |       |                         |          |            |             |      |          |      |
|--------------------------|--------|-----------------------|--|--------------------|------|-------------|-------|-------------------------|----------|------------|-------------|------|----------|------|
| Sample ID: 0006003-01AMS |        | Batch ID: GC-1_000602 |  | Test Code: SW8021B |      | Units: µg/L |       | Analysis Date: 6/2/2000 |          | Prep Date: |             |      |          |      |
| Client ID: 0005063       |        | Run ID: GC-1_000602A  |  | PQL                |      | SPK value   |       | SeqNo: 28295            |          |            |             |      |          |      |
| Analyte                  | Result |                       |  |                    |      |             |       | %REC                    | LowLimit | HighLimit  | RPD Ref Val | %RPD | RPDLimit | Qual |
| Benzene                  | 2065   |                       |  | 10                 | 800  |             | 1223  | 105.3%                  | 73       | 126        |             |      |          |      |
| Ethylbenzene             | 1349   |                       |  | 10                 | 800  |             | 529.6 | 102.4%                  | 88       | 113        |             |      |          |      |
| m,p-Xylene               | 2519   |                       |  | 20                 | 1600 |             | 967.2 | 97.0%                   | 83       | 112        |             |      |          |      |
| Methyl tert-Butyl Ether  | 1066   |                       |  | 20                 | 800  |             | 190.4 | 109.4%                  | 81       | 125        |             |      |          |      |
| o-Xylene                 | 1024   |                       |  | 10                 | 800  |             | 214.6 | 101.2%                  | 93       | 110        |             |      |          |      |
| Toluene                  | 1328   |                       |  | 10                 | 800  |             | 496.5 | 104.0%                  | 76       | 126        |             |      |          |      |

|                           |        |                       |           |                    |        |             |           |                         |      |            |      |
|---------------------------|--------|-----------------------|-----------|--------------------|--------|-------------|-----------|-------------------------|------|------------|------|
| Sample ID: 0006003-01AMSD |        | Batch ID: GC-1_000602 |           | Test Code: SW8021B |        | Units: µg/L |           | Analysis Date: 6/2/2000 |      | Prep Date: |      |
| Client ID: 0005063        |        | Run ID: GC-1_000602A  |           |                    |        |             |           | SeqNo: 28296            |      |            |      |
| Analyte                   | Result | PQL                   | SPK value | SPK Ref Val        | %REC   | LowLimit    | HighLimit | RPD Ref Val             | %RPD | RPDLimit   | Qual |
| Benzene                   | 2029   | 10                    | 800       | 1223               | 100.8% | 73          | 126       | 2065                    | 1.8% | 6          |      |
| Ethylbenzene              | 1327   | 10                    | 800       | 529.6              | 99.7%  | 88          | 113       | 1349                    | 1.6% | 5          |      |
| m,p-Xylene                | 2474   | 20                    | 1600      | 967.2              | 94.2%  | 83          | 112       | 2519                    | 1.8% | 7          |      |
| Methyl tert-Butyl Ether   | 1019   | 20                    | 800       | 190.4              | 103.5% | 81          | 125       | 1066                    | 4.5% | 9          |      |
| o-Xylene                  | 1021   | 10                    | 800       | 214.6              | 100.8% | 93          | 110       | 1024                    | 0.3% | 6          |      |
| Toluene                   | 1320   | 10                    | 800       | 496.5              | 102.9% | 76          | 126       | 1328                    | 0.6% | 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: 13-Jun-00

**CLIENT:** Blagg Engineering  
**Work Order:** 0005063  
**Project:** BP Amoco - GCU #153E

## QC SUMMARY REPORT

Laboratory Control Spike - generic

|                         |        |                       |                    |              |             |              |                          |             |            |          |      |
|-------------------------|--------|-----------------------|--------------------|--------------|-------------|--------------|--------------------------|-------------|------------|----------|------|
| Sample ID: LCS WATER    |        | Batch ID: GC-1_000530 | Test Code: SW8021B |              | Units: µg/L |              | Analysis Date: 5/30/2000 |             | Prep Date: |          |      |
| Client ID:              |        | 0005063               | Run ID:            | GC-1_000530A |             | SeqNo: 28213 |                          |             |            |          |      |
| Analyte                 | Result | PQL                   | SPK value          | SPK Ref Val  | %REC        | LowLimit     | HighLimit                | RPD Ref Val | %RPD       | RPDLimit | Qual |
| Benzene                 | 41     | 0.5                   | 40                 | 0.1373       | 102.2%      | 89           | 112                      |             |            |          |      |
| Ethylbenzene            | 40.88  | 0.5                   | 40                 | 0            | 102.2%      | 93           | 112                      |             |            |          |      |
| m,p-Xylene              | 77.26  | 1                     | 80                 | 0            | 96.6%       | 88           | 108                      |             |            |          |      |
| Methyl tert-Butyl Ether | 41.6   | 1                     | 40                 | 0            | 104.0%      | 87           | 115                      |             |            |          |      |
| o-Xylene                | 40.73  | 0.5                   | 40                 | 0.0429       | 101.7%      | 93           | 112                      |             |            |          |      |
| Toluene                 | 40.96  | 0.5                   | 40                 | 0.1473       | 102.0%      | 92           | 111                      |             |            |          |      |

|                         |        |                       |                    |              |                         |          |            |             |      |          |      |
|-------------------------|--------|-----------------------|--------------------|--------------|-------------------------|----------|------------|-------------|------|----------|------|
| Sample ID: LCS WATER    |        | Batch ID: GC-1_000602 | Test Code: SW8021B | Units: µg/L  | Analysis Date: 6/2/2000 |          | Prep Date: |             |      |          |      |
| Client ID:              |        | 0005063               | Run ID:            | GC-1_000602A | SeqNo: 28293            |          |            |             |      |          |      |
| Analyte                 | Result | PQL                   | SPK value          | SPK Ref Val  | %REC                    | LowLimit | HighLimit  | RPD Ref Val | %RPD | RPDLimit | Qual |
| Benzene                 | 40.86  | 0.5                   | 40                 | 0.0361       | 102.1%                  | 89       | 112        |             |      |          |      |
| Ethylbenzene            | 40.82  | 0.5                   | 40                 | 0            | 102.0%                  | 93       | 112        |             |      |          |      |
| m,p-Xylene              | 77.09  | 1                     | 80                 | 0            | 96.4%                   | 88       | 108        |             |      |          |      |
| Methyl tert-Butyl Ether | 41.92  | 1                     | 40                 | 0            | 104.8%                  | 87       | 115        |             |      |          |      |
| o-Xylene                | 40.75  | 0.5                   | 40                 | 0            | 101.9%                  | 93       | 112        |             |      |          |      |
| Toluene                 | 40.93  | 0.5                   | 40                 | 0.0798       | 102.1%                  | 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: 13-Jun-00

**CLIENT:** Blagg Engineering  
**Work Order:** 0005063  
**Project:** BP Amoco - GCU #153E

## QC SUMMARY REPORT

Continuing Calibration Verification Standard

| Sample ID: CCV1 BTEX_0004 |        | Batch ID: GC-1_000530 | Test Code: SW8021B | Units: µg/L  | Analysis Date: 5/30/2000 |              |           |             | Prep Date: |          |      |
|---------------------------|--------|-----------------------|--------------------|--------------|--------------------------|--------------|-----------|-------------|------------|----------|------|
| Client ID:                |        | 0005063               | Run ID:            | GC-1_000530A |                          | SeqNo: 28210 |           |             |            |          |      |
| Analyte                   | Result | PQL                   | SPK value          | SPK Ref Val  | %REC                     | LowLimit     | HighLimit | RPD Ref Val | %RPD       | RPDLimit | Qual |
| Benzene                   | 21.32  | 0.5                   | 20                 | 0            | 106.6%                   | 85           | 115       |             |            |          |      |
| Ethylbenzene              | 21.22  | 0.5                   | 20                 | 0            | 106.1%                   | 85           | 115       |             |            |          |      |
| m,p-Xylene                | 39.95  | 1                     | 40                 | 0            | 99.9%                    | 85           | 115       |             |            |          |      |
| Methyl tert-Butyl Ether   | 22.51  | 1                     | 20                 | 0            | 112.6%                   | 85           | 115       |             |            |          |      |
| o-Xylene                  | 21.16  | 0.5                   | 20                 | 0            | 105.8%                   | 85           | 115       |             |            |          |      |
| Toluene                   | 21     | 0.5                   | 20                 | 0            | 105.0%                   | 85           | 115       |             |            |          |      |
| 1,4-Difluorobenzene       | 89.19  | 0                     | 100                | 0            | 89.2%                    | 80           | 105       |             |            |          |      |
| 4-Bromochlorobenzene      | 90.01  | 0                     | 100                | 0            | 90.0%                    | 78           | 108       |             |            |          |      |
| Fluorobenzene             | 88.33  | 0                     | 100                | 0            | 88.3%                    | 78           | 108       |             |            |          |      |

| Sample ID: CCV2 BTEX_0004 |        | Batch ID: GC-1_000530 | Test Code: SW8021B | Units: µg/L  | Analysis Date: 5/30/2000 |              |           |             | Prep Date: |          |      |
|---------------------------|--------|-----------------------|--------------------|--------------|--------------------------|--------------|-----------|-------------|------------|----------|------|
| Client ID:                |        | 0005063               | Run ID:            | GC-1_000530A |                          | SeqNo: 28211 |           |             |            |          |      |
| Analyte                   | Result | PQL                   | SPK value          | SPK Ref Val  | %REC                     | LowLimit     | HighLimit | RPD Ref Val | %RPD       | RPDLimit | Qual |
| Benzene                   | 20.41  | 0.5                   | 20                 | 0            | 102.1%                   | 85           | 115       |             |            |          |      |
| Ethylbenzene              | 20.14  | 0.5                   | 20                 | 0            | 100.7%                   | 85           | 115       |             |            |          |      |
| m,p-Xylene                | 37.85  | 1                     | 40                 | 0            | 94.6%                    | 85           | 115       |             |            |          |      |
| Methyl tert-Butyl Ether   | 22.62  | 1                     | 20                 | 0            | 113.1%                   | 85           | 115       |             |            |          |      |
| o-Xylene                  | 20.13  | 0.5                   | 20                 | 0            | 100.7%                   | 85           | 115       |             |            |          |      |
| Toluene                   | 20.04  | 0.5                   | 20                 | 0            | 100.2%                   | 85           | 115       |             |            |          |      |
| 1,4-Difluorobenzene       | 88.49  | 0                     | 100                | 0            | 88.5%                    | 80           | 105       |             |            |          |      |
| 4-Bromochlorobenzene      | 89.4   | 0                     | 100                | 0            | 89.4%                    | 78           | 108       |             |            |          |      |
| Fluorobenzene             | 88.38  | 0                     | 100                | 0            | 88.4%                    | 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: 0005063

Project: BP Amoco - GCU #153E

## QC SUMMARY REPORT

Continuing Calibration Verification Standard

| Sample ID: CCV3 BTEX_0004 |        | Batch ID: GC-1_000530 |           | Test Code: SW8021B |        | Units: µg/L  |           | Analysis Date: 5/30/2000 |      | Prep Date: |      |
|---------------------------|--------|-----------------------|-----------|--------------------|--------|--------------|-----------|--------------------------|------|------------|------|
| Client ID:                |        | 0005063               |           | Run ID:            |        | GC-1_000530A |           | SeqNo:                   |      | 28212      |      |
| Analyte                   | Result | PQL                   | SPK value | SPK Ref Val        | %REC   | LowLimit     | HighLimit | RPD Ref Val              | %RPD | RPDLimit   | Qual |
| Benzene                   | 40.46  | 0.5                   | 40        | 0                  | 101.1% | 85           | 115       |                          |      |            |      |
| Ethylbenzene              | 40.04  | 0.5                   | 40        | 0                  | 100.1% | 85           | 115       |                          |      |            |      |
| m,p-Xylene                | 75.78  | 1                     | 80        | 0                  | 94.7%  | 85           | 115       |                          |      |            |      |
| Methyl tert-Butyl Ether   | 44.07  | 1                     | 40        | 0                  | 110.2% | 85           | 115       |                          |      |            |      |
| o-Xylene                  | 40.03  | 0.5                   | 40        | 0                  | 100.1% | 85           | 115       |                          |      |            |      |
| Toluene                   | 40.4   | 0.5                   | 40        | 0                  | 101.0% | 85           | 115       |                          |      |            |      |
| 1,4-Difluorobenzene       | 88.78  | 0                     | 100       | 0                  | 88.8%  | 80           | 105       |                          |      |            |      |
| 4-Bromochlorobenzene      | 88.73  | 0                     | 100       | 0                  | 88.7%  | 78           | 108       |                          |      |            |      |
| Fluorobenzene             | 87.55  | 0                     | 100       | 0                  | 87.5%  | 78           | 108       |                          |      |            |      |

| Sample ID: CCV1 BTEX_0004 |        | Batch ID: GC-1_000602 |           | Test Code: SW8021B |        | Units: µg/L  |           | Analysis Date: 6/2/2000 |      | Prep Date: |      |
|---------------------------|--------|-----------------------|-----------|--------------------|--------|--------------|-----------|-------------------------|------|------------|------|
| Client ID:                |        | 0005063               |           | Run ID:            |        | GC-1_000602A |           | SeqNo:                  |      | 28290      |      |
| Analyte                   | Result | PQL                   | SPK value | SPK Ref Val        | %REC   | LowLimit     | HighLimit | RPD Ref Val             | %RPD | RPDLimit   | Qual |
| Benzene                   | 19.94  | 0.5                   | 20        | 0                  | 99.7%  | 85           | 115       |                         |      |            |      |
| Ethylbenzene              | 20.2   | 0.5                   | 20        | 0                  | 101.0% | 85           | 115       |                         |      |            |      |
| m,p-Xylene                | 37.98  | 1                     | 40        | 0                  | 95.0%  | 85           | 115       |                         |      |            |      |
| Methyl tert-Butyl Ether   | 21.94  | 1                     | 20        | 0                  | 109.7% | 85           | 115       |                         |      |            |      |
| o-Xylene                  | 20.19  | 0.5                   | 20        | 0                  | 101.0% | 85           | 115       |                         |      |            |      |
| Toluene                   | 20     | 0.5                   | 20        | 0                  | 100.0% | 85           | 115       |                         |      |            |      |
| 1,4-Difluorobenzene       | 88.8   | 0                     | 100       | 0                  | 88.8%  | 80           | 105       |                         |      |            |      |
| 4-Bromochlorobenzene      | 88.31  | 0                     | 100       | 0                  | 88.3%  | 78           | 108       |                         |      |            |      |
| Fluorobenzene             | 87.52  | 0                     | 100       | 0                  | 87.5%  | 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

**QC SUMMARY REPORT**  
Continuing Calibration Verification Standard

**CLIENT:** Blagg Engineering  
**Work Order:** 0005063  
**Project:** BP Amoco - GCU #153E

|                           |        |                       |                    |             |                         |          |           |             |      |          |      |
|---------------------------|--------|-----------------------|--------------------|-------------|-------------------------|----------|-----------|-------------|------|----------|------|
| Sample ID: CCV2 BTEX_0004 |        | Batch ID: GC-1_000602 | Test Code: SW8021B | Units: µg/L | Analysis Date: 6/2/2000 |          |           | Prep Date:  |      |          |      |
| Client ID: 0005063        |        | Run ID: GC-1_000602A  |                    |             | SeqNo: 28291            |          |           |             |      |          |      |
| Analyte                   | Result | PQL                   | SPK value          | SPK Ref Val | %REC                    | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Benzene                   | 20.24  | 0.5                   | 20                 | 0           | 101.2%                  | 85       | 115       |             |      |          |      |
| Ethylbenzene              | 20.82  | 0.5                   | 20                 | 0           | 104.1%                  | 85       | 115       |             |      |          |      |
| m,p-Xylene                | 39.13  | 1                     | 40                 | 0           | 97.8%                   | 85       | 115       |             |      |          |      |
| Methyl tert-Butyl Ether   | 22.59  | 1                     | 20                 | 0           | 113.0%                  | 85       | 115       |             |      |          |      |
| o-Xylene                  | 20.69  | 0.5                   | 20                 | 0           | 103.4%                  | 85       | 115       |             |      |          |      |
| Toluene                   | 20.48  | 0.5                   | 20                 | 0           | 102.4%                  | 85       | 115       |             |      |          |      |
| 1,4-Difluorobenzene       | 88.3   | 0                     | 100                | 0           | 88.3%                   | 80       | 105       |             |      |          |      |
| 4-Bromochlorobenzene      | 90.36  | 0                     | 100                | 0           | 90.4%                   | 78       | 108       |             |      |          |      |
| Fluorobenzene             | 87.31  | 0                     | 100                | 0           | 87.3%                   | 78       | 108       |             |      |          |      |

| Sample ID: CCV3 BTEX_0004 |        | Batch ID: GC-1_000602 | Test Code: SW8021B | Units: µg/L | Analysis Date: 6/2/2000 |          | Prep Date: |             |      |          |      |
|---------------------------|--------|-----------------------|--------------------|-------------|-------------------------|----------|------------|-------------|------|----------|------|
| Client ID: 0005063        |        | Run ID: GC-1_000602A  |                    |             | SeqNo: 28292            |          |            |             |      |          |      |
| Analyte                   | Result | PQL                   | SPK value          | SPK Ref Val | %REC                    | LowLimit | HighLimit  | RPD Ref Val | %RPD | RPDLimit | Qual |
| Benzene                   | 38.65  | 0.5                   | 40                 | 0           | 96.6%                   | 85       | 115        |             |      |          |      |
| Ethylbenzene              | 38.52  | 0.5                   | 40                 | 0           | 96.3%                   | 85       | 115        |             |      |          |      |
| m,p-Xylene                | 72.89  | 1                     | 80                 | 0           | 91.1%                   | 85       | 115        |             |      |          |      |
| Methyl tert-Butyl Ether   | 42.9   | 1                     | 40                 | 0           | 107.2%                  | 85       | 115        |             |      |          |      |
| o-Xylene                  | 38.62  | 0.5                   | 40                 | 0           | 96.5%                   | 85       | 115        |             |      |          |      |
| Toluene                   | 38.82  | 0.5                   | 40                 | 0           | 97.0%                   | 85       | 115        |             |      |          |      |
| 1,4-Difluorobenzene       | 88.28  | 0                     | 100                | 0           | 88.3%                   | 80       | 105        |             |      |          |      |
| 4-Bromochlorobenzene      | 88.57  | 0                     | 100                | 0           | 88.6%                   | 78       | 108        |             |      |          |      |
| Fluorobenzene             | 86.73  | 0                     | 100                | 0           | 86.7%                   | 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: 0005063  
Project: BP Amoco - GCU #153E  
Test No: SW8021B

## QC SUMMARY REPORT SURROGATE RECOVERIES

Aromatic Volatiles by GC/PID

| Sample ID      | 14FBZ | 4BCBZ | FLBZ |
|----------------|-------|-------|------|
| 0005059-01A    | 88.5  | 87.9  | 88.3 |
| 0005060-01A    | 87.9  | 90.6  | 86.8 |
| 0005060-01AMS  | 86.6  | 90.4  | 86.6 |
| 0005060-01AMSD | 87.6  | 90.5  | 86.4 |
| 0005060-04A    | 88.4  | 88.6  | 86.3 |
| 0005060-06A    | 87.9  | 90.5  | 86.8 |
| 0005061-01D    | 85.8  | 85.2  | 85.5 |
| 0005061-02D    | 86.8  | 86.1  | 86.7 |
| 0005061-03A    | 88.7  | 90.2  | 88.6 |
| 0005062-01A    | 88.8  | 90.9  | 87.5 |
| 0005062-02A    | 89    | 90.5  | 87.5 |
| 0005063-01A    | 81.7  | 85.9  | 80.8 |
| 0005064-01A    | 88.4  | 89.2  | 87.7 |
| 0005066-01A    | 89.6  | 89    | 90.1 |
| 0005066-02A    | 89.6  | 89.2  | 89.3 |
| 0005066-03A    | 88.8  | 89.2  | 89.2 |
| 0005067-01A    | 89.6  | 92    | 88   |
| 0005067-03A    | 90.3  | 87.9  | 89.3 |
| 0005067-04A    | 88.9  | 87.7  | 87.8 |
| 0005067-05A    | 89    | 88.1  | 87.9 |
| 0006001-01A    | 89.5  | 89.8  | 88   |
| 0006001-02A    | 89.4  | 90.4  | 88.2 |
| 0006001-03A    | 89.1  | 90    | 88.4 |
| 0006001-04A    | 89.2  | 89.7  | 88.4 |
| 0006001-05A    | 89.6  | 89.5  | 88.1 |
| 0006002-01A    | 92.3  | 89.4  | 85.2 |
| 0006002-02A    | 88.8  | 88.9  | 86.6 |

| 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: 0005063  
Project: BP Amoco - GCU #153E  
Test No: SW8021B

## QC SUMMARY REPORT SURROGATE RECOVERIES

Aromatic Volatiles by GC/PID

| Sample ID       | 14FBZ | 4BCBZ | FLBZ |
|-----------------|-------|-------|------|
| 0006002-03A     | 82    | 84.4  | 81.4 |
| 0006002-04A     | 111 * | 90.3  | 93   |
| 0006002-05A     | 88.3  | 90.4  | 87.1 |
| 0006002-06A     | 136 * | 93.9  | 95.7 |
| 0006003-01A     | 87.8  | 90.1  | 86.3 |
| 0006003-01AMS   | 87.8  | 90.2  | 85.5 |
| 0006003-01AMSD  | 87.3  | 90.1  | 85.6 |
| 0006003-02A     | 88.7  | 88.6  | 87.3 |
| 0006003-03A     | 89.8  | 90    | 88.1 |
| CCV1 BTEX_00040 | 88.8  | 88.3  | 87.5 |
| CCV2 BTEX_00040 | 88.3  | 90.4  | 87.3 |
| CCV3 BTEX_00040 | 88.3  | 88.6  | 86.7 |
| LCS WATER       | 88.3  | 89    | 86.7 |
| MB1             | 89.4  | 88.7  | 88.1 |

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

\* Surrogate recovery outside acceptance limits

On Site Technologies, LTD.

Date: 27-Jun-00

CLIENT: Blagg Engineering  
Work Order: 0006033  
Project: BP Amoco - GCU #153E

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:              | 0006033               | 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                                                      |

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:** 0006033  
**Project:** BP Amoco - GCU #153E

## 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:               |        | 0006033               | 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       |             |            |          |      |
| o-Xylene                 | 4463   | 50                    | 4000               | 11.62        | 111.3%                   | 93       | 110       |             |            |          | S    |
| 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: 0006033        |        | 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

# On Site Technologies, LTD.

Date: 27-Jun-00

**CLIENT:** Blagg Engineering  
**Work Order:** 0006033  
**Project:** BP Amoco - GCU #153E

## 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: 0006033      |        | Run ID: GC-1_000618A  | PQL                | SPK value   | SPK Ref Val | %REC                     | LowLimit | HighLimit  | SeqNo: 28758 |
| Analyte                 | Result |                       |                    |             |             |                          |          |            |              |
| 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        |              |

**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

## QC SUMMARY REPORT

Continuing Calibration Verification Standard

CLIENT: Blagg Engineering

Work Order: 0006033

Project: BP Amoco - GCU #153E

| 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:                |        | 0006033               | Run ID:            | GC-1_000618A |             |          |                          |             |      |          |            |  |
| Analyte                   | Result | PQL                   | SPK value          | SPK Ref Val  | %REC        | LowLimit | HighLimit                | RPD Ref Val | %RPD | RPDLimit | Qual       |  |
| 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:                | 0006033 | Run ID:               | GC-1_000618A       |             | SeqNo:                   | 28756    |            |             |      |          |      |
| Analyte                   | Result  | PQL                   | SPK value          | SPK Ref Val | %REC                     | LowLimit | HighLimit  | RPD Ref Val | %RPD | RPDLimit | Qual |
| 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: 0006033

Project: BP Amoco - GCU #153E

## 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:                |        | 0006033               | Run ID: GC-1_000618A |             |        | SeqNo: 28757             |           |             |                    |
| Analyte                   | Result | PQL                   | SPK value            | SPK Ref Val | %REC   | LowLimit                 | HighLimit | RPD Ref Val | %RPD RPDLimit Qual |
| Benzene                   | 42.5   | 0.5                   | 40                   | 0           | 106.3% | 85                       | 115       |             |                    |
| Ethylbenzene              | 42.22  | 0.5                   | 40                   | 0           | 105.5% | 85                       | 115       |             |                    |
| m,p-Xylene                | 80.24  | 1                     | 80                   | 0           | 100.3% | 85                       | 115       |             |                    |
| Methyl tert-Butyl Ether   | 44.61  | 1                     | 40                   | 0           | 111.5% | 85                       | 115       |             |                    |
| o-Xylene                  | 42.68  | 0.5                   | 40                   | 0           | 106.7% | 85                       | 115       |             |                    |
| Toluene                   | 42.52  | 0.5                   | 40                   | 0           | 106.3% | 85                       | 115       |             |                    |
| 1,4-Difluorobenzene       | 89.3   | 0                     | 100                  | 0           | 89.3%  | 80                       | 105       |             |                    |
| 4-Bromochlorobenzene      | 84.12  | 0                     | 100                  | 0           | 84.1%  | 78                       | 108       |             |                    |
| Fluorobenzene             | 88.14  | 0                     | 100                  | 0           | 88.1%  | 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

On Site Technologies, LTD.

Date: 27-Jun-00

CLIENT: Blagg Engineering  
 Work Order: 0006033  
 Project: BP Amoco - GCU #153E  
 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     | 84.6  | 83.4  | 84.5 |
| 0006031-01A     | 89.2  | 82.6  | 89.3 |
| 0006031-03A     | 89.8  | 83.3  | 89.1 |
| 0006033-01A     | 87.8  | 82.8  | 87.3 |
| 0006034-01A     | 90.4  | 83.7  | 89.4 |
| 0006034-02A     | 90.1  | 83.8  | 89   |
| 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   |
| 0006034-06A     | 90.4  | 84.3  | 89.2 |
| 0006036-01A     | 89.4  | 83.4  | 88.4 |
| CCV1 BTEX_00040 | 90.2  | 84.8  | 88.5 |
| CCV2 BTEX_00040 | 89.7  | 84.4  | 88.6 |
| CCV3 BTEX_00040 | 89.3  | 84.1  | 88.1 |
| LCS WATER       | 89.3  | 85    | 88.2 |
| MBI             | 91.1  | 83    | 89.6 |

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

\* Surrogate recovery outside acceptance limits

1

Form 3160-5  
(June 1990)UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

## SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.  
Use "APPLICATION FOR PERMIT—" for such proposals

## SUBMIT IN TRIPLICATE

## 1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

## 2. Name of Operator

Amoco Production Company

## 3. Address and Telephone No.

200 Amoco Court, Farmington, N.M. 87401 Tel: (505) 326-9200

## 4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

NE 1/4 NW 1/4, SEC. 28, T 29 N, R 12 W, NMPM

## FORM APPROVED

Budget Bureau No. 1004-0135

Expires: March 31, 1993

## 5. Lease Designation and Serial No.

NM-03526

## 6. If Indian, Allottee or Tribe Name

## 7. If Unit or CA, Agreement Designation

892000844F

## 8. Well Name and No.

GCH 153 E

## 9. API Well No.

3004524292

## 10. Field and Pool, or Exploratory Area

DAKOTA

## 11. County or Parish, State

SAN JUAN, NM

## 12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

## TYPE OF SUBMISSION

☐ Notice of Intent☒ Subsequent Report☐ Final Abandonment Notice

## TYPE OF ACTION

☐ Abandonment☐ Recompletion☐ Plugging Back☐ Casing Repair☐ Altering Casing☒ Other Pit closure☐ Change of Plans☐ New Construction☐ Non-Routine Fracturing☐ Water Shut-Off☐ Conversion to Injection☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

## 13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

Pit closure verification - see attached documentation.

DEHYDRATOR - ABANDONED

## 14. I hereby certify that the foregoing is true and correct

Signed

B. Shaw

Title

Enviro. Coordinator

Date

2-9-95

(This space for Federal or State office use)

Approved by

Conditions of approval, if any:

Title

Date

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

\*See instruction on Reverse Side



District I

P.O. Box 1980, Hobbs, NM

District II

P.O. Drawer DD, Artesia, NM 88211

District III

1000 Rio Brazos Rd, Aztec, NM 87410

State of New Mexico

Energy, Minerals and Natural Resources Department

## OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

SUBMIT 1 COPY TO  
APPROPRIATE  
DISTRICT OFFICE  
AND 1 COPY TO  
SANTA FE OFFICE

PIT REMEDIATION AND CLOSURE REPORTOperator: Amoco Production Company Telephone: (505) - 326-9200Address: 200 Amoco Court, Farmington, New Mexico 87401Facility Or: GCM 153E

Well Name

Location: Unit or Qtr/Qtr Sec C Sec 28 T 29N R 12W County SAN JUANPit Type: Separator ABANDONED Dehydrator X OtherLand Type: BLM   , State   , Fee   , Other UNIT AGMT.Pit Location: Pit dimensions: length 90', width 39', depth 13'  
(Attach diagram)Reference: wellhead X, otherFootage from reference: 165'Direction from reference: 35 Degrees    East North X  
of  
X West South   

## Depth To Ground Water:

(Vertical distance from  
contaminants to seasonal  
high water elevation of  
ground water)

Less than 50 feet (20 points)  
50 feet to 99 feet (10 points)  
Greater than 100 feet (0 Points) 20

## Wellhead Protection Area:

(Less than 200 feet from a private  
domestic water source, or; less than  
1000 feet from all other water sources)

Yes (20 points)  
No (0 points) 0

## Distance To Surface Water:

(Horizontal distance to perennial  
lakes, ponds, rivers, streams, creeks,  
irrigation canals and ditches)

Less than 200 feet (20 points)  
200 feet to 1000 feet (10 points)  
Greater than 1000 feet (0 points) 20

RANKING SCORE (TOTAL POINTS): 40

Date Remediation Started: \_\_\_\_\_ Date Completed: \_\_\_\_\_

Remediation Method: Excavation ☒ Approx. cubic yards 1690  
 (Check all appropriate sections) Landfarmed \_\_\_\_\_ Insitu Bioremediation \_\_\_\_\_  
 Other COMPOSTED

Remediation Location: Onsite ☒ Offsite \_\_\_\_\_  
 (ie. landfarmed onsite, name and location of offsite facility)

General Description Of Remedial Action: \_\_\_\_\_

Excavation + INSITU BIO-REMEDIATION BY JERRY FINNEY

Ground Water Encountered: No \_\_\_\_\_ Yes ☒ Depth 13'Final Pit: Sample location see Attached Documents

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

Sample depth \_\_\_\_\_

Sample date \_\_\_\_\_ Sample time \_\_\_\_\_

Sample Results

Benzene (ppm) \_\_\_\_\_

Total BTEX (ppm) \_\_\_\_\_

Field headspace (ppm) \_\_\_\_\_

TPH \_\_\_\_\_

Ground Water Sample: Yes ☒ No \_\_\_\_\_ (If yes, attach sample results)

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

DATE 2-9-95

SIGNATURE

B. ShawPRINTED NAME  
AND TITLEBuddy D. Shaw  
ENVIRONMENTAL COORDINATOR

|                      |                                                                                |                                               |
|----------------------|--------------------------------------------------------------------------------|-----------------------------------------------|
| CLIENT: <u>AMOCO</u> | BLAGG ENGINEERING, INC.<br>P.O. BOX 87, BLOOMFIELD, NM 87413<br>(505) 632-1199 | LOCATION NO: <u>80200</u><br>C.D.C. NO: _____ |
|----------------------|--------------------------------------------------------------------------------|-----------------------------------------------|

|                                    |                               |
|------------------------------------|-------------------------------|
| FIELD REPORT: CLOSURE VERIFICATION | PAGE No: <u>1</u> of <u>1</u> |
|------------------------------------|-------------------------------|

|                                                                                                                |                                                       |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| LOCATION: NAME: <u>GCU</u> WELL #: <u>153E</u> PIT: <u>ABAND. DEHY</u>                                         | DATE STARTED: <u>12/29/94</u><br>DATE FINISHED: _____ |
| QUAD/UNIT: <u>C</u> SEC: <u>28</u> TWP: <u>29N</u> RNG: <u>12W</u> PM: <u>NM</u> CNTY: <u>ST</u> ST: <u>NM</u> | ENVIRONMENTAL SPECIALIST: <u>NV</u>                   |
| QTR/FOOTAGE: <u>NE/4</u> <u>NW/4</u> CONTRACTOR: <u>P. VELASQUEZ</u>                                           |                                                       |

|                                                                                                   |
|---------------------------------------------------------------------------------------------------|
| EXCAVATION APPROX. <u>90</u> FT. x <u>39</u> FT. x <u>13</u> FT. DEEP. CUBIC YARDAGE: <u>1690</u> |
| DISPOSAL FACILITY: <u>ON-SITE</u> REMEDIATION METHOD: <u>COMPOSTED</u>                            |
| LAND USE: <u>RANGE/INDUSTRIAL</u> LEASE: <u>NM-03526</u> FORMATION: <u>DR</u>                     |

|                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------|
| FIELD NOTES & REMARKS: PIT LOCATED APPROXIMATELY <u>165</u> FT. <u>N35W</u> FROM WELLHEAD.                         |
| DEPTH TO GROUNDWATER: <u>&lt;50'</u> NEAREST WATER SOURCE: <u>&gt;1000'</u> NEAREST SURFACE WATER: <u>&lt;200'</u> |

|                                                                      |                                                                                                                  |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| NMOCB RANKING SCORE: <u>40</u> NMOCB TPH CLOSURE STD: <u>100</u> PPM | CHECK ONE:<br><input checked="" type="checkbox"/> PIT ABANDONED<br><input type="checkbox"/> STEEL TANK INSTALLED |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|

SOIL AND EXCAVATION DESCRIPTION:

UNABLE TO OBTAIN VIABLE SAMPLE FROM SIDEWALLS. NORTH SIDE SLOPED, EAST, SOUTH & WEST SIDEWALLS VERTICAL. SANDY FROM GROUND SURFACE DOWN TO APPROX. 8'; 8'-13' INTERVAL, CLAYEY PLASTIC.

2-20-95 SAMPLE PIT + POND WATER.

SCALE

0 FT

| TIME | SAMPLE I.D. | LAB No: | WEIGHT (g) | mL. FREON | DILUTION | READING | CALC. ppm |
|------|-------------|---------|------------|-----------|----------|---------|-----------|
|      |             |         |            |           |          |         |           |
|      |             |         |            |           |          |         |           |
|      |             |         |            |           |          |         |           |

**PIT PERIMETER**

**OVM RESULTS**

| SAMPLE ID | FIELD HEADSPACE PID (ppm) |
|-----------|---------------------------|
| 1         |                           |
| 2         |                           |
| 3         |                           |
| 4         |                           |
| 5         |                           |

**PIT PROFILE**

**LAB SAMPLES**

| SAMPLE ID     | ANALYSIS | TIME |
|---------------|----------|------|
| PW1 @ GW (3') | BTX      | 1230 |
| PW2 @ GW (3') | ATX      | 1235 |
| PIT           | BTX      | N/A  |
| POND          | N/A      | N/A  |

|                                                                |
|----------------------------------------------------------------|
| TRAVEL NOTES: CALLOUT: <u>12/29/94</u> ONSITE: <u>12/29/94</u> |
|----------------------------------------------------------------|

OFF: (505) 325-8786



LAB: (505) 325-5667

**AROMATIC VOLATILE ORGANICS**

Attn: *Nelson Velez*  
Company: *Blagg Engineering*  
Address: *P.O. Box 87*  
City, State: *Bloomfield, NM 87413*

Date: *12/30/94*  
Lab ID: *2520*  
Sample ID: *4555*  
Job No. *2-1000*

Project Name: *GCU 153 E*  
Project Location: *PW 1 @ GW ( 13' ) - Aban. Dehy Pit*  
Sampled by: *NV* Date: *12/29/94*  
Analyzed by: *DLA* Date: *12/30/94*  
Sample Matrix: *Water*

Time: *12:20*

**Aromatic Volatile Organics**

| <i>Component</i>    | <i>Measured<br/>Concentration ug/L</i> | <i>Detection Limit<br/>Concentration ug/L</i> |
|---------------------|----------------------------------------|-----------------------------------------------|
| <i>Benzene</i>      | <i>182</i>                             | <i>0.2</i>                                    |
| <i>Toluene</i>      | <i>1,108</i>                           | <i>0.2</i>                                    |
| <i>Ethylbenzene</i> | <i>96</i>                              | <i>0.2</i>                                    |
| <i>m,p-Xylene</i>   | <i>1,395</i>                           | <i>0.2</i>                                    |
| <i>o-Xylene</i>     | <i>349</i>                             | <i>0.2</i>                                    |
|                     | <i>TOTAL 3,129 ug/L</i>                |                                               |

*ND - Not Detectable*

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

Approved by: *DeH*

Date: *12/30/94*

P. O. BOX 2606 • FARMINGTON, NM 87499

—TECHNOLOGY BUILDING A BETTER COUNTRY WITH THE ENVIRONMENT—

OFF: (505) 325-8786



LAB: (505) 325-5667

**AROMATIC VOLATILE ORGANICS**

Attn: *Nelson Velez*  
Company: *Blagg Engineering*  
Address: *P.O. Box 87*  
City, State: *Bloomfield, NM 87413*

Date: *12/30/94*  
Lab ID: *2520*  
Sample ID: *4556*  
Job No. *2-1000*

Project Name: *GCU 153 E*  
Project Location: *PW 2 @ GW ( 13' ) - Aban. Dehy Pit*  
Sampled by: *NV* Date: *12/29/94*  
Analyzed by: *DLA* Date: *12/30/94*  
Sample Matrix: *Water*

Time: *12:35*

**Aromatic Volatile Organics**

| <b>Component</b>    | <b>Measured<br/>Concentration ug/L</b> | <b>Detection Limit<br/>Concentration ug/L</b> |
|---------------------|----------------------------------------|-----------------------------------------------|
| <i>Benzene</i>      | <i>397</i>                             | <i>0.2</i>                                    |
| <i>Toluene</i>      | <i>2,268</i>                           | <i>0.2</i>                                    |
| <i>Ethylbenzene</i> | <i>228</i>                             | <i>0.2</i>                                    |
| <i>m,p-Xylene</i>   | <i>2,666</i>                           | <i>0.2</i>                                    |
| <i>o-Xylene</i>     | <i>716</i>                             | <i>0.2</i>                                    |
|                     | <i>TOTAL 6,275 ug/L</i>                |                                               |

*ND - Not Detectable*

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

Approved by: *Jag*

Date: *12/30/94*

**P. O. BOX 2606 • FARMINGTON, NM 87499**

*- TECHNOLOGY BLINDING LIMITED - 10000 1st BLVD - FARMINGTON, NM 87401 -*

**PURGEABLE AROMATICS**

**Blagg Engineering, Inc.**

Project ID: GCU 153 E  
Sample ID: Pit Water  
Lab ID: 0686  
Sample Matrix: Water  
Preservative: Cool, HgCl<sub>2</sub>  
Condition: Intact

Report Date: 02/22/95  
Date Sampled: 02/20/95  
Date Received: 02/20/95  
Date Analyzed: 02/22/95

| Target Analyte | Concentration<br>(ug/L) | Detection Limit<br>(ug/L) |
|----------------|-------------------------|---------------------------|
| Benzene        | 77.2                    | 2.00                      |
| Toluene        | 7.37                    | 2.00                      |
| Ethylbenzene   | ND                      | 2.00                      |
| m,p-Xylenes    | 289                     | 4.00                      |
| o-Xylene       | 92.8                    | 2.00                      |

|                   |            |
|-------------------|------------|
| <b>Total BTEX</b> | <b>466</b> |
|-------------------|------------|

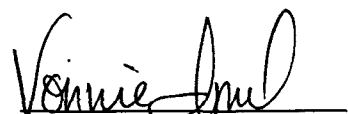
ND - Analyte not detected at the stated detection limit.

|                         |                    |                         |                          |
|-------------------------|--------------------|-------------------------|--------------------------|
| <b>Quality Control:</b> | <u>Surrogate</u>   | <u>Percent Recovery</u> | <u>Acceptance Limits</u> |
|                         | Trifluorotoluene   | 100                     | 88 - 110%                |
|                         | Bromofluorobenzene | 99                      | 86 - 115%                |

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

**Comments:**

  
Analyst

  
Review

OFF: (505) 325-8786



LAB: (505) 325-5667

**AROMATIC VOLATILE ORGANICS**

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

Date: *3/17/95*  
Lab ID: *2645*  
Sample ID: *5553*  
Job No. *2-1000*

Project Name: *GCU 153 E*  
Project Location: *Pit At 3A*  
Sampled by: *REO* Date: *3/15/95*  
Analyzed by: *DLA* Date: *3/16/95*  
Sample Matrix: *Water*

Time: *8:15*

**Aromatic Volatile Organics**

| <i>Component</i>    | <i>Measured<br/>Concentration ug/L</i> | <i>Detection Limit<br/>Concentration ug/L</i> |
|---------------------|----------------------------------------|-----------------------------------------------|
| <i>Benzene</i>      | <i>3.9</i>                             | <i>0.2</i>                                    |
| <i>Toluene</i>      | <i>ND</i>                              | <i>0.2</i>                                    |
| <i>Ethylbenzene</i> | <i>ND</i>                              | <i>0.2</i>                                    |
| <i>m,p-Xylene</i>   | <i>ND</i>                              | <i>0.2</i>                                    |
| <i>o-Xylene</i>     | <i>ND</i>                              | <i>0.2</i>                                    |
|                     | <i>TOTAL 3.9 ug/L</i>                  |                                               |

*ND - Not Detectable*

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

Approved by: *[Signature]*  
Date: *3/17/95*

P. O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -







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

[illegible]

| Distribution: White – On Site | Yellow – LAB | Pink – Sampler | Goldenrod – Client |
|-------------------------------|--------------|----------------|--------------------|
|-------------------------------|--------------|----------------|--------------------|