H2MGROUP

ADDENDUM TO JANUARY 1991 FIELD INVESTIGATION REPORT

FOR

HAZELTINE CORPORATION
GREENLAWN, NEW YORK

SEPTEMBER 16, 1992

H2MGROUP
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EXECUTIVE SUMMARY

In accordance with a Work Plan approved by the New York State Department of Environmental Conservation (NYSDEC), this supplemental field investigation (SFI) was conducted by Holzmacher, McLendon and Murrell, P.C. (H2M) from November 1991 to March 1992 for Hazeltine Corporation (HC) at their Premises (Premises) located in Greenlawn, New York. This addendum follows a Field Investigation (FI) report of January, 1991.

The objectives of this SFI of the Premises are as follows:

1. Evaluate, in accordance with Task 3 of the approved work plan, whether the shallowest groundwater underlying the Recharge Basin has suffered any adverse environmental effect as a result of discharges of process wastewater to the Basin in the past; and

2. Evaluate, in accordance with Task 3 of the approved work plan, whether the shallowest groundwater present in the vicinity of the former C-Tank, E-Tank and SPDES Outfall 001A area has suffered any adverse environmental effect caused by these former activities.

The soil and groundwater samples collected during the FI and this addendum have provided extensive data for the characterization of soil and groundwater quality underlying the Premises. The absence of elevated compounds in the soils or shallowest groundwater at the site indicates no impact from past discharges. Data have consistently indicated that the past discharge areas have not caused a contamination problem. In addition, the local geologic conditions indicate perched (as defined by Radian Corporation in 1991) groundwater beneath the Premises. This perched groundwater zone is noted to be underlain by silt and clay.

The foregoing therefore satisfies the objectives of this SFI with the conclusion that the shallowest groundwater underlying the Recharge Basin has not suffered any adverse environmental effect as a result of discharges of process wastewater to the basin in the past; and that the shallowest groundwater present in the vicinity of the former C-Tank, E-Tank, and SPDES Outfall 001A area has not suffered any adverse effect caused by these former activities.

A detailed presentation of the conclusions and recommendations is presented herein.

1.0 INTRODUCTION

This SFI was conducted at the Premises located in the Greenlawn section of the Town of Huntington, Suffolk County, New York (See Figure 1-1 For Location Map). The major operation at the Premises is the assembly of electronic systems and equipment.

Previous investigations have been conducted at the Premises to assess the potential for environmental impacts on soil and groundwater quality related to past State Pollutant Discharge Elimination System (SPDES) permitted wastewater discharges. Past studies include a Phase I Investigation performed under the direction of the New York State Department of Environmental Conservation (NYSDEC) in January of 1986 and a Field Investigation (FI) performed in 1990-1991 for HC in compliance with a NYSDEC Order on Consent (1989). Based upon the NYSDEC comments to the FI report (1991), a workplan for this SFI was prepared, approved, and executed. This SFI marks H.C.'s continued compliance with requests made by NYSDEC.

1.1 Objectives

The objectives of this SFI of the Premises are defined in Section 2.1 of the approved work plan and are as follows:

1. Evaluate, in accordance with Task 3 of the approved work plan, whether the shallowest groundwater underlying the Recharge Basin has suffered any adverse environmental effect as a result of discharges of process wastewater to the Basin in the past; and

2. Evaluate, in accordance with Task 3 of the approved work plan, whether the shallowest groundwater present in the vicinity of the former C-Tank,

E-Tank and SPDES Outfall 001A area has suffered any adverse environmental effect caused by these former activities.

This investigation was performed at the request of the NYSDEC.

1.2 Summary of Workplan Implementation

In order to accomplish the objectives stated above, the work proposed for this SFI consisted of the following four tasks:

1. Installation, with concurrent subsurface soil sampling and subsequent groundwater sampling, of one additional monitoring well (MW-4) in the vicinity of the Recharge Basin located east of Building 2 (Objective 1).

2. Resampling of groundwater in monitoring wells MW-1, MW-2 and MW-3X, or a replacement well as necessary (Objective 2).

3. Evaluation of results in accordance with Task 3 of the approved work plan.

4. Preparation of an Addendum to the field investigation report.

2.0 SUMMARY OF HYDROGEOLOGIC SETTING

2.1 Local Hydrogeology

During drilling of the wells for this SFI, the geology and hydrogeology was logged by a hydrogeologist at H2M. Well MW-3X was substituted by another well because it would not yield an acceptable sample. The new well will be referred to as MW-3XR throughout this Addendum. The sand layer at 75 feet in MW-3XR (located approximately 640 feet northwest of MW-2), was estimated to be 10 feet thick, grading into a sandy silt and clayey silt starting at about 85 feet, to a depth of about 120 feet. From 120 to 135 feet, a sandy silt interbedded with clay occurs, similar in appearance to the sediments observed immediately above the laminated clay layer in MW-2. Below 135 feet, the sediments become much coarser, and are characterized by repeating layers of silt, fine sand, gravel, and a medium, orange-colored sand. This latter sequence appeared to be continuous from 140 feet down to the completion depth of MW-3XR (see Appendix A for drilling logs).

Split spoon samples were collected in MW-4 beginning at 15 feet below grade. Continuous two foot cores were collected to a total depth of 45 feet. Each spoon was checked with an HNu photoionization detector (PID) and the soil lithology was determined. From 15 to 28 feet below grade in the boring of MW-4, the soils are classified as loose, coarse well graded sands and fine gravel with trace fine cobbles. From 28 to 83 feet, the sand sediments become smaller in particle size. These well sorted and poorly graded sands ranged from very fine in size to medium fine. Interbedded in these layers, little to some fine and medium gravel are present. Beginning at 85 feet, the fine to very fine sands began grading into a reddish sandy silt layer. This layer, however, appears only as a thin lense with a total thickness of 1.5 feet. From 87 feet to 106 feet, the tan brown, well graded, medium to fine sands were observed. Below 106 feet, a moist brownish clay with trace silt varves and some very fine

mica chips were observed (see Appendix A for drilling log). This relatively impermeable strata is also noted at MW-1 and MW-2, which would explain the perched water table conditions at these locations.

2.2 Groundwater

As requested by the approved work plan, an additional well (MW-4) was installed. MW-4 was located on the berm between the east and west sides of the recharge basin, as requested by the NYSDEC. As noted above, MW-3XR was drilled as a substitute well for MW-3X.

Two rounds of synoptic water level measurements from all wells on site were collected and recorded. All four (4) wells were surveyed for both horizontal and vertical control. Relative groundwater elevations were calculated by subtracting the depth to water from the elevation of the top of the well casing or measuring point (aka, reference elevation). One round of groundwater measurements were collected on January 10, 1992 and the second round on February 10, 1992 (see Table 2-1).

Wells MW-1, MW-2 and MW-4 intercept the shallowest groundwater at those locations beneath the Premises. Groundwater measurements taken in January 1992 and again in February 1992 indicated irregular groundwater level fluctuations. Accordingly, the groundwater flow direction and elevation of the perched groundwater zone could not be consistently mapped. Therefore, a contour map was not constructed.

In accordance with the approved work plan, we will present a discussion of the regional geology and hydrogeology in subsection 2.3, in order to evaluate the regional groundwater flow pertitnent to MW-3XR. The discussion makes reference to published literature and other

public documents that generally explain the hydraulic behavior of the regional aquifer system beneath the perched groundwater zone at the Premises.

2.3 Regional Hydrogeology

The lowermost aquifer on Long Island occurs nearly exclusively within the Lloyd sand member of the Raritan formation. The overlying Raritan clay acts as a thick and laterally extensive confining layer in most areas of the deep aquifer. The general direction of groundwater flow in the Lloyd aquifer is towards the north towards Long Island Sound (Lubke, 1964; Jensen and Soren, 1974). No public water supply wells in the Greenlawn area are screened in the Lloyd aquifer.

An intermediate aquifer identified as the Magothy aquifer exists on Long Island within most of the Pleistocene and Magothy (Late-Cretaceous) age deposits. The altitude of the top of the intermediate aquifer ranges from 60 to almost 200 feet below MSL. Water in the aquifer has been described as generally confined, with the confinement being more pronounced in the deeper parts of this aquifer (Lubke, 1964). Like the Lloyd aquifer, the direction of groundwater flow in the intermediate aquifer is north towards Long Island Sound.

Above the intermediate aquifer is the Upper Glacial aquifer, which occurs in the coarse sand and gravel of the upper Pleistocene deposits, and in some areas is hydraulically connected to the finer sand and gravel in the upper Magothy formation. The upper limit of the Upper Glacial aquifer defines the regional water table on Long Island. The lower limit of the aquifer varies, and is represented by discontinuous clay bodies in both the upper Pleistocene deposits and the Magothy formation. Hydraulic conductivity within the Upper Glacial aquifer may change markedly at the contact between the more permeable Pleistocene and the less permeable Magothy deposits (Lubke, 1964). In the general area of the Greenlawn Premises, the depth to water is estimated to be 175 feet below ground surface (55 feet above MSL).

Regional groundwater studies for northwestern Suffolk County (Lubke, 1964) have delineated isolated saturated zones overlying the regional aquifer system. These perched zones generally lie on layers of localized glacial till, or on interbedded clays in the Pleistocene deposits. Previously identified perched water bodies in northwestern Suffolk County (Lubke, 1964) appear to be located in relative proximity to the Harbor Hill end moraine. The perched water body beneath the Premises is not used as public water supply.

Direction of Groundwater Flow

As previously stated, due to the variation of perched water flow direction and elevation, the regional water table was used to assess groundwater flow. Groundwater flow direction, as extrapolated from the regional direction, is depicted on the SCDHS water table contour map. Flow was established to be northerly towards the Sound (see Figure 2-1 for Regional Groundwater Contour Map).

2.4 Public Water Supply

Currently, 9 of the 11 public water supply wells in the Greenlawn area are screened at depths corresponding to the Magothy aquifer. There are currently two public water supply wells in the Greenlawn area that are screened in the Upper Glacial water table aquifer. Data on Public Water Supply Wells located within a three mile radius of the facility are provided in Appendix B.

3.0 SOIL SAMPLING AND RESULTS

3.1 Soil Sampling Procedures and Analyses

Split spoon samples were collected during the drilling of monitoring well MW-4 (see Figure 3-1 for location) to identify the physical characteristics of the subsurface sediments; to identify lithologic variation; and to determine the nature and probable extent of subsurface soil contamination, if present.

Soil samples were obtained using the "Standard Method for Penetration Testing and Split-Barrel Sampling of Soils" (ASTM D1586-67). Split spoon samples were obtained at 5 foot intervals during the installation of MW-4. All of the split spoon soil samples were opened with minimal disturbance and screened with a 10.2 electron volt (eV) HNu photoionization detector (PID). The responses noted during the field screening of the monitoring well split spoon soil sampling are detailed in the lithologic log included in Appendix A. No HNu responses elevated above background conditions were noted.

During the drilling of MW-3XR, split spoon samples were collected starting at a depth of 75 feet below grade (156.6 feet MSL) to a total depth of the well. Continuous spoons were collected from 130 feet to 172 feet (101.6 to 59.6 feet MSL) and are described in the boring logs in Appendix A.

During the drilling of MW-4, soil samples were selected for laboratory analysis based on field observations according to the protocols set forth in the approved work plan. On this basis, four soil samples were selected for laboratory analysis with the concurrence of NYSDEC representative at the following subsurface depths intervals; 33-35, 55-57, 75-77 and 93-95 feet. The soil samples were submitted to H2M Labs, Inc. for analysis for Target

Compound List (TCL) volatile organic compounds (VOCs), TCL metals and cyanide according to Contract Laboratory Protocol (CLP).

3.2 Soil Sampling Results

Four soil samples were analyzed for TCL VOCs, TCL metals and cyanide. Table 3-1 presents summary of the laboratory results of soil sampling at MW-4 (33-35, 55-57, 75-77 and 93-95 feet). No volatile organic compounds or cyanide were detected (with the exception of chloroform which was detected in the method blank also at low levels) in any of the soil samples. Table 3-1 presents the results of inorganic compounds quantified in the soil samples (see Appendix C for laboratory results). Since the 1991 FI report was prepared, the NYSDEC has distributed Draft Soil Media Methodology Guidelines. When concentrations of inorganics detected in the soils were compared to the Draft Soil Media Methodology Guidelines prepared by Division of Hazardous Substances Regulations, June 7, 1991, the concentrations were below these NYSDEC guidelines.

4.0 WELL INSTALLATION, GROUNDWATER SAMPLING AND RESULTS

4.1 Well Installation

Two (2) monitoring wells were installed at the locations shown in Figure 3-1. Monitoring well MW-3XR was completed as 4-inch I.D., schedule 40 PVC riser with 15 feet, .010 inch slot PVC screen from 165 to 180 feet below grade (64 to 49 feet MSL). MW-4 was completed with 4-inch I.D., schedule 40 PVC riser with 20 feet, .010 inch slot PVC screen, from 86 to 106 feet below grade (146 to 126 feet MSL). A hollow stem auger rig, operated by Water Resources Inc. (a licensed monitoring well driller) was subcontracted by HC to install the monitoring wells.

The threaded joints of both wells were sealed using Teflon tape. The annular space around the well screens was filled with a No. 2 grade sand pack extending from 6-inches below the bottom of the screen to a height of 2 feet above the top of screen. A 2 foot bentonite seal was placed above the sand pack. The depth to the bottom and top of each seal was measured in the borehole to the nearest 0.1 foot using a clean weighted tape. The remaining annular space was grouted with a bentonite/cement slurry. A cement bentonite surface seal was constructed by filling the annular space of the borehole to approximately 3 feet below-grade and extended to grade where the well was completed as an above grade well. A 6-inch diameter protective steel casing was installed over each well and set into a neat cement collar. A locking device was attached to the cap.

Wells were developed by pumping until the well yielded a clean, sand and silt-free discharge. Specific conductivity and pH measurements were taken of the discharge until both parameters stabilized (within 10% of last reading) to confirm adequate development. Depth to groundwater measurements were made before and after well development in order to ensure

hydraulic connection to the aquifer. Field data pertaining to both the well construction and development was recorded in the field hydrogeologist's bound field notebook.

Following installation of the groundwater monitoring wells, a site elevation survey was performed. The elevation of the top of the riser pipe of the wells was surveyed to the nearest 0.01 foot as well as the ground elevation to the nearest 0.1 foot.

Depth to water measurements were taken two times at each of the new well locations; January 10 and February 10, 1992, just prior to the two rounds of groundwater sampling. These measurements were obtained using a field decontaminated Fisher M-Scope water sensitive probe. The depth to water was measured to the nearest 0.01 foot and referenced to the top of the well pipe. After use in each well, the measuring device was cleaned to prevent cross contamination between wells. The probe was cleaned with a phosphate-free detergent and rinsed with distilled water.

The elevation of the water table at each well location was calculated by subtracting the depth to water measurement from the surveyed elevations of the top of each riser pipe. The depth to water at MW-4 corresponded with the shallowest groundwater beneath MW-1 and MW-2 (see Table 2-1), while MW-3XR was completed to a depth of 185 feet, which indicates the regional water table..

4.2 Groundwater Sampling Procedures and Analyses

Two (2) rounds of groundwater samples were collected on January 10 and February 10, 1992, respectively. Monitoring wells MW-3XR and MW-4 were sampled during the January 10, 1992 sampling event. All four monitoring wells (MW-1, 2, 3XR & 4) were sampled during the second round (February 10, 1992). The sample from well MW-1 was split for duplicate analysis (denoted as MW-1X). This split sample was intended to confirm laboratory

precision. A minimum of one (1) week separated sampling from well construction and development during the first groundwater sampling round conducted on January 10, 1992. Dedicated, laboratory cleaned, polyethylene disposable bailers (with dedicated polypropylene cord) were used to procure groundwater samples for this investigation.

pH and specific conductivity were measured immediately after the sample bottles were filled at each well. The pH probe was calibrated with a No. 7 buffer solution. The specific conductivity probe was calibrated with an ionic solution that was closest in conductivity to that anticipated in the groundwater sample. A sample of the groundwater was placed in a clean glass beaker to measure field parameters. Specific conductivity and pH were then measured and recorded in a bound field notebook, along with other observations involved in sampling the well (i.e., color, turbidity, odor). See Appendix A for summary of sampling.

Prior to opening the well guard pipe, a 4 foot by 4 foot plastic sheet was slit in the center and lowered to the ground around the well. The well was then opened, and the depth to water was measured to the nearest 0.01 foot. The static well volume was calculated and multiplied by 3 to determine the minimum amount of water that was purged from the well prior to sampling.

A cleaned centrifugal pump, with dedicated decontaminated hose was utilized to purge each well of the required volume of water (3 to 5 times the static well volume). Groundwater samples were collected for analysis for TCL VOCs and TCL metals (filtered and unfiltered) and cyanide. H2M Labs, Inc. performed the analyses in accordance with CLP.

4.3 Groundwater Sampling Results

During the sampling conducted on January 10, 1992, groundwater samples were obtained and analyzed for TCL VOCs and TCL Metals (total and dissolved) at MW-3XR and MW-4. The second round of groundwater sampling was conducted at monitoring wells MW-

1, 2, 3XR and 4. Copies of the analytical data are included as a separate attachment to this Addendum (Appendix C).

For comparative purposes, the analytical data was reviewed with respect to established groundwater standards due to the lack of a background well (see Table 2-1 for water level measurements). The data were compared to 1) New York State (NYS) groundwater standards and guidance values for Class GA waters (6 NYCRR Parts 702 and 703), 2) NYS Department of Health Public Water Systems Maximum Contaminant Levels Regulations (10 NYCRR Part 5.1) and 3) NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values. A tabulation of compounds quantified during the two rounds of groundwater sampling are provided in Tables 4-1 through 4-4. During the January 10, 1992 sampling round, low concentrations of several TCL VOCs were quantified at the deeper well (MW-3XR) as summarized in Table 4-1. These compounds include: 1,1-Dichloroethene (17 μg/l); 1,1,1-Trichloroethane (28B μg/l); Trichloroethene (16 μ/l); and Tetrachloroethene (57 μ/l);. No volatile organic compounds were detected at MW-4.

Inorganic compounds detected in MW-3XR and MW-4 (January 10, 1992) are summarized in Table 4-2. These compounds generally included low concentrations of metals in the dissolved samples. Sodium was the only dissolved inorganic compound detected above the standard (in MW-3XR). The elevated concentration of the analyte may be due to the use of road salts used at the Premises in the winter.

Concentrations of total metals at both MW-3XR and MW-4 were detected at higher concentrations than the dissolved metals. This indicates that suspended solid content of the groundwater sample (turbidity) has affected the analytical results, resulting in an artificial

elevation of inorganic concentrations. This does not meaningfully represent groundwater quality of the aquifer because suspended solids do not naturally occur in an aquifer.

As summarized in Table 4-3 for the February 10, 1992 groundwater sampling event, the following compounds were quantified (estimates are denoted with a "J") at the respective concentration and location indicated in parentheses: 1,2-Dichloroethene (MW-1 at 2J μg/l and MW-1X at 1J μg/l); 1,1,1-Trichloroethane (at all of the wells in concentrations ranging from 1J to 10 μg/l); 1,1-Dichloroethene (MW-3XR at 6 μg/l); Trichloroethene (MW-3XR at 2J μg/l); and Tetrachloroethene (MW-3XR at 11 μg/l). It should be noted that the concentrations of VOCs at MW-3XR decreased from January 1992 to February 1992.

Inorganic compounds quantified (for February 1992) are summarized in Table 4-4. These results show low detected concentrations of dissolved metals. All of the dissolved inorganic compounds quantified were below the standards and guidelines established for those compounds with the exception of sodium at MW-1 (and MW-1X) and MW-3XR. While the total concentrations were generally higher than the dissolved concentrations of metals, the former are not representative of groundwater quality, as explained above.

5.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

5.1 Decontamination Procedures

Prior to (and between) drilling soil borings and wells, all augers, split spoons, drilling rods, and other drilling equipment were steam cleaned. All sampling devices and equipment placed into each borehole and well was decontaminated in accordance with the protocol outlined in the approved work plan.

5.2 QA/QC Methodology and Results

The QA/QC methodology and sampling protocols established for the soil and water quality analyses, as detailed in the QA/QC Plan of the Work Plan, were followed during sampling. This included the collection of trip blanks, field blanks and matrix spike/matrix spike duplicate (MS/MSD) samples at a predetermined ratio.

Two (2) QA/QC (one (1) field blank and one (1) trip blank) samples accompanied each of the groundwater sampling events. MS/MSD samples were collected at a frequency of 1 in 20 samples. The field blank vial(s) were filled during sampling by adding distilled/deionized water to one of the bailers and then filling the field blank vials from the bailer. The trip blank accompanied the analytical glassware back and forth from the laboratory and the field. The trip blank samples were analyzed for TCL VOCs only. The field blank sample was analyzed for the full suite of analytical parameters (same as samples). Copies of the analytical data are presented in Appendix C (under separate cover).

After all sample bottles were filled, they were appropriately labeled and put in ice-filled coolers for delivery to H2M Labs, Inc. for analysis. Completed chain-of-custody forms accompanied all samples, copies are included in Appendix C.

One (1) field blank and one (1) trip blank sample accompanied the monitoring well borehole soil sampling event. The field blank vials were filled by pouring distilled/deionized water over the field decontaminated split spoon samplers just prior use in collecting soil samples and filling the field blank vials. The trip blank sample accompanied the soil analytical glassware back and forth from the laboratory and the field. The trip blank sample was analyzed for TCL VOCs only. The field blank sample was analyzed for the full suite of parameters. Copies of analytical data are included in Appendix C (separate bound attachment).

The results of field and trip blank analyses (January 10, 1992) during soil sampling show no detected TCL VOCs (see Table 5-1 for summary). Inorganics were reported but these were also detected in the laboratory method blank. These analyses and detections do not affect the data for interpretation.

The results of field and trip blank analyses during groundwater sampling indicate low concentrations of acetone and 1,1,1-trichloroethane during the February 10, 1992 sampling round. Inorganics were reported but these were also detected in the laboratory method blank. These analyses and detections do not affect the data for interpretation.

An evaluation of the split samples (MW-1 and MW-1X) results indicate close agreement. This result confirms laboratory precision during analyses of the samples.

In summary, the data is usable for the objectives of this addendum.

6.0 CONCLUSIONS AND RECOMMENDATIONS

This SFI was conducted in order to:

1. Evaluate, in accordance with Task 3 of the approved work plan, whether the shallowest groundwater underlying the Recharge Basin has suffered any adverse environmental effect as a result of discharges of process wastewater to the Basin in the past; and

2. Evaluate, in accordance with Task 3 of the approved work plan, whether the shallowest groundwater present in the vicinity of the former C-Tank, E-Tank and SPDES Outfall 001A area has suffered any adverse environmental effect caused by these former activities.

6.1 Conclusions

During drilling of MW-4, soil samples were collected at 33-35, 55-57, 75-77 and 93-95 feet. Samples were retained and laboratory tested in accordance with CLP for TCL VOCs, TCL metals and cyanide. The results of the soil sampling analyses indicated non-detectable levels of any TCL VOCs and cyanide. Although metals were detected, quantification was below the Draft Soil Media Methodology Guidelines.

A total of two (2) rounds of groundwater monitoring were conducted for wells MW-3XR and MW-4. These rounds of sampling were conducted in January and February, 1992. During the February round of sampling, all four (4) groundwater monitoring wells were sampled and tested for TCL VOCs, TCL metals and cyanide.

Based upon the extensive soil sampling and groundwater sampling investigation, there is no evidence to suggest that the point source discharges (SPDES permitted discharges) have caused any groundwater contamination in the shallowest groundwaters beneath the Premises. This is supported by the preceding FI and this SFI which included by eleven (11) soil borings and four (4) groundwater monitoring wells, all placed in areas approved by NYSDEC and sampled at depths as approved by NYSDEC. Based on the FI and SFI, the groundwater beneath the Premises does not exhibit significant adverse environmental impacts.

6.2 Recommendations

Based upon the findings and conclusions of this Addendum, H2M recommends that monitoring wells MW-1, MW-2, MW3XR and MW-4 be abandoned in accordance with NYSDEC specifications and no further action be undertaken at the Greenlawn Premises.

7.0 DISCLAIMER

These findings are based upon a detailed sampling procedure that has been formulated and approved by NYSDEC in accordance with sound technical procedures both for sampling and for laboratory analysis (USEPA where appropriate). Conclusions from this data are limited to those areas focused on in the study and represent our best judgment using analytical techniques, current environmental regulations, and our past experience.

TABLES

TABLE 2-1

HAZELTINE CORPORATION

GREENLAWN, NEW YORK

GROUNDWATER ELEVATION DATA

MONITORING WELL	REFERENCE ELEVATION*	DEPTH TO WATER (1) 1/10/92	GROUNDWATER ELEVATION (2) 1/10/92	DEPTH TO WATER (1) 2/10/92	GROUNDWATER ELEVATION (2) 2/10/92
1	227.36	89.81	137.55	90.89	136.47
2	227.62	90.60	137.02	89.90	137.72
3XR	229.07	168.38	60.69	169.80	59.27
4	231.64	93.62	138.02	92.25	139.39

NOTES:

* Elevation in relative feet above mean sea level; top of PVC casing is marked measuring point.

(1) Depth to water below PVC measuring point (feet).

(2) Calculated groundwater elevation data, in feet from reference elevation datum.

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TABLE 3-1

HAZELTINE CORPORATION - GREENLAWN, NEW YORK

PARAMETERS QUANTIFIED IN BOREHOLE SOILS AT MONITORING WELL NO. 4

NOVEMBER 14, 1991

	DEPTH					
PARAMETER	33'-35'	55'-57'	75'-77'	93'-95' (1)	NYSDEC DRAFT (2) SOIL CLEANUP GUIDELINES	Typical Background *
TCL Metals						
Aluminum	531	818	822	1,430	NA	7000 - 100,000
Arsenic	0.91B	0.67B	ND	0.88B	80.0	3-12
Barium	2.9B	4.7B	5.4B	7.8B	4,000	15-600
Beryllium	ND	ND	ND	0.15B	0.16	0 - 1.75
Calcium	81.9B	111B	120B	343B	NA	130 - 35,000
Chromium	2.7	5.4	2.1	5.1	400	1.5 - 40
Cobalt	ND	ND	ND	1.7B	NA	2.5 - 6
Copper	3.0B	2.7B	2.7B	15.3	400	1 - 700
Iron	1,480	2,080	1,970	4,160	NA	100 - 100,000
Lead	0.59B	0.66B	0.55B	1.1B	250	30
Magnesium	157B	365B	282B	435B	NA	50 - 50,000
Manganese	25.7	39.2	38.9	109	20,000	5 - 5,000
Nickel	2.9B	ND	2.7B	5.4B	2,000	0.5 - 25
Potassium	130B	167B	177B	251B	NA	47.5 - 43,000
Sodium	31.7B	38.7B	59.3B	104B	NA	150 - 50,000
Thallium	0.80B	0.80B	0.76B	1.0B	6.0	-
Vanadium	1.6B	3.4B	2.7B	3.9B	600	2 - 270
Zinc	5.3	5.8	5.0	8.2	20,000	5 - 2,900

NOTES:

All concentrations in mg/kg

(1) MS/MSD sample submitted for this sample.

(2) Human Direct Ingestion Soil Concentrations derived from USEPA's Health Effects Assessment Tables (HEAST), 1990.

ND Not found above the detection limit of the analytical test method

-- No data available

"B" Analyte was found in blank as well as sample

* from LaMunyan C&D Site PSA Report

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TABLE 4-1

HAZELTINE CORPORATION

GREENLAWN, NEW YORK

VOLATILE ORGANICS QUANTIFIED IN GROUNDWATER

JANUARY 10, 1992

PARAMETER	MW-3XR	MW-4	6 NYCRR 702 & 703 NYSDEC STANDARD GA GROUNDWATER	10 NYCRR SUBPART 5.1 MCLs	NYSDEC(1) TOGS 1.1.1
TCL VOCs					
1,1-Dichloroethene	17	ND	5	5	0.07 (g)
1,1,1-Trichloroethane	28B	ND	5	5	0.6 (g)
Trichloroethene	16	ND	5	5	10 (s)
Tetrachloroethene	57	ND	5	5	0.7 (g)

NOTES:

All concentrations in μg/L

(1) NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values.

ND Not detected

(g) Guidance value

B Analyte was found in blank as well as sample

(s) Standard value

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TABLE 4-2

HAZELTINE CORPORATION - GREENLAWN, NEW YORK

TOTAL AND DISSOLVED CONCENTRATIONS OF INORGANIC COMPOUNDS QUANTIFIED IN GROUNDWATER

JANUARY 10, 1992

PARAMETER	MW-3XR		MW-4		6 NYCRR 702 & 703(2) NYSDEC STANDARD GA GROUNDWATER	10 NYCRR SUBPART 5.1 MCL	NYSDEC (1) TOGS 1.1.1
	TOTAL	DISSOLVED	TOTAL	DISSOLVED			
TCL Metals							
Aluminum	14,900	20.9B	16,100	53.9B	NA	NA	NA
Arsenic	3.0B	ND	3.2B	ND	25	50	25 (s)
Barium	68.1B	104B	132B	54.1B	1,000	1,000	1,000 (s)
Beryllium	1.4B	ND	1.0B	ND	NA	NA	3 (g)
Calcium	4,060B	3,450B	8,200	5,390	NA	NA	NA
Chromium	19.9	ND	33.1	ND	50	50	50 (s)
Cobalt	15.4B	ND	21.7B	ND	NA	NA	NA
Copper	26.6	2.6B	85.5	5.8B	200	1,000	1,000 (s)
Iron	24,500	45.1B	27,500	143	300*	300*	300 (s)
Lead	23.5	3.1B	20.5	1.3B	25	50	25 (s)
Magnesium	1,850B	1,070B	5,640	1,440B	NA	NA	35,000 (g)
Manganese	1,030	78.0	1,280	8.5B	300*	300*	300 (s)
Nickel	18.3B	ND	39.7B	ND	NA	NA	NA
Potassium	1,700B	854B	3,630B	1,470B	NA	NA	NA
Sodium	18,300	24,200	9,590	9,160	20,000	NA	NA
Thallium	1.2B	ND	ND	1.2B	NA	NA	4 (g)
Vanadium	31.9B	ND	33.9B	ND	NA	NA	NA
Zinc	150	60.0	130	50.0	300	5,000	5,000 (s)

NOTES:

All concentrations in µg/L

(1) NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values.

B Indicates analyte was detected in both the sample and the blank.

NA Not available

(s) Standard value

ND Not detected

(g) Guidance value

* Standard for iron and manganese is 500 µg/L

(2) Not including effluent standards

H2MGROUP

TABLE 4-3

HAZELTINE CORPORATION

GREENLAWN, NEW YORK

VOLATILE ORGANICS QUANTIFIED IN GROUNDWATER

FEBRUARY 10, 1992

PARAMETER	MW-1	MW-1X	MW-2	MW-3XR	MW-4	6 NYCRR 702 & 703 NYSDEC STANDARD GA GROUNDWATER	10 NYCRR SUBPART 5.1 MCL	NYSDEC (1) TOGS 1.1.1
TCL VOCs								
1,2-Dichloroethene (Total)	2J	1J	ND	ND	ND	10	10	50 (g)
1,1,1-Trichloroethane	2J	ND	2J	10	1J	5	5	0.6 (g)
1,1-Dichloroethene	ND	ND	ND	6	ND	5	5	0.07 (g)
Trichloroethene	ND	ND	ND	2J	ND	5	5	10 (s)
Tetrachloroethene	ND	ND	ND	11	ND	5	5	0.7 (g)
TIC (2)								
Substituted Halogenated Ethane	6J	ND	ND	ND	ND	-	-	-

NOTES:

All concentrations in µg/L

(1) NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values.
J Estimated value
ND Not detected
(g) Guidance value
(s) Standard value
(2) Tentatively identified compound
"-" Standards not available for TICs

TABLE 4-4

HAZELTINE CORPORATION - GREENLAWN, NEW YORK

TOTAL AND DISSOLVED CONCENTRATIONS OF INORGANIC COMPOUNDS QUANTIFIED IN GROUNDWATER

FEBRUARY 10, 1992

PARAMETER	MW-1		MW-1X		MW-2		MW-3XR		MW-4		6 NYCRR 702(2) & 703 NYSDEC STANDARDS FOR GROUNDWATER	10 NYCRR SUBPART 5.1 MCLs	NYSDEC(1) TOGS 1.1.1
	TOTAL	DISSOLVED	TOTAL	DISSOLVED	TOTAL	DISSOLVED	TOTAL	DISSOLVED	TOTAL	DISSOLVED			
TCL Metals													
Aluminum	634	70B	565	78.3B	182B	43B	32,500	89.5B	1,930	123B	NA	NA	NA
Arsenic	3.1B	3.8B	2.7B	3.7B	3.7B	2.6B	4.9B	2.4B	ND	ND	25	50	25 (s)
Barium	14.4B	4.5B	12.5B	ND	25.9B	23B	248	7.8B	27.9B	13.2B	1,000	1,000	1,000 (s)
Beryllium	ND	ND	ND	ND	ND	ND	3.8B	ND	ND	ND	NA	NA	3 (g)
Cadmium	ND	ND	ND	ND	4.2B	4.3B	ND	ND	ND	ND	10	10	10 (s)
Calcium	1,760B	1,250B	1,320B	1,320B	5,530	6,700	5,770	2,750B	6,460	7,060	NA	NA	NA
Chromium	12.3	ND	7.8B	ND	8.0B	ND	62.9	12.7	15.1	ND	50	50	50 (s)
Cobalt	ND	ND	ND	6.1B	ND	6.3B	35.8B	ND	6.2B	ND	NA	NA	NA
Copper	30.4	15.6B	25.6	13.0B	70.9	28.8	114	14.6B	22.7B	9.4B	200	1,000	1,000 (s)
Iron	1020	62.2B	833	47.8B	789	50.4B	61,600	47.8B	3,690	70.7B	300	300*	300 (s)
Lead	8.7	ND	5.2	ND	10.5	ND	232	ND	9.6	ND	25	50	25 (s)
Magnesium	429B	278B	383B	247B	1,250B	1,390B	5,330	700B	2,110B	1,700B	NA	NA	35,000 (g)
Manganese	28.1	10.0B	23.6	10.7B	32.2	29.0	2,950	66.9	209	2.9B	300	300*	300 (s)
Nickel	40.3	10.1B	11.4B	11.2B	ND	ND	59.6	11.4B	ND	11.2B	NA	NA	NA
Potassium	1,100B	1,010B	1,020B	954B	1,840B	1,990B	4,380B	825B	2,140B	2,090B	NA	NA	NA
Silver	8.7B	5.5B	4.5B	6.7B	ND	1.3B	ND	5.6B	ND	ND	50	50	50 (s)
Sodium	29,600	28,800	28,800	28,800	15,300	17,300	26,300	24,400	8,370	8,820	20,000	NA	NA
Vanadium	6.4B	7.6B	5.8B	11.7B	ND	4.1B	87.6	10.8B	7.5	4.0B	NA	NA	NA
Zinc	90	50	80	80	120	90	420	60	60	20	300	5,000	5,000 (s)

NOTES:

All concentrations in µg/L

(1) NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values.

B Analyte detected in both the sample and the blank.

NA Not available

ND Not detected

(s) Standard value

(g) Guidance value

* Standard for iron and manganese is 500 µg/L

(2) Not including effluent standards

TABLE 5-1

HAZELTINE CORPORATION - GREENLAWN, NEW YORK

SUMMARY OF QA/QC SAMPLING

	11/11/91		1/10/92			2/10/92		
QUANTIFIED PARAMETER	FIELD BLANK	TRIP BLANK	FIELD BLANK (TOTAL)	FIELD BLANK (DISSOLVED)	TRIP BLANK	FIELD BLANK (TOTAL)	FIELD BLANK (DISSOLVED)	TRIP BLANK
TCL VOCs								
Acetone	ND	ND	ND	NA	ND	ND	NA	5J
1,1,1-Trichloroethane	ND	ND	ND	NA	ND	1J	NA	1J
TCL METALS								
Aluminum	107B	NA	26.9B	20.9B	NA	50.6B	39.5B	NA
Barium	ND	NA	ND	15.2B	NA	ND	ND	NA
Calcium	245B	NA	283B	287B	NA	374B	255B	NA
Chromium	ND	NA	9.3B	ND	NA	7.9B	6.4B	NA
Copper	5.7B	NA	4.6B	7.3B	NA	6.7B	7.7B	NA
Iron	165	NA	88.1B	111	NA	40.0B	58.6B	NA
Lead	ND	NA	4.2B	2.4B	NA	ND	ND	NA
Magnesium	42.5B	NA	ND	39.4B	NA	33.6B	58.2B	NA
Manganese	ND	NA	1.3B	5.7B	NA	1.2B	1.3B	NA
Nickel	ND	NA	ND	ND	NA	ND	12.0B	NA
Potassium	722B	NA	ND	63.6B	NA	56.6B	ND	NA
Silver	ND	NA	ND	ND	NA	5.1B	ND	NA
Sodium	493B	NA	229B	1,300B	NA	464B	582B	NA
Thallium	ND	NA	4.0B	2.6B	NA	ND	ND	NA
Vanadium	ND	NA	ND	ND	NA	4.7B	ND	NA
Zinc	127	NA	80	20.0	NA	20.0	ND	NA

NOTES:

All concentrations in µg/L

ND Not detected

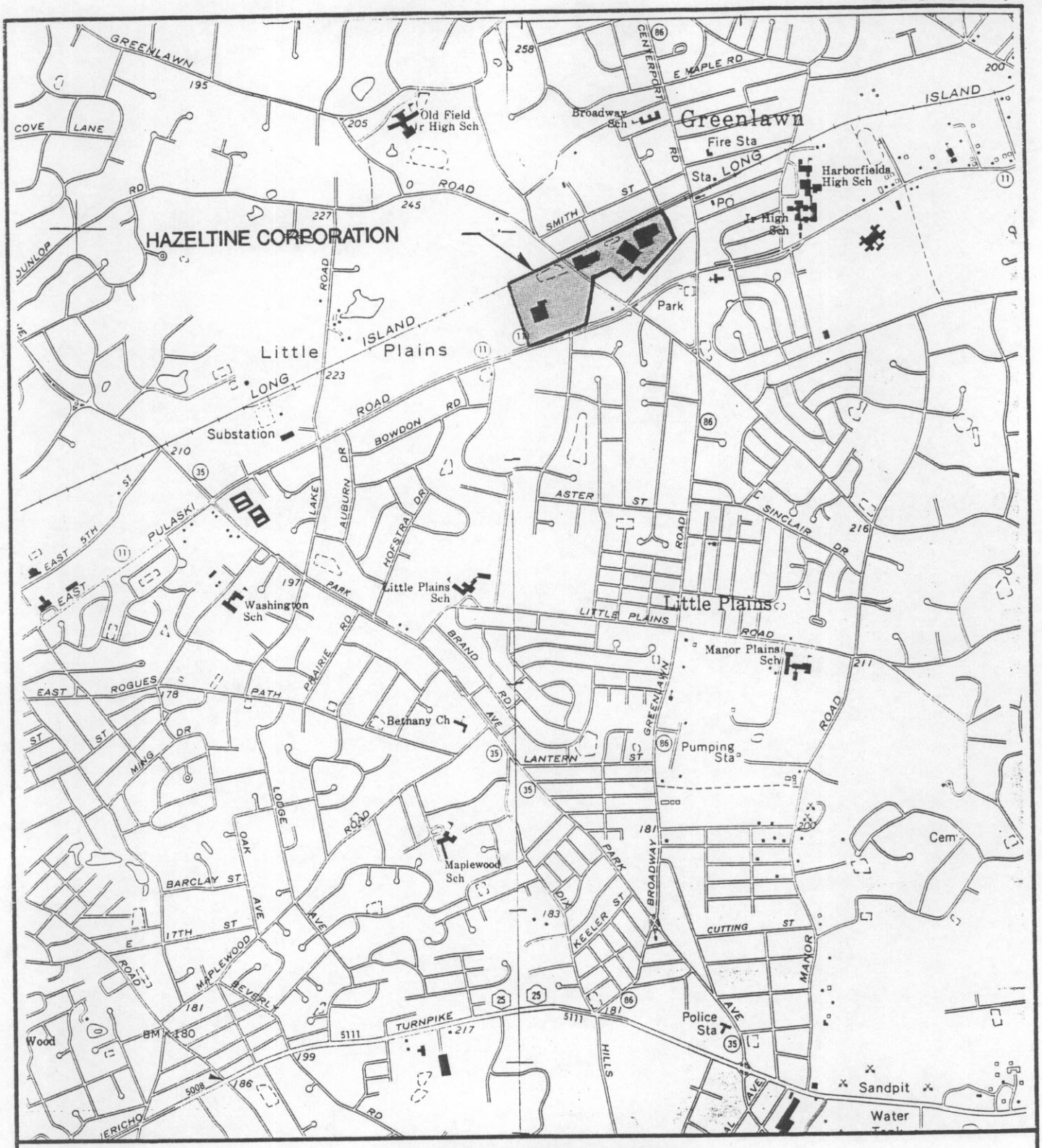
NA Not analyzed

J Indicated parameter detected below mean detection limit

B Analyte was found in blank as well as sample

FIGURES

FIGURE 1-1



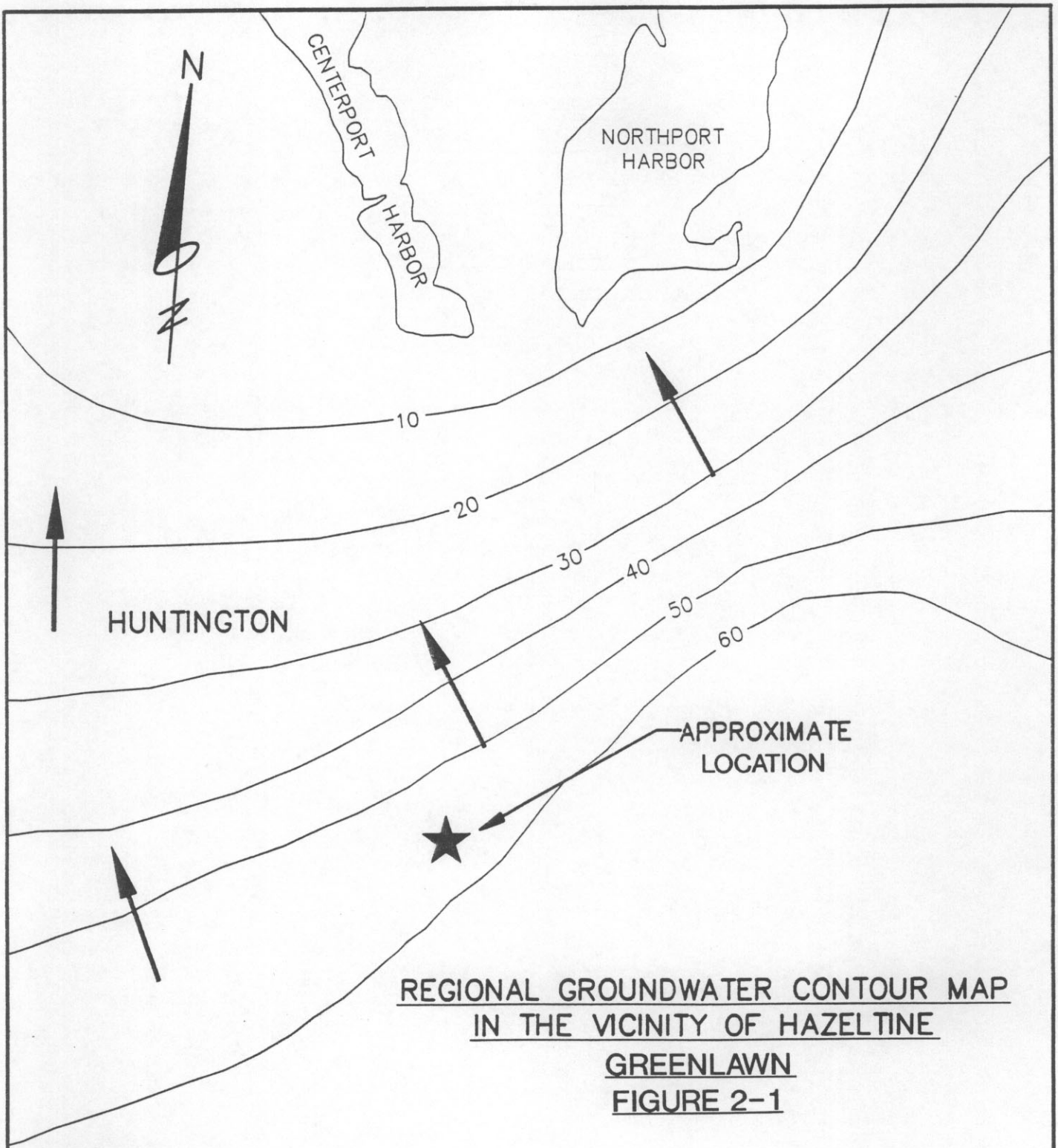
LOCATION MAP

SCALE: 1" = 2000'

HAZELTINE CORPORATION
GREENLAWN, NEW YORK

SOURCE: NYSDOT HUNTINGTON & GREENLAWN QUADRANGLES (1975)

H2MGROUP
ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS
MELVILLE, N.Y.
TOTOWA, N.J.



REGIONAL GROUNDWATER CONTOUR MAP IN THE VICINITY OF HAZELTINE GREENLAWN

FIGURE 2-1

LEGEND:

10 — GROUNDWATER CONTOUR LINE WITH ELEVATION IN FEET ABOVE MEAN SEA LEVEL CONTOUR INTERVAL 10 FEET

→ DIRECTION OF GROUNDWATER FLOW

SOURCE: SCDHS, 1991

SCALE

2000 0 1000 2000

1 inch = 2000 ft.

FIG_3-2.DWG

H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

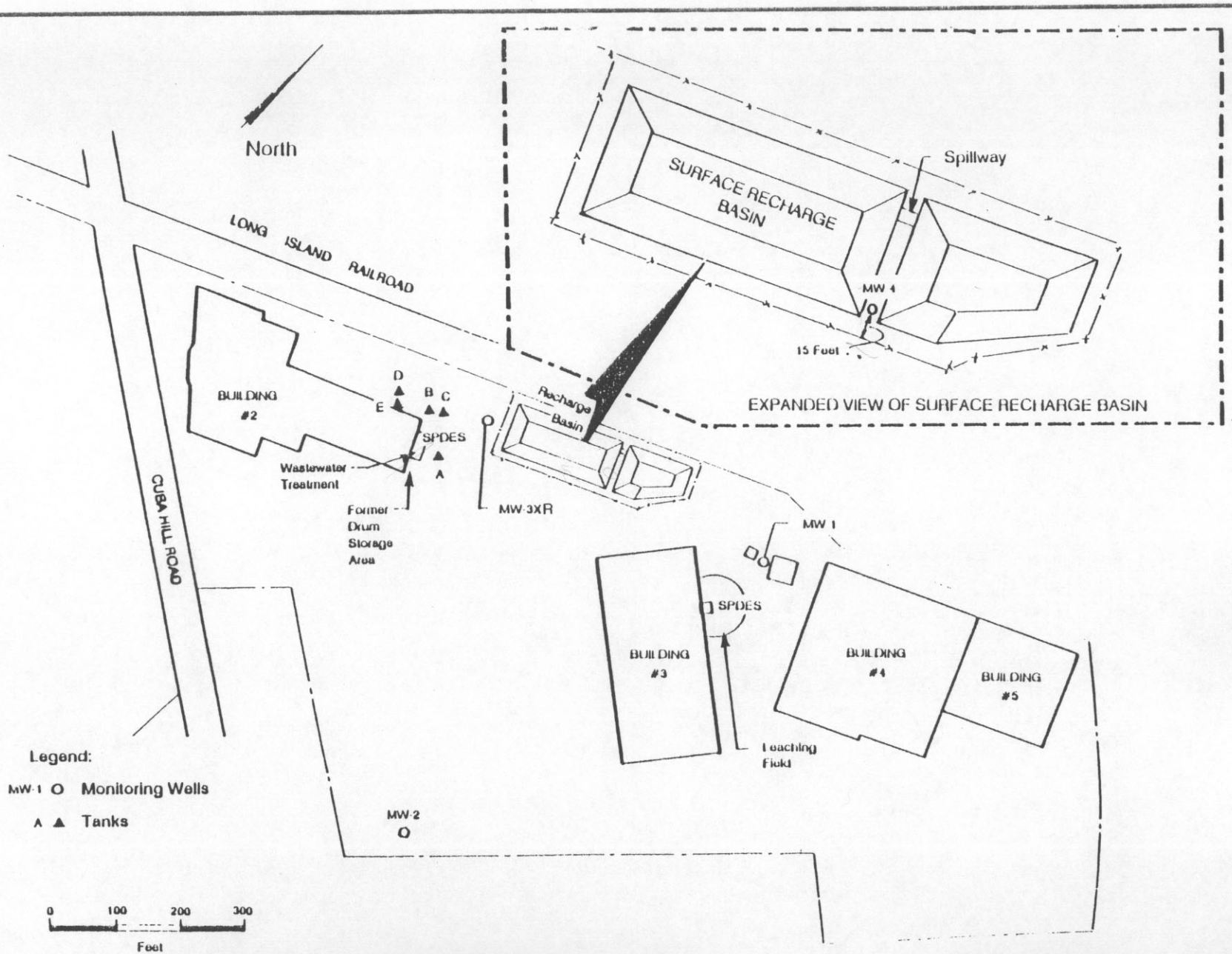


FIGURE 3-1 PLAN, HAZELTINE CORPORATION, GREENLAWN, NEW YORK

BASE MAP SOURCE: RADIAN 1991

H2MGROUP ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

H2MGROUP

APPENDIX A

DRILLING LOGS

FIELD SAMPLING RECORD SHEETS

H2M GEOLOGIC LOG JOB NO. HAZE9103

WELL DATA: HOLE DIAM.: 8" TD 106' SCREEN SETTING: 106'-86' SLOT 0.10
CASING DIAM. 4" LENGTH 106 WELL STATUS COMPLETE

Borehole Location: MW-4
Contractor: WATER RESOURCES
Driller: JOHN BARNES
Elevation: ____ Ref Point: ____

Completion Depth: 106'
Date Started: 11/13/91 Finished: 11/14/91
Weather: Sunny + Cool Mid 40's
Logged by: MNG/EPC Checked by: ____

Type of Rig: Truck ✓ Trailer Mounted ___ Tripod ___ Other ___
Drilling Method: Hollow STEM Bit type: CARBIDE
Sampler Hammer Weight: 130 (lbs).
Average Hammer Fall (inches): 30

Depth to Groundwater: 85.3 Date: 11/14/91 Time: 0800 Aquifer: UPPER GLACIAL

Sample Depth	No	Blows 6"	Hnu Res	Color	Recov (in)	Sample Description	Lithology
.5							
1							
1.5							
2.0							
2.5							
3.0							
3.5							
4.0							
4.5							
5.0	1	5	0 RAW	TAN	11"	MEDIUM DENSE; TAN	SW
5.5		7	0 HEAT	BROWN		BROWN; MED TO FINE	
6.0		9				SANDS WITH TRACE	
6.5		10				FINE GRAVELS; DRY	
7.0							
7.5							
8.0							
8.5							
9.0							
9.5							
10.0							

PAGE 2 of 5 H2M GEOLOGIC LOG (CONTINUED) JOB NO. HAZE4103

Borehole Location: MW-4 Completion Depth: 106
Elevation: _____ Ref Point: _____ Logged by: FPL/MNG Checked by: MNG

Depth to Groundwater: 85.3 Date: 11/14/92 Time: 0800 Aquifer: _____

Sample Depth	Sampl No.	Blows 6"	Hnu Res	Recov (in)	Sample Description	Lithology
11						
12						
13						
14						
15	(2)	4,5	O RAW	8"	LOOSE; TAN BROWN; WELL GRADED	
16		3,3	O HEATED		COARSE TO FINE SAND W/SOME GRAVELS	SW
17	(3)	6,4	O RAW	10"	LOOSE; BROWN ORANGE; WELL GRADED	
18		5,4	O HEATED		COARSE TO FINE SANDS W/SOME GRAVELS	SW
19	(4)	7,9	O RAW	4"	MED. DENSE; TAN BROWN; WELL GRADED	
20		11,8	O HEATED		COARSE TO MEDIUM; SANDS W/LITTLE GRAVEL	SW
21	(5)	12,13	O RAW	12"	MED DENSE; TAN YELLOW; WELL GRADED	
22		11,12	O HEATED		COARSE TO FINE SANDS AND GRAVELS, TRACE COBBLES	SW/GW
23	(6)	15,12	O RAW	12"	MED DENSE; TAN BROWN; WELL GRADED	
24		16,13	O HEATED		COARSE TO MEDIUM SAND AND GRAVEL, LITTLE COBBLES	SW/GW
25	(7)	12,16	O RAW	10"	MED DENSE; REDDISH BROWN; COARSE TO	
26		17,13	O HEATED		MED; SANDS W/SOME GRAVELS + TRACE COBBLES	SW
27	(8)	11,10	O RAW	14"	27 - 27.9 - LOOSE SANDS AND GRAVELS	
28		8,17	O HEATED		27.9 - 28.4 - WET FINE SANDS - POORLY GRADED	SW
29	(9)	7,12	O RAW	10"	MED. DENSE; TAN BROWN WELL GRADED	
30		11,15	O HEATED		COARSE TO FINE SANDS AND GRAVEL - DRY	SW
31	(10)	9,12	O RAW	12"	31 - 31.6 - LOOSE TB SANDS AND GRAVEL	
32		11,14	O HEATED		31.6 - 32.0 - POORLY GRADED TB SANDS	SW
33	(11)	15,17	O RAW	13"	DENSE; TAN BROWN; WELL GRADED	
34		18,20	O HEATED		MOIST SAND AND GRAVELS	SW
35					(SAMPLE 33'-35' ANALYZED)	

SIGNATURE: Michael N. Martella DATE: 11/18/92

PAGE 3 of 5 H2M GEOLOGIC LOG (CONTINUED) JOB NO. HAZE 1103

Borehole Location: MW-4 Completion Depth: 106'
Elevation: _____ Ref Point: _____ Logged by: FPC/MNG Checked by: MNG

Depth to Groundwater: 85.3 Date: 11/14/91 Time: 0800 Aquifer: _____

Sample Depth	Sampl No.	Blows 6"	Hnu Res	Recov (in)	Sample Description	Lithology
36						
38						
40						
42						
44	(12)	14,21	O RAW	15"	DENSE; COARSE TO FINE, WELL GRADED	
46		22,16	O HEATED		SANDS AND GRAVEL - DRY	SW
48						
50						
52						
54	(13)	13/17	O RAW	10"	DENSE; WELL GRADED; COARSE TO FINE	
56		19,21	O HEATED		TAN BROWN SANDS W/LITTLE GRAVEL	SW
58					(SPLIT SPOON FROM 55'-57' ANALYZED)	
60						
62						
64	(14)	10, 12	O RAW	10"	MED. DENSE; WELL GRADED; COARSE TO MED	
66		14, 17	O HEATED		TAN BROWN SANDS W/ TRACE GRAVEL; DRY	SW
68						
70						
72						
74						
75	(15)	9, 14	O RAW	11"	DENSE; WELL GRADED; COARSE TO FINE	
76		16, 18	O HEATED		SANDS AND GRAVEL; DRY	SW
77	(16)	7, 9	O RAW	10"	MED. DENSE; WELL GRADED; COARSE TO	
78		11, 14	O HEATED		FINE SANDS AND GRAVEL; DRY	SW
79						

SIGNATURE: _____ DATE: 11/13/91

PAGE 4 of 5 — H2M GEOLOGIC LOG (CONTINUED) — JOB NO. WAZE9103

Borehole Location: MW-4 — Completion Depth: 106'
Elevation: ____ Ref Point: ____ — Logged by: MNG/FPC — Checked by: MNG

Depth to Groundwater: 85.3 Date: 11/14/91 Time: 0800 Aquifer: ____

Sample Depth	Sampl No.	Blows 6"	Hnu Res	Recov (in)	Sample Description	Lithology
80	(17)	17,19	0 RAW	10"	DENSE; POORLY GRADED; FINE TO	
81		23,22	0 HEATED		MEDIUM SANDS W/ TRACE FINE GRAVEL DRY	SP
82	(18)	15,17	0 RAW	10"	DENSE; POORLY GRADED; FINE TO MED.	
83		15,19	0 HEATED		W/ SMALL VERY FINE SAND LAYER	SP
84	(19)	26,27	0 RAW	15"	DENSE; LIGHT BROWN LAYERS OF FINE TO	
85		25,26	0 HEATED		VERY FINE SANDS W/ LITTLE SILTS; WET	SM
86	(20)	23,25	0 RAW	8"	DENSE; FINE TO MEDIUM; POORLY GRADED SANDS	
87		24,25	0 HEATED		WITH SOME FINE GRAVEL - MOIST	SP
88	(21)	26,29	0 RAW	10"	VERY DENSE; FINE TO MEDIUM POORLY	
89		32,31	0 HEATED		GRADED SANDS; TAN BROWN - SOME GRAVEL	SP
90	(22)	24,23	0 RAW	8"	DENSE; POORLY GRADED MEDIUM SANDS	
91		21,25	0 HEATED		2 INCH LAYER OF WET VERY FINE SANDS MOIST	SP
92	(23)	27,24	0 RAW	10"	DENSE; POORLY GRADED FINE TO MEDIUM	
93		22,19	0 HEATED		REDDISH BROWN SANDS MOIST.	
94	(24)	26,21	0 RAW		DENSE; POORLY GRADED; VERY FINE	SP
95		18,20	0 HEATED	14"	(SAMPLE ANALYZED) TO MEDIUM BROWN TAN SANDS - WET	
96	(25)	27,26	N/A		DENSE; POORLY GRADED FINE TO MED	
97		26,24		18"	WET BROWN TAN SANDS. WET	SP
98	(26)	24,20	N/A		DENSE; FINE POORLY GRADED, WET	
99		21,23		14"	SANDS - NOT SATURATED YET	SP
100	(27)	29,32	N/A		VERY DENSE - VERY FINE WET TAN BROWN	
101		31,34		16"	SANDS W/ SOME TB SILTS	SP/SM
102	(28)	24,23	N/A		DENSE; POORLY GRADED FINE TO MEDIUM	
103		21,26		15"	WET SANDS	SP
104						

SIGNATURE: [signature] DATE: 11/14/91

PAGE 5 of 5 H2M GEOLOGIC LOG (CONTINUED) JOB NO. HAZE9103

Borehole Location: MW-4 Completion Depth: 106'
Elevation: _____ Ref Point: _____ Logged by: MNG/FPC Checked by: MNG

Depth to Groundwater: 85.3 Date: 11/14/91 Time: 0800 Aquifer: _____

Sample Depth	Sampl No.	Blows 6"	Hnu Res	Recov (in)	Sample Description	Lithology
104	(29)	32,35	N/A	12"	VERY DENSE; TAN BROWN POORLY GRADED	SP/SC
105		36,38			TAN BROWN SANDS - TRACE FINE CLAY	
106	(30)	32,31	N/A	FULL	VERY DENSE; TAN BROWN POORLY GRADED	SP/SC
107		33,32			TB FINE SANDS W/SOME BROWN DRY CLAY	
108	(31)	39,37	NA	FULL	VERY DENSE; COMBINATION OF BROWNISH	
109		41,43			MOIST CLAY AND SILT VARVES	OH/MH
					WITH SMALL MICA CHIPS	
					END OF BORING	

SIGNATURE: Michael N. Gentile DATE: 11/14/91

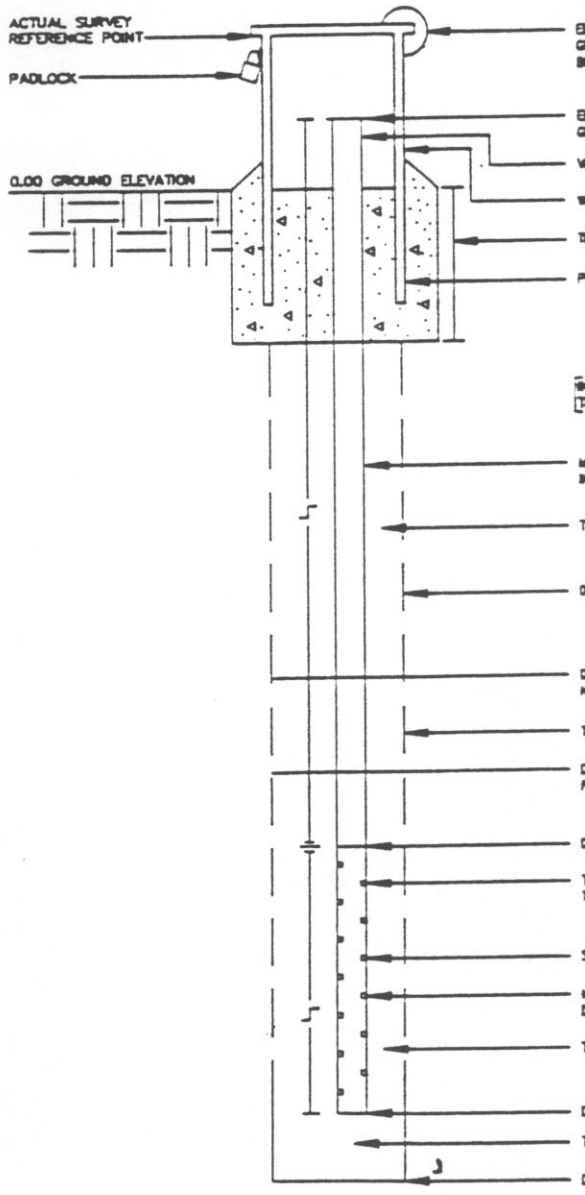
FIGURE 2 – GROUNDWATER MONITORING WELL REPORT

SITE: HAZELTINE - GREEN LAWN LOCATION: MONITORING WELL #3XR PROJECT NO.:

CONTRACTOR: WATER RESOURCES DRILLER: JOHN BARNES

INSPECTOR: MICHAEL N. GENTILS INSTALLATION DATE: 11/91 WELL NO.: MW-3XR

NOTE: UNLESS OTHERWISE DESIGNATED ALL DEPTHS ARE BASED ON A 0.00 GROUND ELEVATION



DRILLING METHOD	HOLLOW STEM
ELEVATION OR STICKUP ABOVE/BELOW GROUND SURFACE OF CASING OF ROAD BOX (1'–0" UNLESS OTHERWISE NOTED)	3.0 FT
ELEVATION OR STICKUP ABOVE/BELOW GROUND SURFACE OF RISER PIPE	
VENT HOLE	
WEEP HOLE	
THICKNESS OF SURFACE SEAL/CONCRETE	1.9 FT
PROTECTIVE CASING	1.0 FT. (DIAMETER (I.D.) / LENGTH)
INDICATE ALL SCALE SHOWING DEPTH [THICKNESS AND TYPE]	
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	PVC 4" (MATERIAL / DIAMETER (I.D.))
TYPE OF BACKFILL AROUND RISER	CEMENT/BENTONITE
DIAMETER OF BOREHOLE	8.5 INCHES
DEPTH OF TOP OF SUBSURFACE SEAL–NOTE MA 11 COINCIDES WITH SCREEN BACKFILL	
TYPE OF SUBSURFACE SEAL/GROUT	BENTONITE PELLETS
DEPTH OF TOP OF BACKFILL AROUND POINT/SCREEN	165 FT
DEPTH OF BOTTOM OF RISER	170 FT
TYPE OF POINT OR SCREEN (PIPE SIZE TELESCOPING) AND MANUFACTURE	PVC
SCREEN CAGE OR SIZE OF OPENINGS	SLOTTED .010
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT/SCREEN	PVC 4 INCHES
TYPE OF BACKFILL AROUND	GRADE O SAND
DEPTH OF BOTTOM OF SCREEN	
TYPE OF BACKFILL UNDER POINT/SCREEN	GRADE D SAND
DEPTH OF BOTTOM OF BOREHOLE	185

(L1) LENGTH OF RISER 170 (L2) LENGTH OF SCREEN 10 REFERENCE POINT TOP CASING GROUND ELEV.

ACTUAL ELEVATIONS – WHERE AVAILABLE

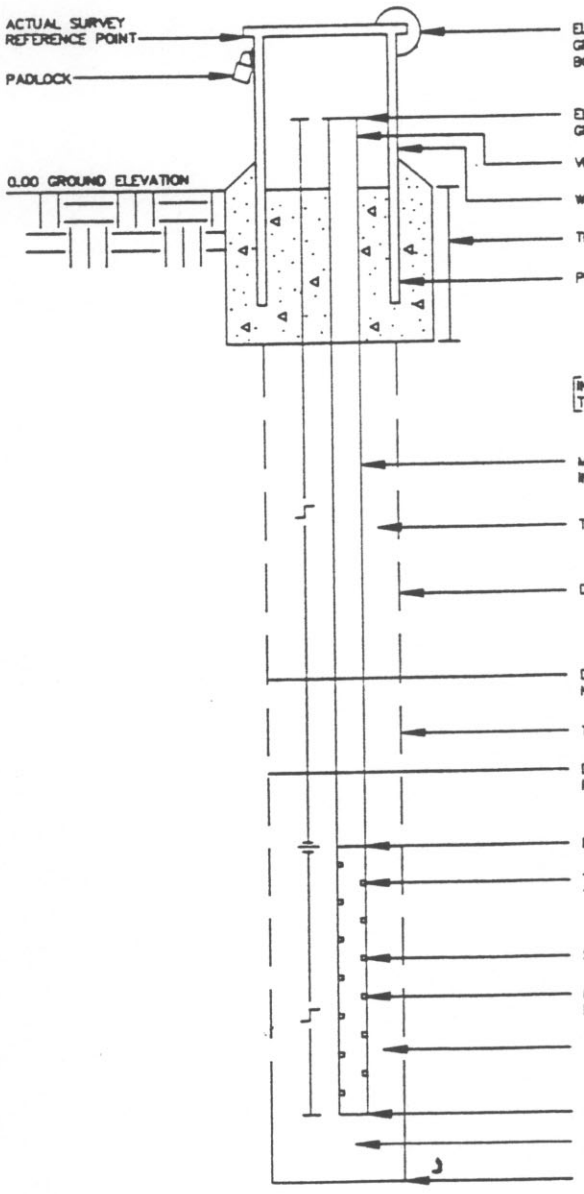
FIGURE 2 – GROUNDWATER MONITORING WELL REPORT

SITE: HAZELTINE - GREENLAWN LOCATION: MONITORING WELL #4 PROJECT NO.: ____

CONTRACTOR: WATER RESOURCES DRILLER: JOHN BARNES

INSPECTOR: MICHAEL N. GENTILS INSTALLATION DATE: 11/14/91 WELL NO.: #4

NOTE: UNLESS OTHERWISE DESIGNATED ALL DEPTHS ARE BASED ON A 0.00 GROUND ELEVATION



DRILLING METHOD	HOLLOW STEM
ELEVATION OR STICKUP ABOVE/BELOW GROUND SURFACE OF CASING OF ROAD BOX (1'–0" UNLESS OTHERWISE NOTED)	3.2 FT.
ELEVATION OR STICKUP ABOVE/BELOW GROUND SURFACE OF RISER PIPE	
VENT HOLE	
WEEP HOLE	
THICKNESS OF SURFACE SEAL/CONCRETE	1.8 FT
PROTECTIVE CASING	1.0 FT (DIAMETER (I.D.) / LENGTH)
[INDICATE ALL SCALE SHOWING DEPTH THICKNESS AND TYPE]	
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	PVC 4" (MATERIAL / DIAMETER (I.D.))
TYPE OF BACKFILL AROUND RISER	CEMENT SLURRY
DIAMETER OF BOREHOLE	8.5 INCHES
DEPTH OF TOP OF SUBSURFACE SEAL–NOTE NA 11 COINCIDES WITH SCREEN BACKFILL	BENTONITE PELLETS
TYPE OF SUBSURFACE SEAL/GROUT	
DEPTH OF TOP OF BACKFILL AROUND POINT/SCREEN	83 FT
DEPTH OF BOTTOM OF RISER	86 FT
TYPE OF POINT OR SCREEN (PIPE SIZE TELESCOPING) AND MANUFACTURE	PVC #10 SLOT
SCREEN CAGE OR SIZE OF OPENINGS	
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT/SCREEN	INCHES
TYPE OF BACKFILL AROUND	GRADE 1 SAND
DEPTH OF BOTTOM OF SCREEN	106 FT
TYPE OF BACKFILL UNDER POINT/SCREEN	GRADE 1 SAND
DEPTH OF BOTTOM OF BOREHOLE	107 FT

(L1) LENGTH OF RISER 86 FT (L2) LENGTH OF SCREEN 20 FT REFERENCE POINT TOP CASING GROUND ELEV. ____

ACTUAL ELEVATIONS – WHERE AVAILABLE

GROUNDWATER SAMPLING RECORD SHEET

SITE: Hazeltine - Greenlawn Facility DATE: 1/10/92 TIME: 0920

JOB#: SAMPLERS: MNG/MSC

SAMPLE LOCATION: MW-3XR MEASURING PT: Top of Casing

DEPTH TO WATER: 168.38 FT. WELL DEPTH: 186.05 FT.

STATIC WATER LEVEL: 17.67 FT. STATIC VOLUME: 11.5 GALS.

MIN. VOLUME TO BE REMOVED: 34.5 GALS.

EVACUATION TECHNIQUE: SUBM. PUMP ☑ CENT. PUMP ☐

BLADDER PUMP ☐ BAILER ☐

DEPTH TO PUMP INTAKE: 186 FT.

FLOW RATE: 3 GPM GALS. PER LINEAR FT.

TIME PUMPED: 20 MINS. 2 INCH x .163

TOTAL VOLUME PURGED: 60 GALS. 4 INCH x .653

SAMPLING ANALYSIS:

Field Blank Collected from Bailer Prior to Sampling

FIELD PARAMETERS:

TEMP: ^{0}C CONDUCTIVITY: 300/300 us

pH: 7.51/7.45 TURBIDITY: 7100/7100 NTU

NOTES: Purge water very turbid after 40 gallons purged then clear to slightly turbid, cloudy, after next 20 gallons. (very fine sand, no silt)

SIGNATURE:

GROUNDWATER SAMPLING RECORD SHEET

SITE: Hazeltine - Greenlawn Facility DATE: 1/10/92 TIME: 11:35

JOB#: SAMPLERS: MNG/MSC

SAMPLE LOCATION: MW-4 MEASURING PT: Top of casing

DEPTH TO WATER: 93.62 FT. WELL DEPTH: 105.95 FT.

STATIC WATER LEVEL: 12.33 FT. STATIC VOLUME: 8.0 GALS.

MIN. VOLUME TO BE REMOVED: 24 GALS.

EVACUATION TECHNIQUE: SUBM. PUMP ☑ CENT. PUMP ☐

BLADDER PUMP ☐ BAILER ☐

DEPTH TO PUMP INTAKE: 100 FT.

FLOW RATE: 5 GPM GALS. PER LINEAR FT.

TIME PUMPED: 10 MINS. 2 INCH x .163

TOTAL VOLUME PURGED: 50 GALS. 4 INCH x .653

SAMPLING ANALYSIS:

MW-1 : 89.81

MW-2 90.60

FIELD PARAMETERS:

TEMP: ^{0}C CONDUCTIVITY: 90/90 us

pH: 7.36/7.36 TURBIDITY: 90/90 NTU

NOTES: Slightly Turbid when pumping

MS/MSD collected at this site (well location)

SIGNATURE:

H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

GROUNDWATER SAMPLING RECORD SHEET

SITE: HAZELTINE - GREENLAWN FACILITY DATE: 2/10/92 TIME:

JOB#: HAZE9103 SAMPLERS: MNG/RWE

SAMPLE LOCATION: MW-1 MEASURING PT: TOP OF CASING

DEPTH TO WATER: 90.89 FT. WELL DEPTH: 105.7 FT.

STATIC WATER LEVEL: 14.81 FT. STATIC VOLUME: 9.67 GALS.

MIN. VOLUME TO BE REMOVED: 29 GALS.

EVACUATION TECHNIQUE: SUBM. PUMP ☑ CENT. PUMP ☐

BLADDER PUMP ☐ BAILER ☐

DEPTH TO PUMP INTAKE: 100 FT.

FLOW RATE: 8 GPM GALS. PER LINEAR FT.

TIME PUMPED: 4 MINS. 2 INCH x .163

TOTAL VOLUME PURGED: 32 GALS. 4 INCH x .653 ✓

SAMPLING ANALYSIS:

TCL METALS FILTERED + UNFILTERED, CYANIDE, PHENOLS

TCL VOLATILES ORGANICS

FIELD PARAMETERS:

TEMP: NM ^{O}C CONDUCTIVITY: 320 us

pH: 7.14 TURBIDITY: MNG NTU

NOTES: FIELD DUPLICATE COLLECTED AT THIS WELL LOCATION

SIGNATURE: Michael N. Gentile

GROUNDWATER SAMPLING RECORD SHEET

SITE: HAZELTINE - GREENLAWN FACILITY DATE: 2/10/92 TIME:

JOB#: HAZE9103 SAMPLERS: MNG/RWE

SAMPLE LOCATION: MW-2 MEASURING PT: TOP OF CASING

DEPTH TO WATER: 89.90 FT. WELL DEPTH: 141.4 FT.

STATIC WATER LEVEL: 51.5 FT. STATIC VOLUME: 33.62 GALS.

MIN. VOLUME TO BE REMOVED: 100.8 GALS.

EVACUATION TECHNIQUE: SUBM. PUMP ☑ CENT. PUMP ☐

BLADDER PUMP ☐ BAILER ☐

DEPTH TO PUMP INTAKE: 100 FT.

FLOW RATE: 8 GPM GALS. PER LINEAR FT.

TIME PUMPED: 13 MINS. 2 INCH x .163

TOTAL VOLUME PURGED: 104 GALS. 4 INCH x .653 ✓

SAMPLING ANALYSIS:

TCL METALS FILTERED + UNFILTERED, CYANIDE, PHENOLS

TCL VOLATILE ORGANICS

FIELD PARAMETERS:

TEMP: NM ^{0}C CONDUCTIVITY: 130 us

pH: 7.24 TURBIDITY: NM NTU

NOTES: FIELD BLANK COLLECTED PRIOR TO PURGING MONITORING WELLS

SIGNATURE: Michael N. Gentile

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MELVILLE, N.Y. TOTOWA, N.J.

GROUNDWATER SAMPLING RECORD SHEET

SITE: HAZELTINE - GREENLAWN FACILITY DATE: 2/10/92 TIME: 1040

JOB#: HAZE9103 SAMPLERS: MNG/RWE

SAMPLE LOCATION: MW-3XR MEASURING PT: TOP OF CASING

DEPTH TO WATER: 169.80 FT. WELL DEPTH: 186.5 FT.

STATIC WATER LEVEL: 16.7 FT. STATIC VOLUME: 10.9 GALS.

MIN. VOLUME TO BE REMOVED: 32 GALS.

EVACUATION TECHNIQUE: SUBM. PUMP ☐ CENT. PUMP ☐

HAND BAILED - DUE TO DEPTH BLADDER PUMP ☐ BAILER ☑

DEPTH TO PUMP INTAKE: N/A FT.

FLOW RATE: N/A GPM GALS. PER LINEAR FT.

TIME PUMPED: N/A MINS. 2 INCH x .163

TOTAL VOLUME PURGED: 32 GALS. 4 INCH x .653 ✓

SAMPLING ANALYSIS:

TCL METALS FILTERED + UNFILTERED, CYANIDE, PHENOLS

TCL VOLATILE ORGANICS

FIELD PARAMETERS:

TEMP: N/M °C CONDUCTIVITY: 250 us

pH: 7.36 TURBIDITY: NM NTU

NOTES: ELEVATION SURVEY OF WELL IS INCORRECT. WELL WAS NOT COMPLETED DURING SURVEY AND THE MARK OF THE PVC HAS BEEN CUT TO COMPLETE THE MANHOLE

SIGNATURE: Michael N. Gentile

H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

GROUNDWATER SAMPLING RECORD SHEET

SITE: HAZELTINE - GREENLAWN FACILITY DATE: 2/10/92 TIME:

JOB#: HAZE9103 SAMPLERS: MNG / RWE

SAMPLE LOCATION: MW-4 MEASURING PT: TOP OF CASING

DEPTH TO WATER: 92.25 FT. WELL DEPTH: 106 FT.

STATIC WATER LEVEL: 13.75 FT. STATIC VOLUME: 8.9 GALS.

MIN. VOLUME TO BE REMOVED: 27 GALS.

EVACUATION TECHNIQUE: SUBM. PUMP ☑ CENT. PUMP ☐

BLADDER PUMP ☐ BAILER ☐

DEPTH TO PUMP INTAKE: 100 FT.

FLOW RATE: 8 GPM GALS. PER LINEAR FT.

TIME PUMPED: 4 MINS. 2 INCH x .163

TOTAL VOLUME PURGED: 32 GALS. 4 INCH x .653

SAMPLING ANALYSIS:

TCL METALS FILTERED + UNFILTERED, CYANIDE, PHENOLS

TCL VOLATILE ORGANICS

no phenols

FIELD PARAMETERS:

TEMP: NM °C CONDUCTIVITY: 120 us

pH: 7.41 TURBIDITY: NM NTU

NOTES: MATRIX SPIKE / MATRIX SPIKE DUPLICATE (MS/MSD)

COLLECTED AT THIS WELL LOCATION

SIGNATURE: Michael N. Gentile

H2MGROUP

APPENDIX B

PUBLIC WATER SUPPLY WELLS

Table 2-1 (Continued)
PUBLIC WATER SUPPLY WELLS LOCATED WITHIN A THREE-MILE RADIUS OF
HAZELTINE CORPORATION, GREENLAWN, NEW YORK

Approximate Location	New York State Water Resources Commission No.	Owner	Depth (feet)	Capacity (GPM)	Population Served	Position Relative to Premises
Hollywood Place	S66366	South Huntington Water District	478	1,300	3,300[a]	Sidegradient
Laurel Hill Road	S20530	Suffolk County Water Authority	607	1,200	2,600[a]	Sidegradient
Laurel Hill Road	S33970	Suffolk County Water Authority	609	1,200	2,600[a]	Sidegradient
Meade Drive	S67656	Suffolk County Water Authority	468	1,300	2,600[a]	Downgradient

NA - Not available.

[a]This value was calculated by dividing an estimate of the number of people served by the system by the total number of wells contributing to the system.

Source: Field Investigation Work Plan, Fred C. Hart Associates, Inc., June 30, 1989.

Table 2-1
PUBLIC WATER SUPPLY WELLS LOCATED WITHIN A THREE-MILE RADIUS OF HAZELTINE CORPORATION, GREENLAWN, NEW YORK

Approximate Location	New York State Water Resources Commission No.	Owner	Depth (feet)	Capacity (GPM)	Population Served	Position Relative to Premises
Pulaski Road	S23998	Greenlawn Water District	600	1,200	8,000	Sidegradient
Buttercup Lane	S23145	Greenlawn Water District	600	1,200	8,000	Downgradient
Park Avenue	S11803	Greenlawn Water District	218	NA	NA	Upgradient
Manor Road	S23997	Greenlawn Water District	625	NA	NA	Upgradient
Cuba Hill Road	S37100	Greenlawn Water District	575	NA	NA	Upgradient
Stony Hollow Road	S5068	Greenlawn Water District	192	NA	NA	Downgradient
Washington Street	S45610	South Huntington Water District	313	1,400	3,000[a]	Downgradient

NA - Not available.

[a]This value was calculated by dividing an estimate of the number of people served by the system by the total number of wells contributing to the system.

Source: Field Investigation Work Plan, Fred C. Hart Associates, Inc., June 30, 1989.