3R - 316

# REPORTS

# DATE:
# 1999

*Public Service Company*
*of New Mexico*
*Alvarado Square MS 0408*
*Albuquerque, NM 87158*

RECEIVED

APR 07 1999

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

April 5, 1999

Mr. William Olson
Hydrogeologist
Oil Conservation Division
2040 So. Pacheco
Santa Fe, New Mexico 87505

**RE: 1999 SAN JUAN BASIN ANNUAL GROUNDWATER REPORT**

Dear Bill:

PNM is pleased to submit the 1999 Annual Groundwater Report on Unlined Surface Impoundments in the San Juan Basin. Pursuant to PNM's Groundwater Management Program for Unlined Surface Impoundment Closures, the report details the ongoing investigation/remedial activities at unlined surface impoundments having groundwater contamination as identified by PNM. A list of groundwater sites reported in this document is provided below.

Blanco Wash Drip
Davis 1
Dogie East Pit
Dogie North Pit
Florance 124
Florance 32A
Florance 40
Florance 44
Florance M 47X
Hampton 4M
Honolulu Drip
Ice Canyon Drip
Jacques 2A
Jicarilla Contract 147-6
Linda 1A
Mangum 1E
McClanahan 22
McClanahan A 2E
McCoy Gas Com A1
Miles Federal 1E Drip
O' Shea 1M
Patterson A Com A1
Pritchard 2
Randleman 1
Reid 16 Drip
Turner 1A
Wilmerding 1M
Zachry 18E

Consistent with PNM's San Juan Basin Groundwater Management Plan, PNM will request closure of four of the above sites, the Florance 32A, Jacques 2A, Mangum 1E and the McClanahan A2E, with the submittal of the 1st Quarter 1999 Pit Closures Report. This request is based upon the analytical data collected over the last two years at each of the sites. BTEX concentrations have been consistently below WQCC standards for four consecutive quarters.

Upon approval of the groundwater closure report, PNM will plug and abandon all of the groundwater monitoring wells at each of the locations. The concrete pad and metal vault surrounding each well will be removed. The well casing will be cut to ground surface and each well will be plugged to the surface

with cement containing 5% bentonite. If you have any questions regarding the contents of the report, please contact me at (505) 241-2974.

Sincerely,

Maureen Gannon
Project Manager

Enclosure

cc: Colin Adams, Esq.
Ingrid Deklau, WFS
Denny Foust, OCD-Aztec Office
Ron Johnson
Mark Sikelianos
Bill VonDrehle, WFS

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Environmental Services

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ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

# Annual Groundwater Report

# 1999

## Volume II

***Unlined Surface Impoundments***
***San Juan Basin***

PNMGS Well Site: Florance 44

Copies: WFS(1)
Operator (1)
NMOCD District Office (1)
NMOCD Santa Fe (1)

# Groundwater Site Summary Report

**Quarter/Year:** 2nd/98, 3rd/98, 4th/98 & 1st/99

**Operator:** Amoco
**Sec:** 31 **Twn:** 30 **Rng:** 8 **Unit:** H
**Canyon:** Salvador, San Juan

**Vulnerable Class:** Extended
**OCD Ranking:** 20
**Lead Agency:** NMOCD

**Topo Map:** previously submitted
**Well Completion Diagram:** previously submitted
**Site Map with Groundwater Analysis:** Figure 1
**Groundwater Contour Map:** Figure 2 (January 1999)
**Hydrograph:** Figure 3
**Full Suite- Groundwater Sampling:** previously submitted
**Analytical Results:** attached

## Site Hydrology:

The Florance 44 site lies in a small side canyon immediately west of Salvador Canyon, which empties into the San Juan River near the town of Archuleta, New Mexico. The side canyon drops in elevation towards the east, and is hemmed in by steep cliffs to the north and south of the site (see Figure 1). The wellhead elevation is 5836 ft. amsl. A small spring formerly flowed across the well pad, entering the site from the south. However, after the secondary source removal activities in November, 1997 the springflow was diverted to the east, and was prevented from entering the area of the well pad by berms on the south side of the well pad (Figure 1).

Alluvial materials encountered beneath the site are composed mainly of sand, with varying amounts of clay. Bedrock in the area is a hard sandstone, and was frequently encountered at shallow depths beneath the site. At the extreme southern end of the site (at the Amoco separator pit), bedrock was found at depths of 4 to 7 feet. Towards the west (upstream), bedrock was found at 14 feet deep in the area of MW-1. In the center of the site (near MW-2), bedrock was found at 16 feet. In general, the top of the bedrock surface parallels surface topography, and slopes towards the center of the drainage and thence towards the east.

Groundwater beneath the site is as shallow as 7 feet (in upgradient well MW-1) to as deep as 43 feet (in downgradient well MW-4). Groundwater flows east-northeast beneath the site (Figure 2), parallel with surface topography and in the same direction as the assumed bedrock-alluvium contact. The water levels are found within alluvium, which is saturated in the area of study.

Hydrographs at the site (Figure 3) show fairly steady to slightly rising water levels over time. Owing to the removal and reinstallation of wells, it is not possible to construct a comprehensive hydrograph in the central part of the well pad. However, bore holes SB-1 through SB-3 (see Figure 1) showed dry conditions to the bedrock surface, and wells MW-5 and MW-6 contain only a few feet or less of saturated alluvium. It is believed that the diversion of the spring on the south side of the study area has caused the gradual dewatering of the local alluvium.

## Activities for Previous Year:

Because of contamination discovered during PNM's additional source removal activities at the Florance 44 in November 1997, which included recontamination of the clean fill in our previous excavation, PNM prepared and submitted to OCD a summary report detailing the activities, results and recommendations at the Florance 44 in April, 1998. In July, 1998 the OCD directed PNM to remediate the site jointly with the operator. After discussion and analysis, PNM proposed a well installation and sampling plan in December, 1998. Amoco accepted, and the field program commenced in January, 1999.

**Public Service Company of New Mexico - Gas Services**
Environmental Services Division - Alvarado Square, MS-0408
Albuquerque, NM 87158

**Contact: Maureen Gannon** **Telephone: 505-241-2974**

Soil borings SB-1, -2 and -3 encountered dry conditions and would not produce groundwater. Little to no contamination was observed in these borings (Figure 1). Soil borings SB-4 and SB-5 encountered saturated alluvium and were completed as monitor wells MW-5 and MW-6. These wells were sampled, along with well MW-4, in January, 1999.

Water level data were collected from all wells during the sampling event. Groundwater samples were submitted for chemical analyses of benzene, toluene, ethylbenzene, and xylenes (BTEX). All sampling was performed in strict compliance with EPA protocol. PNM delivered the samples to OnSite Technologies, Farmington, New Mexico for chemical analyses of BTEX using EPA method 8020.

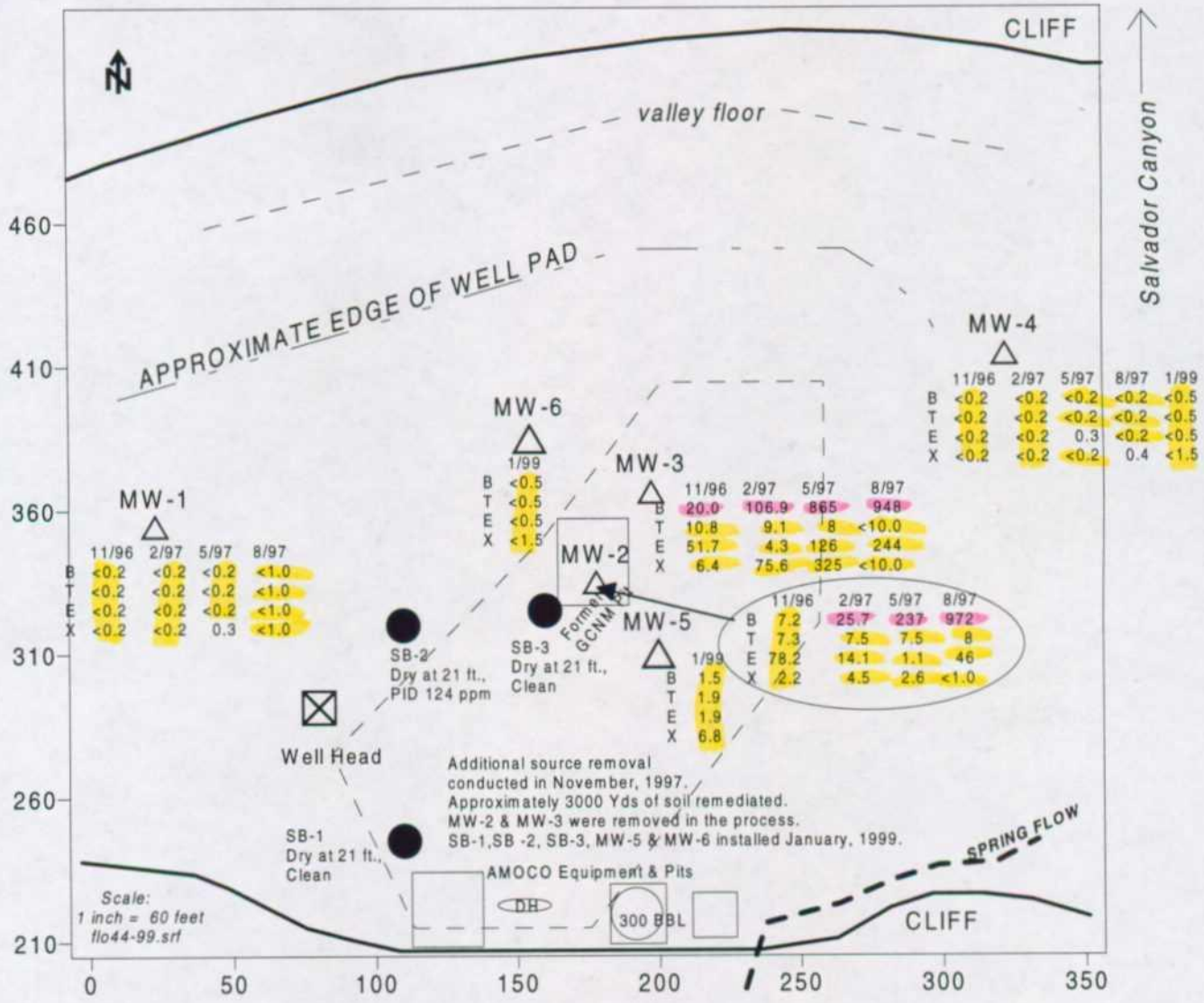
**Results:**

Wells MW-5 and MW-6 showed BTEX concentrations below standards and below detection limits, respectively. It is believed that the additional excavation, in addition to other actions taken by the operator, were successful in controlling the source of hydrocarbon contamination at the Florance 44 site.

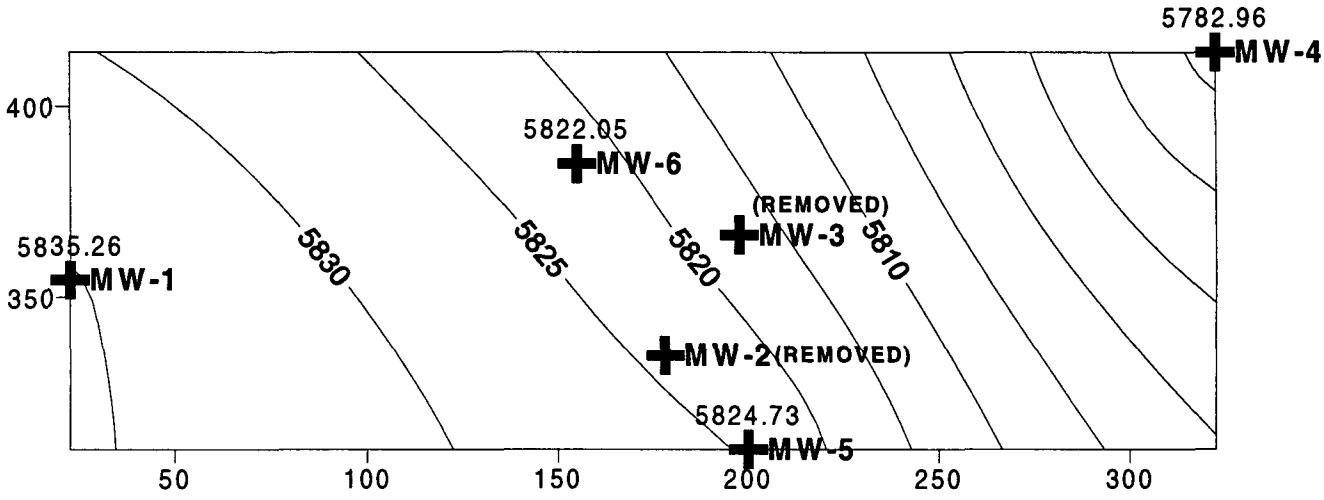
**Further Action:**

PNM will continue to monitor the groundwater gradient and perform quarterly groundwater sampling at the Florance 44.

# Figure 1.
# Florance 44: Site Map With Analytical Results
# (Concentrations in ppb)



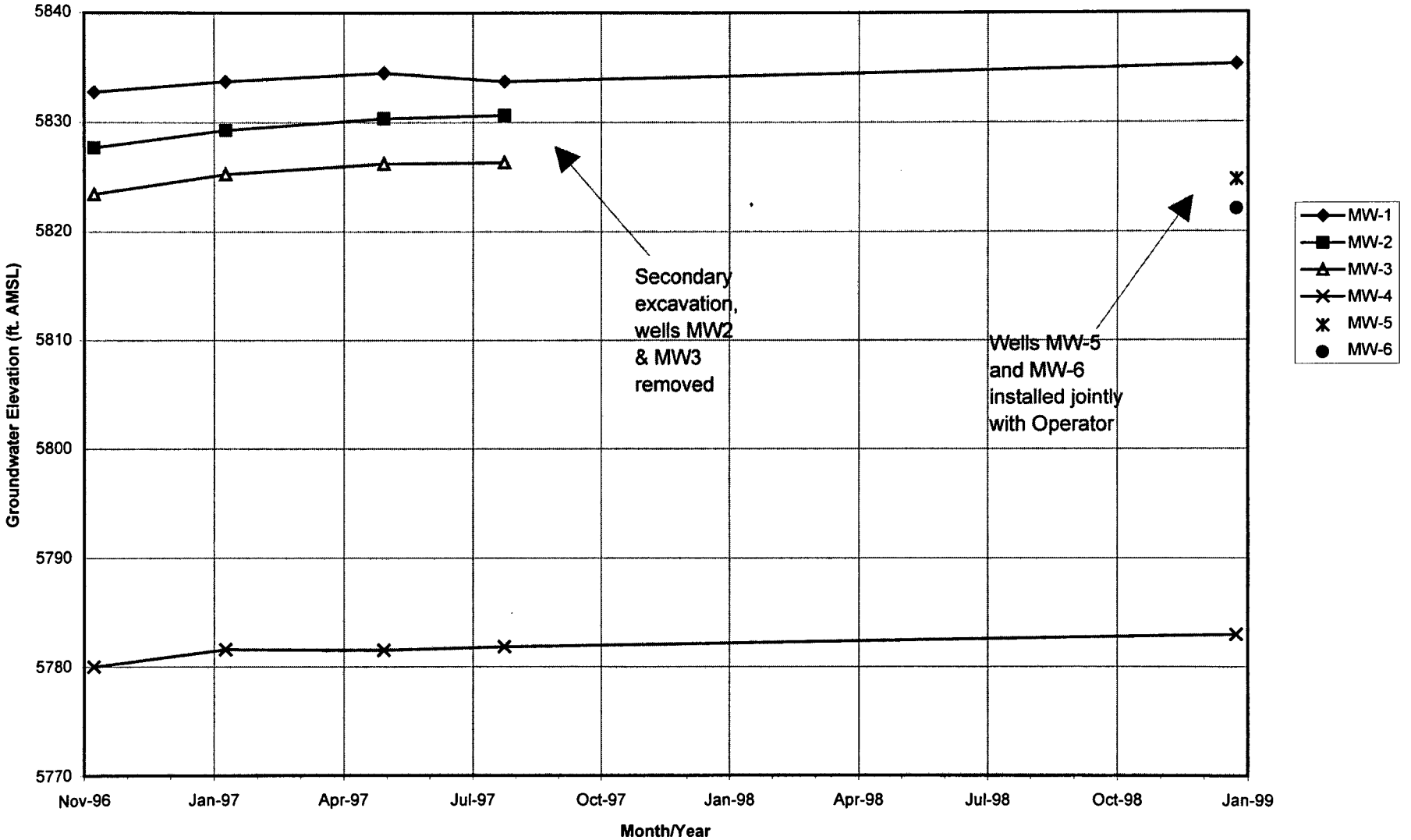
# Figure 2.
# Florance 44 Groundwater Contour Map
# (January 12, 1999)




SCALE IN FEET
(X-axis = Easting, Y-axis = Northing)

44flo199.srf

**Figure 3. Florance 44 Hydrograph**
**(Water Level vs. Time)**




s:/flo44/new44.XLS

OFF: (505) 325-5667

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-1556

January 21, 1999

Maureen Gannon
PNM - Public Service Company of NM
Alvarado Square Mail Stop 0408
Albuquerque, NM 87158
TEL: (505) 241-2974
FAX (505) 241-2340

1st Quarter 1999

RE: Florance 44

Order No.: 9901005

Dear Maureen Gannon,

On Site Technologies, LTD. received 4 samples on 1/12/99 for the analyses presented in the following report.

The Samples were analyzed for the following tests:
BTEX (SW8021B)

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

David Cox

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

**On Site Technologies, LTD.**

**Date:** *21-Jan-99*

**CLIENT:** PNM - Public Service Company of NM
**Project:** Florance 44
**Lab Order:** 9901005

# CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.



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

OFF: (505) 325-5667

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LAB: (505) 325-1556

# ANALYTICAL REPORT

**Date:** *21-Jan-99*

| | | | |
|---|---|---|---|
| **Client:** | PNM - Public Service Company of NM | **Client Sample Info:** | Florance 44 |
| **Work Order:** | 9901005 | **Client Sample ID:** | 9901121030; MW-4 |
| **Lab ID:** | 9901005-01A **Matrix:** AQUEOUS | **Collection Date:** | 1/12/99 10:30:00 AM |
| **Project:** | Florance 44 | **COC Record:** | 7462 |

| Parameter | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **BTEX** | | **SW8021B** | | | | Analyst: **HR** |
| Benzene | ND | 0.5 | | µg/L | 1 | 1/13/99 |
| Toluene | ND | 0.5 | | µg/L | 1 | 1/13/99 |
| Ethylbenzene | ND | 0.5 | | µg/L | 1 | 1/13/99 |
| m,p-Xylene | ND | 1 | | µg/L | 1 | 1/13/99 |
| o-Xylene | ND | 0.5 | | µg/L | 1 | 1/13/99 |

**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



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LAB: (505) 325-1556

# ANALYTICAL REPORT

**Date:** *21-Jan-99*

| | | | |
|---|---|---|---|
| **Client:** | PNM - Public Service Company of NM | **Client Sample Info:** | Florance 44 |
| **Work Order:** | 9901005 | **Client Sample ID:** | 9901121050; MW-5 |
| **Lab ID:** | 9901005-02A **Matrix:** AQUEOUS | **Collection Date:** | 1/12/99 10:50:00 AM |
| **Project:** | Florance 44 | **COC Record:** | 7462 |

| Parameter | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **BTEX** | | **SW8021B** | | | | Analyst: **HR** |
| Benzene | 1.5 | 0.5 | | µg/L | 1 | 1/13/99 |
| Toluene | 1.9 | 0.5 | | µg/L | 1 | 1/13/99 |
| Ethylbenzene | 1.9 | 0.5 | | µg/L | 1 | 1/13/99 |
| m,p-Xylene | 6.8 | 1 | | µg/L | 1 | 1/13/99 |
| o-Xylene | ND | 0.5 | | µg/L | 1 | 1/13/99 |

**Qualifiers:**

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R - RPD outside accepted recovery limits

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Surr: - Surrogate



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LAB: (505) 325-1556

# ANALYTICAL REPORT

**Date:** *21-Jan-99*

| | | | |
|---|---|---|---|
| **Client:** | PNM - Public Service Company of NM | **Client Sample Info:** | Florance 44 |
| **Work Order:** | 9901005 | **Client Sample ID:** | 9901121110; MW-6 |
| **Lab ID:** | 9901005-03A **Matrix:** AQUEOUS | **Collection Date:** | 1/12/99 11:10:00 AM |
| **Project:** | Florance 44 | **COC Record:** | 7462 |

| Parameter | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **BTEX** | | **SW8021B** | | | | Analyst: **HR** |
| Benzene | ND | 0.5 | | µg/L | 1 | 1/13/99 |
| Toluene | ND | 0.5 | | µg/L | 1 | 1/13/99 |
| Ethylbenzene | ND | 0.5 | | µg/L | 1 | 1/13/99 |
| m,p-Xylene | ND | 1 | | µg/L | 1 | 1/13/99 |
| o-Xylene | ND | 0.5 | | µg/L | 1 | 1/13/99 |

**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



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

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

Duplicate of grab 6

# ANALYTICAL REPORT

**Date:** *21-Jan-99*

| | | | |
|---|---|---|---|
| **Client:** | PNM - Public Service Company of NM | **Client Sample Info:** | Florance 44 |
| **Work Order:** | 9901005 | **Client Sample ID:** | 9901121130; MW-7 |
| **Lab ID:** | 9901005-04A **Matrix:** AQUEOUS | **Collection Date:** | 1/12/99 11:30:00 AM |
| **Project:** | Florance 44 | **COC Record:** | 7462 |

Duplicate of MW-6

| Parameter | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **BTEX** | | **SW8021B** | | | | Analyst: **HR** |
| Benzene | ND | 0.5 | | µg/L | 1 | 1/13/99 |
| Toluene | ND | 0.5 | | µg/L | 1 | 1/13/99 |
| Ethylbenzene | ND | 0.5 | | µg/L | 1 | 1/13/99 |
| m,p-Xylene | ND | 1 | | µg/L | 1 | 1/13/99 |
| o-Xylene | ND | 0.5 | | µg/L | 1 | 1/13/99 |

**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



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

# CHAIN OF CUSTODY RECORD

ON SITE TECHNOLOGIES, LTD.

612 E. Murphy Dr. • P.O. Box 2606 • Farmington, NM 87499
LAB: (505) 325-5667 • FAX: (505) 325-6256

Date: 1/12/99

Page: 1 of 1

| | | | |
|---|---|---|---|
| Purchase Order No.: | | Job No. | |
| SEND INVOICE TO | Name | Denver Bearden | |
| | Company | PNM Gas Services | Dept. 324-3763 |
| | Address | 603 W. Elm Street | |
| | City, State, Zip | Farmington, NM 87401 | |

| | | | |
|---|---|---|---|
| REPORT RESULTS TO | Name | Maureen Gannon | Title |
| | Company | PNM Gas Services | |
| | Mailing Address | Alverado Square, Mail Stop 0408 | |
| | City, State, Zip | Albuquerque, NM 87158 | |
| | Telephone No. | 505-848-2974 | Telefax No. |

Sampling Location: Florance 44

Sampler: Mark Sikalianos

| SAMPLE IDENTIFICATION | SAMPLE DATE | SAMPLE TIME | MATRIX | PRES. | Number of Containers | ANALYSIS REQUESTED: BTEX 8020 | LAB ID |
|---|---|---|---|---|---|---|---|
| MW-4 9901121030 | | | $H_2O$ | HCl | 2 | X | |
| MW-5 9901121050 | | | $H_2O$ | HCl | 2 | X | |
| MW-6 9901121110 | | | $H_2O$ | HCl | 2 | X | |
| ~~MW-7~~ 9901121130 DUP MW-6 | | | $H_2O$ | HCl | 2 | X | |

| | | | |
|---|---|---|---|
| Relinquished by: | Date/Time 1/12/99 1400 | Received by: | Date/Time 1/12/99 1412 |
| Relinquished by: | Date/Time | Received by: | Date/Time |
| Relinquished by: | Date/Time | Received by: | Date/Time |

Method of Shipment:

Authorized by: _____ Date 1/12/99
(Client Signature Must Accompany Request)

| Rush | 24-48 Hours | 10 Working Days | Special Instructions: |
|---|---|---|---|
| | | | Results to be sent to both parties. |

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

On Site Technologies, LTD.

**Date:** *21-Jan-99*

**CLIENT:** PNM - Public Service Company of NM
**Work Order:** 9901005
**Project:** Florance 44

# QC SUMMARY REPORT
## Method Blank

Sample ID: **MB1** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:

Client ID: **9901005** Run ID: **GC-1_990113A** SeqNo: **10370**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | .1198 | 0.5 | | | | | | | | | J |
| Ethylbenzene | .0523 | 0.5 | | | | | | | | | J |
| m,p-Xylene | .1228 | 1 | | | | | | | | | J |
| Methyl tert-Butyl Ether | ND | 1 | | | | | | | | | |
| o-Xylene | .0531 | 0.5 | | | | | | | | | J |
| Toluene | .1449 | 0.5 | | | | | | | | | J |

**Qualifiers:**
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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:** *21-Jan-99*

**CLIENT:** PNM - Public Service Company of NM
**Work Order:** 9901005
**Project:** Florance 44

# QC SUMMARY REPORT
## Sample Matrix Spike

Sample ID: **9901003-06AMS** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:
Client ID: **9901005** Run ID: **GC-1_990113A** SeqNo: **10371**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 394.3 | 2.5 | 200 | 200 | 97.1% | 73 | 115 | | | | |
| Ethylbenzene | 240.2 | 2.5 | 200 | 32 | 104.1% | 74 | 117 | | | | |
| m,p-Xylene | 417.9 | 5 | 400 | 9.5 | 102.1% | 76 | 112 | | | | |
| Methyl tert-Butyl Ether | 270.1 | 5 | 200 | 86 | 92.1% | 62 | 122 | | | | |
| o-Xylene | 210.5 | 2.5 | 200 | 3.1 | 103.7% | 83 | 112 | | | | |
| Toluene | 214.9 | 2.5 | 200 | 8.8 | 103.1% | 71 | 120 | | | | |

Sample ID: **9901003-06AMSD** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:
Client ID: **9901005** Run ID: **GC-1_990113A** SeqNo: **10373**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 415.9 | 2.5 | 200 | 200 | 107.9% | 73 | 115 | 394.3 | 5.3% | 8 | |
| Ethylbenzene | 263.5 | 2.5 | 200 | 32 | 115.8% | 74 | 117 | 240.2 | 9.3% | 9 | R |
| m,p-Xylene | 459 | 5 | 400 | 9.5 | 112.4% | 76 | 112 | 417.9 | 9.4% | 9 | SR |
| Methyl tert-Butyl Ether | 288 | 5 | 200 | 86 | 101.0% | 62 | 122 | 270.1 | 6.4% | 7 | |
| o-Xylene | 230.4 | 2.5 | 200 | 3.1 | 113.6% | 83 | 112 | 210.5 | 9.0% | 9 | SR |
| Toluene | 220.2 | 2.5 | 200 | 8.8 | 105.7% | 71 | 120 | 214.9 | 2.4% | 9 | |

✓ LCS RPD < 20%. MW 1/21/99

**Qualifiers:**
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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

**CLIENT:** PNM - Public Service Company of NM
**Work Order:** 9901005
**Project:** Florance 44

# QC SUMMARY REPORT
## Sample Matrix Spike

Sample ID: **9901005-02AMS** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:
Client ID: **9901121050; MW-9901005** Run ID: **GC-1_990113A** SeqNo: **10372**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 231.6 | 2.5 | 200 | 2 | 114.8% | 73 | 115 | | | | |
| Ethylbenzene | 232 | 2.5 | 200 | 2 | 115.0% | 74 | 117 | | | | |
| m,p-Xylene | 454.7 | 5 | 400 | 6.9 | 111.9% | 76 | 112 | | | | |
| Methyl tert-Butyl Ether | 216.7 | 5 | 200 | 0 | 108.3% | 62 | 122 | | | | |
| o-Xylene | 227.1 | 2.5 | 200 | 0.2 | 113.5% | 83 | 112 | | | | S ✓LCS |
| Toluene | 228.6 | 2.5 | 200 | 2 | 113.3% | 71 | 120 | | | | |

Sample ID: **9901005-02AMSD** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:
Client ID: **9901121050; MW-9901005** Run ID: **GC-1_990113A** SeqNo: **10374**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 202 | 2.5 | 200 | 2 | 100.0% | 73 | 115 | 231.6 | 13.7% | 8 | R |
| Ethylbenzene | 202.3 | 2.5 | 200 | 2 | 100.2% | 74 | 117 | 232 | 13.7% | 9 | R |
| m,p-Xylene | 394.5 | 5 | 400 | 6.9 | 96.9% | 76 | 112 | 454.7 | 14.2% | 9 | R |
| Methyl tert-Butyl Ether | 192 | 5 | 200 | 0 | 96.0% | 62 | 122 | 216.7 | 12.1% | 7 | R |
| o-Xylene | 198.2 | 2.5 | 200 | 0.2 | 99.0% | 83 | 112 | 227.1 | 13.6% | 9 | R |
| Toluene | 199.3 | 2.5 | 200 | 2 | 98.7% | 71 | 120 | 228.6 | 13.7% | 9 | R |

RPD<209 1/21/99

**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:** *21-Jan-99*

**CLIENT:** PNM - Public Service Company of NM
**Work Order:** 9901005
**Project:** Florance 44

# QC SUMMARY REPORT

## Laboratory Control Spike - generic

Sample ID: **LCS WATER** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:

Client ID: **9901005** Run ID: **GC-1_990113A** SeqNo: **10369**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 41.05 | 0.5 | 40 | 0.1 | 102.4% | 84 | 110 | | | | |
| Ethylbenzene | 41.08 | 0.5 | 40 | 0.05 | 102.6% | 86 | 113 | | | | |
| m,p-Xylene | 79.93 | 1 | 80 | 0.1 | 99.8% | 81 | 114 | | | | |
| Methyl tert-Butyl Ether | 40.73 | 1 | 40 | 0 | 101.8% | 69 | 129 | | | | |
| o-Xylene | 40.62 | 0.5 | 40 | 0.05 | 101.4% | 86 | 112 | | | | |
| Toluene | 40.46 | 0.5 | 40 | 0.1 | 100.9% | 85 | 111 | | | | |

**Qualifiers:**
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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:** *21-Jan-99*

**CLIENT:** PNM - Public Service Company of NM
**Work Order:** 9901005
**Project:** Florance 44

# QC SUMMARY REPORT

## Continuing Calibration Verification Standard

Sample ID: **CCV1 QC0606/07** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:
Client ID: **9901005** Run ID: **GC-1_990113A** SeqNo: **10362**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 21.27 | 0.5 | 20 | 0 | 106.3% | 85 | 115 | | | | |
| Ethylbenzene | 21.31 | 0.5 | 20 | 0 | 106.6% | 85 | 115 | | | | |
| m,p-Xylene | 40.81 | 1 | 40 | 0 | 102.0% | 85 | 115 | | | | |
| Methyl tert-Butyl Ether | 21.09 | 1 | 20 | 0 | 105.5% | 85 | 115 | | | | |
| o-Xylene | 20.9 | 0.5 | 20 | 0 | 104.5% | 85 | 115 | | | | |
| Toluene | 20.89 | 0.5 | 20 | 0 | 104.5% | 85 | 115 | | | | |
| 1,4-Difluorobenzene | 96.44 | 0 | 100 | 0 | 96.4% | 90 | 102 | | | | |
| 4-Bromochlorobenzene | 97.87 | 0 | 100 | 0 | 97.9% | 93 | 102 | | | | |
| Fluorobenzene | 94.46 | 0 | 100 | 0 | 94.5% | 84 | 103 | | | | |

Sample ID: **CCV2 QC0606/07** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:
Client ID: **9901005** Run ID: **GC-1_990113A** SeqNo: **10363**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 21 | 0.5 | 20 | 0 | 105.0% | 85 | 115 | | | | |
| Ethylbenzene | 20.98 | 0.5 | 20 | 0 | 104.9% | 85 | 115 | | | | |
| m,p-Xylene | 40.04 | 1 | 40 | 0 | 100.1% | 85 | 115 | | | | |
| Methyl tert-Butyl Ether | 20.48 | 1 | 20 | 0 | 102.4% | 85 | 115 | | | | |
| o-Xylene | 20.62 | 0.5 | 20 | 0 | 103.1% | 85 | 115 | | | | |
| Toluene | 20.58 | 0.5 | 20 | 0 | 102.9% | 85 | 115 | | | | |
| 1,4-Difluorobenzene | 96.44 | 0 | 100 | 0 | 96.4% | 90 | 102 | | | | |
| 4-Bromochlorobenzene | 99 | 0 | 100 | 0 | 99.0% | 93 | 102 | | | | |
| Fluorobenzene | 94.27 | 0 | 100 | 0 | 94.3% | 84 | 103 | | | | |

**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:** PNM - Public Service Company of NM
**Work Order:** 9901005
**Project:** Florance 44

# QC SUMMARY REPORT
## Continuing Calibration Verification Standard

Sample ID: **CCV3 QC0606/07** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:
Client ID: **9901005** Run ID: **GC-1_990113A** SeqNo: **10364**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 42.38 | 0.5 | 40 | 0 | 106.0% | 85 | 115 | | | | |
| Ethylbenzene | 42.06 | 0.5 | 40 | 0 | 105.1% | 85 | 115 | | | | |
| m,p-Xylene | 81.5 | 1 | 80 | 0 | 101.9% | 85 | 115 | | | | |
| Methyl tert-Butyl Ether | 40.17 | 1 | 40 | 0 | 100.4% | 85 | 115 | | | | |
| o-Xylene | 41.57 | 0.5 | 40 | 0 | 103.9% | 85 | 115 | | | | |
| Toluene | 41.57 | 0.5 | 40 | 0 | 103.9% | 85 | 115 | | | | |
| 1,4-Difluorobenzene | 95.88 | 0 | 100 | 0 | 95.9% | 90 | 102 | | | | |
| 4-Bromochlorobenzene | 99.34 | 0 | 100 | 0 | 99.3% | 93 | 102 | | | | |
| Fluorobenzene | 94.21 | 0 | 100 | 0 | 94.2% | 84 | 103 | | | | |

Sample ID: **CCV4 QC0606/07** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:
Client ID: **9901005** Run ID: **GC-1_990113A** SeqNo: **10365**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 43.54 | 0.5 | 40 | 0 | 108.8% | 85 | 115 | | | | |
| Ethylbenzene | 43.56 | 0.5 | 40 | 0 | 108.9% | 85 | 115 | | | | |
| m,p-Xylene | 85.06 | 1 | 80 | 0 | 106.3% | 85 | 115 | | | | |
| Methyl tert-Butyl Ether | 34.41 | 1 | 40 | 0 | 86.0% | 85 | 115 | | | | |
| o-Xylene | 42.84 | 0.5 | 40 | 0 | 107.1% | 85 | 115 | | | | |
| Toluene | 42.77 | 0.5 | 40 | 0 | 106.9% | 85 | 115 | | | | |
| 1,4-Difluorobenzene | 96.22 | 0 | 100 | 0 | 96.2% | 90 | 102 | | | | |
| 4-Bromochlorobenzene | 97.71 | 0 | 100 | 0 | 97.7% | 93 | 102 | | | | |
| Fluorobenzene | 94.27 | 0 | 100 | 0 | 94.3% | 84 | 103 | | | | |

**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:** PNM - Public Service Company of NM
**Work Order:** 9901005
**Project:** Florance 44

# QC SUMMARY REPORT
## Continuing Calibration Verification Standard

Sample ID: **CCV5 QC0606/07** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:
Client ID: **9901005** Run ID: **GC-1_990113A** SeqNo: **10366**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 41.35 | 0.5 | 40 | 0 | 103.4% | 85 | 115 | | | | |
| Ethylbenzene | 41.82 | 0.5 | 40 | 0 | 104.5% | 85 | 115 | | | | |
| m,p-Xylene | 78.09 | 1 | 80 | 0 | 97.6% | 85 | 115 | | | | |
| Methyl tert-Butyl Ether | 38.43 | 1 | 40 | 0 | 96.1% | 85 | 115 | | | | |
| o-Xylene | 40.7 | 0.5 | 40 | 0 | 101.8% | 85 | 115 | | | | |
| Toluene | 39.43 | 0.5 | 40 | 0 | 98.6% | 85 | 115 | | | | |
| 1,4-Difluorobenzene | 96.87 | 0 | 100 | 0 | 96.9% | 90 | 102 | | | | |
| 4-Bromochlorobenzene | 99.76 | 0 | 100 | 0 | 99.8% | 93 | 102 | | | | |
| Fluorobenzene | 94.58 | 0 | 100 | 0 | 94.6% | 84 | 103 | | | | |

Sample ID: **CCV6 QC0606/07** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:
Client ID: **9901005** Run ID: **GC-1_990113A** SeqNo: **10367**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 21.46 | 0.5 | 20 | 0 | 107.3% | 85 | 115 | | | | |
| Ethylbenzene | 20.62 | 0.5 | 20 | 0 | 103.1% | 85 | 115 | | | | |
| m,p-Xylene | 40.59 | 1 | 40 | 0 | 101.5% | 85 | 115 | | | | |
| Methyl tert-Butyl Ether | 18.2 | 1 | 20 | 0 | 91.0% | 85 | 115 | | | | |
| o-Xylene | 20.13 | 0.5 | 20 | 0 | 100.7% | 85 | 115 | | | | |
| Toluene | 20.72 | 0.5 | 20 | 0 | 103.6% | 85 | 115 | | | | |
| 1,4-Difluorobenzene | 95.42 | 0 | 100 | 0 | 95.4% | 90 | 102 | | | | |
| 4-Bromochlorobenzene | 87.95 | 0 | 100 | 0 | 88.0% | 93 | 102 | | | | S |
| Fluorobenzene | 94.35 | 0 | 100 | 0 | 94.3% | 84 | 103 | | | | |

**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:** PNM - Public Service Company of NM
**Work Order:** 9901005
**Project:** Florance 44

# QC SUMMARY REPORT
## Continuing Calibration Verification Standard

Sample ID: **CCV7 QC0606/07** Batch ID: **GC-1_990113** Test Code: **SW8021B** Units: **µg/L** Analysis Date **1/13/99** Prep Date:

Client ID: **9901005** Run ID: **GC-1_990113A** SeqNo: **10368**

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 22.6 | 0.5 | 20 | 0 | 113.0% | 85 | 115 | | | | |
| Ethylbenzene | 22.76 | 0.5 | 20 | 0 | 113.8% | 85 | 115 | | | | |
| m,p-Xylene | 43.66 | 1 | 40 | 0 | 109.1% | 85 | 115 | | | | |
| Methyl tert-Butyl Ether | 21.49 | 1 | 20 | 0 | 107.4% | 85 | 115 | | | | |
| o-Xylene | 22.31 | 0.5 | 20 | 0 | 111.5% | 85 | 115 | | | | |
| Toluene | 22.32 | 0.5 | 20 | 0 | 111.6% | 85 | 115 | | | | |
| 1,4-Difluorobenzene | 96.43 | 0 | 100 | 0 | 96.4% | 90 | 102 | | | | |
| 4-Bromochlorobenzene | 96.61 | 0 | 100 | 0 | 96.6% | 93 | 102 | | | | |
| Fluorobenzene | 94.76 | 0 | 100 | 0 | 94.8% | 84 | 103 | | | | |

**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:** 21-Jan-99

**CLIENT:** PNM - Public Service Company of NM
**Work Order:** 9901005
**Project:** Florance 44
**Test No:** SW8021B

# QC SUMMARY REPORT
# SURROGATE RECOVERIES

**BTEX**

| Sample ID | 14FBZ | 4BCBZ | FLBZ |
|---|---|---|---|
| 9901003-01A | 96.8 | 97.3 | 95.2 |
| 9901003-02A | 96.8 | 98.1 | 94.8 |
| 9901003-03A | 96.7 | 98.9 | 95 |
| 9901003-04A | 96.8 | 97.9 | 95 |
| 9901003-05A | 97 | 98 | 95.2 |
| 9901003-06A | 97.2 | 98 | 95.5 |
| 9901003-06AMS | 95.6 | 99.9 | 94 |
| 9901003-06AMSD | 98.6 | 103 * | 96.9 |
| 9901003-07A | 94.8 | 96.3 | 93.7 |
| 9901003-08A | 97.5 | 99.3 | 96.4 |
| 9901005-01A | 95 | 97.8 | 94.2 |
| 9901005-02A | 95.1 | 96.7 | 94.1 |
| 9901005-02AMS | 95.2 | 99.6 | 94.2 |
| 9901005-02AMSD | 95.8 | 97.9 | 94.4 |
| 9901005-03A | 96.7 | 98.5 | 94 |
| 9901005-04A | 95.8 | 98.3 | 94.3 |
| CCV1 QC0606/07 | 96.4 | 97.9 | 94.5 |
| CCV2 QC0606/07 | 96.4 | 99 | 94.3 |
| CCV3 QC0606/07 | 95.9 | 99.3 | 94.2 |
| CCV4 QC0606/07 | 96.2 | 97.7 | 94.3 |
| CCV5 QC0606/07 | 96.9 | 99.8 | 94.6 |
| CCV6 QC0606/07 | 95.4 | 88 * | 94.3 |
| CCV7 QC0606/07 | 96.4 | 96.6 | 94.8 |
| LCS WATER | 96 | 98.6 | 94.4 |
| MB1 | 97.2 | 91.7 * | 96 |

| Acronym | | Surrogate | QC Limits |
|---|---|---|---|
| 14FBZ | = | 1,4-Difluorobenzene | 90-102 |
| 4BCBZ | = | 4-Bromochlorobenzene | 93-102 |
| FLBZ | = | Fluorobenzene | 84-103 |

*** Surrogate recovery outside acceptance limits**