

PNM PUBLIC SERVICE COMPANY OF NEW MEXICO

ALVARADO SQUARE ALBUQUERQUE, NEW MEXICO 87158 _ _ _ _

December 16, 1983

RECEIVED

DEC 19 1983

Mr. Anthony Drypolcher
Acting Bureau Chief
Groundwater and Hazardous
Waste Bureau
New Mexico Environmental
Improvement Division
Post Office Box 968
Santa Fe, NM 87504

GROUND WATER/HAZARDOUS WAS
BUREAU

Dear Mr. Drypolcher:

Subject: Technical Information Related
to Waste Tank at Public Service
Company of New Mexico--Person
Generating Station

This letter transmits the following technical information related to studies at subject location:

1. Initial Soil Sampling Plan. During the period of October 29-27, 1983, soil samples were collected at the site using a hollow-stem auger rig and split-spoon sampler. Five holes were drilled as indicated on an enclosed diagram. A cross-sectional diagram of the tank and degreasing pit area is also enclosed. The location and depths of sample holes were selected to provide initial information on lateral and vertical distribution of organic solvent (tetrachloroethylene) in the soil.
2. Laboratory Results. Results of soil sample analyses for tetrachloroethylene (PCE) and moisture are attached. Soil samples for organic analyses were stored in VOA vials and frozen. In the laboratory, samples were thawed and a portion of the soil in the vial was removed and extracted with methanol. The extract was analyzed using gas chromatography with electron capture detection. A reference to the procedure is given on the laboratory report sheet. The detection level for this procedure is approximately 1 ppb. The accuracy of the analytical instrumentation is very high (i.e., estimated to be a few ppb). Replicate subsamples from some vials were analyzed to evaluate variability due to soil heterogeneity in the vial and due to differences introduced by subsampling soil from the VOA vial. Thus, the standard deviations presented on the laboratory report reflect overall uncertainty that results from real variability in the vial and from variability in the subsampling procedure.

3. Second Phase Soil Sampling Plan. Results of the initial sampling from five holes indicated considerable variability in both horizontal and vertical direction as well as some asymmetry. Due to the proximity of the degreasing shop to the tank, no samples could be taken in a southerly direction from the tank. However, recent removal of shop walls and roof will allow sampling in this area. The second phase sampling will entail sampling eight additional holes as indicated on the enclosed diagram. These holes were selected to provide additional detail on extent of variability. Split-spoon samples will be collected every 5 feet from the surface to the 50-foot depth, then every 2.5 feet between 50 and 70 feet, and every 5 feet to a total depth of 90 feet.
4. Interlaboratory Analytical Checks. To evaluate interlaboratory variability in data, one out of twenty samples will be analyzed by another laboratory. Uniform sample preparation and analytical techniques will be used by the two laboratories. These interlab checks will be analyzed in triplicate so that statistical techniques (i.e., t-tests) can be used to compare results. Such techniques are necessary due to the inherent soil sampling variability discussed above.
5. Use of Tetrachloroethylene as Most Conservative Organic Tracer. Components of the commercial solvent, Dowelene, and other solvents that were stored in the tank are volatile organic compounds. Because tetrachloroethylene (b.p. = 121°C) is less volatile than trichloroethane (b.p. = 74°C), it is expected that tetrachloroethylene will have a longer residence time in soils, and is therefore the most conservative organic tracer for studying migration of solvent. The following analytical results also support the hypothesis that tetrachloroethylene is present in higher concentrations than trichloroethane in soil samples:

PCE

TCA

<u>Sample</u>	<u>Tetrachloroethylene</u>	<u>Trichloroethane</u>	<u>Ratio</u>
Dowelene (Manufacture's Specs)	25 Percent	75 Percent	1/3
Tank Liquid	3,562 ppm	17,274 ppm	1/5
Soil PS-5 @ 15'	1,662 ppm	462 ppm	4/1
Soil PS-4 @ 60'	571 ppm	22 ppm	26/1
Soil PS-4 @ 90'	0.02 ppm	ND (<0.01 ppm)	--

6. Additional Parameters. The above data support the use of tetrachloroethylene as the best tracer of the organic solvent. However, as requested, some soil samples will also be analyzed for lead and trichloroethane. The current plan is to analyze two soil samples per hole (i.e., one at about 15 feet depth and one at about 60 feet depth) for these additional parameters. Lead would be measured in an aqueous extract of the soil sample using EPA's EP method.

7. Location of a Background Sampling Site. Due to potential nonuniformity in solvent distribution, a valid background location, which will still be relatively near the tank, cannot be identified until after the second sampling phase is completed. Such a hole could then be located and sampled if a third soil sampling phase occurs in January or February 1984.
8. Third Phase Soil Sampling Plan. The need for yet further soil sampling can only be determined after integrating data from the initial and second sampling phases. Factors that will be considered for undertaking a third sampling phase include the extent of heterogeneity and asymmetry indentified by the two sampling phases.
9. Groundwater Sampling. Procedures used to date have involved standard methods to obtain representative soil samples. Basically, these procedures involve the use of a hollow-stem auger and split-spoon sampler to obtain soil samples. This technique is very good for soil sampling, but is not well suited for directly obtaining groundwater samples. Due to the very low concentrations (i.e., a few ppb) of PCE in soils at depth, it is expected that concentrations in underlying groundwater would be undetectable. Thus, any groundwater sample has to be carefully collected using standard protocols to ensure that measured PCE concentrations are valid representations of what is actually in the water and are not artifacts caused by contamination due to improper or careless groundwater sampling techniques. Such potential problems are our concern if techniques such as bailing water from inside the hollow stem auger after drilling proceeded into the water table were used. Such a turbid sample that had been exposed to both the inside and outside of the auger would not be considered representative of actual groundwater quality. These and related matters associated with groundwater sampling were discussed by PNM Staff (Jody Plum and Ross Erbes) and NMEID Staff (Joel Hubbell and Boyd Hamilton) during a phone conversation on December 14, 1983. We will, however, continue to evaluate methods for obtaining representative samples, and include a discussion of our ideas concerning any water sampling in future correspondence.

No G.W. sampling
as of this date.

Mr. Anthony Drypolcher

-4-

December 16, 1983

If you have any questions concerning this technical information, please contact me at 848-2029.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. A. Jordan', with a long horizontal flourish extending to the right.

Richard A. Jordan, Manager
Regulatory, Licensing & Compliance

RAJ/KWK:wp
Enclosures

xc: Jack Rex - 0216



Analytical and Environmental Services

(505) 345-8964
7300 Jefferson St. NE
Albuquerque, NM 87110

Dec 16 1983

To: PNM
Alvarado Square
Albuquerque, NM 87158

Date: 8 November 1983
JV- 1192
Page 1 of 2

Attention: Jody Plum

Analyte: Tetrachloroethylene **PCE**

Sample ID	Analytical Results	Sample ID	Analytical Results
1 - Surface	0.062 ppm	3 - 60'	0.032 ppm
1 - 10'	0.030 ppm	4 - Surface	0.017 ppm
1 - 20'	0.015 ppm	4 - 10'	371.5 ppm
1 - 30'	0.025 ppm	4 - 20'	230.2 ppm
1 - 40'	0.020 ppm	4 - 30'	236.8 ppm
1 - 50'	0.015 ppm	4 - 40'	263.3 ± 70.4 ppm
2 - Surface	57.3 ± 31.9 ppm 0.0319 ppm	4 - 50'	305.7 ± 113.2 ppm
2 - 10'	0.006 ppm	4 - 60'	156.27 ppm
2 - 20'	0.003 ppm	4 - 70'	0.006 ± 0.002 ppm
2 - 30'	0.004 ppm	4 - 80'	0.010 ± 0.003 ppm
2 - 40'	0.007 ppm	4 - 90'	0.019 ± 0.016 ppm
2 - 50'	0.052 ppm	5 - 15'	2127.0 ppm
3 - Surface	0.009 ppm	5 - 20'	202.7 ppm
3 - 10'	0.005 ppm	5 - 30'	167.6 ppm
3 - 15'	700.0 ppm	5 - 40'	438.5 ± 211.0 ppm
3 - 20'	361.7 ppm	5 - 50'	295.2 ± 40.0 ppm
3 - 32.5'	613.0 ppm	5 - 60'	0.013 ppm
3 - 30'	405.6 ppm	5 - 70'	0.002 ppm
3 - 40'	451.8 ppm	5 - 80'	0.004 ± 0.006 ppm
3 - 50'	18.0 ppm	5 - 90'	0.011 ± 0.006 ppm

Normal Detection Limit : .001 mg/l

Reference: "Test Methods for Evaluating Solid Waste", 2nd Edition, USEPA, SWER, SW846, 1982.

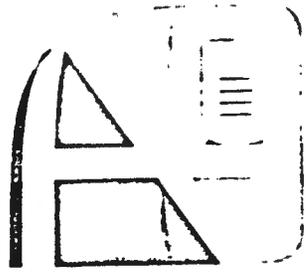
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GROUND WATER/HAZARDOUS WASTE
BUREAU

(505) 345-8004
7300 Jefferson St. NE
Albuquerque, NM 87109

Analytical and Environmental Services



AnaCor
Laboratories

To: PNM
Alvarado Square
Albuquerque, NM 87102

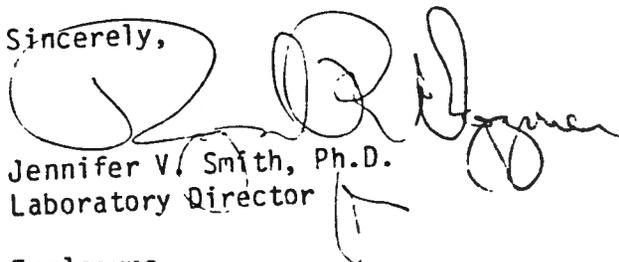
Date: 8 November 1993
JV- 1192

Attention: Jody Plum

Analyte	Sample ID/Analytical Results			
	PS2 32.7' (0955)	PS2 22.5'	PS2 50.0' (1045)	PS2 42.5' (1025)
% Moisture	4.95 %	7.85 %	6.56 %	3.64 %

An invoice for services is enclosed. Thank you for your consideration in contacting AnaCor Laboratories.

Sincerely,



Jennifer V. Smith, Ph.D.
Laboratory Director

Enclosure

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DEC 19 1993

GROUND WATER/HAZARDOUS W.S.
BUREAU

Analytical and Environmental Services



AnaCOR
Laboratories

To: PNM
Alvarado Square
Albuquerque, NM 87158

Date: 15 November 1983
JV- 1292 (Continued)
Page 1 of 2

Attention: Jody Plum

Analyte: % Moisture

Sample ID/depth(ft)	Analytical Results/max. particle diam.
PS-3 30'	3.14 % -(minor gravel to 1/4")
PS-3 40'	3.81 % -(minor gravel to 3/8")
PS-3 50'	2.87 % -(minor gravel to 1/4")
PS-3 60'	5.74 % *
PS-1 30'	3.67 % -(very minor gravel to 3/8")
PS-1 40'	4.27 % -(minor gravel to 1")
PS-1 50'	2.28 % -(common gravel to 1")
PS-4 2.5'	4.90 % -(asphaltic material some gravel to 3/8")
PS-4 5'	3.15 % -(minor gravel to 3/8")
PS-4 10'	3.98 % -(minor gravel to 1/2')
PS-4 15'	5.60 % -(some gravel to 3/8")
PS-4 20'	6.67 % *
PS-4 25'	5.08 % -(some gravel to 1/2")
PS-4 30'	5.78 % *
PS-4 35'	9.24 % *
PS-4 40'	4.32 % *
PS-4 50'	4.93 % -(minor gravel to 3/8")
PS-4 60'	5.11 % -(minor gravel to 1")
PS-4 70'	5.19 % -(some gravel to 3/8")
PS-4 80'	7.06 % *
PS-4 90'	5.69 % -(minor gravel to 3/8")
PS-5 15'	4.45 % -(common gravel to 3/8")
PS-5 20'	5.18 % *
PS-5 25'	5.89 % *
PS-5 30'	7.13 % *
PS-5 35'	7.05 % *
PS-5 40'	4.43 % -(minor gravel to 1/4")
PS-5 45'	5.28 % *
PS-5 50'	6.68 % *
PS-5 60'	3.42 % -(some gravel to 3/4")
PS-5 70'	3.10 % -(common gravel to 3/8")
PS-5 80'	2.39 % -(some gravel to 1/4")
PS-5 90'	2.76 % -(common gravel to 1")

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(505) 345-8964
7300 Jefferson St. NE
Albuquerque, NM 87109



Analytical and Environmental Services

AnaCor
Laboratories

To: PNM
Alvarado Square
Albuquerque, NM 87158

Date: 28 November 1983
JV- 1192 (Cont.)

Attention: Jody Plum

Analyte

Sample ID/Analytical Results

	PS-5 15'	PS-4 90'	PS-5 90'	Tank
Trichloroethane ^{TCF}	462.2 ppm			17274.0 ppm
Trichloroethylene	<0.01 ppm			<0.01 ppm
Tetrachloroethylene ^{TCF}	1661.7 ppm			3562.4 ppm
Benzene	<0.01 ppm	<0.01 ppm	<0.01 ppm	<0.01 ppm
Toluene	<0.01 ppm	<0.01 ppm	<0.01 ppm	<0.01 ppm
Dichloroethane	<0.01 ppm	<0.01 ppm	<0.01 ppm	<0.01 ppm
Carbon Tetrachloride	<0.01 ppm	<0.01 ppm	<0.01 ppm	<0.01 ppm
1,2 Dichloroethane	<0.01 ppm	<0.01 ppm	<0.01 ppm	<0.01 ppm
1,1 Dichloroethylene	<0.01 ppm	<0.01 ppm	<0.01 ppm	<0.01 ppm

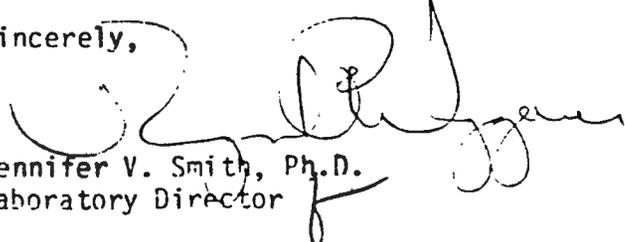
Normal Detection Limits:

Trichloroethane	0.01 mg/l	Dichloroethane	0.01 mg/l
Trichloroethylene	0.01 mg/l	Carbon Tetrachloride	0.01 mg/l
Tetrachloroethylene	0.01 mg/l	1,2 Dichloroethane	0.01 mg/l
Benzene	0.01 mg/l	1,1 Dichloroethylene	0.01 mg/l
Toluene	0.01 mg/l		

Reference: "Organic Analysis Using Gas Chromatography/Mass Spectrometry",
1979, Budde & Eichelberger, Ann Arbor Science.

An invoice for services is enclosed. Thank you for your consideration
in contacting AnaCor Laboratories.

Sincerely,


Jennifer V. Smith, Ph.D.
Laboratory Director

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