Nuclear Fuel Services, Inc.
P.O. Box 337, MS 123
Erwin, TN 37650

(423) 743-9141

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

21G-96-0137
GOV-01-60
ACF-96-229

September 30, 1996

Mr. G. Alan Farmer, Chief
RCRA Branch
Waste Management Division
Environmental Protection Agency
Region IV
100 Alabama Street, S.W.
Atlanta, GA 30303

Mr. Thomas Tiesler, Director
Division of Solid Waste Management
TN Department of Environment
and Conservation
Fifth Floor, L&C Tower
401 Church Street
Nashville, TN 37243-1535

REFERENCE: *HSWA Permit for 1984 RCRA Amendments*
Nuclear Fuel Services, Inc., Erwin, TN
EPA ID: TND 003 095 635

Dear Messrs. Farmer and Tiesler:

As required by the above reference, Condition II.E.3.a. and Condition II.F.3.a., Nuclear Fuel Services, Inc. (NFS) is enclosing the quarterly RCRA Facility Investigation (RFI) and Interim Measures (IM) Progress Reports as Attachments I and II. The next quarterly RFI/IM Progress Reports will be submitted by December 29, 1996.

If you have any questions or need further information, please contact me or Ms. Marie Moore, Environmental Safety Manager, at (423) 743-1737. Please reference our unique document identification number (21G-96-0137) in any correspondence concerning this letter.

Sincerely,

NUCLEAR FUEL SERVICES, INC.

Andrew M. Maxin
Vice President
Safety and Regulatory

BMM/rcy

Enclosure

xc: Regional Administrator
U.S. Nuclear Regulatory Commission
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101 Marietta Street, NW
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Atlanta, GA 30323

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Atlanta, GA 30323

IE07

21G-96-0137
GOV-01-60
ACF-96-229

ATTACHMENT I

To Letter Dated September 30, 1996
A. M. Maxin to Mr. G. Alan Farmer and Mr. Thomas Tiesler

RFI Progress Report

(16 pages to follow)

RFI PROGRESS REPORT
NUCLEAR FUEL SERVICES, INC.
EPA ID NO. TND 00 309 5635

1.0 SWMUs 13 (Building 111 Bulk Chemical Storage Area) and 14 (Well 72 LNAPL)

1.1 Work Completed

Results from analyses of eight soil samples retrieved from four boreholes downgradient of SWMU 13 (Figure 1, Attachment) were received and data validation, tabulation, and evaluation were completed. Analytical results are presented in Section 1.2.

1.2 Findings and Observations

Polycyclic aromatic hydrocarbons (PAHs), tributyl phosphate (TBP), total petroleum hydrocarbons (TPHs), arsenic and beryllium were detected at concentrations above health based action levels. Sample results are presented in Tables 1 and 2, Attachment.

Benzo(a)anthracene was detected in three of eight soil samples. The concentration in one of the three soil samples was above the health based action level of 1 mg/kg. Concentrations ranged from 0.87 mg/kg to 3.3 mg/kg.

Benzo(b)fluoranthene was detected in three of eight soil samples. Concentrations in all three soil samples were above the health based action level of 1 mg/kg. Concentrations ranged from 1.35 mg/kg to 5.5 mg/kg.

Benzo(k)fluoranthene was detected in three of eight soil samples. Concentrations in all three samples were above the health based action level of 0.1 mg/kg. Concentrations ranged from 0.9 to 2.6 mg/kg.

Dibenzo(a,h,)anthracene was detected in two of eight soil samples. Concentrations in both samples (0.395 mg/kg and 1.4 mg/kg) were above the health based action level of 0.1 mg/kg.

Indeno(1,2,3-cd)pyrene was detected in three of eight soil samples. Concentrations in all three samples were above the health based action level of 0.1 mg/kg. Concentrations ranged from 0.69 mg/kg to 2.7 mg/kg.

The three samples containing PAHs were retrieved from two locations (#1 and #2, Figure 1) in a drainage ditch downgradient from Building 111 and SWMU 13. This drainage ditch also receives runoff from Buildings 100, 105, and 130 and is parallel and

immediately adjacent to a former rail spur. PAHs were not detected at concentrations above health based action levels in previous SWMU 13 investigations and were not detected in the soil samples taken from Locations 3 and 4 which are between SWMU 13 and the ditch. In addition, chemical products containing PAHs were not stored in the dike area. Therefore, PAH contamination in downgradient soil is not believed to be attributable to SWMU 13. PAH contamination in soil may be attributable to the former rail spur or the use of asphalt sealant on the area which contributes runoff to the drainage ditch.

TBP was detected in five of eight soil samples with concentrations ranging from 0.43 mg/kg to 490 mg/kg. The concentration in the surface sample (490mg/kg) collected at Location 3 was above the health based action level of 400 mg/kg; the TBP concentration in the subsurface sample at this location (150 mg/kg) was well below the action level. TBP was not detected above action levels in any of the samples collected downgradient of Location 3. TBP soil concentrations are depicted in Figure 2, Attachment. The horizontal extent of TBP contamination has been defined as extending no further than approximately 15 feet downgradient of SWMU 13.

Arsenic was detected in all eight soil samples at concentrations above the health based action level of 0.5 mg/kg (based on slope factor of 1.5/risk level of E^{-6}) but less than the 20 mg/kg action level (based on oral reference dose of $3E^{-4}$). Arsenic concentrations ranged from 3.4 mg/kg to 7.09 mg/kg with a mean of 4.88 mg/kg. Arsenic concentrations in background soil samples obtained from the NFS softball field during the SWMUs 2, 4, and 6 RFI ranged from 5.3 mg/kg to 13.2 mg/kg. The concentrations of arsenic detected in soil downgradient of SWMU 13 are consistent with background concentrations and are not indicative of contamination.

Beryllium was detected in seven of eight SWMU 13 soil samples at estimated concentrations greater than the 0.2 mg/kg action level. The PQL (0.57 mg/kg) of the remaining sample was also above the action level. Beryllium concentrations ranged from <0.57 mg/kg to 11.4 mg/kg. The mean concentration of beryllium in background soil is 0.92 mg/kg. Beryllium concentrations in SWMU 13 soil are consistent with background concentrations with the exception of one sample obtained from Location 1.

The concentration of beryllium (11.4 mg/kg) in the 0.5 - 3.5' depth interval from Location 1 is indicative of contamination. Location 1 is the farthest downgradient sample collected during the SWMU 13 follow-up investigation. However, one soil sample was collected from a location approximately 33 feet downgradient of Location 1 during the AOC 2/4 (Plant Drainage System) RFI. Downgradient is generally to the

northwest (the direction of surface water flow). Beryllium was present in the soil sample collected from beneath the drainage ditch (3-4' depth interval) at a concentration (0.8 mg/kg) which is consistent with background and not indicative of contamination. Based on these results, the horizontal extent of beryllium contamination in the vicinity of SWMU 13 has been defined as extending no further than 65 feet downgradient of SWMU 13. Because beryllium was not stored in the dike area, beryllium contamination is not believed to be attributable to SWMU 13. Beryllium contamination in the vicinity of SWMU 13 may be attributable to materials and/or manufacturing processes in Building 111. Beryllium soil concentrations are depicted in Figure 3, Attachment.

Hydrocarbon analyses of SWMU 13 soil consisted of #2 fuel oil, kerosene, and varsol. Number two fuel oil was detected at estimated concentrations in three of eight soil samples, varsol was detected in two of eight soil samples, and kerosene was not detected in any of the soil samples. RCRA action levels do not exist for #2 fuel oil or varsol; however, a State of Tennessee UST cleanup standard exists for TPHs in soil. The State of Tennessee UST cleanup standards for TPHs in "non-drinking water" soil are 500 mg/kg (10^{-4} to 10^{-6} permeability) and 1,000 mg/kg (10^{-6} permeability).

Varsol is estimated at concentrations above UST cleanup standards (10^{-4} to 10^{-6} permeability) in the surface (2300 mg/kg) and subsurface soil (550 mg/kg) at Location 3. TPHs were not present above UST cleanup standards downgradient of Location 3. Based on these results, the horizontal extent of contamination has been defined as extending no further than 15 feet downgradient of SWMU 13. Because varsol was not stored at SWMU 13, varsol contamination is not believed to be attributable to SWMU 13. Varsol contamination may be attributable to machinery cleaning in Building 111. TPH soil concentrations are depicted in Figure 4, Attachment.

Based on these results, NFS believes that the nature and extent of contamination attributable to SWMU 13 has been defined and concludes that no further investigative action is required.

2.0 SWMU 20/Well 103A Investigation

2.1 Work Completed

Soil sampling to determine the source of tetrachloroethylene (PCE) contamination in Well 103A began May 30, 1996 and was completed June 3, 1996. Twenty-two soil samples were obtained from 17 boreholes in the vicinity of Buildings 111, 130 and 120/131; 14 samples were obtained as part of the SWMU 20/Well 103A investigation and 8 samples were obtained as part of the SWMU 13 investigation. Soil samples were analyzed for PCE and radionuclides. Analytical results are presented in the following section (Section 2.2).

2.2 Findings and Observations

PCE was detected in 16 of the 22 (73%) soil samples (Table 3, Attachment). Detected concentrations ranged from 0.010 mg/kg to an estimated value of 5.948 mg/kg. PCE concentrations in all samples were below the 10 mg/kg action level.

PCE concentrations and the corresponding locations are depicted in Figure 5, Attachment. The highest concentrations of PCE were detected in the vicinity and downgradient of Building 120. The highest concentration (5.948 mg/kg) of PCE was detected at borehole 20PW-S7 (1' - 4' interval), located along the northwest side of Building 120. Borehole 20PW-S8 (interval 0-1'), located within Building 120, contained a concentration of 3.050 mg/kg of PCE and borehole 20PW-S5, located along the northeast side of Building 120, contained a concentration of 2.436 mg/kg in the 1'- 4' interval. The remaining soil samples contained PCE concentrations of less than 1 mg/kg.

Results of soil sampling indicate PCE is present at concentrations below action levels in the vicinity of Building 120. Previous activities in Building 120 may be attributable to the source of PCE. The presence of PCE in soil along with previous activities in proximity to Building 120 may be attributable to the source of contamination in Well 103A.

2.3 Work Projected (September 30, 1996 - December 30, 1996)

No further investigation is planned until off-site wells have been installed and sampled.

3.0 Areas of Concern 2 (Building 111 Boiler Blowdown/Backwash) and 4 (Plant Drainage System)

3.1 Work Completed

Data review, validation, and evaluation of surface water data from three locations in the plant drainage system were completed. Preliminary findings were reported in the last Quarterly RFI Progress Report.

Peer review of the draft AOCs 2 and 4 RFI Report was completed. Revisions to the draft began during this reporting period.

3.2 Work Projected (September 30, 1996 - December 30, 1996)

The RFI report will be completed and subsequently submitted to regulatory agencies in the fourth quarter of 1996.

4.0 General Information

SWMUs 2 (Pond 4), 4 (Yard Incinerator), and 6 (Abandoned Channel of Banner Spring Branch) RFI Reporting Error: Surface water data in the RFI Report for SWMUs 2, 4, and 6 (EcoTek 1994) were incorrect for copper and zinc. The units were inadvertently reported as mg/L rather than µg/L. The corrected results are presented in Table 4, Attachment, and will be corrected in the RFI Report for AOCs 2 and 4. The AOCs2/4 report will be submitted for regulatory review the last quarter of 1996.

SWMUs 9 and 10 (Radiological Waste Burial Ground and Demolition Landfill): Joint approval of Addendum 1 to the Pond 4 Decommissioning/Interim Measures workplan was received on August 23, 1996 from the EPA and the Tennessee Department of Environment and Conservation (TDEC) authorizing excavation of the North Site Burial Ground (SWMU 9). A license amendment authorizing work in the Burial Ground was also received August 27, 1996 from the Tennessee Department of Radiological Health. Excavation cannot begin, however, until an NRC license amendment is received.

RCRA Facility Groundwater Investigation and Risk Assessment Workplan: Conditional approval for the Phase III RCRA Facility Groundwater Investigation and Risk Assessment Workplan was received on July 12, 1996. The revised workplan and responses to EPA and State comments were submitted to the EPA and TDEC on Friday, September 13, 1996.

The risk assessment for on-site groundwater is complete. Assessment of off-site data is

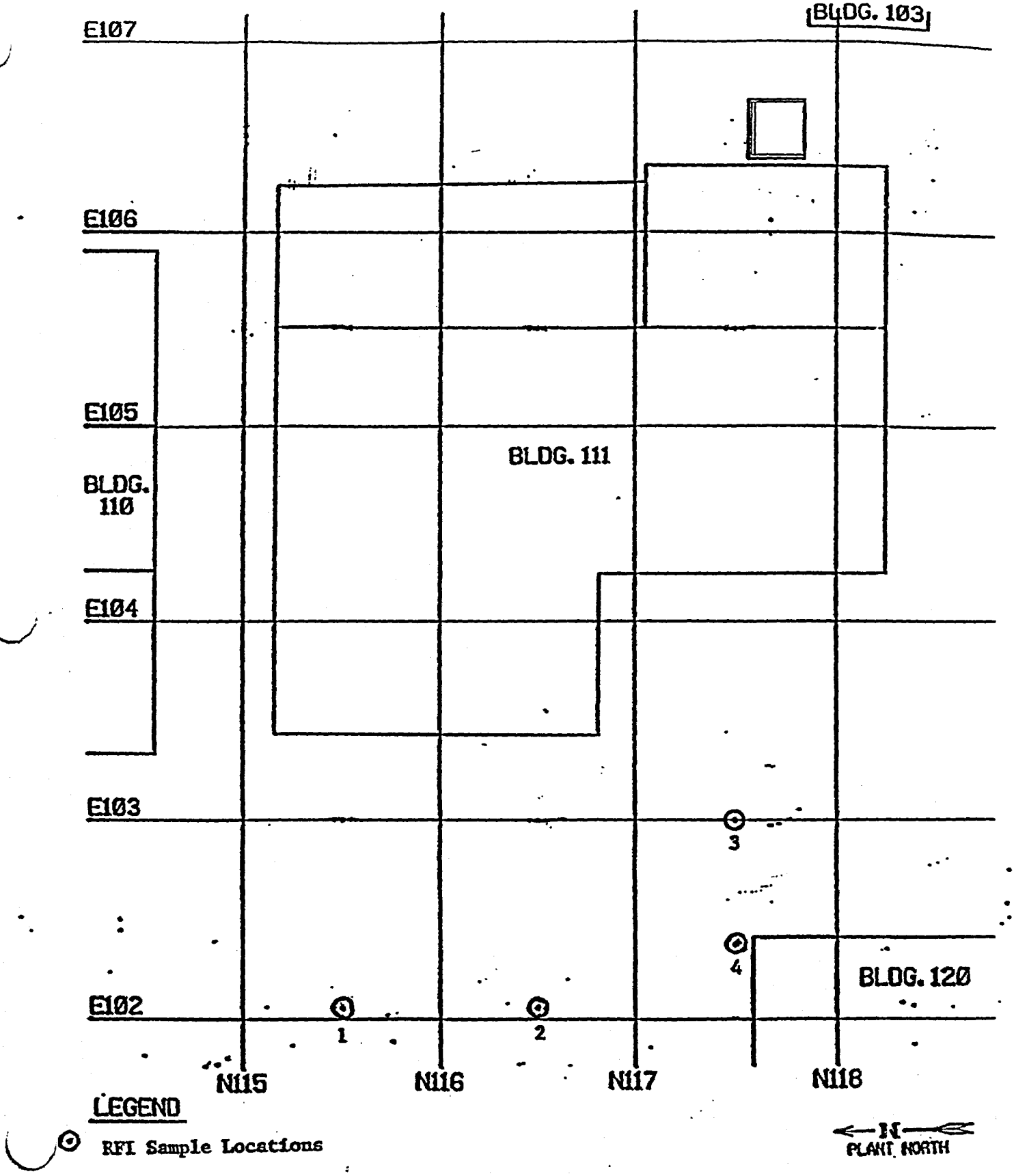
scheduled to begin in December 1996 provided sample results are available from off-site monitoring wells.

Off-site Well Installations: Drilling for well installations to determine the nature and extent of off-site groundwater contamination was scheduled to begin in early September, 1996. However, due to a delay in obtaining a lease agreement with a property owner, drilling will not begin until October, 1996.

ATTACHMENT
(9 pages to follow)

Figure 1

SWMU 13 Follow-Up Soil Sampling Locations



111-C002

Table 1

SWMU 13 - Analytical Results for Metals and Semivolatiles Detected at or above Action Levels (Soil)

Sample ID	Date Collected	Depth (ft.)	Benzo(a)-anthracene (mg/kg)	Benzo(b)-fluoranthene (mg/kg)	Benzo(k)-fluoranthene (mg/kg)	Dibenzo(a,h)-anthracene (mg/kg)	Indeno (1,2,3-cd)-pyrene (mg/kg)	Tributyl Phosphate (mg/kg)	Arsenic (mg/kg)	Beryllium (mg/kg)
13-PW-S1-1/D	5/29/96	0-0.5	0.870	1.350	0.905	0.395	0.690	0.725	7.09	J 0.921
13-PW-S1-2	5/29/96	0.5-3.5	3.300	5.500	2.600	1.400	2.700	2.200	7.01	J 11.4
13-PW-S2-1	5/30/96	0-0.5	0.880	1.600	0.850	< 0.330	0.690	0.430	4.05	J 0.924
13-PW-S2-2	5/30/96	0.5-3.5	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	3.40	J 1.64
13-PW-S3-1	5/29/96	0-0.5	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	490.000	3.56	< 0.569
13-PW-S3-2	5/29/96	0.5-3.5	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	150.000	3.53	J 0.827
13-PW-S4-1	5/30/96	0-0.5	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	5.52	J 1.02
13-PW-S4-2	5/30/96	0.5-2.5	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	4.84	J 0.892
Mean			0.838	1.263	0.751	0.472	0.716	80.543	4.88	2.3
Standard Deviation			0.959	1.674	0.736	0.351	0.765	162.292	1.43	3.5
No. of Observations			8	8	8	8	8	8	8	8
t-value			1.415	1.415	1.415	1.415	1.415	1.415	1.415	1.415
90% Upper Conf. Limit			1.317	2.100	1.119	0.648	1.099	161.734	5.59	4.0
Action Level			1	1	0.1	0.1	0.1	400	0.5/20	0.2

Notes:

Analyses performed by IEA, Inc., Cary, NC

D Duplicate; Sample results averaged

J Estimated value

< Less than the detection limit

SWMU 13 - Analytical Results for Total Petroleum Hydrocarbons (Soil)

Client ID	Borehole/ Depth	Collection Date	#2 Fuel Oil (mg/kg)	Kerosene (mg/kg)	Varsol (mg/kg)	Total Petroleum Hydrocarbons (mg/kg)
13PW-S1-1/ Dup	1 / 0 - .5'	5/29/1996	J 90	< 10	< 10	J 110
13PW-S1-2	1 / .5' - 3.5'	5/29/1996	J 85	< 10	< 10	J 105
13PW-S2-1	2 / 0 - .5'	5/30/1996	J 210	< 10	< 10	J 230
13PW-S2-2	2 / 1' - 4'	5/30/1996	< 10	< 10	< 10	< 30
13PW-S3-1	3 / 0 - .5'	5/29/1996	< 500	< 500	2300	J 3300
13PW-S3-2	3 / .5' - 3.5'	5/29/1996	< 100	< 100	550	J 750
13PW-S4-1	4 / 0 - .5'	5/30/1996	< 10	< 10	< 10	< 30
13PW-S4-2	4 / .5' - 2.5'	5/30/1996	< 10	< 10	< 10	< 30
Statistics:						
Mean			127	< 83	364	J 573
Standard Deviation			154	161	753	1055
No. of Observations			8	8	8	8
t-value			1.415	1.415	1.415	1.415
90% Upper Conf. Limit			204	< 163	740	J 1101
Action Level			ND	ND	ND	500

Notes:
Total Petroleum Hydrocarbons are the sum of #2 Fuel Oil, Kerosene, & Varsol
Analyses performed by IEA, Inc., Cary, NC
Dup Duplicate; Sample results averaged.
ND No data
J Estimated value
< Less than the detection limit

Table 2

Figure 2

SWMU 13 - TBP Concentrations in Soil (mg/kg)

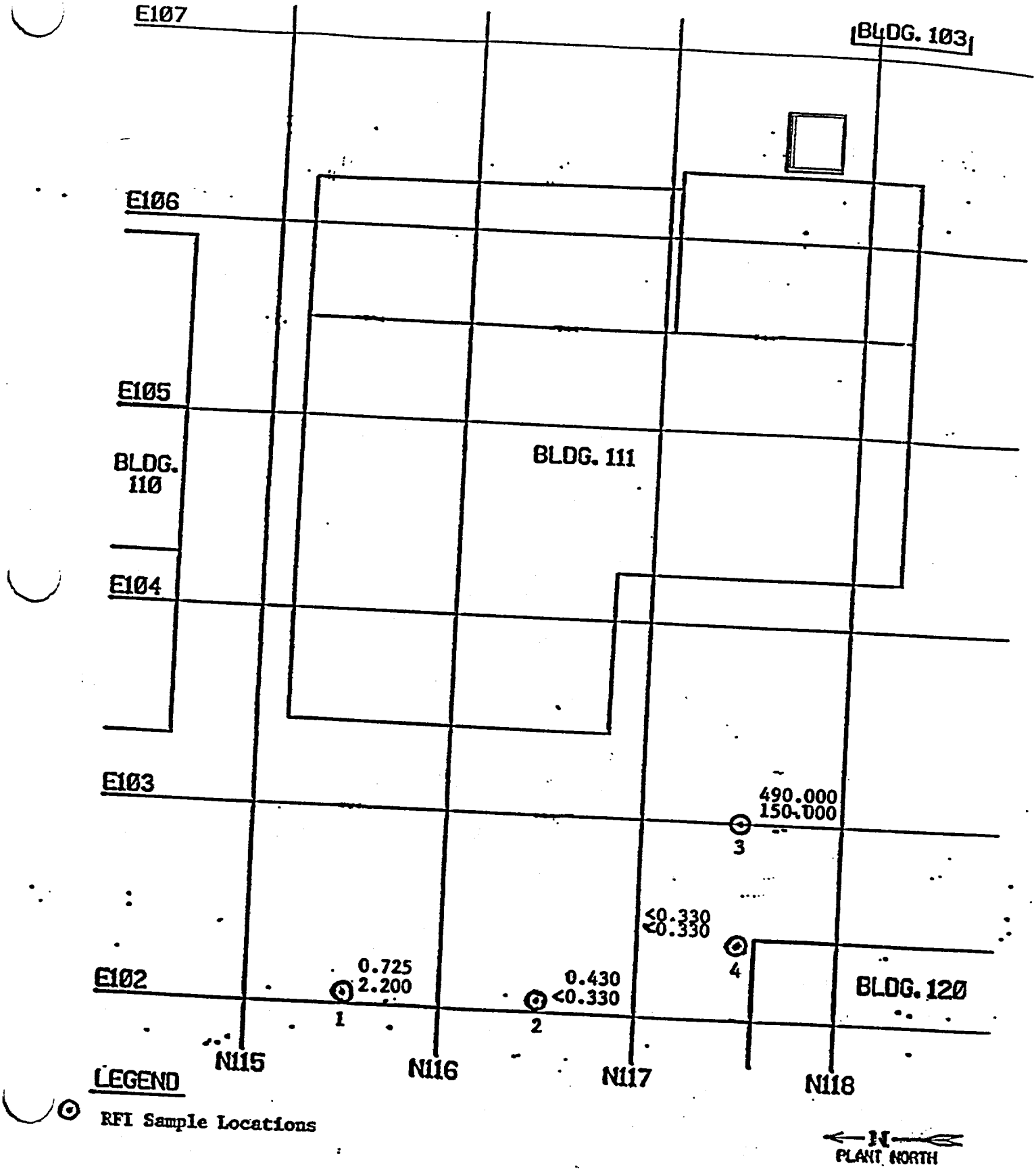


Figure 3

SWMU 13 -- Beryllium Concentrations in Soil (mg/kg)

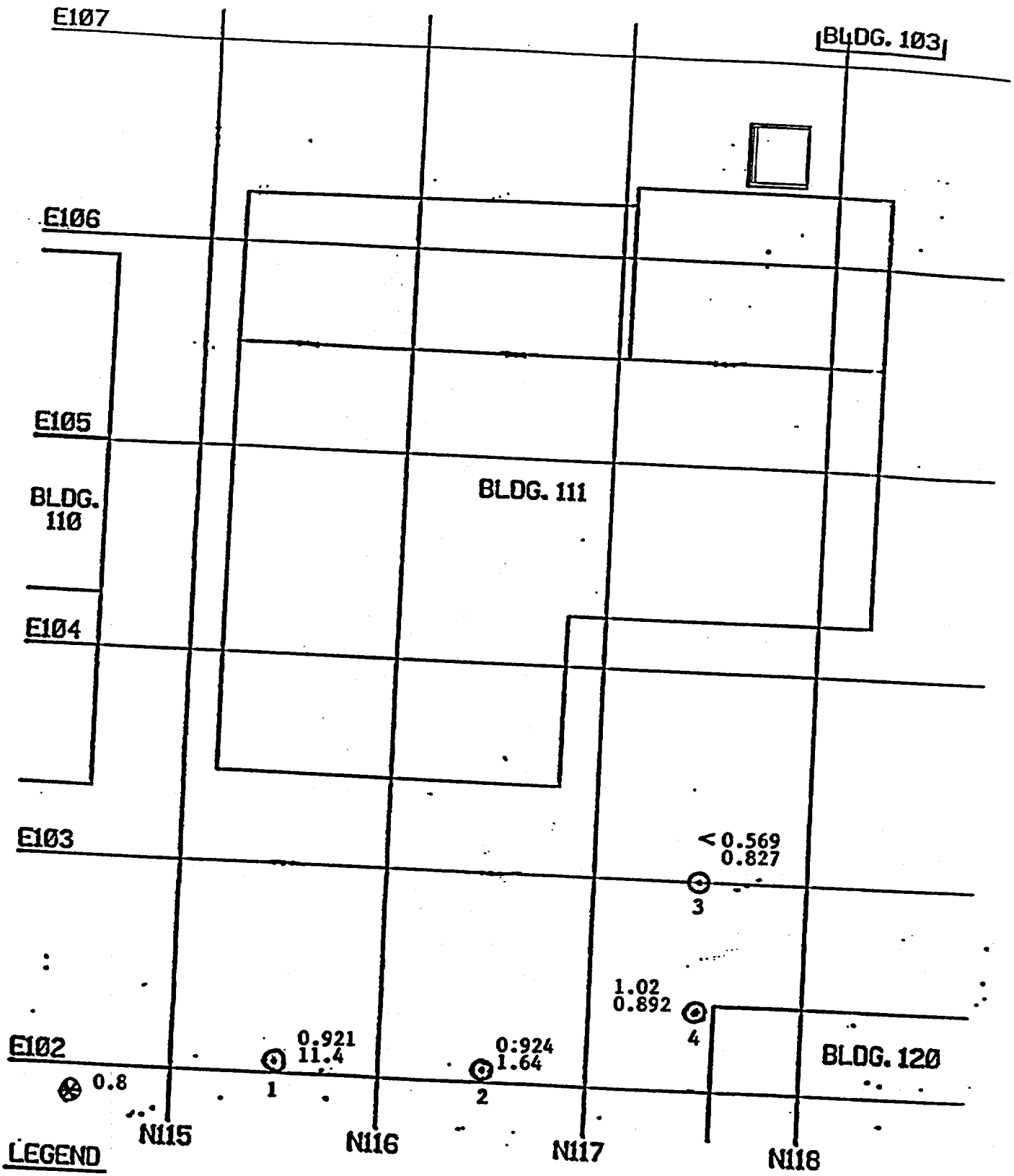
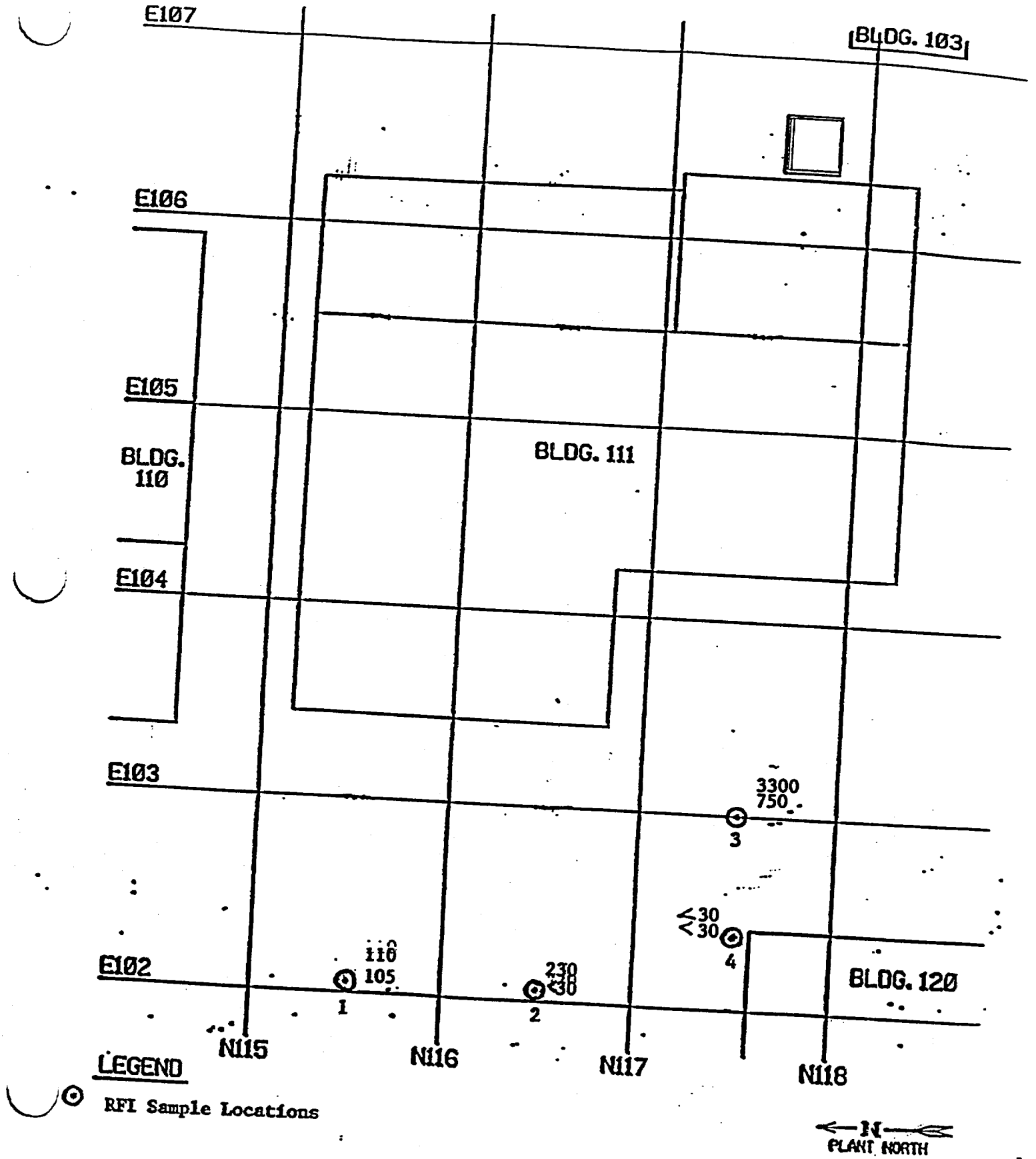


Figure 4

SWMU 13 - TPH Concentrations in Soil (mg/kg)



111-C002

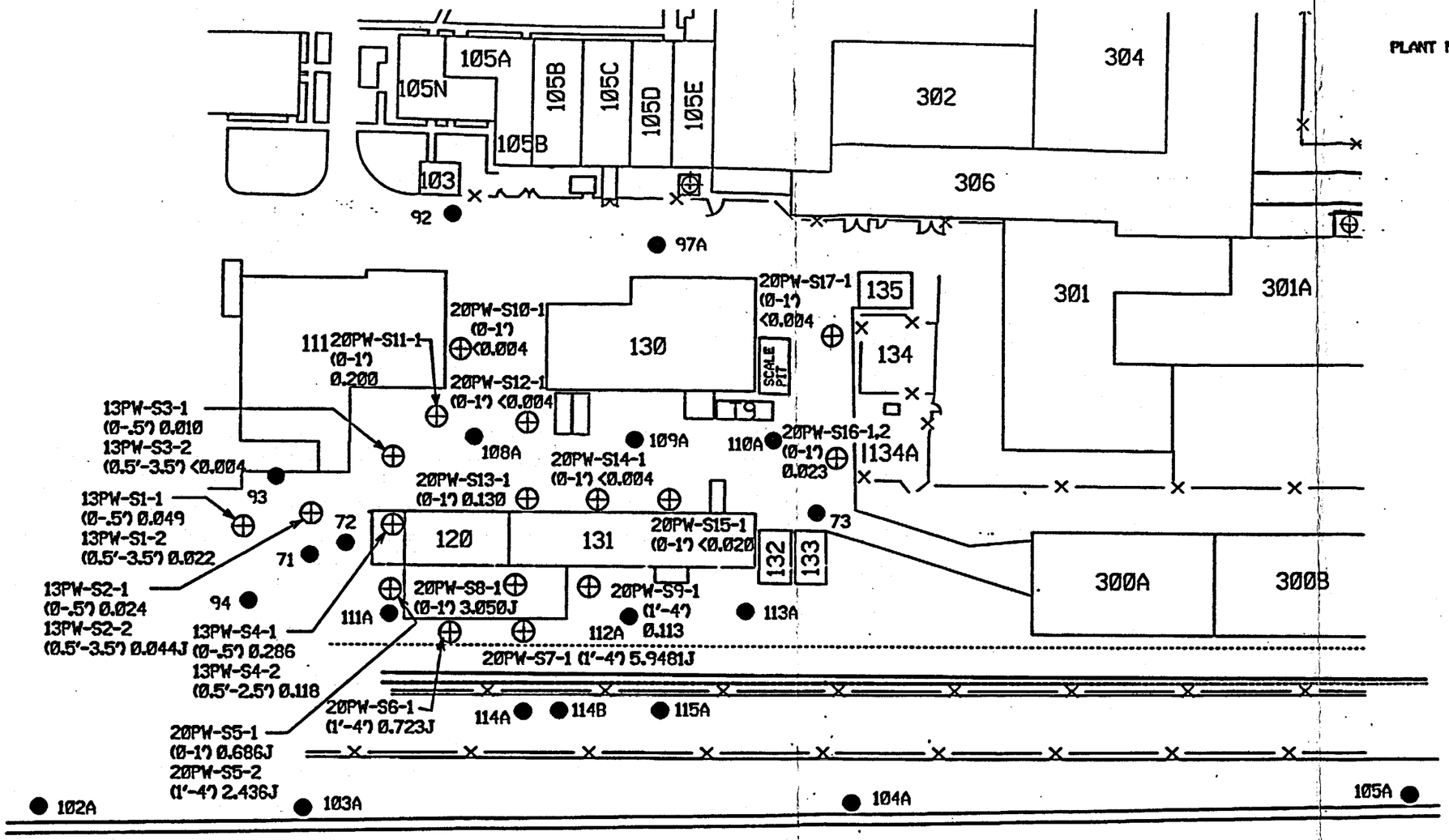
Table 3

SWMU 20 / Well 103A Investigation Analytical Results for Tetrachloroethylene (Soil)

Client ID	Borehole/ Depth	Collection Date	Tetrachloroethylene (mg/kg)
13PW-S1-1/Dup	1 / 0-.5'	05/29/96	0.049
13PW-S1-2	1 / 0.5'-3.5'	05/29/96	0.022
13PW-S2-1	2 / 0-.5'	05/30/96	0.024
13PW-S2-2	2 / 0.5'-3.5'	05/30/96	J 0.044
13PW-S3-1	3 / 0-.5'	05/29/96	0.010
13PW-S3-2	3 / 0.5'-3.5'	05/29/96	< 0.004
13PW-S4-1	4 / 0-.5'	05/30/96	0.286
13PW-S4-2	4 / 0.5'-2.5'	05/30/96	0.118
20PW-S5-1	5 / 0-1'	06/03/96	J 0.686
20PW-S5-2	5 / 1'-4'	06/03/96	J 2.436
20PW-S6-1	6 / 1'-4'	06/03/96	J 0.723
20PW-S7-1	7 / 1'-4'	06/03/96	J 5.948
20PW-S8-1	8 / 0-1'	05/31/96	J 3.050
20PW-S9-1	9 / 1'-4'	05/31/96	0.113
20PW-S10-1	10 / 0-1'	06/03/96	< 0.004
20PW-S11-1	11 / 0-1'	05/31/96	0.200
20PW-S12-1	12 / 0-1'	05/31/96	< 0.004
20PW-S13-1	13 / 0-1'	06/03/96	0.130
20PW-S14-1	14 / 0-1'	05/31/96	< 0.004
20PW-S15-1	15 / 0-1'	05/31/96	< 0.020
20PW-S16-1,2/Dup	16 / 0-1'	06/03/96	0.023
20PW-S17-1	17 / 0-1'	06/03/96	< 0.004
Statistics:			
Mean			0.632
Standard Deviation			1.398
No. of Observations			22
t-value			1.316
90% Upper Conf. Limit			1.024
Action Level (mg/kg)			10

Dup - Duplicate; sample results averaged
< - Less than the detection limit
J - The result is an estimate
Analysis completed by NFS Laboratory

PCE-SWMU20-Soil.xls



FOR INFORMATION ONLY

LEGEND

⊕ SAMPLE LOCATION
● EXISTING MONITORING WELL
J ESTIMATED VALUE

CLIENT ID -20PW-S9-1
DEPTH -(1'-4')
PCE (mg/kg) -0.113

BY	DATE	REVISION	LET
		ADDED -1 TO CLIENT ID'S	A
MDK/LMN	09-04-96	ORIGINAL ISSUE	—

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TOLERANCE UNLESS SPECIFIED
FRACTIONAL ±1/64"
ANGULAR ±1/2°
DECIMAL
.XX ±.01
.XXX ±.001

NFS

REVISED BY
PROPOSED CONSTRUCTION DATE:
DRAFTER
PROPOSED APPROVALS
ENG.

NUCLEAR FUEL SERVICES, INC.
ERWIN, TENNESSEE

SWMU 20/WELL 103A INVESTIGATION
PCE CONCENTRATIONS IN SOIL (mg/kg)

DRAFTER R.P. STOREY
SCALE 1" = 68'
DATE 09-18-96
AS-BUILT APPROVALS
ENG. L.M. Nichols
DRAWING NO. 005-C0028-B

Table 4

SWMUs 2, 4, and 6 - Analytical Results for Semivolatile Organics, General Chemistry Parameters, and Metals Detected at or above Action Levels (Surface Water)

	Client ID	Collection Date	Pyrene (mg/L)			Total Cyanide (mg/L)		Nitrate/Nitrite as N (mg/L)		Copper (mg/L) *		Zinc (mg/L) *
Background	02-SW-001	10/11/93	<	0.010	H	0.003	H	1.81	<	0.003	B	0.0241
Upgradient	02-SW-002,D	10/11/93	<	0.010	H	0.011	H	1.60		0.0042	B	0.0761
	02-SW-005	10/11/93	<	0.010	H	0.006	H	0.89		0.0072	B	0.166
Mean			<	0.010	H	0.009	H	1.2		0.0057	B	0.121
Downgradient	02-SW-006	10/11/93	J	0.001	H	0.010	H	1900		0.0209	B	0.085
	02-SW-007	10/11/93	<	0.010	H	0.010	H	0.74		0.0054	B	0.131
	02-SW-008	10/11/93	J	0.002	H	0.006	H	2.1		0.003	B	0.0884
Mean				0.004	H	0.009	H	---- **		0.0098	B	0.1015
Standard Deviation				0.004		0.002		895		0.0079		0.0209
No. of Observations				3		3		3		3		3
t-value				1.886		1.886		1.886		1.886		1.886
90% Upper Conf. Limit				0.01		0.01		---- **		18		0.124
Water Criteria for Banner Spring [A]				1 [D]		0.0052		10 [D]		0.012		0.106
Estimated Value for Martin Creek [B]				0.0002		0.0006		0.21		0.0003		0.00884
Water Criteria for Martin Creek [C]				0.00003		0.0052		10 [D]		0.012		0.106

NOTES:

The contracted laboratory was EcoTek LSI located in Atlanta, GA.
< Less than detection limit.
Surface water samples were not collected for locations 02-SW-003 and 02-SW-004 due to lack of accumulation of surface water
B - Analyte found in associated blank as well as in sample.
H - Holding time exceeded (estimated value).
J - Estimated value when result is less than the practical quantitation limit but greater than zero.
* - Data correctly converted to mg/L; conversion not performed for data presented in previously submitted report (EcoTek 1994).
** - Statistical data not presented due to outlier.
[A] - Water criteria based on Tennessee Water Quality Criteria for fish and aquatic life.
[B] - Sample 02-SW-008 divided by a dilution factor of 10.
[C] - Water criteria based on Tennessee Water Quality Criteria for fish and aquatic life, and recreational use.
[D] - EPA Health Based Action Level or drinking water MCL is used since water quality criteria not available.

21G-96-0137
GOV-01-60
ACF-96-229

ATTACHMENT II

To Letter Dated September 30, 1996
A. M. Maxin to Mr. G. Alan Farmer and Mr. Thomas Tiesler

Interim Measures Progress Report

(23 pages to follow)

INTERIM MEASURES (IM) PROGRESS REPORT
SWMUs 2 ,4, AND 6
NUCLEAR FUEL SERVICES, INC.
EPA ID. NO. TND 00 309 5635

1.0 Work Completed

Since the last IM Progress Report dated July 2, 1996, excavation has progressed both inside and outside of Building 410.

Inside the building, approximately 22,500 square feet have been excavated for waste and debris removal. This brings the work to 89% completion (See Attachment 1). Of the area excavated inside the building since July 2, approximately 8,500 cubic feet of waste has been processed and packaged for off-site disposal.

Excavation outside of Building 410 continued this quarter and approximately 8,500 square feet were excavated, yielding about 37,500 cubic feet of debris, waste and soil to be processed. This work brings the outside excavation total to about 80% completion.

Excavated areas, inside and out, have been visually examined and surveyed with metal detection equipment to verify waste and debris removal.

Through August 31, 1996, 4,334,398 gallons of groundwater have been treated and discharged in accordance with applicable regulations to the Erwin POTW in the 737 days since start-up. The combined well output along with supplemental pumping from adjacent ponds has averaged 4.08 gallons per minute.

2.0 Findings and Observations

Current generation rates indicate that waste and debris comprise approximately 38 percent of the total volume excavated. The groundwater elevation data indicates that levels are being maintained at a point sufficiently low enough to support excavation. Charts of the observed groundwater levels are attached, along with a diagram of the well locations relative to the building (Attachments 2-9).

All wastes continue to be below the applicable TCLP and PCB regulatory levels this quarter.

INFLUENT DATA

Pond 4 groundwater influent has been sampled and analyzed monthly since August 1994, prior to treatment, for the following constituents: 1,2 dichloroethylene (1,2 DCE), tetrachloroethylene (PCE), trichloroethylene (TCE), vinyl chloride, tributyl phosphate (TBP), bis(2-ethylhexyl)pthalate (BEHP), and di-n-octyl phthalate (DOP). In July 1995 the influent sampling frequency increased from monthly to weekly. Pond 4 groundwater influent data for constituents detected in samples collected August 1994 through September, 1996 are presented in Attachment 10 and are discussed below.

1,2 Dichloroethylene - 1,2 DCE was detected in all influent samples at concentrations ranging from 0.072 mg/L to 2.734 mg/L. Samples obtained during this reporting period (June 4, 1996 through September 6, 1996) peaked with the highest concentration (2.734 mg/l in June, 1996) and the lowest concentration (0.072 mg/l in August, 1996) seen since this sampling effort was initiated. Attachment 11 is a graph depicting 1,2 DCE concentrations.

Tetrachloroethylene - PCE was detected in 65 of 66 (98%) samples at concentrations ranging from 0.268 mg/L to 13.293 mg/L. The lowest concentration of PCE (0.268 mg/L) was detected August 29, 1996 and the highest concentration (13.293 mg/L) was detected January 8, 1996. PCE was detected in 12 of 13 (92%) of samples obtained during this reporting period. Detected concentrations of PCE ranged from 0.268 mg/L to 4.402 mg/L. PCE data are graphed in Attachment 12.

Trichloroethylene - TCE was detected in all influent samples at concentrations ranging from 0.019 mg/L to 4.101 mg/L. The lowest concentration of TCE (0.019 mg/L) was detected on March 3, 1995 and the highest concentration (4.101 mg/L) was detected on January 3, 1995. Concentrations of TCE in this reporting period ranged from 0.107 mg/L to 2.201 mg/L. TCE data are graphed in Attachment 13.

Vinyl Chloride - Vinyl chloride was detected in 22 of 66 (33%) samples at concentrations ranging from 0.020 mg/L to 0.684 mg/L. The lowest concentration (0.020 mg/L) was detected December 5, 1994 and the highest concentration (0.684 mg/L) was detected June 12, 1996. Vinyl chloride was not detected in the remaining influent samples at concentrations greater than the Practical Quantitation Limit (PQL); however, the PQL (<0.005 mg/L) is greater than the 0.002 mg/L MCL. Vinyl chloride was detected in 8 of 13 (62%) samples obtained during this reporting period at concentrations ranging from 0.215 mg/L to 0.684 mg/L. Vinyl chloride data are graphed in Attachment 14.

Tributyl Phosphate - Tributyl phosphate was detected in 52 of 64 (81%) samples at concentrations ranging from 0.034 mg/L (July 24, 1996) to 30.00 mg/L (September 1, 1994). Analysis for TBP was not conducted on August 16, 1994 and August 8, 1995 groundwater

samples. TBP was detected in 6 of 13 (46%) of samples obtained during this reporting period at concentrations ranging from 0.034 mg/L to 0.614 mg/L. TBP data are graphed in Attachment 15.

Bis(2-ethylexyl)pthalate - BEHP was detected in 2 of 65 (3%) influent samples at concentrations of 0.0061 mg/L (August 16, 1994) and 2.598 mg/L (July 12, 1995). The August 8, 1995 influent sample was not analyzed for BEHP. BEHP was not detected in samples obtained during this reporting period.

Di-n-octyl phthalate - DOP has not been detected in influent samples. The August 8, 1995 influent sample was not analyzed for DOP. Detection limits ranged from <0.010 mg/L to <0.030 mg/L.

GROUNDWATER DATA

Monitoring Wells #26 and #28 are located in the Pond 4 area and are sampled monthly for PCE, vinyl chloride, and TBP as an indicator of groundwater quality in the Pond 4 area. Wells #101A and #102A are located along the western perimeter of the NFS site and are downgradient of the Pond 4 area. Wells #101A and #102A were sampled quarterly for PCE, vinyl chloride, and tributyl phosphate through June 1995. In June 1995, the sampling frequency increased to monthly. Analytical results are presented in Attachment 16, and are summarized below.

Tetrachloroethylene - PCE was detected in 23 of 24 (96%) of samples obtained from Well #26. Concentrations of PCE were greater than the 0.005 mg/L MCL in 6 of 24 (25%) samples. Concentrations of PCE above the MCL ranged from 0.0060 mg/L to 0.0240 mg/L. PCE was detected at concentrations greater than MCL in 100% of the samples obtained from Well #28. PCE concentrations ranged from 0.2134 mg/L to 2.1725 mg/L.

PCE was detected in 14 of 18 (78%) of samples obtained from Well 101A. Concentrations of PCE were greater than the MCL in 13 of 18 (72%) of the samples. Concentrations of PCE above the MCL in Well #101A ranged from 0.0056 mg/L to 0.1550 mg/L. PCE was detected at concentrations greater than the MCL in 100% of the samples obtained from Well #102A. PCE concentrations ranged from 0.2363 mg/L to 1.5342 mg/L.

Vinyl Chloride - Vinyl chloride has not been detected in Well #26 at concentrations greater than the PQL; however, the PQL (<0.005 mg/L) is greater than the 0.002 mg/L action level. Vinyl chloride was detected in 19 to 22 (86%) samples obtained from Well #28. Vinyl chloride concentrations ranged from an estimated value of 0.0060 mg/L to 0.3601 mg/L.

Vinyl chloride was detected in 9 of 18 (50%) samples obtained from Well #101A. Vinyl chloride concentrations range from 0.0072 mg/L to 0.1202 mg/L. Vinyl chloride was detected

in 1 of 16 (6%) samples obtained from Well #102A. The detected concentration (0.024 mg/L) is greater than the 0.002 mg/L MCL.

Tributyl Phosphate - TBP was not detected in Wells #26, #28, #101A, or #102A at concentrations greater than the 0.2 mg/L provisional action level.

Additional data are needed to determine if groundwater in the vicinity of Pond 4 has improved. Wells #26, #28, #101A, #102A, and #103A will continue to be monitored monthly.

3.0 Deviations from Workplan

There have been no deviations from the workplan during this quarter. However, the workplan was revised in July to incorporate nineteen changes to better reflect current operating practices and to remove out-of-date license numbers, personnel titles, project lay-out drawings and other references no longer applicable to the project. Changes are as noted below:

Paragraph	Change
.0	Changed Radioactive Material License S-86001-I92 to Ponds Decommissioning License S-86007-G96.
Table 2-1	Added "or package for disposal", changed "Wash" to "Separate" and added "Compact and/or package debris for disposal in Excavation/Sorting/Separation Section. Changed "separation" to "cleaning" in Water Treatment Section.
2.1.2.4	Added "or packaged for off-site burial" in 3rd paragraph.
2.1.2.6	Revised 1st paragraph.
2.1.2.7	Revised 2nd paragraph.
Figure 2-2	Completely revised.
2.2,2.2.1,2.2.2, Figure 2-11 Figure 2-12	Changed "Site D&D Project Manager" to "Director of Environmental Restoration" and "Engineering & Decommissioning Director. To "Vice President Engineering & Decommissioning".

Paragraph	Change
2.2.3	Deleted reference to EcoTek contract engineering support.
2.4	Deleted old paragraph 2.4 and renumbered old Paragraph 2.5 to new paragraph 2.4.
Figure 3-1	Revised location of Separation & Sorting Equipment and location of Personnel Entry/Exit Zone.
3.5.1.	Added "super sacks" to 2nd paragraph.
3.5.1.4	Changed "drums" to "containers" in 3rd bullet item.
3.5.1.4	Revised 4th bullet item.
3.5.2	Deleted old 2nd paragraph on container/filters.
3.5.2	Revised 3rd paragraph.
3.5.4	Changed "Type A" to "IP-1".
3.5.5.1	Changed "LSA/Fissile Exempt" to "LSA-1".
3.6	Changed "October 1992" to "October 1995" in Title 49 reference.
6.0	Added references to Fundamental Nuclear Material Control Plan for SNM of High Enriched Uranium.

4.0 Problems and Solutions

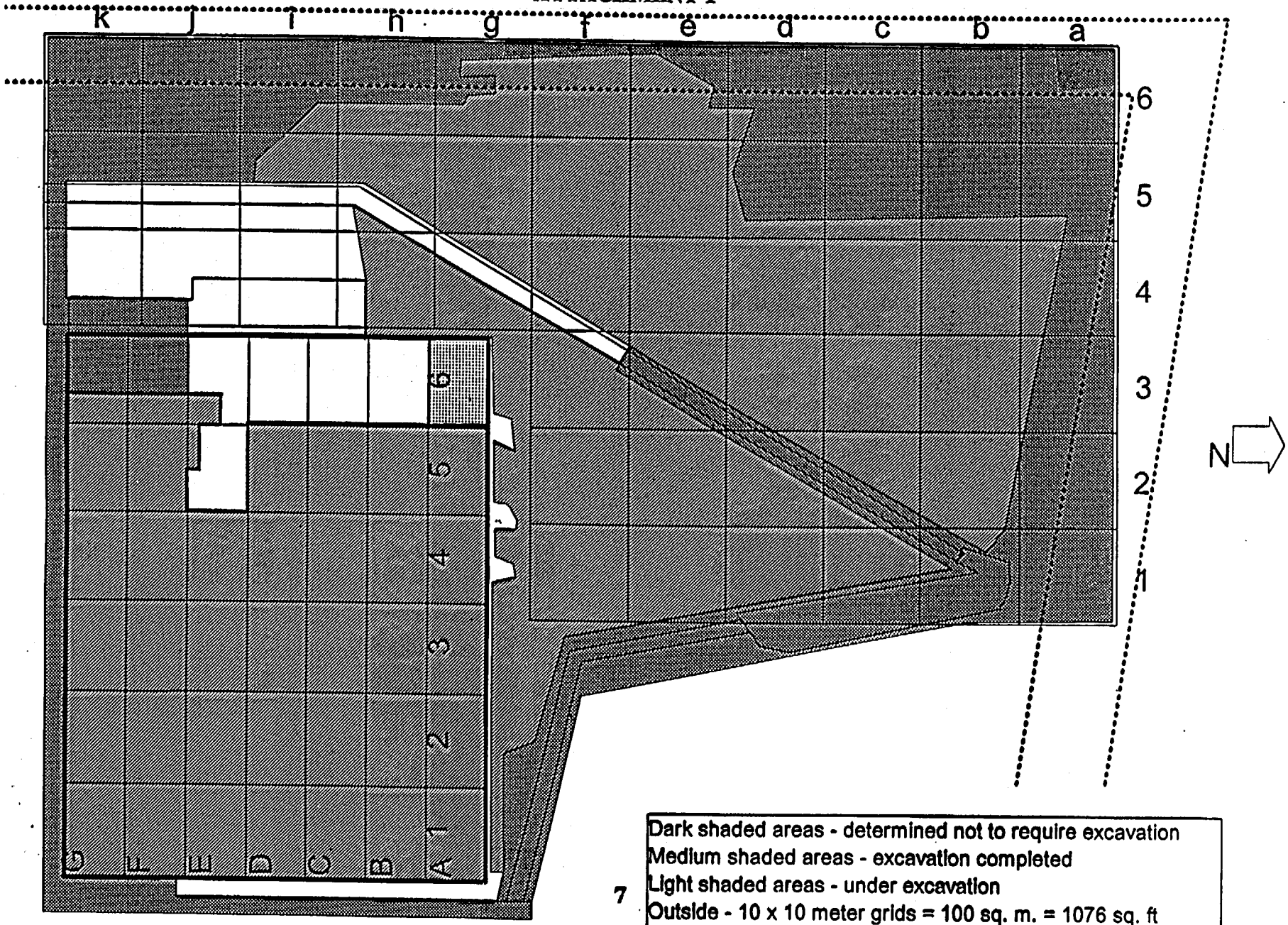
Although the groundwater drawdown wells continue to perform poorly, supplemental pumping of Pond water adjacent to the worksite has maintained groundwater elevation sufficient to support full excavation of waste and debris. No new problems have surfaced this quarter.

5.0 Work Projected

Work projected for the fourth quarter of 1996 includes:

- Continue drawdown and treatment of well and pond water.
- Continue operation of the soil sorting and separation process.
- Continue excavation of waste materials.
- Continue generation of burial boxes of excavated debris.

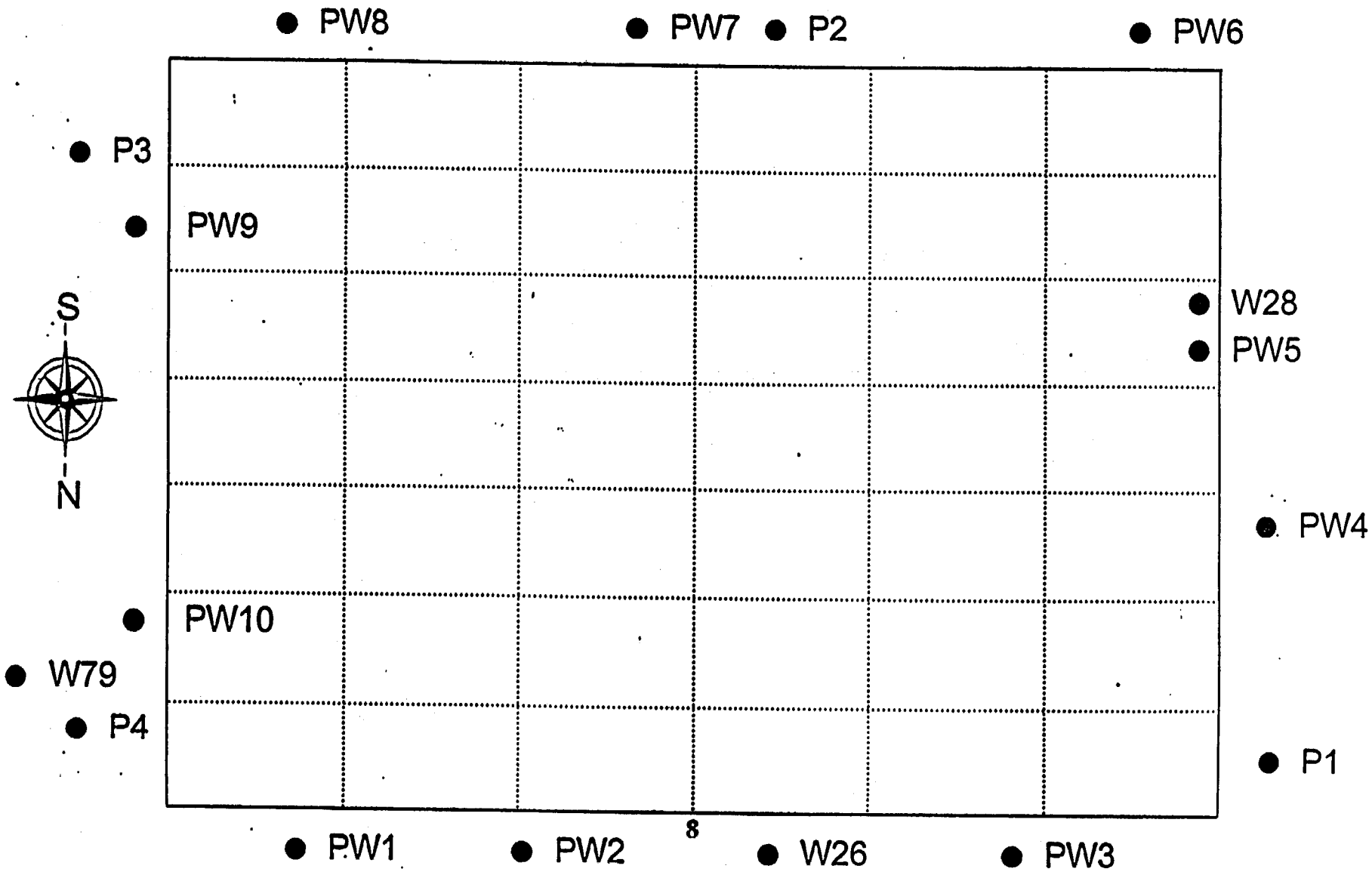
ATTACHMENT 1



Dark shaded areas - determined not to require excavation
Medium shaded areas - excavation completed
Light shaded areas - under excavation
Outside - 10 x 10 meter grids = 100 sq. m. = 1076 sq. ft
Inside - 20 x 30 foot grids = 600 sq. ft..

ATTACHMENT 2

WELL LOCATIONS - BUILDING 410



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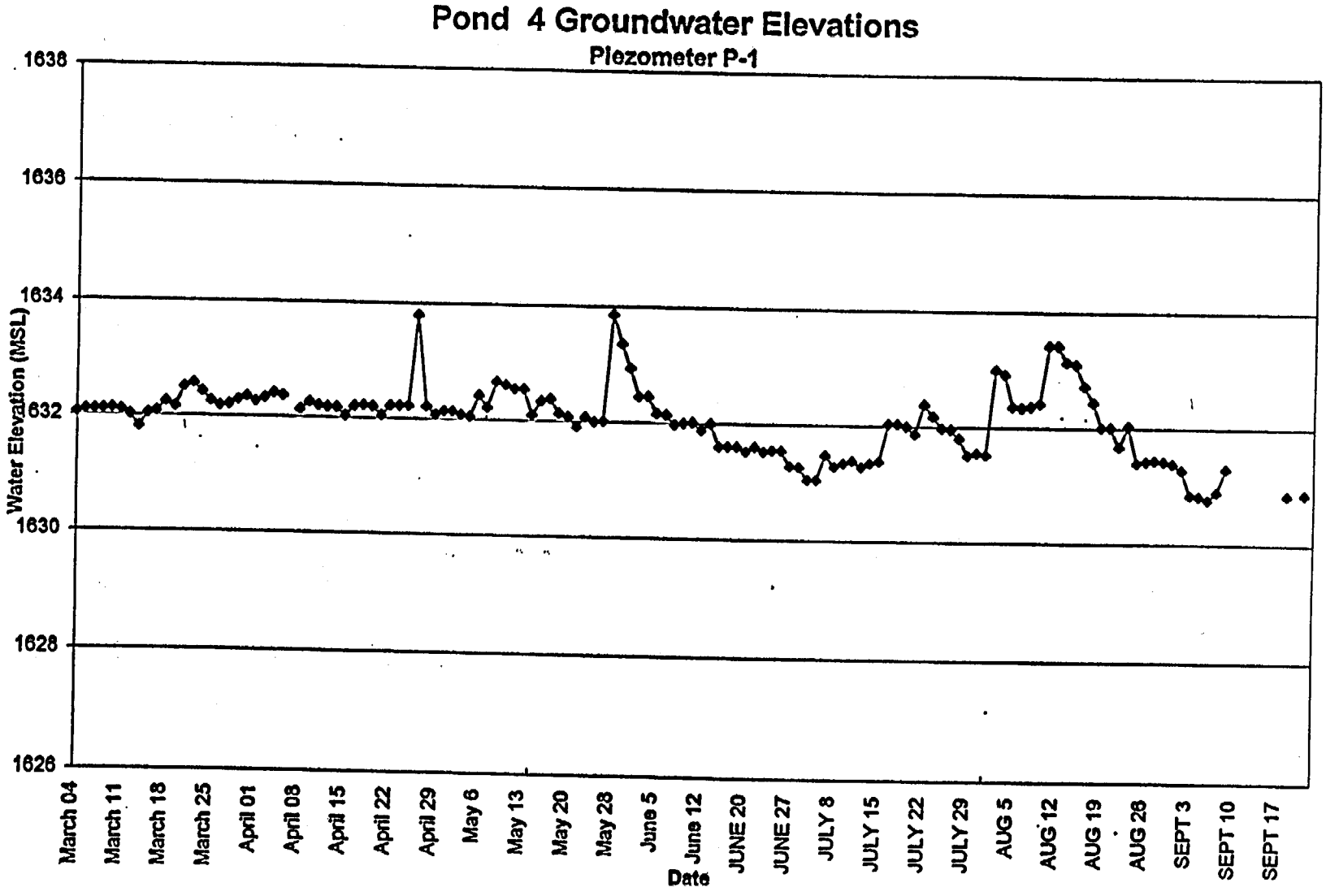
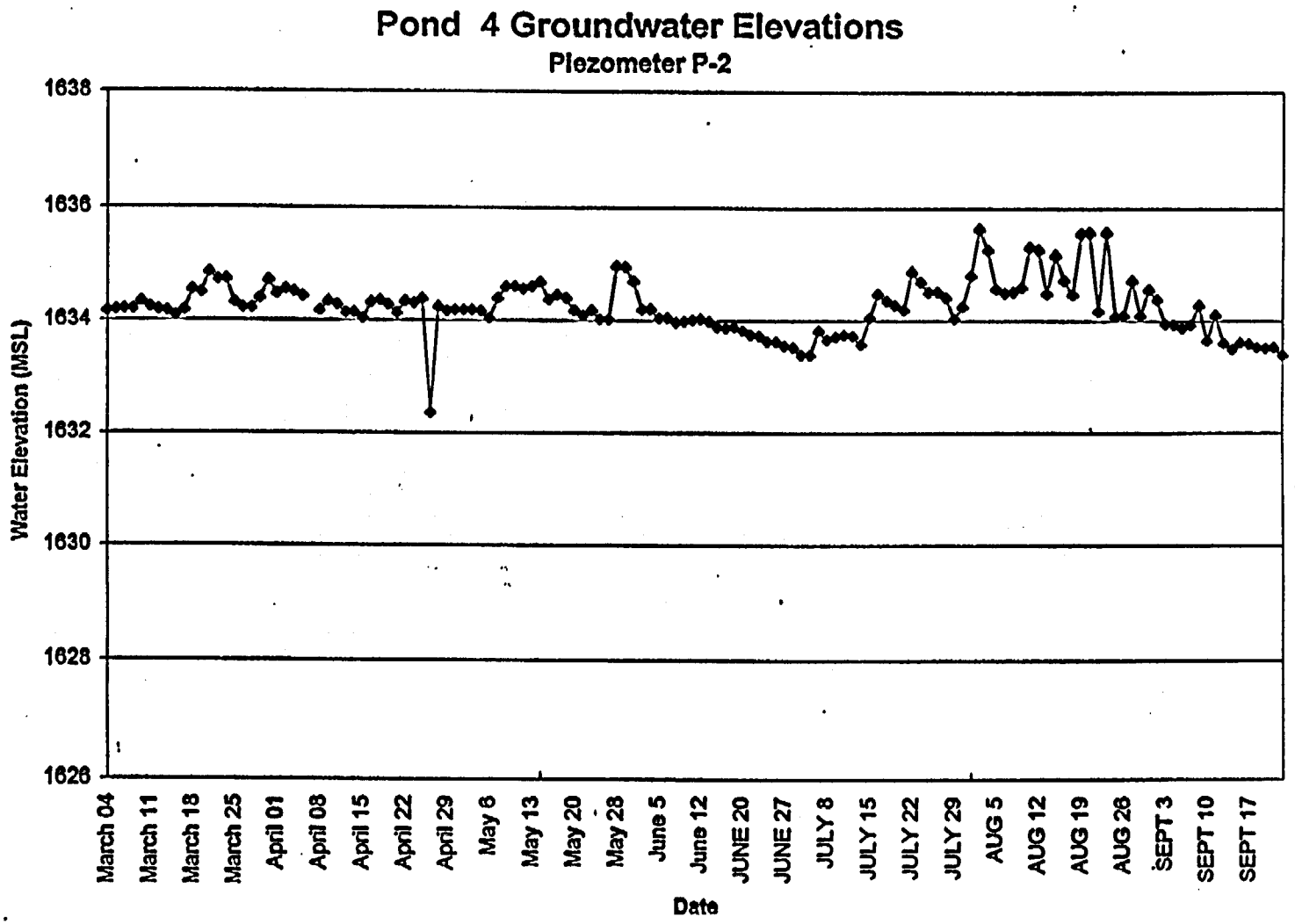


ATTACHMENT 4



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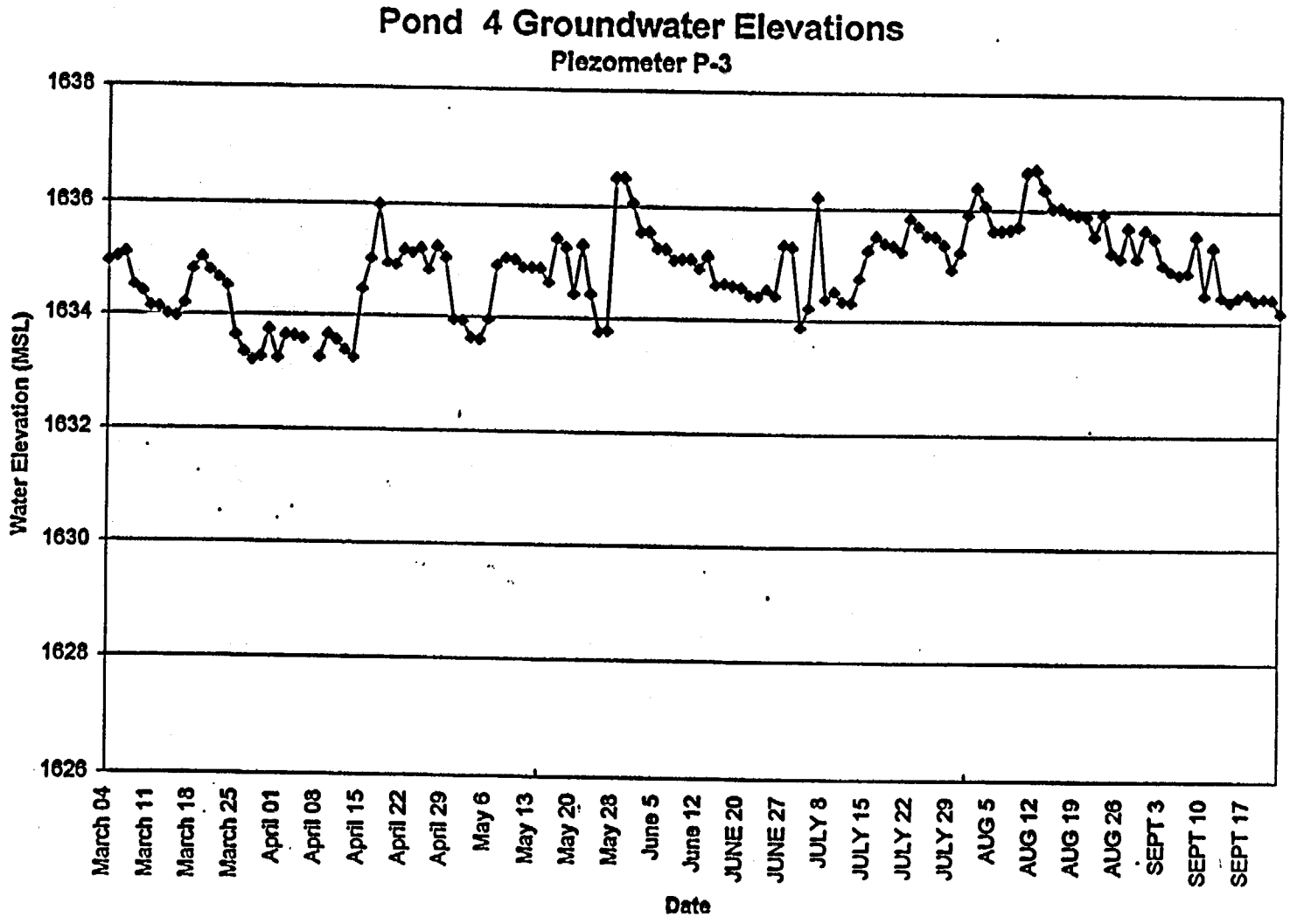

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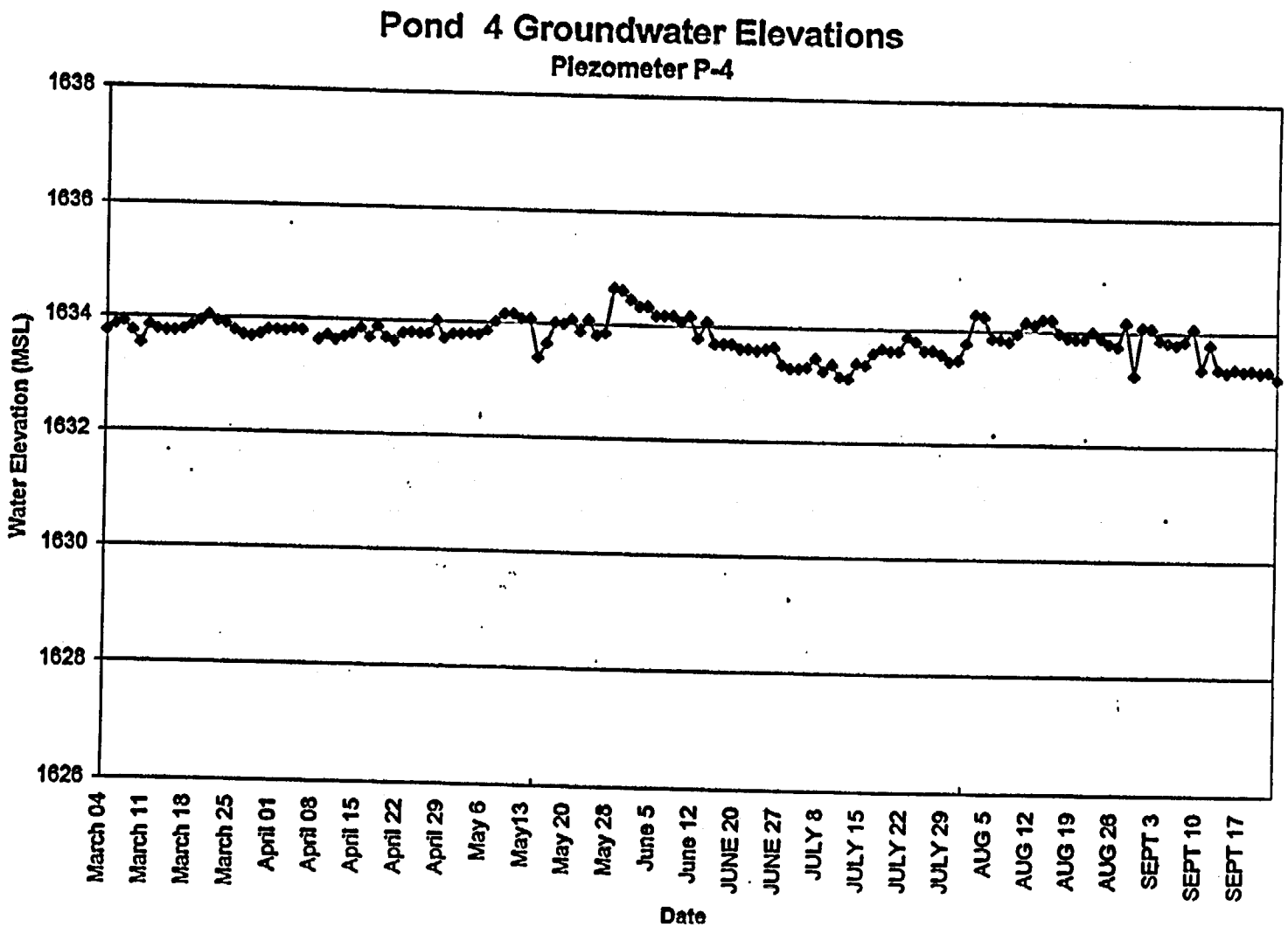

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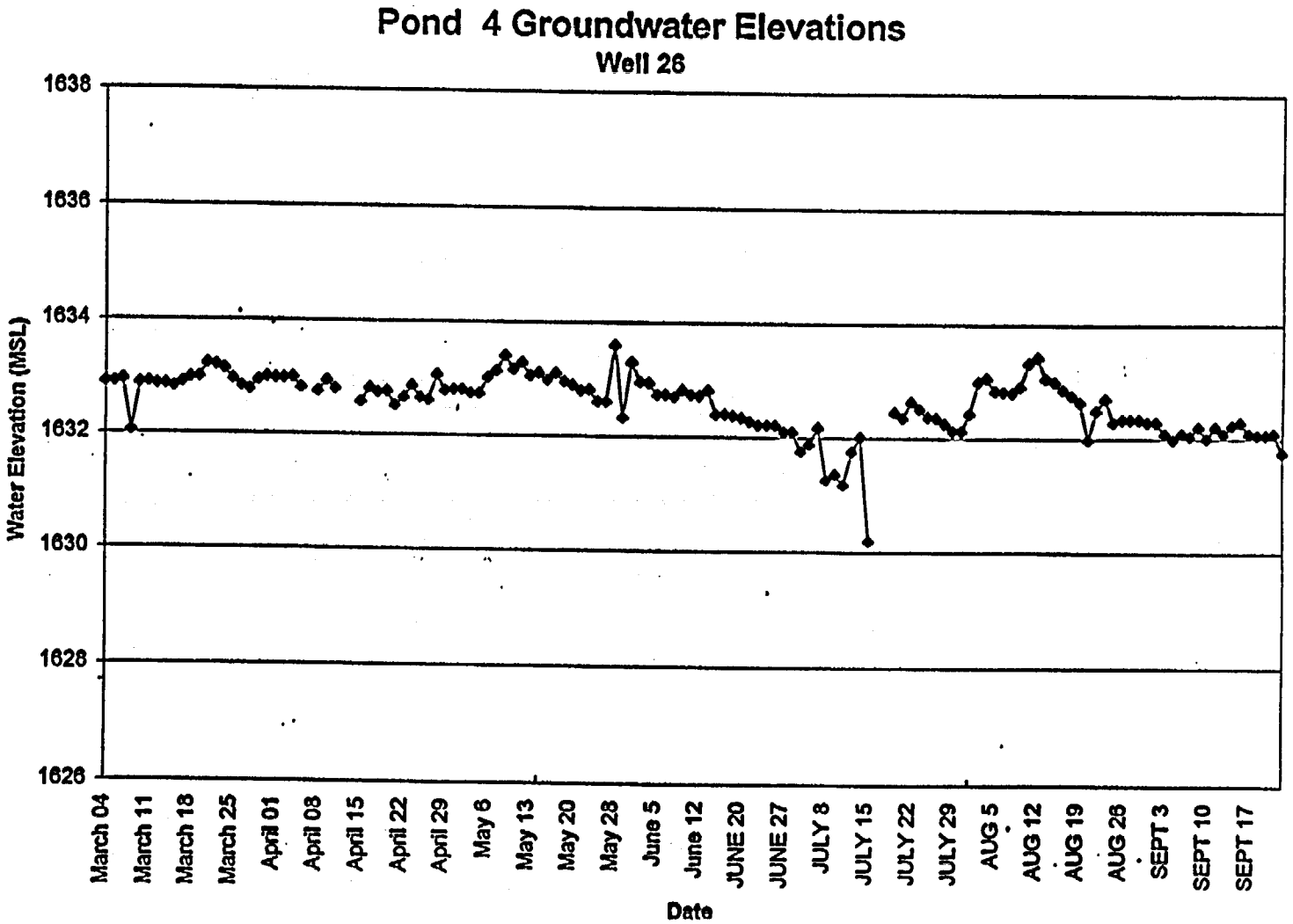
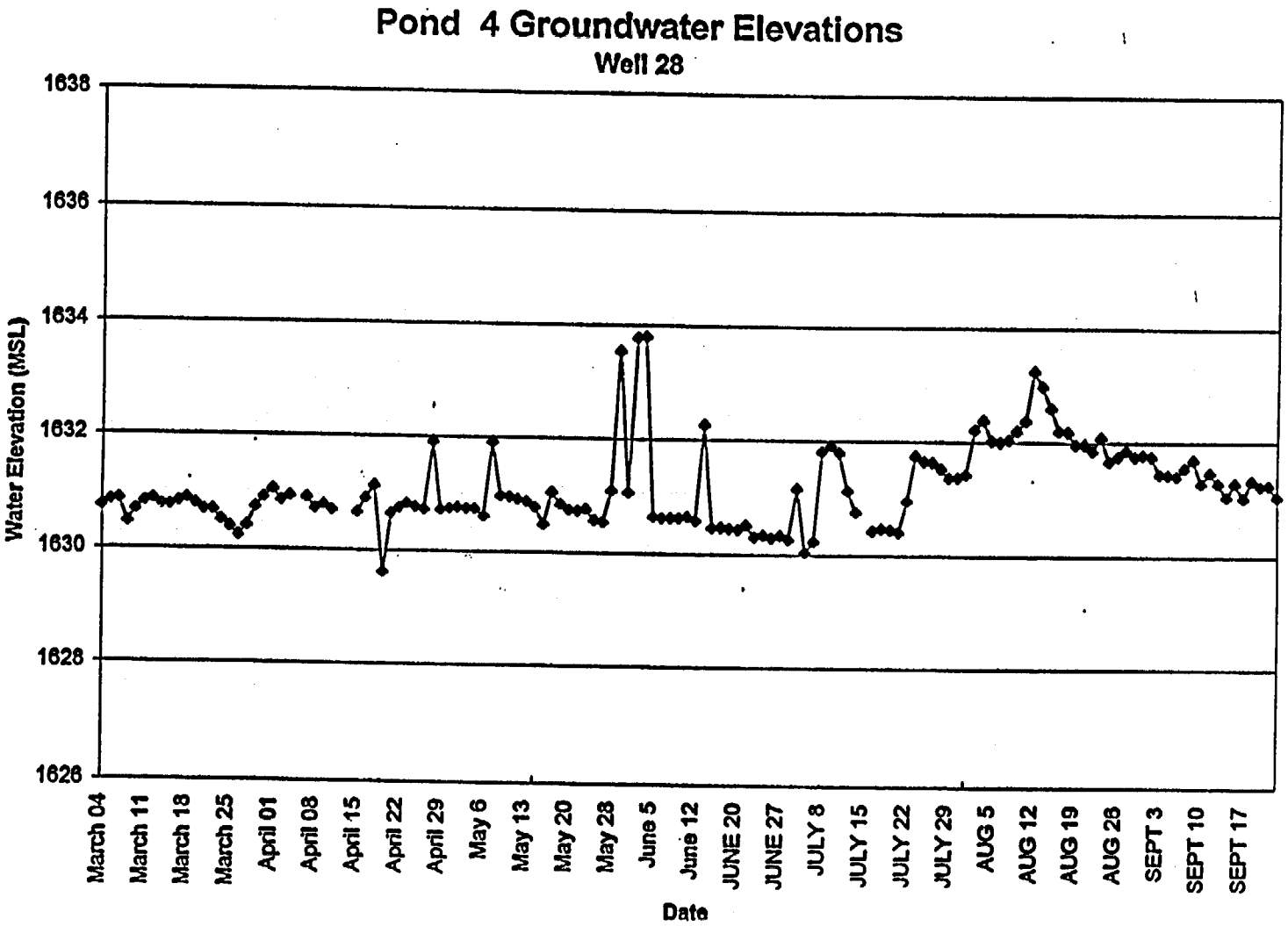
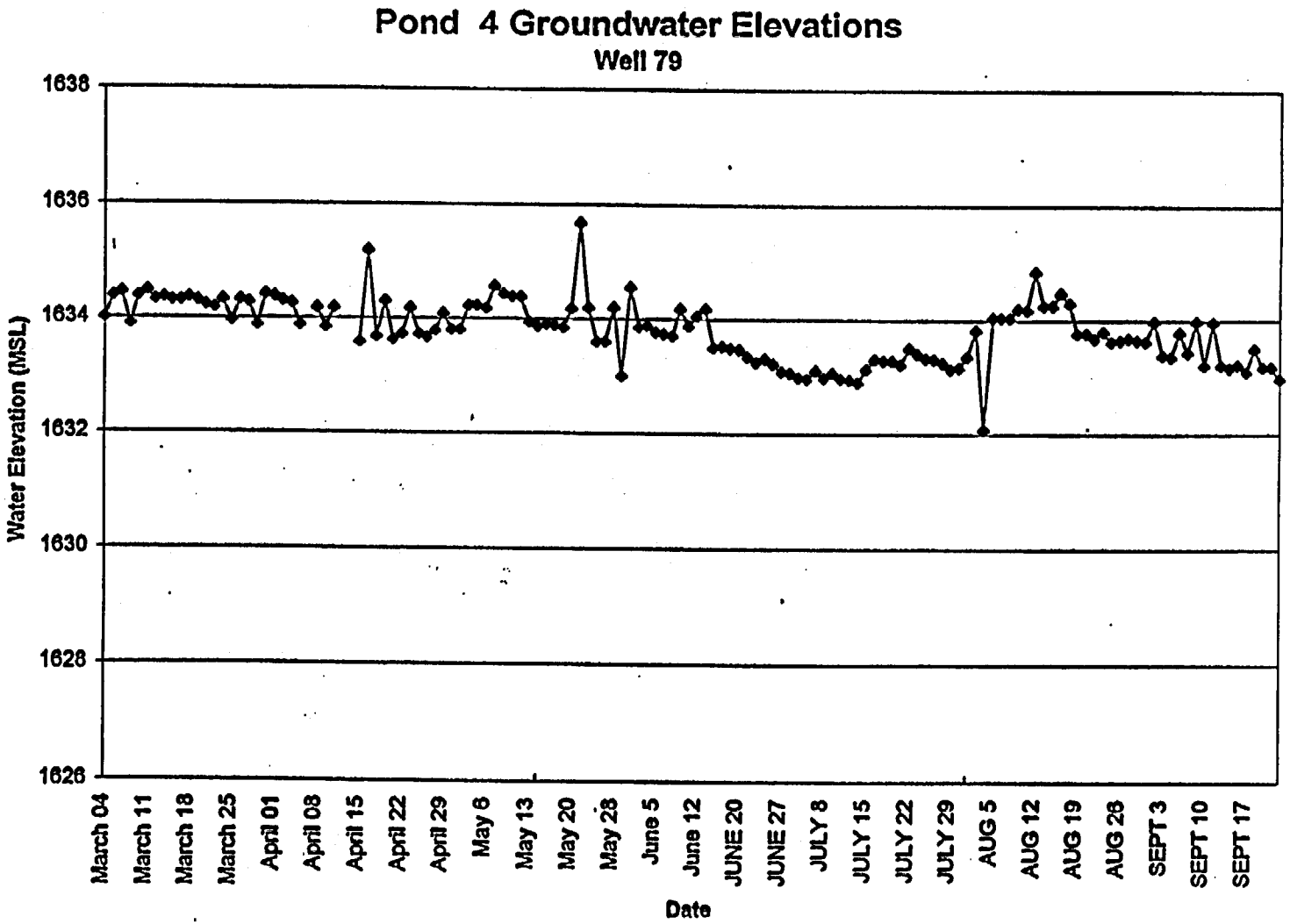


ATTACHMENT 8



ATTACHMENT 9



ATTACHMENT 10

Analytical Results For Constituents Detected in Pond 4 Groundwater Influent

Date Collected	1,2 Dichloro-ethylene (mg/l)	Tetrachloro-thylene (mg/l)	Trichloro-ethylene (mg/l)	Vinyl Chloride (mg/l)	Tributyl Phosphate (mg/l)	Bis(2-ethylhexyl) phthalate (mg/l)	Di-n-octyl phthalate (mg/l)
08/16/94	0.100	0.290	0.098	< 0.025	ND	0.006	< 0.010
09/01/94	0.293	2.814	0.261	0.065	30.000	< 0.030	< 0.030
10/03/94	0.312	2.517	0.309	0.087	12.187	< 0.030	< 0.030
12/05/94	0.138	1.789	0.280	0.020	8.016	< 0.030	< 0.030
01/03/95	0.389	1.221	4.101	0.072	15.000	< 0.030	< 0.030
02/03/95	0.304	4.813	0.790	0.036	1.053	< 0.030	< 0.030
03/03/95	0.114	1.915	0.019	< 0.005	8.386	< 0.030	< 0.030
04/03/95	0.584	5.087	0.409	< 0.005	0.100	< 0.030	< 0.030
05/03/95	0.259	0.782	0.209	0.126	0.130	< 0.030	< 0.030
06/04/95	0.421	4.477	0.322	< 0.005	0.108	< 0.030	< 0.030
07/06/95	0.740	7.277	0.837	0.109	20.972	< 0.030	< 0.030
07/12/95	0.708	2.598	0.318	< 0.005	2.746	2.598	< 0.030
07/17/95	0.439	2.435	0.358	< 0.005	0.498	< 0.030	< 0.030
07/24/95	0.850	10.609	1.782	< 0.005	13.741	< 0.030	< 0.030
07/31/95	0.809	5.713	0.678	< 0.005	6.088	< 0.030	< 0.030
08/06/95	0.990	11.214	2.159	< 0.005	23.027	< 0.030	< 0.030
08/08/95	0.588	7.419	0.997	< 0.005	ND	ND	ND
08/14/95	0.904	7.473	1.303	< 0.005	< 0.030	< 0.030	< 0.030
08/29/95	0.273	2.427	0.242	< 0.005	0.904	< 0.030	< 0.030
09/19/95	0.241	2.471	0.305	< 0.005	8.700	< 0.030	< 0.030
09/26/95	0.341	2.740	0.265	< 0.005	< 0.030	< 0.030	< 0.030
10/03/95	0.493	4.505	0.266	< 0.005	0.396	< 0.030	< 0.030
10/09/95	0.106	1.499	0.069	< 0.005	1.498	< 0.030	< 0.030
10/17/95	0.801	0.801	1.098	< 0.005	10.783	< 0.030	< 0.030
10/25/95	0.668	6.950	1.239	0.117	10.242	< 0.030	< 0.030
10/31/95	0.817	8.424	1.333	< 0.005	13.489	< 0.030	< 0.030
11/08/95	0.662	6.872	0.876	< 0.005	13.658	< 0.030	< 0.030
11/14/95	0.600	5.287	0.829	< 0.005	5.794	< 0.030	< 0.030
11/20/95	1.016	8.551	1.423	< 0.005	6.208	< 0.030	< 0.030
11/28/95	0.680	5.783	1.034	0.104	5.507	< 0.030	< 0.030
12/04/95	0.943	9.075	1.353	< 0.005	12.042	< 0.030	< 0.030
12/11/95	0.427	2.930	0.462	< 0.005	0.577	< 0.030	< 0.030
12/18/95	0.720	6.452	1.184	< 0.005	9.244	< 0.030	< 0.030
12/26/95	1.406	12.295	2.372	< 0.005	2.704	< 0.030	< 0.030
01/02/96	1.389	12.809	1.458	< 0.005	28.572	< 0.030	< 0.030
01/08/96	1.274	13.293	1.736	< 0.005	19.626	< 0.030	< 0.030
01/19/96	0.888	8.365	0.136	< 0.005	21.486	< 0.030	< 0.030
01/27/96	0.859	4.595	0.773	0.432	22.746	< 0.030	< 0.030
01/30/96	0.904	5.481	1.019	< 0.005	9.837	< 0.030	< 0.030
03/01/96	0.219	1.040	0.201	< 0.005	0.079	< 0.030	< 0.030
03/08/96	0.186	0.815	0.207	< 0.005	0.356	< 0.030	< 0.030
03/17/96	0.338	0.962	0.458	< 0.005	0.060	< 0.030	< 0.030
03/18/96	0.325	0.914	0.465	< 0.005	0.060	< 0.030	< 0.030
03/29/96	0.740	0.958	0.769	< 0.005	0.043	< 0.030	< 0.030
04/04/96	0.774	1.138	0.821	< 0.005	0.045	< 0.030	< 0.030
04/10/96	0.781	1.130	0.844	< 0.005	0.055	< 0.030	< 0.030
04/19/96	0.380	0.671	0.473	< 0.005	0.046	< 0.030	< 0.030
04/22/96	1.048	0.655	0.551	< 0.005	0.058	< 0.030	< 0.030
04/30/96	0.893	1.940	1.782	0.167	0.178	< 0.030	< 0.030
05/07/96	0.245	0.367	0.398	< 0.005	< 0.030	< 0.030	< 0.030
05/13/96	0.706	1.497	1.431	0.122	0.048	< 0.030	< 0.030
05/22/96	0.632	0.617	0.997	0.097	< 0.030	< 0.030	< 0.030
05/28/96	0.492	0.638	0.820	0.090	< 0.030	< 0.030	< 0.030

ATTACHMENT 10
(Continued)

Analytical Results For Constituents Detected in Pond 4 Groundwater Influent

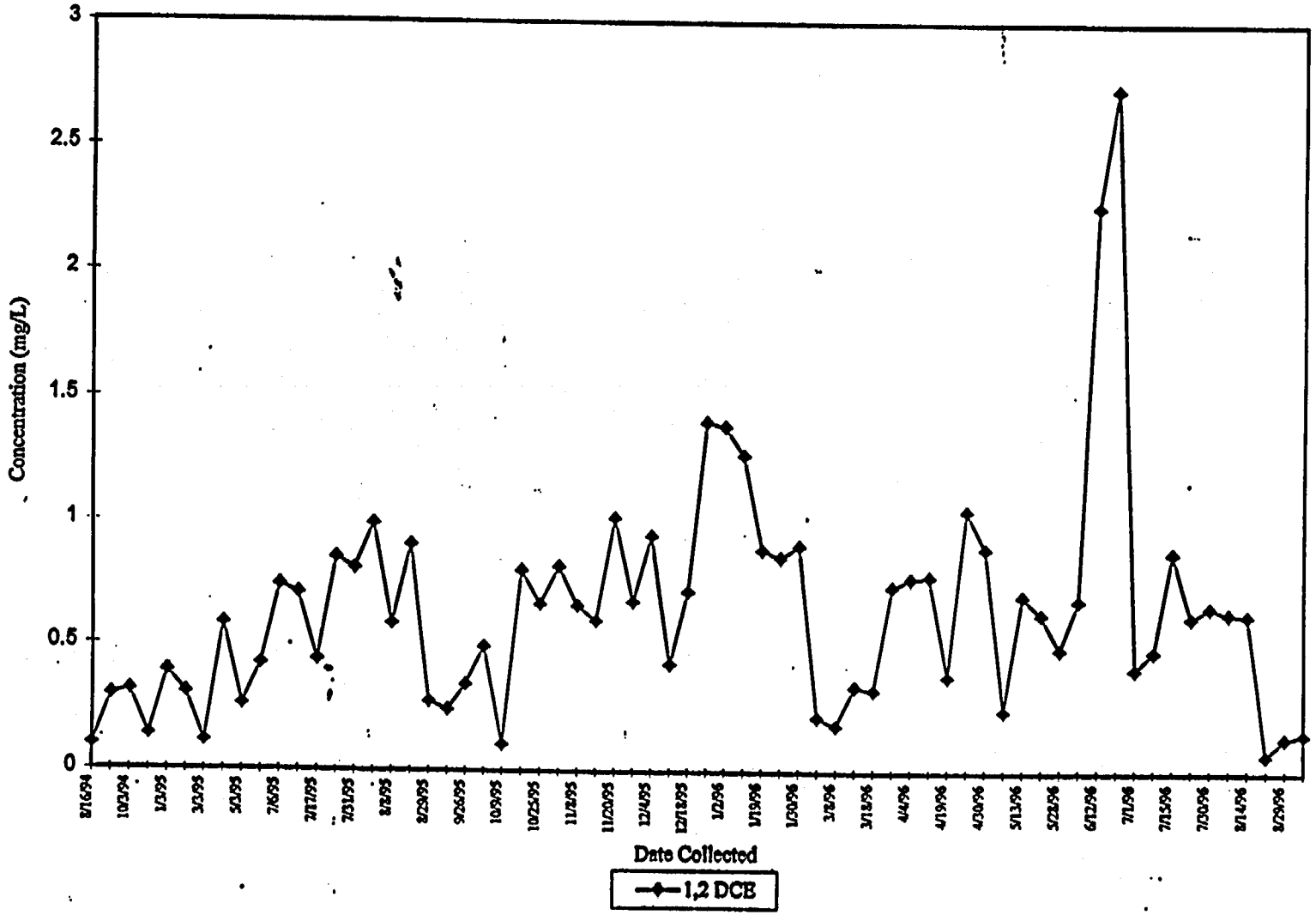
Date Collected	1,2 Dichloro-ethylene (mg/l)	Tetrachloro-thylene (mg/l)	Trichloro-ethylene (mg/l)	Vinyl Chloride (mg/l)	Tributyl Phosphate (mg/l)	Bis(2-ethylhexyl) phthalate (mg/l)	Di-n-octyl phthalate (mg/l)
06/04/96	0.689	0.441	0.962	< 0.005	0.614	< 0.030	< 0.030
06/12/96	2.269	1.076	1.905	0.684	0.334	< 0.030	< 0.030
06/17/96	2.734	0.949	2.195	0.668	0.508	< 0.030	< 0.030
07/01/96	0.411	0.618	0.424	< 0.005	< 0.030	< 0.030	< 0.030
07/08/96	0.483	0.675	0.457	0.575	< 0.030	< 0.030	< 0.030
07/15/96	0.878	4.402	2.201	0.631	0.372	< 0.030	< 0.030
07/24/96	0.621	0.918	0.415	0.368	0.034	< 0.030	< 0.030
07/30/96	0.661	0.838	0.283	0.360	0.043	< 0.030	< 0.030
08/07/96	0.637	0.727	0.338	0.215	< 0.030	< 0.030	< 0.030
08/14/96	0.628	0.833	0.559	0.251	< 0.030	< 0.030	< 0.030
08/21/96	0.072	< 0.080	0.107	< 0.050	< 0.030	< 0.030	< 0.030
08/29/96	0.140	0.268	0.124	< 0.050	< 0.030	< 0.030	< 0.030
09/06/96	0.156	0.391	0.151	< 0.050	< 0.030	< 0.030	< 0.030
Mean	0.645	3.603	0.834	0.087	5.459	0.069	0.030
Standard Deviation	0.454	3.509	0.725	0.167	7.899	0.316	0.002
No. of Observations	66	66	66	66	64	65	65
t-value	1.296	1.296	1.296	1.296	1.296	1.296	1.296
90% Upper Confiden	0.718	4.163	0.949	0.114	6.738	0.120	0.030
Action Level	0.07	0.005	0.005	0.002	0.2	0.003	0.7

NOTES:

The contracted laboratory was EcoTek, LSI, located in Atlanta, Georgia for the sample collected on 8/16/95, all other samples were analyzed by NFS' on-site laboratory.
Action Levels based on US EPA Maximum Contaminant Levels (MCL) for drinking water (May 1995).
< Less than detection limit
ND No data

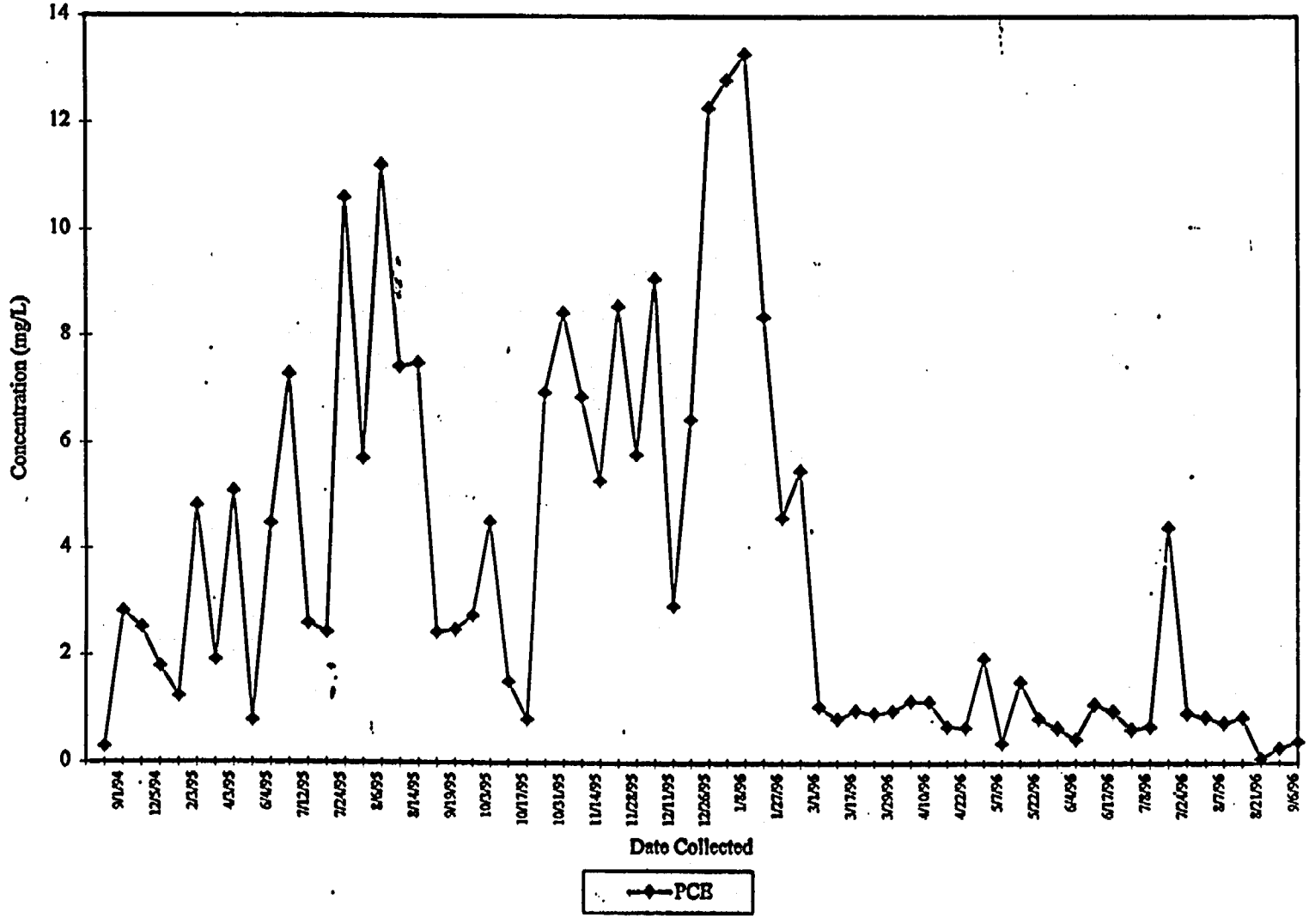
ATTACHMENT 11

1,2 DCE Results for Pond 4



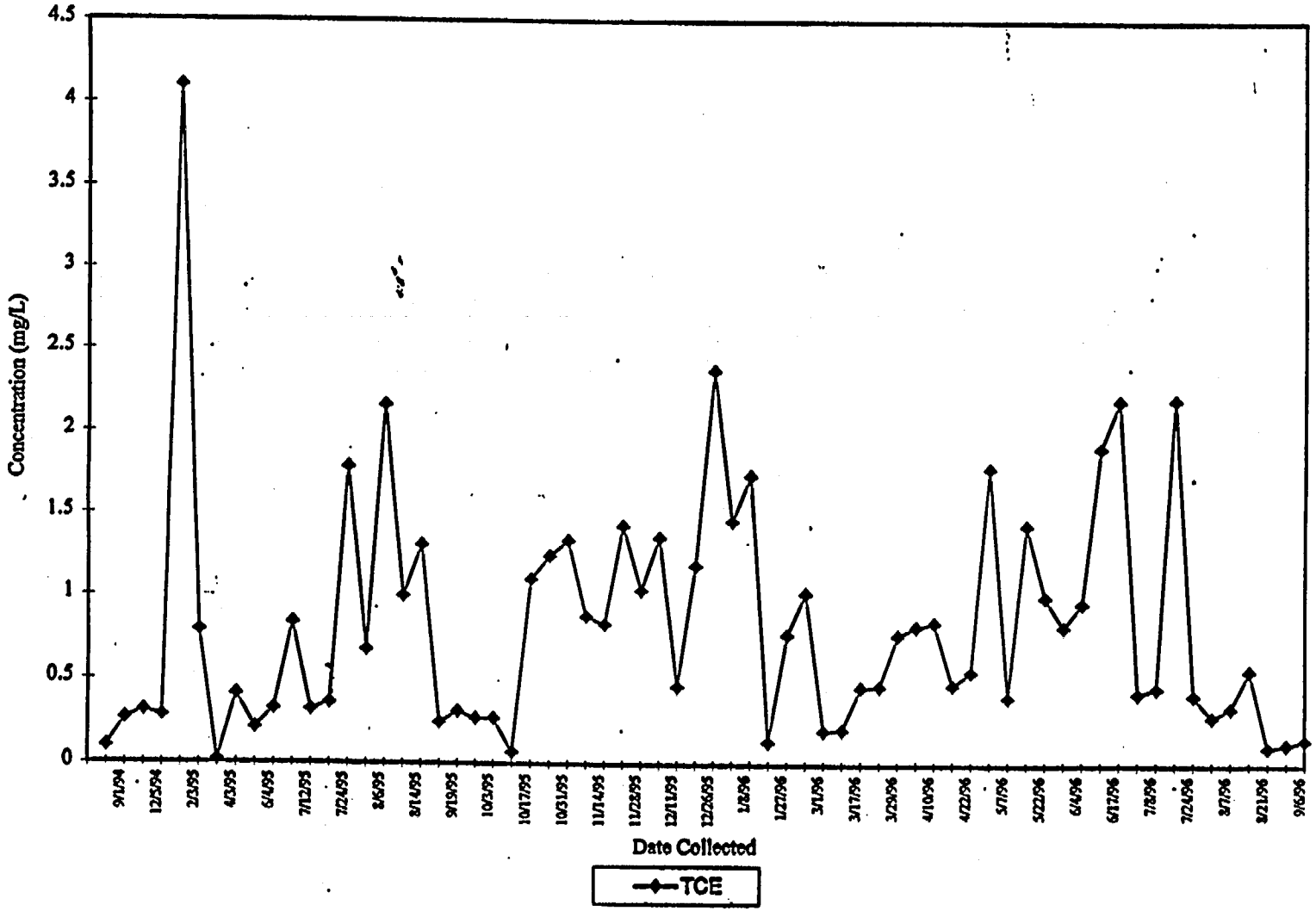
ATTACHMENT 12

PCE Results for Pond 4



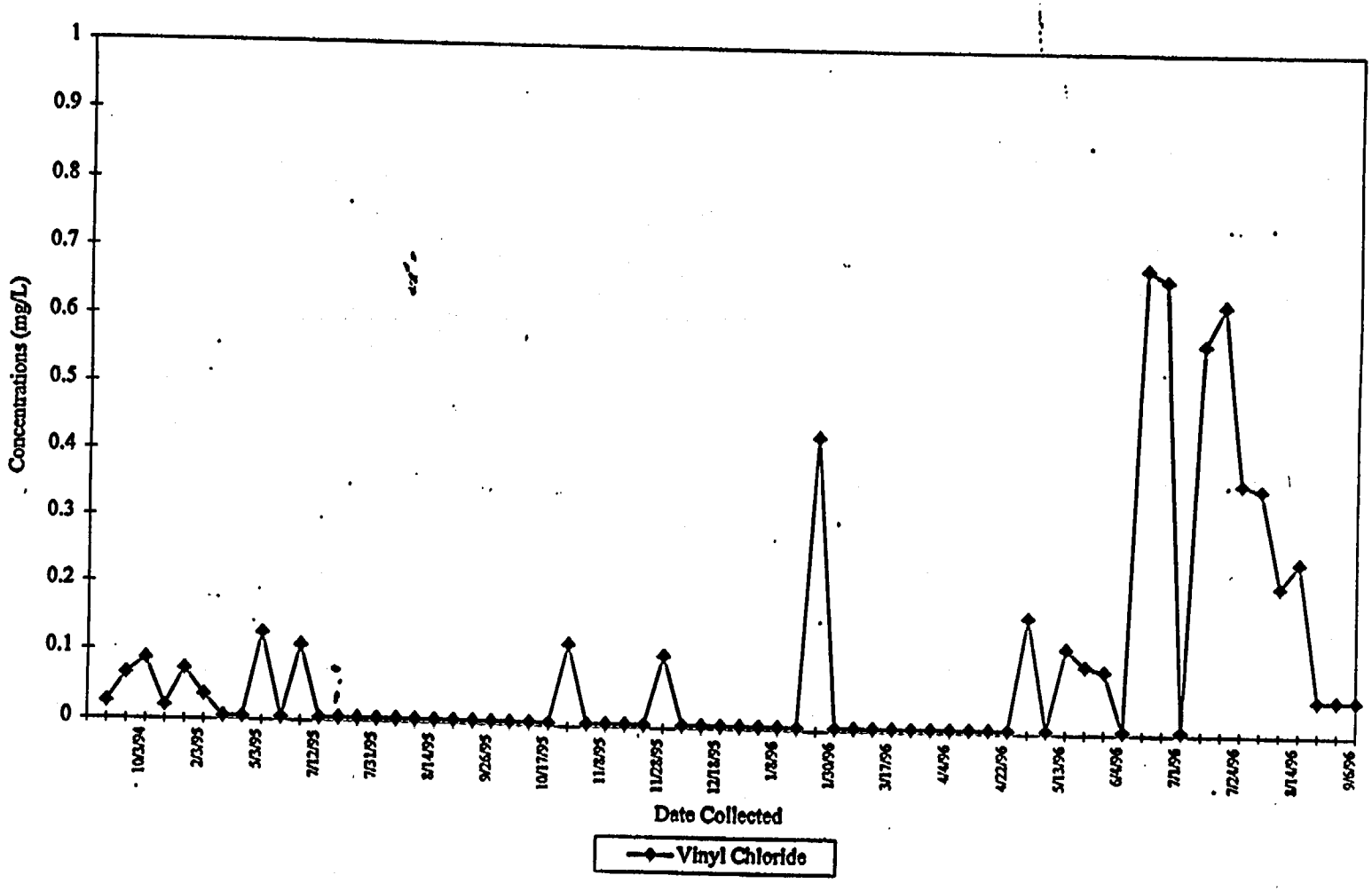
ATTACHMENT 13

TCE Results for Pond 4



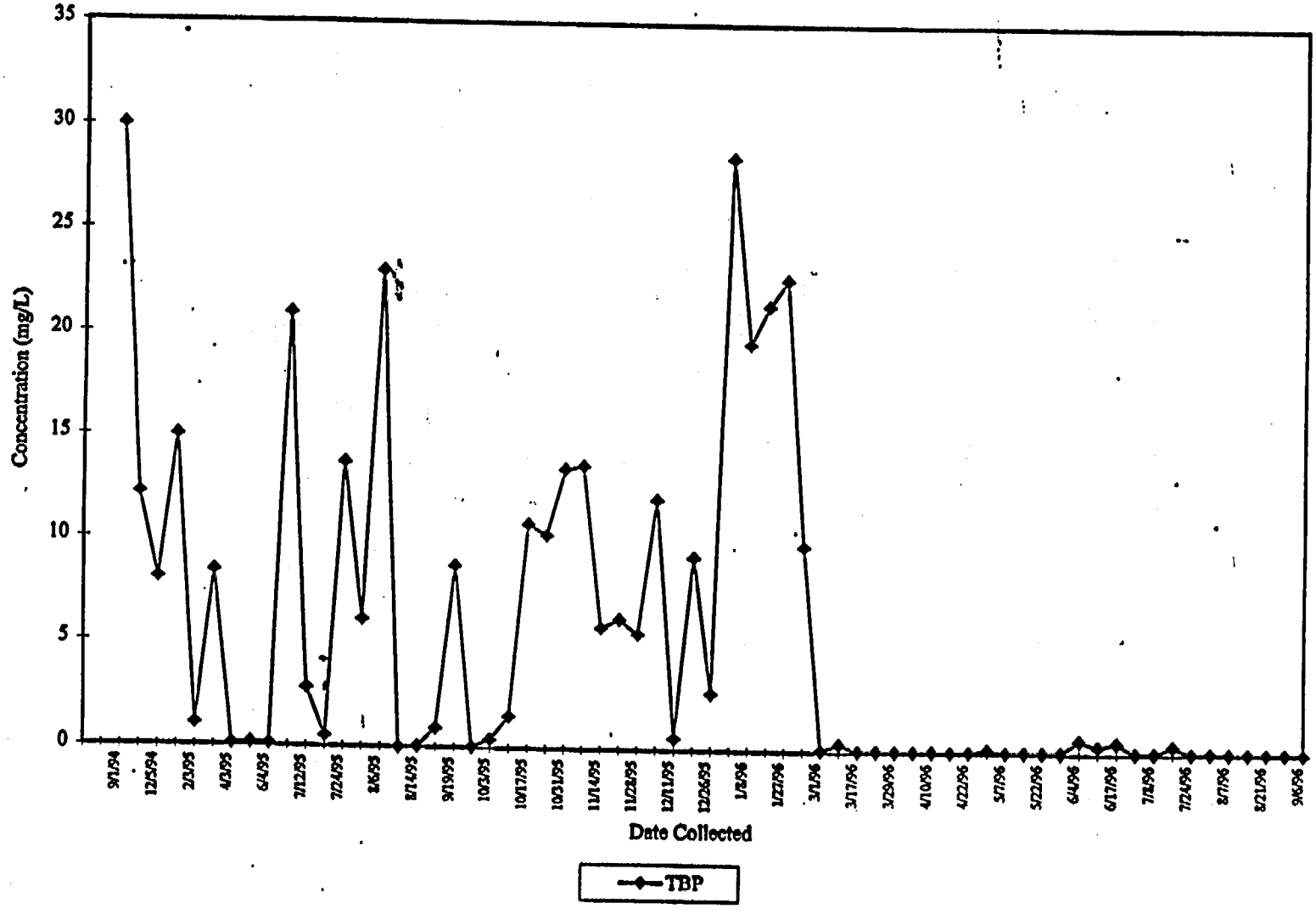
ATTACHMENT 14

Vinyl Chloride Results for Pond 4



ATTACHMENT 15

TBP Results for Pond 4



ATTACHMENT 16

Analytical Results for Wells 26,28,101A, and 102A

Date Collected	Tetrachloroethylene (mg/L)				Vinyl Chloride (mg/L)				Tributyl Phosphate (mg/L)			
	Well 26	Well 28	Well 101A	Well 102A	Well 26	Well 28	Well 101A	Well 102A	Well 26	Well 28	Well 101A	Well 102A
7/29/92	...	0.5900	...	...	...	J 0.0060	...	...	...	< 0.0100	...	...
11/93	...	...	0.1140	...	...	...	0.0540	...	...	...	< 0.005	...
2/94	...	...	0.1550	...	...	...	0.0470	...	...	...	< 0.1180	...
5/94	...	...	...	...	...	...	...	...	...	...	...	< 0.005
7/94	0.0006	...	...	...	< 0.005	...	...	...	0.0049	...	...	...
8/94	0.0002	0.4407	...	...	< 0.005	0.1324	...	...	0.0100	0.1400	...	...
9/94	0.0020	...	0.0056	0.3990	< 0.005	...	0.0080	< 0.005	...	...	...	...
10/94	0.0032	0.6608	0.0035	0.6290	< 0.005	0.0263	< 0.005	< 0.005	< 0.005	0.0270	0.0354	< 0.030
11/94	0.0024	0.2935	...	...	< 0.005	0.0183	...	...	< 0.0178	0.0463	< 0.030	< 0.005
12/94	0.0016	0.9518	...	...	< 0.005	0.0371	...	...	0.0196	0.1230	...	...
1/95	0.0240	1.3089	...	...	< 0.005	0.0996	...	...	< 0.030	< 0.030	...	...
2/95	0.0010	1.2872	0.0152	0.8972	< 0.005	0.0429	0.0072	< 0.005	< 0.030	< 0.030	0.0780	< 0.030
3/95	0.0013	2.1725	...	...	< 0.005	0.1884	...	...	< 0.030	< 0.030	...	...
4/95	0.0060	1.6870	...	...	< 0.005	0.1630	...	...	< 0.030	0.1280	...	...
5/95	0.0040	1.5450	0.0110	0.8793	< 0.005	0.1400	< 0.005	< 0.005	< 0.030	0.1160	0.0510	< 0.030
6/95	0.0020	1.4380	< 0.0001	0.8093	< 0.005	0.0970	< 0.005	< 0.005	< 0.030	0.0730	0.0380	< 0.030
7/95	0.0030	1.4110	0.0158	1.0540	< 0.005	< 0.005	< 0.005	< 0.005	< 0.030	0.0360	0.0340	< 0.030
8/95	0.0020	1.4850	0.0124	0.9247	< 0.005	0.1370	< 0.005	< 0.005	< 0.030	< 0.030	0.0310	< 0.030
9/95	0.0024	1.0114	0.0425	1.1948	< 0.005	0.1007	< 0.005	< 0.005	< 0.030	0.0640	0.0360	< 0.030
10/95	0.0028	1.7980	0.0107	1.2033	< 0.005	0.2037	< 0.005	< 0.005	< 0.030	0.1050	0.0320	< 0.030
11/95	0.0038	1.6046	0.0236	0.9979	< 0.005	0.1919	< 0.005	< 0.005	< 0.030	0.1350	0.0520	< 0.030
12/95	0.0018	...	0.0588	0.6224	< 0.005	...	0.0314	< 0.005	< 0.030	...	0.0990	< 0.030
1/96	0.0040	1.9221	0.0524	0.2363	< 0.005	< 0.005	0.0830	< 0.005	< 0.030	< 0.030	0.0680	< 0.030
2/96	...	...	...	...	...	...	...	...	...	...	...	...
3/96	< 0.0001	1.7608	...	...	< 0.005	0.1561	...	...	< 0.030	0.0740	...	...
4/96	0.0063	1.9627	< 0.0001	1.2063	< 0.005	0.3165	< 0.005	< 0.005	< 0.030	0.1540	0.0480	< 0.030
5/96	0.0057	1.8598	< 0.0001	1.5342	< 0.005	0.1365	0.0260	0.024	< 0.030	0.1680	0.0440	< 0.030
6/96	0.0089	1.6155	0.0824	0.9828	< 0.005	0.3601	0.1146	< 0.005	< 0.030	0.1080	0.0420	< 0.030
7/96	0.0085	0.2134	< 0.0001	1.0688	< 0.005	< 0.005	0.1202	< 0.005	< 0.030	< 0.030	0.0410	< 0.030
Mean	0.0041	1.3182	0.0335	0.9150	0.0050	0.1176	0.0298	0.0062	0.0260	0.0787	0.0490	0.0271
Standard Deviation	0.0048	0.5583	0.0429	0.3154	0.0000	0.0965	0.0377	0.0046	0.0082	0.0489	0.0261	0.0081
No. Observations	24	22	18	16	24	22	18	16	23	22	18	17
t-value	1.319	1.323	1.333	1.341	1.319	1.323	1.333	1.341	1.321	1.323	1.333	1.337
90% Conf. Limit	0.0053	1.4756	0.0470	1.0207	0.005	0.1448	0.0416	0.0077	0.0282	0.0905	0.0572	0.0297
Action Level	0.005	0.005	0.005	0.005	0.002	0.002	0.002	0.002	0.2*	0.2*	0.2*	0.2*

NOTES:

Action Levels based on US EPA Maximum Contaminant Levels (MCL) for drinking water (February 1996).
* - Provisional action level based on Issue Paper (1992), verified with USEPA RCRA Health Assessment Office (May 1996)
< Less than detection limit
... No sample collected
Analysis performed by NFS

Pond4-wells.xls