3R - 303

GENERAL CORRESPONDENCE

YEAR(S):
1996-1994

Public Service Company
of New Mexico
603 W. Elm - P.O. Box 4750
Farmington, NM 87499
505 950-1997
Fax 505 325-7365

October 29, 1996

PNM Gas Services

Oil Conservation Division
Attention: Bill Olson
2040 South Pacheco
Santa Fe, NM 87505

Subject: OCD Closure Reports
3rd Reporting Quarter 1996

Dear Bill Olsen,

PNM Gas Services is submitting closure reports to the Oil Conservation Division for the sites listed at the bottom of this page. These sites were remediated between July 1, 1996 and October 1, 1996. Our office is also submitting two groundwater sites, the Abrams Gas Com L#1 and Cozzens B #1E, for closure. If you have any questions, call Krista Lawrence at (505) 324-3764.

Angel Peak #22 South
Archuleta #1
Bruington #1
Bruington #2
Calloway #1
Calvin #1E
Congress #4
Current #2
FJ Titt #2
FJ Titt #2A
Federal Gas Com L #1
Federal Gas Com L #1E
Florance #10
Florance #13
Florance #13A
Florance #16
Florance #16A
Florance #18A
Florance #19A
Florance #2
Florance #24
Florance #27
Florance #2A
Florance #40A
Florance #42
Florance AC #3
Florance P #39
Giomi GC C #1
Hamner #1
Hampton #5
Hare #4
Helen Jackson #1
Helen Jackson #1A
Helen Jackson #2
Howell #2A

Largo Federal #3
Manley #1
Mansfield #1
Mansfield #1A
McClanahan #16E
McClanahan #18
McCord 2&3 Tie In Drip
Michael #1
Mims State Com #1A
Mims State Com #2
Nye #11
Nye #12
Nye #13
Nye #14
Nye #16
Nye #16A
Nye #17
Nye #1A
Nye #3A
Nye #8
Omler A #3E
Omler A #5E
Payne #2A
Pierce #3
Pierce #5
Pritchard #3
Pritchard #3A
Pritchard A #1
Pritchard A #1A
Reid #10 Drip
Reid #12
Reid #15
Reid #18
Reid #18Drip
Reid #19
Reid #21E
Reid #23
Riddle #2
State AE #2 Drip
State Com B #3A
Wilson #1
Zachry #19E
Zachry #4 Drip

In addition PNM Gas Services is filing closure for the following Jicarilla Apache Locations:

Axi Apache O #2
Axi Apache O #2 Drip
Axi Apache O #7
Jicarilla 103 #10
Jicarilla 103 #11
Jicarilla 103 #11E Drip
Jicarilla 103 #12M
Jicarilla 103 #12M Drip North
Jicarilla 103 #12M Drip East
Jicarilla 103 #13
Jicarilla 103 #13 Drip

Jicarilla 103 [illegible]
Jicarilla 103 #14 Drip
Jicarilla 103 #15
Jicarilla 103 #4
Jicarilla 103 #4 Drip
Jicarilla 103 #7
Jicarilla 103 #7E
Jicarilla A #20
Jicarilla A #8
Jicarilla Apache 102 #1
Jicarilla D #1
Jicarilla D #13
Jicarilla D #3 Drip
Jicarilla E #10E
Jicarilla E #11
Jicarilla E #2
Jicarilla E #3
Jicarilla E #4
Jicarilla E #4 Drip
Jicarilla E #8
Jicarilla F #2
Jicarilla F #4
Jicarilla F #4 Drip
Jicarilla F #5A
Jicarilla F #5A Drip North
Jicarilla F #5A Drip South
Jicarilla F #6
Jicarilla H #5 Drip
Jicarilla J #10E
Jicarilla J #11
Jicarilla J #16
Jicarilla J #18
Jicarilla J #23A
Jicarilla J #3
Jicarilla J #4
Jicarilla J #5
Jicarilla J #6
Jicarilla J #6 Drip
Jicarilla J #8
Jicarilla J #9
Jicarilla J #9E
Lowe #3
Lowe #4

Sincerely,

Krista Lawrence for Maureen Gannon

Maureen Gannon
Environmental Engineer

cc: Denny Foust
BLM - Farmington
Williams Field Services

District I
P O Box 1980, Hobbs, NM

District II
P O. Drawer DD, Artesia, NM 88221

District III
1000 Rio Brazos Rd, Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

2040 South Pacheco Street
Santa Fe, New Mexico 87505

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

OK

PIT REMEDIATION AND CLOSURE REPORT

Operator: PNM Gas Services (Amoco) **Telephone:** 324-3764

Address: 603 W. Elm Street Farmington, NM 87401

Facility or Well Name: Abrams Gas Com L #1

Location: Unit: M Sec. 26 T. 29 N R. 10 W County San Juan

Pit Type: Separator ☑ Dehydrator ☐ Other

Land Type: BLM ☐ State ☐ Fee ☑ Other

Pit Location: Pit dimensions: length 12 ' width 12 ' depth 4 '

(Attach diagram) Reference: wellhead ☑ other

Footage from reference: 81'

Direction from reference: due Degrees ☐ East North ☐ of ☑ West South ☐

Depth to Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water	Less than 50 feet 50 feet to 99 feet Greater than 100 feet	(20 points) (10 points) (0 points)	20
Wellhead Protection Area: (Less than 200 feet from a private domestic water source, or; less than 1,000 feet from all other water sources)	Yes No	(20 points) (0 points)	20
Distance to Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches	Less than 200 feet 200 feet to 1,000 feet Greater than 1,000 feet	(20 points) (10 points) (0 points)	10
RANKING SCORE (TOTAL POINTS) :			50

RECEIVED
OCT 3 1 1996
Environmental Bureau
Oil Conservation Division

Date Remediation Started: 10/5/94 **Date Completed:** 12/15/94

Remediation Method: (Check all appropriate sections)

Excavation X Approx. Cubic Yard 608

Landfarmed X Amount Landfarmed (cubic yds) 608

Other

Remediation Location: (i.e., landfarmed onsite, name and location of offsite facility)

Onsite Offsite Envirotech

Backfill Material Location:

General Description of Remedial Action:

Soil Remediation: Excavated contaminated soil to pit size of 36'x24'x19' and transported soil to an offsite commercial landfarm.

Groundwater Remediation: See attached Groundwater Site Summary Report

Ground Water Encountered: No ☐ Yes ☑ Depth 17 feet

Final Pit Closure Sampling: (if multiple samples, attach sample result and diagram of sample locations and depths.)

Sample Location Bottom of Excavation

Sample depth 20'

Sample date 12/1/94 Sample time 11:00:00 AM

Sample Results

Benzene (ppm)

Total BTEX (ppm)

Field headspace (ppm) 45

TPH 15.00 Method 418.1

Vertical Extent (ft) Risk Assessment form attached Yes ☐ No ☑

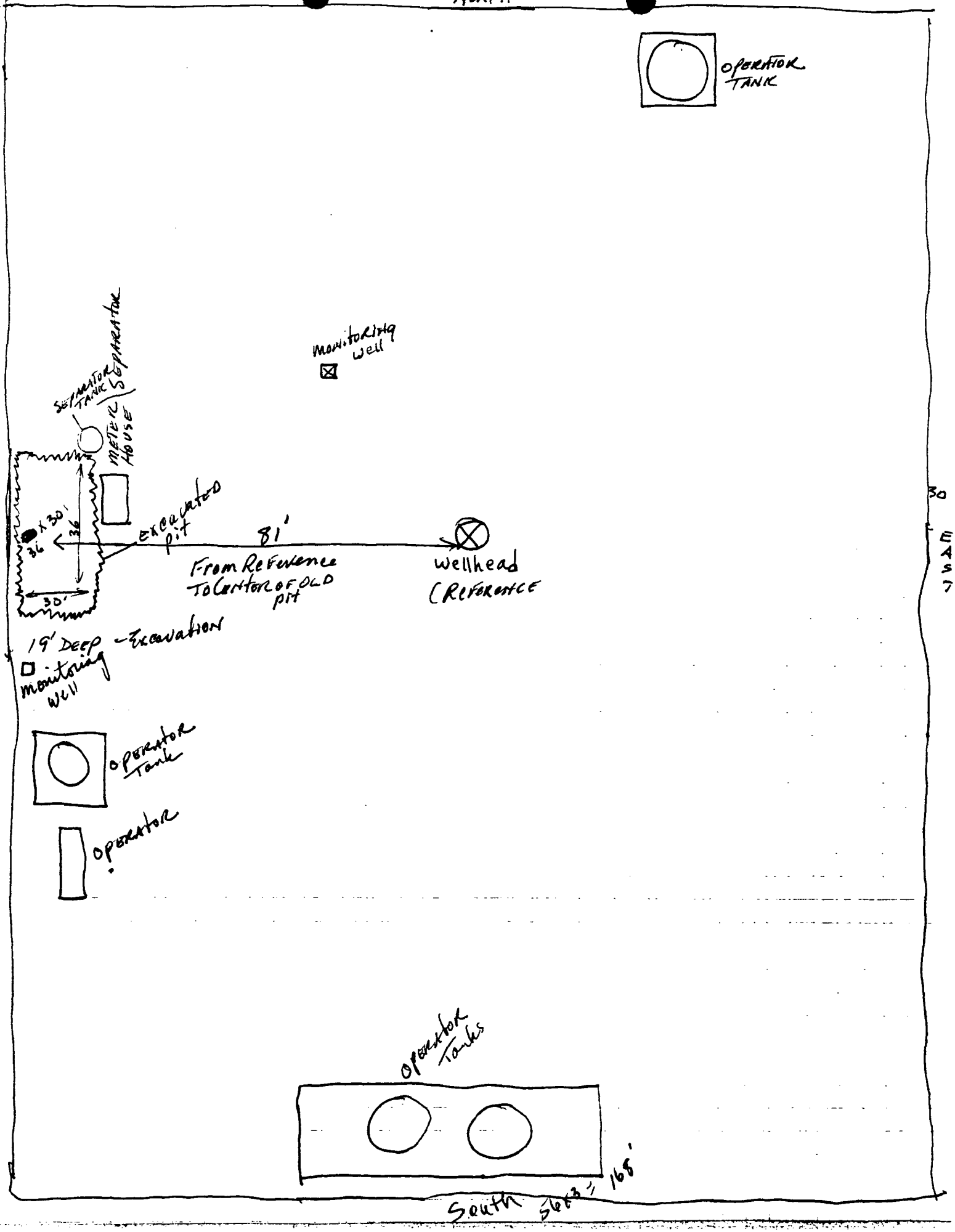
Ground Water Sample: Yes ☐ No ☑ (If yes, attach sample results)

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

DATE October 25, 1996

SIGNATURE Maureen Gannon

PRINTED NAME AND TITLE Maureen Gannon
Environmental Engineer


44 x 3 = 132'
NORTH
OPERATOR TANK
SEPARATOR TANK
METER HOUSE
SEPARATOR
monitoring well
36
x 30'
36
EXCAVATED pit
81'
From Reference To Center of old pit
Wellhead (Reference
19' Deep - Excavation
monitoring well
operator Tank
operator
operator Tanks
South
165'
WEST
EAST
30

OFF: (505) 325-8786

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-5667

TOTAL PETROLEUM HYDROCARBONS

Attn:	*Denver Bearden*	Date:	12/1/94
Company:	*Gas Company of New Mexico*	*Lab ID:*	*2536*
Address:	*P.O. Box 1899*	*Sample No.*	*4184*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1121*

Project Name:	***Abrams Gas Com L1***				
Project Location:	***AB-2-EX-B W-20'***				
Sampled by:	DB	Date:	12/1/94	Time:	11:00
Analyzed by:	DC	Date:	12/1/94		
Type of Sample:	*Soil*				

Laboratory Analysis

Laboratory Identification	***Sample Identification***	***Total Petroleum Hydrocarbons***
4184-2536	*Abrams Gas Com L1* ***AB-2-EX-B W-20'***	15 *mg/kg*

Method - *EPA Method 418.1 Total Petroleum Hydrocarbons*

Approved by:
Date: 12/1/94

PNMGS Well Site: Abrams L 1

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

Groundwater Site Summary Report

Quarter: 3 **Year:** 96

Operator: Amoco
Sec: 26 **Twn:** 29 **Rng:** 10 **Unit:** M
Canyon: Armenta

Vulnerable Class: Original
OCD Ranking: 50
Lead Agency: NMOCD

Topo Map: previously submitted
Groundwater Contour Map: Figure 1
Hydrograph Map: Figure 2
Site Map with Analysis: Figure 3
Well Completion Diagram: previously submitted
Analytical Results: attached

Activities for Quarter:

PNM performed quarterly groundwater sampling at the Abrams Gas/Com L1 site on August 21, 1996. Water levels 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) using EPA Method 8020. Sampling was performed in strict compliance with EPA protocol. PNM hand-delivered samples to OnSite Technologies, Farmington, New Mexico.

Conclusions and Recommendations:

Figure 1 is the groundwater contour map of the site for the third quarter of 1996. Groundwater flows in a northwesterly direction beneath the site. Figure 2 is a hydrograph (water level versus time) of each groundwater monitoring well. Water levels at the Abrams consistently rose by an average of 4 feet in each well between April and August. This is probably the result of irrigation during the summer months in this area.

BTEX concentrations were non-detect in each of the five monitoring wells. PNM has now monitored groundwater at the site for four consecutive quarters and BTEX concentrations have been consistently below WQCC standards. We conclude that source removal and natural attenuation have been successful in remediating the soil and groundwater contamination at this site. Figure 3 provides a historical picture of the groundwater analytical results of the site.

PNM is filing formal closure of our former pit at the Abrams Gas/Com L1 well site. The closure report is included in the recent submittal of PNM Gas Services' October 30, 1996 "OCD Closure Reports" to OCD.

Further Action:

PNM will plug and abandon all five groundwater monitoring wells at the site. Where possible, the PVC well casing will be pulled and disposed. PNM will remove all metal vaults and concrete pads and restore the ground surface to its natural state.

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**

Figure 1. Abrams Gas/Com L1 Groundwater Contour Map (August 1996)

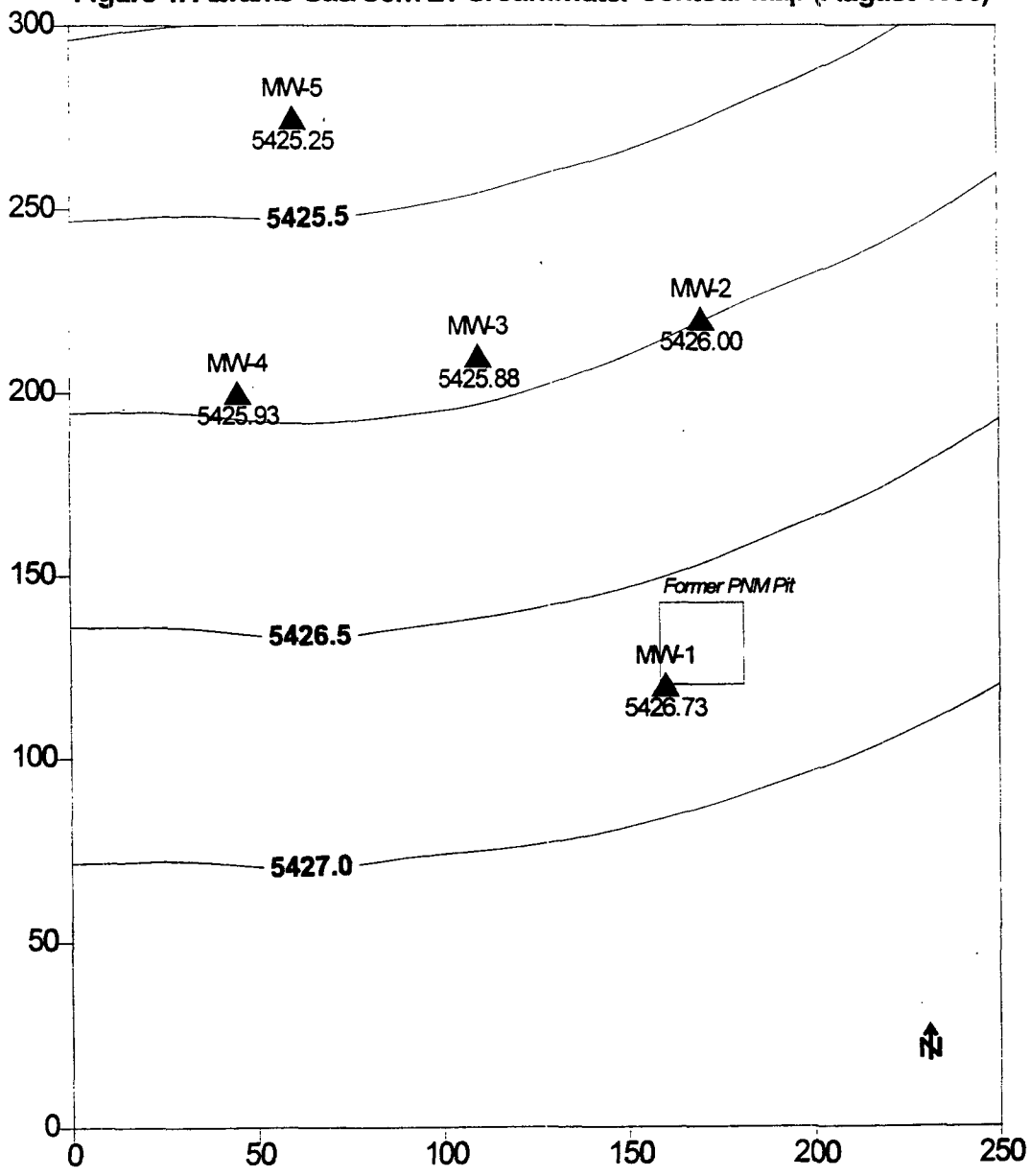


Figure 2. Abrams Gas/Com L1 Hydrograph
(water level vs. time)

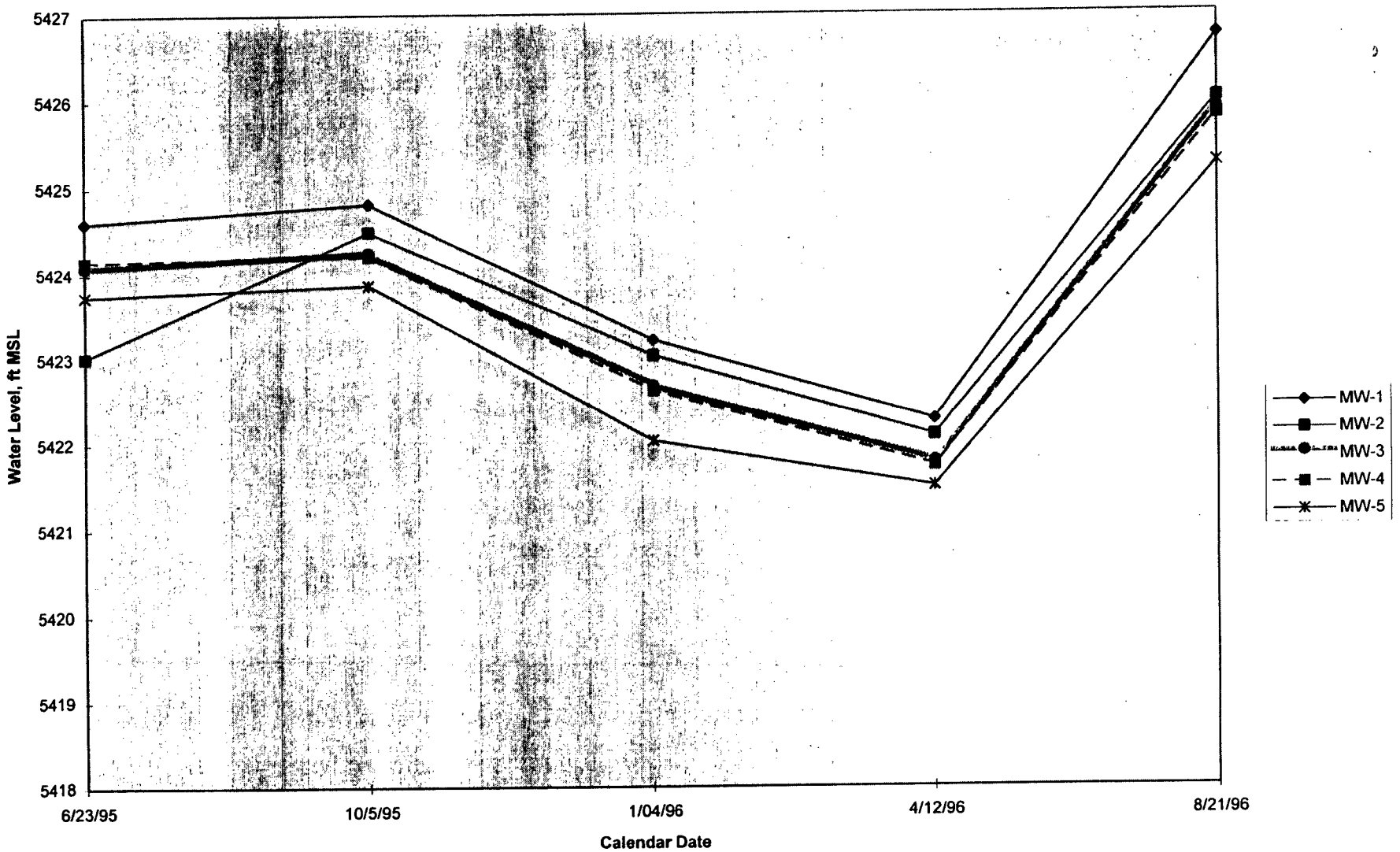
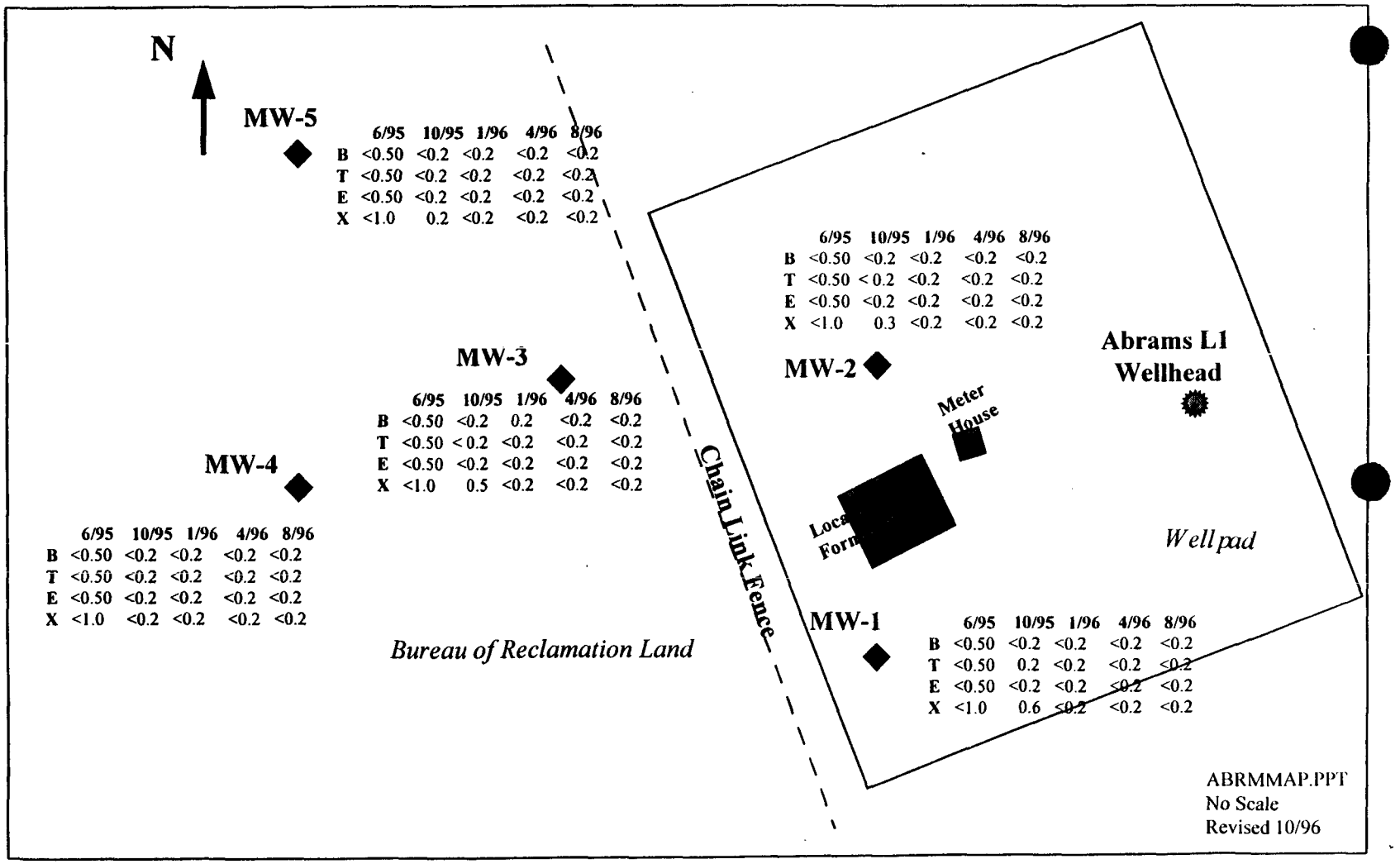


Figure 3. Abrams Gas/Com 1 Well Site

Well Locations & Analytical Results

(Concentrations in ppb)



OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	22-Aug-96
Company:	*PNM Gas Services*	*COC No.:*	*4979*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*11844*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Abrams Gas/Com L1***				
Project Location:	***9608211000; MW-1***				
Sampled by:	MG	Date:	21-Aug-96	Time:	10:00
Analyzed by:	DC	Date:	21-Aug-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: JC4
Date: 8/22/96

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	22-Aug-96
Company:	*PNM Gas Services*	*COC No.:*	*4979*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*11845*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Abrams Gas/Corn L1***				
Project Location:	***9608211030; MW-2***				
Sampled by:	MG	Date:	21-Aug-96	Time:	10:30
Analyzed by:	DC	Date:	21-Aug-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: JC4

Date: 8/22/96

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	22-Aug-96
Company:	*PNM Gas Services*	*COC No.:*	*4979*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*11846*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Abrams Gas/Com L1***				
Project Location:	***9608211100; MW-3***				
Sampled by:	MG	Date:	21-Aug-96	Time:	11:00
Analyzed by:	DC	Date:	21-Aug-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: JaC
Date: 8/22/96

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	22-Aug-96
Company:	*PNM Gas Services*	*COC No.:*	*4979*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*11847*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Abrams Gas/Com L1***				
Project Location:	***9608211130; MW-4***				
Sampled by:	MG	Date:	21-Aug-96	Time:	11:30
Analyzed by:	DC	Date:	21-Aug-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: DaG
Date: 8/22/96

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	22-Aug-96
Company:	*PNM Gas Services*	*COC No.:*	*4979*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*11848*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Abrams Gas/Com L1***				
Project Location:	***9608211200; MW-5***				
Sampled by:	MG	Date:	21-Aug-96	Time:	12:00
Analyzed by:	DC	Date:	21-Aug-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: DaG

Date: 8/22/96

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	22-Aug-96
Company:	*PNM Gas Services*	*COC No.:*	*4979*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*11849*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Abrams Gas/Com L1***				
Project Location:	***9608211230; MW-6***				
Sampled by:	MG	Date:	21-Aug-96	Time:	12:30
Analyzed by:	DC	Date:	21-Aug-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: JaG
Date: 8/22/96

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

QUALITY ASSURANCE REPORT

for EPA Method 8020

Date Analyzed: 21-Aug-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	20.0	0	15%
Toluene	ppb	20.0	22.4	12	15%
Ethylbenzene	ppb	20.0	21.5	7	15%
m,p-Xylene	ppb	40.0	42.3	6	15%
o-Xylene	ppb	20.0	21.5	7	15%

Matrix Spike

Parameter	*1- Percent Recovered*	*2 - Percent Recovered*	*Limit*	*%RSD*	*Limit*
Benzene	115	91	(39-150)	16	20%
Toluene	119	94	(46-148)	17	20%
Ethylbenzene	122	96	(32-160)	17	20%
m,p-Xylene	117	92	(35-145)	17	20%
o-Xylene	115	91	(35-145)	16	20%

Surrogate Recoveries

Laboratory Identification	*S1 Percent Recovered*	*S2 Percent Recovered*
Limit Percent Recovered	(70-130)	
11844-4979	102	
11845-4979	100	
11846-4979	100	
11847-4979	100	
11848-4979	100	
11849-4979	100	

S1: Flourobenzene

CHAIN OF CUSTODY RECORD

4979

ON SITE TECHNOLOGIES, LTD.

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

Date: 8/21/96

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: ABRAMS GAS/COAL L1

Sampler: MGannon

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION		SAMPLE DATE	SAMPLE TIME	MATRIX	PRES.	Number of Containers	BTEX 8020	LAB ID
960821 1000	MW-1			H_2O	Hcl	2	X	11844-4979
960821 1030	MW-2					2	X	11845
960821 1100	MW-3					2	X	11846
960821 1130	MW-4					2	X	11847
960821 1200	MW-5					2	X	11848
960821 1230	MW-6			H_2O	Hcl	2	X	11849

Relinquished by: Maureen Gannon	Date/Time 08/21/96 1432	Received by:	Date/Time 8/21/96 1432
Relinquished by:	Date/Time	Received by:	Date/Time
Relinquished by:	Date/Time	Received by:	Date/Time

Method of Shipment:

Authorized by: Maureen Gannon (Client Signature Must Accompany Request) Date 08/21/96

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

GCL
Environmental Science and Engineering
A BDM International Company

505 Marquette NW, Ste. 1100 • Albuquerque, NM 87102
(505) 842-0001 • FAX: (505) 842-0595

OIL CONSERVATION DIVISION
RECEIVED
95 JUN 19 AM 8 52

June 16, 1995

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

RE: ABRAMS GAS/COM L1 GROUNDWATER MONITOR WELL INSTALLATION

Dear Mr. Olson:

On behalf of Public Service Company of New Mexico/Gas Company of New Mexico (PNM/GCNM), GCL will conduct drilling and groundwater monitor well installation at the above-referenced site starting Tuesday, June 20, 1995. The field work is expected to continue through Friday, June 23, 1995. As stated in a letter from GCL to the OCD dated May 17, 1995, the investigatory report along with results of the groundwater sampling will be submitted to the OCD by July 31, 1995.

If you have any questions regarding the contents of this letter, please call Denver Bearden at (505) 632-4131 or me at (505) 842-0001.

Sincerely,
Geoscience Consultants, Ltd. (GCL)

Maureen D. Gannon

Maureen D. Gannon
Senior Engineer

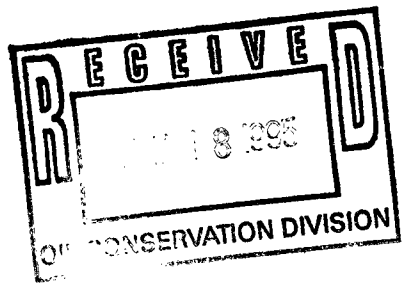
MDG/3078/OLSON03.LTR

cc: D. Bearden, GCNM-Bloomfield
D. Faust, OCD-Aztec
T. Ristau, PNM-Albuquerque

GCL
Environmental Science and Engineering
A BDM International Company

505 Marquette NW, Ste. 1100 • Albuquerque, NM 87102
(505) 842-0001 • FAX: (505) 842-0595

May 17, 1995



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

RE: ABRAMS GAS/COM L1 GROUNDWATER INVESTIGATION WORK PLAN

Dear Mr. Olson:

On behalf of Public Service Company of New Mexico/Gas Company of New Mexico (PNM/GCNM), GCL is requesting an extension of the reporting deadline associated with implementation of the above-referenced work plan. OCD approved the Abrams Gas/Com L1 Groundwater Investigation Work Plan in a letter to Mr. Denver Bearden, GCNM, dated February 20, 1995. In the letter, the first condition of approval requires GCNM to submit a report on the investigation to the OCD by June 2, 1995. As we discussed in our phone conversation on Tuesday, May 16, 1995, GCNM anticipates that the installation of the monitoring wells will not take place until the first half of June 1995 due to pending approval for right-of-way access from the Bureau of Reclamation. Based upon this tentative schedule, results of the groundwater sampling should be available by July 15 and provided to OCD along with a report on the investigation by July 31, 1995. All other conditions of approval will be met by GCNM as written in the February 20, 1995 letter.

If you have any questions regarding the contents of this letter, please call Denver Bearden at (505) 632-4131 or me at (505) 842-0001. We will contact you as soon as we have a definitive date scheduled for the monitoring well installation.

Sincerely,
Geoscience Consultants, Ltd. (GCL)

Maureen D. Gannon
Senior Engineer

MDG/3078/OLSON01.LTR

cc: D. Bearden, GCNM-Bloomfield
D. Faust, OCD-Aztec
T. Ristau, PNM-Albuquerque

GAS COMPANY OF NEW MEXICO

February 9, 1995

Mr. Bill Olson
Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87504

Dear Mr. Olson:

Gas Company of New Mexico (GCNM) is pleased to submit the Work Plan for Monitoring Well Installation at the Abrams Gas/Com L1 well sit located near Bloomfield, New Mexico. Soil remediation is complete at the site. The work plan proposes the installation of five monitoring wells and a schedule for compliance monitoring to determine if any impact of groundwater has occurred at the site.

Please contact me if you have any questions. We await your response prior to implementation of the work plan.

Sincerely,

Denver Bearden
Administrator III

DB:rm
Enclosure

cc: Denny Faust, OCD-Aztec
Maureen Gannon, GCL
John Hale, PNM
Toni Ristau, PNM

Gas Company of New Mexico
Work Plan for Monitoring Well Installation at the Abrams Gas/Com L1

January 31, 1995

Prepared for:

PUBLIC SERVICE COMPANY OF NEW MEXICO/
GAS COMPANY OF NEW MEXICO
Mr. Denver Beardan
Gas Company of New Mexico
Kutz Canyon Plant
P.O. Box 1899
Bloomfield, New Mexico 87413

Prepared by:

GEOSCIENCE CONSULTANTS, LTD.
ALBUQUERQUE OFFICE
505 Marquette Avenue, NW
Suite 1100
Albuquerque, New Mexico 87102
(505) 842-0001
FAX (505) 842-0595

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Appendix

1.0 Introduction

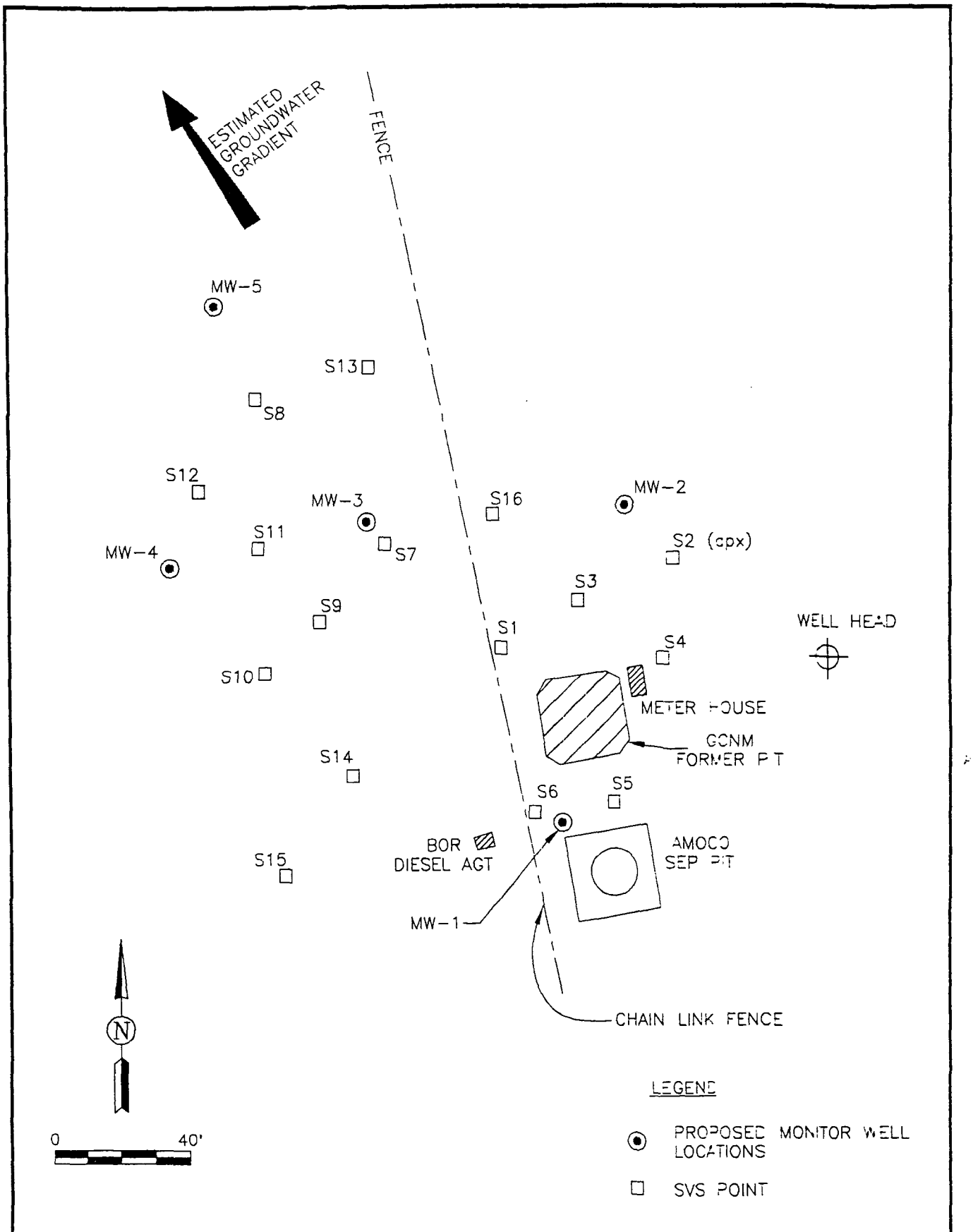
Public Service Company of New Mexico and Gas Company of New Mexico (PNM/GCNM) have completed an initial site investigation of an unlined earthen pit associated with a separator unit at the Abrams Gas/Com L1 well site near Bloomfield, New Mexico. PNM/GCNM propose to install monitoring wells and perform compliance monitoring of groundwater at the site. Furthermore, PNM/GCNM has completed the excavation of contaminated soil within the unlined earthen separator pit. This work plan addresses the installation of monitoring wells upgradient and downgradient of this pit and establishes a compliance monitoring schedule for these wells. Soil remediation activities are also included in this plan.

2.0 Description of Recent Site Activities

PNM/GCNM began soil excavation at the Abrams Gas/Com L1 on October 5, 1994. Using a trackhoe, approximately 300 cubic yards of soil were removed. Excavation activities ceased when groundwater was encountered at 17 feet. A fence was erected around the site, and the excavated soil was removed to an on-site landfarm. A groundwater sample taken from the bottom of the pit approximately one month after excavation ceased revealed a total benzene, toluene, ethylbenzene, and xylenes (BTEX) concentration of 473 micrograms per liter (µg/L). Appendix A provides a copy of the analytical results (Analytica, 11/02/94).

Figure 1 shows the location of the separator pit in relationship to a nearby Amoco separator pit. The Amoco pit is approximately 20 feet south of the GCNM pit. A soil boring was drilled upgradient of GCNM's pit and downgradient of Amoco's pit. The boring was located approximately 2 feet north of Amoco's fenced pit. Saturated soil was encountered at 13.5 feet, and groundwater was reached at approximately 17 feet. Results of a water sample taken from the borehole indicated that the BTEX concentration was below New Mexico Water Quality Control Commission (WQCC) standards (Appendix A, Analytica, 12/01/94).

In November 1994, On Site Technologies was contracted to perform a soil-vapor survey to assist with delineation of soil and potential groundwater contamination at the site. A scope of work and the results of the soil-vapor survey are included as Appendix B. Sixteen testholes were extended to depths of 15 to 17 feet below ground surface. Soil vapors were extracted by evacuating a Teflon tube. These



GCL	CLIENT: PNM/GCNM	
	DATE: 1/10/95	REV. NO.: 0
	AUTHOR: M.D.G.	DRAWN BY: M.P.
	CK'D BY: M.D.G.	FILE:ABRAMS1.DWG

FIGURE 1
PROPOSED MONITOR WELL LOCATIONS
ABRAMS GAS/COM L1

samples were qualitatively analyzed with an organic vapor meter (OVM) and a photoionization detector (PID).

Sheet 1 of Attachment B presents the analytical results of the soil-vapor survey. The highest recorded hydrocarbon vapor concentration was 18 parts per million (ppm) at two separate locations situated approximately 30 and 80 feet, respectively, from the GCNM pit in the northwest direction. The soil contamination appears to trend parallel to the suspected groundwater gradient.

Soil excavation resumed in December 1994 at the GCNM pit. An additional 300 cubic yards of grossly contaminated soil was removed and stored on site until all soil was transported to an approved landfarm for final disposal. Soil samples were taken from the bottom and sides of the excavated pit for laboratory analysis of total petroleum hydrocarbons (TPH) and BTEX. Table 1 provides the sampling results during the second phase of excavation. TPH and BTEX concentrations in soil collected from the bottom of the excavated pit at 20 feet were determined to be below the Oil Conservation Division's (OCD's) recommended soil remediation level of 100 ppm TPH for the original vulnerable area (OCD, "Unlined Surface Impoundment Closure Guidelines," February 1993). TPH levels in the west and northwest corners of the excavated pit remained above OCD's recommended soil remediation level. Refer to Appendix A for a hard copy of these analytical results.

BTEX concentrations in groundwater samples taken from the pit during the second phase of excavation were below WQCC standards (refer to Table 1). BTEX was detected at 0.121 ppm in a sample collected on November 29, 1994. Another groundwater sample, collected on November 30, provided a BTEX concentration of 0.310 ppm. Appendix A includes a hard copy of the analytical results. After this sampling event, the excavated pit was physically closed. Twenty yards of Navajo Agricultural Products Industry (NAPI) fertilizer was spread in the northwest and west corners of the pit where higher levels of TPH/BTEX were found in soil at a depth of approximately 18 feet and 19 feet. Clean soil was imported and used as backfill material. PNM/GCNM believe that TPH/BTEX source removal is complete at this site.

3.0 Monitoring Well Installation

A total of five monitoring wells are proposed for this site in order to determine if and to what extent groundwater contamination exists. Their locations have been selected based on the soil-vapor results. Figure 1 provides a site map with the

Table 1

Abrams Gas/Com L1 Second Phase Excavation Sampling Results

Soil Sampling Results

Sample ID#	Date Sampled	Laboratory	Description/Depth	TPH (mg/kg)
AB-1-SW-19'	11/29/94	Analytica	Pit Bottom @ 19'	49.5
AB-2-EX W-19'	12/01/94	On Site	Pit Bottom @ 19' (West Wall)	1838
AB-2-EX-B W-20'	12/01/94	On Site	Pit Bottom @ 20'	15
AB-1-EX NW-18'	12/01/94	On Site	Pit Bottom @ 18' (Northwest Wall)	745

Groundwater Sampling Results

Sample ID#	Date Sampled	Laboratory	Description/Depth	BTEX (ppm)
AB-1-GW-20'	11/29/94	Analytica	Water from pit bottom @ 20'	0.121
AB-1	11/30/94	On Site	Water from pit bottom @ 20'	0.310

3078/ABRSAMP.TBL

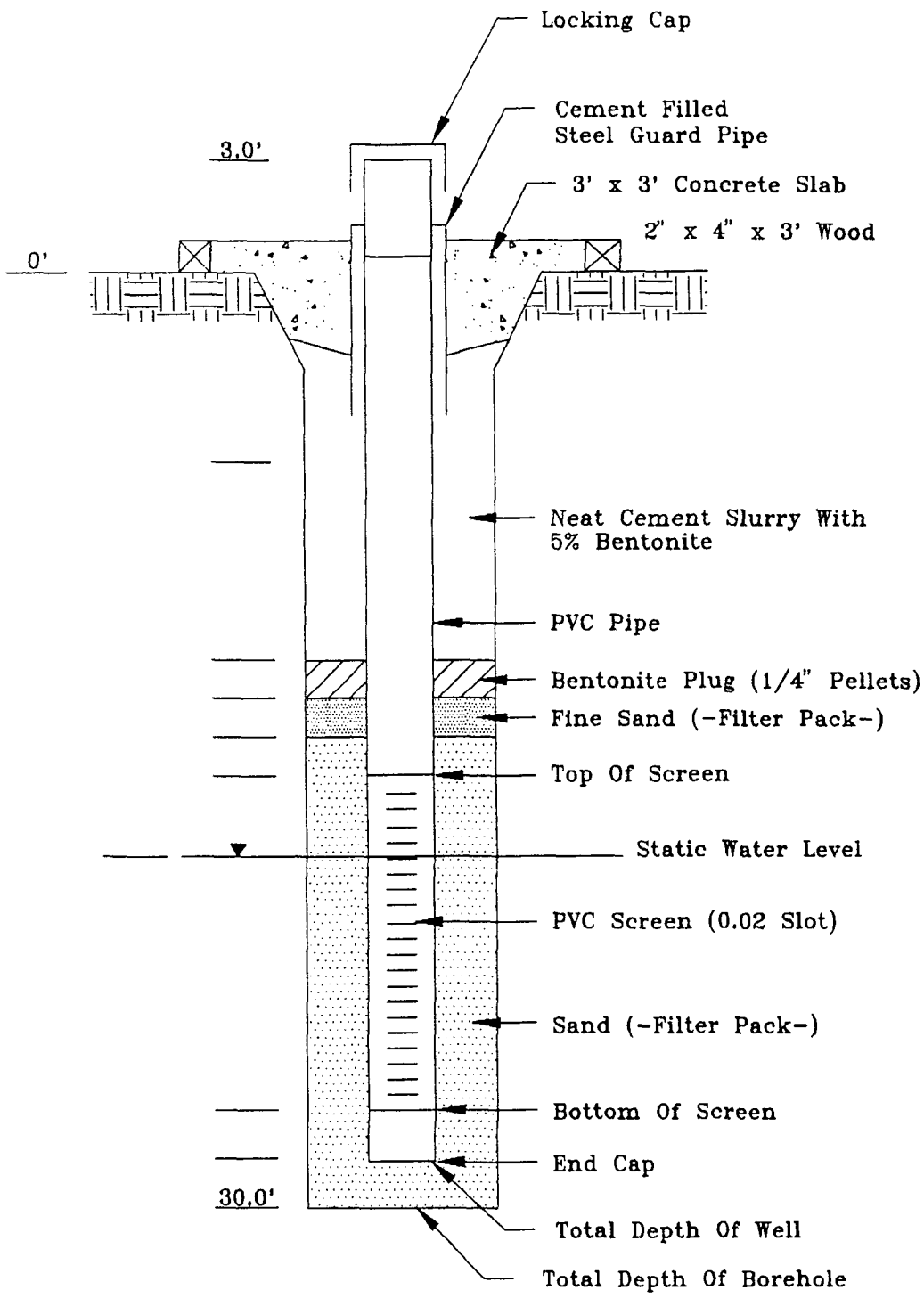
selected locations for well installation. A physical description of each location is provided below:

- MW-1: Adjacent to Testhole S6
- MW-2: Northeast of the delineated soil-vapor plume near Testhole S2
- MW-3: Slightly downgradient of Testhole S7
- MW-4: Northwest of the delineated soil-vapor plume near Testhole S12
- MW-5: Outer edge of the delineated soil-vapor plume parallel to the groundwater gradient and northeast of Testholes S8 and S13

Figure 2 provides details of the monitoring well design for the site. Installation of the monitoring wells will be performed using a hollow-stem auger drilling rig. Total depth of the shallow monitoring wells is anticipated to be approximately 25 to 30 feet below surface grade. This is dependent on the depth to the static water table in the alluvium water-bearing zone. Samples of the drill cuttings will be collected by the driller at 5-foot intervals and placed in an area designated by the on-site geologist. The on-site geologist will log the lithology using standard log forms and format.

The well casing for the shallow monitoring wells shall consist of 2-inch diameter, flush joint, schedule 40 polyvinyl chloride (PVC) pipe, precleaned and prepackaged by the manufacturer. The casing will be installed by connecting individual sections while they are lowered into the borehole through the hollow center of the auger column. Knock-out plugs may be used on the lead auger to prevent undue invasion of formational sand into the auger. Approximately 10 to 15 feet of well casing is anticipated for each of the shallow monitoring wells, depending on the static water elevation of the alluvial water-bearing zone and anticipated fluctuation in groundwater level during one year. The well screen shall consist of 2-inch, 0.020-inch slot PVC. A 15-foot well screen will be placed such that the complete saturated zone is screened with an additional 5 feet of screen above the air/water interface.

After the well casing and screen have been installed, the auger flights will be retrieved in 5-foot intervals. Precleaned and prepackaged 8/16 or 10/20 silica sand will be poured down the auger annulus to fill the void left as each 5-foot flight is removed. This sand, combined with a small volume of formational sand that may slough into the borehole during retraction of the auger column, will provide the filter pack for the well screen. The sand will be placed to a level of 2- to 3-feet



GCL

CLIENT: PNM/GCNM	
DATE: 1/12/95	REV. NO.: 0
AUTHOR: M.D.G.	DRAWN BY: M.P.
CK'D BY: M.D.G.	FILE:ABRAMS2.DWG

FIGURE 2
MONITOR WELL DESIGN
ABRAM GAS/COM L1

above the top of the well screen. A 2- to 3-foot bentonite pellet seal will be placed on top of the filter pack to form an impervious barrier and prevent downward migration of moisture through the wellbore. The bentonite layer shall be hydrated with 2 to 5 gallons of distilled water. The remainder of the well annulus up to the ground surface will be grouted using a portland cement slurry mixed with 5 percent bentonite. The grout will be inserted from the surface after all remaining auger flights have been removed. A cement seal around the top of the well, measuring at least 3 feet by 3 feet, will be installed. A short section of metal casing will be installed around the top of the PVC pipe and extended 3 to 5 feet into the ground. Each well casing will be fitted with a PVC screw-type locking cap. The top of all monitoring well casings will have a locked well seal installed.

Well water will be bailed from the well to remove gross amounts of clay and silt. Bailing will also be served as a verification of proper well alignment. The wells will be determined to be fully developed when the indicator parameters of pH, temperature, and electrical conductance of water sampled from the well have stabilized over three consecutive measurements. Stability of parameters will be allowed to vary ± 50 μmhos for the conductivity and ± 1°C for the temperature. Wells that do not stabilize within a reasonable amount of development (within three times the casing volume of water within each well) will be examined on a case-by-case basis. A complete record of well installation and development will be recorded by the on-site geologist in the field notebook. All produced water and drill cuttings will be disposed of on site to grade.

4.0 Proposed Compliance Monitoring Schedule

After completion and development of each monitoring well, groundwater sampling will be conducted. All sampling will be conducted in accordance with Environmental Protection Agency (EPA) protocol and follow strict chain-of-custody procedures. A new, prepackaged 1-inch diameter disposable polyethylene bailer will be designated for each well to prevent cross-contamination between wells during sampling. A total of three well casing volumes of water will be withdrawn, and the pH, conductivity, and temperature will be measured periodically until these parameters stabilize. All purged water from the wells will be disposed of on site to grade.

The following compliance monitoring schedule is proposed:

First Sampling Event (following development of wells)

Parameters:

- EPA Method 8020 (BTEX)
- Major Cations/Anions (various EPA or standard methods)
- EPA Method 610 (polynuclear aromatic hydrocarbons or [PAHs])
- WQCC Metals: arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury (inductively coupled plasma [ICP] for heavy metals, atomic absorption spectroscopy [AAS] for mercury and selenium)

Subsequent Sampling: Quarterly

Parameters:

- EPA Method 8020 (BTEX)

5.0 Groundwater Monitoring Strategy

Based on the groundwater sampling results obtained to date, there is no current evidence of groundwater contamination at Abrams Gas/Com L1. As discussed in Section 4.0, quarterly monitoring for BTEX is proposed in order to demonstrate that BTEX contamination is groundwater does not exist at the site or is below WQCC standards. In the event that sampling does provide indication of groundwater contamination, the site will be reassessed and a remediation strategy will be proposed to the OCD.

Appendix A

Analytical Results of Soil and Groundwater Sampling
at the Abrams Gas/Com L1 Site

ANALYTICA
ENVIRONMENTAL LABORATORY

PURGEABLE AROMATICS

Gas Company of New Mexico

Project ID:	Abrams L1	Report Date:	11/02/94
Sample ID:	Sample #1	Date Sampled:	11/01/94
Lab ID:	0300	Date Received:	11/01/94
Sample Matrix:	Water	Date Analyzed:	11/01/94
Preservative:	Cool		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	10.0
Toluene	56.4	10.0
Ethylbenzene	34.9	10.0
m,p-Xylenes	314	20.0
o-Xylene	67.7	10.0

Total BTEX	473

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	92	88 - 110%
Bromofluorobenzene	88	86 - 115%

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: MB34639

Report Date: 11/02/94
Date Analyzed: 11/01/94

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

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	96	88 - 110%
Bromofluorobenzene	86	86 - 115%

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

Comments:

Analyst

Reviewer

Purgeable Aromatics

Duplicate Analysis

Lab ID:	300Dup	Report Date:	11/02/94
Sample Matrix:	Water	Date Sampled:	11/01/94
Preservative:	Cool	Date Received:	11/01/94
Condition:	Intact	Date Analyzed:	11/01/94

Target Analyte	Original Conc. (ug/L)	Duplicate Conc. (ug/L)	Acceptance Range (ug/L)
Benzene	ND	ND	NA
Toluene	56.4	54.7	44.6 - 66.5
Ethylbenzene	34.9	33.7	21.7 - 46.9
m,p-Xylenes	314	305	NE
o-Xylene	67.7	65.6	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.

	Surrogate	Percent Recovery	Acceptance Limits
Quality Control:	Trifluorotoluene	92	88 - 110%
	Bromofluorobenzene	87	86 - 115%

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

Comments:

Analyst

Review

Purgeable Aromatics

Matrix Spike Analysis

Lab ID:	MB34639Spk	Report Date:	11/02/94
Sample Matrix:	Water	Date Sampled:	NA
Preservative:	NA	Date Received:	NA
Condition:	NA	Date Analyzed:	11/01/94

Target Analyte	Spike Added (ug/L)	Original Conc. (ug/L)	Spiked Sample Conc. (ug/L)	% Recovery	Acceptance Limits(%)
Benzene	10	ND	9.79	98%	39 -150
Toluene	10	ND	9.80	97%	46 - 148
Ethylbenzene	10	ND	9.60	96%	32 - 160
m,p-Xylenes	20	ND	19.2	96%	NE
o-Xylene	10	ND	9.34	93%	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	Percent Recovery	Acceptance Limits
Trifluorotoluene	91	88 - 110%
Bromofluorobenzene	91	86 - 115%

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

Comments:

Analyst

Review

ANALYTICA
ENVIRONMENTAL LABORATORY

PURGEABLE AROMATICS

Gas Company of New Mexico

Project ID:	Abrams	Report Date:	12/01/94
Sample ID:	AB - 1 - GW - 20'	Date Sampled:	11/29/94
Lab ID:	0469	Date Received:	11/29/94
Sample Matrix:	Water	Date Analyzed:	11/30/94
Preservative:	Cool		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	1.89	1.00
Toluene	13.5	10.0
Ethylbenzene	6.16	1.00
m,p-Xylenes	77.1	20.0
o-Xylene	24.2	10.0

Total BTEX	121

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	96	88 - 110%
Bromofluorobenzene	92	86 - 115%

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

Comments:

Analyst

Review

ANALYTICA
ENVIRONMENTAL LABORATORY

TOTAL PETROLEUM HYDROCARBONS

EPA Method 418.1

Gas Company of New Mexico

Project ID:	Abrams	Report Date:	12/01/94
Sample Matrix:	Soil	Date Sampled:	11/29/94
Preservative:	Cool	Date Received:	11/29/94
Condition:	Intact	Date Extracted:	12/01/94
		Date Analyzed:	12/01/94

Sample ID	Lab ID	Concentration (mg/kg)	Detection Limit (mg/kg)
AB - 1 - SW - 19'	0468	49.5	23.9

ND- Analyte not detected at the stated detection limit.

Reference: Method 3550 - Sonication Extraction; Test Methods for Evaluating Solid Waste, SW-846, United States Environmental Protection Agency, September, 1986; Method 418.1 - Petroleum Hydrocarbons, Total Recoverable; Chemical Analysis of Water and Waste, United States Environmental Protection Agency, 1978.

Comments:

Analyst

Review

Purgeable Aromatics

Matrix Spike Analysis

Lab ID:	466Spk	Report Date:	12/01/94
Sample Matrix:	Water	Date Sampled:	11/25/94
Preservative:	Cool	Date Received:	11/25/94
Condition:	Intact	Date Analyzed:	11/30/94

Target Analyte	Spike Added (ug/L)	Original Conc. (ug/L)	Spiked Sample Conc. (ug/L)	% Recovery	Acceptance Limits (%)
Benzene	10	ND	10.7	107%	39 -150
Toluene	10	ND	10.6	106%	46 - 148
Ethylbenzene	10	ND	10.8	108%	32 - 160
m,p-Xylenes	20	ND	20.2	100%	NE
o-Xylene	10	ND	9.85	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	Percent Recovery	Acceptance Limits
Trifluorotoluene	102	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

Quality Control Report

Method Blank Analysis

Sample Matrix: Water
Lab ID: MB34668

Report Date: 12/01/94
Date Analyzed: 11/30/94

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

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	103	88 - 110%
Bromofluorobenzene	93	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:	469Dup	Report Date:	12/01/94
Sample Matrix:	Water	Date Sampled:	11/29/94
Preservative:	Cool	Date Received:	11/29/94
Condition:	Intact	Date Analyzed:	11/30/94

Target Analyte	Original Conc. (ug/L)	Duplicate Conc. (ug/L)	Acceptance Range (ug/L)
Benzene	1.89	1.63	0.26 - 3.26
Toluene	13.5	14.0	10.3 - 17.2
Ethylbenzene	6.16	3.43	2.24 - 7.34
m,p-Xylenes	77.1	74.3	NE
o-Xylene	24.2	22.8	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.

	Surrogate	Percent Recovery	Acceptance Limits
Quality Control:	Trifluorotoluene	93	88 - 110%
	Bromofluorobenzene	94	86 - 115%

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

Comments:

Analyst

Review

Quality Control Report
TOTAL PETROLEUM HYDROCARBONS
EPA Method 418.1

Method Blank Analysis

Project ID:	Abrams	Report Date:	12/01/94
Sample Matrix:	Soil	Date Extracted:	12/01/94
		Date Analyzed:	12/01/94

Lab ID	Concentration (mg/kg)	Detection Limit (mg/kg)
MB34669	ND	5.00

ND- Analyte not detected at the stated detection limit.

Reference: Method 3550 - Sonication Extraction; Test Methods for Evaluating Solid Waste, SW-846, United States Environmental Protection Agency, September, 1986; Method 418.1 - Petroleum Hydrocarbons. Total Recoverable; Chemical Analysis of Water and Waste, United States Environmental Protection Agency, 1978.

Comments:

Analyst

Review

Quality Control Report
TOTAL PETROLEUM HYDROCARBONS
EPA Method 418.1

Matrix Spike Analysis

Project ID:	Abrams	Report Date:	12/01/94
Sample Matrix:	Soil	Date Extracted:	12/01/94
		Date Analyzed:	12/01/94

Lab ID	Spiked Sample Conc. (mg/kg)	Unspiked Sample Conc. (mg/kg)	Spike Added (mg/kg)	Percent Recovery
MBSPK34669	47.8	ND	50.0	96%

ND- Analyte not detected at the stated detection limit.

Reference: Method 3550 - Sonication Extraction; Test Methods for Evaluating Solid Waste, SW-846, United States Environmental Protection Agency, September, 1986; Method 418.1 - Petroleum Hydrocarbons, Total Recoverable; Chemical Analysis of Water and Waste, United States Environmental Protection Agency, 1978.

Comments:

Analyst

Review

Quality Control Report
TOTAL PETROLEUM HYDROCARBONS
EPA Method 418.1

Matrix Spike Duplicate Analysis

Project ID:	Abrams	Report Date:	12/01/94
Sample Matrix:	Soil	Date Extracted:	12/01/94
		Date Analyzed:	12/01/94

Lab ID	Spiked Duplicate Conc. (mg/kg)	Spiked Sample Conc. (mg/kg)	Percent Difference	Acceptance Limit
MBSPKDP34669	47.1	47.8	2%	20%

ND- Analyte not detected at the stated detection limit.

Reference: Method 3550 - Sonication Extraction; Test Methods for Evaluating Solid Waste, SW-846, United States Environmental Protection Agency, September. 1986: Method 418.1 - Petroleum Hydrocarbons, Total Recoverable; Chemical Analysis of Water and Waste, United States Environmental Protection Agency, 1978.

Comments:

Analyst

Review

OFF: (505) 325-8786

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-5667

TOTAL PETROLEUM HYDROCARBONS

Attn:	*Denver Bearden*	Date:	12/1/94
Company:	*Gas Company of New Mexico*	*Lab ID:*	*2536*
Address:	*P.O. Box 1899*	*Sample No.*	*4184*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1121*

Project Name:	***Abrams Gas Com L1***				
Project Location:	***AB-2-EX-B W-20'***				
Sampled by:	DB	Date:	12/1/94	Time:	11:00
Analyzed by:	DC	Date:	12/1/94		
Type of Sample:	*Soil*				

Laboratory Analysis

Laboratory Identification	***Sample Identification***	***Total Petroleum Hydrocarbons***
4184-2536	*Abrams Gas Com L1* ***AB-2-EX-B W-20'***	15 *mg/kg*

Method - *EPA Method 418.1 Total Petroleum Hydrocarbons*

Approved by:
Date: 12/1/94

OFF: (505) 325-8786

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-5667

TOTAL PETROLEUM HYDROCARBONS

Attn:	*Denver Bearden*	Date:	12/1/94
Company:	*Gas Company of New Mexico*	*Lab ID:*	*2536*
Address:	*P.O. Box 1899*	*Sample No.*	*4183*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1121*

Project Name:	***Abrams Gas Com L1***				
Project Location:	***AB-2-EX W-19'***				
Sampled by:	DB	Date:	12/1/94	Time:	11:00
Analyzed by:	DC	Date:	12/1/94		
Type of Sample:	*Soil*				

Laboratory Analysis

Laboratory Identification	***Sample Identification***	***Total Petroleum Hydrocarbons***
4183-2536	*Abrams Gas Com L1* ***AB-2-EX W-19'***	1,838 *mg/kg*

Method - *EPA Method 418.1 Total Petroleum Hydrocarbons*

Approved by:
Date: 12/1/94

OFF: (505) 325-8786

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-5667

TOTAL PETROLEUM HYDROCARBONS

Attn:	*Denver Bearden*	Date:	12/1/94
Company:	*Gas Company of New Mexico*	*Lab ID:*	*2536*
Address:	*P.O. Box 1899*	*Sample No.*	*4182*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1121*

Project Name:	***Abrams Gas Com L1***				
Project Location:	***AB-1-EX NW-18'***				
Sampled by:	DB	Date:	12/1/94	Time:	11:00
Analyzed by:	DC	Date:	12/1/94		
Type of Sample:	*Soil*				

Laboratory Analysis

Laboratory Identification	***Sample Identification***	***Total Petroleum Hydrocarbons***
4182-2536	*Abrams Gas Com L1* ***AB-1-EX NW-18'***	*745 mg/kg*

Method - *EPA Method 418.1 Total Petroleum Hydrocarbons*

Approved by: Da Ly
Date: 12/1/94

OFF: (505) 325-8786

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-5667

AROMATIC VOLATILE ORGANICS

Attn:	*Denver Bearden*	Date:	12/1/94
Company:	*Gas Company of New Mexico*	*Lab ID:*	*2536*
Address:	*P.O. Box 1899*	*Sample ID:*	*4181*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1121*

Project Name:	***Abrams Gas Com L1***				
Project Location:	***AB-1***				
Sampled by:	DB	Date:	11/30/94	Time:	14:20
Analyzed by:	DLA	Date:	12/1/94		
Sample Matrix:	*Water*				

Aromatic Volatile Organics

Component	***Measured Concentration ug/L***	***Detection Limit Concentration ug/L***
Benzene	8.3	*0.2*
Toluene	17.5	*0.2*
Ethylbenzene	13.2	*0.2*
m,p-Xylene	216.9	*0.2*
o-Xylene	54.1	*0.2*
	TOTAL 310.0 ug/L	

ND - Not Detectable

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

Approved by:
Date: 12/1/94

Appendix B

Soil-Vapor Survey Results

RECEIVED DEC 0 6 1994

ON SITE TECHNOLOGIES, LTD.

December 5, 1994

Ms. Maureen Gannon
GCL
505 Marquette Ave., NW., Suite 1100
Albuquerque, NM 87102

RE: SOIL VAPOR SURVEY
ABRAMS GC L#1
GAS COMPANY OF NM DEHY PIT

PROJECT: 4-1149

The following summarizes the results of a Soil Vapor Survey (SVS) conducted by On Site Technologies, Ltd. for GCL at the referenced Amoco Production Company well location. The goal of the SVS was to assist GCL with delineation of soil and groundwater contamination from an unlined dehydrator pit operated by Gas Company of New Mexico.

PROJECT BRIEF:

GCL is attempting to delineate a hydrocarbon plume from an unlined dehydrator pit located on the referenced gas well location, east of Bloomfield, New Mexico. The dehydrator was operated by the Gas Company of New Mexico. Saturated soil contamination had been established to 13.5 feet below the ground surface. Soils at the site were sands and silty sands. The released hydrocarbons were relatively volatile, and a soil vapor survey (SVS) was believed to be a timely and cost effective method for delineation.

Prior to this SVS, the heavily contaminated soils in the immediate area of the former dehydrator pit had been excavated to approximately 17 feet. An Amoco separator pit, located twenty feet south of the dehydrator pit, reportedly had been closed by excavation several years prior to the current SVS and dehydrator pit remediation.

In 1986-1987, a preliminary site assessment indicated groundwater was 15 to 17 feet below the ground surface, contaminated above regulatory levels for hydrocarbons, and had a gradient to the west-northwest .

SCOPE OF WORK:

On Site's scope of services for the SVS included the following:

1) Drilling and vapor sampling 16 soil vapor test holes. Test holes drilled using a hydraulic punch hammer equipped with a 5/8" steel drive pipe and retractable vapor bit.

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2) Measurement of soil vapors using an organic vapor meter equipped with a PID (10.6 eV lamp).

3) Plane engineering survey for elevations, site coordinates and rough site details.

4) Preparation of a brief summary with a site diagram detailing SVS data and recommended groundwater monitor well locations.

SOIL VAPOR SURVEY:

The SVS was conducted by Michael K. Lane and Jon Little of On Site on November 16 and 17, 1994. Ms. Maureen Gannon of GCL and Mr. Denver Bearden of GCNM were also present during the initial portion of the survey.

Sixteen test holes were punched to depths of 15 to 17 feet below the ground surface. As directed by GCL and GCNM's personnel on site, the SVS focused on the area immediately around the former dehydrator pit and in the estimated down gradient direction of groundwater. No effort was made to survey the Amoco separator pit. Locations of the SVS points are noted on the attached Survey.

Based upon the groundwater estimated depth and results of the first few test holes, soil vapors were measured at 15 and 17 feet bgs. Soil vapors were measured by advancing the drill pipe to the desired depth, opening the retractable tip, evacuating a Teflon tube connected to the tip, and measuring for volatile organic vapors using an OVM with a PID. Peak measurements were recorded in parts per million.

A Photovac MicroTIP OVM was used for this SVS. To increase sensitivity, the OVM was calibrated using Isobutylene (100 ppm) and no benzene correction was applied to the measurements.

SUMMARY OF FINDINGS:

Table 1 summarizes the results by test hole and notes the site specific coordinates and elevations. The highest recorded vapors of 18 ppm were in S1 and S7 at 12-15 feet bgs. Wet to saturated soil was observed on the vapor point tip at several of the soil vapor points indicating possible groundwater.

TABLE 1
REFERENCE COORDINATES AND
SOIL VAPOR READINGS
ABRAMS GC L#1
(11/16-17/1994)

SV PT.	COORD. X (ft)	COORD. Y (ft)	RELATIVE ELEV. (ft)	SOIL VAPOR (ppm) @ 12'	@ 15'	@ 17'
WELL	0.0	0.0	100.00			
S1	-97.6	0.2	99.54		17.7	2.4
S2	NO	READING	TAKEN	ND	ND	ND
S3	-76.8	14.1	98.83	1.2	1.2	1.6
S4	-50.2	-3.1	99.34	ND	ND	0.1
S5	-65.3	-43.7	99.42	5.0	4.6	3.6
S6	-90.6	-48.6	99.75	3.6	5.0	
S7	-133.9	30.2	99.69	18.0	6.0	8.5
S8	-174.9	71.6	99.68		1.5	1.0
S9	-153.0	8.7	99.83		7.1	4.0
S10	-169.5	-9.7	100.30		ND	ND
S11	-171.0	27.6	100.18		3.6	2.4
S12	-190.1	44.1	100.39		ND	ND
S13	NO	READING	TAKEN		1.2	0.6
S14	-143.1	-38.2	100.6		1.7	4.7
S15	-161.9	-50.2	100.39		ND	ND
S16	-103.1	38.0	99.08		0.2	0.1

NOTES:
1) Coordinates taken relative to north (Well head 0,0).
2) Reference elevation from bottom flange of well head (100.00')
3) Soil vapor of peak PID reading at depths below ground surface (bgs) noted.

CONCLUSIONS:

Based on the results of the SVS the following conclusions may be drawn:

1) Low soil vapor measurements indicate that significant soil contamination was only in the immediate area of the pit.

2) The soil and possible groundwater contamination appears to have a primary axis parallel to the estimated groundwater gradient.

3) Three to five monitor wells are needed to verify the level and extent of groundwater contamination, and gradient. Sheet 3 details suggested locations for monitor wells.

- At a minimum, it is strongly recommended that monitor wells MW1, MW2 and MW3 be installed to verify closer and to monitor the effectiveness of the recent remediation effort by excavation.
- Monitor well MW4 is recommended to differentiate the Gas Company and Amoco pits.
- Monitor well MW5 is suggested to better verify cross-gradient closure.

When using the results of any SVS, the following limitations must be considered:

1) Soil vapors measured may be lower than those measured by the NMOCD Headspace Method, as soils were not preheated, the soil matrix was not aggregated and broken up, and some samples may have been taken in water saturated soils.

2) It was assumed that the petroleum product released was extremely volatile in nature allowing a SVS to effectively define the extent of hydrocarbon contamination.

3) The OVM is a qualitative insturment which does not separately analyze the vapors measured, has a sensitivity range of 0.1 to 2000 ppm, an accuracy of $\pm$10%, and, as calibrated, a precision of $\pm$1 ppm.

4) The extent of groundwater contamination may be estimated from the SVS where there is no detectable soil vapors. However, groundwater closure standards are on the order of parts per billion, 1000 times less than the detection limit of the OVM.

LIMITATIONS & CLOSURE

The observations given in this summary are based on a visual reconnaissance of the site, information provided by GCL and Gas Company of New Mexico, subsurface conditions encountered at the soil vapor locations, and observed soil vapor measurements. This summary does not reflect subsurface variations which may exist between sampling points.

The scope of On Site's services was limited to providing field testing and information to assist GCL with the environmental assessment of hydrocarbon contamination in the area of an abandoned dehydrator pit on the referenced Amoco location. On Site's scope of services did not include, development of any possible remedial actions, or notification of regulatory agencies or responsible parties.

This summary has been prepared for the exclusive use of GCL as it pertains to the Gas Company of New Mexico's dehydrator pit on Abrams GC L#1, SW/SW (M) Section 26, T26N, R10W, NMPM, San Juan County, New Mexico. All work has been performed in accordance with generally accepted professional practices in environmental consulting.

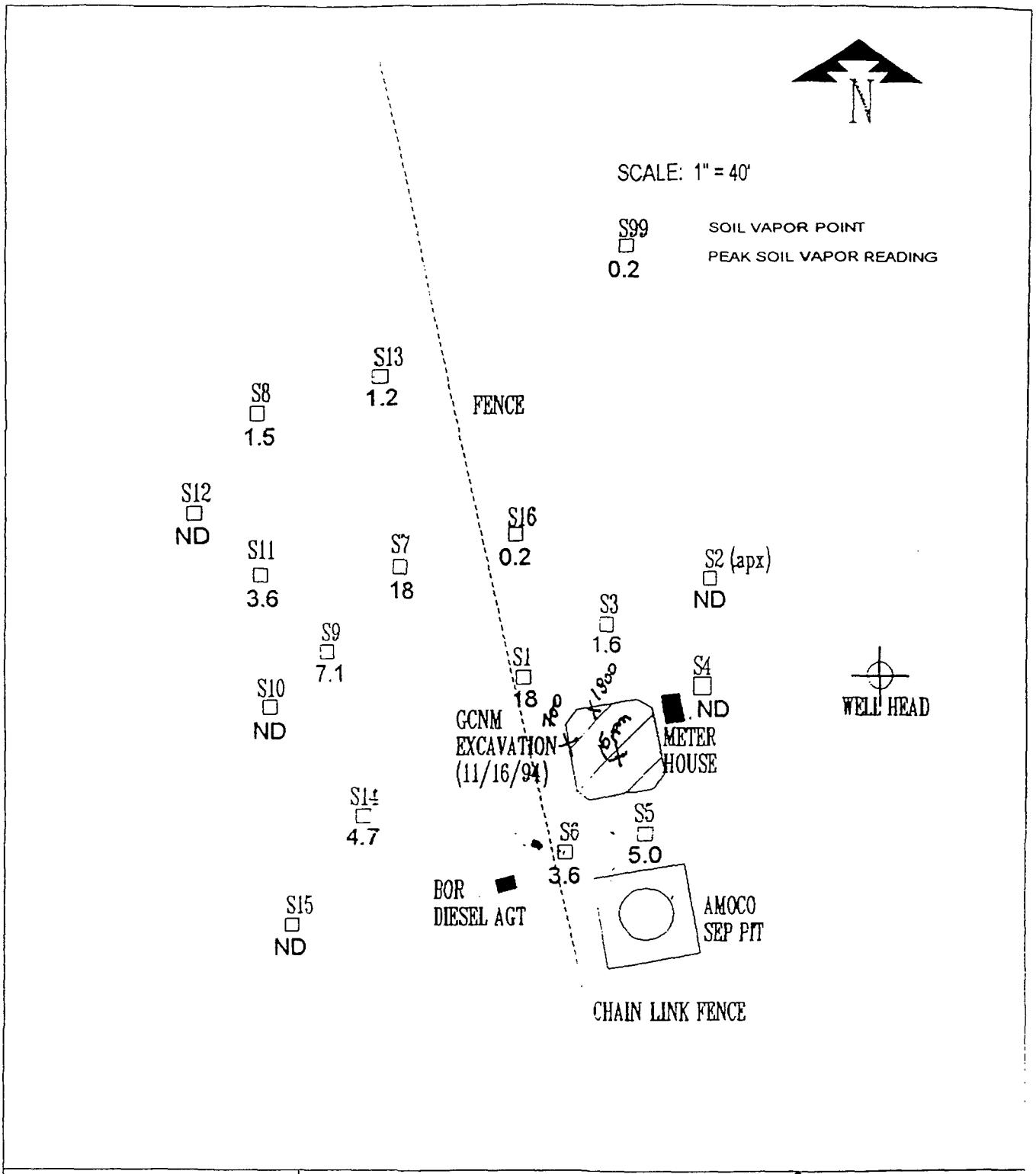
Respectfully submitted,
ON SITE TECHNOLOGIES, LTD.

Michael K. Lane, P.E.
Senior Geological Engineer

Reviewed By:

Cynthia A. Sluyter-Gray
Site Assessment Supervisor

MKL:CSG/mkl
FILE: 41149SVS.RPT



GCL ABRAMS GC L#1, (M) S 26, T29N, R10W SAN JUAN COUNTY, NM		SOIL VAPOR SURVEY
PROJECT: GCNM DEHY PIT		DRWN: NOV 18, 1994
PROJECT NO: 4-1149		DRWN BY: MKL
SHEET: 1	FILE: 41149S1	REVISED: DEC 5, 1994

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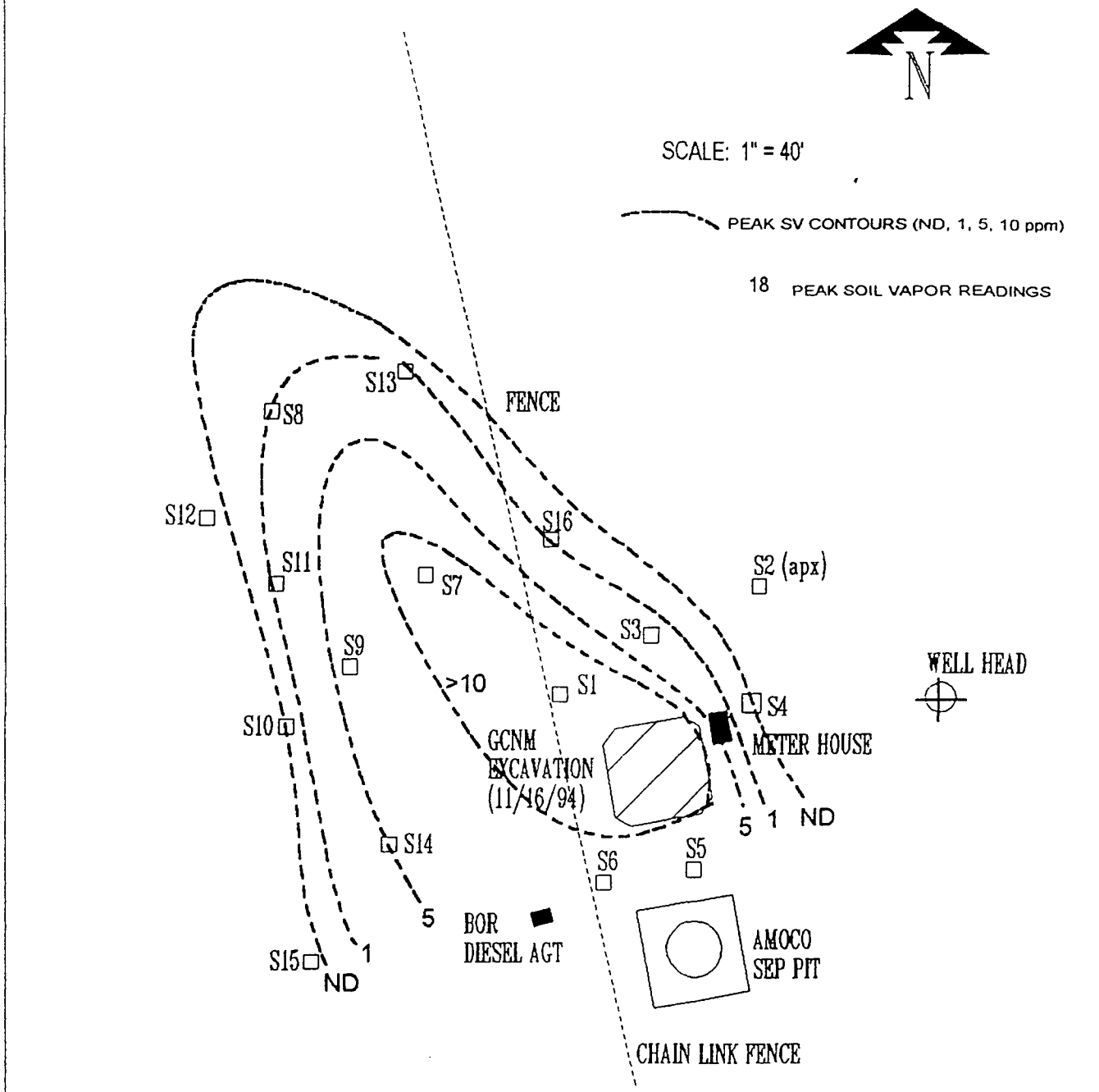
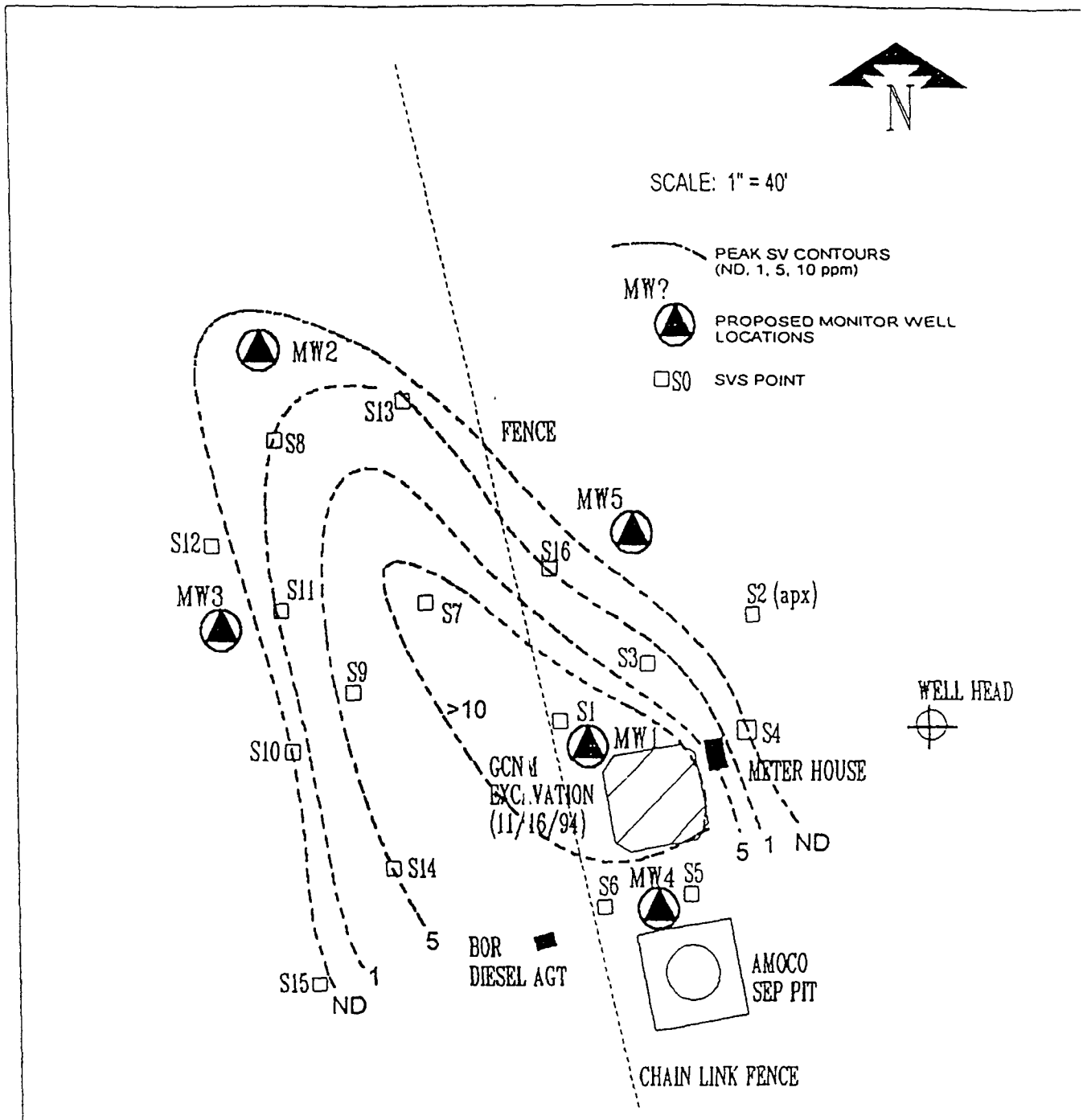


GCL ABRAMS GC L#1, (M) S 26, T29N, R10W SAN JUAN COUNTY, NM		SVS CONTOUR	ON SITE TECHNOLOGIES, LTD. P.O. BOX 2606, FARMINGTON, NM 87499 (505) 325-5667
PROJECT: GCNM DEHY PIT		DRWN: NOV 18, 1994	
PROJECT NO: 4-1149		DRWN BY: MKL	
SHEET: 2	FILE: 41149S2	REVISED: DEC 5, 1994	



GCL ABRAMS GC L#1, (M) S 26, T29N, R10W SAN JUAN COUNTY, NM		TENTATIVE MONITOR PROGRAM	ON SITE TECHNOLOGIES, LTD. P.O. BOX 3606, FARMINGTON, NM 87499 (505) 325-5667
PROJECT: GCNM DEHY PIT		DRWN: NOV 18, 1994	
PROJECT NO: 4-1149		DRWN BY: MKL	
SHEET: 3	FILE: 41149S3	REVISED: DEC 5, 1994	

GAS COMPANY OF NEW MEXICO

October 26, 1994

Mr. Bill Olsen
Geologist
2040 South Pacheco
Santa Fe, NM 87501

Dear Mr. Olsen:

This letter is a follow-up of the verbal notification to Denny Foust and yourself on groundwater concerns at the Abrams Gas Com L1.

We were remediating the separator pit by excavation when at 17 feet we encountered groundwater. We ceased excavation and immediately notified the OCD.

We have not proceeded with any remediation.

We are doing an assessment of the site which will include the Amoco separator pit located adjacent to our pit.

Several options are being considered on how to best remediate both soil and water.

When we have a scope-of-work and a plan-of-action, we will forward the detailed plan for your review.

Sincerely,

Denver Bearden
Administrator III

DB:rt

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☑ Telephone ☐ Personal	Time 1415	Date 10/5/94

Originating Party	Other Parties
Denver Bearden - Gas Company of NM 632-4131	Bill Olsen - Envir. Bureau

Subject

Abrams Gas Com L #1
SW SW Sec 26 T29N R10W

Discussion

Excavating pit at Abrams L #1, hit ground water, ground water contaminated. Still excavating

Told him need to submit written notice in one week

Conclusions or Agreements

Gas Co. will submit written notice by next week

Distribution File

Signed Bill Olsen