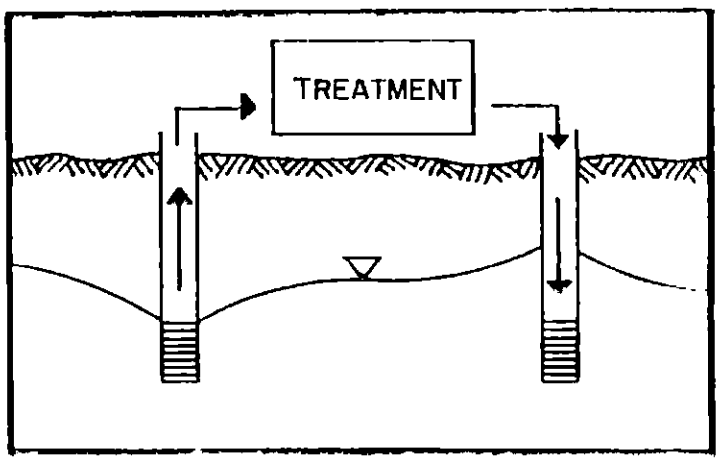
REMEDIAL INVESTIGATION / FEASIBILITY STUDY
PHASE I SAMPLING REPORT

RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

PREPARED FOR

S.J. & J. SERVICE STATIONS, INC.



REVISED
JUNE, 1990

fanning, phillips & molnar
ENGINEERS
MONTGOMERY NEW YORK

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PREFACE

This report is a continuum of the "Remedial Investigation/Feasibility Study Sampling Plan prepared for SJ&J Service Station Inc., 1988. It will present a brief summary of the site setting, the sampling plan, and previous sampling. The report will then focus on the Results of Stage I Sampling, the Discussions and Conclusions, and the Recommendations.

SUMMARY OF THE STAGE I SAMPLING PLAN

The former Kenmark Textile Corporation Site, now occupied by Susquehanna Textile Corporation, located at Conklin Avenue, in Farmingdale, New York had been placed on the Federal EPA and New York State inactive hazardous waste list because of repeated violations of the State Pollution Discharge Elimination System law, discharging with only partial treatment to a lagoon (leaching pit) on site. The site has been designated as a Class 2 Site under the New York State Inactive Hazardous Waste Site law. This designation means that the site poses a significant potential threat to the environment and requires the development of an inactive hazardous waste disposal site remedial investigation.

The objective of the March 1988 Remedial Investigation Sampling plan was to determine the nature of the waste and the areal and vertical distribution on the site in a phased approach. Through the execution of the Sampling Plan, much was learned of the past and present operations of the site as well as the environmental setting. Figure 2.1 shows the site location on the USGS Amityville, seven and a half minute (7 1/2) topographic quadrangle. Figure 2.2 shows the site property and layout.

The manufacturing process that occurred at Kenmark is similar to what is occurring: textile printing. This process imparts a colored design on to a fabric by processing dye through a silk screen. In this process, printing pastes or dyes, which were stored and mixed on site, are transferred to the fabric. The fabric is then steamed, aged, or otherwise treated to fix the color to the fabric. The emulsion is washed from the silk screens after they have been used.

Presently, this wastewater is discharged to the Southwest Sewer District. However, in the past, Kenmark discharged this wastewater directly to an unlined lagoon with only partial treatment.

Based upon the sampling and analysis completed by the Suffolk County Department of Health, Lakeland Engineering and the NYSDEC, the sampling of supernatant discharge into the leaching pit has shown one or more violations of GA groundwater standards for COD, pH, MBAS, dissolved solids, suspended solids, chloride, phenols, copper, iron, chromium (hexavalent), silver and lead. Tests were also performed on the hydroxide sludge for EP toxicity and was determined not to be toxic or hazardous waste as per the RCRA toxicity definition. Soil samples obtained by the NYSDEC from the pump house basin, sludge drying beds and from the leaching pit reported the presence of the following metals: cadmium, chromium, copper, zinc, arsenic, lead, mercury, nickel and silver. However, no volatiles, base neutrals, or acid extractables were detected. It was discovered that there were drums of solvents stored on a concrete pad outside the boiler room on the south side of the building. There were also drums of hydroxide sludge stored south of the solvent drum storage area on the cement parking lot.

Based upon the site's past industrial processes and past analysis and parameters identified within the wastewater discharge, a remedial investigation Sampling Plan was proposed and accepted by the New York State Department of Environmental Conservation in May 1988. This report is the result of that Sampling Plan and will be presented as Section 8.0, Results, Section 9.0, Discussions and Conclusions, and Section 10.0, Recommendations.

SECTION 8.0
RESULTS OF STAGE I SAMPLING

The historical and scientific information presented in Sections 2.0, 3.0 and 4.0 of this study has provided a rationale for sampling the soils and groundwater at the SJ&J site. The sampling effort focused on characterizing the soils and groundwater that may have been affected by the past wastewater treatment and discharge area and the former drum area. In addition, the sampling effort also focused on creating a more detailed hydrogeologic setting for the site.

In accordance with the sampling methodology and procedures outlined in Sections 4.0, 5.0 and 6.0 the of sampling plan, data was obtained from the following locations at the site: test boring in former solvent drum storage area (investigation for volatile soil contamination), along pipeline as determined by magnetometer survey and field observation (investigation for metals soil contamination), test boring in leaching pit, (investigation for metals soil contamination) background samples (investigation for metals soil contamination), outside sludge drying beds (investigation for metals and TCL soil contamination), steam cooker area (investigation for metals soil contamination), sludge drying beds (investigation for metals and TCL soil contamination), well borings (investigation for VOC soil contamination), leaching pools (investigation for VOC and metal soil contamination), and groundwater monitoring wells (investigation for TCL, VOC and metal groundwater contamination).

This section of the report will be divided into six (6) Subsections; 8.1 results of geophysical site investigation, 8.2 results of soils sampling and analyses, 8.3 results of groundwater

sampling and analyses, 8.4 results of water samples obtained from industrial wastewater and broken pipe, 8.5 site specific geohydrology, and 8.6 QA/QC. Section 9.0 will present the discussions and conclusions of this study based upon the results presented in this section.

8.1 Results of Geophysical Site Investigation

A magnetometer survey was conducted (using a Schonstedt Heliflux Magnetic Locator Model GA-52B) on site for the purpose of locating a possible underground steel pipe (which may have been used in the past to carry wastewater to the leaching pit). The magnetometer survey was performed by passing the instrument over the ground surface in a grid pattern as shown in Figure 4.1 of this study. The survey area was located between the former sludge drying beds and the leaching pit.

The results of the magnetometer survey indicated anomalous readings occurring at a number of locations within the survey grid. However, field observations indicated that the pipe was located slightly off-set of the anomalies (shown on Figures 8.1 and 8.2).

Boring locations for soil sampling along the pipeline were then finalized by the results of this survey. The results of the samples taken along the pipeline will be discussed in a subsection of 8.2.

8.2 Results of Soil Sampling and Analyses

A total of 57 soil samples were obtained on site and two (2) soil samples were obtained off site (Figure 8.2 shows the sampling locations on site). A summary of the soil sampling for SJ&J is shown in Table 8.1. Table 8.1 lists the sample ID# and sample location, the date of sampling, the sample depth interval, the date the sample was submitted to the lab, a physical description of the sample, and the

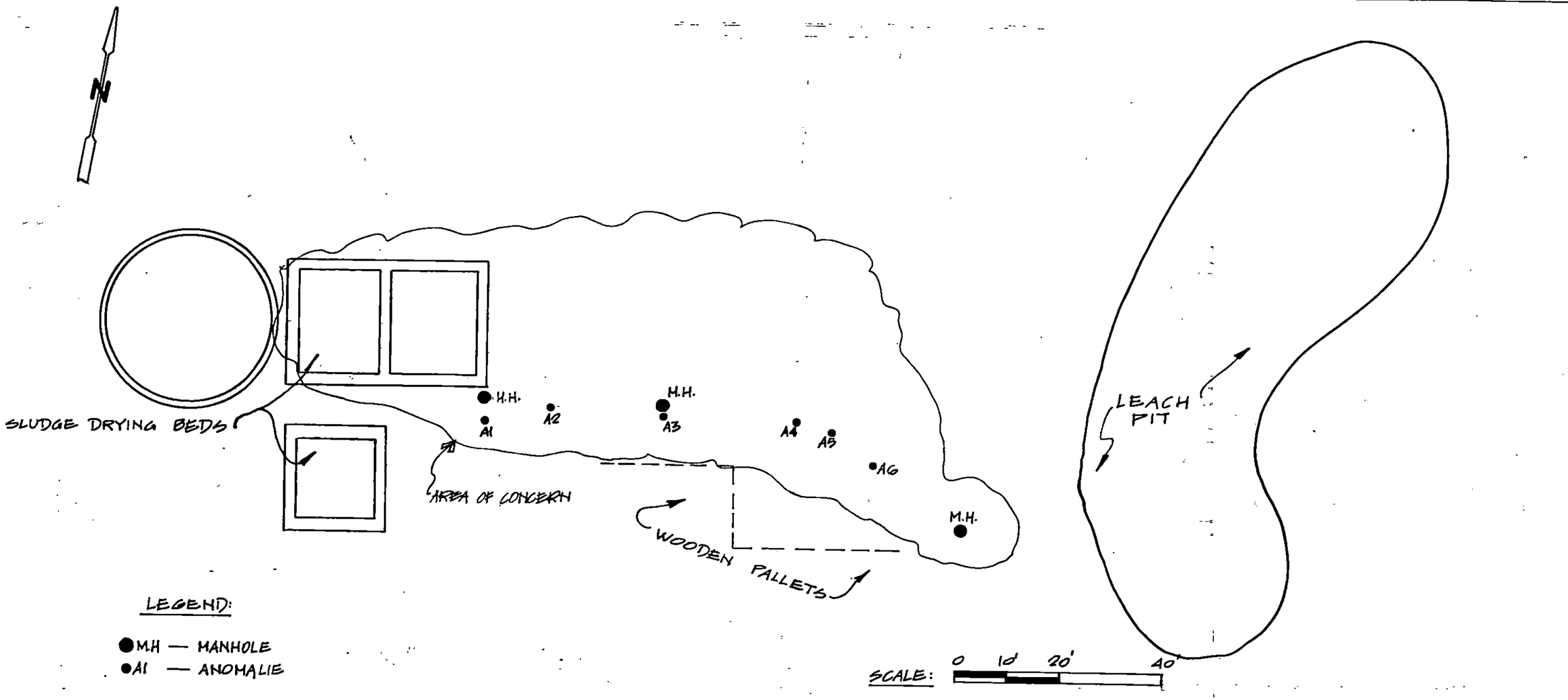

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FIGURE 8.1
GEOPHYSICAL SURVEY
MAGNETOMETER RESULTS

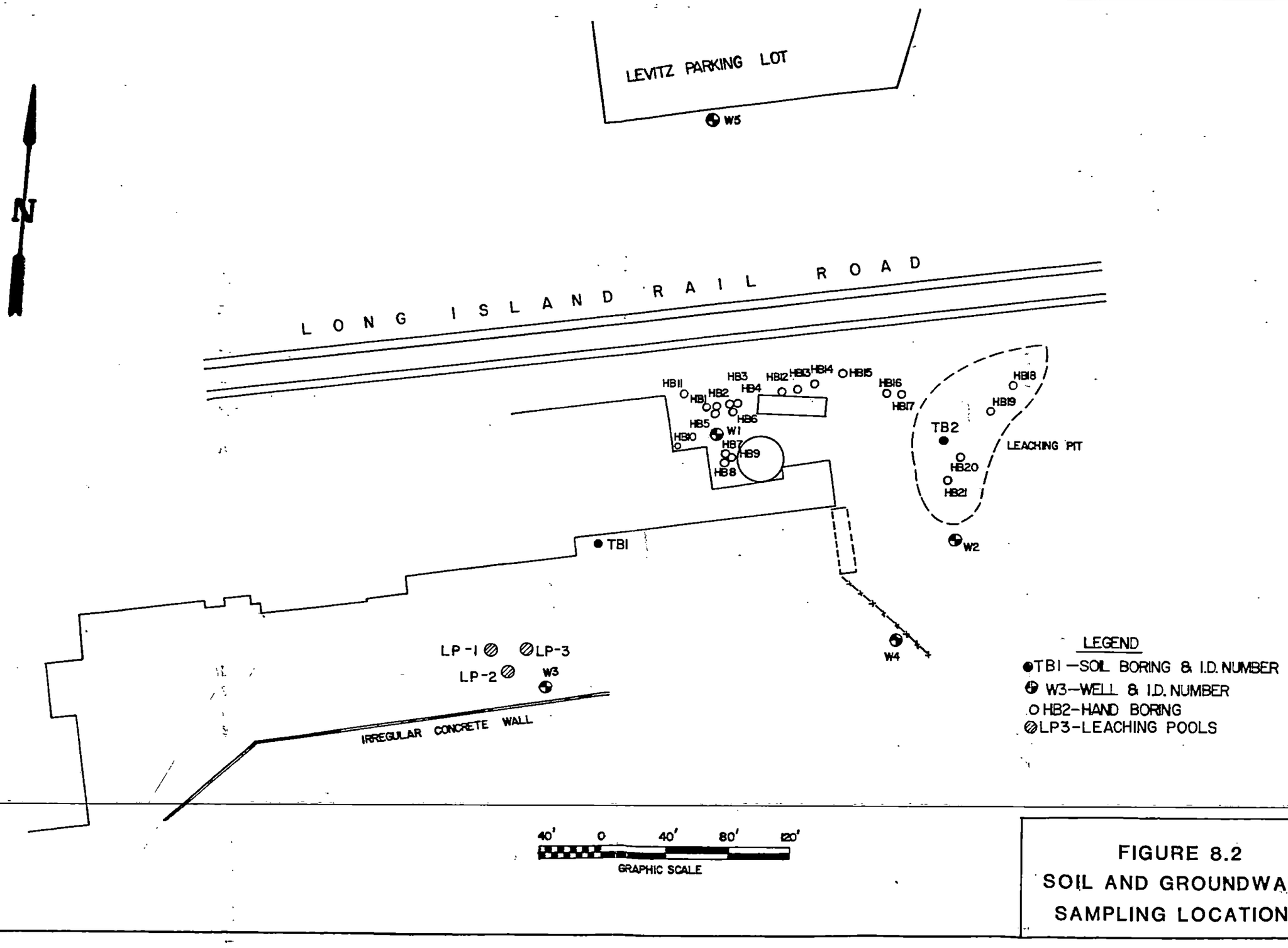

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FIGURE 8.2
SOIL AND GROUNDWATER
SAMPLING LOCATIONS

TABLE 8.1

SUMMARY OF SOIL SAMPLING AT SJ&J SITE

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
TEST BORING IN FORMER SOLVENT DRUM STORAGE AREA					
TB-1	05/26/88	4'-6'	05/26/88	Gravelly sand with some clay.	VOCs(1)
TB-1	05/26/88	8'-10'	05/26/88	Sand-gravel with some fine sand.	VOCs
TB-1	05/26/88	18'-20'	05/26/88	Medium-course sand with rounded fine gravel.	VOCs
TB-1	05/26/88	22'-24'	05/26/88	Medium-course sand with rounded fine gravel.	VOCs
ALONG PIPELINE					
HB-11	06/03/88	0"-6"	06/06/88	Gray silty sludge and brown silt.	Metals(2)
HB-12	06/03/88	6"-12"	06/06/88	Brown sand with silt and gravel.	Metals
HB-13	06/03/88	6"-12"	06/06/88	Fine brown sand with silt.	Metals
HB-14	06/03/88	6"-12"	06/06/88	Fine brown sand with silt.	Metals
HB-15	06/03/88	0"-6"	06/06/88	Brown silty sand with some gravel.	Metals
HB-16	06/03/88	6"-12"	06/06/88	Brown silt with some fine sand and clay.	Metals
HB-17	06/03/88	6"-12"	06/06/88	Brown silty clay.	Metals
TEST BORING IN LEACH PIT					
TB-2	07/12/88	10'-12'	07/13/88	Brown-orange fill with discolored gray sand.	Metals
TB-2	07/12/88	12'-14'	07/13/88	Medium-course sand slightly discolored.	Metals
TB-2	07/12/88	14'-16'	07/13/88	Medium-course sand with gravel. Streaks of blackish substance.	Metals
TB-2	07/12/88	16'-18'	07/13/88	Medium-course sand with some gravel. Streaks of blackish substance.	Full TCL scan
TB-2	07/12/88	18'-20'	07/13/88	Medium-course sand with some gravel. Some moist silt.	Metals
TB-2	07/12/88	20'-22'	07/13/88	Medium-course black and brown sand with some gravel.	Metals
TB-2	07/12/88	22'-24'	07/13/88	Brown (slightly gray) medium-course sand with some blackish color.	Metals(3)

* All samples composited from indicated depths.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 8.2 for summary of OVA screening of soil samples and Appendix G for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

TABLE 8.1 (continued)

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
TB-2	07/12/88	24'-26'	07/13/88	Medium-course sand (brown) with gravel. Some discoloration.	VOCs(1) Metals(2)
TB-2	07/12/88	26'-28'	07/13/88	Black stained medium-course sand with some gravel.	Metals
HAND BORING IN LEACHING PIT					
HB-18	06/03/88	0"-6"	06/06/88	Stained dark gray medium-course sand and gravel.	Metals
HB-18	06/03/88	2.5'-3'	06/06/88	Gray-stained medium-course sand and gravel.	VOCs Metals
HB-18	06/03/88	4'-4.5'	06/06/88	Medium-course sand with gravel. Slight gray staining.	VOCs Metals
HB-19	06/03/88	0"-6"	06/06/88	Medium-course sand with some gravel.	Metals
HB-19	06/03/88	2.5'-3'	06/06/88	Medium-course sand with some gravel.	VOCs Metals
HB-19	06/03/88	4.5'-5'	06/06/88	Medium-course sand with some gravel.	VOCs Metals
HB-20	06/06/88	0"-6"	06/06/88	Brown, medium-course sand with gravel.	VOCs Metals
HB-20	06/06/88	2.5'-3'	06/06/88	Tan, medium-course sand with gravel.	Metals
HB-20	06/06/88	5'-5.5'	06/06/88	Tan, medium-course sand with gravel, pebbles.	VOCs Metals
HB-21	06/06/88	0"-6"	06/06/88	Brown, medium-course sand with silt and gravel.	Metals
HB-21	06/06/88	2.5'-3'	06/06/88	Tan, medium-course sand with gravel	VOCs Metals
HB-21	06/06/88	5'-5.5'	06/06/88	Medium-course sand with gravel.	Metals
BACKGROUND SAMPLES					
BLCN	06/06/88	0'-2'	06/06/88	Medium-course sand with some gravel.	VOC Metals
BLCN	06/06/88	0'-2'	06/06/88	Medium-course sand with some gravel.	VOCs Metals

* All samples composited from indicated depths.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 8.2 for summary of OVA screening of soil samples and Appendix G for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

TABLE 8.1 (continued)

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
OUTSIDE SLUDGE DRYING BEDS					
HB-5	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals(2)
HB-5	06/02/88	2'-2.5'	06/02/88	Medium course sand with some gravel.	Metals
HB-6	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-6	06/02/88	2'-2.5'	06/02/88	Medium course sand with some gravel.	Metals
HB-9	06/02/88	3'-3.5'	06/02/88	Medium course sand with some gravel.	Metals
STEAM COOKER AREA					
HB-10	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals
HB-10	06/02/88	At 18"(4)	06/02/88	Medium course sand with some gravel.	Metals
SLUDGE DRYING BEDS					
HB-1	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	VOCs(1) Metals
HB-1	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals
HB-2	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-2	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals
HB-3	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-3	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals Full Priority Pollutant Scan
HB-4	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-4	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	VOCs Metals
HB-7	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	VOCs Metals
HB-7	06/02/88	2.5'-3'	06/02/88	Medium course sand with some gravel.	Metals
HB-8	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	VOCs Metals
HB-8	06/02/88	2.5'-3'	06/02/88	Medium course sand with some gravel.	Metals

* All samples composited from indicated depths.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 8.2 for summary of OVA screening of soil samples and Appendix G for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

TABLE 8.1 (continued)

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
WELL BORINGS					
MW-1	05/31/88	20'-22'	05/31/88	Medium-course sand with fine gravel.	VOCs(1)
MW-3	05/27/88	25'-27'	05/31/88	Medium-course sand lens of fine gravel	VOCs
MW-4	05/31/88	15'-17'	05/31/88	Medium-course sand	VOCs
LEACHING POOLS					
LP-1	05/27/88, 05/31/88	0"-6"	05/31/88, 06/02/88	Dark, fine silt with slight odor.	VOCs Metals(2)
LP-2	05/27/88, 05/31/88	0"-6"	05/31/88, 06/02/88	Black, moist clay with some gravel	VOCs Metals
LP-3	05/27/88, 05/31/88	0"-6"	05/31/88, 06/02/88	Dark clay with sand. Slight odor.	VOCs Metals
FIELD AND TRIP BLANKS					
TRIP BLANK	05/25/88	Aqueous Trip Blank	05/26/88	Aqueous	VOCs
TRIP BLANK	05/25/88	Aqueous Trip Blank	05/31/88, 06/02/88	Aqueous	VOCs
FIELD BLANK	05/31/88	Aqueous Field Blank	05/31/88, 06/31/88	Aqueous	VOCs
TRIP BLANK	05/31/88	Aqueous Trip Blank	06/02/88	Aqueous	VOCs
FIELD BLANK	05/31/88	Aqueous Field Blank	06/02/88	Aqueous	VOCs Metals
TRIP BLANK	06/01/88	Aqueous Trip Blank	06/02/88	Aqueous	VOCs Metals
FIELD BLANK	06/01/88	Aqueous Field Blank	06/02/88	Aqueous	VOCs Metals
TRIP BLANK	06/06/88	Aqueous Trip Blank	06/06/88	Aqueous	VOC Metals
FIELD BLANK	06/06/88	Aqueous Field Blank	06/06/88	Aqueous	VOC Metals
TRIP BLANK	06/06/88	Aqueous Trip Blank	06/06/88	Aqueous	VOC Metals
FIELD BLANK	06/06/88	Aqueous Field Blank	06/06/88	Aqueous	VOC Metals
TRIP BLANK	07/12/88	Aqueous Trip Blank	07/13/88	Aqueous	Full TCL scan
FIELD BLANK	07/12/88	Aqueous Trip Blank	07/13/88	Aqueous	Full TCL scan

* All samples composited from indicated depths.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 8.2 for summary of OVA screening of soil samples and Appendix G for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

parameters that were tested. Split samples, trip blanks and field blanks are also listed in Table 8.1 according to the dates they were submitted.

An organic vapor analyzer (OVA) was used to detect total organic vapors present in the head space of each soil sample listed in Table 8.1. This was done in order to screen the soil samples. Those showing high readings (greater than 5 ppm) were analyzed for volatile organic compounds (VOCs) at the laboratory. The head space analysis followed the procedures outlined in Section 4.0 of the sampling plan and included heating each sample in a temperature controlled oven for 30 minutes. The OVA results of the screening are presented in Appendix G. In addition, a field gas chromatograph (GC) was used to determine the existence of multiple organic compounds in samples detected with high total organic vapors. The GC strip charts for all standards that were analyzed in the field such as Methane, Perchloroethylene and the OVA head space results for the soils are presented in Appendix G.

The results of the OVA head space analysis for soil samples necessitated 24 soil samples to be tested further for VOCs by the laboratory (see Table 8.2 for summary of OVA screening of soil sample head space for VOC Analysis).

Select soil samples were split with the New York State Department of Environmental Conservation (NYSDEC). One soil sample was also split by Fanning, Phillips and Molnar for analysis at two (2) CLP laboratories (H2M and NYTEST).

In summary, 57 soil samples were tested for total metal analysis (As, Cd, Cr, Cr^{+6},Cu, Pb, Hg, Ag, Ni, and Zn), 24 soil samples were

TABLE 8.2

SUMMARY OF OVA HEADSPACE SCREENING OF SOIL SAMPLES*
THAT REQUIRED VOLATILE ORGANIC COMPOUND ANALYSIS
SJ&J

Sample ID (Depth interval)	Field Oven Temperature	Time of Heating	Reading (ppm(1))
TB-1 (4'-6')	130°F	1/2 hour	2
TB-1 (8'-10')	130°F	1/2 hour	4
TB-1 (18'-20')	130°F	1/2 hour	12
TB-1 (22'-24')	130°F	1/2 hour	5
TB-2 (16'-18')	130°F	1/2 hour	34
TB-2 (24'-26')	130°F	1/2 hour	38
Well #1 (20'-22')	150°F	1/2 hour	22
Well #3 (25'-27')	140°F	1/2 hour	2
Well #4 (15'-17')	150°F	1/2 hour	12
Leach Pool #1	130°F	1/2 hour	400
Leach Pool #2	130°F	1/2 hour	>1,000
Leach Pool #3	130°F	1/2 hour	52
HB-1 (0"-6")	120°F	1/2 hour	6
HB-3 (6"-12")	150°F	1/2 hour	2
HB-4 (6"-12")	125°F	1/2 hour	18
HB-7 (0"-6")	125°F	1/2 hour	10
HB-8 (0"-6")	125°F	1/2 hour	6
HB-18 (2 1/2'-3')	125°F	1/2 hour	50
HB-18 (4'-4 1/2')	125°F	1/2 hour	39
HB-19 (2 1/2'-3')	125°F	1/2 hour	24
HB-19 (4 1/2'-5')	125°F	1/2 hour	40
HB-20 (0"-6")	140°F	1/2 hour	15
HB-20 (5'-5 1/2')	140°F	1/2 hour	8
HB-21 (30"-36")	140°F	1/2 hour	38

* All samples listed in this table were retained for VOC analysis by laboratory as per USEPA Method 624. See Appendix G for all OVA results.

(1) ppm - Parts per million relative to the OVA reaction to a methane standard

tested for VOCs and 2 soil samples were tested for the full target compound list (TCL) parameters. Furthermore, a total of six (6) trip blanks and five (5) field blanks were tested for VOCs, four (4) field blanks and one (1) trip blank were tested for metals, and two (2) trip blanks and two (2) field blanks were tested for the full TCL parameters.

The results of all soil analyses will be presented in this subsection (8.2) according to the sampling locations as listed in Table 8.1.

Sludge Drying Beds

A total of twelve (12) soil samples were obtained from within the former sludge drying beds (soils were sampled from six (6) borings at two (2) depths). The sludge drying beds were used to accept the hydroxide sludge (lime sludge) for drying. This area had reportedly been cleaned up and our tests were intended to confirm the lack of metals. Soils at these locations were sampled to detect the presence of metals and at some locations, VOCs. The OVA results of the soil sample head space necessitated VOC analysis for HB-1 (0"-6"), HB-3 (6"-12"), HB-4 (6"-12"), HB-7 (0"-6") and HB-8 (0"-6"). See Table 8.2 for the summary of OVA screening results.

Table 8.3 was constructed to show the laboratory results of the twelve (12) soil samples tested from the sludge drying beds (see Figure 8.2 for locations of sampling). Discussions and conclusions based upon field conditions and laboratory results are presented in subsection 9.3 of this report.

Outside Sludge Drying Beds

A total of five (5) soil samples were obtained from outside the

TABLE 8.3*
LABORATORY RESULTS OF SOIL SAMPLING

SLUDGE DRYING BEDS
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # - HB-1(1) (0"-6")	HB-1 (6"-12")	HB-2 (0"-6")	HB-2 (6"-12")	HB-3 (0"-6")	HB-3 (6"-12")	HB-4 (0"-3")	HB-4 (6"-12")	HB-7 (0"-6")	HB-7 (30"-36")	HB-8 (0"-6")	HB-8 (30"-36")
SAMPLE DEPTH -													
SAMPLE DATE -		6/2	6/2	6/2	6/2	6/2	6/2	6/2	6/2	6/2	6/2	6/2	6/2
METALS (mg/kg)													
Arsenic	0.01	2.9	1.7	2.2	1.5	2.2	1.82	1.6	1.4	1.4	1.6	1.5	1.5
Cadmium	0.005	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Chromium	0.01	25	18.2	19.4	12.4	21.1	17.0	25.3	20	15	14.8	23	7.4
Copper	0.025	61.7	37.2	47.2	38.6	50.9	34.0	65	53.7	23	25.0	45	14.0
Lead	0.005	157	67.7	87.7	21.7	82.3	46.3	36.7	53.1	15.9	25.0	42.5	18.9
Mercury	0.0002	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Nickel	0.04	12.3	2.8B	6.2	2.7B	5.5B	4.5B	3.4B	3.6B	3.5B	940B	3.2B	2.5B
Silver	0.01	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Zinc	0.02	180	66.5	77.7	24.2	150	6.4	71.0	73.7	21	32	50	31.0
VOLATILE ORGANIC COMPOUNDS (mg/kg)													
TCL VOCs													
Methylene Chloride	0.005	0.010B	--	--	--	--	1.900B	--	0.006B	0.045B	--	0.034B	--
TOTAL TCL VOCs	(2)	0.010	--	--	--	--	1.900	--	0.008	0.045	--	0.034	--
TENTATIVELY IDENTIFIED VOCs													
Trifluoroethane		UD	--	--	--	--	0.033J	--	UD	UD	--	UD	--
Hexamethyltrisiloxane		UD	--	--	--	--	2.800J	--	UD	UD	--	UD	--
Difluorodimethylsilane		0.130JB	--	--	--	--	UD	--	UD	0.023JB	--	0.019JB	--
Hexanol		UD	--	--	--	--	UD	--	UD	0.011J	--	0.006J	--
Unknowns		0.075J	--	--	--	--	UD	--	UD	0.150J	--	0.080J	--
Other Unknowns (also detected in blanks)		0.056JB	--	--	--	--	0.100JB	--	0.015JB	0.048JB	--	0.076JB	--
TOTAL TENTATIVELY IDENTIFIEED VOCs		0.261	--	--	--	--	2.933	--	0.015	0.232	--	0.181	--
TOTAL VOCs		0.271	--	--	--	--	4.833	--	0.023	0.277	--	0.215	--
BASE NEUTRAL EXTRACTABLES (mg/kg)													
Phenanthrene	0.33	--	--	--	--	--	0.210J	--	--	--	--	--	--
Fluoranthene	0.33	--	--	--	--	--	0.250J	--	--	--	--	--	--
Pyrene	0.33	--	--	--	--	--	0.240J	--	--	--	--	--	--
Bis (2-Ethylhexyl) phthalate	0.33	--	--	--	--	--	1.700B	--	--	--	--	--	--
TOTAL BASE NEUTRAL EXTRACTABLES		--	--	--	--	--	2.400J	--	--	--	--	--	--
TOTAL ACID EXTRACTABLES (mg/kg)		--	--	--	--	--	UD	--	--	--	--	--	--
TOTAL PCBs (mg/kg)		--	--	--	--	--	UD	--	--	--	--	--	--
PESTICIDES (mg/kg)													
Heptachlor	0.008	--	--	--	--	--	0.063J	--	--	--	--	--	--
Heptachlor epoxide	0.008	--	--	--	--	--	0.027J	--	--	--	--	--	--
Endosulfan I	0.008	--	--	--	--	--	0.019	--	--	--	--	--	--
TOTAL PESTICIDES		--	--	--	--	--	0.109	--	--	--	--	--	--

* - See Appendix H for laboratory results of trip blanks and field blank.
(1) - See Figure 8.2 for sampling locations
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
TCL - Target Compound list
-- - Not analyzed
UD - Undetected
B - Detected in method blank
J - Below mean quantification level of lab
CRQL - Contract Required Quantification Limit

sludge drying beds (from three (3) borings, of which two (2) boring locations were tested at two (2) different depths and one (1) was tested at one (1) depth). This location was sampled due to the proximity to the sludge drying beds and to determine the possibility of spillage and leakage from the piping. The results of the OVA screening of the soil head space for each sample did not necessitate VOC analysis (see Appendix G).

Table 8.4 shows the laboratory results of the five (5) soil samples obtained from outside the sludge drying beds. Figure 8.2 shows the locations of these borings. Discussions and conclusions based upon field conditions and laboratory results are presented in subsection 9.3 of this report.

Along Pipeline

The results of the Magnetometer survey as (discussed in subsection 8.1) indicated the presence of an anomaly existing between the sludge drying beds and the leaching pit (as shown in Figure 8.1). As a result, a total of seven (7) boring locations were cited along this path and seven (7) soil samples were subsequently obtained (see Figure 8.2). The purpose of the sampling along the pipeline was to detect the presence of select metals in the shallow soils that may have been introduced at these locations due to possible leakage of the pipe that once carried the lime sludge or wastewater hydroxide from the sludge drying beds to the leaching pit. The results of the OVA screening of the soil head space for each sample did not necessitate VOC analysis (see Appendix G).

The laboratory results for soil samples obtained along the pipeline are presented in Table 8.5. Discussions and conclusions

TABLE 8.4*
LABORATORY RESULTS OF SOIL SAMPLING

OUTSIDE SLUDGE DRYING BEDS
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) - SAMPLE DEPTH - SAMPLE DATE	HB-5 (0"-6") 6/2	HB-5 (24"-30") 6/2	HB-6 (0"-6") 6/2	HB-6 (24"-30") 6/2	HB-9 (36"-42") 6/2
METALS (mg/kg)							
Arsenic	0.01		1.8	5.5	4.7	5.6	3.8
Cadmium	0.005		UD	UD	UD	UD	UD
Chromium	0.01		19.0	12	10	13	18.0
Copper	0.025		53	4.8	5.0	6.2	58.0
Lead	0.005		157	17.3	174	21.6	227
Mercury	0.0002		UD	UD	UD	UD	UD
Nickel	0.04		11	5.3B	5.8B	7.5	13.0
Silver	0.01		UD	UD	UD	UD	UD
Zinc	0.02		220	24	22	42	250

* - See Appendix H for laboratory results of trip blanks and field blanks.
(1) - See Figure 8.2 for sampling locations
UD - Undetected
B - Contaminant detected in Method Blank
CRQL - Contract Required Quantification Limit

TABLE 8.5*
LABORATORY RESULTS OF SOIL SAMPLING

ALONG PIPELINE
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) - SAMPLE DEPTH - SAMPLE DATE	HB-11 (0"-6") 6/3	HB-12 (6"-12") 6/3	HB-13 (6"-12") 6/3	HB-14 (6"-12") 6/3	HB-15 (0"-6") 6/3	HB-16 (6"-12") 6/3	HB-17 (6"-12" 6/3
METALS (mg/kg)									
Arsenic	0.01		5.2	14	16	17	6.3	220	18
Cadmium	0.005		UD	UD	UD	UD	UD	UD	2.9
Chromium	0.01		105	21.1	22.6	22.1	28.9	29.6	750
Copper	0.025		315	86.6	113	82.7	49.8	73.3	750
Lead	0.005		90	154	371	59.0	160	157	180
Mercury	0.0002		UD	UD	0.22	UD	0.54	UD	UD
Nickel	0.04		7.3	12.2	20.7	8.7	15.7	27.7	19.2
Silver	0.01		UD	UD	UD	UD	UD	UD	UD
Zinc	0.02		260	210	490	190	220	140	860

* - See Appendix H for laboratory results of trip blanks and field blanks.
(1) - See Figure 8.2 for sampling locations.
UD - Undetected
CRQL - Contract Required Quantification Limit

based upon field conditions and laboratory results are presented in subsection 9.3 of this report.

Steam Cooker Discharge Area

A total of two (2) soil samples were obtained from the steam cooker discharge area (within one (1) boring at two (2) different depths). The purpose of these samples was to detect the presence of metals in the shallow soils and to obtain a vertical look at the concentrations at depth, in this location where wastewater was produced from the steaming process after the fabric dying. The results of the OVA screening of the soil headspace for each sample did not necessitate VOC analysis (see Appendix G).

Table 8.6 shows the results of the laboratory analysis for the soil samples obtained in the steam cooker discharge area (see Figure 8.2 for locations). Discussions and conclusions based upon field conditions and laboratory results are presented in subsection 9.3 of this report.

Leaching Pit (Shallow Borings)

A total of twelve (12) shallow soil samples were obtained from within the boundaries of the former leaching pit (four (4) boring locations at three (3) depths). The purpose of sampling the soils at three (3) different depths within the four (4) borings in the leaching pit was to determine the concentrations of metals and, in some locations, VOCs within the soils in order to delineate the vertical and lateral extent of the possible contamination that may have been introduced into the soils due to the past discharge of the hydroxide sludge (lime sludge). The results of the OVA screening of soil headspace for each sample necessitated VOC analysis for HB-18 (30"-

TABLE 8.6
LABORATORY RESULTS OF SOIL SAMPLING

STEAM COOKER
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) - SAMPLE DEPTH - SAMPLE DATE -	HB-10 (6"-12") 6/2	HB-10 (AT 18") 6/2
METALS (mg/kg)				
Arsenic	0.01		1.5	2.0
Cadmium	0.005		UD	UD
Chromium	0.01		6.5	17.0
Copper	0.025		50.0	54.0
Lead	0.005		44.4	95.4
Mercury	0.0002		UD	UD
Nickel	0.04		28	40.0
Silver	0.01		UD	UD
Zinc	0.02		190	260

* - See Appendix H for laboratory results of trip blanks and field blanks.
(1) - See Figure 8.2 for sampling locations.
UD - Undetected
CRQL - Contract Required Quantification Limit

36"), HB-18 (48"-54"), HB-19 (30"-36"), HB-19 (54"-60"), HB-20 (0"-6"), HB-20 (60"-66"), and HB-21 (30"-36"). See Table 8.2 for the summary OVA screening results.

The laboratory results are presented in Table 8.7. Discussions and conclusions based upon field conditions and laboratory results are presented in subsection 9.3 of this report.

Leaching Pit (Boring To Water Table)

A total of nine (9) soil samples were obtained at TB-2 on Figure 8.2 (see Table 8.8 for laboratory results of the soil samples). It should be noted that in Table 8.8 the sample depths begin at TB-2 (10'-12'). This was the grade level before filling in the leach pit. The leach pit was too steep to get a rig drill into, hence, a ramp was created to obtain the sample. Transit shots were taken to determine the exact level of grade prior to filling in. Discussions and conclusions based upon field conditions and laboratory results are presented in subsection 9.3 of this report.

Background Sample
(Birch Lane Circle North)

A total of two (2) soil samples were obtained within one (1) boring located on Birch Lane Circle North as shown in Figure 8.3. These soil samples were obtained for the purpose of determining background conditions of natural (undisturbed) soils in the vicinity of the site.

Table 8.9 shows the results of the soil sampling analysis for the two (2) samples. Discussions and conclusions based upon laboratory results are presented in subsections 9.2 and 9.3 of this report.

Leaching Pools (Former Drum Storage Area)

A total of three (3) soil samples were collected from the bottom

TABLE 8.7*
LABORATORY RESULTS OF SOIL SAMPLING

LEACHING PIT
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) - SAMPLE DEPTH - SAMPLE DATE -	HB-18 (0"-6") 6/3	HB-18 (30"-36") 6/3	HB-18 (48"-54") 6/3	HB-19 (0"-6") 6/3	HB-19 (30"-36") 6/3	HB-19 (54"-60") 6/3	HB-20 (0"-6") 6/6	HB-20 (30"-36") 6/6	HB-20 (60"-66") 6/6	HB-21 (0"-6") 6/6	HB-21 (30"-36") 6/6	HB-21 (60"-66") 6/6
METALS (mg/kg)														
Arsenic	0.01		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Cadmium	0.005		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Chromium	0.01		104	37.8	UD	46.6	3.8	5.3	14.1	4.0	10.6	26.8	5.7	7.8
Copper	0.025		93.5	24.9	11.9	43.5	3.1	2.6	15.3	11.4	4.9	19.7	2.8	4.1
Lead	0.005		56	20	3.0	19	17	0.8	17	1.7	1.5	28.0	1.1	1.8
Mercury	0.0002		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Nickel	0.04		UD	UD	UD	2.4	UD	UD	UD	0.9	UD	UD	UD	UD
Silver	0.01		UD	UD	UD	8.1	UD	UD	UD	UD	UD	150	150	UD
Zinc	0.02		67.7	24	6.6	60.8	3.5	3.9	59.3	7.9	4.6	72	5.3	8.3
VOLATILE ORGANIC COMPOUNDS (mg/kg)														
TCL VOCs														
Methylene Chloride	0.005		--	0.014B	0.010B	--	0.010B	0.010B	0.010B	--	NR	--	0.004JB	--
1,1,1-Trichloroethane	0.005		--	0.002JB	UD	--	UD	UD	UD	--	NR	--	UD	--
TOTAL TCL VOCs	(2)		--	0.016	0.010		0.010	0.010	0.010	--	NR	--	0.004	--
TENTATIVELY IDENTIFIED VOCs														
2-propanone			--	0.019J	0.160J	--	0.090J	0.034J	0.470J	--	NR	--	0.054J	--
1-Methoxy-2-propanone			--	0.250JB	UD	--	UD	UD	UD	--	NR	--	0.018JB	--
3-Carene			--	UD	UD	--	UD	UD	0.080	--	NR	--	UD	--
4-methylene-1-(1-Methy-bicyclo (31.0) hexane			--	UD	UD	--	UD	UD	0.018J	--	NR	--	UD	--
Unknown Alkene			--	0.009J	UD	--	UD	UD	UD	--	NR	--	UD	--
Other Unknowns			--	0.220JB	0.089JB	--	0.097JB	0.083JB	0.077JB	--	NR	--	0.160JB	--
TOTAL TENTATIVELY IDENTIFIED VOCs			--	0.498	0.249	--	0.187	0.117	0.645	--	NR	--	0.232	--
TOTAL VOCs			--	0.514	0.259	--	0.197	0.127	0.655	--	NR	--	0.236	

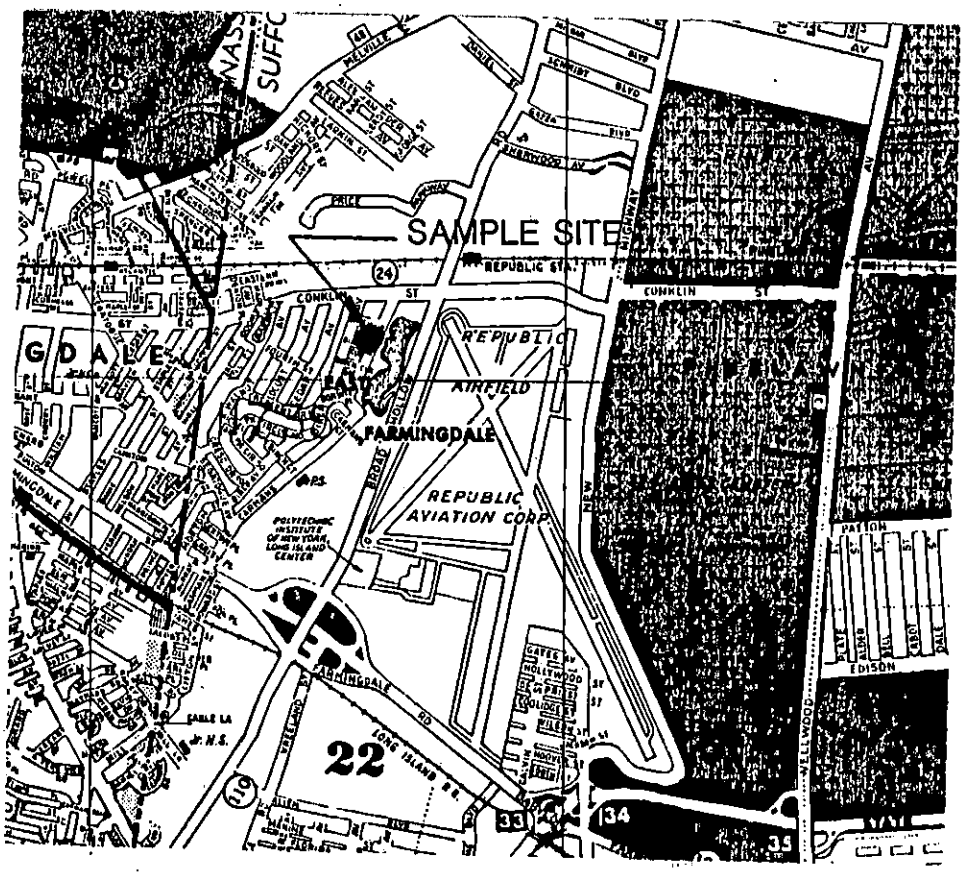
* - See Appendix H for laboratory results of trip blanks and field blanks.
(1) - See Figure 8.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
TCL - Target Compound List
CRQL - Contract Required Quantification Limit
UD - Undetected
-- - Not Analyzed
NR - Not reportable due to interference
B - Detected in Method Blank
J - Below mean quantification level of lab

TABLE 8.8*
LABORATORY RESULTS OF SOIL SAMPLING

LEACHING PIT TEST BORING
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID #(1) SAMPLE DEPTH SAMPLE DATE	TB-2 (10'-12') 7/13	TB-2 (12'-14') 7/13	TB-2 (14'-16') 7/13	TB-2 (16'-18') 7/13	TB-2 (18'-20') 7/13	TB-2 (20'-22') 7/13	TB-2 (22'-24') 7/13	TB-2 (24'-26') 7/13	TB-2 (26'-28') 7/13
METALS (mg/kg)											
Antimony	0.06		UD	UD	UD	UD	UD	UD	UD	UD	UD
Arsenic	0.01		UD	UD	UD	2.1	UD	4.8	UD	UD	2.2
Beryllium	0.005		UD	UD	UD	0.428	UD	UD	UD	UD	UD
Cadmium	0.005		UD	UD	UD	1.5	UD	UD	UD	UD	UD
Chromium	0.01		17.0	10.9	7.8	11.2	13.5	5.9	3.2	16.6	21.5
Copper	0.025		16.8	12.8	12.4	12.2	12.0	9.7	1.5B	2.5B	9.3
Iron	0.1		UD	UD	UD	70.0	UD	UD	UD	UD	UD
Lead	0.005		13.7	9.5	3.9	7.0	8.2	14.5	3.6	3.2	1.7
Mercury	0.0002		UD	UD	UD	UD	UD	UD	UD	UD	UD
Nickel	0.04		3.0B	0.21	1.8B	3.2B	3.9B	1.3B	2.6B	2.1B	UD
Silver	0.01		UD	UD	UD	UD	UD	UD	UD	UD	UD
Zinc	0.02		11.3	15.0	7.3	15.8	22.0	8.8	5.6	7.5	9.1
VOLATILE ORGANIC COMPOUNDS (mg/kg)											
TCL VOCs											
Methylene Chloride	0.005		--	--	--	0.068B	--	--	--	0.020B	--
Toluene	0.005		--	--	--	0.002J	--	--	--	UD	--
Acrolein	(2)		--	--	--	0.460	--	--	--	UD	--
1,1-Dichloroethene	0.005		--	--	--	UD	--	--	--	UD	--
Chloroform	0.005		--	--	--	UD	--	--	--	UD	--
Trichloroethene	0.005		--	--	--	UD	--	--	--	UD	--
Dibromochloromethane	0.005		--	--	--	UD	--	--	--	UD	--
Tetrachloroethene	0.005		--	--	--	UD	--	--	--	UD	--
1,1,2,2-Tetrachloroethane	0.005		--	--	--	UD	--	--	--	UD	--
Chlorobenzene	0.005		--	--	--	UD	--	--	--	UD	--
TOTAL TCL VOCs			--	--	--	0.530	--	--	--	0.020	--
TENTATIVELY IDENTIFIED VOCs											
2-Propanone			--	--	--	0.060JB	--	--	--	0.100JB	--
1,1,2-Trichloro-1,2,2-Trifluoroethane			--	--	--	0.018J	--	--	--	0.030J	--
Hexane			--	--	--	UD	--	--	--	0.010J	--
Unknowns			--	--	--	0.008J	--	--	--	UD	--
TOTAL TENTATIVELY IDENTIFIED VOCs			--	--	--	0.086	--	--	--	0.140	--
TOTAL VOCs			--	--	--	0.616	--	--	--	0.160	--
BASE NEUTRAL EXTRACTABLES (mg/kg)											
Diethyl phthalate			--	--	--	0.340	--	--	--	--	--
Bis (2-Ethylhexyl) phthalate			--	--	--	0.500B	--	--	--	--	--
TOTAL BASE NEUTRAL EXTRACTABLES			--	--	--	0.840	--	--	--	--	--
TOTAL ACID EXTRACTABLES (mg/kg)			--	--	--	UD	--	--	--	--	--
POLYCHLORINATED BIPHENYLS			--	--	--	UD	--	--	--	--	--
TOTAL PESTICIDES			--	--	--	UD	--	--	--	--	--

* - See Appendix H for laboratory results of trip blanks and field blanks.
(1) - See Figure 8.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
TCL - Target Compound List
CRQL - Contract Required Quantification Limit
UD - Undetected
-- - Not Analyzed
B - Detected in Method Blank
J - Below mean quantification level of lab



F,P&M

FIGURE 8.3
LOCATION OF BIRCH LANE CIRCLE NORTH SAMPLE

TABLE 8.9*
LABORATORY RESULTS OF SOIL SAMPLING

BACKGROUND SAMPLES
(BIRCH LANE CIRCLE NORTH)
OFF-SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID #(1) SAMPLE DEPTH SAMPLE DATE	BLCN (0"-6") 6/06/88	BLCN (24"-30") 6/06/88
METALS (mg/kg)				
Arsenic	0.01		40.0	UD
Cadmium	0.005		0.7	UD
Chromium	0.01		26.1	6.9
Copper	0.25		6.6	2.4
Lead	0.005		23.0	3.1
Mercury	0.0002		0.24	UD
Nickel	0.04		10.7	2.0
Silver	0.01		UD	UD
Zinc	0.02		39.3	11.5
VOLATILE ORGANIC COMPOUNDS (mg/kg)				
TCL VOCs				
Methylene Chloride	0.005		0.004JB	0.008B
TOTAL TCL VOCs			0.004	0.008
TENTATIVELY IDENTIFIED VOCs				
2-Propanone	(2)		0.023J	UD
1-Methoxy-2-propanone			0.012JB	0.011JB
Unknown alkene			0.021JB	UD
Other unknowns (also detected in blanks)			0.130JB	0.076JB
TOTAL TENTATIVELY IDENTIFIED VOCs			0.186	0.087
TOTAL VOCs			0.190	0.095

* - See Appendix H for laboratory results of trip blanks and field blanks.
(1) - See Figure 8.3 for sampling location.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
TCL - Target Compound List
CRQL - Contract Required Quantification Limit
UD - Undetected
NA - Not Applicable
B - Detected in Method Blank
J - Below mean quantification level of lab

of three (3) leaching pools located on site (as shown in Figure 8.2). The purpose of sampling the soils at these locations was to detect the presence of contaminants possibly introduced by the former drum storage of solvents. The results of the OVA screening of soil headspace for each sample necessitated VOC analysis for all three (3) samples obtained from the leaching pools.

The laboratory results are presented in Table 8.10. Discussion and conclusions based upon field conditions and laboratory results are presented in subsection 9.3 of this report.

Test Boring In Former Solvent Drum Storage Area (To Water Table)

Based upon the OVA results of soil headspace for each sample, (Appendix G) VOC analysis was performed for a total of four (4) soil samples that were obtained at different depths within boring TB-1 as indicated in Figure 8.2.

Table 8.11 shows the laboratory results of the soil sampling for this test boring location. Discussions and conclusions based upon field conditions and laboratory results are presented in subsection 9.3 of this report.

8.3 Results of Groundwater Sampling and Analyses

A total of five (5) wells were installed as part of the SJ&J study, four (4) of which were on site and one (1) upgradient at Levitz's (north of the Rail Road). A summary of each well installation and development is presented in Table 8.12 and the locations of the five (5) monitoring wells are shown in Figure 8.2. These wells were constructed according to the New York State DEC monitoring well specifications as shown in Appendix E of this report.

Split spoon soil samples were obtained from the groundwater

TABLE 8.10*
LABORATORY RESULTS OF SOIL SAMPLING

LEACHING POOLS
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) SAMPLE DATE	LP-1 5/27-5/31	LP-2 5/27-5/31	LP-3 5/27-5/31
METALS (mg/kg)					
Arsenic	0.01		UD	UD	8.9
Cadmium	0.005		UD	6.7	2.9
Chromium	0.01		31.5	110	55
Copper	0.025		92	790	160
Lead	0.005		440	470	890
Mercury	0.0002		0.40	7.0	0.90
Nickel	0.04		13.5	12.2B	39
Silver	0.01		UD	UD	UD
Zinc	0.02		390	702	570
VOLATILE ORGANIC COMPOUNDS (mg/kg)					
TCL VOCs					
Methylene Chloride	0.005		0.075B	0.260B	0.099B
1,2-Dichloroethene (total)	0.005		UD	1.200	0.003J
Chloroform	0.005		0.002J	0.013J	0.003J
Trichlorofluoromethane	(2)		0.006	0.004J	0.002J
Toluene	0.005		0.025	4.200	UD
Chlorobenzene	0.005		0.017	0.038	UD
Ethylbenzene	0.005		0.690	0.230	UD
Tetrachloroethene	0.005		UD	0.059	UD
TOTAL TCL VOCs			0.815	6.004	0.107
TENTATIVELY IDENTIFIED VOCs					
2-Propanone			0.34JB	0.880JB	UD
Methylcyclohexane			0.240J	UD	UD
3-Ethyl-2-Methylpentane			0.110J	UD	UD
Ethylcyclohexane			0.100J	UD	UD
1-Nitroethylbenzene			0.950J	UD	UD
m-Xylene			0.950J	0.670J	UD
o,p-Xylene			0.370J	1.100J	UD
2-Methoxy-2-Methylpropane			UD	0.370J	UD
(E,E)-2-4-Heptadien 6-ynal			UD	1.100J	UD
1,1,3-Trimethylcyclohexane			UD	0.310J	UD
1-Methylethylbenzene			UD	0.980J	UD
Unknown substitute benzene			UD	1.300J	UD
2-3-Heptadiene 5-yne-3,4-dimethyl			UD	UD	6.600J
cis-1-Ethyl-2-methylcyclo-hexane			UD	UD	0.390J
1,1,3-Trimethyl cyclopentane			UD	UD	1.400J
Octahydropentalene			UD	UD	1.200J
Bromocycloheptane			UD	UD	0.640J
2-Ethyl-1,3-dimethylcyclo-hexane			UD	UD	0.540J
N-N-carbonyl bis-acetamine			UD	UD	0.400J
2,2,3,3-Tetramethylbutane			UD	UD	0.970J
5-Butoxy-Pentane			UD	UD	1.100J
Unknown alkane			UD	UD	0.500J
Unknowns			8.820J	9.600J	UD
TOTAL TENTATIVELY IDENTIFIED VOCs			11.880	16.310	13.740
TOTAL VOCs			12.695	22.314	13.847

* - See Appendix H for laboratory results of trip blanks and field blanks.
(1) - See Figure 8.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
TCL - Target Compound List
CRQL - Contract Required Quantification Limit
UD - Undetected
B - Detected in Method Blank
J - Below mean quantification level of lab

TABLE 8.11*
LABORATORY RESULTS OF SOIL SAMPLING

TEST BORING
(IN FORMER SOLVENT DRUM STORAGE AREA)
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE I.D.(1) - SAMPLE DEPTH - SAMPLE DATE	TB-1 (4'-6') 5/26	TB-1 (8'-10') 5/26	TB-1 (18'-20') 5/26	TB-1 (22'-24') 5/26
VOLATILE ORGANIC COMPOUNDS (mg/kg)						
TCL VOCs						
Methylene Chloride	0.005		0.007B	UD	UD	UD
Toluene	0.005		0.003J	UD	UD	UD
1,1-Dichloroethene	0.005		0.003J	UD	UD	UD
Chloroform	0.005		0.003J	UD	UD	UD
Trichloroethene	0.005		0.002J	UD	UD	UD
Dibromochloromethane	0.005		0.004J	UD	UD	UD
Tetrachloroethene	0.005		0.006	UD	UD	UD
1,1,2,2-Tetrachloroethane	0.005		0.003J	UD	UD	UD
Chlorobenzene	0.005		0.003J	UD	UD	UD
TOTAL TCL VOCs	(2)		0.034	UD	UD	UD
TENTATIVELY IDENTIFIED VOCs						
2-Propanone			UD	0.006J	0.005J	0.006J
Hexane			UD	0.014JB	0.015J	0.016JB
TOTAL TENTATIVELY IDENTIFIED VOCs			UD	0.020	0.020	0.022
TOTAL VOCs			0.034	0.020	0.020	0.022

* - See Appendix H for Laboratory results of trip blanks and field blanks.
(1) - See Figure 8.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
TCL - Target Compound List
CRQL - Contract Required Quantification Limit
UD - Undetected
-- - Not Analyzed
B - Detected in Method Blank
J - Below mean quantification level of lab.

TABLE 8.12(1)

SUMMARY OF WELL INSTALLATION AND
DEVELOPMENT AT SJ&J SITE
Farmingdale, NY

Well ID#	Date Installed	Depth of Well	Screen Length	Screen Slot Size	Depth to Water	Date of Final Development	Total Gallons Purged
MW-1	06/01/88	25'	10'	0.010"	29'	07/14/88	48
MW-2	06/11/88	36'	10'	0.010"	28'	07/13/88	35
MW-3	05/28/88	37'	10'	0.010"	28' 4 3/16"	07/14/88	34
MW-4	06/01/88	35'	10'	0.010"	26' 10"	07/14/88	41
MW-5*	06/24/88	26'	10'	0.010"	16' 5 1/2"	07/14/88	95

(1) - See Figure 8.2 for well locations
* MW-5 was not installed on the site. This well was selected to represent upgradient groundwater conditions.

observation wells during well drilling (over 5' increments) and the head space of each soil sample was screened with the OVA for total organic vapors (see Appendix G for results). Table 8.2 summarizes the samples that were tested for VOCs as a result of the OVA head space analysis.

Table 8.13 presents the laboratory results from the well borings. Discussions and conclusions based upon field conditions and laboratory results are presented in subsection 9.4 of this report.

Prior to sampling groundwater, each of the five (5) wells for laboratory analysis, the wells were exhausted a minimum of four (4) volumes and measurements of the pH, specific conductance, and temperature were recorded following each of the well volumes that were exhausted. Table 8.14 shows the well stabilization measurements that were recorded prior to sampling for each of the five (5) wells. Table 8.14 shows each well number, the measurement (which was taken following the exhausting of one well volume from each well), the pH, specific conductance, and temperature.

The results of groundwater testing for each of the five (5) wells are shown in Table 8.15 (see Figure 8.2 for locations). Discussions and conclusions based on the laboratory results are presented in subsection 9.4 of this report.

8.4 Water Sampling From Various Sources

During the sampling effort on the SJ&J site, a sample of water from the old settling pool was obtained and analyzed for full TCL parameters and labeled as old industrial wastewater settling tank. This sample was intended to determine how clean the present wastewater treatment system is. The results of the lab analysis for the

TABLE 8.13*
LABORATORY RESULTS OF SOIL SAMPLING
WELL BORINGS
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/kg	SAMPLE ID # (1) SAMPLE DEPTH SAMPLE DATE	WELL-1 (20'-22') 5/31/88	WELL-3 (25'-27') 5/27/88	WELL-4 (15'-17') 5/31/88
VOLATILE ORGANIC COMPOUNDS (mg/kg)					
TCL VOCs					
Methylene Chloride	0.005		0.032B	0.041B	0.017B
Chloroform	0.005		UD	0.001J	UD
TOTAL TCL VOCs			0.032	0.042	0.017
TENTATIVELY IDENTIFIED VOCs					
4-Methyl-2-Pentanamine	(2)		0.016J	0.018J	UD
Diflourodimethylsilane			UD	0.160J	UD
2-Propanone			UD	0.200JB	UD
2,5-Dimethyl hexane			0.190J	UD	UD
3,6-Dimethyl octane			0.720J	UD	UD
Butyl Isopropyl Sulfane			0.062J	UD	UD
4-Azido-heptane			0.038J	UD	UD
2,3,7-Trimethyloctane			0.130J	UD	UD
Unknown amine			UD	UD	0.020J
Decane			UD	UD	0.930J
4-Methyl-2-propyl-1-pentanol			UD	UD	0.026J
Unknowns			0.640J	0.004J	UD
TOTAL TENTATIVELY IDENTIFIED VOCs			1.796	0.382	0.976
TOTAL VOCs			1.828	0.424	0.993

* - See Appendix H for laboratory results of trip blanks and field blanks.
(1) - See Figure 8.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
TCL - Target Compound List
CRQL - Contract Required Quantification Limit
UD - Undetected
B - Detected in Method Blank
J - Below mean quantification level of lab

TABLE 8.14

WELL STABILIZATION MEASUREMENTS*
Prior to Sampling
July 21, 1988
SJ&J Site
Farmingdale, NY

Well Number	Measurement(1)	Well Volume Exhausted	pH	Specific Conductance (umhos/cc)	Temperature (^{o}F)
MW-1	1st	2	7.8	210	57.2
MW-1	2nd	3	7.8	220	N.T.(2)
MW-1	3rd	4	7.8	220	57.2
MW-1	4th	5	7.8	220	N.T.
MW-2	1st	2	7.7	570	59.9
MW-2	2nd	3	7.6	520	59.0
MW-2	3rd	4	7.6	520	N.T.
MW-2	4th	5	7.6	450	N.T.
MW-2	5th	6	7.6	510	59.0
MW-2	6th	7	7.6	520	N.T.
MW-3	1st	2	7.6	250	N.T.
MW-3	2nd	3	7.6	240	61.7
MW-3	3rd	4	7.6	240	61.7
MW-3	4th	5	7.5	240	N.T.
MW-4	1st	2	7.8	300	N.T.(3)
MW-4	2nd	3	7.8	290	N.T.
MW-4	3rd	4	7.8	300	N.T.
MW-5	1st	2	8.0	270	N.T.
MW-5	2nd	3	8.0	300	N.T.
MW-5	3rd	4	8.0	290	N.T.

* All wells were exhausted a minimum of four volumes of water prior to stability measurements of each well (see Figure 8.2 for well location).

(1) Each measurement was taken following the exhausting of one well volume of water from each well.

(2) N.T. - Not Tested

(3) Temperature gauge broke at this point.

TABLE 8.15*
LABORATORY RESULTS OF GROUNDWATER SAMPLING

SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT	CRQL mg/l	MW-1 Unfiltered	MW-1 Filtered	MW-2 Unfiltered	MW-2 Filtered	MW-3 Unfiltered	MW-3 Filtered	MW-4 Unfiltered	MW-4 Filtered	MW-5 Unfiltered	MW-5 Filtered
METALS (mg/l)											
Antimony	0.06	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Arsenic	0.01	UD	UD	UD	UD	UD	UD	0.011	UD	UD	UD
Beryllium	0.005	UD	UD	0.002B	UD	UD	UD	UD	UD	UD	UD
Cadmium	0.005	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Chromium	0.01	UD	UD	0.013	UD	0.011	UD	0.009B	UD	UD	UD
Copper	0.025	0.057	0.009B	0.053	0.005B	0.056	0.003B	0.081	0.006B	0.030	0.019B
Lead	0.005	0.023	0.002B	0.017	UD	0.40	0.003B	0.054	0.007	0.013	UD
Mercury	0.0002	UD	UD	UD	UD	UD	UD	0.0002	UD	UD	UD
Nickel	0.04	0.006B	0.008B	0.010B	0.005B	0.023B	0.007B	0.013	UD	0.062	UD
Selenium	0.005	UD	UD	UD	UD	UD	UD	--	--	UD	UD
Thallium	0.01	--	--	UD	UD	UD	UD	--	--	UD	UD
Zinc	0.02	0.078	0.031	0.034	0.054	0.053	0.053	0.094	0.060	0.034	0.066

SAMPLE DATE		MW-2 07/21/88	MW-3 07/21/88	MW-4 07/21/88	MW-5 07/21/88
VOLATILE ORGANIC COMPOUNDS (mg/l)					
TCL VOCs					
Chloromethane	0.01	0.039	**0.190**	**0.370**	0.015
Methylene Chloride	0.005	0.014B	0.160B	0.006	0.008JB
1,1-Dichloroethane	0.005	UD	UD	0.005	UD
1,2-Dichloroethene (Total)	0.005	0.003J	UD	UD	UD
1,2-Dichloroethane	0.005	UD	UD	0.008	UD
1,1,1-Trichloroethane	0.005	0.007	0.004J	0.010	UD
Trichloroethene	0.005	0.005B	UD	0.005JB	0.004JB
Benzene	0.005	UD	UD	UD	0.008J
Tetrachloroethene	0.005	**0.140**	UD	UD	UD
Toluene	0.005	UD	UD	0.003J	0.010
Chlorobenzene	0.005	UD	UD	UD	0.010
TOTAL TCL VOCs		0.208	0.354	0.407	0.055
TENTATIVELY IDENTIFIED VOCs (mg/l)**					
Unknowns	(2)	UD	0.960J	UD	UD
2-Propanone		0.023J	0.470J	0.013	UD
1,2-Dimethoxyethane		UD	0.190	UD	UD
1-(2-Methoxyethoxy) -Butane		UD	0.030J	UD	UD
3-Methyl-2-Butanone		UD	0.072J	UD	UD
3-Methyl Pentane		UD	0.130J	UD	UD
Butanoicacid Methylester		UD	0.069J	UD	UD
2-Butanone (Methyl-ethyl Ketone)		UD	0.925J	UD	UD
Hexane		UD	UD	UD	0.020J
Ethanol		UD	UD	0.360J	UD
Dimethoxy Methane		UD	UD	0.140	UD
Other Unknowns		1.400JB	0.420JB	1.800JB	0.080JB
TOTAL TENTATIVELY IDENTIFIED VOCs		1.423	3.266	2.313	0.100
TOTAL VOCs		1.631	3.620	2.720	0.155
BASE NEUTRAL EXTRACTABLES (mg/l)					
Bis(2-Ethylhexyl)phthalate		0.007JB	0.011B	UD	0.017B
Di-n-octylphthalate		0.002J	0.006J	UD	UD
TOTAL BASE NEUTRAL EXTRACTABLES		0.009	0.017	--	0.017
TOTAL ACID EXTRACTABLES (mg/l)		UD	UD	--	UD

** - See Appendix H for laboratory results of trip blanks and field blanks.
(1) - See Figure 8.2 for sampling locations.
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
** - Carbon dioxide results were not included
TCL - Target Compound List
CRQL - Contract Required Quantification Limit
B - Detected in Method Blank
J - Below mean quantification of laboratory
-- - Not Analyzed
UD - Undetected
NS - No class GA standard
Bold - Bold numbers indicate exceedence of GA Standards

industrial wastewater is shown in Table 8.16. Discussions and conclusions based upon field conditions and laboratory results are presented in subsection 9.5 of this report.

In addition, a water sample was obtained from a broken pipe which was uncovered during the site investigation. This water sample was tested by the laboratory for the TCL parameters. It is believed that this pipe drained the pool that was used for the supernatants for the sludge drying beds. The laboratory results of this sample is shown in Table 8.16 (as indicated as broken pipe). Discussions and conclusions based upon laboratory results are presented in subsection 9.5 of this report.

8.5 Site Specific Geohydrology

Drilling logs of all five (5) wells were recorded and are shown in Appendix I. The site specific geology is shown on Plate 8.1 which includes a site plan and three (3) geologic cross sections through the site. In addition, soil samples were obtained from the saturated zone within the borings of MW-1, MW-3, MW-4 and MW-5 in order to determine the average hydraulic conductivity of the water table aquifer by using the Moretrench American Corporation Method. The results of the calculations showed an average hydraulic conductivity to be approximately 1,640 gal/day/sq.ft.

Water level measurements were taken at each of the wells and were recorded as shown in Table 8.12. Table 8.12 was constructed to show the summary of well installation and development for each of the five (5) wells. Table 8.12 lists the well ID#, the date it was installed, the depth of the well, the length of the screen, the slot size of the screen, the depth to water, the date of final development, and total

TABLE 8.16*
LABORATORY RESULTS FOR WATER SAMPLES
OBTAINED FROM VARIOUS SOURCES
SJ&J SITE
Farmingdale, NY

DETECTED CHEMICAL CONSTITUENT(1)	CROL mg/l	Old Industrial Waste Water Settling Tank	Broken Pipe
METALS (mg/l)			
Arsenic	0.01	UD	UD
Cadmium	0.005	UD	UD
Chromium	0.01	UD	0.022
Copper	0.025	4.330	**0.143**
Lead	0.005	**0.106**	**0.290**
Mercury	0.0002	UD	0.0003
Nickel	0.04	0.215	0.0122
Zinc	0.02	**2.040**	**0.247**
Silver	0.01	UD	UD
Chromium (Hexavalent)	--	--	UD
VOLATILE ORGANIC COMPOUNDS (mg/l)			
TCL VOCs			
Chloromethane	0.01	0.029B	0.019B
Methylene Chloride	0.005	0.013B	UD
1,1-Dichloroethane	0.005	0.010	UD
1,2-Dichloroethene (Total)	0.005	UD	UD
1,2-Dichloroethane	0.005	UD	UD
1,1,1-Trichloroethane	0.005	UD	UD
Trichloroethene	0.005	UD	UD
Benzene	0.005	0.004J	UD
Tetrachloroethene	0.005	UD	UD
Toluene	0.005	0.027	UD
Chlorobenzene	0.005	UD	UD
1,1-Dichloroethene	0.005	0.015	UD
Ethylbenzene	0.005	**0.064**	UD
Chloroethane	0.01	UD	0.012B
TOTAL TCL VOCs		0.162	0.031
TENTATIVELY IDENTIFIED VOCs**			
Unknowns	(2)	0.330J	0.212J
Butycyclopentane		0.025J	UD
Unknown Nitrile		0.036J	UD
Unknown sub noname		0.034J	UD
2-Propanone		UD	0.045J
3,4-Nonadiene		UD	0.067J
4-Ethyl-3-Heptene		UD	0.007J
3-Ethyl-3-Heptene		UD	0.035J
2-Methyl heptane		UD	0.039J
Methylcycloheptane		UD	0.021J
1,2-Dimethoxyethane		UD	UD
1-(2-Methoxyethoxy) -Butane		UD	UD
3-Methyl-2-Butanone		UD	UD
3-Methyl Pentane		UD	UD
Butanoicacid Methylester		UD	UD
2-Butanone (Methyl -ethyl Ketone)		UD	UD
Hexane		UD	UD
Ethanol		UD	UD
Dimethoxy Methane		UD	UD
Other Unknowns		UD	UD
TOTAL TENTATIVELY IDENTIFIED VOCs		0.425	0.426
TOTAL VOCs		0.587	0.457
BASE NEUTRAL EXTRACTABLES			
Bis(2-Ethylhexyl)phthalate		UD	UD
Di-n-octylphthalate		UD	UD
TOTAL BASE NEUTRAL EXTRACTABLES		UD	UD
TOTAL ACID EXTRACTABLES		UD	UD

* - See Appendix H for laboratory results of trip blanks and field blanks
(1) - See Figure 8.2 for sampling locations
(2) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.
TCL - Target Compound List
UD - Undetected
B - Detected in Method Blank
J - Below mean quantification level of laboratory
CRQL - Contract Required Quantification Limit
** - Carbon dioxide results were not included
-- - Not analyzed
Bold - Bold numbers indicate exceedence of GA Standards

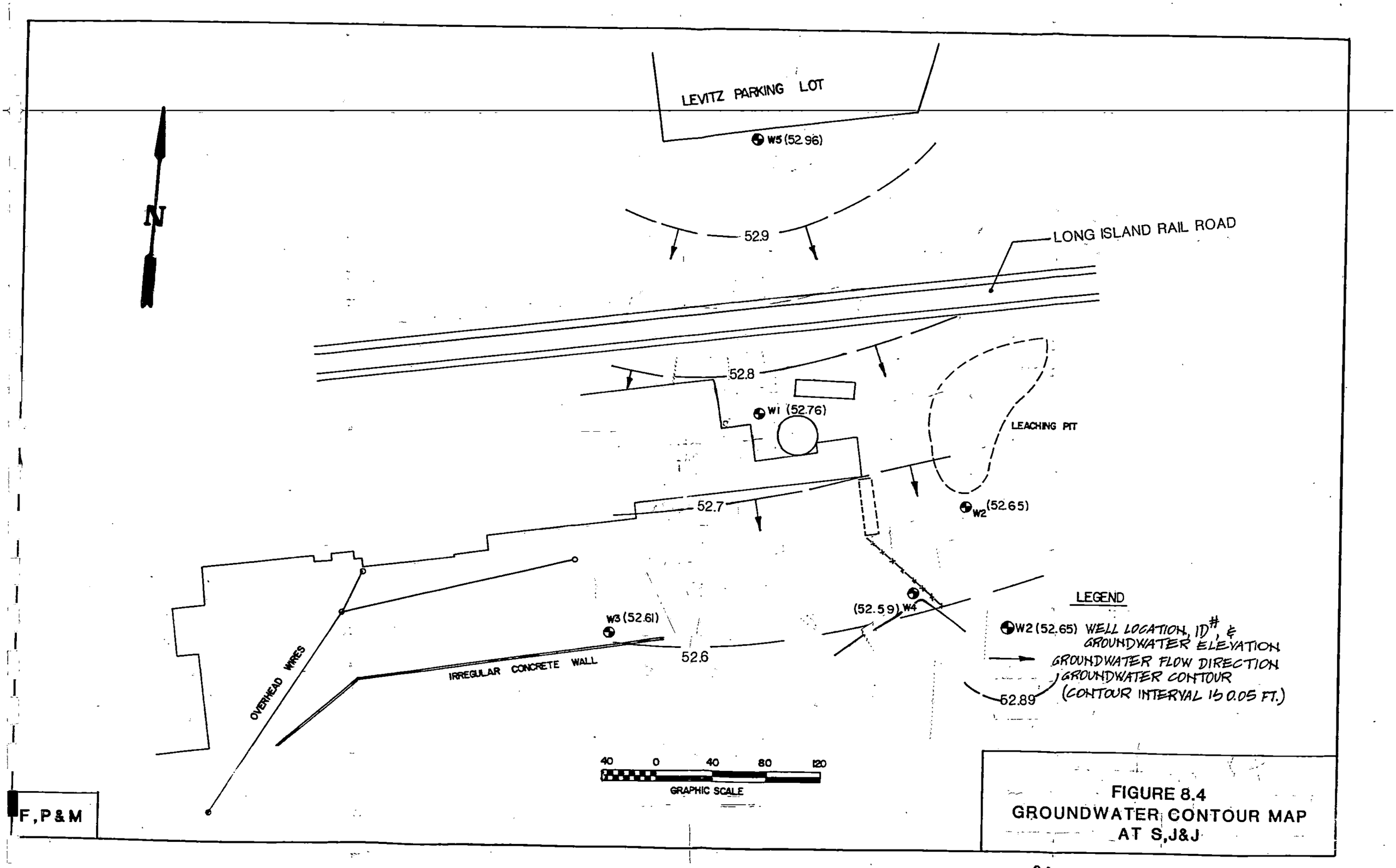
gallons purged.

The elevation and location of each well point and measuring point of each well was surveyed by a New York State licensed surveyor (see Appendix J for survey map). From the survey and water level measurements, Figure 8.4 was constructed to show a groundwater contour map of the water table. The contour map shows the flow direction beneath the site to be South-Southeast. From Figure 8.4, the average groundwater flow gradient was calculated to be 0.00086. Through calculations of the average hydraulic conductivity and the average groundwater gradient, the groundwater flow velocity was calculated to be approximately 0.53 ft/day (see Appendix K for calculations).

8.6 QA/QC

The laboratory results for all trip and field blanks are presented in Appendix H. The results indicate detected concentrations of metals and VOCs in most blanks including the laboratory method blanks as indicated in Appendix H. The concentrations of metals and VOCs detected in the blanks are below the quantification levels of the laboratory in most cases.

The testing of C.L.P. laboratory variability (by sending one sample to H2M and the other to NY Test) was interesting. The laboratory results for the split soil sample TB-2 (22'-24') are presented in Table 8.17. The results show that the two (2) laboratories are in close agreement. Out of the nine (9) metals tested they agree on Cadmium, Silver and Mercury as being undetected. They have similar results for Arsenic, Chromium and Lead, but differ by one order of magnitude for Zinc, Copper and Nickel. These differences could be explained by the lack of homogeneity in split soil samples and the low concentrations.



F,P&M

FIGURE 8.4
GROUNDWATER CONTOUR MAP
AT S,J&J

TABLE 8.17
LABORATORY RESULTS OF SPLIT
SOIL SAMPLING (TB-2 (22' - 24')
H2M AND NYTEST
SJJ SITE, FARMINGDALE, NEW YORK

METALS (mg/kg)	CRQL (mg/kg)	H2M	NYTEST
Arsenic	0.01	UD	1.2
Cadmium	0.005	UD	UD
Chromium	0.01	3.2	6.0
Copper	0.025	1.5B	15.0
Lead	0.005	3.6	UD
Mercury	0.0002	UD	UD
Nickel	0.04	2.6B	14.0
Silver	0.01	UD	UD
Zinc	0.02	5.6	110.0

UD Undetected
B Detected in Method Blank
CRQL Contract Required Quantification Limit

SECTION 9.0
DISCUSSIONS AND CONCLUSIONS

The purpose of this section is to summarize the soil and groundwater test results from the Stage I sampling. Subsection 9.1 presents a summary of the hydrogeologic conditions encountered at the SJ&J site. Subsection 9.2 includes a discussion of the guidelines and standards used for the assessment of the contamination in the soils and groundwater on the site. Subsection 9.3 includes the discussion and conclusions for each of the soil sampling locations. Subsection 9.4 includes the discussion and conclusions for each of the groundwater sampling locations on the site.

9.1 Hydrogeologic Conditions

As discussed in Section 3.0, the generalized geology of the site area features a Precambrian crystalline bedrock predominantly composed of schist and gneiss overlain by the Lloyd sand member and clay member of the Raritan formation of Cretaceous age. Overlying the Raritan formation is the Magothy formation, also of cretaceous age, which consists of non-fossiliferous beds and lenses of gray and white fine coarse sand, clay and silty sand and clay as previously discussed in Section 3.0. At the site area, upper Pleistocene deposits (glacial) directly overlay the Magothy formation as glacial outwash deposits, composed of stratified medium to coarse grained sand and gravel.

The significant aquifers at the site area, in descending order, include the upper glacial aquifer (water table aquifer), which is composed of Pleistocene outwash deposits, the Magothy aquifer composed of the Magothy formation, and the Lloyd aquifer composed of the Lloyd sand member of the Raritan formation. The clay member of the Raritan

formation acts as a confining unit to the Lloyd sand member.

The water table at the site is within the upper glacial aquifer as shown in Figure 3.6 and 8.4. The results of the generalized flow direction at the site and the site specific groundwater flow shows that the flow direction is in South to Southeast direction. Estimates of the average hydraulic conductivity and transmisivity for the site through the USGS paper 627-E "Water Transmitting Properties of Aquifers on Long Island, New York" estimated the hydraulic conductivity for the approximate site area to be 2,000 gals/day/sq.ft. A site specific evaluation of the hydraulic conductivity was calculated, based on the split spoon soil samples obtained from the saturated soils at the site. Using the Moretrench American Corp. Method, the hydraulic conductivity estimate was 1,640 gals/day/sq. ft. This is in close agreement with the USGS estimates. The groundwater pore velocity was calculated to be 0.53 ft/day beneath the site, in a South to Southeast direction.

The site geology is shown on plate 8.1 which shows the borings and cross sections through the site. Appendix I includes the drilling logs for all five (5) wells installed. Calculations for the hydraulic conductivity and groundwater flow velocity are shown in Appendix K.

9.2 Discussion of Guidelines and Standards Used for the Assessment of the Contamination in the Soils and Groundwater at the Site.

Soils (Metals):

The laboratory data for soils on this site will be compared to USEPA "Natural" soils, New York State Department of Environmental Conservation (NYSDEC) Superfund Guidelines, and United States Environmental Protection Agency (USEPA) Superfund Records on Decision (ROD) range for similar sites (which established clean up levels at

other sites located over an aquifer and contaminated with metals).

It is the intent of Fanning, Phillips and Molnar to determine the long term health implications of the contamination that has been detected in the soils at the SJ&J site. Because there are no health based soil standards for New York State, we are using three guidelines; USEPA "Natural" soils (Table 9.1), the NYSDEC Superfund Guidelines (Table 9.2), and USEPA Records on Decision (RODs) clean up levels for other superfund sites (Table 9.2). All soil sample results for metal analysis were compared individually with each of these three guidelines. Soil samples exceeding all three guidelines were noted as areas of significant concern in that they are above a health based guideline (USEPA), background soils for the area, and "Natural" soils. These areas will be investigated further by resampling and, if necessary, a feasibility study for remediation.

SOILS (Organics):

All soil sample results for organic compound analysis (which includes volatile organic compounds (VOCs), base neutral and acid extractables (BN/AE), polychlorinated biphenyls (PCBs), and pesticides) were also compared individually with New York State standards and USEPA records on decision.

Table 9.1 shows concentrations of compounds in "Natural" soils. This table has been constructed of several sources and can be useful to evaluate what is "natural". For the purposes of evaluation of this site, we have used the USEPA "Natural Soils Common Range". The other sources are listed to support the USEPA natural soils range. The USEPA natural soils common range represents a common range for metals in the natural soils of the Continental United States. In

Table 9.1

Concentrations of Compounds in "Natural" Soils*

Compound	Range From[1] Various Sources	Mean Ambient[2] Background Soils in Eastern U.S.	USEPA[3] Natural Soils Common Range	Full Concentration Range
Arsenic	(0.1-194)	5.4	(1.0-50)	(0.1-194)
Cadmium	(2.0-130)	1.0	(.01-0.7)	(.01-130)
Chromium	(5.0-3,000)	36.0	(1.0-1,000)	(1.0-3,000)
Chromium (Hex)	--	--	--	--
Copper	(2.0-100)	14.0	(2.0-100)	(2.0-100)
Lead	(<1.0-888)	14.0	(2.0-200)	(<1.0-888)
Mercury	(.01-4.6)	0.096	(.01-0.3)	(.01-4.6)
Nickel	(0.1-1,530)	13.0	(5.0-500)	(0.1-1,530)
Silver	(.01-8.0)	--	(.01-5.0)	(.01-8.0)
Zinc	(10-2,000)	36.0	(10-300)	(10-2,000)

* All concentrations are in mg/kg (ppm).

(1) The range from various sources is referenced to:
McClanahan 847C, revised June 22, 1984.
See Appendix L for listing of sources used in this reference.

(2) The mean ambient background soils in Eastern United States is referenced to:
Geochemistry of some rocks, soil, plant and vegetables in conterminous United States Geological Survey professional paper 574 F, 1975.

(3) The USEPA Natural Soils common range is referenced to:
USEPA office of solid waste and emergency response, HAZARDOUS WASTE LAND TREATMENT, SW-874 (April, 1983) page 273, Table 6.46.

-- No listing

TABLE 9.2

NYSDEC AND USEPA (RODS) GUIDELINES FOR CONTAMINANTS IN SOILS

Compound	NYSDEC[1] Guidelines	USEPA Superfund[2] Rods Range
Metals (mg/kg)		
Arsenic	UD	20
Cadmium	UD	3
Chromium	6.9	(15-100)
Chromium (Hex)	--	--
Copper	2.4	(9.7-170)
Lead	3.1	(100-1000)
Mercury	UD	1
Nickel	2.0	(18-100)
Silver	UD	(.6-5)
Zinc	11.5	(53-350)
VOLATILE ORGANIC COMPOUNDS (mg/kg)		
Benzene	1	1
TOTAL VOCs	10	1
TOTOAL POLYCYCLIC AROMATIC HYDROCARBONS (mg/kg)	--	(2.94-100)
TOTAL BASE NEUTRAL EXTRACTABLE (mg/kg)	--	100
TOTAL PETROLEUM HYDROCARBONS (mg/kg)	10	--
POLYCHLORINATED BIPHENYLS (mg/kg)	10	(1-10)
TOTAL ORGANIC PESTICIDES (mg/kg)	1	--

(1) NYSDEC Superfund Guidelines for soils. Note that the soil concentrations are represented by the lowest background sample (Birch Lane) concentrations as shown in Table 8.9.
(2) The USEPA Superfund Records on Decision (ROD) range was developed through review of case related USEPA site clean-ups throughout the Region I, II, and III. See Appendix L for Table that presents each case scenario.
* All concentrations are in mg/kg (ppm)
-- No listing
UD Undetected

Table 9.1, the USEPA concentration range for metals in natural soils is widespread. For example, the full concentration range for chromium in soils is between 1.0 and 1,000 ppm. This range brackets concentrations at three orders of magnitude. Concentrations listed for Mercury indicate the range to be 0.01 to 0.3 (ppm). This range brackets concentrations at one order of magnitude. It is, therefore, shown on Table 9.1 that there is quite a diverse range of metal compounds occurring in natural soils in the Continental United States. Hence, the concept of using a single background sample to define clean up levels should be supplemented with more of a health based approach.

Table 9.2 shows concentrations of compounds in soils as indicated by NYSDEC Superfund Guidelines. For metals, these State guidelines are indicated as the concentrations reported from soil samples obtained to represent "background" conditions for the site area. For this report, background soil samples were obtained off the site at Birch Lane Circle North and are indicated as BLCN samples in the text (see Table 8.9 for results). There were two (2) samples obtained from Birch Lane at different depths, but within the same glacial outwash formation. The lowest concentration for each inorganic compound (metal) was used as the NYSDEC Guideline for metals. These levels are reported in Table 9.2. In addition, the NYSDEC guidelines for organic compounds (volatiles, base neutrals, acid extractables, total petroleum hydrocarbons, PCBs, and total organic pesticides) are indicated as guidelines for NYSDEC Superfund sites.

Table 9.2 shows the USEPA Superfund RODs range. The range of concentration listed in Table 9.2 was derived from thirty-five (35)

RODs with heavy metal contamination in Regions I, II, and III (northeast U.S.). The range for USEPA Superfund RODs was meant to capture what was deemed acceptable by the EPA as clean up levels throughout the Northeast U.S. The concentration ranges are indicated on Table 9.2. It is important to note that each of the USEPA Superfund ROD metal concentrations were based upon risk assessment studies that vary depending upon the sensitivity and exposure of the receptor.

In summary, the three (3) guidelines used by Fanning, Phillips and Molnar for the SJ&J site are expected to focus on the soils in areas of significant concern. The methodology is as follows: First, determine the contaminant levels in soils that exceed the background sample. Second, look further to see if it falls out of the USEPA "natural" soil concentration range (upper limit) and third, test to see if that level will cause a health problem USEPA (RODs). This will allow us to focus in on contaminants of concern and perform a risk assessment on the serious concerns of the site. The soil samples that were detected with concentrations of compounds exceeding the three (3) guidelines were noted as such in the text, and will be followed up with a risk assessment and recommendations for remediation.

Groundwater (Metals and Organics):

The laboratory data for groundwater was compared to the NYSDEC groundwater standards: Division of Water TOGS (GA) 1.1.1 and Water Quality Regulations NYS Codes, Rules, and Regulation, Title 6, Chapter X, Part 703.5; which includes NYSDOH (10 NYCRR Subpart 5-1) MCLs, NYSDOH (10 NYCRR, Part 170) Raw Water Standards, and EPA 40CFR 141 MCL. Groundwater samples detected with contaminant concentrations

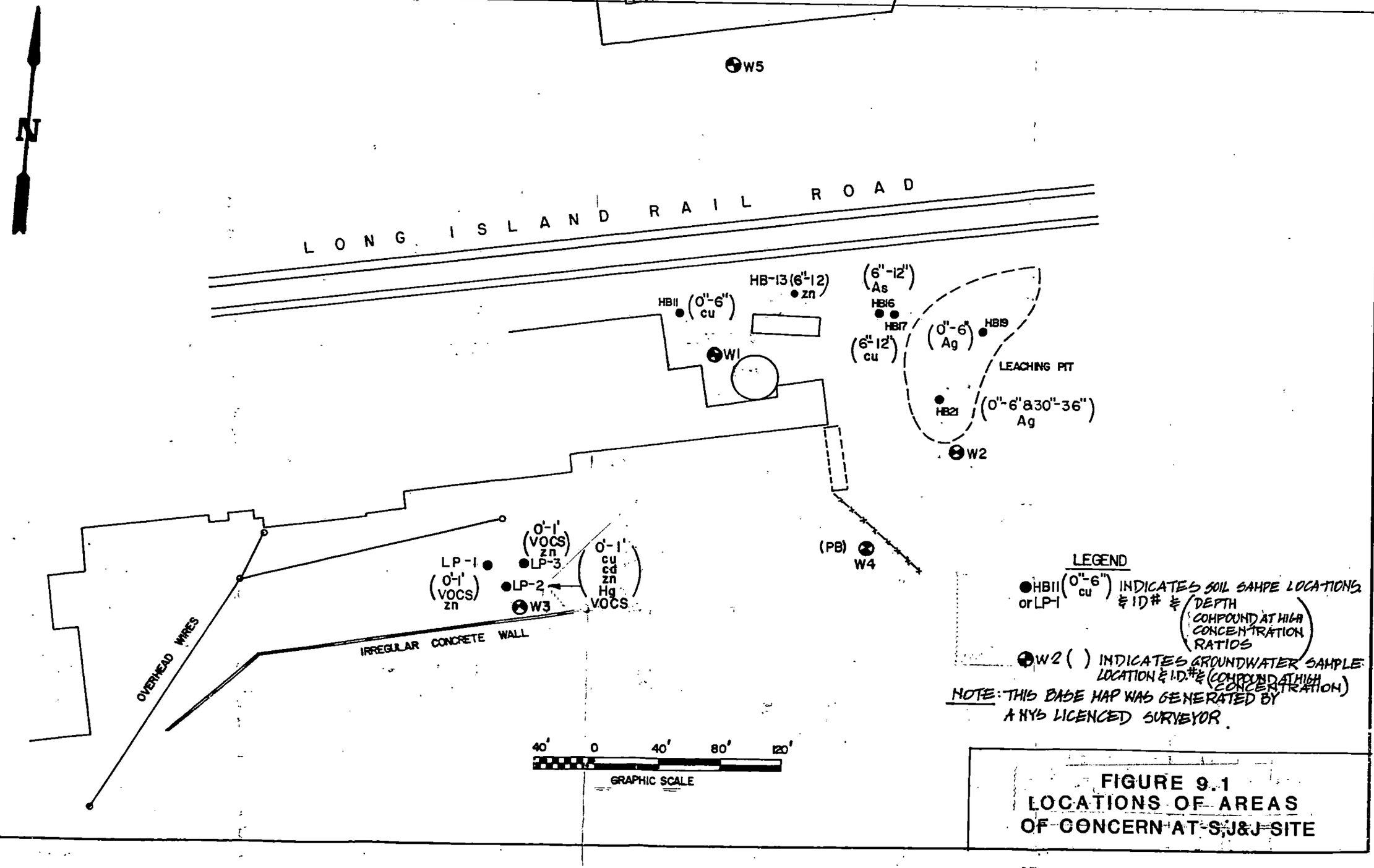


FIGURE 9.1
LOCATIONS OF AREAS OF CONCERN AT S,J&J SITE

recommendations for the soils contaminated with Cu, As and Zn on the site.

Steam Cooker Discharge Area

The laboratory results of the soil sampling in the steam cooker discharge area indicated that the concentration of contaminants detected in the soil were below levels of significant concern.

Leaching Pit (Shallow Borings)

The laboratory results of the soil sampling in the leaching pit indicated that concentrations of Ag were detected at levels which exceeded the guidelines in Tables 9.1 and 9.2 (see Table 8.7) at locations HB-19 (0"-6"), HB-21 (0"-6") and HB-21 (30"-36"). Low concentrations of target compound list and tentatively identified VOCs were also detected However, the total VOC concentrations in the samples tested were below the guidelines in Table 9.2.

The high concentrations of Ag detected in the three (3) soil samples (see Figure 9.1) warrants further attention. Section 10.0 will present recommendations for the soils contaminated with high concentrations of Silver on the site.

Leaching Pit (Boring to Water Table)

The laboratory results of soil sampling within boring TB-2 at nine (9) depths within the leaching pit indicated that metals were detected in all nine (9) soil samples but were below the guidelines in Tables 9.1 and 9.2. In addition, concentrations of total VOCs and base neutral extractables (BNEs) were detected below the guidelines in Table 9.2.

It should be noted that stained soils were identified at a depth of approximately 10'-18' at TB-2. OVA results of the soil headspace

indicated 34 ppm in the 16'-18' zone and 38 ppm in the 25'-27' zone. The discoloration and OVA results may indicate past spillage, however, targeted parameters were not detected at significant concentrations. Groundwater monitoring well MW-2 is directly downgradient of this zone and has not been detected with contamination that would indicate the leaching pit to be a significant source.

Birch Lane Circle North (Background Soil Sample)

The laboratory results of the two (2) soil samples obtained at Birch Lane Circle North were analyzed in order to generate a guideline defined to be "background" concentrations. The background concentration was determined by listing the lowest concentration for each inorganic parameter as shown in Table 9.2 (in the column for NYSDEC guidelines for metal concentrations). This was done in order to establish one (1) of three (3) criteria for evaluating this site.

Leaching Pools (Former Drum Storage Area)

The laboratory results of the soil sampling within the three (3) leaching pools indicated that the soil sample obtained from LP-2 was detected with high concentrations of Cu, Hg, Cd and Zn which exceeded the guidelines in Tables 9.1 and 9.2. The soil samples obtained from LP-1 and LP-3 were detected with high concentrations of Zn which exceeded the guidelines. In addition, the total VOC concentrations in all three (3) leaching pools exceeded the guidelines in Table 9.2. The high concentrations of Cu, Hg, Cd, Zn and VOCs (see Figure 9.1) requires further attention. It has not been determined as to the source of the contamination in the leaching pools.

The client has been notified of the contamination in the leaching pools and Fanning, Phillips and Molnar has directed them to block the

infiltration of water into all three (3) of the leaching pools in order to eliminate the potential leaching of the contaminants into the underlying soils. Section 10.0 will present recommendations for the soils within the leaching pools.

It should be pointed out that Table 4.1 of this report indicates that four (4) leaching pools were supposed to be sampled. However, through field investigation, one (1) of these locations was identified as a sewer man-hole cover, and therefore, there was no soil sample obtained at that location.

Test Boring in Former Solvent Drum Storage Area (To Water Table)

The laboratory results of the soil sampling within test boring (TB-1) indicated that low concentrations of total VOCs were detected in all four (4) of these soil samples. The total VOC concentrations detected were below the guidelines in Table 9.2.

9.4 Discussions and Conclusions for the Groundwater Sampled at the Site

Soils:

The laboratory results of the soil samples obtained during the installation of wells MW-1, MW-3 and MW-4 indicated only low concentrations of total VOCs (see Table 8.13). The concentrations of total VOCs were below the guidelines in Table 9.2.

Groundwater:

The laboratory results for the groundwater samples obtained on the SJ&J site were compared to the groundwater standards as defined in the NYSDEC groundwater standards: NYSDEC Division of Water TOGS 1.1.1, and Water Quality Regulation New York State Codes, Rules and Regulations, Title 6, Chapter X, Part 703.5, which includes NYSDOH (10 NYCRR Subpart 5-1) MCLs, NYSDOH (10 NYCRR Part 170) Raw Water

Standards, and EPA 40 CFR 141 MCL. Groundwater samples detected with contaminant concentrations exceeding these standards were noted as such (see Table 8.15).

The laboratory results of the groundwater sampling from four (4 unfiltered) on-site monitoring wells and one (1 unfiltered) upgradient monitoring well indicate that all five (5) wells exceeded the 6 NYCRR 703 standard class (GA) standards for Cu and Zn. This indicates that groundwater on-site is characteristic of groundwater upgradient of the site. The laboratory results for monitoring wells MW-3 and MW-4 (both unfiltered) reveal that concentrations of Pb exceed NYSDEC Division of Water TOGS 1.1.1 (TOGS) as well as GA standards. All five (5) of the filtered wells exceed the GA standards for Zn. The upgradient well has the highest Zn concentrations (compare Tables 8.15 and 9.3).

In addition, groundwater samples MW-2, MW-3, MW-4, and upgradient well MW-5 were detected with concentrations of VOCs. Table 8.15 shows that a number of target compound list VOCs were detected at low concentrations. A number of tentatively identified VOCs were detected most of which are unknown. The total VOCs at MW-2, MW-3, MW-4 and MW-5 ranged from .155 mg/l in MW-5 to 3.62 mg/l in MW-3. Base neutral and acid extractables were detected in extremely low concentrations or not at all.

The exceedences of the groundwater standards at MW-3 and MW-4 for Pb requires further investigation. The large number of VOCs that were detected in MW-2, MW-3, MW-4, and MW-5 indicates that VOCs are present in the water table, both up and downgradient of the site. It was noted that more than half of the total VOC concentrations are made up of unknowns and not the TCL parameters.

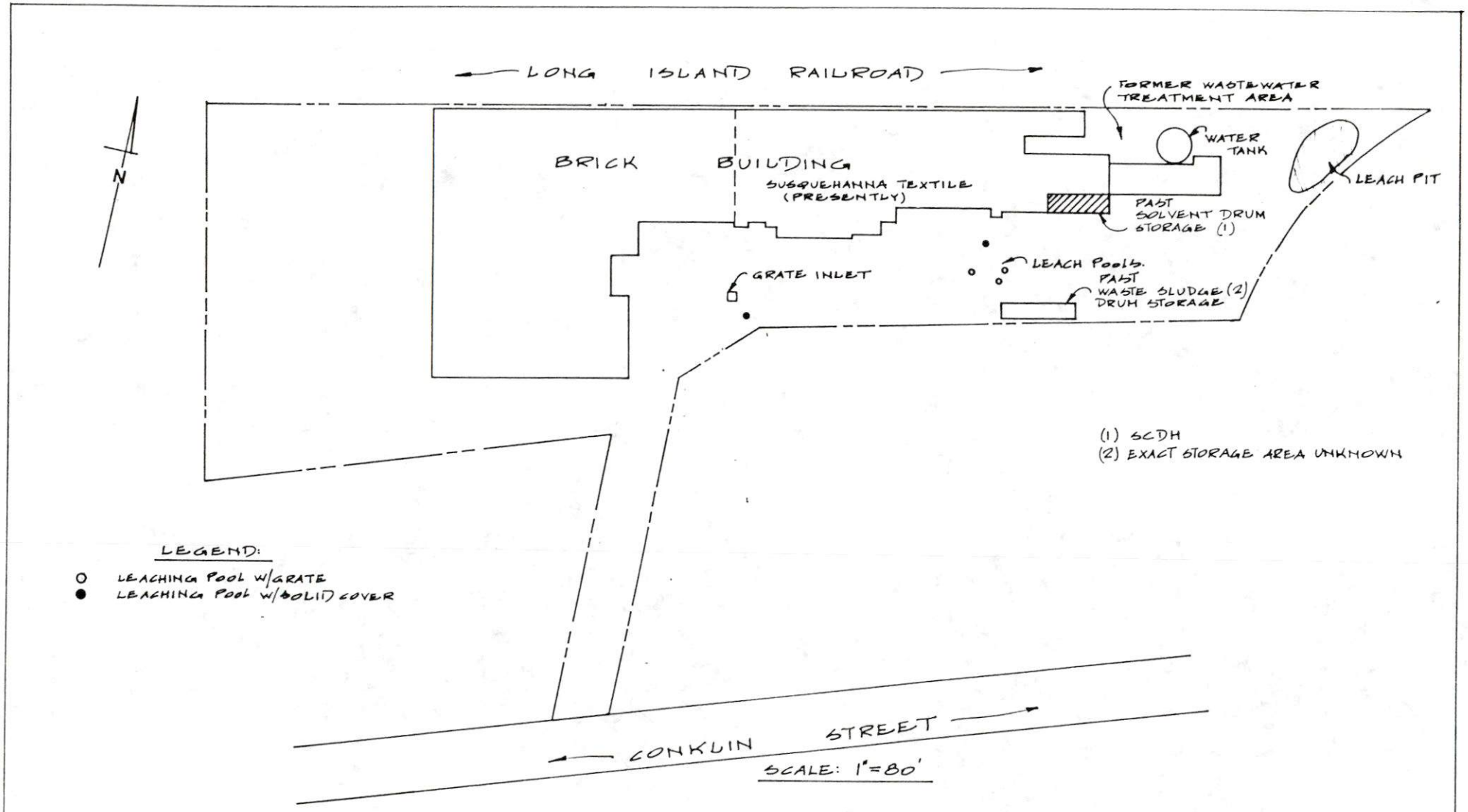
In addition, there is no pattern or fingerprint of the organics found in the leaching pools and the organics found in the wells. This relationship shows more of a random pattern. The location of MW-3 indicates that the source of VOCs may be attributed to the leaching pools directly upgradient of this well. Section 10.0 presents recommendations for the groundwater at the site.

9.5 Discussions and Conclusions for the Water Sampling From Various Sources

The laboratory results for the water samples obtained from the old industrial wastewater settling tank and the broken pipe were compared to the applicable standards listed in Table 9.3. Both locations have metal concentrations in the water samples in excess of quality standards for groundwaters. The old settling tank location exceeds the GA standard for Zn while the broken pipe exceeds the same standard for Cu. Metal concentrations for Pb at the broken pipe location and both Pb and Cu at the old settling tank location exceed both the TOGS and GA standards.

The individual VOC concentrations of chloromethane and chloroethane exceed the GA standard at the broken pipe location. Both compounds were detected in the method blank. At the old settling tank location, chloromethane, methylene chloride, 1,1-dichloroethane, toluene, 1,1-dichloroethene exceed the GA standard. Chloromethane and methylene chloride were detected in the method blank. Ethylbenzene exceeded both the TOGS and GA standards.

At both locations, the total VOC concentrations exceeded the TOGS standard primarily due to the cumulation of concentrations below the mean quantification level of the laboratory.



F, P & M

FIGURE 3.2 SITE MAP

SJ+J

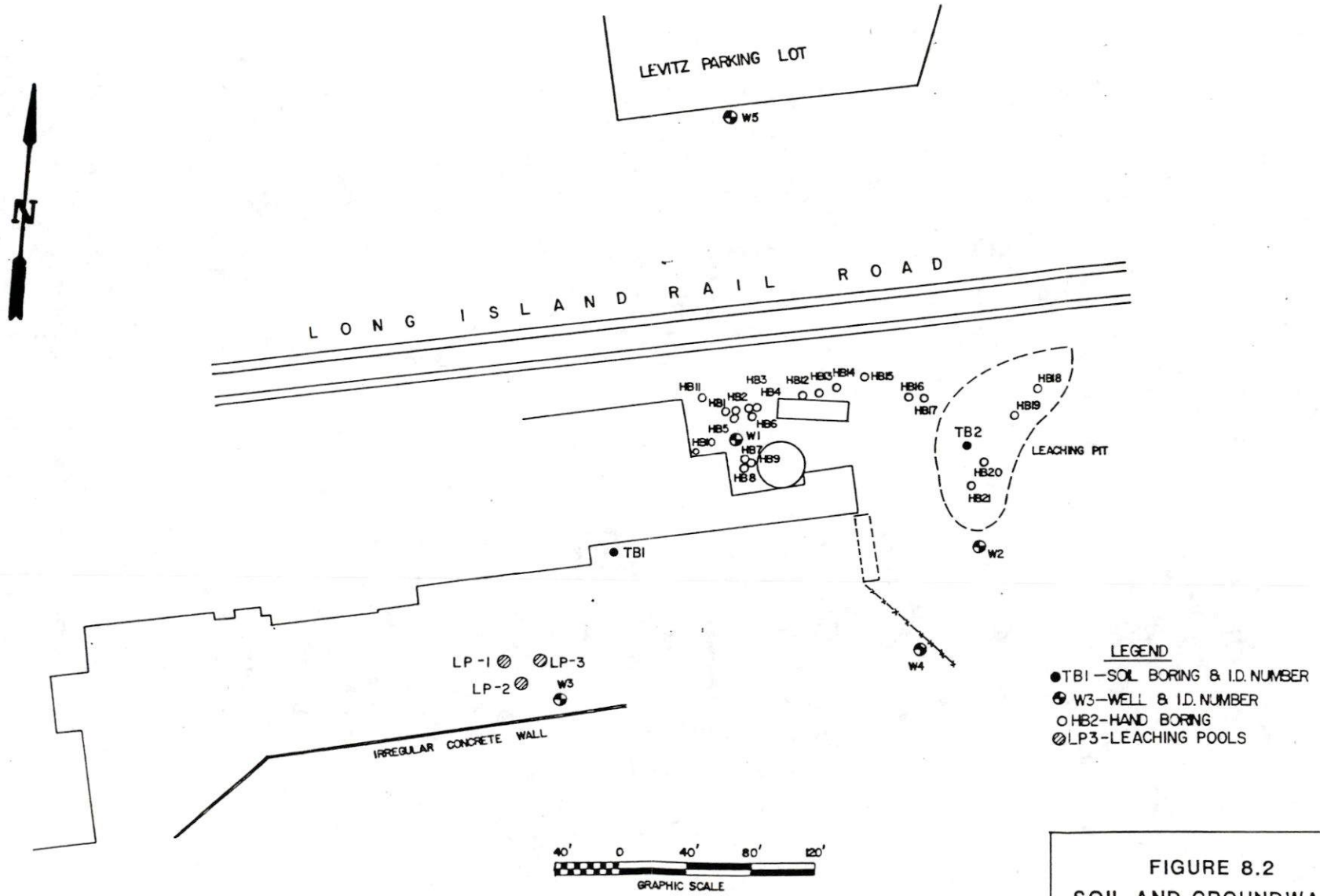


FIGURE 8.2
SOIL AND GROUNDWATER
SAMPLING LOCATIONS

4

SJ + J

SJ + J

TABLE 8.1

SUMMARY OF SOIL SAMPLING AT SJ&J SITE

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
TEST BORING IN FORMER SOLVENT DRUM STORAGE AREA					
TB-1	05/26/88	4'-6'	05/26/88	Gravelly sand with some clay.	VOCs(1)
TB-1	05/26/88	8'-10'	05/26/88	Sand-gravel with some fine sand.	VOCs
TB-1	05/26/88	18'-20'	05/26/88	Medium-course sand with rounded fine gravel.	VOCs
TB-1	05/26/88	22'-24'	05/26/88	Medium-course sand with rounded fine gravel.	VOCs
ALONG PIPELINE					
HB-11	06/03/88	0"-6"	06/06/88	Gray silty sludge and brown silt.	Metals(2)
HB-12	06/03/88	6"-12"	06/06/88	Brown sand with silt and gravel.	Metals
HB-13	06/03/88	6"-12"	06/06/88	Fine brown sand with silt.	Metals
HB-14	06/03/88	6"-12"	06/06/88	Fine brown sand with silt.	Metals
HB-15	06/03/88	0"-6"	06/06/88	Brown silty sand with some gravel.	Metals
HB-16	06/03/88	6"-12"	06/06/88	Brown silt with some fine sand and clay.	Metals
HB-17	06/03/88	6"-12"	06/06/88	Brown silty clay.	Metals
TEST BORING IN LEACH PIT					
TB-2	07/12/88	10'-12'	07/13/88	Brown-orange fill with discolored gray sand.	Metals
TB-2	07/12/88	12'-14'	07/13/88	Medium-course sand slightly discolored.	Metals
TB-2	07/12/88	14'-16'	07/13/88	Medium-course sand with gravel. Streaks of blackish substance.	Metals
TB-2	07/12/88	16'-18'	07/13/88	Medium-course sand with some gravel. Streaks of blackish substance.	Full TCL scan
TB-2	07/12/88	18'-20'	07/13/88	Medium-course sand with some gravel. Some moist silt.	Metals
TB-2	07/12/88	20'-22'	07/13/88	Medium-course black and brown sand with some gravel.	Metals
TB-2	07/12/88	22'-24'	07/13/88	Brown (slightly gray) medium-course sand with some blackish color.	Metals(3)

* All samples composited from indicated depths.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 8.2 for summary of OVA screening of soil samples and Appendix G for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

TABLE 8.1 (continued)

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
TB-2	07/12/88	24'-26'	07/13/88	Medium-course sand (brown) with gravel. Some discoloration.	VOCs(1) Metals(2)
TB-2	07/12/88	26'-28'	07/13/88	Black stained medium-course sand with some gravel.	Metals
HAND BORING IN LEACHING PIT					
HB-18	06/03/88	0"-6"	06/06/88	Stained dark gray medium-course sand and gravel.	Metals
HB-18	06/03/88	2.5'-3'	06/06/88	Gray-stained medium-course sand and gravel.	VOCs Metals
HB-18	06/03/88	4'-4.5'	06/06/88	Medium-course sand with gravel. Slight gray staining.	VOCs Metals
HB-19	06/03/88	0"-6"	06/06/88	Medium-course sand with some gravel.	Metals
HB-19	06/03/88	2.5'-3'	06/06/88	Medium-course sand with some gravel.	VOCs Metals
HB-19	06/03/88	4.5'-5'	06/06/88	Medium-course sand with some gravel.	VOCs Metals
HB-20	06/06/88	0"-6"	06/06/88	Brown, medium-course sand with gravel.	VOCs Metals
HB-20	06/06/88	2.5'-3'	06/06/88	Tan, medium-course sand with gravel.	Metals
HB-20	06/06/88	5'-5.5'	06/06/88	Tan, medium-course sand with gravel, pebbles.	VOCs Metals
HB-21	06/06/88	0"-6"	06/06/88	Brown, medium-course sand with silt and gravel.	Metals
HB-21	06/06/88	2.5'-3'	06/06/88	Tan, medium-course sand with gravel	VOCs Metals
HB-21	06/06/88	5'-5.5'	06/06/88	Medium-course sand with gravel.	Metals
BACKGROUND SAMPLES					
BLCN	06/06/88	0'-2'	06/06/88	Medium-course sand with some gravel.	VOC Metals
BLCN	06/06/88	0'-2'	06/06/88	Medium-course sand with some gravel.	VOCs Metals

* All samples composited from indicated depths.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 8.2 for summary of OVA screening of soil samples and Appendix G for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

TABLE 8.1 (continued)

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
OUTSIDE SLUDGE DRYING BEDS					
HB-5	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals(2)
HB-5	06/02/88	2'-2.5'	06/02/88	Medium course sand with some gravel.	Metals
HB-6	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-6	06/02/88	2'-2.5'	06/02/88	Medium course sand with some gravel.	Metals
HB-9	06/02/88	3'-3.5'	06/02/88	Medium course sand with some gravel.	Metals
STEAM COOKER AREA					
HB-10	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals
HB-10	06/02/88	At 18"(4)	06/02/88	Medium course sand with some gravel.	Metals
SLUDGE DRYING BEDS					
HB-1	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	VOCs(1) Metals
HB-1	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals
HB-2	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-2	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals
HB-3	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-3	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	Metals Full Priority Pollutant Scan
HB-4	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	Metals
HB-4	06/02/88	6"-12"	06/02/88	Medium course sand with some gravel.	VOCs Metals
HB-7	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	VOCs Metals
HB-7	06/02/88	2.5'-3'	06/02/88	Medium course sand with some gravel.	Metals
HB-8	06/02/88	0"-6"	06/02/88	Medium course sand with some gravel.	VOCs Metals
HB-8	06/02/88	2.5'-3'	06/02/88	Medium course sand with some gravel.	Metals

* All samples composited from indicated depths.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 8.2 for summary of OVA screening of soil samples and Appendix G for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

TABLE 8.1 (continued)

Sample Location and ID#	Date of Sampling	Sample Depth Interval	Date Sample was Submitted to lab	Physical Description of Sample	Parameters Tested
WELL BORINGS					
MW-1	05/31/88	20'-22'	05/31/88	Medium-course sand with fine gravel.	VOCs(1)
MW-3	05/27/88	25'-27'	05/31/88	Medium-course sand lens of fine gravel	VOCs
MW-4	05/31/88	15'-17'	05/31/88	Medium-course sand	VOCs
LEACHING POOLS					
LP-1	05/27/88, 05/31/88	0"-6"	05/31/88, 06/02/88	Dark, fine silt with slight odor.	VOCs Metals(2)
LP-2	05/27/88, 05/31/88	0"-6"	05/31/88, 06/02/88	Black, moist clay with some gravel	VOCs Metals
LP-3	05/27/88, 05/31/88	0"-6"	05/31/88, 06/02/88	Dark clay with sand. Slight odor.	VOCs Metals
FIELD AND TRIP BLANKS					
TRIP BLANK	05/25/88	Aqueous Trip Blank	05/26/88	Aqueous	VOCs
TRIP BLANK	05/25/88	Aqueous Trip Blank	05/31/88, 06/02/88	Aqueous	VOCs
FIELD BLANK	05/31/88	Aqueous Field Blank	05/31/88, 06/31/88	Aqueous	VOCs
TRIP BLANK	05/31/88	Aqueous Trip Blank	06/02/88	Aqueous	VOCs
FIELD BLANK	05/31/88	Aqueous Field Blank	06/02/88	Aqueous	VOCs Metals
TRIP BLANK	06/01/88	Aqueous Trip Blank	06/02/88	Aqueous	VOCs Metals
FIELD BLANK	06/01/88	Aqueous Field Blank	06/02/88	Aqueous	VOCs Metals
TRIP BLANK	06/06/88	Aqueous Trip Blank	06/06/88	Aqueous	VOC Metals
FIELD BLANK	06/06/88	Aqueous Field Blank	06/06/88	Aqueous	VOC Metals
TRIP BLANK	06/06/88	Aqueous Trip Blank	06/06/88	Aqueous	VOC Metals
FIELD BLANK	06/06/88	Aqueous Field Blank	06/06/88	Aqueous	VOC Metals
TRIP BLANK	07/12/88	Aqueous Trip Blank	07/13/88	Aqueous	Full TCL scan
FIELD BLANK	07/12/88	Aqueous Trip Blank	07/13/88	Aqueous	Full TCL scan

* All samples composited from indicated depths.
(1) Volatile Organic Compounds by U.S.E.P.A. Method 624 as per results of OVA screening (see Table 8.2 for summary of OVA screening of soil samples and Appendix G for all screening results).
(2) Metals are: As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn (Also, Cr^{+6} for sample TB-2)
(3) Sample split between NYTest and H_2M Labs.
(4) Not composited due to obstruction in soil.

SECTION 10.0
RECOMMENDATIONS

Throughout this site investigation, a number of environmental concerns were identified on the site and were addressed through soil and groundwater sampling. The discussions and conclusions of this report as well as the comments by the NYSDEC (see Appendix N), enabled Fanning, Phillips and Molnar to formulate the following recommendations (see Figure 9.1 for locations of areas of concern at the SJ&J site):

1. Resample the groundwater during late spring (during high water table conditions) in order to substantiate the first round sampling results. The groundwater samples should be tested for TCL parameters as before at well locations MW-2, MW-3, and MW-5. The groundwater at MW-4 should be tested for total metal analysis (select metals) and VOCs as per EPA Method 624. The groundwater at MW-1 should be tested for total metals (select metals) and VOCs as per EPA Method 624.

1a. Should the resampling of the wells confirm organic contamination for MW-3, install a well directly downgradient of MW-3 (100') to investigate downgradient water quality from the three (3) pools. This well will be off site and will require permission from the land owner. This groundwater should be tested for TCL compounds.

2. Obtain two additional background soil samples at a depth of 1' in the vicinity of the previous Birch Lane samples. Test these samples for targeted metals.

3. Sample soils in all three (3) leaching pools by continuous split

spoon samples down to the water table. Samples should be tested for select metals, VOCs and petroleum hydrocarbon. Based upon the laboratory results, soils should be excavated from the pools by a licensed hauler, and disposed of at a NYSDEC approved landfill if the petroleum hydrocarbon level does not exceed 3 percent.

4. Excavate soil in area where pipe is suspected to exist to establish pipe location.

5. A second round of soil sampling should be performed at locations HB-11 (0"-6"), HB-13 (6"-12"), HB-16 (6"-12"), HB-17 (6"-12"), HB-19 (0"-6") and HB-21 (0"-6" and 30"-36") for the purpose of data validation. This is because a number of metals and organic compounds were detected in the field blanks, trip blanks, and method blanks. The resampling should provide more representative results for this site.

5a. Upon verification of the metal concentrations detected at HB-11 (0"-6"), HB-13 (6"-12"), HB-16 (6"-12"), HB-17 (6"-12"), HB-19 (0"-6") and HB-21 (0"-6" and 30"-36"), recommendations for remedial alternatives may be warranted. Metals are relatively immobile in soils and are not migrating into the water table thus far as shown in the groundwater sampling results. This will be confirmed from the second round of groundwater sampling. Preliminary evaluation of the exposure routes in concentrations of As, Cu, Cd, Ag and Zn in the soils at the SJ&J site indicate that there is no significant concern for dust control (see Appendix M for evaluation and methodology used).

1. Excavate soils and use as aggregate for concrete.

2. Encapsulation via pavement (asphalt parking lot etc.) in order to minimize the migration of Cu, As, Ag, Cd, and Zn into the water table aquifer and to further isolate it from the occupants on the site.

DISCLAIMER

These findings are based upon a detailed sampling procedure that has been formulated in accordance with U.S. E.P.A. procedures both for sampling and for laboratory analysis. Conclusions from this data are limited to those areas focused on in the study and represents our best judgment using analytical techniques and our past experience. Even though our investigation has been scientific and thorough, it is possible that certain areas of this site may pose environmental concerns that as yet are undiscovered. In addition, environmental regulations may change in the future and could have an effect on our conclusions.

APPENDIX G

OVA HEADSPACE RESULTS AND GC STRIP CHARTS

TABLE

OVA		HEADSPACE	ANALYSIS SUMMARY	
Sample		Temperature	Time of Heating	Reading
Test Boring 1	(6"-12")	130° F	1/2 hour	N.R.B.
	(2')	130° F	1/2 hour	.6 ppm
	(4'-6')	130° F	1/2 hour	2 ppm
	(6'-8')	130° F	1/2 hour	.2 ppm
	(8'-10')	130° F	1/2 hour	4 ppm
	(10'-12')	130° F	1/2 hour	2 ppm
	(12'-14')	130° F	1/2 hour	3 ppm
	(14'-16')	130° F	1/2 hour	N.R.B.
	(16'-18')	130° F	1/2 hour	1 ppm
	(18'-20')	130° F	1/2 hour	12 ppm
	(20'-22')	130° F	1/2 hour	3 ppm
	(22'-24')	130° F	1/2 hour	5 ppm
	(24'-26')	130° F	1/2 hour	1 ppm
	(26'-28')	130° F	1/2 hour	.4 ppm
Well #1	(1')	150° F	1/2 hour	2 ppm
	(5'-7')	150° F	1/2 hour	.2 ppm
	(10'-12')	150° F	1/2 hour	.6 ppm
	(15'-17')	150° F	1/2 hour	1.2 ppm
	(20'-22')	150° F	1/2 hour	22 ppm
	(25'-27')	150° F	1/2 hour	4.2 ppm

TABLE (continued)

OVA Sample		HEADSPACE Temperature	ANALYSIS SUMMARY Time of Heating	Reading
Well #3	(1')	120° F	1/2 hour	2 ppm
	(5'-7')	125° F	1/2 hour	.4 ppm
	(10'-12')	130° F	1/2 hour	1 ppm
	(15'-17')	130° F	1/2 hour	2 ppm
	(20'-22')	130° F	1/2 hour	2 ppm
	(25'-27')	140° F	1/2 hour	2.0 ppm
Well #4	(2')	150° F	1/2 hour	N.R.B.
	(5'-7')	150° F	1/2 hour	.2 ppm
	(10'-12')	150° F	1/2 hour	N.R.B.
	(15'-17')	150° F	1/2 hour	12 ppm
	(20'-22')	150° F	1/2 hour	N.R.B.
	(25'-27')	150° F	1/2 hour	.4 ppm
Leach Pool 1		130° F	1/2 hour	400 ppm
Leach Pool 2		130° F	1/2 hour	>1,000 ppm
Leach Pool 3		130° F	1/2 hour	52 ppm
Hand Boring 1	(0"-6")	120° F	1/2 hour	6 ppm
	(6"-12")	120° F	1/2 hour	1 ppm
Hand Boring 2	(0"-6")	130° F	1/2 hour	N.R.B.
	(0"-1')	130° F	1/2 hour	2 ppm

TABLE (continued)

OVA HEADSPACE ANALYSIS SUMMARY

Sample		Temperature	Time of Heating	Reading
Hand Boring 3	(Ø"-6")	150° F	1/2 hour	N.R.B.
	(6"-12")	150° F	1/2 hour	2 ppm
Hand Boring 4	(Ø"-6")	125° F	1 hour	2 ppm
	(6"-12")	125° F	1/2 hour	18 ppm
Hand Boring 5	(Ø"-6")	125° F	1 hour	2 ppm
	(2'-2 1/2')	125° F	1 hour	2 ppm
Hand Boring 6	(Ø"-6")	125° F	1/2 hour	N.R.B.
	(2'-2 1/2')	125° F	1/2 hour	2 ppm
Hand Boring 7	(Ø"-6")	125° F	1/2 hour	1Ø ppm
	(2 1/2'-3')	125° F	1/2 hour	2 ppm
Hand Boring 8	(Ø"-6")	125° F	1/2 hour	6 ppm
	(2 1/2'-3')	125° F	1/2 hour	1 ppm
Hand Boring 9	(6"-12")	125° F	1/2 hour	N.R.B.
Hand Boring 1Ø	(6"-12")	125° F	1/2 hour	N.R.B.
Hand Boring 11	(Ø"-3")	120o F	1/2 hour	N.R.B.

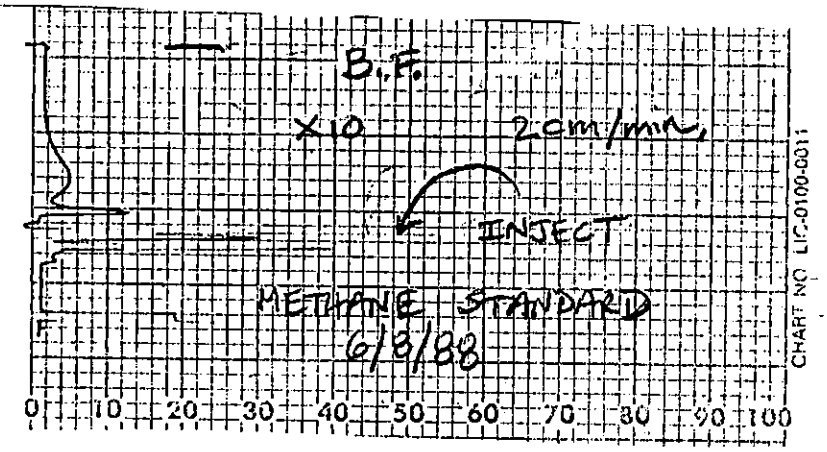
TABLE (continued)

OVA Sample	HEADSPACE Temperature	ANALYSIS SUMMARY Time of Heating	Reading
Hand Boring 12 (6"-12")	120° F	1/2 hour	2 ppm
Hand Boring 13 (6"-12")	120° F	1/2 hour	2 ppm
Hand Boring 14 (6"-12")	120° F	1/2 hour	3 ppm
Hand Boring 15 (0"-6")	120° F	1/2 hour	N.R.B.
Hand Boring 16 (6"-12")	120° F	1/2 hour	3 ppm
Hand Boring 17 (6"-12")	120° F	1/2 hour	N.R.B.
Hand Boring 18 (0"-6")	125° F	1/2 hour	2 ppm
(2 1/2'-3')	125° F	1/2 hour	50 ppm
(4 -4 1/2')	125° F	1/2 hour	39 ppm
Hand Boring 19 (0"-6")	125° F	1/2 hour	2 ppm
(2 1/2'-3')	125° F	1/2 hour	24 ppm
(4 1/2'-5')	125° F	1/2 hour	40 ppm

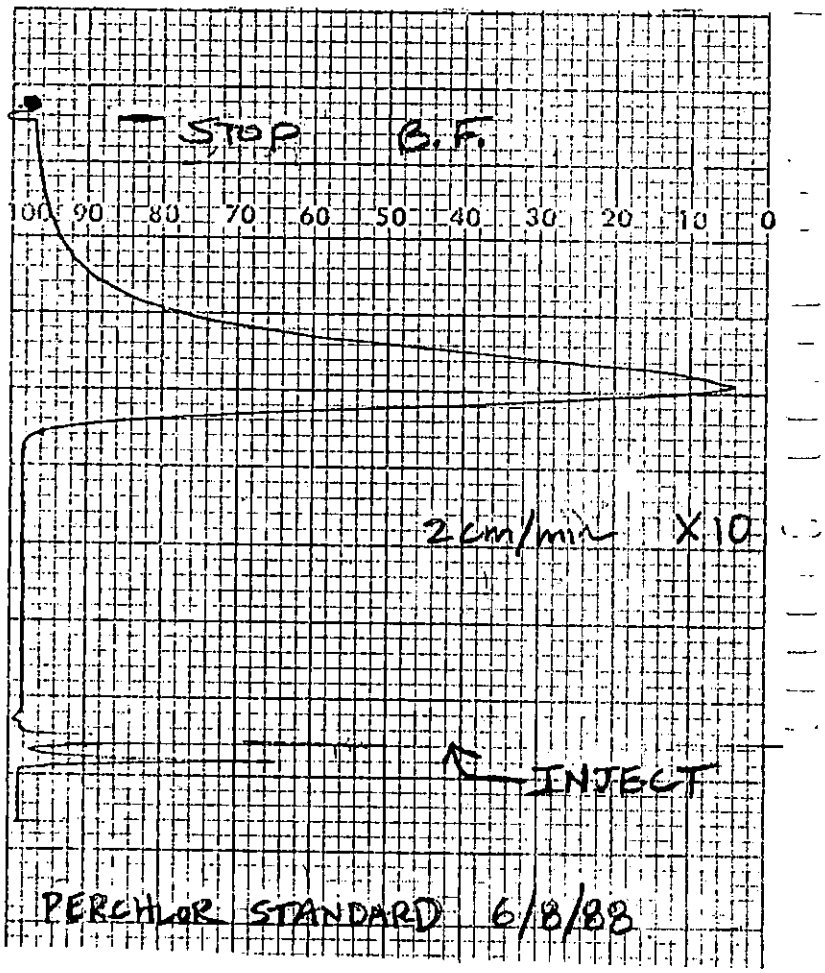
TABLE (continued)

OVA HEADSPACE ANALYSIS SUMMARY

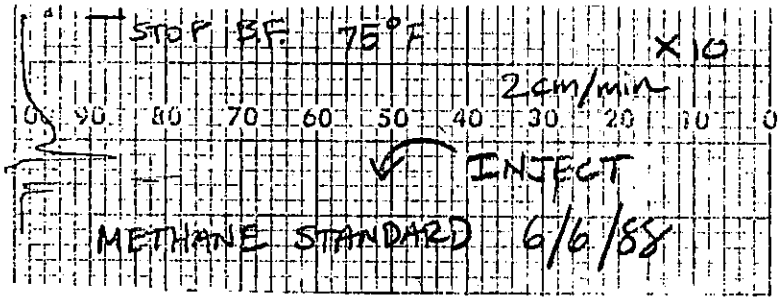
Sample		Temperature	Time of Heating	Reading
Hand Boring 20	(0"-6")	140° F	1/2 hour	15 ppm
	(2 1/2'-3')	140° F	1/2 hour	4 ppm
	(5'-5 1/2')	140° F	1/2 hour	8 ppm
Hand Boring 21	(0"-6")	140° F	1/2 hour	1 ppm
	(2 1/2'-3')	140° F	1/2 hour	38 ppm
	(5'-5 1/2')	140° F	1/2 hour	5 ppm
Test Boring #2	(10'-12')	130° F	1/2 hour	NRB
	(12'-14')	130° F	1/2 hour	.4 ppm
	(14'-16')	130° F	1/2 hour	NRB
	(16'-18')	130° F	1/2 hour	34 ppm
	(18'-20')	N O T T E S T E D		
	(20'-22')	130° F	1/2 hour	4 ppm
	(22'-24')	130° F	1/2 hour	4 ppm
	(24'-26')	130° F	1/2 hour	38 ppm
	(26'-28')	Split, Sample with DEC	N O T	T E S T E D



METHANE STANDARD 6/8/88



PERCHLOR STANDARD 6/8/88



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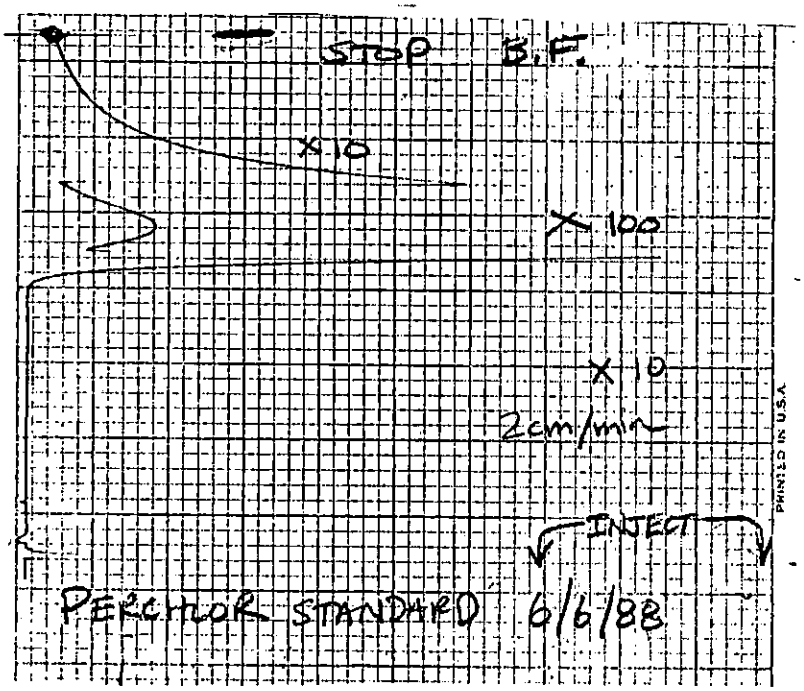

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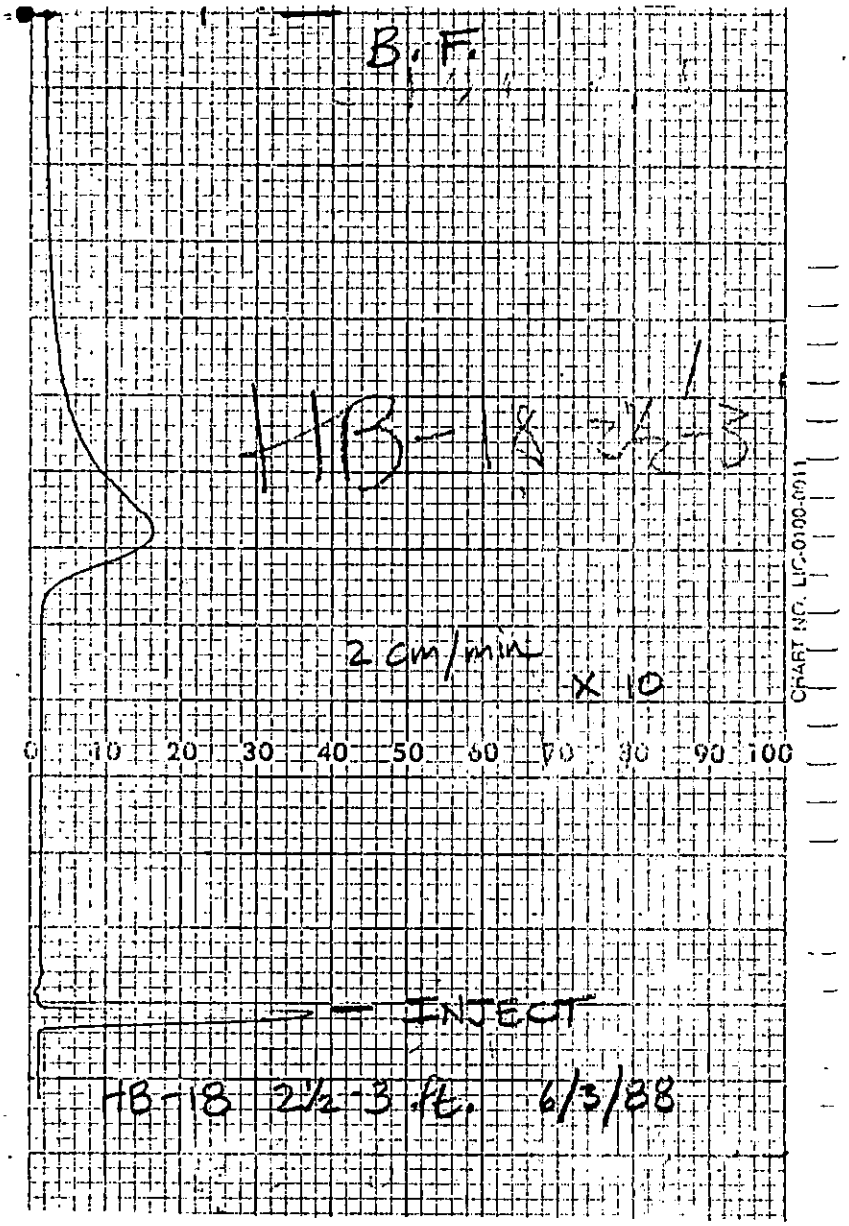
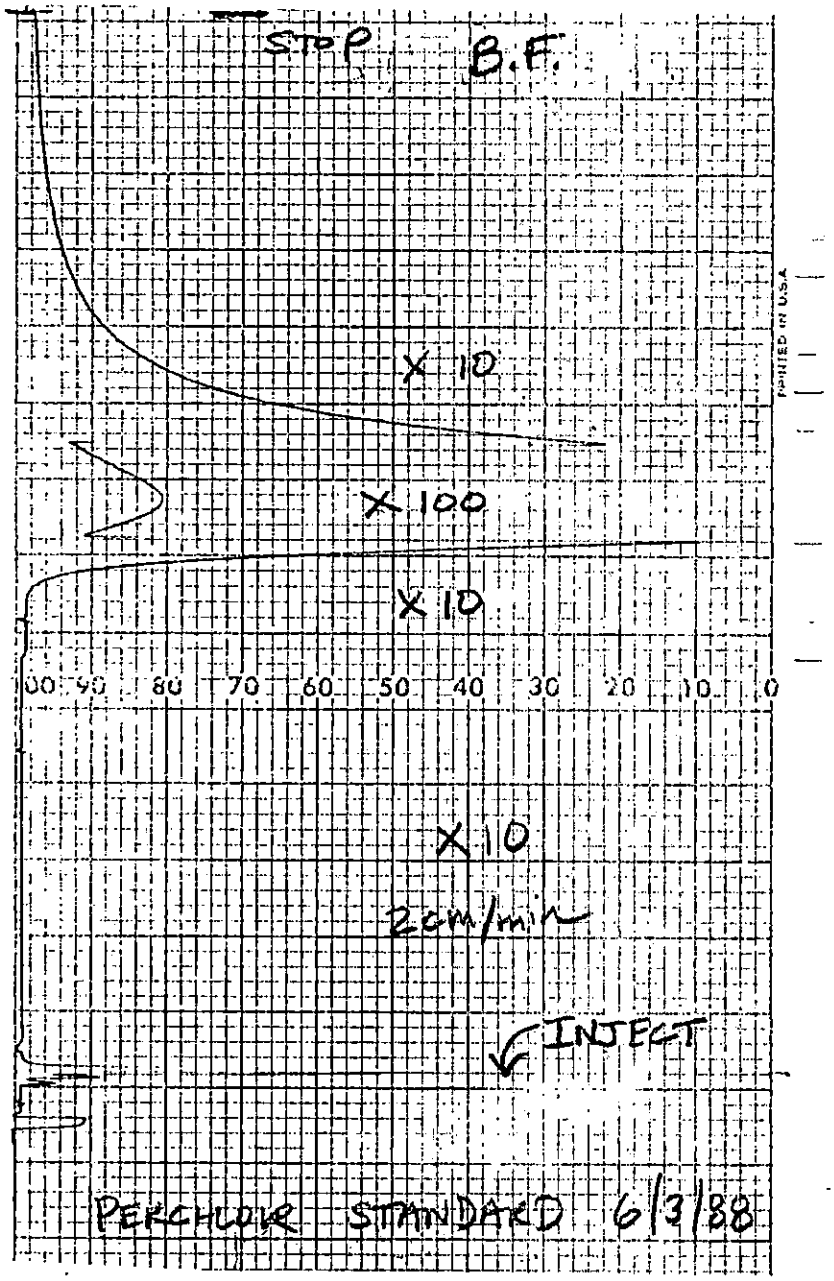


HAND BORING-18 (HB-18) 2.5-3 FEET 6/3/88



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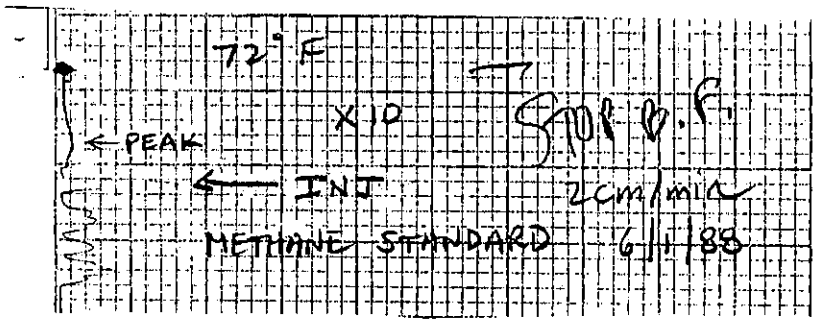
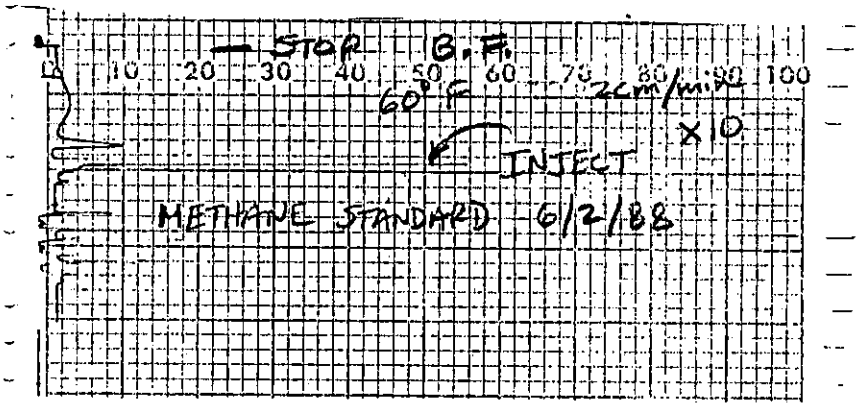


METHANE STANDARD 6/1/88



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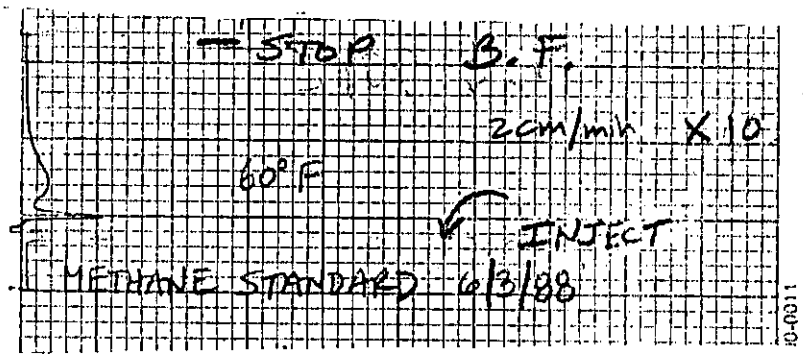

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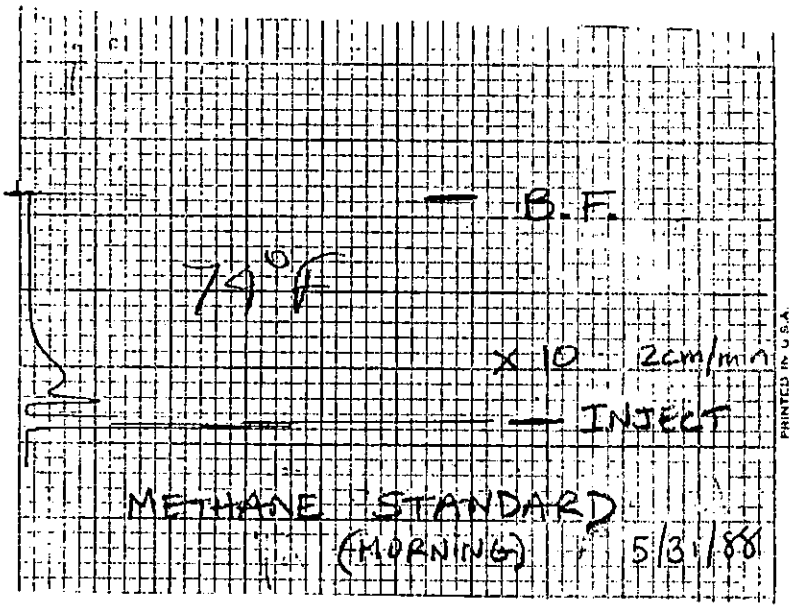

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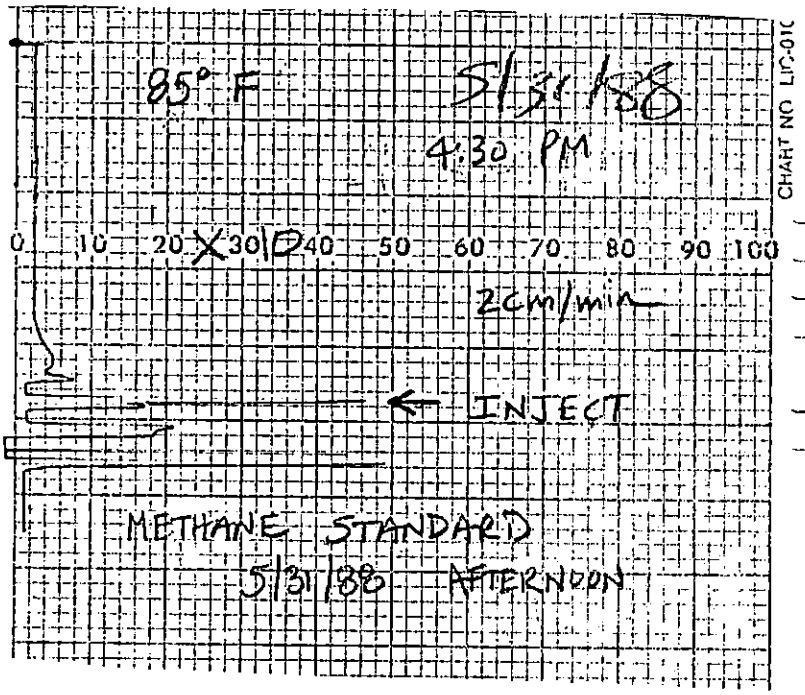

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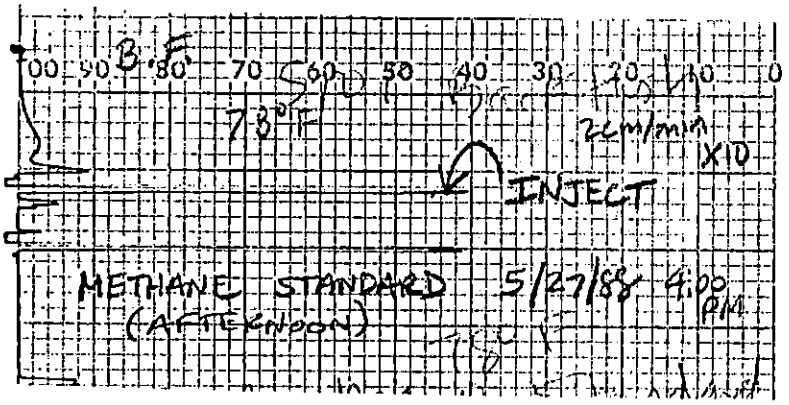

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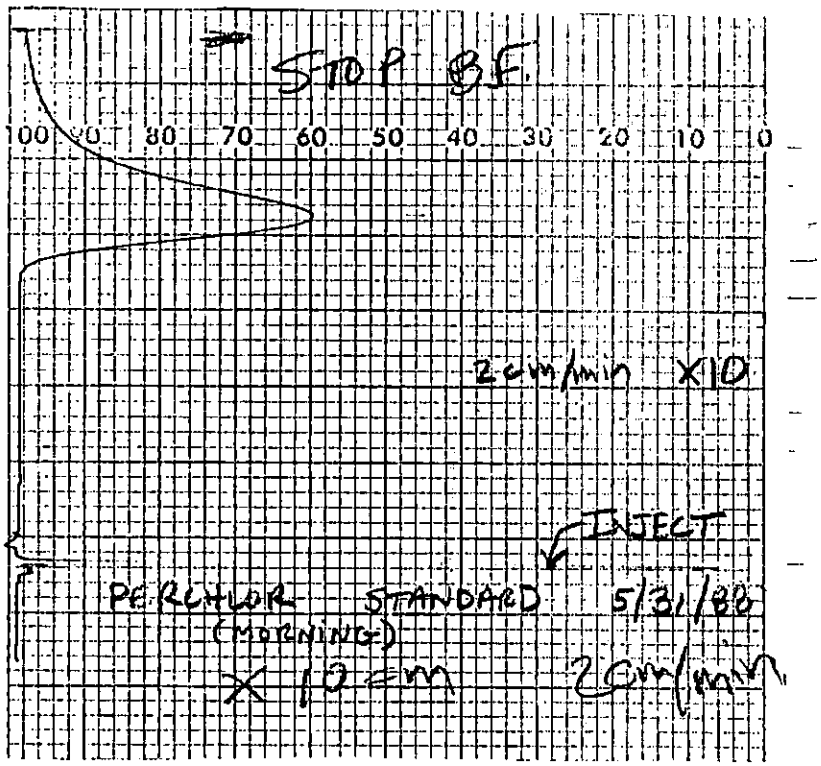
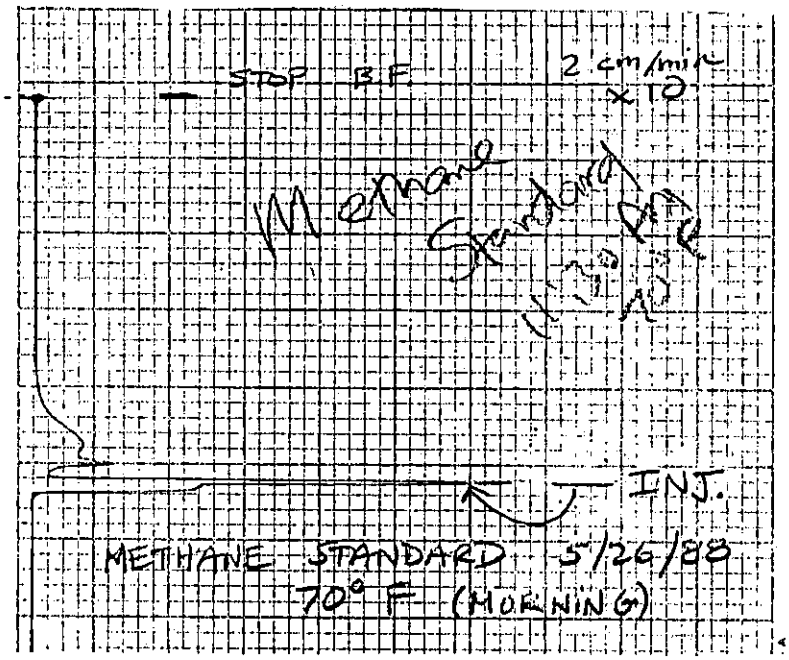


PERCHLOR STANDARD 5/31/88



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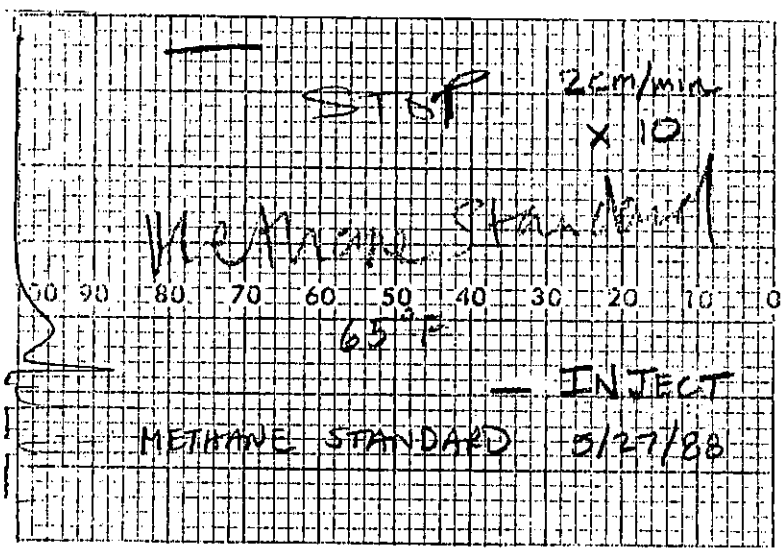

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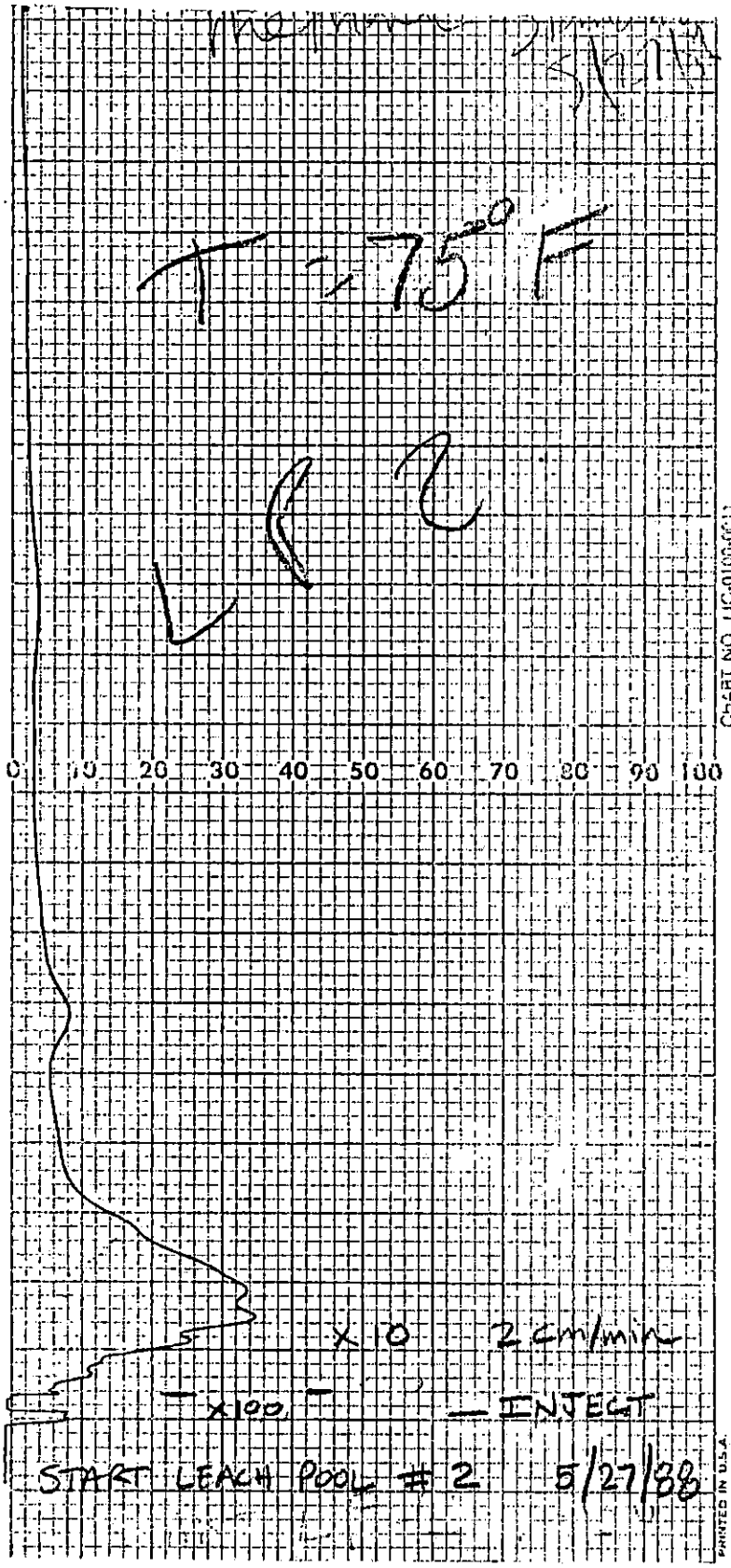

START LEACH POOL #2 5/27/88

APPENDIX H

LABORATORY RESULTS FOR TRIP BLANKS AND FIELD BLANKS

DECTECTED METALS IN TRIP AND FIELD BLANKS (ug/1)

		DATE SAMPLED	5/27		6/2		6/6		6/13		6/13		7/13		7/21			
															FB		TB	
	CRQL	SAMPLE ID #	TB	FB	FB	TB	FB	TB	FB	TB	FB	TB	FB	TB	Fil.	Unfil.	Fil.	Unfil.
Antimony	0.06		40B	UD	40B	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Arsenic	0.01		UD	10B	UD	10B	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Beryllium	0.005		1B	1B	1B	1B	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Copper	0.025		20B	20B	20B	20B	UD	UD	UD	6B	UD	6B	UD	UD	UD	17B	UD	4B
Nickel	0.04		UD	13B	UD	13B	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Selenium	0.005		4B	UD	4B	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Zinc	0.02		7B	6B	7B	6B	UD	UD	UD	UD	UD	UD	UD	UD	11	31	2	3
Lead	0.005		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	9	UD	UD	UD	UD	UD

TRIP BLANKS AND FIELD BLANKS SJ&J (DATES ARE WHEN SAMPLES WERE COLLECTED)

		DATE SAMPLED	5/26	5/27		5/31		6/1		6/3		6/6		6/8		7/13		7/21	
		SAMPLE ID #	TB	TB	FB	FB	TB	FB	TB	FB	TB	TB	TB	FB	TB	FB	TB	FB	TB
VOLATILE ORGANIC COMPOUNDS (mg/l)																			
TCL VOCs																			
Methylene Chloride	0.005		UD	0.010B	0.031B	0.016B	0.015B	0.069B	0.380B	0.008B	0.007B	0.003JB	UD	0.029B	0.004JB	0.015B	0.025B	0.013B	0.011B
Trichloroflouromethane			UD	0.004J	0.006	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Toluene	0.005		UD	UD	0.003J	UD	UD	0.430	UD	0.007B	UD	0.030B	UD	0.003J	UD	UD	UD	UD	0.004J
Chloroform	0.005		UD	UD	UD	0.002JB	UD	0.002J	UD	UD	UD	UD	UD	UD	UD	0.002JB	0.003JB	UD	UD
Chloromethane	0.01		UD	UD	UD	UD	UD	UD	UD	UD	UD	0.012B	0.005JB	0.012B	0.005JB	UD	UD	UD	0.370
1,1,1,-Trichloroethane	0.005		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	0.003J	UD	UD	UD	UD
Benzene	0.005		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	0.002JB	UD	UD	0.003J
1,1 Dichloroethene	0.005		UD	UD	UD	UD	UD	0.004J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	0.002J
Ethylbenzene	0.005		UD	UD	UD	UD	UD	0.013	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Chlorobenzene	0.005		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	0.004J
Trichloroethene	0.005		UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	0.002JB
TOTAL TCL VOCs	(1)		UD	0.014	0.040	0.018	0.015	0.518	0.380	0.015	0.007	0.045	0.005	0.044	0.012	0.019	0.028	0.013	0.396
TENTATIVELY IDENTIFIED VOCs																			
2-Propanol			0.007J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Unknown alkane			UD	UD	0.062J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
4 methyl-3-pentanoic acid			UD	UD	0.008J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Hexane			0.022JB	0.180J	0.220J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	0.006J	UD	UD
Propylcyclohexane			UD	UD	0.010J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
1,2/1,4 Dimethylbenzene			UD	UD	0.014J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
N-pentatriacatene			UD	UD	0.016J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Propylbenzene			UD	UD	0.029J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Cyclobutanol			UD	0.025J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
4-hexane			UD	0.006J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Unknowns			UD	UD	0.077J	UD	0.022J	1.370J	0.145J	UD	UD	UD	UD	0.013J	UD	0.066J	UD	0.140J	0.130J
Diflourodimethylsilane			UD	UD	UD	0.005JB	0.006JB	UD	0.012JB	UD	UD	0.011J	UD	UD	UD	UD	UD	UD	UD
1,1,3,3,5,5 Hexamethyltrisiloxane			UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Other Unknowns (also detected in blanks			UD	UD	UD	UD	0.150J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
Formamide			UD	UD	UD	UD	0.101J	UD	0.039B	0.160JB	0.130JB	0.069JB	0.150JB	0.070JB	UD	UD	UD	0.500JB	0.470JB
Acetic acid methylester			UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
3-methylpentane			UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	0.011J	UD	UD	UD	UD	UD
m-Xylene			UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	0.007J	UD	UD	UD	UD	UD
o,p-xylene			UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	0.010J	UD	UD	UD	UD	UD
1 methoxy-2-propanone			UD	UD	UD	UD	UD	0.013J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
2-propanone			UD	UD	UD	UD	UD	0.007J	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	UD
3-carene			UD	UD	UD	UD	UD	UD	UD	0.018JB	0.013JB	0.018JB	0.027JB	0.017JB	UD	UD	UD	UD	UD
4-methyl-2-pentanone (MiBK)			UD	UD	UD	UD	UD	UD	UD	0.008J	0.010J	0.011J	0.007J	UD	UD	0.048JB	0.019JB	UD	0.025J
Unknown Alkene			UD	UD	UD	UD	UD	UD	UD	UD	UD	UD	0.130JB	UD	UD	UD	UD	UD	UD
												0.017J	UD	UD	UD	UD	UD	UD	UD
												0.054J	UD	UD	UD	UD	UD	UD	UD
TOTAL TENTATIVELY IDENTIFIED VOCs			0.029	0.211	0.436	0.005	0.279	1.390	0.196	0.186	0.153	0.180	0.314	0.128	UD	0.114	0.025	0.640	0.625
TOTAL VOCs			0.029	0.225	0.476	0.023	0.294	1.908	0.576	0.201	0.160	0.225	0.319	0.172	0.012	0.133	0.053	0.553	1.021

TCL - Target Compound List
J - Below mean quantification level of lab
B - Detected in Method Blank
UD - Undetected
CRQL - Contract Required Quantification Limit
(1) - Blank space indicates variable detection limits. See original laboratory results for each sample and parameter.

APPENDIX I

DRILLING LOGS

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ENGINEERS
RONKONKOMA NEW YORK

Drilling Log

Project S, J & J — Owner

Location PARMINGDALE N.Y. — W.O. Number

Well Number TEST BORING #1 — Total Depth 28' — Diameter

Surface Elevation — Water Level: Initial 27½' — 24-hrs.

Screen: Dia. — Length — Slot Size

Casing: Dia. — Length — Type

Drilling Company TYREE BROS. — Drilling Method HOLLOW STEM AUGER

Driller PETE GAYNOR — Log By K. STOKES — Date Drilled 5/27/88

Sketch Map: SUSQUEHANNA BOILER ROOM; TEST BORING #1; N

Notes: INSTALLED AT FORMER SOLVENT DRUM STORAGE AREA, SOUTH OF BOILER ROOM

DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	GRAPHIC LOG	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0				0"-2" CONC. SOIL & ASPHALT MIX — TEST BORING GROUTED AFTER COMPLETION
2				SILTY BROWN CLAY
4				
6				MED-COARSE SAND W/GRAVEL
8				
10				OCCASSIONAL STONES TO 3" THROUGHOUT FORMATION
12				
14				
16				MED. COARSE SAND W/FINE WELL ROUNDED GRAVEL
18				
20				
22				OCCASSIONAL STONES TO 3" THROUGHOUT FORHATION
24				
26				

fanning, phillips & molnar
ENGINEERS
RONKONKOMA, NEW YORK

Drilling Log

Project S,J&J Owner

Location FARMINGDALE, N.Y. W.O. Number

Well Number TEST BORING #1 Total Depth 28' Diameter

Surface Elevation Water Level: Initial 27½' 24-hrs.

Screen: Dia. Length Slot Size

Casing: Dia. Length Type

Drilling Company TYREE BROS Drilling Method HOLLOW STEM AUGER

Driller PETE GAYNOR Log By K. STOKES Date Drilled 5/27/88

Sketch Map

Notes

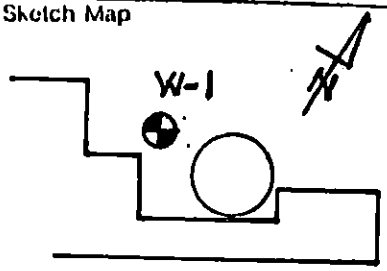
DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	GRAPHIC LOG	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
28				
30				
32				
34				
36				
38				
40				
42				
44				
46				
48				
50				
52				

fanning, phillips & molnar
ENGINEERS
HONEOYE FALLS NEW YORK

Drilling Log

Project S.J.E.J. Owner
Location FARMINGDALE N.Y. W.O. Number
Well Number MW-1 Total Depth 24' Diameter
Surface Elevation Water Level: Initial 17' 24-hrs.
Screen: Dia. Length Slot Size
Casing: Dia. Length Type
Drilling Company Drilling Method
Driller Log By K. STOKES. Date Drilled

Sketch Map



Notes

DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	GRAPHIC LOG	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
2				MED.- COARSE SAND W/GRAVEL
4				
6				
8				
10				
12				CLAYEY SILT (BROWN) W/ 1/2" STONE
14				
16				▽
18				MED.- COARSE SAND W/GRAVEL.
20				
22				
24				
26				

fanning, phillips & molnar
ENGINEERS
RONKONKOMA NEW YORK

Drilling Log

Project 5525 Owner

Location FARMINGDALE N.Y. W.O. Number

Well Number HW #5 Total Depth 26' Diameter 2"

Surface Elevation Water Level: Initial 17' 24-hrs.

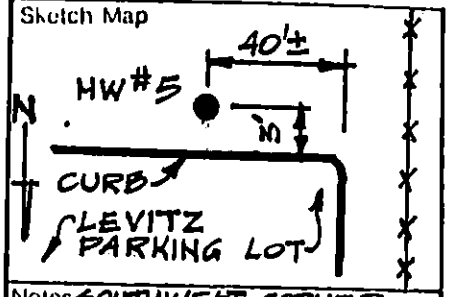
Screen: Dia. 2" Length 10' (14½' - 24½') Slot Size .010

Casing: Dia. 2" Length 14½' Type PVC

Drilling Company TYREE BROS. Drilling Method HOLLOW STEM AUGER

Driller KEN WATSON Log By K. STOKES Date Drilled 6/24/88

Sketch Map



Notes SOUTHWEST CORNER LEVITZ PARKING LOT, SOUTH OF CURB

DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	GRAPHIC LOG	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0				LOCKING CAP CEMENTED FLUSH TO GRADE
2				
4				CEMENT BENTONITE GROUT
6				MED.-COARSE SAND WITH GRAVEL
8				
10				2' BENTONITE PELLET SEAL
12				12'-12'6" BROWN CLAYEY SILT WITH ½" STONES
14				
16				
18				
20				00 GRAVEL PACK
22				MED.-COARSE SAND WITH GRAVEL
24				
26				

fanning, phillips & molnar
ENGINEERS
RONKONKOMA NEW YORK

Drilling Log

Project S,J #5 Owner

Location FARMINGDALE N.Y W.O. Number

Well Number MW-3 Total Depth 37' Diameter 2"

Surface Elevation Water Level: Initial 28.75 24-hrs.

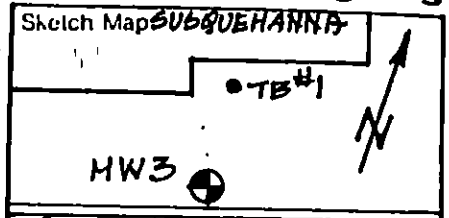
Screen: Dia. 2" Length 10'(FROM 26'-36') Slot Size .010"

Casing: Dia. 2" Length 26' Type P.V.C.

Drilling Company TYREE BROS. Drilling Method HOLLOW STEM AUGER

Driller PETE GAYNOR Log By K. STOKES Date Drilled 5/28/88

Sketch Map SUSQUEHANNA



Notes HW3 APPROX. 50' TO THE SOUTH OF TEST BORING #1

DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	GRAPHIC LOG	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0				LOCKING CAP CEMENTED FLUSH TO GRADE CONCRETE
2				SILTY BROWN CLAY
4				
6				ANNULAR SPACE GROUTED WITH CEMENT/BENTONITE GROUT
8				
10				MED.-COARSE SAND WITH FINE GRAVEL
12				
14				
16				
18				MED.-COARSE SAND WITH TRACE GRAVEL
20				
22				3' BENTONITE PELLET SEAL
24				
26				MED.-COARSE SAND, LENSES FINE GRAVEL

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RONKONKOMA NEW YORK

Drilling Log

Project S.J.E.J. Owner
Location FARMINGDALE N.Y. W.O. Number
Well Number MW-3 Total Depth 37' Diameter 2"
Surface Elevation Water Level: Initial 24-hrs.
Screen: Dia. 2" Length 10'(FROM 26'-36') Slot Size .010"
Casing: Dia. 2" Length 26' Type P.V.C
Drilling Company TYREE BROS. Drilling Method HOLLOW STEM AUGER
Driller PETE GAYNOR Log By K. STOKES Date Drilled 5/28/88

Sketch Map

Notes

DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	GRAPHIC LOG	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
28				TOPSCREEN @ 26'
30				MED.-COARSE SAND W/GRAVEL
32				SCREENED GRAVEL PACKED WITH 00 GRAVEL
34				
36				BOTTOM SCREEN @ 36'
38				BOTTOM BOREHOLE @ 37'
40				
42				
44				
46				
48				
50				
52				

fanning, phillips & molnar
ENGINEERS
HONKONKOMA NEW YORK

Drilling Log

Project S,J,E,J Owner

Location FARMINGDALE N.Y. W.O. Number

Well Number MW-4 Total Depth 35' Diameter 2"

Surface Elevation Water Level: Initial 27' 24-hrs.

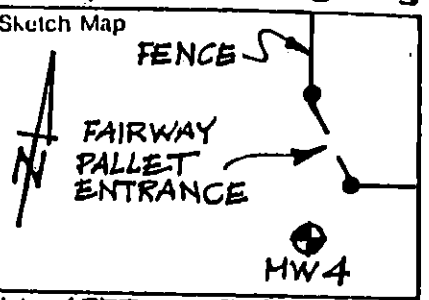
Screen: Dia. 2" Length 10'(FROM 24'-34') Slot Size .010"

Casing: Dia. 2" Length 24' Type PVC

Drilling Company TYREE BROS. Drilling Method HOLLOW STEM AUGER

Driller KEN WATSON Log By K. STOKES Date Drilled 6/1/88

Sketch Map



Notes APPROX. 50' SOUTH OF FAIRWAY PALLET ENTRANCE

DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	GRAPHIC LOG	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
				LOCKING CAP CEMENTED FLUSH TO GRADE
2				BLACK SAND TRACE SILT
4				LIGHT BROWN SILT W/ FINE SAND
6				SILTY BROWN SAND
8				ANNULAR SPACE GROUTED WITH CEMENT/BENTONITE GROUT
10				MED.-COARSE SAND W/ GRAVEL
12				
14				
16				MED.-COARSE SAND WITH CEMENT/BENTONITE GROUT
18				
20				3' BENTONITE SEAL
22				
24				MED.-COARSE SAND, TRACE FINE GRAVEL
26				

fanning, phillips & molnar
ENGINEERS
RONKONKOMA NEW YORK

Drilling Log

Project S,J&J Owner

Location FARMINGDALE N.Y. W.O. Number

Well Number MW-4 Total Depth 35' Diameter 2"

Surface Elevation Water Level: Initial 27' 24-hrs.

Screen: Dia. 2" Length 10'(FROM 24'-34') Slot Size .010"

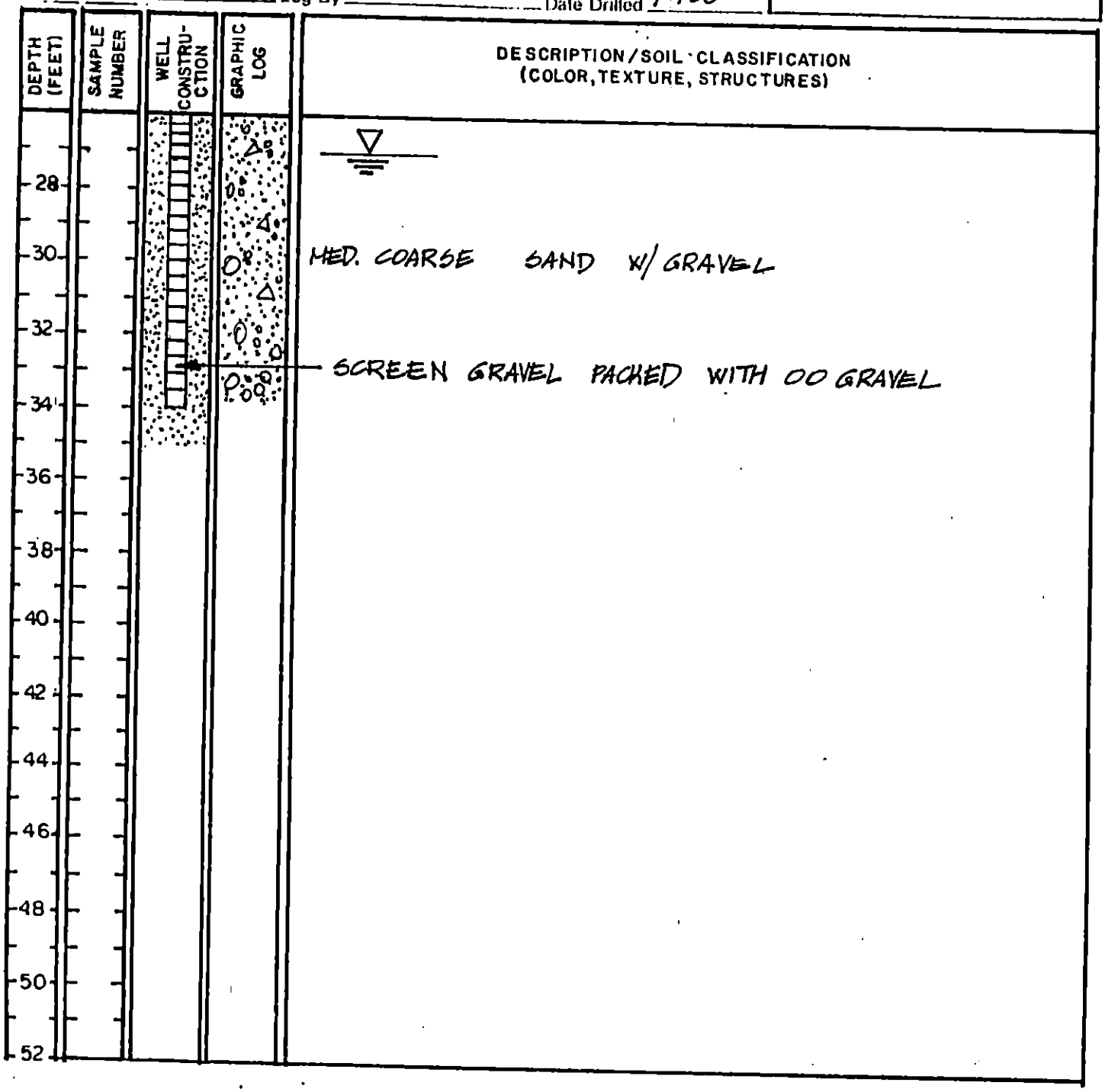
Casing: Dia. 2" Length 24' Type PVC

Drilling Company TYREE BROS. Drilling Method HOLLOW STEAM AUGER

Driller KEN WATSON Log By K. STOKES Date Drilled 6/1/88

Sketch Map

Notes

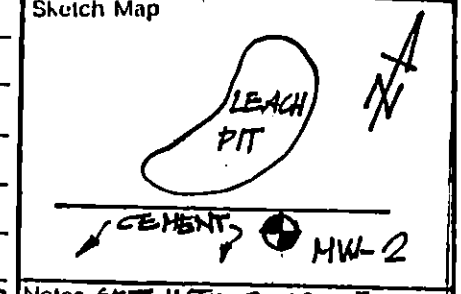


fanning, phillips & molnar
ENGINEERS
MINNEAPOLIS NEW YORK

Drilling Log

Project S, J & J Owner
Location FARMINGDALE N.Y. W.O. Number
Well Number MW-2 Total Depth 30' Diameter 2"
Surface Elevation Water Level: Initial 28' 24-hrs.
Screen: Dia. 2" Length 10' (FROM 25'-35') Slot Size .010"
Casing: Dia. 2" Length 25' Type PVC
Drilling Company TYREE BROS. Drilling Method HOLLOW STEM AUGER
Driller KEN WASTON Log By K. STOKES Date Drilled 6/11/88

Sketch Map



Notes SET INTO CONC. OF FAIRWAY PALLET APPROX. 30' SOUTH OF LEACH PIT

DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	GRAPHIC LOG	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0				0'-6" CONCRETE – LOCKING CAP CEMENTED FLUSH TO GRADE
2				BROWN SANDY FILL
4				BROWN CLAYEY SILT
6				
8				ANNULAR SPACE GROUTED WITH CEMENT BENTONITE GROUT
10				
12				MED.-COARSE SAND W/ GRAVEL
14				
16				
18				
20				
22				2' BENTONITE PELLETS
24				
26				

fanning, phillips & molnar
ENGINEERS
HONOLULU NEW YORK

Drilling Log

Project SJES Owner

Location FARMINGDALE N.Y. W.O. Number

Well Number HW-2 Total Depth 35' Diameter 2"

Surface Elevation Water Level: Initial 24-hrs.

Screen: Dia. 2" Length 10'(FROM 25'-35') Slot Size .010

Casing: Dia. 2" Length 25' Type PVC

Drilling Company TYREE BROS. Drilling Method HOLLOW STEM AUGER

Driller KEN WASTON Log By K. STOKES Date Drilled 6/11/88

Sketch Map

Notes

DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	GRAPHIC LOG	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
28				DISCOLORED GRAY SATURATED MED.-COARSE SAND WITH GRAVEL
30				
32				
34				SCREEN GRAVEL PACKED WITH 00 GRAVEL
36				
38				
40				
42				
44				
46				
48				
50				
52				

fanning, phillips & molnar
ENGINEERS
RONKONKOMA NEW YORK

Drilling Log

Project S.J. & J. Owner

Location FARMINGDALE N.Y. W.O. Number

Well Number TEST BORING #2 Total Depth 18' Diameter

Surface Elevation Water Level: Initial 24-hrs.

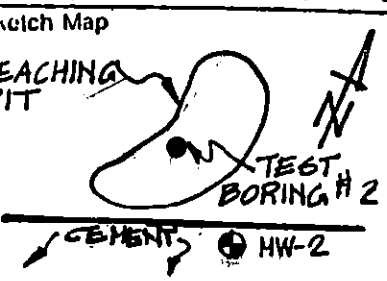
Screen: Dia. Length Slot Size

Casing: Dia. Length Type

Drilling Company TYREE BROS. Drilling Method HOLLOW STEM AUGER

Driller Log By H. STOKES Date Drilled 7/13/88

Sketch Map



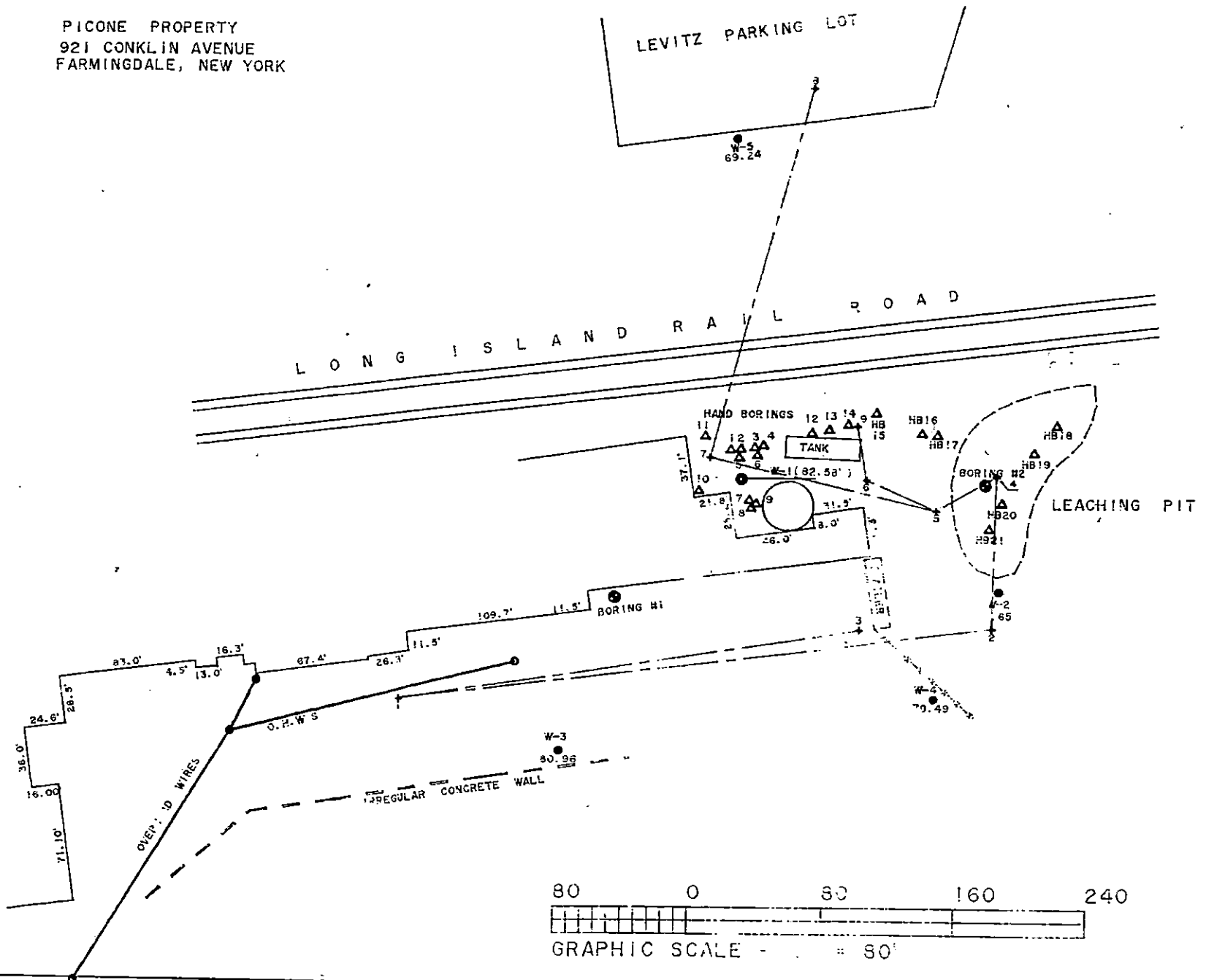
Notes

DEPTH (FEET)	SAMPLE NUMBER	WELL CONSTRUCTION	GRAPHIC LOG	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
2				BROWN-ORANGE FILL W/GRAY SAND
4				MED-COARSE SAND W/GRAVEL
6				
8				MED-COARSE SAND W/GRAVEL. SOME MOIST SILT
10				
12				MED-COARSE SAND, SOME BLACKISH COLOR
14				
16				BLACK STAINED MED-COARSE SAND W/GRAVEL.
18				
20				
22				
24				
26				

APPENDIX J

SURVEYORS MAP OF SITE

PICONE PROPERTY
921 CONKLIN AVENUE
FARMINGDALE, NEW YORK



APPENDIX K

CALCULATIONS OF HYDRAULIC CONDUCTIVITY AND GW PORE VELOCITY

SIEVE ANALYSIS RESULTS

SAMPLE ID	US STANDARD SIEVE NUMBER	MESH SIZE (INCHES)	WEIGHT(g)	% OF TOTAL	% FINER
MW-3 (30'-32')	>8	0.090	24.04	37.9	62.1
	>14	0.051	6.05	9.5	52.6
	>30	0.020	19.06	30.1	22.5
	>40	0.015	6.12	9.7	12.8
	<40	---	8.13	12.8	---
TOTAL			63.40		
MW-1 (30'-32')	>8	0.090	27.76	45.0	55.0
	>14	0.051	5.39	8.7	46.3
	>30	0.020	15.71	25.4	20.9
	>40	0.015	5.44	8.8	12.0
	<40	---	7.43	12.0	---
TOTAL			61.73		
SANDFILL FOR LEACHING PIT	>8	0.090	0.97	5.2	94.8
	>14	0.051	0.14	0.8	94.0
	>30	0.020	0.78	4.2	89.8
	>40	0.015	0.95	5.1	84.6
	<40	---	15.64	84.6	---
TOTAL			18.48		
LEVITZ MW-5 (18'-20')	>8	0.090	17.42	30.6	69.4
	>14	0.051	3.68	6.5	62.9
	>30	0.020	17.11	30.1	32.8
	>40	0.015	6.38	11.2	21.6
	<40	---	12.34	21.7	---
TOTAL			56.93		
MW-4 (30'-32')	>8	0.090	0.18	0.5	99.5
	>14	0.051	1.14	3.1	96.4
	>30	0.020	18.46	50.0	46.4
	>40	0.015	6.67	18.1	28.4
	<40	---	10.50	28.4	---
TOTAL			36.95		

DESIGNATION: MW-1

BORING: 30'-32'

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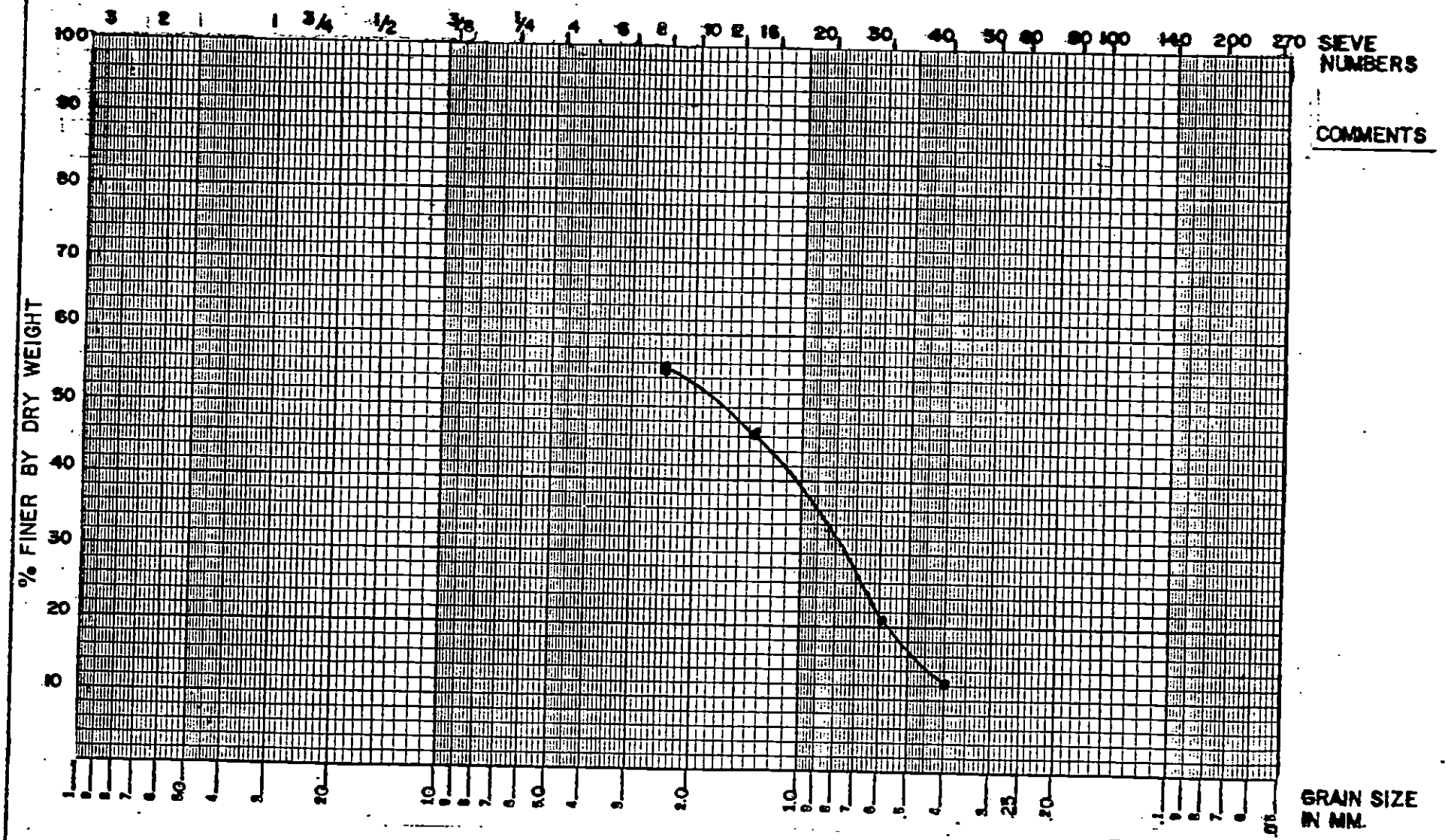
RONKONKOMA NEW YORK

JOB: SJ&J

DATE:



WELL SCREEN SLOT SIZES 250 150 100 80 60 40 30 25 20 * 10 SLOTTED SCREEN

GRAVEL		SAND	
COARSE	FINE	COARSE	MEDIUM

DESIGNATION: MW-4

BORING: (30-32')

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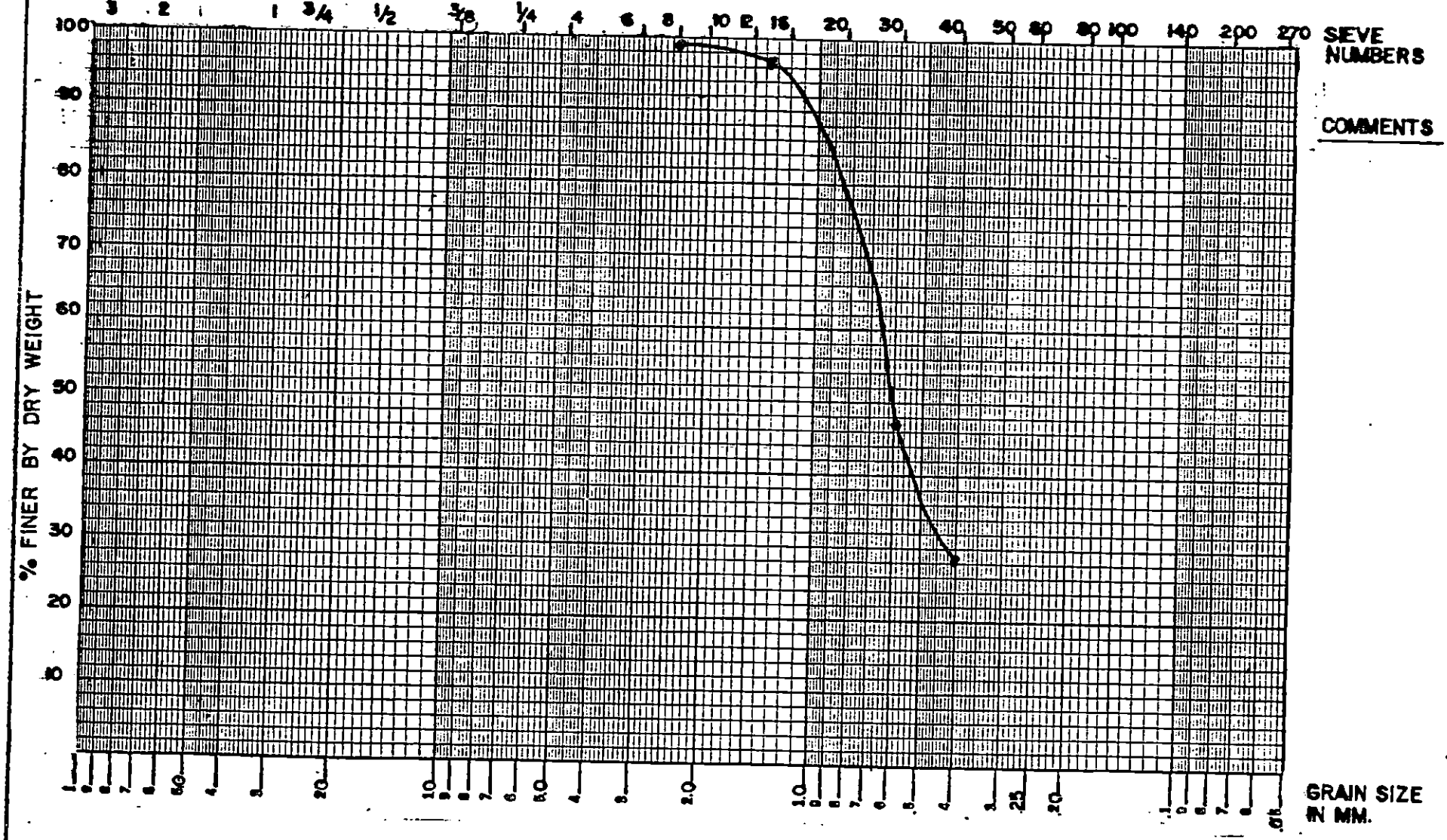
ENGINEERS
RONKONKOMA NEW YORK

JOB: SJ&J

DATE:



WELL SCREEN SLOT SIZES — 250 150 100 80 60 40 30 25 20 * 10 SLOTTED SCREEN

GRAVEL		SAND	
COARSE	FINE	COARSE	

DESIGNATION: MW-3

BORING: (30-32')

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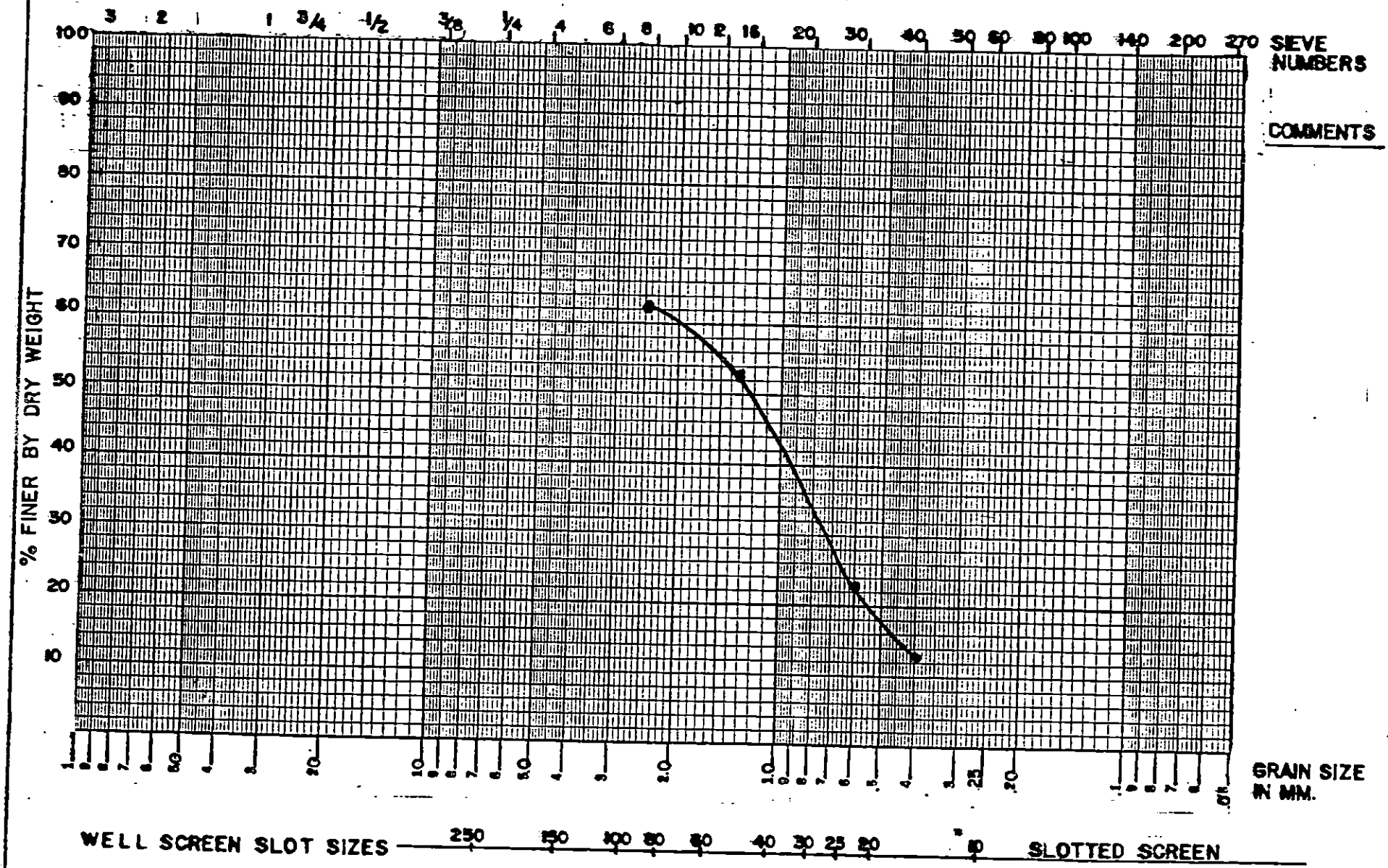
RONKONKOMA NEW YORK

JOB: SJ&J

DATE:



WELL SCREEN SLOT SIZES 250 150 100 80 60 40 30 25 20 SLOTTED SCREEN

GRAVEL		SAND	
COARSE	FINE	COARSE	

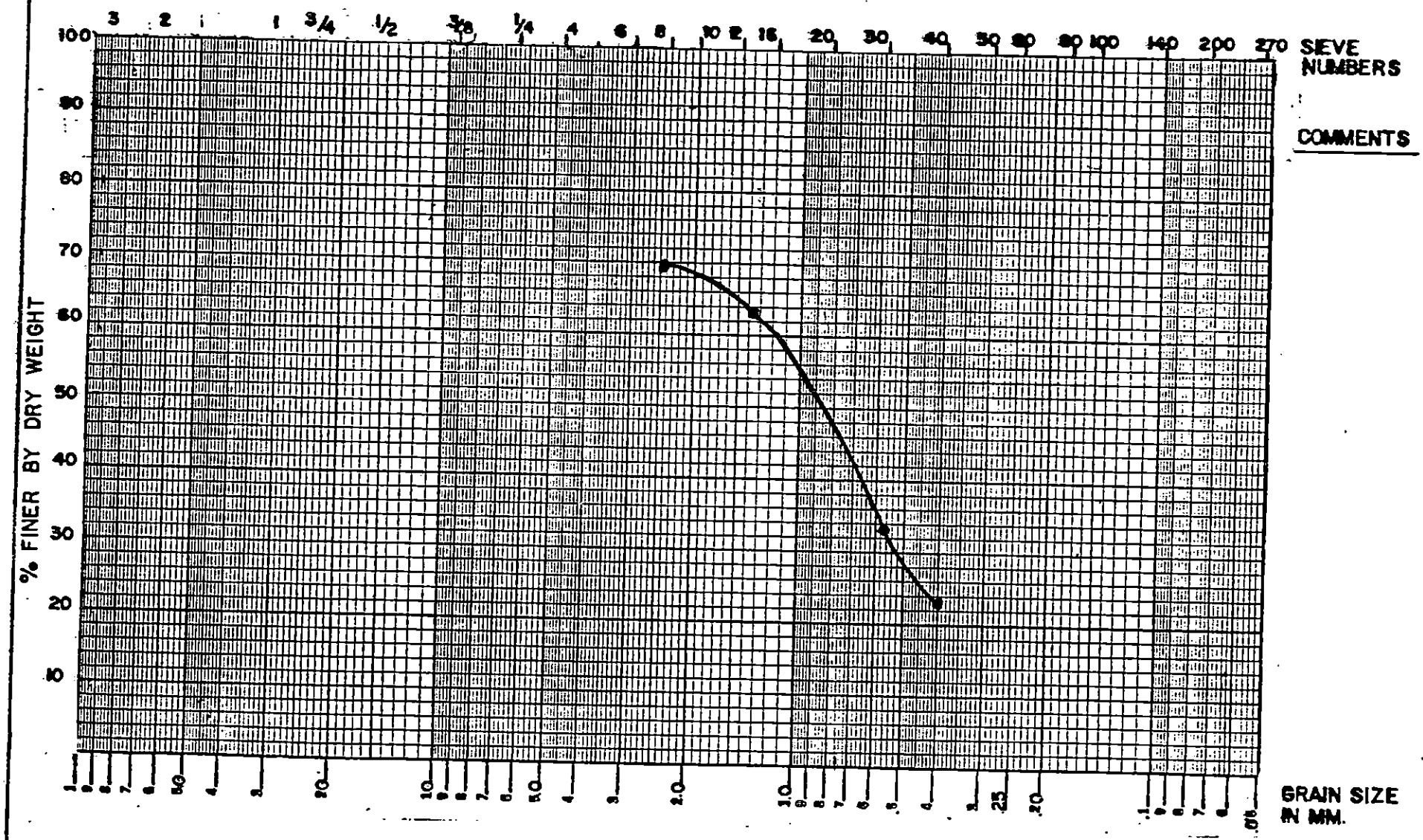
DESIGNATION: MW-5

BORING: (18'-20')

fanning, phillips & molnar
ENGINEERS
RONKONKOMA NEW YORK

JOB: SJ&J

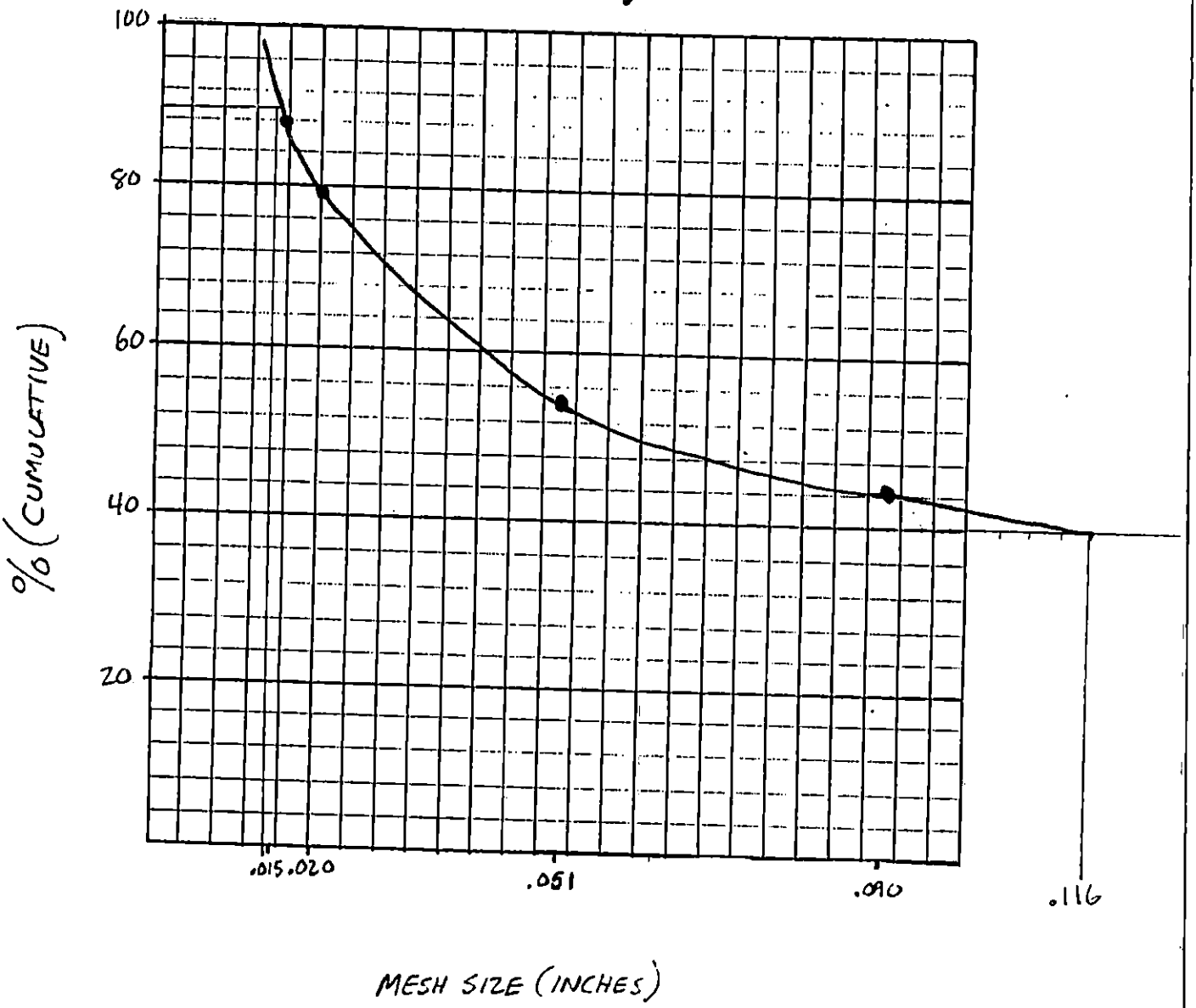
DATE:



WELL SCREEN SLOT SIZES 250 150 100 80 60 40 30 25 20 10 SLOTTED SCREEN

GRAVEL		SAND	
COARSE	FINE	COARSE	

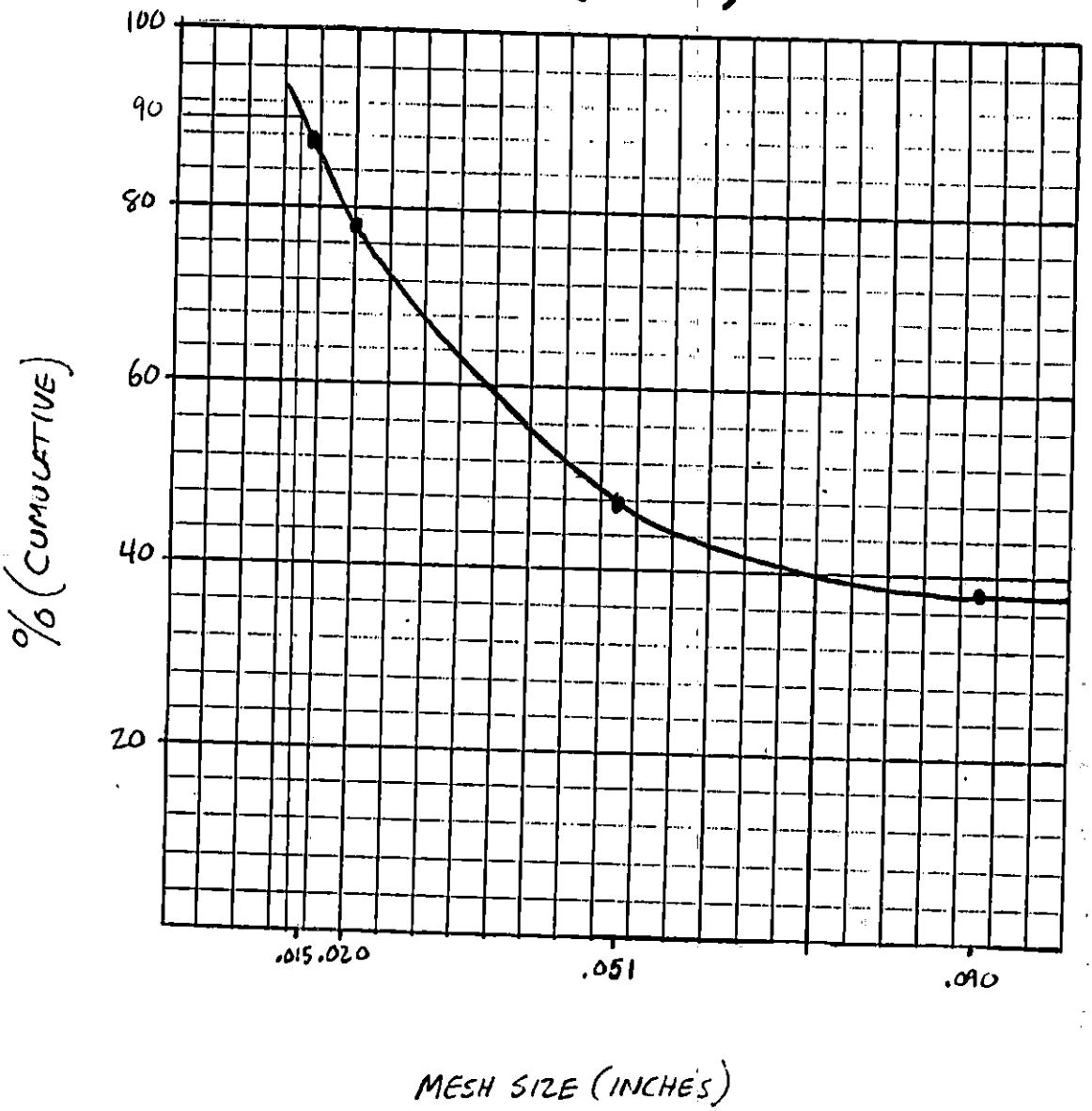
MW-1 (30'-32')



$$U_c = \frac{.116}{.014} = 8.3$$

D60 GRAIN SIZE = 0.062 inches / 1.6 mm

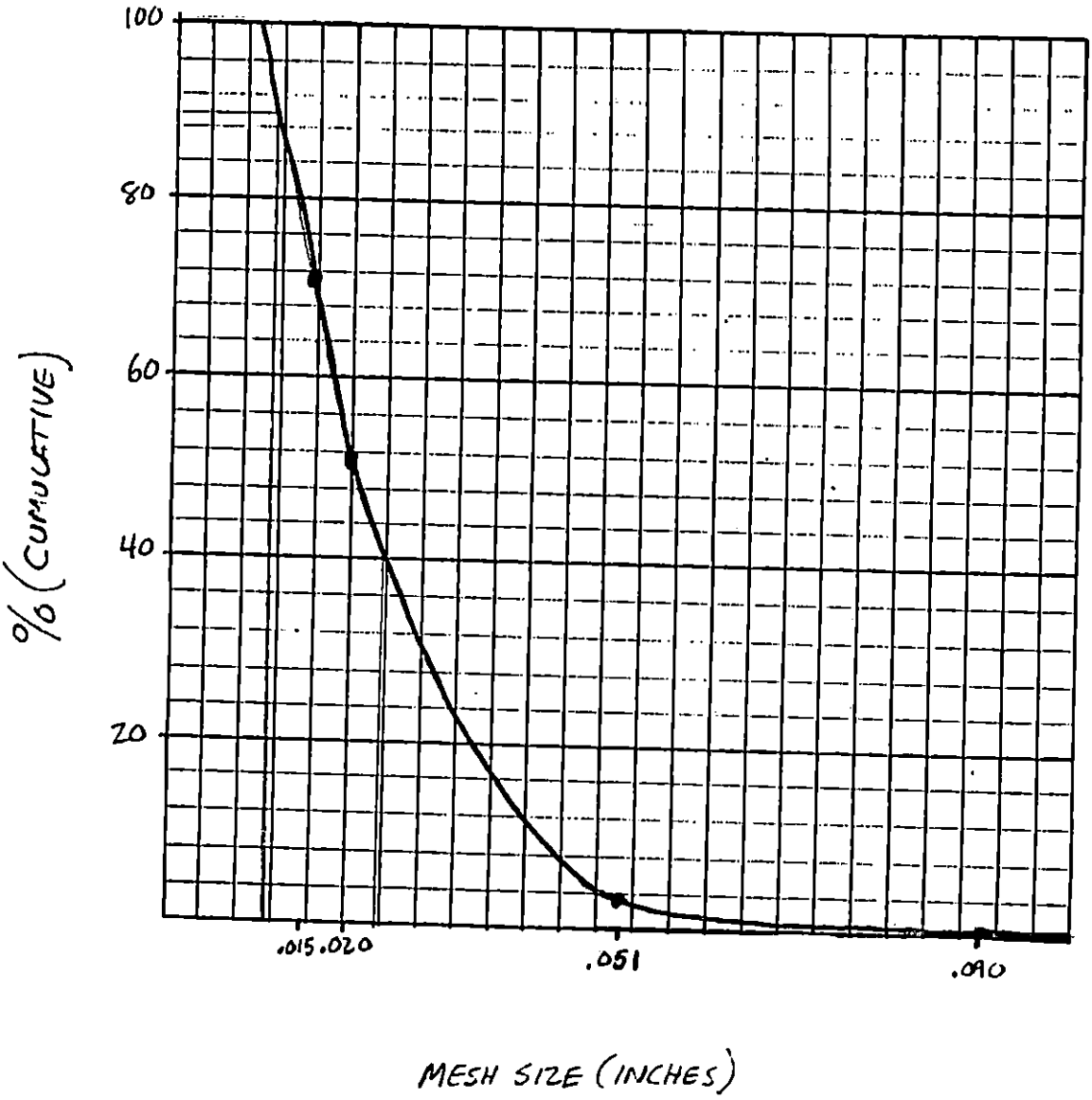
MW-3 (30'-32')



$$U_C = \frac{.072}{.014} = 5.1$$

50% GRAIN SIZE - 0.046 inches / 1.2 mm

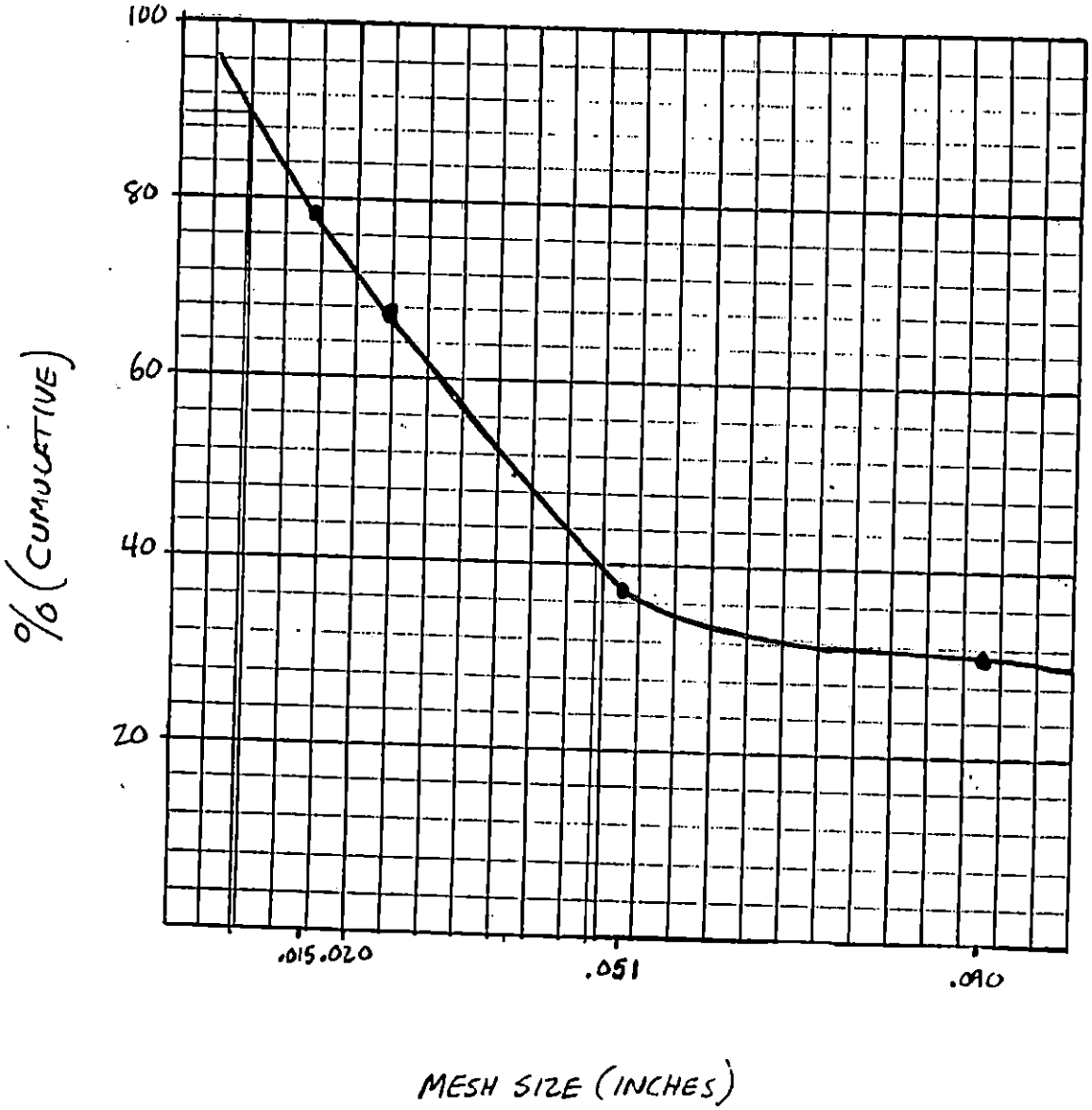
MW-4 (30'-32')



$$C_c = \frac{.023}{.011} = 2.1$$

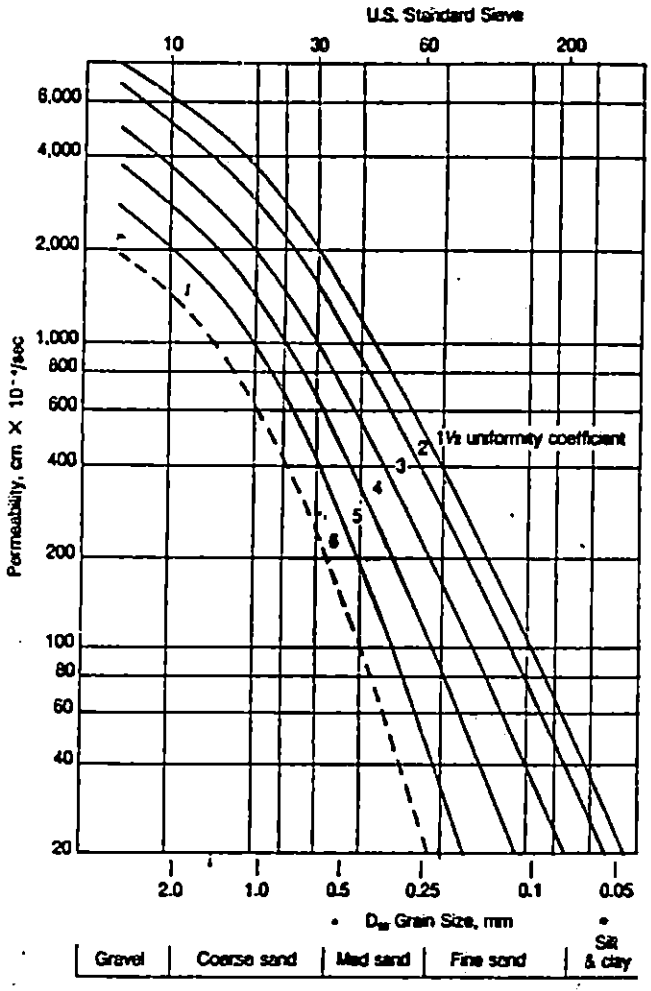
50% GRAIN SIZE - 0.021 inches / 0.5 mm

MW-5 (18'-20')



$C_c = \frac{.047}{.008} = 5.9$

50% GRAIN SIZE - 0.038 inches / 1.0 mm



Loose soils

GRAPH USED TO EXTRAPOLATE PERMEABILITIES FROM GRAIN SIZE ANALYSIS DATA (FROM GROUNDWATER AND WELLS, 2nd EDITION, DRISCOLL).

Table 2.4 Range of Values of Porosity

	n(%)
Unconsolidated deposits	
Gravel	25–40
Sand	25–50
Silt	35–50
Clay	40–70
Rocks	
Fractured basalt	5–50
Karst limestone	5–50
Sandstone	5–30
Limestone, dolomite	0–20
Shale	0–10
Fractured crystalline rock	0–10
Dense crystalline rock	0–5

TABLE USED IN CONJUNCTION WITH SIEVE ANALYSIS RESULTS TO EXTRAPOLATE SOIL POROSITY RATIOS (TABLE FROM FREEZE AND CHERRY)

SAMPLE ID	UNIFORMITY COEFFICIENT (Uc)	D50 GRAINSIZE	PERMEABILITY (LOOSE SOILS) Cmx10^{-4}/sec	K (gpd/ft^2)	K ft/sec. (x 1.55x10^{-6})	q (ft/sec)	POROSITY* (n)	VELOCITY (ft/sec)	VELOCITY (ft/day)
MW-1	8.3	1.6	375	799	1.2×10^{-3}	1.0×10^{-6}	0.30	3.3×10^{-6}	0.29
MW-3	5.1	1.2	950	2024	3.0×10^{-3}	2.6×10^{-6}	0.33	7.9×10^{-6}	0.68
MW-4	2.1	0.5	1200	2556	4.0×10^{-3}	3.4×10^{-6}	0.37	9.2×10^{-6}	0.79
MW-5	5.9	1.0	550	1172	1.8×10^{-3}	1.5×10^{-6}	0.37	4.1×10^{-6}	0.35
AVERAGE	5.4	1.1	769	1638	2.5×10^{-3}	2.1×10^{-6}	0.34	6.1×10^{-6}	0.53

$q = K \Delta h/\Delta L$

q/n = velocity

$\frac{\Delta h}{\Delta L}$ (AVE) $\frac{0.16\ ft.}{186.56\ ft} = 8.6 \times 10^{-4}$

* From Freeze and Cherry and EPDM Experimental data

APPENDIX L

TABLES:
METALS IN SOILS
USEPA RODS (CLEAN UP LEVELS)

REVISED JUNE 22, 1984 MCCLANAHAN 847C

METALS IN SOILS

ELEMENT		CONCENTRATION IN SOILS mg/kg (ppm) RANGE	TYPICAL MEDIUM	SOURCE
ANTIMONY	Sb	- - 150	6	(4, 5 and 7
ARSENIC	As	0.1 - 194	11	2
BORON	B	2 - 130	10	1
CADMIUM	Cd	0.01 - 7	0.5	1
CALCIUM	Ca	LT 150 - 320,000	24,000	3
CHROMIUM	Cr	5 - 3,000	100	1
COBALT	Co	1 - 40	8	1
COPPER	Cu	2 - 100	20	1
FLOURINE	F	6 - 7070	270	2
IRON	Fe	100 - GT 100,000	25,000	2
LEAD	Pb	LT 1 - 888	29	2
MANGANESE	Mn	50 - 18,300	850	1 and 2
MERCURY	Hg	0.01 - 4.6	0.098	2
MOLYBDENUM	Mo	0.2 - 5	2	1
NICKEL	Ni	0.1 - 1,530	34	2
SELENIUM	Se	0.1 - 38	0.2	1
SILVER	Ag	0.01 - 8	0.4	2
STRONTIUM	Sr	LT 3 - 3,500	278	2
THORIUM	Th	2 - 13	9	6
TIN	Sn	2 - 200	10	1
VANADIUM	Va	LT 7 - 500	100	1 and 3
YTTRIUM	Y	LT 10 - 200	29	3
ZINC	Zn	10 - 2,000	54	2

NOTE GT GREATER THAN
LT LESS THAN

1. PARR, JAMES F., MARSH, PAUL B., KLA, JOANNE M., LAND TREATMENT OF HAZARDOUS WASTES, AGRICULTURAL ENVIRONMENTAL QUALITY INSTITUTE, AGRICULTURAL RESEARCH SERVICE, USDA, BELTSVILLE, MARYLAND, NOYES DATA CORPORATION, PARK RIDGE, NEW JERSEY, 1983.
2. URE, A. M., AND M. L. BERROW, "ELEMENTAL CONSTITUENTS OF SOILS" ENVIRONMENTAL CHEMISTRY, VOL. 2, pr 94-204 ed H. J. M. BOWEN, ROYAL SOCIETY OF CHEMISTRY, BURLINGHOUSE, LONDON, U.K. 1983.
3. SHACKLETTE, H. T., ET. AL., ET. AL., ELEMENTAL COMPOSITION OF SURFACIAL MATERIAL IN THE CONTERMINOUS UNITED STATES, USGS PROFESSIONAL PAPER 574-D 1971.
4. RAGAINI, R. C., ET. AL., "ENVIRONMENTAL TRACE CONTAMINATION IN KELLOG IDAHO NEAR LEAD SMELTING COMPLEX." ENVIR. SCI AND TECHNOL 11 773-780 1977
5. LISK, D. J., "TRACE METALS IN SOILS, PLANTS, AND ANIMALS." ADV AGRON 24 267-311, 1972.
6. LECHLER, T. J., ET. AL., "MAJOR AND TRACE METAL ANALYSIS OF 12 REFERENCE SOILS BY INDUCTIVELY COUPLED PLASMA-ATOMIC EMISSION SPECTROMETRY." SOIL SCIENCE 130 230-241, 1980.
7. "GEOCHEMISTRY OF SOME ROCKS, SOIL, PLANT AND VEGETABLES IN THE CONTERMINOUS UNITED STATES", GEOLOGICAL SURVEY PROFESSIONAL PAPER 574 - F 1975

USEPA RODs

REVIEW OF CLEAN-UP LEVELS
(ppm)

fanning, phillips & molnar

Source	Location	Total volatile Organics (TVO)	Benzene	Polychlorinated Biphenyls (PCB)	Polynuclear Aromatic Hydrocarbon (PAH)	Base Neutrals (includes PAH's)	Organic Pesticides	Total Petroleum Hydrocarbons (TPHC)	Zinc	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Nickel	Mercury	Silver	Selenium	Total Cyanides
NYSDEC	New York (2)	10.0	1	10.0	-	-	1.0	10	B	B	B	B	B	B	B	B	B	B	B	B
NJDEP	New Jersey	1.0	-	1.5	-	-	-	100	350	20	400	3	100	170	100	100	1	5	4	12
ROD	Renora, Inc., N.J.	1.0	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ROD	Millcreek, Pa.	-	-	10.0	2.94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ROD	Westline Site, Pa.	-	-	-	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ROD	American Creosote, Fl.	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ROD	Arrowhead Refinery, Mn.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ROD	Bayou Bonfouca, La.	-	-	-	100	-	-	-	-	-	-	-	-	-	980	-	-	-	-	-
ROD	Petro Chemical Systems, Tx.	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ROD	Sikes Disposal Pits, Tx.	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ROD	United Creositing, Tx.	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ROL	Metaltex/Aerosystems, N.J.	-	-	-	-	-	-	-	350	-	-	-	100	170	100	-	-	-	-	-
ROD	Sinclair Refininery, N.Y.	-	-	-	-	-	-	-	53	15	-	-	-	9.7	-	26.3	-	0.6	ND	-
ROD	Syncon Resigns, N.J.	1.0	-	-	-	100	-	-	196	20	-	3	15	-	317	18.0	1	-	-	-
ROD	Enterprise Ave., Pa.	-	-	-	-	-	-	-	-	(1)	100(1)	1(1)	5(1)	-	5(1)	-	0.2(1)	5(1)	1(1)	-
ROD	Peppers Steel, Fl.	-	-	1.0	-	-	-	-	-	5	-	-	-	-	1000	-	-	-	-	-
ROD	Arcanum Iron and Metal, Oh.	-	-	-	-	-	-	-	-	-	-	-	-	-	500 (3)	-	-	-	-	-

(1) EP Toxicity
(2) New York standard for metals is to match background levels.
(3) On-site soils were removed if they exceeded 500 ppm.
Off-site soils were removed if they exceeded background levels.
B = Background

APPENDIX M

EQUATIONS AND ASSUMPTIONS USED FOR A LIMITED RISK ASSESSMENT OF METAL CONTAMINATION IN THE SOILS AT THE SJ&J SITE

EQUATIONS AND ASSUMPTIONS USED FOR A LIMITED RISK ASSESSMENT OF METAL CONTAMINATION IN THE SOILS AT THE SJ&J SITE

To evaluate the significance of the elevated concentrations of As, Cd, Cu, Ag and Zn at the SJ&J site, a limited risk assessment was performed for tabulating threshold concentrations of these metals with respect to exposure routes (inhalation) to receptors/occupants of the site. For the SJ&J site, the five (5) metals were detected at elevated concentrations in the unsaturated soils and surficial dirt/dust. Thus, the exposure routes of the metals include inhalation, ingestion and direct contact. Since this site is used for industry, ingestion of the soil mainly associated with children was not considered as an exposure route. Based on the associated exposure routes of the metals at the SJ&J site, inhalation of airborne dusts and direct contact of dust containing the metals were considerations. Equations were applied to calculate the site specific intake rate for soil, sediment or dirt/dust constituents and then this value is divided by the acceptable intake rate as defined by the USEPA, 1980, as the health based criteria (SI/AI>1). The result of this proportion determined whether there is a risk present.

The result of the calculations for As, Cd, Cu, Ag and Zn (using highest concentrations indicated below) shows the applied ratios for all of the metals to be below the health based criteria. As indicated by the calculations of the health based criteria SI/AI in most cases three (3) orders of magnitude lower was noted between the SI/AI relationship, with the exception of Zn, which was four (4) orders of magnitude lower.

Metal	Highest Concentration Detected
Arsenic	220 mg/kg
Cadmium	6.7 mg/kg
Copper	790 mg/kg
Silver	150 mg/kg
Mercury	7.0 mg/kg
Zinc	860 mg/kg

EQUATION, PARAMETERS AND ASSUMPTIONS USED TO CALCULATE SITE-SPECIFIC INTAKE RATES FOR CHEMICAL CONSTITUENTS - INHALATION OF ON-SITE SOIL AND BUILDING DIRT/DUST

Equations:

$$SI_{soil,\ building\ dirt/dust} = \frac{(SC)(AC)(BR)(R_I)(10^{-6})}{(BW)}$$

Parameters:

$SI_{soil,\ building\ dirt/dust}$	= Site-specific intake rate for soil, sediment or dirt/dust constituents (mg/kg/day)
SC	= Soil or building dirt/dust constituent concentration (mg/kg)
AC	= Concentration of ambient airborne particles (mg/m^3)
BR	= Breathing rate (m^3/day)
R_I	= Ratio of gut to blood and lung to blood absorptive fractions
10^{-6}	= Unit conversion (kg/mg)
BW	= Body weight (kg)
SF	= Fraction of a day a person is exposed

Assumptions:

1) An average body weight (BW) of 70 kg and breathing rate (BR) of 20 m^3/day were utilized (US EPA, 1980).

2) R_I is the ratio of the fraction of inhaled substance (F_I) to the fraction of ingested substance (F_I) absorbed into the blood. R_I for As is 0.5, Cd is 4.8, Cu is 4.8 (estimated), Ag is 4.8, and Zn is 4.8 (estimated). The rationale for utilizing this ratio (R_I) is the differential absorptive properties of the lung and gastrointestinal track. The acceptable

EQUATION, PARAMETERS AND ASSUMPTIONS USED TO CALCULATE SITE-SPECIFIC INTAKE RATES FOR CHEMICAL CONSTITUENTS - INHALATION OF ON-SITE SOIL AND BUILDING DIRT/DUST

Assumptions (Cont'd)

intake rates (AI) utilized in this risk assessment were derived from adjusted drinking water criteria and NYSDEC Groundwater Standards based soley upon water ingestion. Consequently, these criteria were developed accounting for ingestion and gastrointestional adsorption of the constituents in question. Thus, directly comparing these AI's to calculated site-specific intake rates (SI) for chemical constituents utilizing an inhalation model without a correction factor (R_1) would be inappropriate.

3) The average concentration of ambient airborne particles (AC) is 0.033 mg/m^3. This is the reported mean concentration of particles less than 2.5 microns in an industrial urban setting (US EPA, 1982a). It is also assumed that these suspended airborne particles have the same constituent concentrations as the building dust or the on-site soil. The 2.5 micron aerodynamic particle diameter was chosen as the upper size limit since particles less than 2.5 microns would be deposited primarily within the pulmonary (alveolar) region of the lung (US EPA, 1982b). Thus, mucocilliary clearance by the upper portions of the respiratory tract would be minimized and adsorption within the alveolar regions of the lung for contaminants adsorbed to these particles would be greatly facilitated.

4) The fraction of a day a person would be exposed (SP) to on-site soil or building dirt/dust is assumed to be 0.50 (i.e., 12 hours/day). This assumption is based on the premise that if the site was utilized, it would most probably be utilized as an industrial site. Therefore, an exposure of 12 hours/day is appropriate (i.e., 8 hour shift plus 4 hours overtime for a safety margin).

EQUATION, PARAMETERS AND ASSUMPTIONS USED TO CALCULATE SITE-SPECIFIC INTAKE RATES FOR CHEMICAL CONSTITUENTS - DIRECT CONTACT WITH ON-SITE SOIL, SEDIMENT AND BUILDING DIRT/DUST

Equation:

$$SI_{\substack{soil,\\ sediment,\\ dirt/dust}} = \frac{(SC)(SD)(SF_{soil})}{(1000)(BW)}$$

Parameters:

$SI_{soil, sediment, dirt/dust}$ = Site-specific intake rate for soil, sediment or dirt/dust constituents that are absorbed (mg/kg/day).

SC = Soil, sediment or building dirt/dust concentration (mg/kg)

SF_{soil} = Fraction of a day a person is exposed to soil, sediment and/or building dust

BW = Body weight (kg)

1000 = Unit conversion (g/kg)

SD = Soil deposition rate (g/day)

Assumptions:

1) A soil deposition rate (SD) of 10 g/day (Kimbrough et al., 1984) was utilized for noncarcinogens for conservatism. The soil deposition rate for carcinogens (i.e., benzo(a)pyrene) is a lifetime average intake of 0.54 g/day (Kimbrough et al., 1984). In addition, dermal absorption equals 100%. Different soil deposition rates were utilized for carcinogens and noncarcinogens to increase the degree of conservatism within the model for non-carcinogens. As stated in

EQUATION, PARAMETERS AND ASSUMPTIONS USED TO CALCULATE SITE-SPECIFIC INTAKE RATES FOR CHEMICAL CONSTITUENTS - DIRECT CONTACT WITH ON-SITE SOIL, SEDIMENT AND BUILDING DIRT/DUST

Assumptions: (Cont'd)

Kimbrough et al., (1984), the soil deposition rate reaches a maximum rate of 10 g/day for children approximately 5 to 7 years old. This maximum deposition rate was applied within the model irrespective of age to threshold contaminants to definitively screen out those chemical contaminants that would not pose a public health threat.

2) The fraction of a day a person would be exposed (SF) to on-site soil or building dirt/dust is assumed to be 0.50 (i.e., 12 hours/day). This assumption is based on the premise that if the site was utilized, it would most probably be utilized as an industrial site. Therefore, an exposure of 12 hours/day is appropriate (i.e., 8 hour shift plus 4 hours overtime for a safety margin).

3) K_d is defined as 900 (Bases et al 1984).

4) An average body weight (BW) of 70 kg was assumed (US EPA, 1980).

Acceptable intake rate AI=1.4×10^{-3} mg/kg/day chronic acceptable intake rate derived from the adjusted ambient water quality criterion (AAWQC) assuming 2 l/day. Injestion rate and a 70 kg body unit over a 20 year period.

(USEPA, 1980)

ACCEPTABLE INTAKE RATES

	Acceptable Intake Rate (mg/kg/day) *
Arsenic	7.1×10^{-4}
Cadmium	2.9×10^{-4}
Copper	2.9×10^{-2}
Silver	1.4×10^{-3}
Zinc	1.4×10^{-1}

*Derived by multiplying the water ingestion rate of 2 liters/day and an average body weight of 70 kg (USEPA, 1985) by the NYSDEC Groundwater Standards for class "GA" groundwaters.

APPENDIX N

NEW YORK STATE DEPARTMENT OF ENVIRONEMENTAL CONSERVATION'S COMMENTS ON RI/FS - JANUARY 9, 1990

New York State Department of Environmental Conservation
Building 40—SUNY, Stony Brook, New York 11794
(516) 751-4078

Thomas C. Jorling
Commissioner

January 9, 1990

Dr. Kevin Phillips, Principal
Fanning, Phillips & Molnar
909 Marconi Avenue
Ronkonkoma, NY 11779

RE: S.J.&J. Service Stations, #152-032
RI/FS Phase I Sampling Report

Dear Dr. Phillips:

The referenced report has been reviewed by the NYSDEC, NYSDOH and USEPA staff.

Our joint comments follow:

SPECIFIC COMMENTS:

p. 30 (Table 8.15), p.48, and elsewhere - sampling results of class 6A groundwater should be also compared to NYSDEC Division of Water TOGS 1.1.1., NYSDOH (10 NYCRR subpart 5-1) MCL's and NYSDOH (10NYCRR Part 170) raw water standards.

p. 46 Two very different background samples cannot be averaged. Two more samples in the same general area at depths at least 1' should be taken.

p. 49 The conclusion that MW-3 is the only well affected by VOC contamination (and therefore a source of the soil and GW contamination) cannot be supported considering data presented on p.p.10,28,30.

p. 47 The presence of considerable concentrations of halogenated VOC's in LP-2 argues against the conclusion that "VOC's appear to be automotive derived in nature." The leaching pools should be examined for potential influent pipes.

p. 27 Is the "settling pool" the clarifier?

p. 44 What are the levels of significant concern mentioned on this page? Please clarify.

p. 51 — The discoloration of formation material near the water table in the leach pit area should be mentioned and explained.

p. 41 and elsewhere — Averaged pollutants concentrations in soil cannot be called NYSDEC guidelines. Said guidelines do not exist yet; anyway, the allowable clean-up concentrations will be based not on guidelines but on the health risk analysis calculations.

Appendix H and elsewhere — Detection of inorganics and organic contaminants in the field, trip and/or method blanks reduces the validity of the analytical results. That should be stated. Another tour of sampling/testing for the affected parameters should be performed.

Sections 8.1 & 8.2 — It should be noted in the text that the pipe that was inferred to lie between the two manhole covers by the results of the magnetometer survey may or may not be the pipe that has discharged wastes to the lagoon. It should be also mentioned that the geophysical survey had little control on the hand borings final locations. Additional investigation of the precise location of said pipe (possibly using as-built drawings, dye-testing, etc.) should be performed.

p. 27 — The text of the document indicated that GW monitoring wells were evacuated a minimum of four (4) well volumes prior to stability measurements. However, table 8.14 (p. 29) indicated a minimum of five exhausted well volumes while showing measurements taken after only three volumes for MW-4 and MW-5. Please make those numbers more consistent.

Section 10 — We generally agree with any sampling in addition to the previously mentioned items to be resampled. You should be aware that DEC's split sampling results showed high concentrations of manganese and especially iron. Also, we are not sure that at this point you can exclude installation of monitoring wells (MW) downstream of MW-1, MW-2, MW-4.

With regards to the "alternatives to the remediation" (p.51), Hazardous Waste Remediation Division of the DEC does not allow use of hazardous waste as landfill cover material. Please be advised that as a matter of policy DEC prefers remedial technologies that permanently and significantly reduce the volume, toxicity and mobility of the contaminants.

GENERAL COMMENTS:

1. Every table with the sampling results should include detection limits.

2. All future RI/FS submissions should be written as independent documents and should conform to the standard CERCLA RI/FS format as per the latest "Interim Final Guidance for Conducting Remedial Investigation/Feasibility Studies under CERCLA (OSWER Directive 9355.3-01)."

3. Many TIC's are below the mean detection limits of the laboratory. Future analysis of groundwater (GW) samples should employ low detection limits for compounds, for example MEK, that showed relatively high levels in the initial round.

The revised report should include only corrections and explanations of the above mentioned items. For the sake of saving time, the resampling, retesting, etc. should be done in the next, final phase of RI/FS and thus should be incorporated in the RI/FS Final Work Plan. The latter should also include off-site investigation, determination of clean-up technologies, health risk assessment, citizen participation plan, along with other issues. Submission of the approvable revised Phase I RI/FS report is not a prerequisite for the starting the preparation of the Final RI/FS Work Plan; they should be done concurrently.

Should you have any questions, do not hesitate to call me at (516) 751-7900.

Very truly yours,

Alex M. Mosk

Alexander M. Moskie, P.E.
Project Manager

AMM:pl

cc: A. Candela
J. Epstein
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