3.0 NUS/FIT FIELD INVESTIGATION METHODOLOGY

To meet the objectives of the Remedial Investigation, as described in Section 1.2, a multi-phased investigative approach was required. The objectives were achieved by NUS/FIT with the completion of the following major tasks, conducted over a sixteen month period from July, 1984 through November, 1985:

- Initial sample collection utilizing NUS/FIT volatile organic headspace analysis.

- Installation of 55 groundwater monitoring wells at 24 locations including soil borings and bedrock corings.

- In-situ (field) permeability testing and laboratory grain size analysis.

- Updating of the basemap conducted by the Environmental Photographic Interpretation Center (EPIC), United States Geological Survey (USGS) and NUS to reflect current planimetric features.

- Surveying of newly installed and pre-existing monitoring wells.

- Performance of three groundwater and surface water sampling rounds for CLP analysis.

- Measurement of water levels in all monitoring wells.

- Performance of a magnetometry survey.

- Installation of piezometers in support of EPA/USGS aquifer test.

The methods and procedures pertinent to each task and a discussion of the data obtained are briefly summarized in the following sections. Detailed work plans for each task were submitted to EPA for review prior to any field work. Ambient air monitoring was conducted with a Foxboro Century Systems Organic Vapor Analyzer (OVA) Model 128 or an HNu Systems PI101 Photoionization Detector during all field activities. No levels of ambient vapors were detected above background during any field activity conducted in the study area. Evaluation of the data is presented in Sections 4.0 and 5.0. Much of the raw data are presented in the appendices, but are discussed throughout the report. More detailed descriptions of the methodology (summarized below) are presented in Appendix D.

3.1 Initial Sampling Round

NUS/FIT conducted an initial sampling round of the Wells G & H aquifer area between July 17 and August 20, 1984.

This provided a comprehensive and contemporaneous sampling of the study area. Table 3-1 presents pertinent data concerning the 52 samples, including the duplicates and blanks that were collected from 34 monitoring wells, three surface water locations (designated by SW prefix), and three sediment locations (designated by SS prefix) (Table 3-1). Sampling locations are depicted in Figures 3-1A and B. Due to the limited availability of sample analytical slots through the Contract Laboratory Program, samples were collected for NUS/FIT screening on a Photovac Gas Chromatograph model 10A10 for volatile organic compounds. A discussion of this technique is presented in Appendix D. The analytical results served to establish the current extent of contamination and further, aided in the subsequent placement of monitoring wells. It should be noted that all of the wells and surface water locations included in the initial sampling round were later resampled for CLP gas chromatography/mass spectrometry (GC/MS) analysis. Analytical results of this and subsequent sampling rounds are discussed in Chapter 5 and are presented in Appendix G.

TABLE 3-1
NUS/FIT INITIAL SAMPLING ROUND (JULY-AUGUST, 1984)
SAMPLE COLLECTION SUMMARY

Sample Location	Sample No.	Date Sampled	Time Sampled	Purging Method	Total Amount Purged (Gallons)	pH/Conductivity*
BSW-2	76274	07-17-84	1030	Gas Pump	10.0	Vol. 1 = 5.8/320 Vol. 2 = 6.2/340 Vol. 3 = 6.5/340 Vol. 4 = 6.5/340 Vol. 5 = 6.5/355
BW-3	76275	07-17-84	1050	Air Lift Pump	13.0	Vol. 1 = 7.0/855 Vol. 2 = 5.0/900 Vol. 3 = 54./900
BW-3 Duplicate	76276	07-17-84	1050	Air Lift Pump	13.0	Vol. 1 = 7.0/855 Vol. 2 = 5.0/900 Vol. 3 = 5.4/900
S-46	76277	07-17-84	1105	NA	4 minutes	Vol. 1 = 7.4/680 Vol. 2 = NA Vol. 3 = NA
BW-5	77501	07-17-84	1215	Hand Bailing	10.8	Vol. 1 = 8.0/720 Vol. 2 = 8.4/720 Vol. 3 = 8.4/710
BSW-1	77502	07-17-84	1300	Hand Bailing	10.5	Vol. 1 = 8.4/300 Vol. 2 = 8.4/300 Vol. 3 = 8.4/300
BW-1	77503	07-17-84	1315	Hand Bailing	13.8	Vol. 1 = 7.8/340 Vol. 2 = 8.3/320 Vol. 3 = 8.4/320
OW-7	77515	07-19-84	0920	Gas Pump	49.05	Vol. 1 = 6.4/340 Vol. 2 = 6.0/350 Vol. 3 = 6.0/370
OW-7 Duplicate	77517	07-19-84	0920	Gas Pump	49.05	Vol. 1 = 6.4/340 Vol. 2 = 6.0/350 Vol. 3 = 6.0/370
OW-19	77516	07-19-84	1025	Submersible Pump	500	Vol. 5 = 6.8/500*
OW19A	77520	07-19-84	1115	Gas Pump	69.0	Vol. 1 = 6.4/350 Vol. 2 = 6.4/360 Vol. 3 = 6.4/350

TABLE 3-1
NUS/FIT INITIAL SAMPLING ROUND (JULY-AUGUST, 1984)
SAMPLE COLLECTION SUMMARY
PAGE TWO

Sample Location	Sample No.	Date Sampled	Time Sampled	Purging Method	Total Amount Purged (Gallons)	pH/Conductivity
OW20	77522	07-19-84	1205	Submersible Pump	300	Vol. 3 = 5.8/560*
OW-20A	77521	07-19-84	1240	Gas Pump	66.0	Vol. 1 = 8.1/1100 Vol. 2 = 7.8/1100 Vol. 3 = 8.0/1100
S-60	77519	07-20-84	1045	Hand Bailing	6.56	Vol. 1 = 9.2/2200 Vol. 2 = 10.0/2000 Vol. 3 = 9.8/2000 Vol. 4 = 9.2/2000
S-6	77565	07-20-84	1240	Gas Pump	21.9	Vol. 1 = 8.0/1200 Vol. 2 = 7.8/1200 Vol. 3 = 7.8/1200
S-5	77566	07-20-84	1317	Hand Bailing	18.0	Vol. 1 = 8.4/1200 Vol. 2 = 8.4/1250 Vol. 3 = 8.4/1200
S-8	77568	07-20-84	1500	Gas Pump	34.2	Vol. 1 = 7.2/420 Vol. 2 = 7.2/420 Vol. 3 = 7.4/420
S-8 Duplicate	77569	07-20-84	1500	Gas Pump	34.2	Vol. 1 = 7.2/420 Vol. 2 = 7.2/420 Vol. 3 = 7.4/420
OW-8	77567	07-20-84	1515	Submersible Pump	180.0	Vol. 2 = 8.4/540*
SW-01	77570	07-25-84	0855	NA	NA	7.8/610
SS-01	77571	07-25-84	0905	NA	NA	NA
SW-04	77572	07-25-84	0955	NA	NA	7.5/550
SS-04	77573	07-25-84	1000	NA	NA	NA
SW-02	77574	07-25-84	1200	NA	NA	NA
SW-02 Duplicate	77575	07-25-84	1200	NA	NA	NA

TABLE 3-1
NUS/FIT INITIAL SAMPLING ROUND (JULY-AUGUST, 1984)
SAMPLE COLLECTION SUMMARY
PAGE THREE

Sample Location	Sample No.	Date Sampled	Time Sampled	Purging Method	Total Amount Purged (Gallons)	pH/Conductivity
SS-02	77576	07-25-84	1200	NA	NA	NA
SS-02 Duplicate	77577	07-25-84	1200	NA	NA	NA
S-11	77578	07-25-84	1445	Gas Pump	23.0	Vol. 1 = 7.6/660 Vol. 2 = 5.0/670 Vol. 3 = 4.0/670
GW-3S	77579	07-26-84	1140	Hand Bailing	9.0	Vol. 1 = 6.3/NM Vol. 2 = 5.8/NM Vol. 3 = 5.9/NM
GW-3S Duplicate	77580	07-26-84	1140	Hand Bailing	9.0	Vol. 1 = 6.3/NM Vol 2 = 5.8/NM Vol. 3 = 5.9/NM
GW-3D	76270	07-26-84	1200	Hand Bailing	21.0	Vol. 1 = 6.2/NM Vol. 2 = 6.5/NM Vol. 3 = 7.0/NM
GW-4S	77581	07-26-84	1455	Hand Bailing	7.8	Vol. 1 = 6.2/NM Vol. 2 = 7.0/NM Vol. 3 = 6.6/NM
GW-4D	77582	07-26-84	1505	Hand Bailing	10.4	Vol. 1 = 7.0/NM Vol. 2 = 6.5/NM
S-22	11210	08-20-84	1150	Hand Bailing	9.0	NM
S-21	11211	08-20-84	1250	Hand Bailing	6.6	NM
BSW-1	77585	07-28-84	1235	Gas Pump	**	NM
BW-1	77586	07-28-84	1230	Gas Pump	**	NM
BSW-2	77587	07-28-84	1545	Gas Pump	**	NM
BW-2	77588	07-28-84	1500	Gas Pump	**	NM
BW-3	77589	07-28-84	1615	Gas Pump	**	NM
BW-4	77590	07-28-84	1630	Gas Pump	**	NM
BW-5	77591	07-28-84	1430	Gas Pump	**	NM

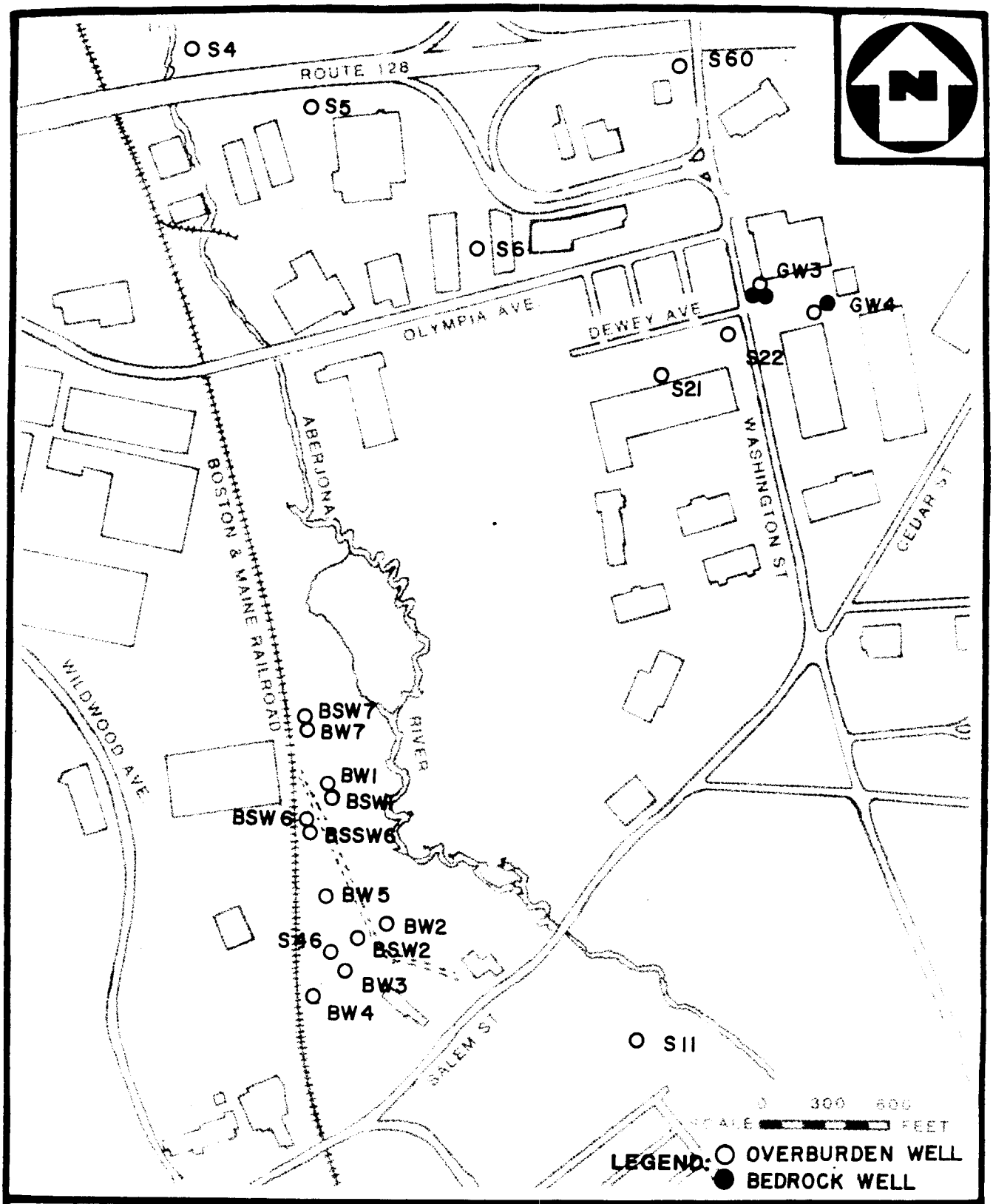
TABLE 3-1
NUS/FIT INITIAL SAMPLING ROUND (JULY-AUGUST, 1984)
SAMPLE COLLECTION SUMMARY
PAGE FOUR

Sample Location	Sample No.	Date Sampled	Time Sampled	Purging Method	Total Amount Purged (Gallons)	pH/Conductivity
BSSW-6	77592	07-28-84	1300	Gas Pump	**	NM
BSW-6	77593	07-28-84	1315	Gas Pump	**	NM
BSW-7	77594	07-28-84	1215	Gas Pump	**	NM
BW-7	77595	07-28-84	1215	Gas Pump	**	NM
Blank	77504	7-17-84	1400	NA	NA	NA
Blank	77518	7-19-84	1200	NA	NA	NA
Blank	77611	7-20-84	1515	NA	NA	NA
Blank	76269	7-25-84	1630	NA	NA	NA
Blank	77583	7-26-84	1130	NA	NA	NA
Blank	11212	8-20-84	1400	NA	NA	NA

Summary	Volatile Samples	Duplcate Samples
Monitoring Well Locations	34	4
Surface Water Locations	3	1
Sediment Locations	3	1
Blanks	6	-
Total	46	6

LEGEND

* - pH (standards) conductivity (microhos/cm) were measured after every well volume. Each measurement is given.
** - Split samples collected by Woodward & Clyde Consultants. A minimum of three (3) well volumes were purged before sampling.
NA - Not Applicable
NM - Not Measured
SW - Surface water sample
SS - Sediment sample



SAMPLING LOCATIONS
(INITIAL ROUND JULY 1984)
WELLS G AND H
WOBURN, MA

NUS CORPORATION
A Halliburton Company

FIGURE 3-1A

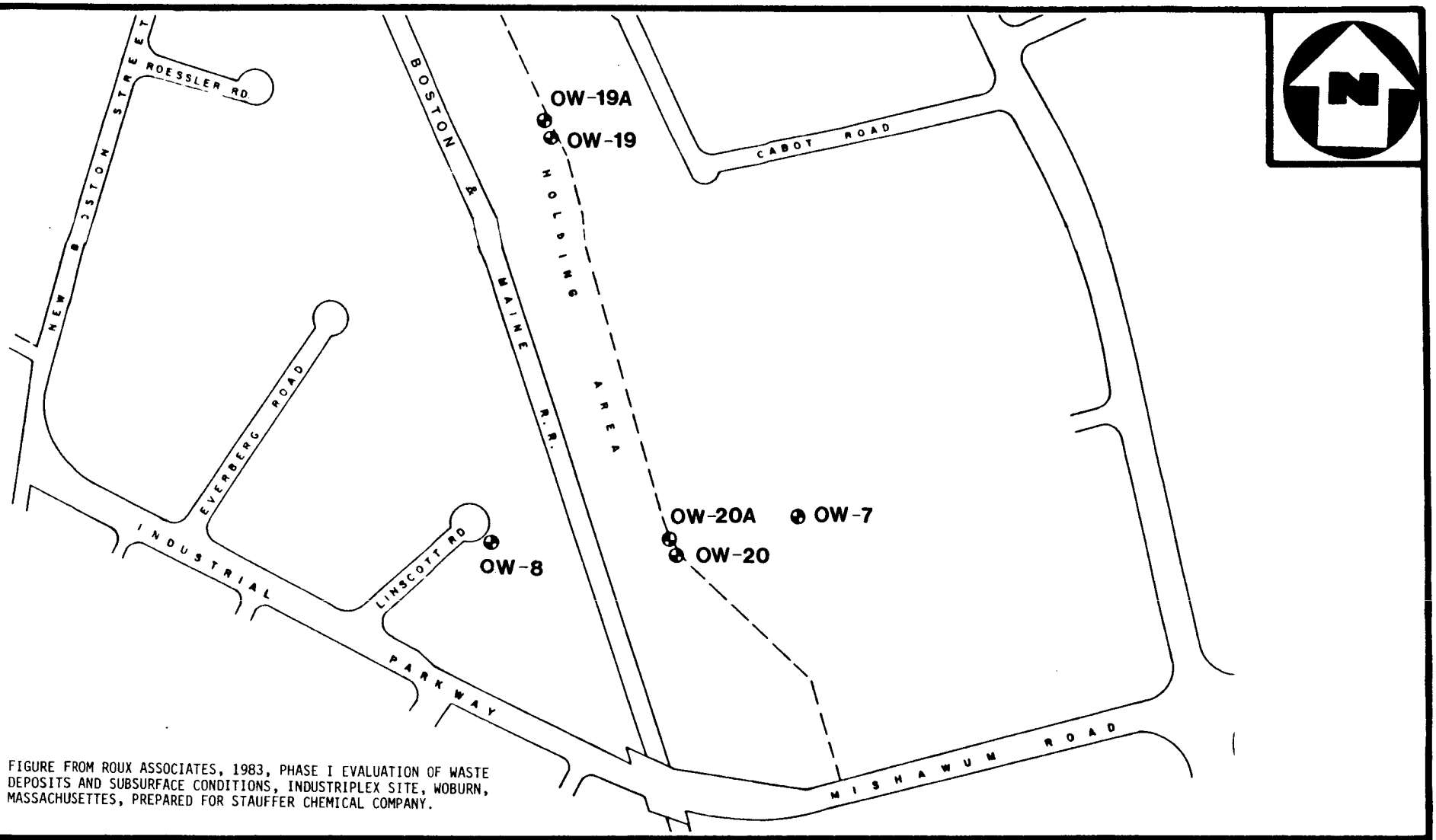


FIGURE FROM ROUX ASSOCIATES, 1983, PHASE I EVALUATION OF WASTE DEPOSITS AND SUBSURFACE CONDITIONS, INDUSTRIPLEX SITE, WOBURN, MASSACHUSETTES, PREPARED FOR STAUFFER CHEMICAL COMPANY.

200 0 200 400
SCALE FEET
APPROXIMATE

LEGEND:

MONITORING WELL

SAMPLING LOCATIONS NORTH OF MISHAWUM ROAD INITIAL ROUND (JULY 1984) FINAL ROUNDS (APRIL-JUNE, 1985) WOBURN, MA

NUS CORPORATION
A Halliburton Company

FIGURE 3-1B

3.1.1 Groundwater Sampling

Groundwater samples were collected after well purging; a minimum of three well volumes to a maximum of five well volumes were purged. Purging was accomplished by mechanical pump or hand bailing. Conductivity and pH were measured after each well volume to ensure that the samples were representative of the water in the aquifer. Samples were collected with a stainless steel bailer and poured into 44 milliliter (ml) septum-sealed vials. All samples were preserved with mercuric chloride to a final concentration of 16 ppm in the vial. Samples were stored on ice until delivery to the EPA's New England Regional Laboratory in Lexington, Massachusetts. Chain of custody procedures were followed and all sampling equipment was decontaminated prior to sampling and between wells to prevent cross contamination (Appendix D).

Included with the groundwater samples collected by NUS/FIT personnel, are split samples obtained from monitoring wells on the Wildwood Conservation Corporation property (Beatrice Foods property). The split samples were made available through the sampling activities of Woodward-Clyde Consultants on July 27, 1984. Sampling specifics are presented in Table 3-1.

3.1.2 Surface Water Sampling

Three surface water locations (designated by SW prefixes in Table 3-1 and Figure 3-1A) were sampled during the initial sampling round. Samples were collected from downstream, upstream, and in the near vicinity of the Wells G & H site on the Aberjona River. All samples were collected in a grab fashion using a remote sampler with a laboratory cleaned jar attached. New jars were attached between sampling locations to prevent cross contamination. Each sample was poured into two 44 ml septum-sealed glass vials and immediately labelled and placed on ice for preservation. Chain of custody procedures were followed and all sampling equipment was decontaminated prior to sample collection at all sampling locations.

3.1.3 Sediment Sampling

Three sediment samples were also collected along the Aberjona River at locations designated by an SS prefix in Table 3-1 and Figure 3-1A. Where river depth did not allow for direct collection via a stainless steel spatula, the remote sampler was utilized in the manner described above. The laboratory cleaned jar was replaced between collection of the samples. Directly after collection, each 44 ml vial was labelled and placed on ice. Chain of custody procedures were followed and all sampling equipment was decontaminated prior to sample collection at all locations.

3.2 Installation of Groundwater Monitoring Wells

The objectives of groundwater monitoring well installation were to provide:

- direct information on depth to bedrock and to groundwater
- surficial and bedrock geologic data for evaluation of groundwater movement in unconsolidated sediments and bedrock
- information on groundwater conditions in overburden and bedrock
- groundwater sampling locations for evaluation of groundwater and the extent of groundwater contamination.
- data on vertical stratification of groundwater contamination

A total of 55 wells were installed at 24 locations in the Wells G & H study area utilizing either the hollow stem auger drilling method or the drive and wash method (Appendix D). Figure 3-2 depicts the NUS/FIT well locations. Table 3-2 presents a summary of each well's construction.

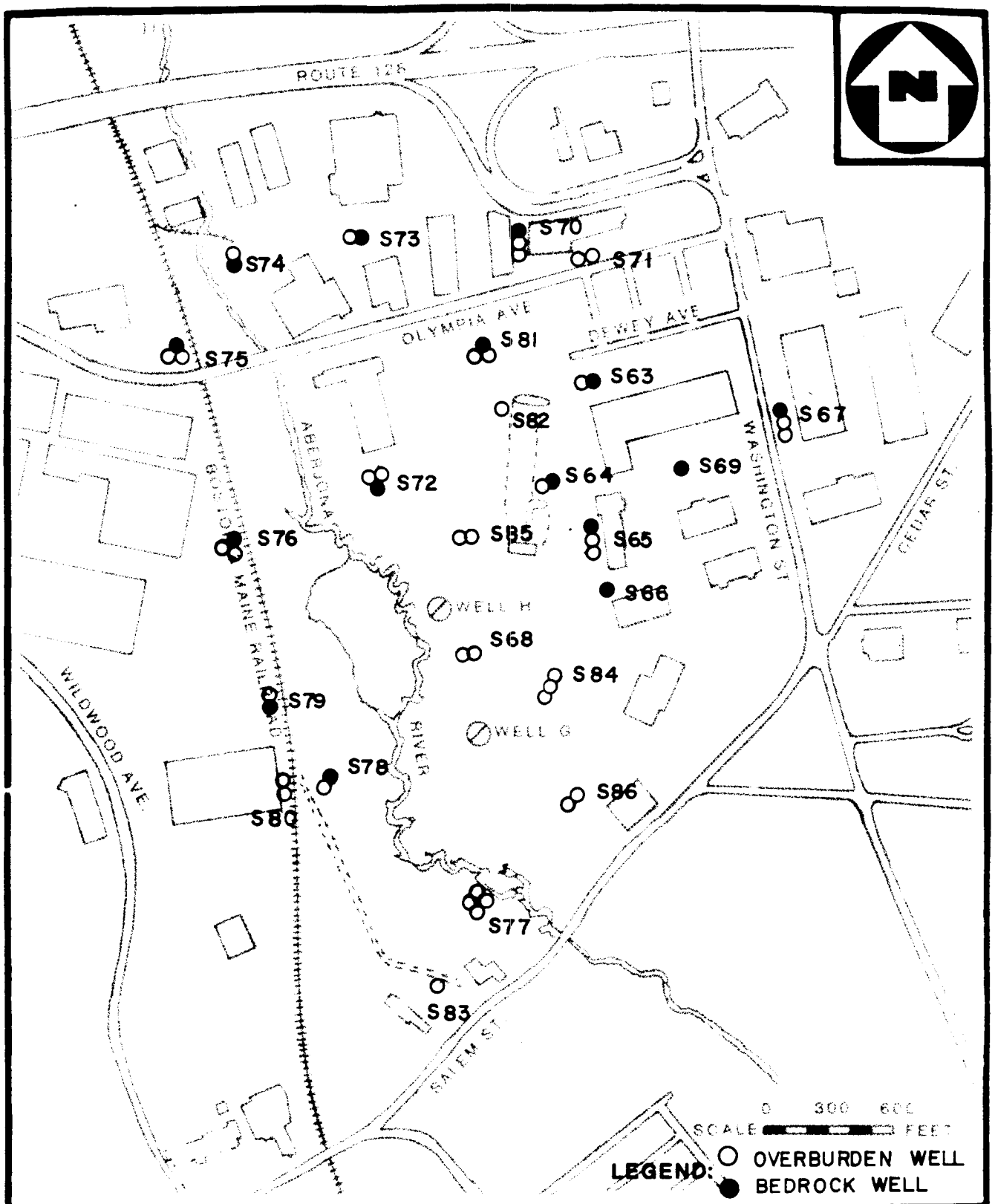
TABLE 3-2
NUS/FIT WELL CONSTRUCTION SUMMARY

Well No.	To Bedrock (feet)	Depth Total Depth (feet)	Screened Internal (feet)
S63D	22	36	26-36
S63S	NA	22	12-22
S64D	36	56	41-56
S64M	NA	32	27-32
S64S	NA	15	10-15
S65D	36.4	56.4	41.4-56.4
S65M	NA	37	27-37
S65S	NA	24	4-24
S66D	11.5	34.7	19.7 to 34.7
S67D	54	75	60-75
S67M	NA	43	33-43
S67S	NA	34	24-34
S68M	105	105	55-105
S68S	NA	43.5	14.5-44.5
S69D	35	55	40-55
S70M	NA	62	42-62
S70S	NA	30	15-30
S71D	16.5	42.7	22.7-42.7
S71M	NA	16	11-16
S72D	116	137	122-137
S72M	NA	92.5	54.5-92.5
S72S	NA	54	14-54
S75D	75	95	80-95
S75M	NA	75	50-75
S75S	NA	44	29-44
S76D	130	150	135-150
S76M	NA	75	78-128
S76S	NA	44	15-65

TABLE 3-2
NUS/FIT WELL CONSTRUCTION SUMMARY
PAGE TWO

Well No.	Depth To Bedrock (feet)	Total Depth (feet)	Screened Internal (feet)
S77D	NA	138.5	133.5-138.5
S77M	NA	75	70-75
S77S	NA	30	25-30
S77SS	NA	13	13-18
S78D	90.5	110.5	95.5-110.5
S78S	NA	25	5-25
S79D	107.5	128	113-128
S79M	NA	97	17-97
S80M	NA	65	55-65
S80S	NA	25	45-55
S81D	62	82	67-82
S81M	NA	50	40-50
S81S	NA	20	10-20
S82M	NA	35	25-35
S83M	81.5	80	70-80
S84D	81.5	78	73-78
S84M	NA	45	40-45
S84S	NA	18	13-18
S85M	NA	71	66-71
S85S	NA	30	20-30
S86M	NA	52	47-52
S86S	NA	30	20-30

All measurements made from ground surface.



NUS/ FIT MONITORING WELL LOCATIONS

WELLS G AND H
WOBURN, MA

NUS CORPORATION
A Halliburton Company

FIGURE 3-2

To prevent the introduction of contamination during the drilling process, all water used during the drilling procedures came from the current Woburn water supply as accessed through a variety of hydrants throughout the study area. Samples were collected from the drillers' water storage tanks and screened in the field on the Foxboro Century Systems Organic Vapor Analyzer (OVA) Model 128 prior to use to ensure that the water was free of (OVA) detectable volatile organic contaminants. OVA screening procedures are described in Appendix D.

Furthermore, all drilling tools used down the borehole (i.e., casing, chuck rods, auger flights) and parts of the drilling rigs extended over the borehole were routinely decontaminated before use at new locations and between boreholes at nested locations to prevent cross contamination (Appendix D).

Split spoon soil samples were collected at five foot intervals or other strata of interest. All samples were stored in labelled jars and retained by NUS/FIT for visual classification. In addition, one septum-sealed 44 ml VOA (volatile organic analysis) vial was partially filled with soil for OVA headspace analysis which was performed in the field by the NUS/FIT onsite chemist in order to detect zones of volatile organic contamination.

Whenever possible, the deepest well in a nested set was drilled first to compile data through volatile organic screening and visual examination of the split spoon samples to assist in subsequent screen placement. The screens were placed to intercept probable zones of contamination in overburden and bedrock.

The wells were constructed using Schedule 80 threaded flush jointed polyvinyl chloride (PVC) with a 1.5 inch inside diameter. The screen slot size for all wells installed was 0.010 inch. The annulus between the screen and the borehole was backfilled with a 60/40 grade Ottawa sand.

A cement/bentonite slurry grout (10:1 ratio by weight cement to bentonite) was used to backfill the borehole from the top of the filter sand to the ground surface. The grout was injected with a tremie pipe to minimize disturbance of the filter

sand. In cases where the top of the screen was less than fifteen feet from ground surface, bentonite pellets were used to seal the well instead of the slurry grout. Typical monitoring well construction is depicted in Figure 3-3.

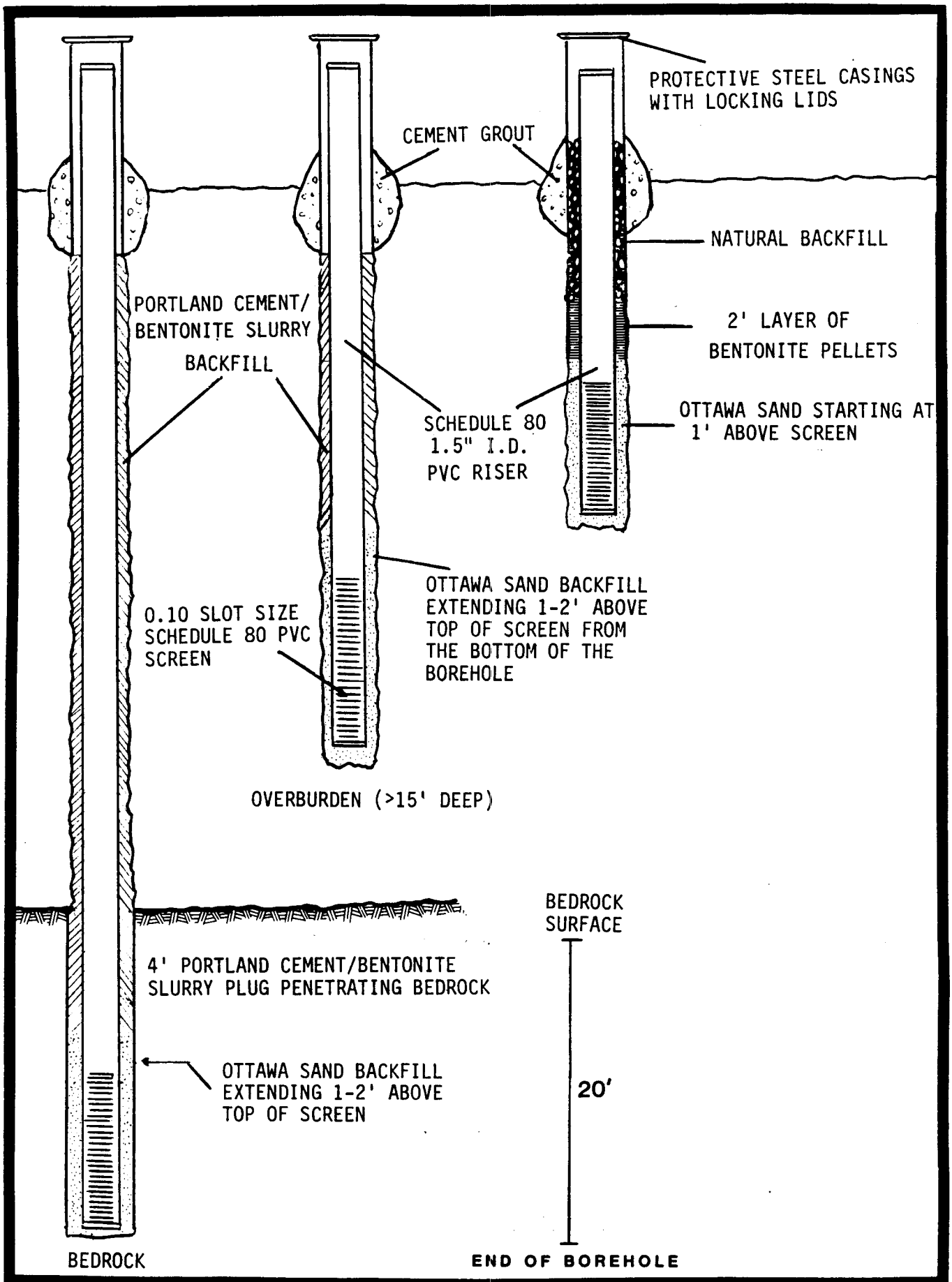
One well from each nested location was cored twenty feet into the bedrock using an NWX size diamond core bit according to standard ASTM method for diamond core drilling. All rock cores were examined in the field, and boxed, labelled and retained by NUS/FIT for future reference. Rock quality designations (RQDs) were calculated for each five foot coring run and are presented in Chapter 4 of this report. Bedrock wells were screened with fifteen feet of 0.010 inch slotted 1.5 inch slotted inside diameter PVC.

Filter sand was added to a level approximately one foot above the top of screen. Cement/bentonite slurry was then emplaced via a tremie pipe with the grout being brought to ground surface. In this manner, a four foot grout plug was emplaced into the bedrock limiting or precluding groundwater movement in the borehole penetrating the overburden and bedrock aquifers.

The PVC risers extended to a level approximately 2.5 feet above ground surface (except on UniFirst Corporation property, where limited space demanded subsurface installation). A five foot high steel security casing with lockable lid was placed around the riser. The security casing was cemented into the ground to a depth of 2.5 feet and locks were attached. Serial numbers engraved on each lock were removed by filing.

3.3 In-Situ Permeability Testing/Grain Size Analysis

The objective of conducting in-situ (field) permeability testing and collecting overburden samples for grain size analysis was to provide quantitative data on hydraulic conductivity of the major surficial units through which groundwater (and contamination) is migrating within the study area.



NUS CORPORATION
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TYPICAL NESTED WELL CONSTRUCTION DIAGRAM

FIGURE 3-3

In-situ falling head permeability tests were conducted. A total of sixteen tests were run at seven locations in two or three strata characteristic of the stratigraphic column. The falling head tests were conducted through an Ottawa sand or coarse gravel "pack" with a particle size visibly larger than the particle size of the stratum being tested (so that the "pack" would not be the limiting factor). Water was added to the top of the casing and measurements were then taken at pre-determined time intervals while the water level in the casing dropped. Duration varied from test to test. Laboratory grain size analysis was conducted on 49 samples collected from strata of interest to provide confirmation of visual classification. Particle size distribution curves were developed from a combined sieve and hydrometer analysis. Results of both the in-situ permeability test and grain size analysis including curves and calculations are presented in Appendix F.

3.4 Base Map Development

NUS/FIT began base map development by acquiring the latest existing topographic map of the area which was drafted by Lockwood, Kessler & Bartlett for the City of Woburn in 1966. NUS/FIT, through EPA, acquired aerial photographic imagery taken in April, 1985. The topographic base map and new aerial imagery were forwarded to EPA's Environmental Photographic Interpretation Center (EPIC), where the planimetric features were transposed from the aerial imagery to a mylar overlay. The overlay was returned to NUS, where a new basemap was created incorporating current (1985) cultural and topographic features. The basemap was subsequently submitted to the United States Geological Survey (USGS) for review where it was further refined. This combined effort produced a base map which reflects the current land use within the study area and is presented as Plate 1 of this report.

3.5 Surveying of Well Locations

In November, 1985, NUS/FIT contracted for ground surveying to accurately locate and establish elevations of wells and piezometers where this data was lacking. All

elevations and distances were established from existing bench marks. Post-survey calculations conducted by NUS/FIT substantiate that the subcontractor stayed well within the permissible closure limits.

Vertical and horizontal data for a number of wells along the eastern flank of the study were made available by EPA through another consultant working in the area. Verification of a number of these points was conducted during the NUS/FIT surveying task and found to be accurate. In total, 100 points were located and elevations established, including the elevation of the Aberjona River.

3.6 Final Sampling Rounds

Groundwater and surface water samples were collected to provide:

- characterization of groundwater and surface water quality as it relates to drinking water standards.
- horizontal and vertical extent of groundwater contamination
- the chemical nature of groundwater contamination
- data to determine source areas of groundwater contamination

NUS/FIT conducted three Contract Laboratory Program (CLP) analysis sampling rounds during the investigation with one round completed each month for the months of April, May, and June, 1985. Study area sampling locations are depicted on Plate 2. Sampling locations north of the study area (north of Mishawum Road) are depicted on Figure 3-1B.

The techniques used by NUS/FIT for well purging and water sample collection are presented in Appendix D.

During the month of April, 1985, 143 samples were collected for a variety of analyses. These numbers include 103 monitoring well locations and 6 surface water locations. Six of the samples collected were screened in-house by NUS/FIT, with the remainder sent to laboratories under the CLP for volatile organic, extractable organic, metal, and drinking water quality standards (Table 3-3).

During the month of May, 1985, NUS/FIT collected a total of 92 samples including 67 monitoring well locations and 6 surface water locations. Fifteen of these samples were analyzed for CLP Hazardous Substance List (HSL) organic compounds and metals. Seventy-seven samples were analyzed for the presence of volatile organic contaminants through the CLP (Table 3-4).

The third and final sampling round was conducted in June, 1985 with a total of 126 samples collected from 78 monitoring well locations and 6 surface water locations. All samples from this round were submitted to CLP for analysis, including 88 samples for volatile organic analysis, 18 samples for HSL organics and metals analysis, and 20 samples for federal and state drinking water quality standards (Table 3-5). Aqueous samples collected for inorganic analysis were filtered to provide data on dissolved constituents. Dissolved concentrations of inorganic parameters will provide data on drinking water quality in support of the Feasibility Study. Table 3-6 summarizes all CLP analyses and shipments. Table 3-7 lists the federal and state drinking water quality parameters. Appendix D provides an explanation of analytical procedures used in this study. Appendix G provides a summary of analytical results which will be discussed in Section 5.0.

3.7 Water Level Measurements

NUS/FIT personnel measured water levels in monitoring wells within the Wells G & H study area from April 2-4, 1985. The water level measurements collected from all monitoring wells were used to construct the water table contour map depicted as Plate 4.

TABLE 3-3
NUS/FIT APRIL 1985 SAMPLING ROUND COLLECTION SUMMARY

Sample Location	Sample Number	Traffic Report No.	Date Sampled	Time Sampled (hrs)	Total Vol. Purged (gal)	Sample pH	Analysis
S-4	12406	AB369	4/16/85	1357	23	-	VOA
S-5	12392	AB353	4/16/85	0824	50	-	VOA
S-6	12393	AB358	4/16/85	0839	26	-	VOA
S-10	12408	AB371	4/16/85	1528	11.5	-	VOA
S-11	12399	AB363	4/16/85	1111	23.5	-	VOA
S-21	12387	AB348	4/11/85	1030	6	6.4	VOA
S-22	12481	AB513	4/24/85	0955	10.5	-	VOA/SAS
S-41	12487	AB517	4/24/85	1355	-	-	VOA
S-46	12430	AB382	4/18/85	1301	-	-	VOA
S-46 (dup)	12431	AB383	4/18/85	1301	-	-	VOA
S-47	12429	-	4/18/85	1249	-	-	In-house
S-63D	12494	AB504	4/23/85	1415	12.8	-	VOA
S-63S	12493	AB503	4/23/85	1430	12.9	-	VOA
S64D	12377	AB338	4/10/85	1037	5.5	8.6	VOA
S64D (dup)	12378	AB339	4/10/85	1037	5.5	8.6	VOA
S64M	12380	AB341	4/10/85	1128	6.1	8.5	VOA
S64M (dup)	12381	AB342	4/10/85	1128	6.1	8.5	VOA
S64S	12376	AB337	4/10/85	1026	5.6	7.8	VOA
S65D	12365	AB327	4/09/85	0906	24.5	7.0	VOA
S65M	12366	AB328	4/09/85	0924	24.9	6.4	VOA
S65S	12367	AB329	4/19/85	0932	24	6.2	VOA
S66D	12407	AB370	4/16/85	1442	16.1	6.6	vOA
S67D	12386	AB347	4/11/85	0945	19.6	6.6	VOA
S67M	12385	AB346	4/11/85	0930	16.5	6.3	VOA
S67S	12384	AB345	4/11/85	0910	16.5	5.9	vOA
S68D	12478	AB542/MAA220	4/23/85	1605	-	-	HSL/metals/SAS
S68D (dup)	13082	-	4/23/85	1605	-	-	SAS
S68M	12477	AB533/MAA219	4/23/85	1620	-	-	HSL/metals/SAS
S69D	12364	AB326	4/09/85	0847	19.7	6.0	VOA
S-70M	12371	AB333	4/09/85	1117	13.7	6.6	VOA
S-70S	12370	AB332	4/09/85	1105	13.4	7.2	VOA
S-71D	12433	AB534/MAA216	4/22/85	1101	15.0	-	HSL/metals
S71M	12432	AB505	4/22/85	1050	dry	-	VOA
S72D	12395	AB360	4/16/85	0906	60.0	11.2	VOA
S72M	12396	AB384	4/16/85	0928	39.0	9.8	HSL
S72S	12394	AB359	4/16/85	0851	21.0	9.7	VOA
S73D	12473	AB510	4/23/85	1051	27.5	-	VOA/SAS
S73S	12474	AB511	4/23/85	1123	15.0	-	VOA/SAS
S74D	12476	AB512	4/23/85	1444	46.0	-	VOA/SAS
S74M	12475	AB536/MAA218	4/23/85	1401	25.0	-	HSL/metals/SAS
S75D	12390	AB351	4/11/85	1300	37.5	6.6	VOA
S75M	12389	AB350	4/11/85	1125	30.0	6.4	VOA
S75S	12388	AB349	4/11/85	1110	16.5	6.3	VOA
S77D	12427	AB381	4/11/85	1121	62.5	9.5	VOA
S77M	12400	AB385	4/16/85	1227	34.0	8.0	HSL
S77S	12401	AB364	4/16/85	1252	12.5	8.2	VOA
S77SS	12402	AB365	4/16/85	1259	5.5	8.5	VOA

TABLE 3-3
NUS/FIT APRIL 1985 SAMPLING ROUND COLLECTION SUMMARY
PAGE TWO

Sample Location	Sample Number	Traffic Report No.	Date Sampled	Time Sampled (hrs)	Total Vol. Purged (gal)	Sample pH	Analysis
S78D	12404	AB367	4/16/85	1332	31.0	8.3	VOA
S78D (dup)	12405	AB368	4/16/85	1332	31.0	8.3	VOA
S78S	12416	AB389	4/16/85	1332	32.0	8.2	HSL
S79D	12360	AB322/MAA215	4/18/85	0905	10.0	8.8	HSL/metals
S80M	12357	AB319/MAA212	4/08/85	1125	30.0	6.4	HSL/metals
S80M (dup)	12358	AB320/MAA213	4/08/85	1125	30.0	6.4	HSL/metals
S80S	12359	AB321/MAA214	4/08/85	1147	30.0	6.2	HSL/metals
S81D	12368	AB330	4/09/85	1010	36.0	7.0	VOA
S81M	12369	AB331	4/19/85	1041	21.0	10.5	VOA
S81S	12411	AB395	4/17/85	1050	4.5	-	HSL
S81S (dup)	12412	AB388	4/17/85	1050	4.5	-	HSL
S82	12397	AB340	4/10/85	1113	15.0	8.3	VOA
S83	12479	AB538/MAA221	4/23/85	1553	37.0	-	HSL/metals
S83 (dup)	12480	AB539/MA222	4/23/85	1553	37.0	-	HSL/metals
S84D	12437	AB507	4/23/85	0858	35.0	-	VOA
S84M	12471	AB508	4/23/85	0935	21.3	-	VOA
S84S	12472	AB509	4/23/85	0958	7.8	-	VOA
S85M	12398	AB362	4/16/85	1049	32.0	8.6	VOA
S85S	12397	AB361	4/16/85	1040	12.0	8.6	VOA
S86M	12409	AB386	4/16/85	0827	12.5	9.2	HSL
S86S	12410	AB387	4/16/85	1125	30.0	8.2	HSL
IUS-2A	12375	AB336	4/9/85	1549	70	5.4	VOA
IUS-2B	12373	AB335	4/9/85	1507	40	4.8	VOA
IUS-2B (dup)	12374	-	4/9/85	1507	40	4.8	In-house
IUS-2C	12372	AB334	4/9/85	1309	13	4.2	VOA
GW-3DB	12455	AB535/MAA227	4/24/85	1310	34	8.3	HSL/metals
GW-3D	12454	AB532/MAA226	4/24/85	1250	30	8.3	HSL/metals
GW-3S	12453	AB531/MAA225	4/24/85	1230	12	8.6	HSL/metals
GW-4S	12441	AB519	4/22/85	1450	10.5	10.3	VOA
GW-4D	12443	AB520	4/22/85	1655	10	13.3	VOA
GW-6	12444	-	4/22/85	1800	15	13.3	In-house
GW-7S	12439	AB525	4/22/85	1225	4.0	6.8	VOA
GW-7D	12440	AB526	4/22/85	1310	33	7.6	VOA
GW-9	12438	AB527	4/22/85	1120	6.5	8.3	VOA
GW-10S	12442	-	4/22/85	1630	12.5	12.3	In-house
GW-10D	12445	-	4/22/85	1830	18	13.5	In-house
GW-10DB	12446	-	4/23/85	0905	27.5	13.1	In-house
GW-11S	12447	AB521	4/23/85	0945	3.4	12.6	VOA
GW-11D	12450	AB522	4/23/85	1305	11	13.5	VOA
GW-12S	12448	AB523	4/23/85	1040	4.7	-	VOA
GW-12D	12449	AB524	4/23/85	1150	11.4	-	VOA
GO-1S	12456	AB528/MAA228	4/24/85	1810	6.0	8.2	HSL/metals
GO-1D	12457	AB529/MAA229	4/24/85	1830	12.0	8.3	HSL/metals
GO-1DB	12458	AB530/MAA230	4/24/85	1900	26.0	9.1	HSL/metals

TABLE 3-3
NUS/FIT APRIL 1985 SAMPLING ROUND COLLECTION SUMMARY
PAGE THREE

Sample Location	Sample Number	Traffic Report No.	Date Sampled	Time Sampled (hrs)	Total Vol. Purged (gal)	Sample pH	Analysis
BW-1	12417	AB374	4/18/85	0934	33.5	-	VOA
BSW-1	12428	AB393	4/18/85	1223	25	-	HSL
BW-2	12425	AB380	4/18/85	1029	37.5	-	VOA
BSW-2	12424	AB379	4/18/85	1011	14.5	-	VOA
BW-3	12413	AB372	4/17/85	1148	27	-	VOA
BW-4	12423	AB378	4/18/85	1005	35	-	VOA
BW-5	12426	AB391	4/18/85	1149	28	-	HSL
BSW-6	12419	AB375	4/18/85	0942	17.5	-	VOA
BSW-6 (dup)	12420	AB376	4/1/885	0942	17.5	-	VOA
BSSW-6	12418	AB392	4/18/85	0925	10.5	-	HSL
BW-7	12422	AB377	4/18/85	1040	10	-	VOA
BSW-7	12421	AB390	4/18/85	1020	30	-	HSL
OW-7	12489	AB492	4/24/85	0900	80	-	VOA/SAS
OW-8	12490	AB493	4/24/85	1000	500	-	VOA/SAS
OW-19	12207	AB400	4/23/85	1515	500	-	VOA/SAS
OW-19A	12206	AB399	4/23/85	1345	130	-	VOA/SAS
OW-20	12397	AB397	4/23/85	1130	320	-	VOA/SAS
OW-20A	12205	AB398	4/23/85	1214	110	-	VOA/SAS
SW-01	12361	AB323	4/08/85	1330	-	-	VOA
SW-02	12362	AB324	4/08/85	1338	-	-	VOA
SW-02 (dup)	12363	AB325	4/08/85	1340	-	-	VOA
SW-03	12482	AB514	4/24/85	1038	-	-	VOA
Sw-03 (dup)	12483	AB515	4/24/85	1038	-	-	VOA
SW-04	12484	AB540/MAA223	4/24/85	1118	-	-	HSL/metals
SW-05	12485	AB516	4/24/85	1209	-	-	VOA
SW-06	12486	AB541/MAA224	4/24/85	1222	-	-	HSL/metals
Test Well 4C	12491	AB501	4/24/85	1100	30	-	VOA
Test Well 2C	12492	AB502	4/24/85	1215	50	-	VOA
Blank	12382	AB343	-	-	-	-	VOA
Blank	12383	AB344	-	-	-	-	VOA
Blank	12391	AB352	-	-	-	-	VOA
Blank	12403	AB366	-	-	-	-	VOA
Blank	12414	AB373	-	-	-	-	VOA
Blank	12415	AB394	-	-	-	-	HSL
Blank	12434	AB506	-	-	-	-	VOA
Blank	12435	-	-	-	-	-	SAS
Blank	12436	AB537/MAA217	-	-	-	-	HSL/metals
Blank	12209	AB518	-	-	-	-	VOA
Blank	12356	AB318/MAA211	-	-	-	-	HSL/metals

TABLE 3-3
NUS/FIT APRIL 1985 SAMPLING ROUND COLLECTION SUMMARY
PAGE FOUR

Summary	Volatiles	HSL	HSL + Metals	SAS
Monitoring Well Location	72	10	14	13
Surface Water Locations	4	-	2	-
Duplicates: Groundwater	5	1	2	1
Surface water	2	-	-	-
Blanks	7	1	2	1
Total	90	12	20	15

LEGEND:

- - no data for that category
- HSL - Hazardous Substance List organics which includes volatiles, base/neutral and acid extractables, pesticides, and PCBs.
- VOA - Hazardous Substance List volatile organics
- SAS - Federal & State Drinking Water Quality Standards
- In-house - NUS/FIT volatile organic screening analysis
- Metals - Hazardous Substance List inorganic constituents

Groundwater sample collection locations are designated by well number.

Surface water sample collection locations are designated by SW prefix.

TABLE 3-4
NUS/FIT MAY 1985 SAMPLING ROUND COLLECTION SUMMARY

Sample Location	Sample Number	Traffic Report No.	Date Sampled	Time Sampled (hrs)	Total Vol. Purged (gal)	Sample pH	Analysis
S-5	12765	AB822	5/21/85	0855	26.2	-	VOA
S-6	12766	AB821	5/21/85	0911	40.0	4.8	VOA
S-6 (dup)	12767	AB820	5/21/85	0911	40.0	4.8	VOA
S-21	12806	AB916	5/30/85	0850	6.5	-	VOA
S-22	12805	AB915	5/30/85	0818	6.0	-	VOA
S-44	12802	AB913	5/29/85	1350	-	-	VOA
S63D	12774	AB813	5/21/85	1131	11.0	5.7	VOA
S63S	12775	AB812	5/21/85	1145	4.0	4.9	VOA
S64D	12736	AB709/MAA412	5/14/85	0939	25.0	-	HSL/metals
S64M	12735	AB708/MAA411	5/14/85	0950	15.0	-	HSL/metals
S64M (dup)	12737	AB710/MAA413	5/14/85	1000	15.0	-	HSL/metals
S64S	12734	AB707/MAA410	5/14/85	1020	6.0	-	HSL/metals
S65D	12750	AB727	5/16/85	0920	18.0	-	VOA
S65M	12749	AB726	5/16/85	0935	8.0	-	VOA
S65M (dup)	12751	AB728	5/16/85	0935	8.0	-	VOA
S65S	12748	AB725	5/16/85	0911	2.0	-	VOA
S66D	12781	AB806	5/22/85	1037	8.25	5.9	VOA
S67D	12780	AB807	5/22/85	1055	26.4	6.6	VOA
S67M	12778	AB809	5/22/85	0826	12.5	7.0	VOA
S67S	12779	AB808	5/22/85	0957	dry at 4.0	5.9	VOA
S68D	12754	AB731	5/16/85	1100	51.0	6.8	VOA
S68D (dup)	12755	AB732	5/16/85	1105	51.0	6.8	VOA
S68M	12753	AB730	5/16/85	1019	20.0	5.4	VOA
S70M	12759	AB828	5/21/85	1040	21.4	7.9	VOA
S70S	12758	AB829	5/21/85	1005	7.3	6.6	VOA
S71D	12761	AB826	5/21/85	1315	14.5	8.3	VOA
S71M	12760	AB827	5/21/85	1300	bailed dry	11.2	VOA
S72D	12776	AB811	5/21/85	1514	60.0	-	VOA
S72D (dup)	12777	AB810	5/21/85	1514	60.0	-	VOA
S72M	12772	AB815	5/21/85	1046	40.5	-	VOA
S72S	12773	AB814	5/21/85	1055	21.6	-	VOA
S73D	12768	AB819	5/21/85	0940	25.4	-	VOA
S73S	12769	AB818	5/21/85	0953	12.7	-	VOA
S74D	12771	AB816	5/21/85	1010	dry at 8.0	5.6	VOA
S74M	12770	AB817	5/21/85	1021	29.0	-	VOA
S75D	12785	AB802	5/22/85	1450	38.5	6.1	VOA
S75M	12783	AB805	5/22/85	1139	30.0	5.3	VOA
S75M (dup)	12784	AB803	5/22/85	1139	30.0	5.3	VOA
S75S	12782	AB804	5/22/85	1120	15.4	5.5	VOA
S76D	12786	AB899	5/29/85	1310	20.0	-	VOA
S76M	12787	AB897	5/29/85	1255	60.0	-	VOA
S76M (dup)	12788	AB898	5/29/85	1255	60.0	-	VOA
S76S	12789	AB896	5/29/85	1245	3.0	-	VOA
S77D	12804	AB900	5/29/85	1600	70.0	-	VOA
S77M	12799	AB910	5/29/85	1106	40.0	6.4	VOA

TABLE 3-4
NUS/FIT MAY 1985 SAMPLING ROUND COLLECTION SUMMARY
PAGE TWO

Sample Location	Sample Number	Traffic Report No.	Date Sampled	Time Sampled (hrs)	Total Vol. Purged (gal)	Sample pH	Analysis
S77M (dup)	12800	AB911	5/29/85	1106	40.0	6.4	VOA
S77S	12798	AB909	5/29/85	1050	15.0	6.1	VOA
S77SS	12797	AB908	5/29/85	1040	10.0	5.9	VOA
S78D	12803	AB914	5/29/85	1536	35.0	7.9	VOA
S78S	12801	AB912	5/29/85	1240	10.9	5.6	VOA
S79D	12793	AB904	5/29/85	0940	61.0	7.5	VOA
S79M	12794	AB905	5/29/85	0926	50.0	5.9	VOA
S80M	12795	AB906	5/29/85	1019	30.0	5.8	VOA
S80S	12796	AB907	5/29/85	1002	34.0	5.4	VOA
S81D	12744	AB714/MAA402	5/14/85	1520	20.0	-	HSL/metals
S81M	12745	AB713/MAA401	5/14/85	1507	35.0	-	HSL/metals
S81S	12746	AB723	5/14/85	1605	8.0	-	VOA
S82	12730	AB715	5/14/85	0850	15.0	-	VOA
S82 (dup)	12731	AB716	5/14/85	0850	15.0	-	VOA
S83	12814	AB924	5/30/85	1205	35.0	-	VOA
S84D	12743	AB722	5/14/85	1422	35.0	-	VOA
S84M	12742	AB721	5/14/85	1410	20.0	-	VOA
S84S	12741	AB720	5/14/85	1400	10.0	-	VOA
S85M	12739	AB712/MAA415	5/14/85	1106	40.0	-	HSL/metals
S85S	12738	AB711/MAA414	5/14/85	1127	20.0	-	HSL/metals
S86M	12757	AB734	5/16/85	1324	dry at 15.0	-	VOA
S86S	12752	AB729	5/16/85	0958	15.0	5.4	VOA
GO-1S	12727	AB703/MAA406	5/15/85	1045	6.0	5.7	HSL/metals
GO-1D	12729	AB705/MAA408	5/15/85	1150	11.0	5.9	HSL/metals
GO-1DB	12728	AB704/MAA407	5/15/85	1130	25.0	5.9	HSL/metals
GW-3S	12724	AB396/MAA403	5/1/585	0825	12.0	6.2	HSL/metals
GW-3D	12725	AB701/MAA404	5/15/85	0910	30.0	7.2	HSL/metals
GW-3DB	12726	AB702/MAA405	5/15/85	0945	32.5	7.1	HSL/metals
Test Well 2A	12756	AB733	5/16/85	1330	45.0	-	VOA
Test Well 2C	12740	AB719	5/14/85	1330	42.0	-	VOA
Test Well 4B	12747	AB724	5/16/85	0819	32.5	4.9	VOA
SW-01	12807	AB917	5/30/85	0906	-	-	VOA
SW-02	12808	AB918	5/30/85	0923	-	-	VOA
SW-03	12809	AB919	5/30/85	0940	-	-	VOA
SW-03 (dup)	12810	AB920	5/30/85	0940	-	-	VOA
SW-04	12811	AB921	5/30/85	1005	-	-	VOA
SW-05	12812	AB922	5/30/85	1020	-	-	VOA
SW-06	12813	AB923	5/30/85	1034	-	-	VOA
Blank	12790	AB901	-	-	-	-	VOA
Blank	12791	AB902	-	-	-	-	VOA
Blank	12792	AB903	-	-	-	-	VOA
Blank	12762	AB825	-	-	-	-	VOA
Blank	12763	AB824	-	-	-	-	VOA
Blank	12764	AB823	-	-	-	-	VOA
Blank	12723	AB706/MAA409	-	-	-	-	HSL/metals
Blank	12732	AB717	-	-	-	-	VOA
Blank	12733	AB718	-	-	-	-	VOA

TABLE 3-4
NUS/FIT MAY 1985 SAMPLING ROUND COLLECTION SUMMARY
PAGE THREE

Summary	Volatiles	HSL + Metals
Monitoring Well Locations	54	13
Surface Water Locations	6	-
Duplicates: Groundwater	8	1
Surface Water	1	-
Blanks	8	1
Total	77	15

LEGEND

- - no data for that category

HSL - Hazardous Substance List organics which includes volatiles, base/neutral and acid extractables, pesticides, and PCBs.

VOA - Hazardous Substance List volatile organics

Metals - Hazardous Substance List inorganic constituents.

Groundwater sample collection locations are designated by well number.

Surface water sample collection locations are designated with an SW prefix.

TABLE 3-5
NUS/FIT JUNE 1985 SAMPLING ROUND COLLECTION SUMMARY

Sample Location	Sample Number	Traffic Report No.	Date Sampled	Time Sampled (hrs)	Total Vol. Purged (gal)	Sample pH	Analysis
S-4	13273	AC233	6/19/85	1030	35	-	VOA
S-5	13254	AC228	6/17/85	1410	44	6.0	VOA
S-6	13246	AB957	6/12/85	1425	35	6.4	VOA
S-10	13257	AC231	6/17/85	1310	13.5	7.2	VOA
S-11	13256	AC230	6/18/85	1500	33	-	VOA
S-44	13258	AC232	6/17/85	1335	-	-	VOA
S63D	13239	AB950	6/12/85	0900	10	-	VOA
S63S	13238	AB949	6/12/85	0845	4	5.7	VOA
S64D	13207	AC462/MAA663	6/28/85	1000	27.5	-	HSL/metals
S64M	13294	AC430/MAA644	6/25/85	1000	11.8	7.4	VOA/SAS
S64M (dup)	13296	AC434	6/25/85	1000	11.8	7.4	VOA
S64S	13184	AC425/MAA643	6/25/85	1030	7.1	6.6	VOA/SAS
S64S (dup)	13186	AC440	6/25/85	1030	7.1	6.6	VOA
S65D	13226	AB937	6/10/85	1310	16.5	7.4	VOA
S65M	13232	AB943	6/11/85	1315	7	6.8	VOA
S65S	13233	AB944	6/11/85	1245	1	6.4	VOA
S66D	13234	AB945	6/11/85	1245	8.6	7.2	VOA
S67D	13235	AB946	6/11/85	1515	26	7.3	VOA
S67M	13237	AB948	6/11/85	1530	12.5	7.0	VOA
S67S	13236	AB947	6/11/85	1445	6.5	6.8	VOA
S68M	13187	AC452/MAA654 MAA635	6/26/85	0900	46	7.5	HSL/metals/SAS
S68S	13188	AC453/MAA655 MAA636	6/26/85	0930	19	8.6	HSL/metals/SAS
S70M	13290	AC438	6/24/85	1630	23	8.2	VOA
S70S	13291	AC439	6/24/85	1630	8	6.8	VOA
S71D	13289	AC445/MAA647	6/24/85	1415	15	7.5	HSL/metals
S71M	13292	AC436	6/24/85	1510	1.5	11.1	VOA
S72D	13185	AC424	6/25/85	1445	64.5	7.2	VOA
S72M	13299	AC427/MAA645	6/25/85	1215	43	5.9	VOA/SAS
S72S	13298	AC431/MAA646	6/25/85	1220	21	6.1	VOA/SAS
S73D	13230	AB941	6/11/85	1045	25	6.1	VOA
S73S	13229	AB940	6/11/85	1030	15	5.6	VOA
S75D	13231	AB942	6/11/85	1040	38.3	7.3	VOA
S75M	13228	AB939	6/11/85	0920	30	6.2	VOA
S75S	13227	AB938	6/11/85	0900,	15	6.3	VOA
S75S	13206	AC460/MAA662	6/27/85	1435	18	6.4	HSL/metals
S76D	13192	AC433/MAA639	6/26/85	1220	42	8.5	VOA/SAS
S76M	13191	AC442/MAA638	6/26/85	1215	52	6.8	VOA/SAS
S76S	13193	AC426/MAA637	6/26/85	1200	25	6.4	VOA/SAS
S77D	13288	AC429	6/25/85	0830	59	7.8	VOA
S77M	13255	AC229	6/18/85	1435	32.5	6.8	VOA
S77S	13204	AC458/MAA660	6/27/85	1400	15	6.7	HSL/metals
S77SS	13205	AC459/MAA661	6/27/85	1420	9	6.6	HSL/metals
S78D	13202	AC437	6/27/85	1120	34	6.4	VOA

TABLE 3-5
NUS/FIT JUNE 1985 SAMPLING ROUND COLLECTION SUMMARY
PAGE TWO

Sample Location	Sample Number	Traffic Report No.	Date Sampled	Time Sampled (hrs)	Total Vol. Purged (gal)	Sample pH	Analysis
S78S	13203	AC457/MAA659 MAA630	6/27/85	1100	12	-	HSL/metals/SAS
S81D	13190	AC461/MAA664	6/28/85	0845	35	-	HSL/metals
S81M	13297	AC447/MAA649 MAA640	6/25/85	0945	19.5	10.6	HSL/metals*/SAS
S81S	13194	AC449/MAA652 MAA631	6/26/85	1130	7.2	6.8	HSL/metals*/SAS
S82	13245	AB956	6/12/85	1055	12	7.3	VOA
S83	13222	AB933	6/10/85	1045	33	6.6	VOA
S83 (dup)	13223	AB934	6/10/85	1045	33	6.6	VOA
S84D	13182	AC443/MAA633	6/26/85	1210	34	6.4	VOA/SAS
S84M	13196	AC432/MAA627	6/27/85	0820	21	-	VOA/SAS
S84S	13197	AC435/MAA628	6/27/85	0830	9	-	VOA/SAS
S85M	13219	AB930	6/10/85	1010	32.5	6.6	VOA
S85M (dup)	13221	AB932	6/10/85	1010	32.5	6.6	VOA
S85S	13217	AB929	6/10/85	1000	12.5	5.6	VOA
S-86M	13225	AB936	6/10/85	1355	22.5	11.0	VOA
S-86S	13224	AB935	6/10/85	1330	12.5	6.7	VOA
S-81M (dup)	13287	AC448/MAA650 MAA641	6/25/85	0945	19.5	10.6	HSL/metals/SAS
S-81S (dup)	13195	AC450/MAA653 MAA632	6/26/85	1130	7.2	6.8	HSL/metals/SAS
S-85S (dup)	13220	AB931	6/10/85	1000	12.5	5.6	VOA
GW-3DB	13269	AC245	6/19/85	1025	33.5	7.4	VOA
GW-3D	13267	AC243	6/19/85	1005	32	6.8	VOA
GW-3S	13265	AC241	6/19/85	0955	12.2	6.4	VOA
GW-4S	13259	AC235	6/19/85	0805	10.8	6.6	VOA
GW-4D	13260	AC236	6/19/85	0825	2.5	7.2	VOA
GW-11S	13261	AC237	6/19/85	0840	3	7.0	VOA
GW-11D	13262	AC238	6/19/85	0900	3	7.0	VOA
GW-12S	13263	AC239	6/19/85	0925	5	6.6	VOA
GW-12D	12264	AC240	6/19/85	0935	11	6.4	VOA
GO-1S	13271	AC247	6/19/85	1130	0.08	6.9	VOA
GO-1DB	13272	AC248	6/19/85	1135	25	7.6	VOA
BW-1	13201	AC441/MAA629	6/27/85	1115	33	-	VOA/SAS
BSW-1	13251	AC225	6/1/785	0850	28	7.1	VOA
BW-2	13249	AC223	6/17/85	1015	32.5	6.0	VOA
BSW-2	13248	AC222	6/17/85	0930	14	5.5	VOA
BW-3	13200	AC456/MAA658	6/27/85	1345	36	6.8	HSL/metals
BW-4	13250	AC224	6/17/85	1115	13	6.3	VOA
BW-5	13253	AC227	6/17/85	1030	30	7.2	VOA
BSW-6	13247	AC221	6/17/85	1250	17.5	6.3	VOA
BSSW-6	13252	AC226	6/17/85	0930	11	7.1	VOA
BW-7	13199	AC455/MAA657	6/27/85	1030	39	6.2	HSL/metals
BSW-7	13198	AC454/MAA656	6/27/85	1015	12	6.2	HSL/metals

TABLE 3-5
NUS/FIT JUNE 1985 SAMPLING ROUND COLLECTION SUMMARY
PAGE THREE

Sample Location	Sample Number	Traffic Report No.	Date Sampled	Time Sampled (hrs)	Total Vol. Purged (gal)	Sample pH	Analysis
SW-01	13274	AC234	6/19/85	0925	-	-	VOA
SW-02	13275	AC249	6/19/85	0855	-	-	VOA
SW-03	13276	AC250	6/19/85	1100	-	-	VOA
SW-04	13277	AC251	6/19/85	0910	-	-	VOA
SW-05	13279	AC253	6/19/85	1045	-	-	VOA
SW-06	13280	AC254	6/19/85	0835	-	-	VOA
TW 2C	13241	AB952	6/12/85	1055	20	6.3	VOA
TW 4B	13240	AB951	6/12/85	1010	33	6.1	VOA
SW-04 (dup)	13278	AC252	6/19/85	0910	-	-	VOA
GW-3DB (dup)	13270	AC246	6/19/85	1025	33.5	7.4	VOA
GW-3D (dup)	13268	AC244	6/19/85	1005	32	6.8	VOA
GW-3S (dup)	13266	AC242	6/19/85	0955	12.2	6.4	VOA
Blank	13242	AB953	-	-	-	-	VOA
Blank	13243	AB954	-	-	-	-	VOA
Blank	13244	AB955	-	-	-	-	VOA
Blank	13281	AC255	-	-	-	-	VOA
Blank	13282	AC256	-	-	-	-	VOA
Blank	13283	AC257	-	-	-	-	VOA
Blank	13284	AC451	-	-	-	-	VOA
Blank	13293	AC444	-	-	-	-	VOA
Blank	13293	AC428	-	-	-	-	VOA
Blank	13295	AC451/MAA651	-	-	-	-	HSL/metals/SAS
Blank	13295	AC446/MAA648	-	-	-	-	HSL/metals/SAS

Summary	Volatiles	HSL + Metals	SAS
Monitoring Well Locations	64	14	16
Surface Water Locations	6	-	-
Duplicates: Groundwater	8	2	2
Surface Water	1	-	-
Blanks	9	2	2
Total	88	18	20

LEGEND:

- - no data for that category
HSL - Hazardous Substance List organics which includes volatiles, base/neutral and acid extractables, pesticides, and PCBs.
VOA - Hazardous Substance List volatile organics
SAS - Federal & State Drinking Water Standards
* - Inorganic results were identified as unusable because samples were not filtered.
Metals - Hazardous Substance List inorganic constituents

TABLE 3-6
SUMMARY OF CONTRACT LABORATORY
ANALYSIS AND SHIPMENT
NUS/FIT APRIL, MAY AND JUNE 1985 SAMPLING ROUNDS

Month	Week	CLP Case No.	Number of Samples	Type of Analysis	Laboratory	Traffic Report Numbers
April	1	4158	5	HSL	ERCO	AB 318-322
			30	Volatiles	Aquatech	AB 323-352
			5	Inorganics	CAA	MAA 211-215
	2	4179	33	Volatiles	Aquatech	AB 379-400, 492-493, 501-527
			15	HSL	GCA	AB 528-542
			15	Inorganics	RMAL	MAA 216-230
			15	DWS	RMAL	not applicable
			15	DWS	Versar	not applicable
	3	4193	27	Volatiles	Compuchem	AB 353, 358-383
			12	HSL	GCA	AB 384-395
May	1	4344	15	HSL	CAA	AB 396, 701-714
			20	Volatiles	Aquatech	AB 715-734
			15	Inorganics	Spectrix	MAA 401-415
	2	4395	28	Volatiles	Aquatech	AB 802-829
	3	4433	29	Volatiles	Compuchem	AB 896-924
June	1	4514	29	Volatiles	Compuchem	AB 929-957
	2	4536	38	Volatiles	GCA	AC 221-258
	3	4574	21	Volatiles	Envir	AC 424-444
			18	HSL	GCA	AC 445-462
			18	Inorganics	US Test	MAA 647-650, 652-664
			20	DWS	RMAL	MAA 627-646, 651
			20	DWS	LES	not applicable

HSL - Hazardous Substance List volatile organic and extractable organic compounds
DWS - Drinking Water Standards (State and Federal)
CLP - Contract Laboratory Program
Volatiles - Hazardous Substance List volatile organic compounds
Inorganics - Hazardous Substance List inorganic constituents

TABLE 3-7
FEDERAL AND STATE DRINKING WATER QUALITY STANDARDS

NATIONAL INTERIUM PRIMARY DRINKING WATER REGULATIONS MAXIMUM CONTAMINANT LEVELS (MCLS)

Parameter

I. Inorganics

Primary Standards (1)	Maximum Contaminant Levels for Inorganic Chemicals (mg/l)
Arsenic	0.05
Barium	1
Cadmium	0.010
Chromium	0.05
Lead	0.05
Mercury	0.002
Nitrate as N	10.
Selenium	0.01
Silver	0.05
Fluoride	1.4 - 2.4 (2)

II. Organic

a)

Contaminant	Level (mg/l)
Endrin	0.0002
Lindane	0.0004
Methoxychlor	0.1
Toxaphene	0.005
2,4-D	0.1
2,4,5-TP Silvex	0.01

b) Total Trihalomethanes (TTHM)
TTHM = sum of the organohalogen compounds
MCL = 0.10 mg/l

TABLE 3-7
FEDERAL AND STATE DRINKING WATER QUALITY STANDARDS
PAGE TWO

NATIONAL DRINKING WATER REGULATIONS
SECONDARY MAXIMUM CONTAMINANT LEVELS (SMCLS)

Secondary Standards[3]	Recommended Maximum Contaminant Levels (mg/l)
Chloride	250
Color	15 color units
Copper	1.0
Corrosivity[4][6]	non-corrosive
Iron	0.3
Manganese	0.05
Odor	3 threshold odor number
pH	6.5-8.5 s.u.
Sulfate	250
Zinc	5.0
Total Dissolved Solids	500
Foaming agents[6]	0.5

OTHER:

Sodium	20 advisory level

Massachusetts Requirements

- Demand, such as COD, BOD[6], TOC[6], chlorine residual[6].
- Pesticides, Herbicides, and other Organics, such as hydrocarbons, carbamates[6] and organo-phosphorus compounds.
- Microbiological Analyses.

  Total Coliform by the Membrane Filter Method.

  Fecal Coliform by the Membrane Filter Mthod.

  Total Coliform by the Fermentation Tube Method.

  Fecal Coliform by the Fermentation Tube Method.

  Standard Plate Count.

TABLE 3-7
FEDERAL AND STATE DRINKING WATER QUALITY STANDARDS
PAGE THREE

Maximum contaminant levels varies with the analytical technique. Number of samples taken is a function of population size.

a) Membrane filter technique
The coliform bacteria count shall not exceed:

1) 1/100 ml as the arithmetic mean of all samples examined per month; or

2) 4/100 ml in more than one sample when 20 are examined per month; or

3) 4/100 ml in more than 5% of samples when 20 or more are examined per month.

b) Fermentation tube method and 10 ml standard portions. The coliform bacteria count shall not exceed:

1) more than 10% of the portions in any month;

2) three or more portions in more than one sample when less than 20 samples are examined per month; or

3) three or more portions in more than 5% of the samples when 20 or more samples are examined per month.

c) Fermentation tube method and 100 ml standard portions. The coliform bacteria count shall not exceed:

1) more than 60% of the portions in any month.

2) 5 portions in more than one sample when less than 5 samples are examined per month; or

3) 5 portions in more than 20% of the samples when 5 or more samples are examined per month.

TABLE 3-7
FEDERAL AND STATE DRINKING WATER QUALITY STANDARDS
PAGE FOUR

- Additional Requirements

  Chloroform -Trihalomethane formation potential(6)

  Temperature

NOTES

1) 40 CFR Part 141 (Federal Register, Vol. 40, No. 248, December 24, 1975)

2) Maximum allowable concentration depends on annual average of maximum daily air temperature at site of supply.

3) 40 CFR Part 143 (Federal Register, Vol 44, No. 140, July 19, 1979).

4) Requires Calcium Hardness Alkalinity, TDS.

5) cuurently being constructed.

6) Analysis not performed due to unavailability of laboratories to perform test or inappropriateness of test as determined by EPA.

Selected monitoring wells were measured biweekly. The water level data from the selected monitoring wells served to establish a data base for US Geological Survey (USGS) groundwater modeling and aquifer test and will not be presented in this report.

Water level measurements were taken using a chalked tape water level indicator which was checked for accuracy against a standard steel measuring tape prior to its use in the field. A reference mark was placed on the PVC monitoring well riser as a continuing measuring reference point. The plunker and first six inches (or wetted portion) of measuring tape were decontaminated before use and between wells.

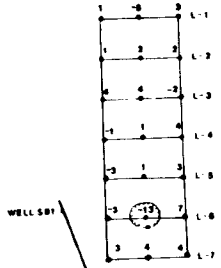
3.8 Magnetometry Survey

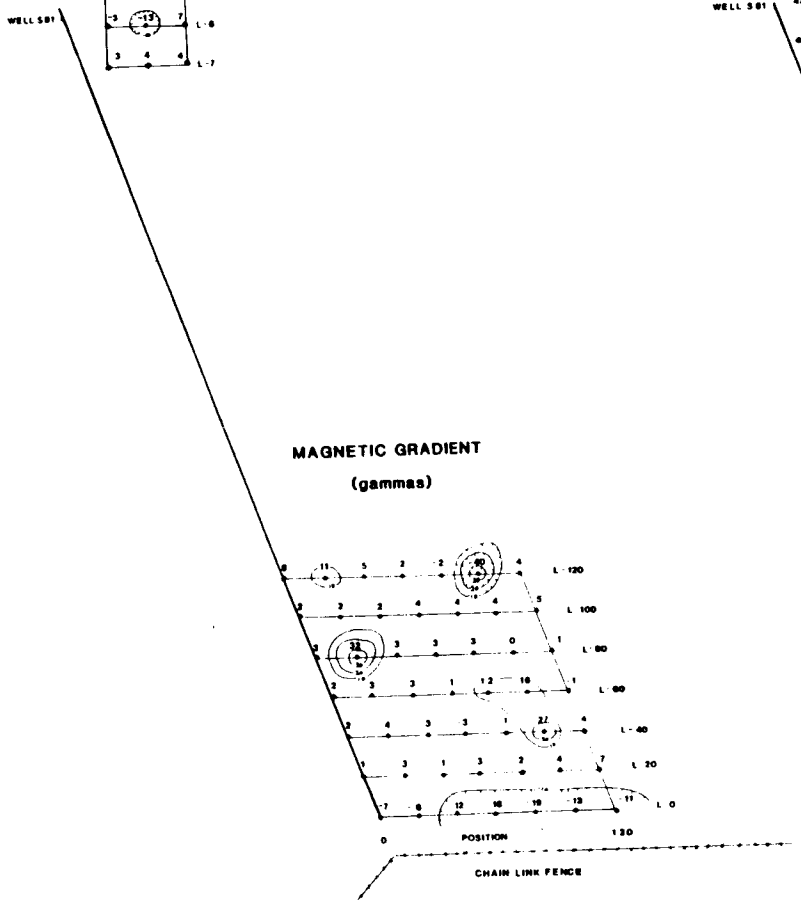
A potential disposal area based on a history of ground surface disturbance (excavation/re-working) exists in an area approximately 300' x 300' located to the south of Olympia Avenue and west of Dewey Street. A magnetometry survey was selected as an appropriate geophysical method for delineating buried metallic or ferrous objects in this area.

The magnetometer field survey was conducted by NUS/FIT staff using an EDA Instruments model PPM-500 proton precession magnetometer as a field magnetometer, and an EDA Instruments PPM-400 proton precession magnetometer as a magnetic base station. The area was tape surveyed to establish a twenty foot grid spacing. Figure 3-4 includes a map of the magnetometry survey area, as well as the total field and vertical gradient measurements. No significant anomalies were detected.

3.9 Aquifer Test

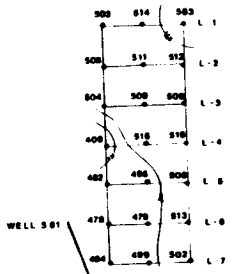
An initial draft screening of remedial strategies for Wells G & H has determined that one likely remedial option would be groundwater treatment (well head

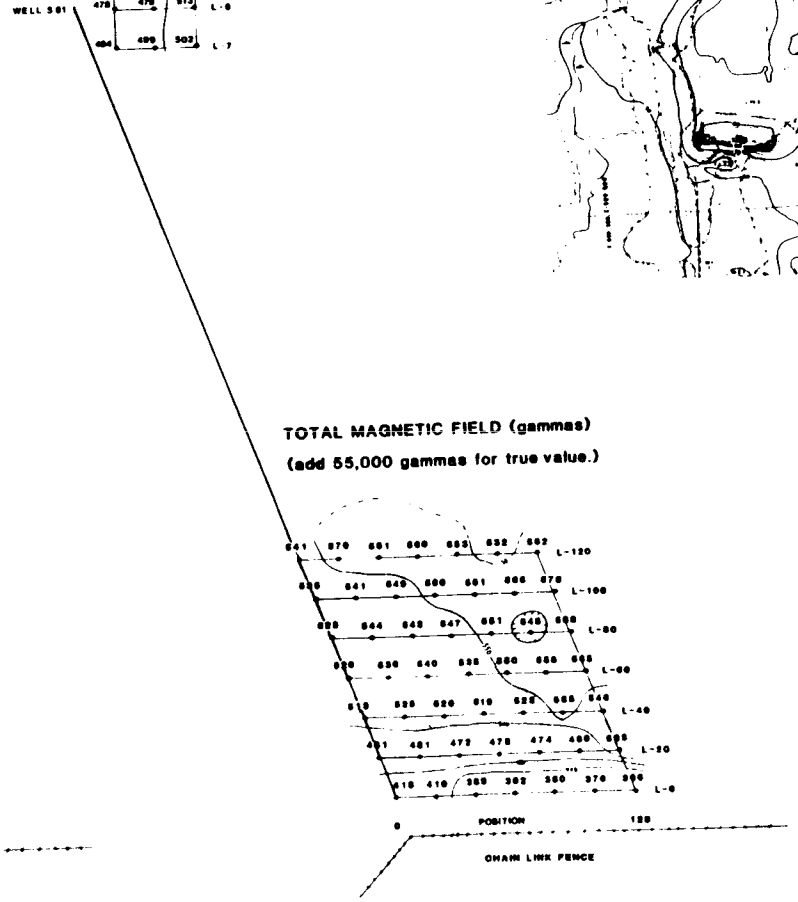




MAGNETIC GRADIENT

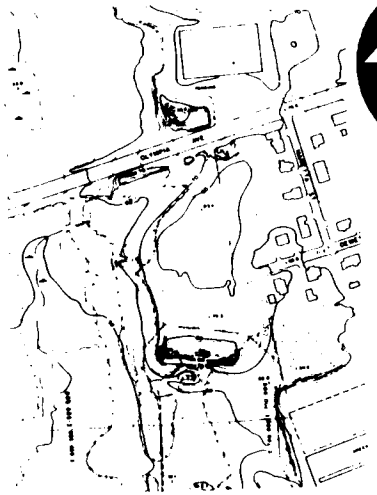
(gammas)





TOTAL MAGNETIC FIELD (gammas)

(add 55,000 gammas for true value.)



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MAGNETOMETER SURVEY
DATA CONTOURS
WELLS G&H SITE
WOBURN, MA

SPRING 1985

FIGURE 3-4

treatment) and discharge. This option requires extensive data concerning aquifer characteristics such as concentration and spatial distribution for each contaminant of concern, as well as the physical and hydraulic properties of the aquifer. To address these data requirements, EPA opted for an extensive aquifer test beyond the original scope of this study.

EPA contracted the USGS to design an aquifer test that would provide data on the area of influence and zone of contribution of Wells G & H. Specifically, the test would demonstrate/determine:

- aquifer hydraulic conductivity
- aquifer specific yield
- the Wells G & H area of diversion
- the hydraulic relationship between the Aberjona River and Wells G & H

In support of this aquifer test, NUS/FIT personnel installed ten streambed piezometers along the Aberjona River. These piezometers were intended to provide data to aid in assessing the relationship between Aberjona River on the aquifer from which Wells G & H draw.

The USGS is expected to release the findings of the aquifer test at a later date.