

3R - 314

REPORTS

DATE:

Nov. 1, 1996

November 1, 1996

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



RE: SAN JUAN BASIN 3RD QUARTER 1996 GROUNDWATER REPORT

Dear Bill:

PNM Gas Services, PNMGS, (formerly Gas Company of New Mexico) is pleased to submit the 3rd Quarter 1996 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 is provided below.

Abrams Gas/Com L1
Cozzens B1
Cozzens B1E
Florance 32A
Florance 44
Florance 124
Honolulu Loop-Line Drip
Kaufmann 1
McCoy A1A
Templeton 1E
Zachry 18E

RECEIVED

NOV 04 1996

Environmental Bureau
Oil Conservation Division

PNM hereby requests two modifications of our Groundwater Management Program Unlined Surface Impoundment Closures submitted to OCD in March of 1996:

- PNM wishes to file annual groundwater progress reports to the OCD instead of quarterly reporting. Concerning sites with problematic or unusual activities, we will prepare individual reports to the OCD between annual reports as necessary. We will also file closure reports on groundwater sites as remediation is completed.
- PNM also asks for an exemption from notifying the OCD 48 hours in advance of any major sampling event or related activity at a groundwater site. We invite OCD to participate in our sampling events at any time. Please feel free to call Denver Bearden or me to schedule a time in the field with us.

If you have any questions regarding the contents of this report or the proposed modifications, please contact me at (505) 241-2974.

Sincerely,
PNM Environmental Services Department

A handwritten signature in cursive script, appearing to read "Maureen Gannon".

Maureen Gannon
Project Manager

Attachment

cc: Denver Bearden, PNMGS
Denny Foust, OCD-Aztec Office
Leigh Gooding, WFS

bcc: Colin Adams (w/o analytical results)
Ron Johnson (w/o analytical results)
Toni Ristau (w/o analytical results)
Mark Sikelianos (w/o analytical results)

Groundwater Site Summary Report

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

Quarter: 3 Year: 96

Operator: Amoco
Sec: 15 Twn: 30 Rng: 8 Unit: F
Canyon: San Juan River

Vulnerable Class: Original
OCD Ranking: 30
Lead Agency: NMOCD

Topo Map: previously submitted
Well Completion Diagram: Figure 1
Groundwater Contour Map: Figure 2
Water Level: Figure 3
Full Suite-Groundwater Results: Table 1
Site Map with Analysis: Figure 4
Analytical Results: attached

Activities for Quarter:

PNM installed five wells at the Florence 32A between August 7 and September 16, 1996. The wells were surveyed and sampled on September 26, 1996. Water level measurements were taken in each of the five monitoring wells. PNM conducted groundwater sampling of each well for chemical analyses of benzene, toluene, ethylbenzene, and xylenes (BTEX). Monitoring wells, MW-1 and MW-2, were sampled for major cations/anions. In addition, MW-2 was sampled for WQCC metals. Sampling was performed in strict compliance with EPA protocol.

PNM delivered the samples to OnSite Technologies, Farmington, New Mexico. The samples were analyzed using the following methods:

- benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8020.
- polynuclear aromatic hydrocarbons (PAHs) using EPA Method 8100
- major cations/anions using various EPA methods
- WQCC metals- filtered (As, Ba, Cd, Cr, Pb, Se, Ag, and Hg using inductively coupled plasma (ICP) for heavy metals and atomic absorption spectroscopy (AAS) for Hg and Se).

Conclusions and Recommendations:

Figure 1 presents a typical well completion diagram for the site. Figure 2 is the groundwater contour map of the site for the third quarter of 1996. Groundwater currently flows in a southerly direction beneath the site. Figure 3 provides the water level elevation at each monitoring well when sampling took place in September.

Table 1 provides a summary of the groundwater analytical results from the September 5 sampling event. Figure 4 provides a pictorial view of each well and its associated BTEX concentration. BTEX concentrations were non-detect in the following monitoring wells: MW-3, MW-4, and MW-5. BTEX concentrations in MW-1 were below WQCC standards. MW-2, located in the former pit area, contained benzene at 714.3 ppb and xylenes at 4,962.4 ppb. All metal analyses in MW-2 were non-detect or below WQCC standards.¹ PAHs were not detected in MW-2.

Further Action:

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

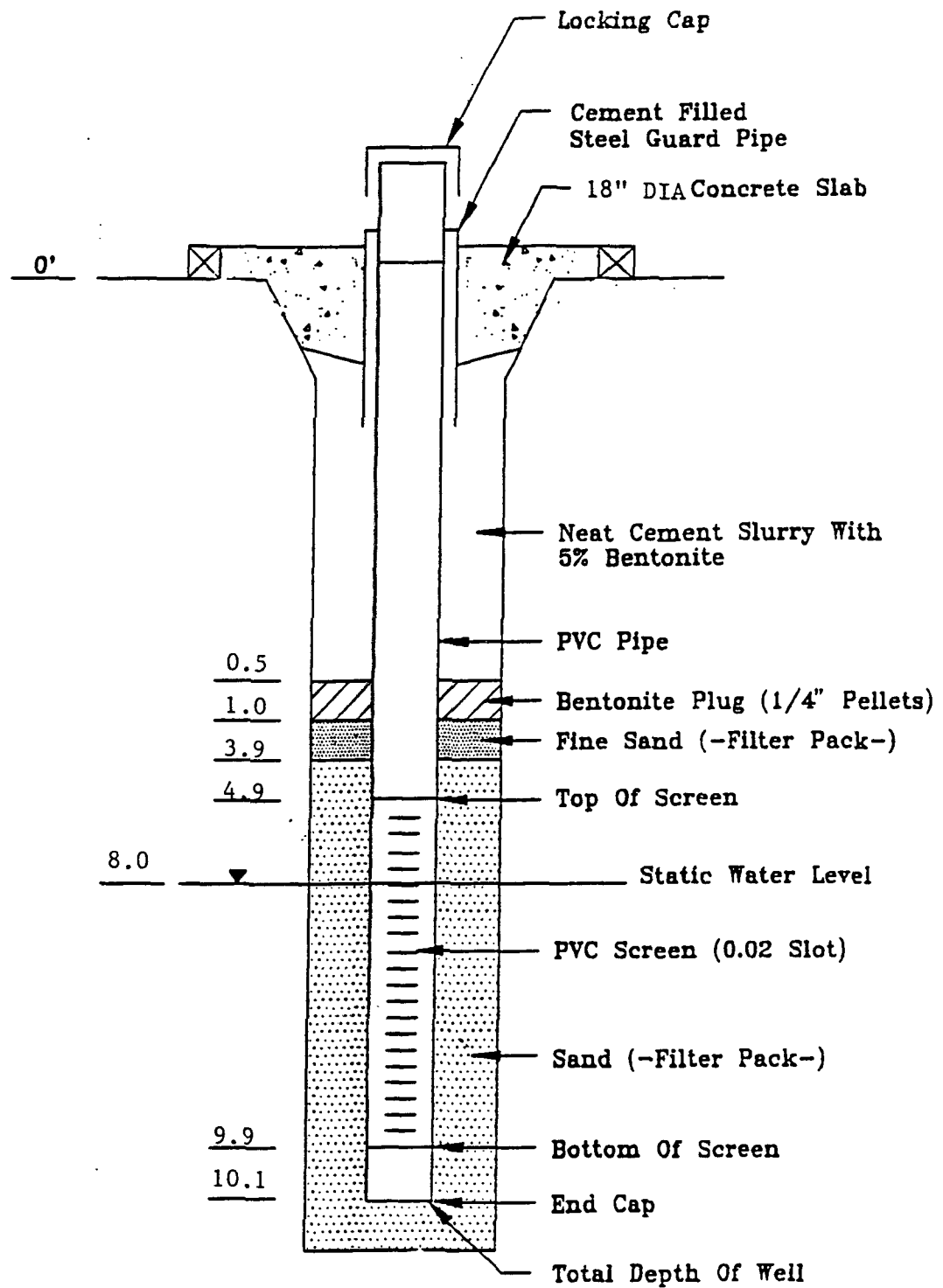
¹ Due to laboratory error, the detection limits for Cd, Pb and Se are above the WQCC standards. PNM is currently working with the laboratory (a contract with On Site Technologies) to ensure the appropriate detection limits are used in the future. PNM will resample these metals in MW-2.

Public Service Company of New Mexico - Gas Services

Environmental Services Division - Alvarado Square, MS-0408
Albuquerque, NM 87158

Contact: Maureen Gannon

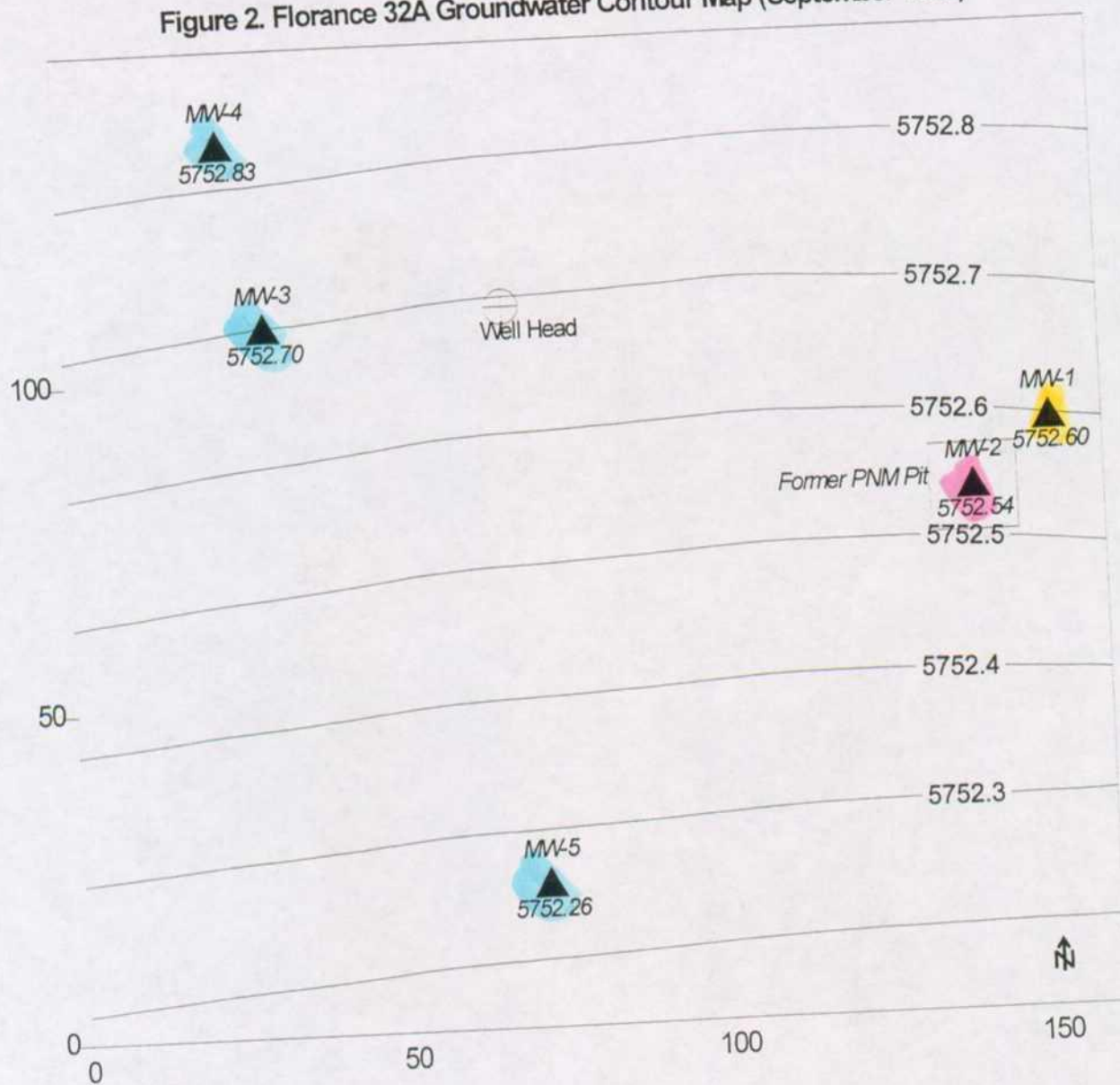
Telephone: 505-241-2974



CLIENT: PNM	
DATE:	REV. NO.: 0
AUTHOR: M.D.G.	DRAWN BY: M.P.
CK'D BY: M.D.G.	FILE: DWG

FIGURE 1
MONITOR WELL DESIGN
Florance #32A

Figure 2. Florance 32A Groundwater Contour Map (September 1996)



**Figure 3. Third Quarter Groundwater Level Elevations
Florance 32A Well Site**

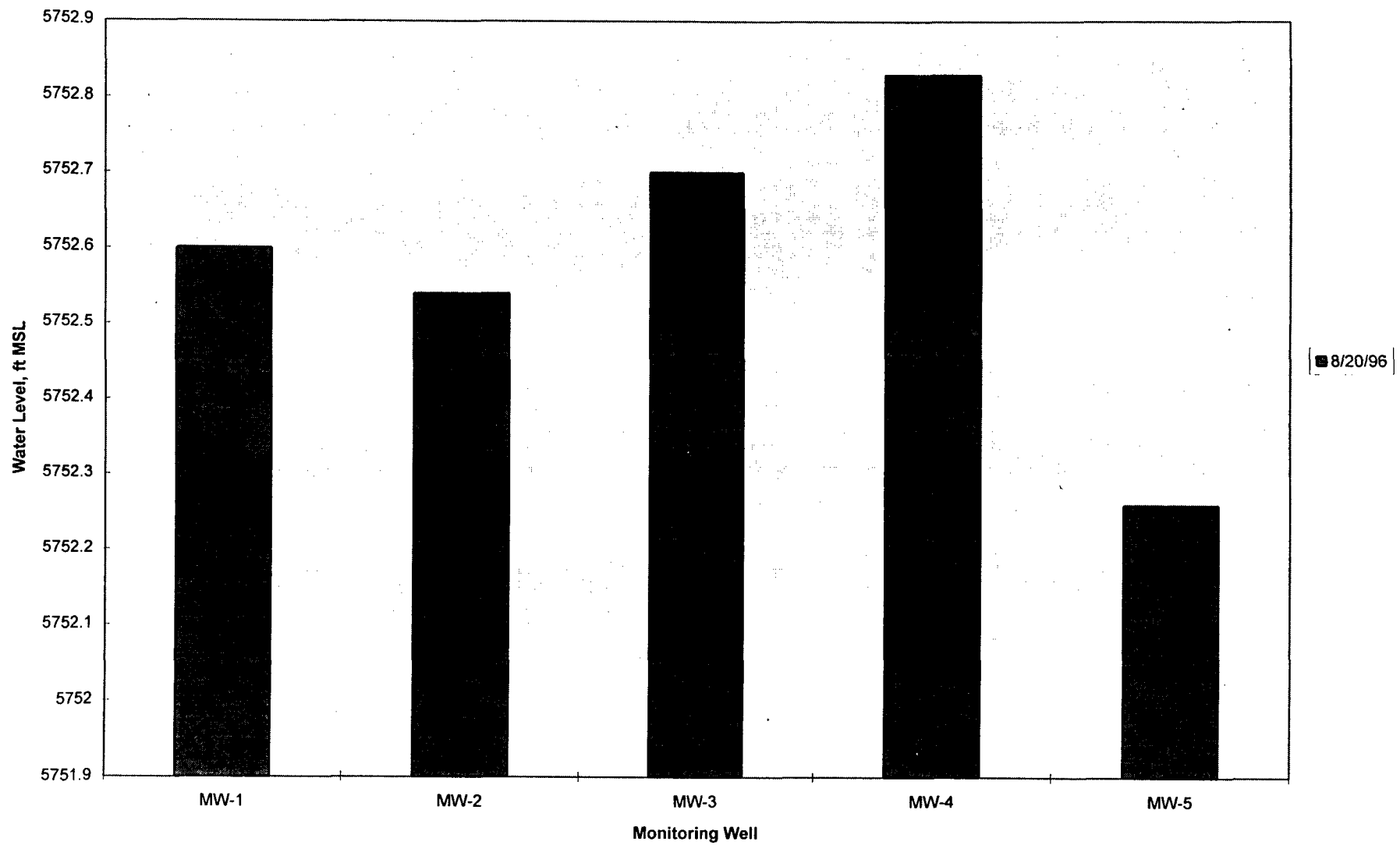


Table 1. FLORANCE #32A GROUNDWATER SAMPLING RESULTS, mg/l

Constituent	WQCC Std.	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6 (MW-5 duplicate)
<i>B</i>	0.01	<0.0002	0.7143	<0.0002	<0.0002	<0.0002	<0.0002
<i>T</i>	0.75	<0.0002	0.5899	<0.0002	<0.0002	<0.0002	<0.0002
<i>E</i>	0.75	0.0003	0.5036	<0.0002	<0.0002	<0.0002	<0.0002
<i>X</i>	0.62	0.0007	4.9624	<0.0002	<0.0002	<0.0002	<0.0002
<i>PAHs</i>	0.3	NS	BDL	NS	NS	NS	NS
<i>Metals</i>							
As	0.1	<0.10	<0.10	NS	NS	NS	NS
Ba	1	0.29	0.77	NS	NS	NS	NS
Cd	0.01	<0.02	<0.02	NS	NS	NS	NS
Cr	0.05	<0.03	<0.03	NS	NS	NS	NS
Pb	0.05	<0.15	<0.15	NS	NS	NS	NS
Se	0.05	<0.30	<0.30	NS	NS	NS	NS
Ag	0.05	<0.02	<0.02	NS	NS	NS	NS
Hg	0.002	<0.0005	0.0014	NS	NS	NS	NS
<i>Cations/Anions</i>							
Na	NA	66.4	206	NS	NS	NS	NS
Ca	NA	27.8	63.5	NS	NS	NS	NS
Mg	NA	3.7	34.0	NS	NS	NS	NS
K	NA	4.5	10.8	NS	NS	NS	NS
Cl	NA	42	47	NS	NS	NS	NS
SO4	NA	72	12	NS	NS	NS	NS
CO3	NA	<1	<1	NS	NS	NS	NS
HCO3	NA	208	915	NS	NS	NS	NS
OH	NA	<1	<1	NS	NS	NS	NS
<i>Cation/Anion Balance</i>							
Difference Cation- Anion	NA	1.40	1.37	NS	NS	NS	NS
Total Cation-Anion	NA	10.79	31.77	NS	NS	NS	NS
% Difference	NA	12.9**	4.3	NS	NS	NS	NS
TDS, calc	NA	424	1288	NS	NS	NS	NS
TDS, meas	NA	351	1070	NS	NS	NS	NS

NA: Not Applicable

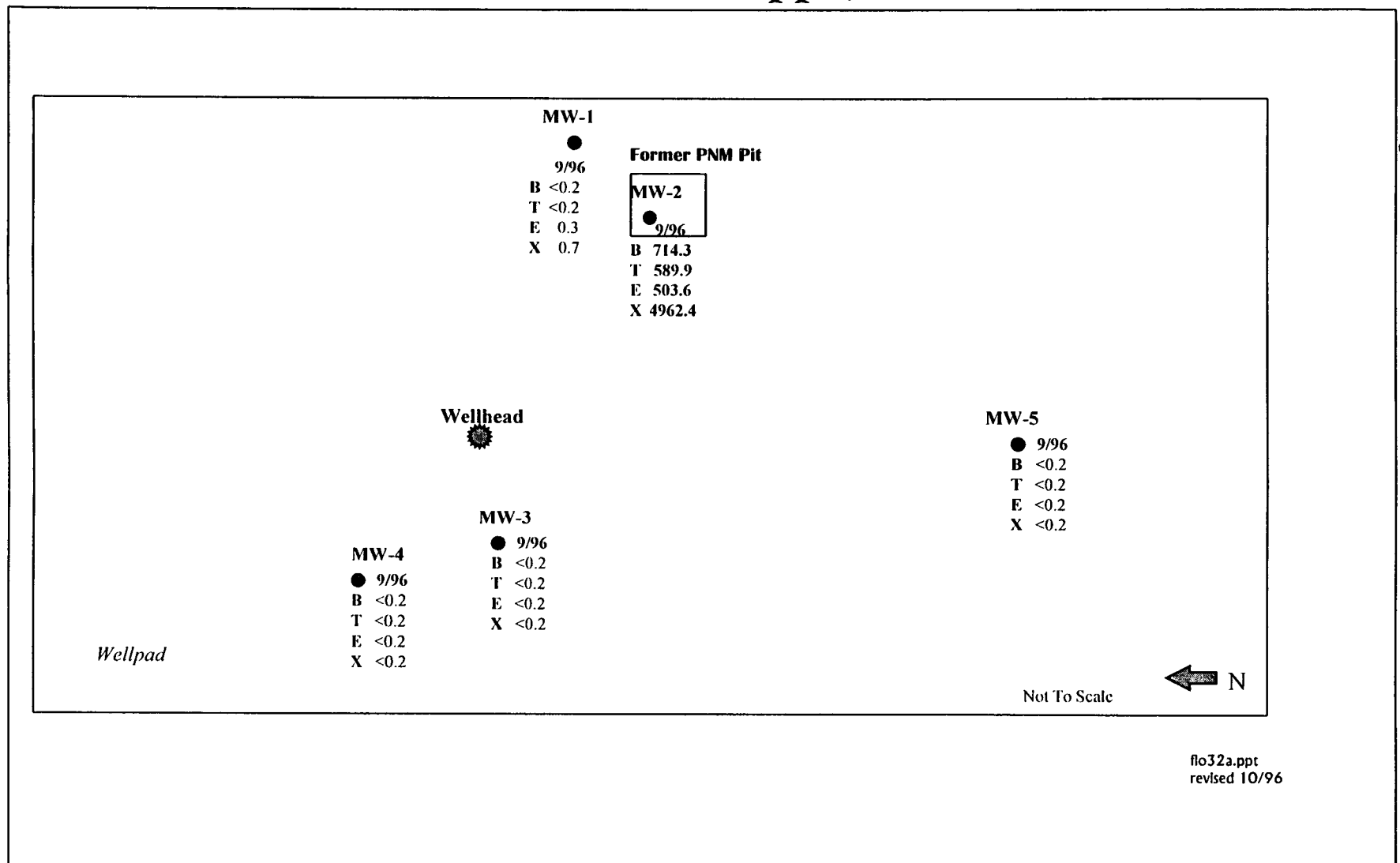
BDL: Below Detection Limit

NS: Not Sampled

Bold: Concentration Above WQCC Standard

** Out of Acceptable Range % Diff. +/- 5

**Figure 4. Florance 32A Well Site
Well Locations & Analytical Results
(Concentrations in ppb)**



OFF: (505) 325-5667



LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *30-Sep-96*
COC No.: *5412*
Sample No.: *12330*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Florance 32A*
Project Location: *9609261130; MW-1*
Sampled by: *MS/MG*
Analyzed by: *DC*
Sample Matrix: *Water*

Date: *26-Sep-96* Time: *11:30*
Date: *26-Sep-96*

Laboratory Analysis

Parameter	Result	Unit of Measure	Detection Limit	Unit of Measure
<i>Benzene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>0.3</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>0.7</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>		<i>1.0</i>		<i>ug/L</i>

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

Approved by: *Daq*
Date: *9/30/96*

OFF: (505) 325-5667



LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *30-Sep-96*
COC No.: *5412*
Sample No.: *12331*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Florance 32A*
Project Location: *9609261200; MW-2*
Sampled by: *MS/MG*
Analyzed by: *DC*
Sample Matrix: *Water*

Date: *26-Sep-96* Time: *12:00*
Date: *26-Sep-96*

Laboratory Analysis

Parameter	Result	Unit of Measure	Detection Limit	Unit of Measure
<i>Benzene</i>	<i>714.3</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>589.9</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>503.6</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>4596.1</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>366.3</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>6770.2</i>	<i>ug/L</i>		

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

Approved by: *[Signature]*
Date: *9/30/96*

OFF: (505) 325-5667



LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *30-Sep-96*
COC No.: *5412*
Sample No.: *12332*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Florence 32A*
Project Location: *9609261230; MW-3*
Sampled by: *MS/MG*
Analyzed by: *DC*
Sample Matrix: *Water*

Date: *26-Sep-96* Time: *12:30*
Date: *26-Sep-96*

Laboratory Analysis

Parameter	Result	Unit of Measure	Detection Limit	Unit of Measure
<i>Benzene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>		<i><0.2</i>		<i>ug/L</i>

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

Approved by: *[Signature]*
Date: *9/30/96*

OFF: (505) 325-5667



LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *30-Sep-96*
COC No.: *5412*
Sample No.: *12333*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Florance 32A*
Project Location: *9609261300; MW-4*
Sampled by: *MS/MG*
Analyzed by: *DC*
Sample Matrix: *Water*

Date: *26-Sep-96* Time: *13:00*
Date: *26-Sep-96*

Laboratory Analysis

Parameter	Result	Unit of Measure	Detection Limit	Unit of Measure
<i>Benzene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
TOTAL	<0.2	ug/L		

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

Approved by: *[Signature]*
Date: *9/30/96*

OFF: (505) 325-5667



LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *30-Sep-96*
COC No.: *5412*
Sample No.: *12334*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Florance 32A*
Project Location: *9609261330; MW-5*
Sampled by: *MS/MG*
Analyzed by: *DC*
Sample Matrix: *Water*

Date: *26-Sep-96* Time: *13:30*
Date: *26-Sep-96*

Laboratory Analysis

Parameter	Result	Unit of Measure	Detection Limit	Unit of Measure
<i>Benzene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i><0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i><0.2</i>	<i>ug/L</i>		

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

Approved by: *[Signature]*
Date: *9/30/96*

OFF: (505) 325-5667



LAB. (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *30-Sep-96*
COC No.: *5412*
Sample No.: *12335*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Florence 32A*
Project Location: *9609261400; MW-6 (Duplicate of MW-5)*
Sampled by: *MS/MG* Date: *26-Sep-96* Time: *14:00*
Analyzed by: *DC* Date: *26-Sep-96*
Sample Matrix: *Water*

Laboratory Analysis

Parameter	Result	Unit of Measure	Detection Limit	Unit of Measure
Benzene	<0.2	ug/L	0.2	ug/L
Toluene	<0.2	ug/L	0.2	ug/L
Ethylbenzene	<0.2	ug/L	0.2	ug/L
m,p-Xylene	<0.2	ug/L	0.2	ug/L
o-Xylene	<0.2	ug/L	0.2	ug/L
TOTAL		<0.2		ug/L

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

Approved by: *Jack*
Date: *9/30/96*

OFF: (505) 325-5667



LAB: (505) 325-1556

QUALITY ASSURANCE REPORT

for EPA Method 8020

Date Analyzed: 26-Sep-96

Internal QC No.: 0486-QC

Surrogate QC No.: 0488-QC

Reference Standard QC No.: 0417-QC

Method Blank

Parameter	Result	Unit of Measure
Average Amount of All Analytes In Blank	<0.2	ppb

Calibration Check

Parameter	Unit of Measure	True Value	Analyzed Value	% Diff	Limit
Benzene	ppb	20.0	19.9	1	15%
Toluene	ppb	20.0	20.0	0	15%
Ethylbenzene	ppb	20.0	20.2	1	15%
m,p-Xylene	ppb	40.0	38.8	3	15%
o-Xylene	ppb	20.0	19.1	4	15%

Matrix Spike

Parameter	1 - Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Benzene	109	111	(39-150)	1	20%
Toluene	80	83	(46-148)	1	20%
Ethylbenzene	102	104	(32-160)	1	20%
m,p-Xylene	88	90	(35-145)	1	20%
o-Xylene	92	94	(35-145)	1	20%

Surrogate Recoveries

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered
Limit Percent Recovered	(70-130)	
12330-5412	98	
12331-5412	96	
12332-5412	98	
12333-5412	98	
12334-5412	98	
12335-5412	98	

S1: Fluorobenzene

(12)

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: **Denver Bearden**
 Company: **PNM Gas Services**
 Address: **603 W. Elm**
 City, State: **Farmington, NM 87401**

Date: **16-Oct-96**
 COC No.: **5412**
 Sample ID: **12330**
 Job No.: **2-1000**

Project Name: **PNM Gas Services - Florance 32A**
 Project Location: **9609261130; MW-1**
 Sampled by: **MS/MG**
 Analyzed by: **HR**

Date: **26-Sep-96** Time: **11:30**
 Date: **2-Oct-96**

Laboratory Analysis

Parameter	Result	Unit of Measure	Result	Unit of Measure
Cations				
Sodium Na	66.4	mg/L	2.89	me/L
Calcium Ca	27.8	mg/L	1.39	me/L
Magnesium Mg	3.7	mg/L	0.31	me/L
Potassium K	4.5	mg/L	0.12	me/L
Anions				
Chloride Cl	42	mg/L	1.18	me/L
Sulfate SO4	72	mg/L	1.50	me/L
Carbonate CO3 as CaCO3	<1	mg/L	<0.01	me/L
Bicarbonate CO3 as CaCO3	208	mg/L	3.41	me/L
Hydroxide OH as CaCO3	<1	mg/L	<0.01	me/L
Total Dissolved Solids				
Calculated, Sum of Cation/Anion	424	mg/L	Cation-Anion Balance 1.40 Difference Cation-Anion, me/L 10.78 Total Cation-Anion, me/L 12.9 % Difference Cation-Anion * Out of Range, %Diff +/-5% Comments	
Total Dissolved Solids Dried @ 180 C	351	mg/L		
pH	8.15			
Conductivity @ 25 C	509	uS/cm		
Total Hardness as CaCO3	85	mg/L		
			*Balance verified by re-analysis of target parameters (PL)	

Approved by: *[Signature]*
 Date: **10/16/96**

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: **Denver Bearden**
 Company: **PNM Gas Services**
 Address: **603 W. Elm**
 City, State: **Farmington, NM 87401**

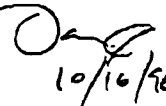
Date: **16-Oct-98**
 COC No.: **5412**
 Sample ID: **12331**
 Job No.: **2-1000**

Project Name: **PNM Gas Services - Florance 32A**
 Project Location: **9609261200; MW-2**
 Sampled by: **MS/MG**
 Analyzed by: **HR**

Date: **26-Sep-96** Time: **12:00**
 Date: **2-Oct-96**

Laboratory Analysis

Parameter	Result	Unit of Measure	Result	Unit of Measure
Cations				
Sodium <i>Na</i>	206	mg/L	8.96	me/L
Calcium <i>Ca</i>	63.5	mg/L	3.17	me/L
Magnesium <i>Mg</i>	34.0	mg/L	2.80	me/L
Potassium <i>K</i>	10.8	mg/L	0.28	me/L
Anions				
Chloride <i>Cl</i>	47	mg/L	1.33	me/L
Sulfate <i>SO4</i>	12	mg/L	0.25	me/L
Carbonate <i>O3 as CaCO3</i>	<1	mg/L	<0.01	me/L
Bicarbonate <i>CO3 as CaCO3</i>	915	mg/L	15.00	me/L
Hydroxide <i>OH as CaCO3</i>	<1	mg/L	<0.01	me/L
Total Dissolved Solids				
Calculated, Sum of Cation/Anion	1288	mg/L	Cation-Anion Balance 1.37 Difference Cation-Anion, me/L 31.77 Total Cation-Anion, me/L 4.3 % Difference Cation-Anion	
Total Dissolved Solids				
Dried @ 180 C	1070	mg/L		
pH	7.24			
Conductivity @ 25 C	1625	uS/cm	Comments	
Total Hardness as CaCO3	299	mg/L		

Approved by: 

Date: 10/16/96

OFF: (505) 325-5667



LAB: (505) 325-1556

QUALITY ASSURANCE REPORT

Cation/Anion Balance

Date: 2-Oct-96

Quality Control Sample

Parameter	Laboratory Identification	True Value	Analyzed Value	Unit of Measure	% Diff	Limit % Diff
Sodium, Na	0507-QC	3.80	3.81	mg/L	0	10
Calcium, Ca	0454-QC	1.56	1.59	mg/L	2	10
Magnesium, Mg	0454-QC	0.97	1.05	mg/L	8	10
Potassium, K	0507-QC	2.24	2.13	mg/L	-5	10
Chloride, Cl	0317-QC	50	55	mg/L	10	10
Sulfate, SO ₄	0507-QC	118	120	mg/L	3	10
Alkalinity	0507-QC	174	190	mg/L	9	10
pH	0507-QC	9.05	9.24		2	10
Conductivity	0507-QC	1210	1182	uS/cm	-4	15
Total Dissolved Solids, 180C	0507-QC	905	848	mg/L	-6	15

Matrix Spike

Parameter	Laboratory Identification	Analyzed Value	Matrix Spike	Spike Value	Unit of Measure	Spike Recovery
Sodium, Na	12385-4483	0.54	0.50	1.07	mg/L	103%
Calcium, Ca	12331-5412	0.64	0.50	1.18	mg/L	104%
Magnesium, Mg	12385-4483	0.18	0.50	0.71	mg/L	104%
Potassium, K	12385-4483	0.92	0.50	1.45	mg/L	102%

Method Blank

Parameter	Laboratory Identification	Analyzed Value	Unit of Measure
Sodium, Na	LF-Blank	<0.2	mg/L
Calcium, Ca	LF-Blank	<0.05	mg/L
Magnesium, Mg	LF-Blank	<0.05	mg/L
Potassium, K	LF-Blank	<0.05	mg/L
Chloride, Cl	LF-Blank	<3 X DL	mg/L
Sulfate, SO ₄	LF-Blank	<1	mg/L
Conductivity	LF-Blank	<2	uS/cm

(2)



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

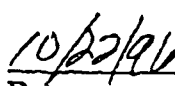
Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 96-10-178

Approved for Release by:



Ed Fry, Project Manager



Date:

Greg Grandits
Laboratory Director

Idelis Williams
Quality Assurance Officer



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis No. H9-9610178-01

On Site Technologies
612 East Murray
Farmington, NM 87401
ATTN: David Cox

P.O.#
5412
10/21/96

PROJECT: ON Site Tech
SITE: Florance 32A
SAMPLED BY: On Site
SAMPLE ID: Florance 32a 9609261200

PROJECT NO: PNM1002
MATRIX: WATER
DATE SAMPLED: 09/26/96 12:00:00
DATE RECEIVED: 10/02/96

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	2.25	ug/L
Acenaphthylene	ND	1.25	ug/L
Acenaphthene	ND	2.5	ug/L
Fluorene	ND	5.0	ug/L
Phenanthrene	ND	5.0	ug/L
Anthracene	ND	2.5	ug/L
Fluoranthene	ND	2.5	ug/L
Pyrene	ND	2.5	ug/L
Chrysene	ND	2.00	ug/L
Benzo (a) anthracene	ND	2.00	ug/L
Benzo (b) fluoranthene	ND	1.50	ug/L
Benzo (k) fluoranthene	ND	1.75	ug/L
Benzo (a) pyrene	ND	0.75	ug/L
Dibenzo (a,h) anthracene	ND	1.75	ug/L
Benzo (g,h,i) perylene	ND	2.5	ug/L
Indeno (1,2,3-cd) pyrene	ND	2.00	ug/L
1-Methylnaphthalene	ND	5.0	ug/L
2-Methylnaphthalene	ND	5.0	ug/L

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
Biphenyl	100 ug/L	D	50	150
Coronene	100 ug/L	D	50	150

ANALYZED BY: KA DATE/TIME: 10/12/96 19:01:51
EXTRACTED BY: DB DATE/TIME: 10/03/96 16:00:00
METHOD: 8310 Polynuclear Aromatic Hydrocarbons
NOTES: * - Practical Quantitation Limit ND - Not Detected
NA - Not Analyzed
D - Diluted, control limits not applicable.

COMMENTS:

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

QUALITY CONTROL
DOCUMENTATION



* SPL BATCH QUALITY CONTROL REPORT **

PAGE

METHOD EPA 8310

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054

PHONE (713) 680-0901

Matrix: Aqueous

Batch Id: 1961007124930

Units: ug/L

BLANK SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(**) (Advisory)	
			Result	Recovery	Result	Recovery		RPD	Recovery Range
			<1>	<4>	<1>	<5>		Max.	
NAPHTHALENE	ND	0.50	0.45	90.0	0.44	88.0	2.25	30	1 - 122
ACENAPHTHYLENE	ND	0.50	0.42	84.0	0.44	88.0	4.65	30	1 - 124
ACENAPHTHENE	ND	0.5	0.36	72.0	0.40	80.0	10.5	30	1 - 124
FLUORENE	ND	0.5	0.37	74.0	0.37	74.0	0	30	1 - 142
PHENANTHRENE	ND	0.5	0.38	76.0	0.40	80.0	5.13	30	1 - 155
ANTHRACENE	ND	0.5	0.35	70.0	0.36	72.0	2.82	30	1 - 126
FLUORANTHENE	ND	0.5	0.38	76.0	0.40	80.0	5.13	30	14 - 123
PYRENE	ND	0.5	0.38	76.0	0.39	78.0	2.60	30	1 - 140
CHRYSENE	ND	0.50	0.29	58.0	0.30	60.0	3.39	30	1 - 199
BENZO (A) ANTHRACENE	ND	0.50	0.38	76.0	0.40	80.0	5.13	30	12 - 135
BENZO (B) FLUORANTHENE	ND	0.50	0.36	72.0	0.38	76.0	5.41	30	6 - 150
BENZO (K) FLUORANTHENE	ND	0.50	0.35	70.0	0.37	74.0	5.56	30	1 - 159
BENZO (A) PYRENE	ND	0.50	0.33	66.0	0.34	68.0	2.99	30	1 - 128
DIBENZO (A,H) ANTHRACENE	ND	0.50	0.29	58.0	0.31	62.0	6.67	30	1 - 110
BENZO (G,H,I) PERYLENE	ND	0.5	0.34	68.0	0.36	72.0	5.71	30	1 - 116
INDENO (1,2,3-CD) PYRENE	ND	0.50	0.28	56.0	0.32	64.0	13.3	30	1 - 116

Analyst: SB

* = Values Outside QC Range

Sequence Date: 10/07/96

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

Method Blank File ID:

ND = Not Detected/Below Detection Limit

Sample File ID:

% Recovery = $\frac{[(<1> - <2>) / <3>] \times 100}{1}$

Blank Spike File ID: 961004A\002-0101

Relative Percent Difference = $\frac{|(<4> - <5>) / [(<4> + <5>) \times 0.5] \times 100}{1}$

Matrix Spike File ID:

(**) = Source: SPL Temporary Limits

Matrix Spike Duplicate File ID:

SAMPLES IN BATCH(SPL ID):

9610205-01D 9610178-01A



SPL BATCH QUALITY CONTROL REPORT **

METHOD EPA 8310

HOUSTON LABORATORY

8860 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054

PHONE (713) 660-0901

Matrix: Aqueous

Units: ug/L

Batch Id: 1961007124930

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
Naphthalene	ND	0.50	0.33	66.0	33 - 122
Acenaphthylene	ND	0.50	0.59	118	42 - 138
Acenaphthene	ND	0.5	0.32	64.0	25 - 123
Fluorene	ND	0.5	0.34	68.0	19 - 142
Phenanthrene	ND	0.5	0.35	70.0	40 - 121
Anthracene	ND	0.5	0.33	66.0	32 - 121
Fluoranthene	ND	0.5	0.39	78.0	51 - 115
Pyrene	ND	0.5	0.38	76.0	45 - 117
Chrysene	ND	0.50	0.34	68.0	44 - 122
Benzo (a) anthracene	ND	0.50	0.45	90.0	57 - 118
Benzo (b) fluoranthene	ND	0.50	0.47	94.0	62 - 121
Benzo (k) fluoranthene	ND	0.50	0.46	92.0	63 - 117
Benzo (a) pyrene	ND	0.50	0.44	88.0	42 - 120
Dibenzo (a,h) anthracene	ND	0.50	0.44	88.0	53 - 118
Benzo (g,h,i) perylene	ND	0.5	0.50	100	51 - 116
Indeno (1,2,3-cd) pyrene	ND	0.50	0.42	84.0	60 - 116

Analyst: SLB

Sequence Date: 10/07/96

SPL ID of sample spiked: LCS

Sample File ID:

Method Blank File ID:

Blank Spike File ID: 961007A\003-0101

Matrix Spike File ID:

Matrix Spike Duplicate File ID: 961007A\003-0101

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = $\left(\frac{\langle 1 \rangle - \langle 2 \rangle}{\langle 3 \rangle} \right) \times 100$ LCS % Recovery = $\left(\frac{\langle 1 \rangle}{\langle 3 \rangle} \right) \times 100$ Relative Percent Difference = $\left| \frac{\langle 4 \rangle - \langle 5 \rangle}{\left(\frac{\langle 4 \rangle + \langle 5 \rangle}{2} \right)} \right| \times 100$

(**) = Source: SPL-Houston Historical Data (3rd Q '96)

(***) = Source: SPL-Houston Historical Data (3rd Q '96)

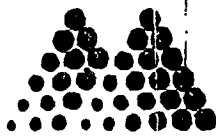
SAMPLES IN BATCH(SPL ID):

9610205-01D 9610178-01A

CHAIN OF CUSTODY
AND
SAMPLE RECEIPT CHECKLIST

Purchase Order No.: <u>5412</u>		Job No. <u>PNM1002</u>		Name <u>DAVID COX</u>		Title			
SEND INVOICE TO	Name <u>ACCOUNTS PAYABLE</u>			REPORT RESULTS TO	Company <u>ON SITE TECH</u>				
	Company <u>ON SITE TECH</u>		Mailing Address <u>612 E. MURRAY</u>						
	Address <u>P.O. BOX 2606</u>				City, State, Zip <u>FARMINGTON NM 87401</u>				
	City, State, Zip <u>FARMINGTON, NM 87499</u>				Telephone No. <u>505-325-2432</u> Telefax No. <u>505-325-6256</u>				
Sampling Location: <u>FLORANCE 32A</u>				Number of Containers	ANALYSIS REQUESTED				
Sampler: <u>MS/MG</u>					PAH 8310 LAB ID				
SAMPLE IDENTIFICATION		SAMPLE		MATRIX				PRES.	
		DATE	TIME						
<u>FLORANCE 32A 9609261200 MW-2</u>		<u>1/26/96</u>	<u>1200</u>	<u>H₂O</u>				<u>COOL</u>	<u>1</u>
Relinquished by: <u>[Signature]</u>		Date/Time <u>1/26/96 1700</u>		Received by: <u>Mary Gibson</u> <u>13°C</u>		Date/Time <u>10/2/96 9:15</u>			
Relinquished by:		Date/Time		Received by:		Date/Time			
Relinquished by:		Date/Time		Received by:		Date/Time			
Method of Shipment:				Rush	24-48 Hours	10 Working Days	Special Instructions:		
Authorized by: <u>[Signature]</u>		Date <u>1/26/96</u>							
(Client Signature Must Accompany Request)									

Facsimile Communication



Mountain States Analytical

The Quality Solution

CONFIDENTIAL MATERIAL

If received in error, please notify sender at once.

To: David Cox

Company: On Site Technologies

Fax No.: 505-325-6256

Date: 10-22-96

From: Skulley

Number of pages 8 (Including this cover sheet)

Comments: Analytical Rept. + 1383-1, 138-53

If you do not receive all of the pages or have problems with transmission,
please call (801) 973-0050 as soon as possible.



Mountain States Analytical

The Quality Solution

October 22, 1996

Mr. David Cox
On Site Technologies, Ltd.
612 E Murray Drive
Farmington, NM 87401

Reference:

Project: Florance 32A
Project No.: FNM 1002
MSAI Group: 13832

Dear Mr. Cox:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

12330-5412 (dissolved)

12311-5412 (dissolved)

All holding times were met for the tests performed on these samples.

If the report is acceptable, please approve the enclosed invoice and forward it for payment.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

Rolf E. Larsen
Project Manager



Mountain States Analytical

The Quality Solution

On Site Technologies, Ltd.
612 E Murray Drive
Farmington, NM 87401

Attn: Mr. David Cox
Project: Florance 32A

Sample ID: 12330-5412 (dissolved) MW-1
Matrix: Waste Water

MSAI Sample: 53877
MSAI Group: 13832
Date Reported: 10/22/96
Discard Date: 11/21/96
Date Submitted: 10/09/96
Date Sampled: 09/26/96
Collected by:
Purchase Order: 5412
Project No.: PNM 1002

Test Analysis	Results as Received	Units	Limit of Quantitation
0259B Mercury by CVAA, w/ww, SW-846 Method: SW-846 7470	ND	mg/l	0.0035
0392I Flame/ICP Prep for Metals, Waters Method: SW-846 3005A	Complete		
0392M Mercury Prep CVAA, Waters Method: SW-846 7470	Complete		
7245 Arsenic by ICP Method: SW-846 6010A	ND	mg/l	0.10
7246 Barium by ICP Method: SW-846 6010A	0.29	mg/l	0.02
7249 Cadmium by ICP Method: SW-846 6010A	ND	mg/l	0.02
7251 Chromium by ICP Method: SW-846 6010A	ND	mg/l	0.03
7255 Lead by ICP Method: SW-846 6010A	ND	mg/l	0.15
7264 Selenium by ICP Method: SW-846 6010A	ND	mg/l	0.30
7266 Silver by ICP Method: SW-846 6010A	ND	mg/l	0.02
0939 Sample Filtering Method: MSAI IN-HOUSE	Complete		

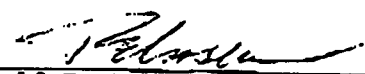
**Mountain States Analytical**On Site Technologies, Ltd. *The Quality Solution*

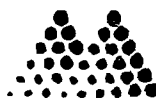
Sample ID: 12330-5412 (dissolved)

Page 2

MSAI Sample: 53877
MSAI Group: 13832

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:
Rolf E. Larsen
Project Manager

**Mountain States Analytical***The Quality Solution*

On Site Technologies, Ltd.
612 E Murray Drive
Farmington, NM 87401

Attn: Mr. David Cox
Project: Florance 32A

Sample ID: 12331-5412 (dissolved) MW-2
Matrix: Waste Water

MSAI Sample: 53878
MSAI Group: 13832
Date Reported: 10/22/96
Discard Date: 11/21/96
Date Submitted: 10/09/96
Date Sampled: 09/26/96
Collected by:
Purchase Order: 5412
Project No.: PNM 1002

Test Analysis	Results as Received	Units	Limit of Quantitation
0259B Mercury by CVAA, w/w, SW-846 Method: SW-846 7470	0.0014	mg/l	0.0005
0392I Flame/ICP Prep for Metals, Waters Method: SW-846 3005A	Complete		
0392M Mercury Prep CVAA, Waters Method: SW-846 7470	Complete		
7245 Arsenic by ICP Method: SW-846 6010A	ND	mg/l	0.10
7246 Barium by ICP Method: SW-846 6010A	0.77	mg/l	0.02
7249 Cadmium by ICP Method: SW-846 6010A	ND	mg/l	0.02
7251 Chromium by ICP Method: SW-846 6010A	ND	mg/l	0.03
7255 Lead by ICP Method: SW-846 6010A	ND	mg/l	0.15
7264 Selenium by ICP Method: SW-846 6010A	ND	mg/l	0.30
7266 Silver by ICP Method: SW-846 6010A	ND	mg/l	0.02
0939 Sample Filtering Method: MSAI IN-HOUSE	Complete		

**Mountain States Analytical**

On Site Technologies, Ltd.

The Quality Solution

Sample ID: 12331-5412 (dissolved)

Page 2

MSAI Sample: 53878

MSAI Group: 13832

ND - Not detected at the limit of quantitation

Respectfully Submitted,
Reviewed and Approved by:Rolf E. Larsen
Project Manager