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DAMES & MOORE

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Mr. Matthew Hoagland
Project Manager
Kellogg-Deering Well Field Superfund Site, Norwalk, CT
U.S. Environment Protection Agency
Waste Management Division
Boston, MA 02203-2211

Dear Mr. Hoagland.

Enclosed is a copy of the final report entitled: "Review of Subsurface Geologic Conditions in the Vicinity fo the Zell Building, Norwalk, CT with respect to the Kellogg-Deering Well Field."

This report is submitted as public comment in review of the RI/FS Report entitled: Final Supplemental Remedial Investigation and Feasibility Study, Kellogg-Deering Superfund Site, Norwalk, Connecticut (July 1989).

Sincerely

DAMES & MOORE

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REVIEW OF SUBSURFACE GEOLOGIC CONDITIONS IN THE VICINITY OF THE ZELL BUILDING NORWALK, CT

WITH RESPECT TO THE KELLOGG-DEERING WELL FIELD

Prepared For:

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AUGUST 1989

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1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

Pitney Bowes was notified by Region 1 of the U.S. EPA that the property leased by Pitney Bowes at 276 Main Street in Norwalk, CT, Zell Buildings 1 and 2 and surrounding property, may have contributed to the Kellogg-Deering well field contamination and that they were now considered a Potentially Responsible Party (PRP) as described in Section 122 of the Superfund Amendments and Reauthorization Act of 1986.

This notification was based on several speculative comments made in a consulting engineers report, prepared by HRP Associates of New Britain, CT, for the Elinco Corporation, a company located at 272 Main Street, next door to the building leased by Pitney Bowes. The Elinco Corporation has a documented history of TCE usage, (including a former 500-gallon aboveground TCE tank), and has also been named by U.S. EPA Region 1 as a PRP for the Kellogg-Deering site. Further information provided to Dames & Moore has identified a former degreasing pit inside the Elinco plant near the northeast corner of the building. Trichloroethene (TCE) and Tetrachloroethene (PCE) are common degreasing agents.

The December 4, 1987 report prepared by Dames & Moore for Murtha, Cullina, Richer and Pinney concluded that Pitney Bowes operations at 276 Main Street could not have been responsible for, or contributed to, the ground water contamination detected in the Kellogg-Deering well field. This report confirms the conclusions of the 1987 report. More recent information developed by NUS, an EPA contractor, is the subject of this report. Dames & Moore has reviewed this information in the context of the geologic setting of the site, and conclude that the Zell buildings currently leased by Pitney Bowes are downgradient of the degreasing pit located in the northeast corner of the Elinco building.

1.2 OBJECTIVES OF THE REPORT

The objectives of this study are to (1) review data compiled to date (2) define subsurface geologic conditions, and (3) address the issue of the Zell Buildings and neighboring buildings as sources of contamination of the Kellogg-Deering Well Field.

The compilation of subsurface data to date includes monitoring well logs water elevations, tracer studies, pump tests, soil gas survey, and analyses of ground water and soil samples. Subsurface conditions that can be defined from these data sets include characterization of the overburden and bedrock geologic units, determination of ground water gradients and flow directions, and the concentration of contaminants in ground water and soils. The locations and concentrations of contaminants in conjunction with subsurface flow gradients, directions, and barriers are useful in identifying the primary source of contamination.

This report includes the following information:

- A daily field log documenting EPA contractor field activities (Appendix C), and site photographs (Appendix B);

- A discussion of the topography, geology and hydrogeology of the area along with graphic illustrations of the site's physical attributes;

- A discussion of the present and historical problems of local ground water contamination within the context of the topographic, geologic and hydrogeologic character of the site;

- The results of the soil sampled from the borehole for monitoring well K-19B, which is located between the two segments of the Zell building complex leased by Pitney-Bowes, (Zell 1 & Zell 2), as well as the results from soil boring ESB-1 from within the Elinco plant;

- The analytical results of the ground water samples that were split with NUS corporation, EPA contractor, comparisons with the EPA results and the analytical results from previous rounds of sampling;

- Results and analyses of the long term and short term tracer studies;

- Results and analyses of the ground water sampling before and after the interceptor well pumping test;

- Results and interpretations of the indoor and outdoor soil gas surveys performed by NUS are discussed and related to the ground water data.

SECTION 2

2.0 SITE CHARACTERISTICS

This section of the report provides information on the physiographic setting of the Zell Building leased by Pitney Bowes, as well as the site's geologic and hydrogeologic characteristics. Pitney Bowes on-site operations as well as their past and current waste handling practices are discussed in the previous report prepared by Dames & Moore on December 4, 1987 for Murtha, Cullina, Richer and Pinney.

2.1 PHYSIOGRAPHIC SETTING

The buildings leased by Pitney Bowes are located at 276 Main Street, the Zell Building complex, in Norwalk, Connecticut (Figure 1) in an area dominated by light industrial and commercial establishments (Figure 2). The Zell Building complex consists of two buildings (Figure 3) which are connected by a common lobby and are surrounded by a paved parking area with loading docks.

To the east of the Zell Building complex is an elevated bedrock ridge upon which a small housing development has been built. To the south is the manufacturing operation of the Elinco Corporation. Along the Zell Building's northern border is an undeveloped wooded area and to the west, across Main Street, is a row of small commercial (retail) businesses. The Kellogg-Deering well field is located within one half mile of the Zell Building complex, west-southwest of the site (Figure 2).

2.2 TOPOGRAPHY

The topography of the area encompassing the Pitney-Bowes/Elinco properties is irregular and ranges from 78.45 feet, well K-18B to 105.23 feet, well MW-1 above mean sea level (MSL) (Figure 1 and Table 1). MW-1 is the highest upgradient point on the overburden surface and K-18B is the lowest downgradient point located on these properties (Table 1).

The elevations of the monitor well and soil boring locations relative to MSL were used in the construction of Figure 4 (Table 1). This data was recorded in the soil boring and well construction logs provided to Dames & Moore by U.S. EPA-Region 1. These data show a component of the topographic gradient from the Elinco property to the Zell buildings.

The site-scale topography of the Zell/Elinco complex is shown in Figure 4. In terms of regional topographic characteristics, the overburden surface, which controls the surface drainage of the area, slopes radially from the southwest to the northwest, toward the regional drainage system of Deering Pond and the Norwalk River (Figure 1).

2.3 GEOLOGY

A study of the soil boring logs (Appendix A) and geologic data provided to Dames & Moore by U.S. EPA-Region 1 has identified two distinct geologic units on site:

- Overburden--this unit consists of various unconsolidated, glacially-derived sediments which range in thickness from 5.5 feet at MW-1 to 38.5 feet at K-11. These sediments are primarily very coarse grained, poorly sorted outwash deposits (sand, gravel, cobbles and boulders) with some interbedded layers of glacial till which are very poorly sorted and finer grained (sand, silt and clay). In general, this unit exhibits high porosity and permeability. Figure 4 depicts the surface contours of this unit with respect to mean sea level (MSL).

- Bedrock--this unit is comprised primarily of felsic and feldspathic gneiss, granite and micaceous schists. The bedrock is heavily fractured in the uppermost sections and gains structural integrity with depth. An elevated bedrock ridge occurs along the eastern and southern extremes of the Pitney-Bowes/Elinco properties and is a prominent feature of the region's structural geology. The surface relief of the bedrock is a strong influence on the area's topography (Figure 1). The site-scale relief of the bedrock surface is shown in Figure 5. A bedrock slab is apparent beneath the northeast corner of the Elinco building, (underneath the location of the former degreasing pit), and the top of this bedrock slab appears to slope to the northwest toward Zell 1 and monitor wells K-11 and MW-100 (Figure 5).

There is a strong inverse correlation between the bedrock surface elevation and the thickness of the overburden (Table 1). The influence of the bedrock topography and overburden thickness on the site's hydrogeology is discussed later.

The predominance of feldspar in the bedrock was determined by the U.S. EPA contractor's field geologist and by correlation with information recorded in the boring logs, and is consistent with the description of the bedrock (Appendix A). Specifically, the presence of albite (sodium feldspar), anorthite (calcium feldspar) and orthoclase (potassium feldspar) was observed by the field geologists. As feldspar weathers at a rapid rate relative to other igneous and metamorphic mineral assemblages, ions of sodium (Na^{+1}), calcium (Ca^{+2}) and potassium (K^{+1}) are released in the bedrock water bearing zone. These cations readily combine with chloride (Cl^{-1}) and bromide (Br^{-1}), (the ions used in the tracer study), to form common salts which precipitate as cement matrices within fractures in the bedrock. The presence of these types of mineral cements was also noted by the field geologists in the boring logs. The impact of this information on the results of the tracer study conducted by NUS, the U.S. EPA-Region 1 contractor, is discussed in section 2.7.

2.4 HYDROGEOLOGY

2.4.1 Background

As previously mentioned, the main contaminants of interest to U.S. EPA-Region 1 within the Kellogg-Deering Well Field are volatile organic compounds (VOCs). Specifically, the EPA has identified two common industrial solvents, trichloroethene (TCE) and tetrachloroethene (PCE), as the problem contaminants within the overburden and bedrock aquifers of this area. As noted in the Dames & Moore report of 1987, the Zell manufacturing activities which previously occurred in both the Zell buildings currently occupied by Pitney Bowes and what is now the Elinco building included metal plating operations and the manufacture of electronic components. Soil borings and soil gas samples taken from Zell's former processing areas in the three buildings have showed anomalously high concentrations of TCE. In addition, Elinco has a documented history of extensive TCE usage and associated potential release, and their property is suspected to be a possible local source of TCE contamination. The presence of a degreasing pit near the northeast corner of the Elinco plant supports this conclusion. Both TCE (specific gravity = 1.47) and PCE (specific gravity = 1.62) are "sinkers;" therefore, the direct downward migration of TCE and PCE from the degreasing pit in the Elinco plant is most likely the highest source term of this contamination. TCE and PCE would infiltrate the shallow overburden ground water at this location and continue to migrate downward to the bedrock surface, where it could pass through fractures or move along the bedrock surface gradient. Additionally, TCE & PCE could migrate from the degreasing pit in the Elinco building with surface water (storm water or "washings" from degreasing operations) and/or by entering floor drains.

Both compounds, TCE and PCE, prefer to exist as themselves, liquid or gas phase, rather than in solution, because their solubilities are low (0.01 and 0.002 parts per 100, respectively). Within ground water, these compounds migrate downward through the water column until they reach a physical barrier to their movement or the density of the host ground water-mineral solution matches their own. A common mode of TCE and PCE migration is to "coat" a pathway along a topographic or bedrock surface gradient and to continue to migrate along this route, "pooling" in depressions and sinking through fractures along the way. Flat locations on the bedrock surface and horizontal planes within bedrock fractures which are positioned so that in the downgradient flow direction they have a slight "upward" slope are common collection points for the dense non-aqueous phase liquid (DNAPL) TCE.

The contour diagrams of the overburden and bedrock surfaces (Figures 4 & 5, Table 1) clearly show that components of both the topographic and bedrock surface gradients are from the northeast corner of the Elinco building toward the Zell 1 building occupied by Pitney-Bowes. Specifically, the bedrock slab beneath the Elinco building slopes toward the positions of monitor wells K-11 and MW-100. The downgradient migration of TCE in product form or as a constituent of the ground water in both the overburden and bedrock may have substantially contributed to the TCE contamination present in the soil, ground water and soil gas beneath the Zell buildings leased by Pitney-Bowes.

TCE is lighter and five times more soluble than PCE, it tends to migrate with surface and ground water much more easily than PCE. Additionally, PCE has a pronounced affinity for the fine grained (silt and clay) fraction of sediments, which are less prevalent within the overburden than coarse-grained material (Appendix A).

2.4.2 Hydrogeology and Contaminant Migration in the Overburden

As discussed in section 2.3, the overburden is dominated by very coarse-grained, unconsolidated glacial sediments. These sediments generally exhibit very high porosity and permeability as well, which makes this unit quite conductive to ground water movement in both the vertical and horizontal flow directions. Aquifer test data provided to Dames & Moore by U.S. EPA-Region 1 corroborate the information present in the boring logs and confirm the generally high hydraulic conductivity of the overburden aquifer (Appendix G). In addition, Dames & Moore's well sampling logs indicate that water levels in the overburden wells varied by as much as four (4) feet between sampling events (Appendix E), which suggests a strong meteorological influence on the hydrogeology of this aquifer . The variability of the water table in the overburden suggests a relatively short residence time for the ground water in this zone, which behaves much like a surface water body in that its volume responds rapidly to meteorological events and its flow characteristics are related more to the pumpage at the Kellogg-Deering Well Field, the geometry of the bedrock surface and the geomorphology of the overburden than simply to the area's topography. Water table contour maps based on the water level data from two rounds sampling discussed by NUS (4/27/88 and 5/2/88; Appendix F) are presented in Figures 6 and 7, respectively. Ground water movement within the overburden appears to have two major components of flow:

- Horizontal--flow responds to the horizontal component of the hydraulic gradient related to the surface elevations of the water table and to pathway control from the geometry of the bedrock and overburden surfaces. The boring logs show the majority of the overburden material to be coarse-grained and to contain no dominant confining layers throughout the site. Therefore, stratigraphic control on ground water flow appears to be less important than the influence from the bedrock surface relief (Figure 5) and the geomorphology of the overburden. The direction of the horizontal component of the hydraulic gradient spreads radially (southwest to northwest) from the complex:

- Vertical--flow in response to gravity and the vertical component of the hydraulic gradient. Coarse material in the overburden provides little resistance to the downward infiltration of ground water through the overburden to the bedrock aquifer; overburden sediments also provide an efficient pathway for the injection of surface water into this zone from storms. In addition, the overburden is as little as 5.5 feet thick in some locations, allowing nearly direct transfer of storm water/runoff between the overburden surface and the bedrock at these locations. Since TCE and PCE are both "sinkers", this mechanism is an important source of contamination to the bedrock aquifer. The aquifer test data in Appendix G suggest the vertical components of the hydraulic gradients present in the overburden aquifer are negligible.

2.4.3 Hydrogeology and Contaminant Migration in the Bedrock

As discussed in section 2.3, the bedrock consists primarily of felsic and feldspathic gneiss and granite. Geochemical data from soil borings provided to Dames & Moore by U.S. EPA-Region 1 show significant concentrations of the common feldspar cations (sodium (Na^{+1}), calcium (Ca^{+2}) and potassium (K^{+1})), which supports the observations of the EPA contractors' field geologists. Information contained in the soil boring logs provided to Dames & Moore suggest that the bedrock is appreciably fractured in the uppermost sections and gains structural integrity with depth.

Aquifer test data provided to Dames & Moore by U.S. EPA-Region 1 show that the ground water flow in the bedrock aquifer is complex. However, a review of the information made available to Dames & Moore and the application of basic geologic principles shows that the ground water within the bedrock has two major components of flow:

- Horizontal--flow responds to the horizontal component of the hydraulic gradient related to the pressure gradient and the surface elevations of the water table and to pathway control from the network of fissures and fractures present within the bedrock. Pressure gradients within the bedrock aquifer would respond in part to the local differentials in the downward force due to the weight of the overburden and from communication with the ground water in the overburden. The aquifer test data presented in Appendix G suggest that the bedrock aquifer is fairly well confined. The regional horizontal flow of the bedrock aquifer is thought to be in the radial direction (southwest to northwest) of the regional drainage system; however, the full effects of the pumping of the overburden aquifer for drinking water purposes on the horizontal movement of the bedrock aquifer is not fully understood.

- Vertical--flow in response to gravity and the vertical component of the hydraulic gradient. Stress from the weight of the overburden adds to the pressure head in the bedrock aquifer. Aquifer test data provided in Appendix G suggest that the importance of the vertical components of the hydraulic gradient is important in some locations. Ground water can move downward until it reaches locations where the bedrock integrity is high and prevents its further migration, or where another less conductive geologic unit is encountered and complicates or blocks flow. Large-scale structural features such as faults, complex regional jointing and massive intrusions dikes, sills, plutons etc., would also complicate the vertical migration of deep ground water. Since TCE and PCE are both "sinkers", their migration through the bedrock aquifer is primarily driven by gravity, with pathway control from the system of fissures and fractures.

Both a short term and long term tracer study were conducted in an attempt to resolve the flow characteristics of the bedrock aquifer--the results of these studies are discussed in section 2.7.

2.5 CHARACTERISTICS OF GROUND WATER CONTAMINATION

TCE contamination was first discovered in the Kellogg-Deering Well Field in 1975. Ground water sampling on the Zell/Elinco complex began in 1985. Analytical data and figures developed by NUS (the U.S. EPA-Region 1 contractor) and provided to Dames & Moore support the deduction that the degreasing pit in the Elinco building is a likely local source of soil, soil gas and ground water TCE contamination (Figure 1-3; Ebasco, 1989 [1]). The chlorinated solvent degreasing pit was previously used by Zell Products Corporation and is enclosed in a concrete vault within the northeast section of the Elinco building. Elinco currently has a degreasing pit which is located in the southeast corner of the former Zell processing area (Figure 1-3; Ebasco, 1989 [1]). This degreasing pit/former processing area is the single most likely high-volume source term of TCE contamination located on the Zell/Elinco complex.

Former process areas operated by the Zell Products Corporation which were located in Zell 1 and Zell 2 were filled in and capped with concrete by Pitney Bowes when they leased and moved into these buildings in 1969 and 1974, respectively. Pitney Bowes has not conducted processing or manufacturing activities in these buildings, which have been used for storage, office space and a research and development laboratory. Therefore, the presence of solvent contamination in the soil, soil gas and ground water in and around Zell 1 and Zell 2 could not be related to Pitney Bowes' operations.

TCE is known to readily permeate and corrode concrete, and the concrete trenches associated with the former process area and degreasing pit in the Elinco building were "observed to be deteriorated, apparently from past chemical attack" (Ebasco, 1989 [1]). Therefore, the total volume of TCE likely to have leaked from the degreasing pit to the soil and ground water below the complex may have been substantial. In addition, the previous hydrogeologic investigations of the Zell/Elinco complex have shown a historical problem of VOCs within the ground water. The previous operations of the Zell Products Corporation, (which occupied the three "complex" buildings), are suspected to have included the use of large amounts of chlorinated solvents in their metal plating and degreasing operations.

Although a discussion of contaminant migration within the context of the area's topography, geology and hydrogeologic character is included in the Final Supplemental RI/FS report prepared by Ebasco for U.S. EPA Region 1, the hydrogeologic data are discussed on a regional scale: the Zell/Elinco complex, (as opposed to the degreasing pit and/or TCE tank), is identified as the source of the TCE contamination of the Kellogg-Deering Well field Superfund Site. Dames & Moore has reviewed and interpreted a portion of this data on a finer scale as it applies to the complex, which suggests that the degreasing pit is the most likely source of the TCE contamination. The quantity of TCE in the study area ground water (in the aqueous phase alone) was calculated by Ebasco to be 19,400 pounds; this is equivalent to 1,663 gallons of "free product" (DNAPL) TCE. Since the presence of DNAPL TCE in the subsurface of the source area is highly likely, and as the concentrations of this low-solubility chemical in the ground water below the "complex" have not decreased since monitoring began in 1985, the total quantity of TCE in the ground water in the study area may be many times that estimated by Ebasco. In order to have dissolved such a significant quantity of TCE (19,400 pounds/1,663 gallons) in the site's ground water, a location within the source area must have released at least this quantity of TCE over a period of time long enough to produce the concentrations of aqueous TCE observed to persist in the area.. This observation further suggests that the principal source of TCE contamination that has originated from the "complex" is the degreasing pit in the Elinco building. This deduction is likely for two reasons:

Migration Potential and Pathway:

- The degreasing pit was reported by HRP Associates to be contained enclosed "in a concrete vault-like structure" (HRP, 1984?) TCE is known to readily permeate and corrode concrete, and could pass as free product through the base of the concrete vault under the influence of gravity. Deterioration of the concrete vault around and below the former Zell processing area may provide a significant pathway for the continued release of TCE from Elinco's degreasing pit (Ebasco, 1989 [1]). Bedrock is shallow beneath the degreasing pit at Elinco, and dips significantly in a radial pattern to the north-northwest and west (HRP, 1984?; Dames & Moore, 1989-Figure 5). Therefore, there is a significant component of the bedrock surface gradient from the degreasing pit in the direction of the highly contaminated wells in the source area and downgradient area (Figure 5, Figures 10A-D).

Quantity of TCE vs. Time:

- The estimated quantity of TCE within the source area alone (18,200 pounds/1560 gallons) necessitates a source capable of providing at least this amount of TCE over a long enough period of time to permit its solution. The degreasing pit located in the northeast corner of the Elinco building is the only current potential source of this volume of TCE identified within the "complex." Continued release of TCE from this area through the corroded concrete vault may explain the persistent levels of TCE in the ground water below the "complex."

Information regarding the contamination of both the overburden and bedrock ground water by TCE , PCE and other VOCs is discussed in the following sections within the context of the information presented above in sections 2.2 through 2.4. Information on ground water conditions in the area which were obtained from previous U.S. EPA-Region 1 investigations, and which were subsequently made available to Dames & Moore, is discussed and compared to the most recent data. A more detailed discussion of the

1988 ground water data from both samples collected by Dames & Moore and samples split with the U.S. EPA-Region 1 contractor, NUS, is presented in sections 2.6.4 and 3.1.

2.5.1 Ground Water Contamination in the Overburden

In addition to the ground water data collected since 1985, a shallow (1'-3' deep) soil boring sample obtained from the Elinco property in 1988 (discussed in section 2.6.3) showed concentrations of TCE more than two times greater than in a similar sample obtained from K-19B on the property leased by Pitney Bowes; this further suggests that the principal source of TCE within the "complex" is the degreasing pit on the Elinco property.

Figures 10A and 10B show the approximate concentration contours of TCE in the overburden ground water for 1985 and 1988, respectively. These Figures were constructed using the ground water data obtained by NUS during the supplemental RI/FS (Ebasco, 1989 [1]). As shown in Figures 10A and 10B, the elongated area of highly contaminated ground water in the overburden generally follows the dip of the bedrock surface from the northeast corner of the Elinco building (degreasing pit) to the northwest corner of Zell 1 (location of MW-101).

The highest concentrations of TCE in the overburden have consistently occurred in the downgradient well MW-101 (23,000 ppb--Dames & Moore). MW-101 occupies the second lowest downgradient position on the bedrock surface, and is screened approximately 30 feet lower than the bedrock surface below the degreasing pit in the Elinco building (Figure 5; Figure 9). Although overburden well K-11 is both closer to the Elinco property and 5 feet lower on the bedrock surface, TCE was detected at much lower concentrations (3,700 ppb--Dames & Moore) in 1988. These data might suggest that MW-101 is in more direct communication with the subsurface below the degreasing pit than K-11 and/or the thickness of the overburden (38.5 feet) and the local stratigraphy limits hydrologic communication between the degreasing pit and K-11. However, additional data provided to Dames & Moore by U.S. EPA from the field laboratory analysis of ground water from K-11 showed substantially higher concentrations of TCE and PCE (Appendix E). Overburden wells MW-104 (1,300 ppb--Dames & Moore) and K-19A (120 ppb--Dames & Moore) showed considerably lower concentrations of TCE. Although information available to Dames & Moore on the previous ground water sampling events is incomplete. TCE concentrations in overburden wells MW-104 (2,200-3,342 ppb-NUS) and MW-101 (16,000-37,660-NUS) reported by NUS in 1985 are consistent with the most recent data.

The 1988 ground water data obtained by Dames & Moore is provided in Tables 3 through 6 and a more detailed discussion of this data is presented in sections 2.6.4 and 3.1 of this report.

2.5.2 Ground Water Contamination In the Bedrock

As discussed in the previous sections 2.4.2, 2.4.3, 2.5 and 2.5.1, the thin veneer of overburden material above the bedrock well locations near the Elinco building (MW-1, MW-2, MW-3) would permit the recurrent and relatively rapid downward infiltration of TCE and PCE and the downward vertical migration of DNAPL and contaminated ground water from the overburden to the bedrock aquifer. Therefore, it is logical that from 1985 until recently, the highest concentrations of TCE in the bedrock ground water have occurred in MW-3 (Figure 10C), adjacent to the northwest corner of the Elinco building and close to the location of the degreasing pit (~100' west-southwest and ~10' lower along the bedrock surface; Figure 5). However, bedrock ground water data from the 1988 sampling events (Figure 10D) indicate that the center of the plume of TCE contamination appears to have migrated from MW-3 to MW-100, "downhill" approximately 20' along the bedrock surface (Figure 5). This conclusion is supported by two separate but related observations:

- TCE concentrations in MW-3 have decreased from as high as 73,950 ppb (NUS) in December, 1985 to as low as 53,000 ppb (NUS) in 1988;

- TCE concentrations in MW-100 have increased from as low as 30,000 ppb (NUS) in November, 1985 to as high as 170,000 (NUS) ppb in 1988.

2.6 MONITORING WELL INSTALLATION & SAMPLING/ SOIL BORING PROGRAM

2.6.1 Activities

Two (2) soil samples were collected from monitoring well K-19B which is located between the Zell 1 and Zell 2.

Four (4) ground water samples were collected from the monitoring wells surrounding the Zell Building (K-11, MW-100, K-19A, K-19B). These samples were collected on March 24, 1988 and the samples were split with NUS Corporation (EPA Contractor). On March 29, 1989 and December 23, 1989, ground water samples were collected from wells MW-100, MW-101, MW-104 and MW-105 before and after the interceptor well pumping test conducted by Fuss & O'Neil: this data is discussed in Section 3.

2.6.2 Results of Soil Samples Collected from K-19B

The soil samples were collected from monitoring well K-19B which is located between the Zell Buildings. The samples were collected over (2) intervals .5-2.5 feet and 5-7 feet below the surface and analyzed for the parameters on the Target Compound List. The results of the analyses are summarized in Tables 2 and 3. The following is a summary of the results. In addition, results of the analysis of a surface soil sample adjacent to the Elinco building are presented and discussed.

1. Inorganic Parameters - The values for most metals (Table 3) were within the typical background concentrations of metals in soils (Booz-Allen & Hamilton, 1983). Values reported for certain metals such as arsenic, barium, vanadium and zinc and are most likely related to the former metal plating operations conducted by Zell Products Corporation. Pitney Bowes has not conducted processing or manufacturing activities in Zell 2, which has been used since 1974 for engineering office space and a research and development laboratory. Therefore, the presence of these metals can not be related to Pitney Bowes' operations.

2. Volatile Organics - Detectable amounts of acetone, methylene chloride and two phthalates (Di-n-butylphthalate and bis (z-ethylhexyl) phthalate) were found in the soil samples and in the laboratory blank. These compounds are common laboratory reagents and are not suspected to be related to the area's ground water contamination;

   - Detectable amounts of 1,2-Dichloroethene (15 ppb), TCE (207 ppb) and PCE (110 ppb) were found in the shallow soil sample. These compounds were not detected in the deeper soil samples, which suggests that their presence in the shallow sample is probably related to the former plating operations of Zell Products Corporation: this location is believed to be near a former unlined metal processing pit operated by Zell. Pitney Bowes filled in and paved the former processing and pit areas prior to moving into the building and has not conducted operations at Zell 2 which could have resulted in this contamination;

   - The remaining nine (9) compounds detected are Polynuclear Aromatic Hydrocarbons (PAH). PAH's were not detected in the deeper sample. These compounds are generally associated with coal tars and asphalt, and may be related to the downward infiltration of surface water through the parking lot. These data are provided in Table 2.

2.6.3 Results of Soil Samples Collected from the Elinco Property

The analytical results of soil boring ESB-1 (NUS corporation) from the Elinco property in 1988 were made available to Dames & Moore, and are summarized below:

1. Inorganic Parameters -The detected values for most metals were comparable to those from the 1-3' sample from K-19B.

2. Volatile Organics - Detectable amounts of acetone and methylene chloride were found in the soil samples and in the laboratory blank. These compounds are common laboratory reagents and are not suspected to be

related to the local ground water contamination. A breakdown of the pertinent VOC data is as follows;

- Trichloroethene (TCE) and Tetrachloroethene (PCE) were found at concentrations of 510 ppb and 97 ppb, respectively, in the shallow soil sample. This concentration of TCE is over twice as high as that found in K-19B. Unfortunately, deeper soil samples were not obtained from ESB-1.

The analytical results of a soil sample taken from a previous boring from within the Elinco building showed TCE concentrations an order of magnitude higher (2,000 ppb) than those detected in ESB-1: this data was reported by U.S. EPA (Appendix F).

2.6.4 Results of Ground Water Samples Collected

The first round of ground water samples were collected on March 24, 1988 by York Laboratories (Dames & Moore Contractor). These samples were split with NUS corporation (EPA Contractor). The analytical results of the sampling are presented in Table 3. The following is a summary of the results.

- Well location K-11 (overburden): detectable concentrations (0-120 ppb range) of 1,1,1-trichloroethane (TCA) and tetrachloroethene (PCE) were found in the ground water sample of both splits. Trichloroethene (TCE) concentrations of 1000-5500 ppb were also found in the sample. TCE is a potential breakdown product of PCE, one of the original contaminants suspected on site. As seen in Figures 5, K-11 is downgradient along the bedrock surface (Figure 5) of the suspected source of contamination (the degreasing pit on the Elinco property). Although TCE concentrations have decreased in the ground water from this overburden well since ground water sampling began in 1985, TCE concentrations have increased in MW-100 during this period; MW-100 is a bedrock well adjacent to the overburden well K-11 (Figure 9). This observation may indicate that contaminated overburden ground water and/or DNAPL TCE is infiltrating the bedrock aquifer through a fracture in the bedrock surface at this location.

- Well location MW-100 (bedrock): low concentrations of PCE and 1,2-dichloroethene were found in both of the split samples. Elevated levels of TCE (up to 170,000 ppb-NUS) were also reported in both analyses of the split sample. This well is located within a few feet of K-11 and monitors the bedrock water aquifer (Figure 9). TCE concentrations in the ground water from this bedrock well have increased since ground water analyses began in 1985, which indicates that the center of the VOC contaminant plume has migrated downward along the bedrock surface from MW-3 on the Elinco property (Figure 10C, Figure 10D).

- Well location K-19A (overburden): detectable concentrations of TCE, PCE and 1,1,1-trichloroethane were found in the ground water samples analyzed by York Laboratories and NUS Corporation. Detectable amounts of these compounds were reported in the overburden soil samples collected from the installation of monitor well K-19B. As previously discussed, these contaminants can not be related to Pitney Bowes' operations.

- Well location K-19B (bedrock): PCE was found at a concentration of 9,700 ppb and elevated levels of TCE (47,000) were detected in the ground water sample analyzed by York Laboratories. PCE and TCE were detected at high levels (17,000 and 130,000 ppb, respectively) in the sample analyzed by NUS Corporation. These anomalous concentrations are probably related to the former metal processing area operated by Zell Products Corporation, and can not be related to Pitney Bowes' operations.

2.7 TRACER STUDY

2.7.1 Background

The objective of the tracer study was to estimate the flow rate, direction and dispersion characteristics of the ground water and the contaminants it contains within the region encompassing the Pitney Bowes/Elinco complex. A short term tracer study was initiated on April 11, 1988 and a long term study began on April 12, 1988.

2.7.2 Short Term Tracer Study

The short term test utilized a sodium chloride (NaCl) ionic tracer solution. Chloride, like bromide, is a conservative tracer which poses no health risk in ground water. Two different ions were used to facilitate the segregation and interpretation of the data from the two separate tracer studies.

To initiate the short term test, a slug consisting of 50 gallons of a 10,000 mg/l solution of NaCl was injected over a 45 minute period into monitoring well MW-1. Injection of the chloride was performed on April 11, 1988. After injection, monitoring well MW-100, MW-103 and MW-104 were sampled on a near daily basis through May 11, 1988 and analyzed for the presence of the chloride ion. After May 11, the sampling interval was reduced to once a week until June 2, 1988, when the short term tracer study was terminated.

The results of the short term tracer study are presented in Table 7. The four monitoring wells sampled periodically did not show a significant increase of the chloride ion concentrations in the ground water. In fact, no observable trend in chloride concentration appears to have occurred in these wells over the course of this study. As discussed in section 2.3, the felspar cations sodium (Na^{+1}), calcium (Ca^{+2}) and potassium (K^{+1}) are present in great abundance in the overburden soils and bedrock. These conditions are ideal to scavenge the chloride ion from solution, and therefore greatly complicate the behavior of chloride in this aquifer. Therefore, Dames & Moore views the short term tracer study to be inconclusive, and to provide no additional information as to the hydrogeologic conditions of the site.

2.7.3 Long Term Tracer Study

The long term study involved the injection of sodium bromide (NaBr) in the two upgradient bedrock wells near the Elinco Building, MW-1 and K-10.

One hundred gallons of 10,000 mg/l concentration NaBr solution was introduced into the ground water at both well K-10 and well MW-3. Several wells, including K-8, K-14, K-15, K-21, K-24 have been periodically sampled and analyzed for the presence of the bromide ion. The long term tracer study was discontinued on July 6, 1988. Results of the long term tracer study are included in Table 8 as well.

Results of the long term tracer are mostly inconclusive. Isolated anomalous concentrations of bromide were detected in bedrock wells located in directions ranging from north (K-20B, 7/19/88; K-9B, 8/09/88) to northwest (K-6B, 8/09/88; K-18B, 8/19/88) to southwest (K-8, 5/03/88), although no recognizable migration pattern is apparent (Table 8). However, not enough information has been made available to determine the hydrologic relationship of many of these well locations relative to the injector wells. Detectable levels of bromide were detected at least once in all of the wells monitored; however, the data does not show a clear trend in bromide concentration in the wells monitored (Table 8). As discussed in the previous sections, the geochemical conditions present within the bedrock (abundance of weathered feldspar and free sodium (Na^{+1}), calcium (Ca^{+2}) and potassium (K^{+1})) are ideal to scavenge the bromide ion from solution, and therefore greatly complicate the behavior of bromide in this aquifer. Therefore, in Dames & Moore's professional opinion, a tracer study using a conservative (non-interactive) tracer compound relative to the region's geochemistry would provide more useful information on the flow characteristics of the bedrock aquifer.

3.0 GROUND WATER SAMPLING BEFORE AND AFTER INTERCEPTOR WELL PUMP TEST

3.1 ACTIVITIES

Ground water sampling before and after the interceptor well pump test performed by Fuss & O'Neil was conducted to evaluate whether the ground water pumping from the interceptor well has induced contamination under the area surrounding the Zell Building presently leased by Pitney Bowes.

3.1.1 Results of Ground Water Sampling Before Pump Test

Ground water sampling The Fuss & O'Neil pump test was conducted on March 29, 1988. These results are presented in Table 5. The following is a summary of the results:

- Well location MW-101 (overburden) - Elevated concentrations (23,000 ppb) of TCE and a lower concentration of 1,2-dichloroethene (1,400 ppb) were found in the ground water sample. These concentrations are higher (by one order of magnitude) than those reported in ground water samples from the other overburden wells on site (Figure 10A, Figure 10B). This elevated level of TCE is most likely related to the collection of TCE along the bedrock surface at this location, as it is one of the lowest bedrock surface points sampled downdip of the the degreasing pit on the Elinco property. Figure 5 depicts the bedrock surface relief of the Elinco-Zell "complex," and illustrates the relative locations of the site's wells with respect to one another and MSL.

- Well location MW-104 (overburden) - Detectable amounts of PCE (62 ppb) and 1,1,1-trichloroethane (34 ppb) were reported in this ground water sample. TCE (1,300 ppb) was also found in this sample. Since the beginning of ground water analyses in 1985, TCE levels have decreased in this well;

- Well location MW-100 (bedrock) - PCE (5,100 ppb) and 1,2-dichloroethene (4,800 ppb) were found in the sample. Elevated levels of

TCE (140,000 ppb) were also found in the sample. This well monitors the bedrock zone and is located within a few feet of K-11, an overburden well. TCE concentrations in the ground water of this bedrock have increased since ground water analyses were started in 1985. This suggests that TCE contamination is continuing to migrate downdip from the degreasing pit in Elinco building along the bedrock surface. MW-100 is screened below the lowest point on the site in terms of bedrock surface elevation (Figure 9);

- *Well location MW-105 (bedrock) - no contaminants were detected in the ground water sample collected at this location. These results are consistent with past analytical results.*

3.1.2 Results of Ground Water Sampling After Pump Test

On December 23, 1988, after Fuss & O'Neil completed pumping the interceptor well on the Pitney Bowes property, ground water samples were collected by Dames & Moore from three monitoring wells (MW-101, MW-104, MW-105) surrounding the Pitney Bowes building. A fourth well (MW-100), which was proposed to be sampled, was locked and inaccessible to field personnel. A discussion of these analyses are summarized below and are presented in Tables 5 and 6.

- Well location MW-101 (overburden) - an elevated concentration (18,000 ppb) of TCE and lower concentrations of 1,2-dichloroethene (2,000 ppb) and acetone (2,500 ppb) were detected in the ground water sample.

- Well location MW-104 (overburden) - similar concentrations of TCE (1,400 ppb) and PCE (63 ppb) were detected after the pump test as compared to those before. This suggests that a source of TCE still exists at the "complex," (i.e. Elinco's degreasing pit and/or DNAPL below the "complex");

- Well location MW-105 (bedrock) - no elevated concentrations of solvents were detected in the ground water at this location. These results are consistent with past ground water data from this location.

Table 7 summarizes the December 23, 1988 analytical results along with the results of the March 29, 1988 sampling event. Upon comparison of the analytical results of the ground water sampling prior to and after completion of the Fuss & O'Neil field work, we can conclude that the concentrations of the contaminants in the ground water have more or less remained consistent. As previously mentioned, the pumping of the interceptor well appears to have no significant affect on the concentration of TCE present in the overburden ground water.

4.0 SOIL GAS SURVEYS AND RESULTS

Soil gas surveys have recently become a common screening technique for volatile organic compounds in the shallow subsurface. Soil gas analysis is a relatively new tool which has only become commonplace in the past few years. Since there is a wide degree of variability in both the sampling and analytical methodologies employed by different soil gas investigators, soil gas surveys have so far been limited in usefulness to a screening technique for VOCs. The results of soil gas surveys are dependent on two major factors:

- The Henry's Law constant of each VOC analyte (i.e., the relative tendency of a compound to prefer to exist in the vapor phase rather than in the liquid or dissolved phase) and;

- The stratigraphic "tightness" of the soil unit at the sampling depth--this is dependent on the percentage of fine-grained material (silt, clay) present in the soil, the soil's moisture content and the soil's organic content. Therefore, a coarse-grained (high sand, gravel content), low-organic content, dry soil would be well suited for a soil gas survey, whereas a fine-grained (high silt, clay content), high-organic content, wet soil would be relatively "tight" and poorly suited for a soil gas survey. From the description of the geologic setting of the site presented in the previous sections, the Elinco-Zell building complex is well suited for a soil gas survey.

The soil gas surveys were performed by NUS corporation, the U.S. EPA-Region 1 contractor. Soil gas samples were generally taken at uniform depths of 2-3 feet below grade, except in locations where a depth profile was desired (Table 9A, Appendix F). After approximately ten (10) sample tube volumes of air were purged, soil gas samples were taken directly from the PVC sampling tube with a syringe and injected into a portable gas chromatograph for analysis. A description of the soil gas sampling and analysis work plan utilized by NUS is included in Appendix F.

Since the soil gas samples taken from the Elinco-Zell building complex were taken from shallow depths within the overburden, these samples represent the presence of the analyte VOCs within the unsaturated zone above the overburden ground water table.

In effect, the VOCs present in the soil gas samples represent a composite of both the vapor phase of the "product" which has entered the overburden directly via infiltration, and the vapor phase fraction of these VOCs which enters the unsaturated zone by volatilization from the dissolved VOCs in overburden ground water.

4.1 INDOOR SOIL GAS SURVEY AND RESULTS

Soil gas samples were taken through the floors of the Elinco plant and Zell buildings by NUS corporation, the U.S. EPA-Region 1 contractor (Figure 11, Table 9B). This soil gas survey detected TCE, PCE and 1,1,1 TCA beneath the Elinco plant's degreasing pit and TCE beneath both Zell 1 and 2. A summary of the analytical results of the indoor soil gas survey is as follows:

1) Elinco plant: three soil gas samples (and one duplicate) were taken from beneath areas adjacent to the degreasing pit. TCE (4040 mg/M^3), PCE (115 mg/M^3) and 1,1,1 TCA (50 mg/M^3) were detected in ESG-1 and its duplicate. This sample was taken adjacent to and north (downgradient) of the degreasing pit (Table 9B, Figure 11). ESG-2 and ESG-3 did not test positively for these parameters.;

2) Zell 1 and Zell 2:

Zell 1: three soil gas samples, and one duplicate, were taken from areas beneath Zell 1. These samples were only analyzed for TCE. TCE was detected in PSG-1 (6,233.6 mg/M^3) and its duplicate PSG-1A (4,315.2 mg/M^3), PSG-2 (4,029.2 mg/M^3) and PSG-3 (3,945.5 mg/M^3). PSG-1 is close to the west wall of Zell 1, near the location of wells K-11 and MW-100. PSG-2 and PSG-3 are located approximately 30 and 50 feet NNE of PSG-1, respectively (Figure 11).

Zell 2: two soil gas samples were taken from areas beneath Zell 2. These samples were only analyzed for TCE. TCE was detected in both PSG-4 (14,890.2 mg/M^3) and PSG-5 (1595.4 mg/M^3). These sample locations are along the west wall of Zell 2, and are directly downgradient of the degreasing pit near the NE corner of the Elinco plant. PSG-5 and PSG-4 and within 30 and 75 feet of wells K-19A and K-19B, which are between Zell 1 and 2 (Figure 11).

The analytical results of the indoor soil gas survey data are consistent with the trends observed in the analytical data from the overburden ground water wells. Since the soil gas samples are drawn from the unsaturated zone directly above the overburden ground water table, the correlation with concentrations of TCE within the overburden ground water near these sample locations observed is understandable. While a comparison of the indoor soil gas survey data (Table 9A) and the overburden ground water data (Tables 4 through 7) generally support this correlation, supplementary analytical data from well K-19A (near PSG-4 & 5) and well K-11 (near PSG-1, 2 & 3) provided to Dames & Moore by U.S. EPA show a strong correlation between the concentrations of TCE in soil gas and shallow ground water (Appendix F). This correlation suggests that a substantial fraction of the VOCs detected in the soil gas of the unsaturated zone beneath the "complex" is due to vapor-phase volatilization of the VOCs in the shallow ground water.

4.2 *OUTDOOR SOIL GAS SURVEY AND RESULTS*

Soil gas samples were taken by NUS corporation, the U.S. EPA-Region 1 contractor from the area surrounding the Elinco plant and the Zell buildings (Figure 11, Table 9A). Soil gas samples were analyzed for TCE, PCE, 1,1,1 TCA and selected petroleum hydrocarbons. TCE was detected in several samples in three general locations:

- Northeast corner of the Elinco plant near the degreasing pit: samples 19, 66, 67 and 68 showed between 23.9 and 320.1 mg/M^3 of TCE (Figure 11, Table 9A). Samples 54A, 54B, and 54C were taken as a soil gas depth profile near the northeast corner of the Elinco plant. This sample location is close to the former location of Elinco's aboveground TCE tank, and suggests surface contamination of soils at this location are related to this tank.

- Between Elinco and Zell Buildings: sample 94 (641.6 mg/M^3 of TCE and 14.0 mg/M^3 of 1,1,1 TCA) is located midway between the center of the north wall of the Elinco plant and the south wall of Zell 1. PCE was detected in sample 39 (123.0 mg/M^3), which is adjacent to the center of the west wall of the Elinco building and is close to the location of MW-3.

- Zell 1 & Zell 2: TCE was detected in several soil gas samples located between Zell 1 and 2 and PCE was also detected in two of these samples. Sample 56 showed both PCE and TCE (2206.5 mg/M^3 of PCE and 1121.1 mg/M^3 of TCE, respectively) at levels that correlate to the concentrations observed in K19-A. Sample 37 showed similar concentrations of PCE to TCE, (6640.0 mg/M^3 of PCE and 229 mg/M^3 of TCE, respectively). These sample locations are adjacent to one another, and both are close to the positions of wells K-19A and K-19B. Only TCE was detected in sample 38 (29.0 mg/M^3), which is approximately 50 feet south of sample 37. VOCs were not detected in other samples taken between Zell 1 and 2. This information supports the findings of both the indoor soil gas survey and the ground water data, and suggests that the VOC contamination at these locations is residual due to a combination of the former metal processing operations of Zell Products Corporation.and the upward migration of vapor phase PCE and TCE from the shallow ground water.

5.0 CONCLUSIONS

The findings of this report are based on the interpretation of analytical data provided to Dames & Moore by U.S. EPA-Region 1 which was obtained from samples of soil, soil gas and ground water from the Elinco-Zell building complex. Based on the conclusions of the the December 4, 1987 report prepared by Dames & Moore for Murtha, Cullina, Richer and Pinney together with the information presented in this report, the following conclusions regarding the site characteristics and contamination present at the Elinco-Zell building complex can be made:

- Pitney-Bowes does not store, use or dispose of significant quantities of TCE in The Zell Building complex located at 276 Main Street in Norwalk, CT, and did not have TCE on site until 1983-1984: their entire inventory of TCE since they have occupied the Zell building complex has amounted to approximately 56 gallons (one 1-gallon container was purchased in 1983 and one 55-gallon drum was purchased by Pitney Bowes in 1984).

- Elinco has a history of extensive TCE use and potential release. A degreasing pit located near the NE corner of the Elinco plant is the probable source of local TCE and PCE contamination.

- The Elinco plant degreasing operations area has the greatest degree of soil contamination by VOCs as reported by U.S. EPA.

- VOC contamination in the overburden ground water is the highest in downgradient well locations which occupy the lowest positions along the bedrock surface relative to MSL. Analytical data from the overburden wells show that aqueous TCE concentrations are remaining relatively constant in these wells (MW-101, K-11). This suggests that either the degreasing pit in the Elinco building is continuing to release TCE, (which subsequently migrates down the bedrock surface gradient), and/or that DNAPL TCE present in the bedrock fractures continues to dissolve and replace the aqueous TCE being removed by the natural flushing of the ground water below the "complex."

- The center of the plume of TCE contamination in the bedrock aquifer has apparently migrated from beneath and adjacent to the Elinco plant in 1985 (well MW-3; Figure 10C) to MW-100 in 1938 (Figure 10D).

- Data obtained from the indoor and outdoor soil gas surveys show TCE and PCE contamination both near the degreasing pit, and near both Zell 1 and Zell 2. The soil gas data shows a strong correlation with the overburden ground water data.

- The short term and long term tracer studies were inconclusive and do not resolve the ground water flow patterns within the bedrock aquifer.

- The pump test of a downgradient interceptor well on the Zell property leased by Pitney Bowes did not significantly affect the ground water quality within the bedrock aquifer. As previously discussed, this suggests that a source of TCE still exists at the "complex," (i.e. Elinco's degreasing pit and/or DNAPL below the "complex")

- Both TCE and PCE have been detected in ground water from monitor wells MW-101, MW-104, and K-11 and bedrock wells MW-100 and MW-3 near Zell Building 1 and the Elinco Building. A likely source of TCE and PCE is the degreasing operation near the northeast corner of the Elinco Building. From the Elinco degreasing operation, the probable pathways of migration are northward along the paved surface entering the ground near Zell Building 1 or directly into the subsurface near the Elinco Building and subsequent migration of TCE down the bedrock surface gradient.

- The Zell building complex located at 276 Main Street in Norwalk, CT, (currently occupied by Pitney Bowes) is downdip of the degreasing pit in the northeast corner of the Elinco plant in terms of the bedrock surface. TCE and PCE (both common degreasing solvents) have specific gravities of 1.47 and 1.62, respectively, and tend to "sink" downgradient under the influence of gravity; therefore, solvents in groundwater travel in a northwest-west direction from the subsurface below the degreasing pit toward and under the Zell Building 1, accumulating in bedrock surface depressions, sinking through fractures, and continuing along the regional hydraulic gradient toward the Kellogg-Deering Well Field.

- The information presented in the Final Supplemental RI/FS report (Ebasco, 1989, [1]), Dames & Moore's 1987 report (Appendix H) and this report strongly support the conclusion that Pitney Bowes' operations in the Zell buildings 1 and 2 could not have contributed to the TCE contamination found in the Kellogg-Deering Well Field Superfund Site.

TABLE 1

GEOPHYSICAL DATA

PITNEY BOWES, NORWALK

Well, Soil Boring #	Overburden Sfc. Elev.	Bedrock Sfc. Elev.	Overburden Thickness
K-11	78.45	39.95	38.50
MW-100	81.00	43.00	38.00
MW-101	80.00	44.10	35.90
K-18B*	77.29	56.79	20.50
K-18A*	77.56	57.56	20.00
K-19B	80.17	63.07	17.10
K-19A	80.20	63.70	16.50
MW-105	83.00	66.00	17.00
MW-106	83.00	66.50	16.50
MW-103	83.00	73.00	10.00
K-10*	82.16	73.16	9.00
MW-104	81.00	75.00	6.00
MW-3*	78.28	60.28	18.0
MW-2*	76.57	65.57	11.0
MW-102	101.00	95.00	6.00
MW-1*	105.23	99.73	5.50

* Wells, soil borings on Elinco property

Elevations corrected to feet above MSL

Elevations of ground surface, bedrock sfc and calculations of overburden thickness based on these data were obtained from the boring logs & monitor well construction diagrams included in Appendix H.

TABLE 2

VOLATILE ORGANIC ANALYSES
SOIL BORING K-19B

VOLATILE ORGANICS PARAMETER	K-19B 0.5-2.5 DEPTH CONC. (ppb)	FLAG	K-19B 5.0-7.0 DEPTH CONC. (ppb)	FLAG	TRIP BLANK CONC. (ppb)	FLAG
Acetone	64		76	B	16	B
Methylene Chloride	59		17	B	5	B
1,2 dichloroethene (Total)	15					
Trichloroethene	207					
Tetrachloroethene	*110*					
Di-n-butylphthalate	350	JB	610	JB		
Phenanthrene	570	J				
Fluoranthene	1100					
Pyrene	1100					
Benzo (a) anthracene	580	J				
Chrysene	680	J				
Bis(2-Ethylhexyl) phthalate	2700		340	J		
Benzo (b) fluoranthene	1300					
Benzo (a) pyrene	830	J				
Indeno (1, 2, 3-cd) pyrene	490	J				
Benzo (g, h, i) perylene	470	J				
Tentatively ID Compounds	22		15			

Notes on Lab Flags

B = Analyte was found in the blank as well as in the sample.
J = The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.

TABLE 3

INORGANIC ANALYSES
SOIL BORING K-19B

INORGANICS PARAMETER	K-19B 0.5-2.5 DEPTH CONC (ppb)	FLAG	K-19B 5.0-7.0 DEPTH CONC. (ppb)	FLAG
Aluminum	20419.4		14205.9	
Antimony	19.4	UN	17.6	U
Arsenic	9.2	S	3	S
Barium	107.1		60.3	
Beryllium	1.3	B	0.9	B
Cadmium	1.6	U	1.5	U
Calcium	3225.8		1694.1	
Chromium	29		26.2	
Cobalt	13.9	B	10.9	B
Copper	31.3		15.9	
Iron	23515.1		18941.2	
Lead	9.7	N*	5.6	N*
Magnesium	5483.9		5323.5	
Manganese	658.1		388.2	
Mercury	0.2	C	0.2	C
Nickel	19.7		16.2	
Potassium	1190.3	B	1802.9	
Selenium	1.3	U	1.2	U
Silver	3.2	UN	2.9	UN
Sodium	645.2	U	588.2	U
Thallium	1.3	UN	1.2	UN
Vanadium	41.3	P	27.9	
Zinc	112.3	E	52.6	E
Cyanide	0.81	U	0.74	U

Notes on Lab Flags

B = Analyte was found in the blank as well as in the sample.
J = The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.
U = Indicates compound was analyzed for but not detected.
N = Indicates spike sample recovery is not within control limits.
E = Indicates a value estimated or not reported due to the presence of interference.
C = Pesticide parameter confirmed by GC/MS.
* = Indicates duplicate analysis is not within control limits.
S = Indicates a value determined by method of standard addition.

TABLE 4

GROUND WATER ANALYTICAL DATA
March 24, 1988

VOLATILE ORGANICS PARAMETERS (ppb)	K-11 VALUE	FLAG	MW-100 VALUE	FLAG	K-19A VALUE	FLAG	K-19B VALUE	FLAG	BLANK #1 VALUE	FLAG	BLANK #2 VALUE	FLAG
Methylene chloride	725 *	B	3,500 *	B	13	B	1,950 *	B	9.5		14.0	
Acetone	2,550 *	B	*		19	B	*		19.0		16.0	
1,1,1-trichloroethane	67	J	4,500		67	J						
Trichloroethene	3,700		130,000	J	120		47,000				4.5	J
1,2-dichloroethene (total)	61	J	5,200	J	13		4,700					

Notes on Lab Flags

B = Analyte was found in the blank as well as in the sample.
J = The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.
* = denotes that value was blank subtracted

TABLE 5

GROUND WATER ANALYTICAL DATA
MARCH 29, 1988

EPA TCL VOLATILE ORGANICS PARAMETER	STATE OF CT ACTION LEVEL	MW-101 CONC. (ppb)	FLAG	MW-104 CONC. (ppb)	FLAG	MW-100 CONC. (ppb)	FLAG	MW-105 CONC. (ppb)	FLAG	TRIP BLANK CONC. (ppb)	FLAG
Methylene chloride	25					*				8	JB
Acetone	NONE	*		*		*					
1,2-dichloroethene (total)	NONE	1,400				4,800	J				
1,1,1-trichloroethane				34	J						
Trichlorcethene	25	23,000		1,300		140,000					
Tetrachloroethene	20			62		5,100					
Toluene	1,000			*		200*	JB				

Notes on Lab Flags

B = Analyte was found in the blank as well as in the sample.
J = The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.
* = denotes that value was blank subtracted

TABLE 6

GROUND WATER ANALYTICAL DATA

DECEMBER 23, 1988

VOLATILE ORGANICS PARAMETERS (ppb)	STATE OF CT ACTION LEVEL	MW-101	MW-104	MW-105	TRIP BLANK
Methylene Chloride	25	U	U	U	U
Acetone	None	2,500	130	6J	6J
1,2 dichloroethene (total)	None	2,000	U	U	U
Trichloroethene (TCE)	25	18,000	1,400	U	U
Tetrachloroethene (PCE)	20	U	63	U	U
Toluene	1,000	150J	U	5	2J

U = The compound was analyzed for but not detected.
B = Analyte was found in the blank as well as in the sample.
J = The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.

TABLE 7

GROUND WATER DATA COMPARISON

ZELL BUILDING WELLS

VOLATILE ORGANICS PARAMETERS (ppb)	MW-101 12/23/88	MW-101 3/29/88	MW-104 12/23/88	MW-104 3/29/88	MW-105 12/23/88	MW-105 3/29/88
Methylene Chloride	U	U	U	U	U	U
Acetone	2,500	B	130	B	6J	U
1,2 dichloroethene (Total)	2,000	1,400	U	U	U	U
Trichloroethane (TCA)	U	U	U	34	U	U
Trichloroethene (TCE)	18,000	23,000	1,400	1,300	U	U
Tetrachloroethene (PCE)	U	U	63	62	U	U
Toluene	150J	U	U	B	5	U

U = The compound was analyzed for but not detected.
B = Analyte was found in the blank as well as in the sample.
J = The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.

TABLE 8

SUPPLEMENTAL RI - TRACER TEST RESULT
OBSERVATION WELLS
KELLOGG DEERING WELL FIELD SITE
NORWALK, CONNECTICUT

Date Sampled	Short term Tracer Test Observation Wells Chloride Concentration (mg/l) MW 1[1]	MW 100	MW-103	MW-104	MW-3[2]	MW-102	K-3A	K-3B	K-6B	K-8	K-9B	K-11	K-14	Long term Tracer Test Observation Wells Bromide Concentration (mg/l) K-15	K-18A	K-18B	K 20B	K 21	K 24
4/10/88[3]	1.85	2 90	4.26	2.30	<0.79	- -	<0.79	<0 79	- -	<0.79	- -	<0 79	- -	<0.79	- -	- -	- -	- -	- -
4/12/88	- -	2 90	4.26	2.30	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
4/13/88	- -	2 98	4.26	2.70	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
4/14/88	- -	2 60	3.48	1.85	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
4/15/88	- -	2 40	- -	1.78	- -	- -	<0.79	- -	- -	- -	- -	<0.79	- -	<0.79	- -	- -	- -	- -	- -
4/17/88	- -	3 37	>3 55	2.30	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
4/18/88	- -	3.30	3.55	2.41	- -	- -	<0 79	<0 79	- -	- -	- -	<0.79	- -	<0.79	- -	- -	- -	- -	- -
4/19/88	- -	3.12	3.73	2.27	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
4/20/88	- -	3.20/3.41[4]	3.90/3.72	2.20/2.49	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
4/21/88	- -	3.34/3.26	3.51/3.51	2.41/2.27	- -	- -	<0.79	<0.79	- -	- -	- -	<0.79	- -	<0.79	- -	- -	- -	- -	- -
4/22/88	- -	3.26	3.55	2.27	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	<0 79	- -
4/24/88	- -	3 83	3.72	2.13	- -	- -	<0 79	<0 79	- -	- -	- -	<0 79	- -	<0.79	- -	- -	- -	- -	- -
4/25/88	- -	2 52/2 41	3.72	1.74	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
4/26/88	- -	- -	3.40	1 70	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
4/27/88	- -	2 66	3.48	1.78	>100	- -	<0 79	<0 79	- -	- -	- -	<0.79	- -	<0.79	- -	- -	- -	<0 79	- -
4/28/88	- -	3 49	3 62	1 92	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
4/29/88	- -	- -	3.55	1.86	- -	- -	<0.79	<0 79	- -	- -	- -	- -	- -	<0 79	- -	- -	- -	<0 79	- -
5/03/88	9 94	2 63	3.12	1.85	- -	- -	<0 79	- -	- -	14 6	- -	- -	<0 79	<0.79	- -	- -	- -	<0 79	- -
5/06/88	- -	3.10	2 80	2 19	- -	- -	<0.79	- -	- -	<0 79	- -	- -	<0.79	<0.79	- -	- -	- -	<0 79	<0 79
5/10/88	- -	3 55	3.20	2.16	- -	- -	- -	- -	- -	<0.79	- -	- -	<0 79	<0.79	- -	- -	- -	<0 79	<0 79
5/19/88	- -	2 41	1.60	1.80	- -	- -	- -	- -	- -	<0.79	- -	- -	0.95	0.95	- -	- -	- -	<0 79	<0 79
5/25/88	- -	3.48	4 60	2.55	- -	- -	- -	- -	- -	<0.79	- -	- -	<0.79	<0.79	- -	- -	- -	<0 79	<0 79
6/02/88[5]	- -	2 55	4.26	2.67	- -	- -	- -	- -	- -	<0.79	- -	- -	<0 79	<0.79	- -	- -	- -	<0 79	<0 79
6/09/88					- -	- -	- -	- -	- -	0.43	- -	- -	0 49	0.38	- -	- -	- -	0 51	0 24
6/15/88					- -	- -	- -	- -	- -	0.49	- -	- -	0.57	0.46	- -	- -	- -	0 47	0 55
6/22/88					- -	- -	- -	- -	- -	0.46	- -	- -	0.60	0.45	- -	- -	- -	0 48	0 36
6/30/88					- -	- -	- -	- -	- -	0 37	- -	- -	0.47	0.36	- -	- -	- -	0 32	0 24
7/06/88					- -	- -	- -	- -	- -	0 41	- -	- -	0 52	0.35	- -	- -	- -	0 35	0 53
7/19/88					- -	0.33	- -	- -	- -	- -	- -	- -	0.47	0.49	- -	- -	0.49	0 51	0 44
7/28/88					75.84	- -	- -	- -	- -	0.49	- -	- -	- -	0.36	- -	- -	- -	0.38	0 35
8/09/88					- -	- -	- -	- -	0.44	0.33	0.29	- -	- -	0.30	- -	- -	- -	0.40	- -
8/19/88					<7.9	- -	- -	- -	- -	0.29	- -	- -	- -	0.27	0.62	1.03	- -	0.37	0 31
8/29/88					- -	- -	- -	- -	- -	0.32	- -	- -	- -	0.26	- -	- -	- -	0 34	0.18
9/08/88					- -	- -	- -	- -	- -	0 32	- -	- -	- -	0.32	- -	- -	- -	0.23	0 33
9/20/88					- -	- -	- -		- -	0.69	- -	- -	- -	0.62	- -	-	- -	0 47	0 87
9/29/88					- -	- -	- -	- -	- -	0 32	- -	- -	- -	0.32	- -	- -	- -	0 39	0 38
10/26/88					- -	- -	- -	- -	- -	0.21	- -	- -	- -	0.12	- -	- -	- -	0.17	0.15

1. Injection well MW 1; Injection conducted on April 11, 1988.
2. Injection wells MW 3 and K-10 injection conducted from April 12 through April 14, 1988.
3. Background levels
4. Sampled twice on date indicated
5. Short term tracer study terminated after 6/02/88 samples were collected.

TABLE 9A

NUS Corporation Outdoor Soil Gas Survey Results
Pitney Bowes-Elinco Complex
Norwalk, Connecticut

Soil Gas Concentrations
in mg/M3

Sample ID	Sample Location	PCE	TCE	1,1,1 TCA	Ethylbenzene
1	East of Zell 2				
2	East of Zell 2				
3	East of Zell 2				
4	East of Zell 2				
5	East of Zell 2				
6	East of Zell 2				
7	Southeast of Zell 2				
8	Southeast of Zell 2				
10A	S of Zell 2/N of Matheis				
11	S of Zell 2/N of Matheis				NA
11A	S of Zell 2/N of Matheis				
12	S of Zell 2/N of Matheis				NA
16	S of Zell 2/N of Matheis				NA
17	S of Zell 2/N of Matheis				NA
19	E of Elinco/N of Matheis		320.10		NA
20	SE corner of Zell 1				NA
21	East of Zell 1				NA
23	Between Elinco & Zell 1				
24	Between Elinco & Zell 1				
25	Between Elinco & Zell 1				
26	SW corner of Zell 1				12.00
27	West of Zell 1				
28	West of Zell 1				
29	West of Zell 1				
30	West of Zell 1				
31	West of Zell 1				
32	NW corner of Zell 1				
34	North of Zell 1				
35	NE corner of Zell 1				
36	Between Zell 1 & 2				
37	Between Zell 1 & 2	6640.00	229.00		
38	Between Zell 1 & 2		29.00		
39	West of Elinco	123.00			
40	West of Elinco				
41	SW corner of Elinco				
42	South of Elinco				
43	South of Elinco				
44	South of Elinco				
45	South of Elinco				
46	S of Elinco/W of Matheis				
47	S of Elinco/W of Matheis				
48	S of Elinco/W of Matheis				
50	SW corner of Matheis Ct.				
51	S of Matheis				

Sample locations are shown in Figure 6.
NA indicates that the soil gas sample was not analyzed for the parameter noted.
Most samples were analyzed for Benzene and Toluene, but neither compound was detected in the survey.

TABLE 9A

	NUS Corporation Soil Gas Survey Results				
	Pitney Bowes-Elinco Complex				
	Norwalk, Connecticut				
		Soil Gas Concentrations			
			in mg/M3		
Sample ID	Sample Location	PCE	TCE	1,1,1 TCA	Ethylbenzene
5 2	SE corner of Matheis				
5 3	E of Matheis				
5 4	NE corner of Elinco				NA
5 4 A	NE corner of Elinco		797.00		
5 4 B	NE corner of Elinco		609.00		
5 4 C	NE corner of Elinco		489.00		
5 5	E of Zell 1				
5 6	Between Zell 1 & 2	2206.50	1121.10		
6 6	NE corner of Elinco		130.60		
6 7	NE corner of Elinco		23.90		
6 8	N of Elinco/S of Zell 1		78.90		
6 9	N of Elinco/S of Zell 1				
7 0	NE corner of Elinco				
7 1	North of Elinco				
7 2	North of Elinco				
8 0	N of Elinco/S of Zell 1				
8 8	S of Elinco/W of Matheis				
8 9	S of Elinco/W of Matheis				
9 0	S of Elinco/W of Matheis				
9 1	S of Elinco/W of Matheis				
9 2	S of Elinco/W of Matheis		21.80		
9 3	S of Elinco/W of Matheis				
9 4	Between Elinco & Zell 1		641.60	14.00	
9 5	West of Zell 1				
9 6	NW corner of Elinco				
9 7	West of Zell 1				
9 8	West of Zell 1				
9 9	Unknown				
1 0 0	SW corner of Zell 2				
1 0 1	E of Elinco/N of Matheis				
1 0 2	E of Elinco/N of Matheis				

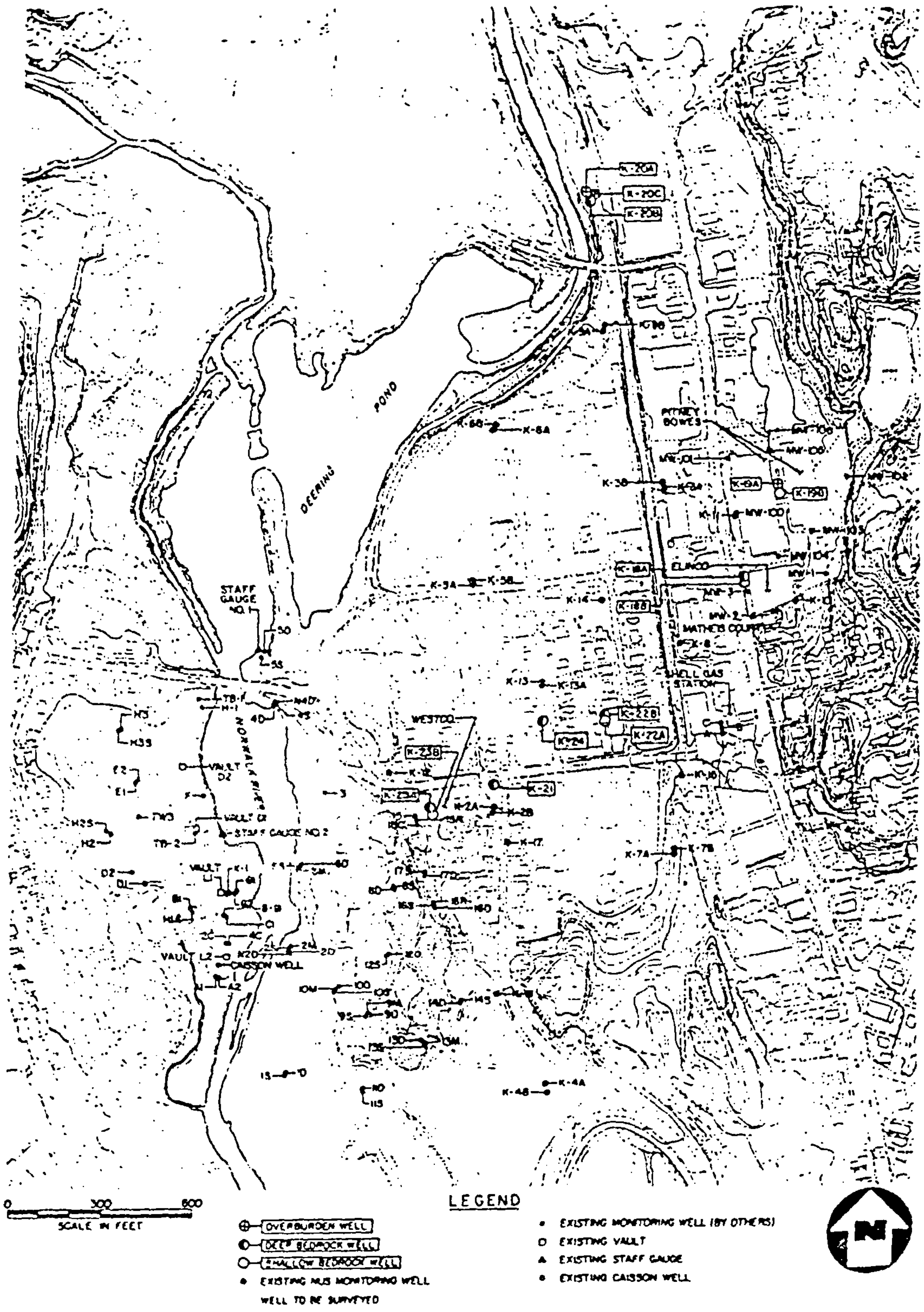
TABLE 9B

NUS Corporation Soil Gas Survey Results
Pitney Bowes--Indoor/Beneath Floor
Norwalk, Connecticut

Sample ID	Sample Location	PCE	TCE	1,1,1 TCA	Ethylbenzene
			Soil Gas Concentrations in mg/M3		
PSG-1	Below Men's Room, Z-1	NA	6233.6	NA	NA
PSG-1A	Below Men's Room, Z-1	NA	4315.2	NA	NA
PSG-2	West central of Zell 1	NA	4029.2	NA	NA
PSG-3	West central of Zell 1	NA	3945.5	NA	NA
PSG-4	N of SW corner of Zell 2	NA	14890.2	NA	NA
PSG-5	Approx 45' N of PSG-4	NA	1595.4	NA	NA

NUS Corporation Soil Gas Survey Results
Elinco--Indoor/Beneath Floor
Norwalk, Connecticut

Sample ID	Sample Location	PCE	TCE	1,1,1 TCA	Ethylbenzene
			Soil Gas Concentrations in mg/M3		
ESG-1	Degreaser unit pit, N side	115	4040	50	
ESG-1 Dup	Degreaser unit pit, N side		4180		
ESG-2	20' NW of ESG-1				
ESG-3	30' WNW of ESG-1				

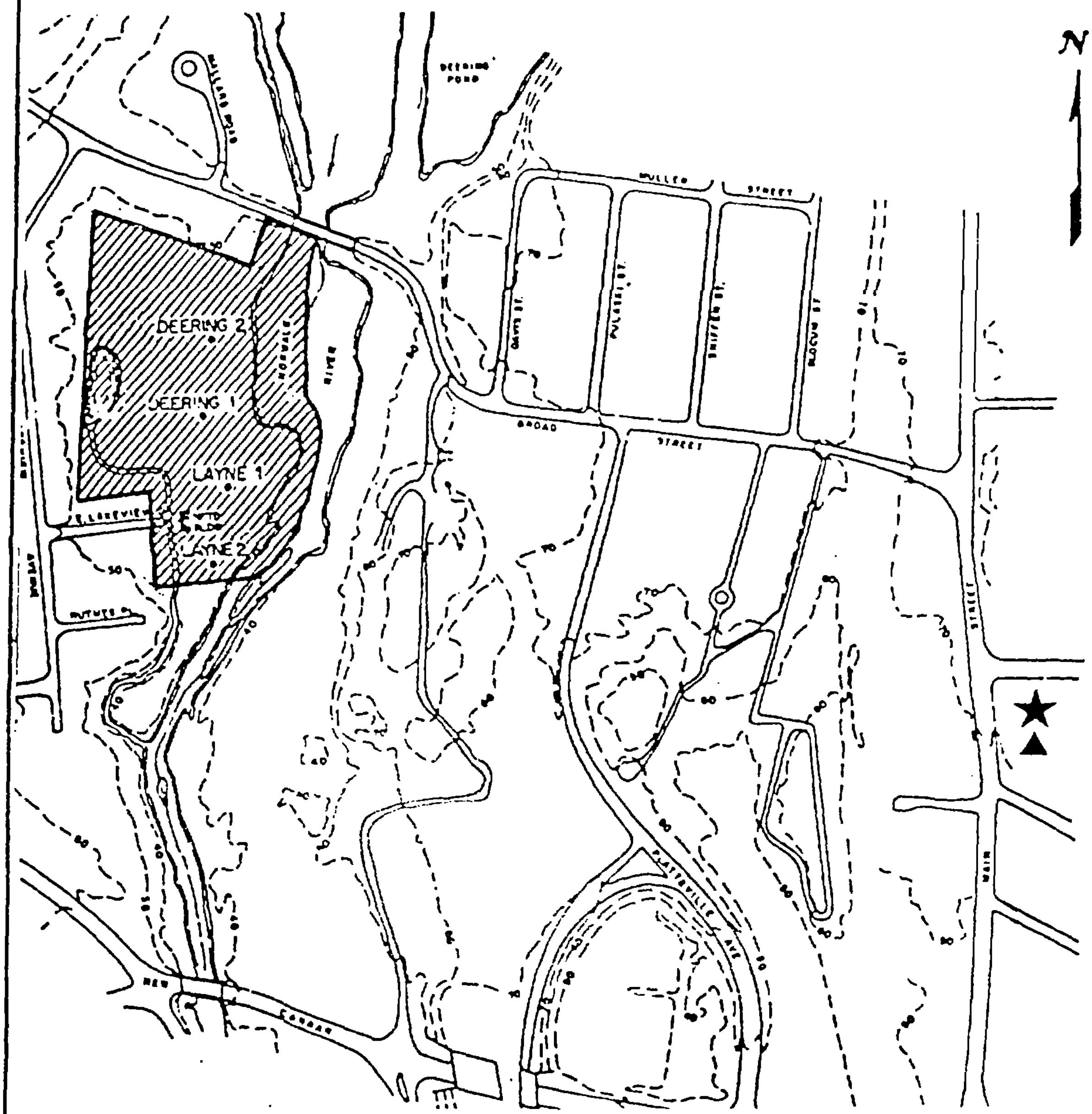


KELLOGG-DEERING WELLFIELD/VICINITY TOPOGRAPHIC MAP

NOTE: PROVIDED TO DAMES & MOORE BY U.S. EPA - REGION 1

Dames & Moore
FIGURE 1

SITE LOCATION MAP



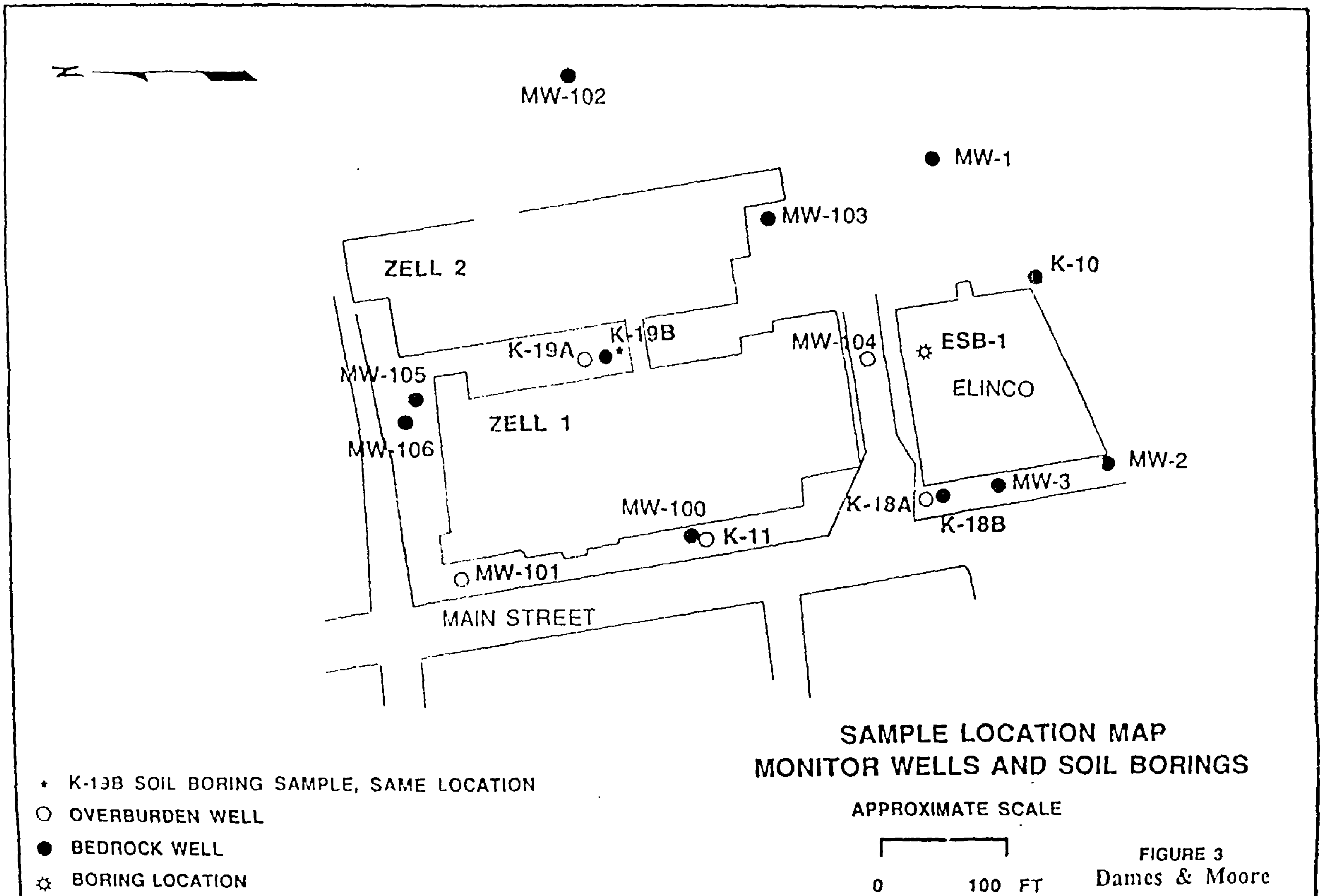
KELLOGG-DEERING WELL FIELD

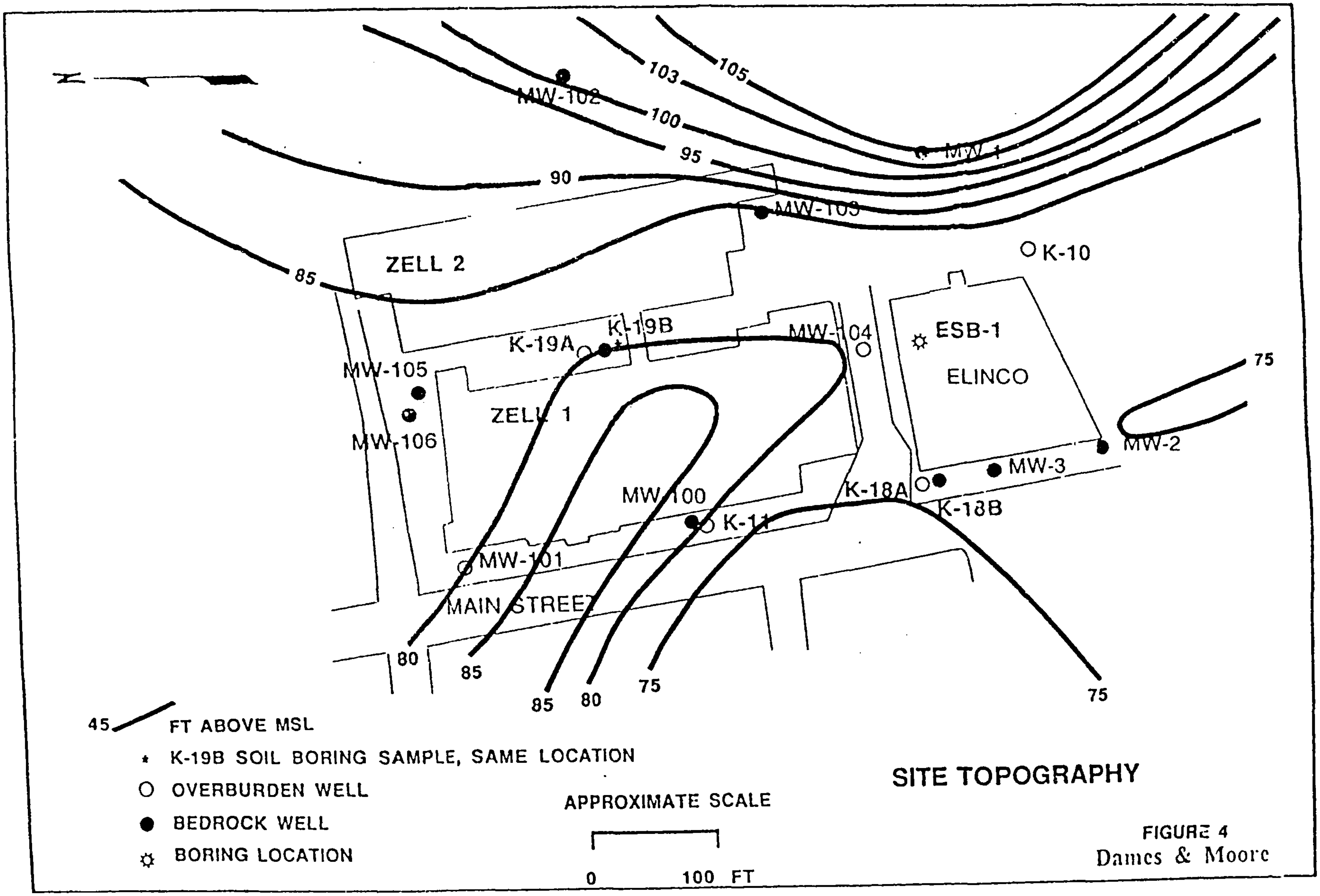
★ ZELL BUILDING

▲ ELINCO PLANT

SCALE: 1" = 400'

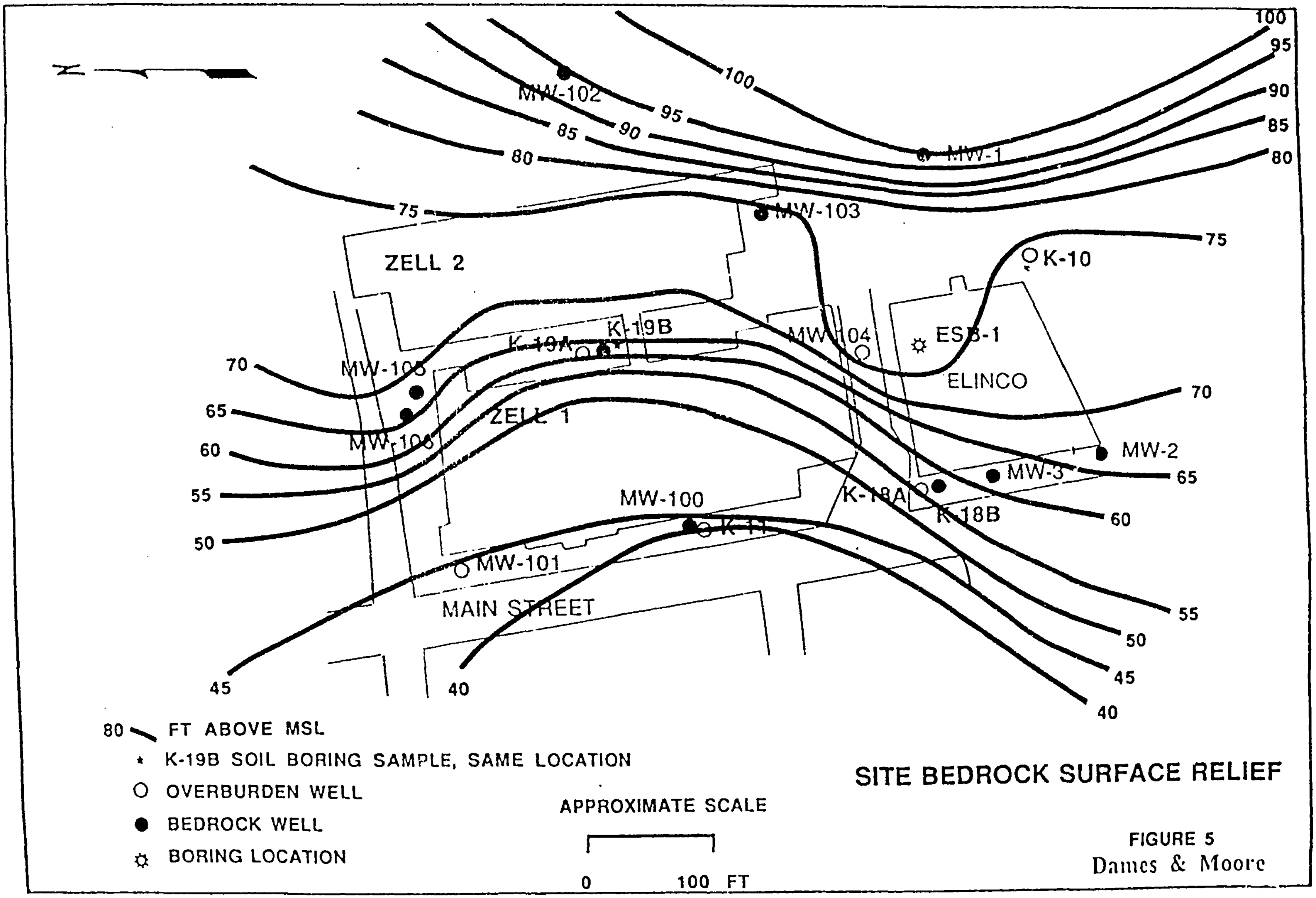
Dames & Moore
FIGURE 2


MW-102
MW-1
MW-103
ZELL 2
K-10
K-19B
K-19A
MW-104
ESB-1
ELINCO
MW-105
ZELL 1
MW-106
MW-2
MW-3
MW-100
K-18A
K-18B
K-11
MW-101
MAIN STREET
SAMPLE LOCATION MAP
MONITOR WELLS AND SOIL BORINGS
* K-19B SOIL BORING SAMPLE, SAME LOCATION
○ OVERBURDEN WELL
● BEDROCK WELL
☼ BORING LOCATION
APPROXIMATE SCALE
0
100 FT
FIGURE 3
Dames & Moore



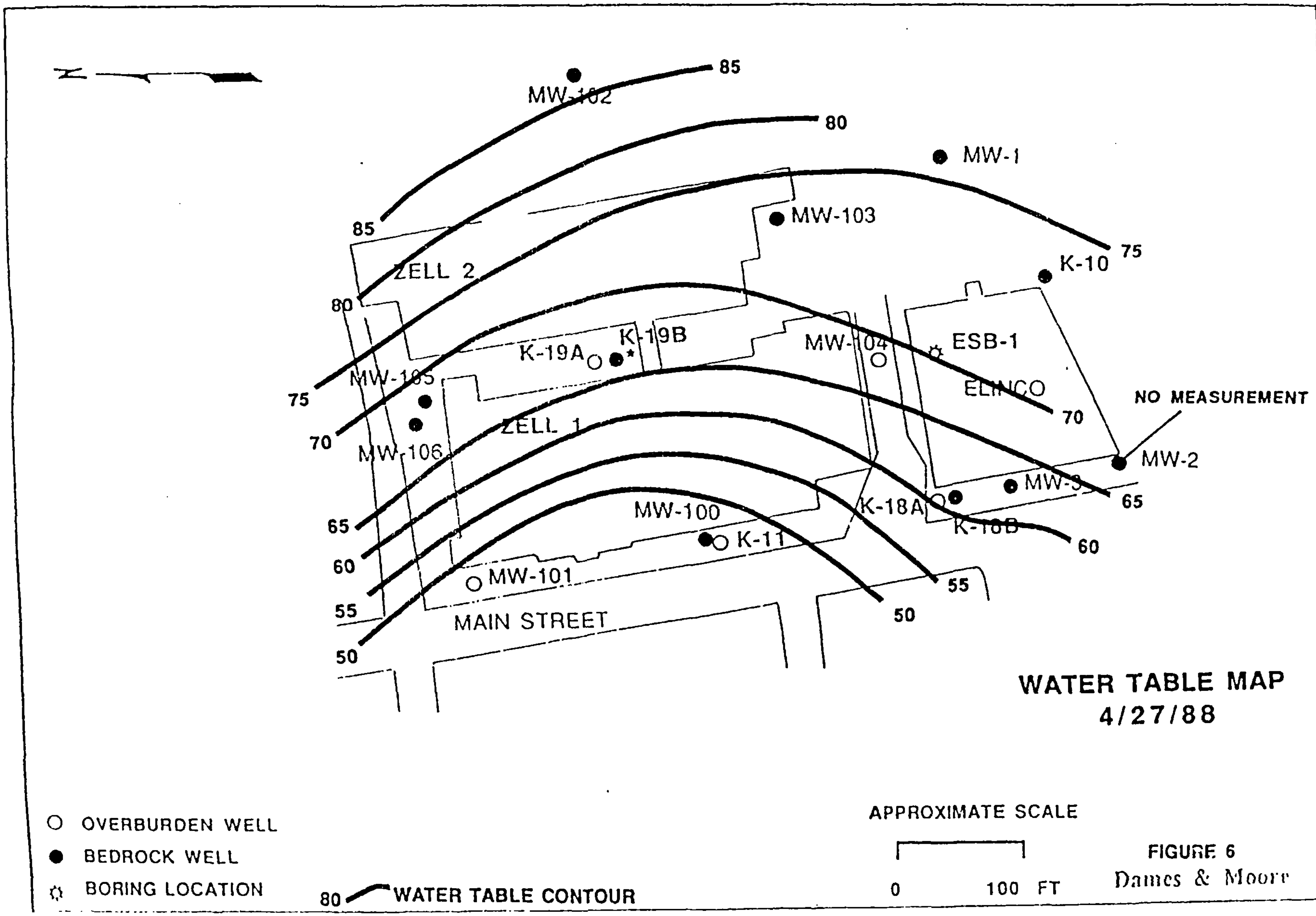
SITE TOPOGRAPHY

FIGURE 4
Dames & Moore



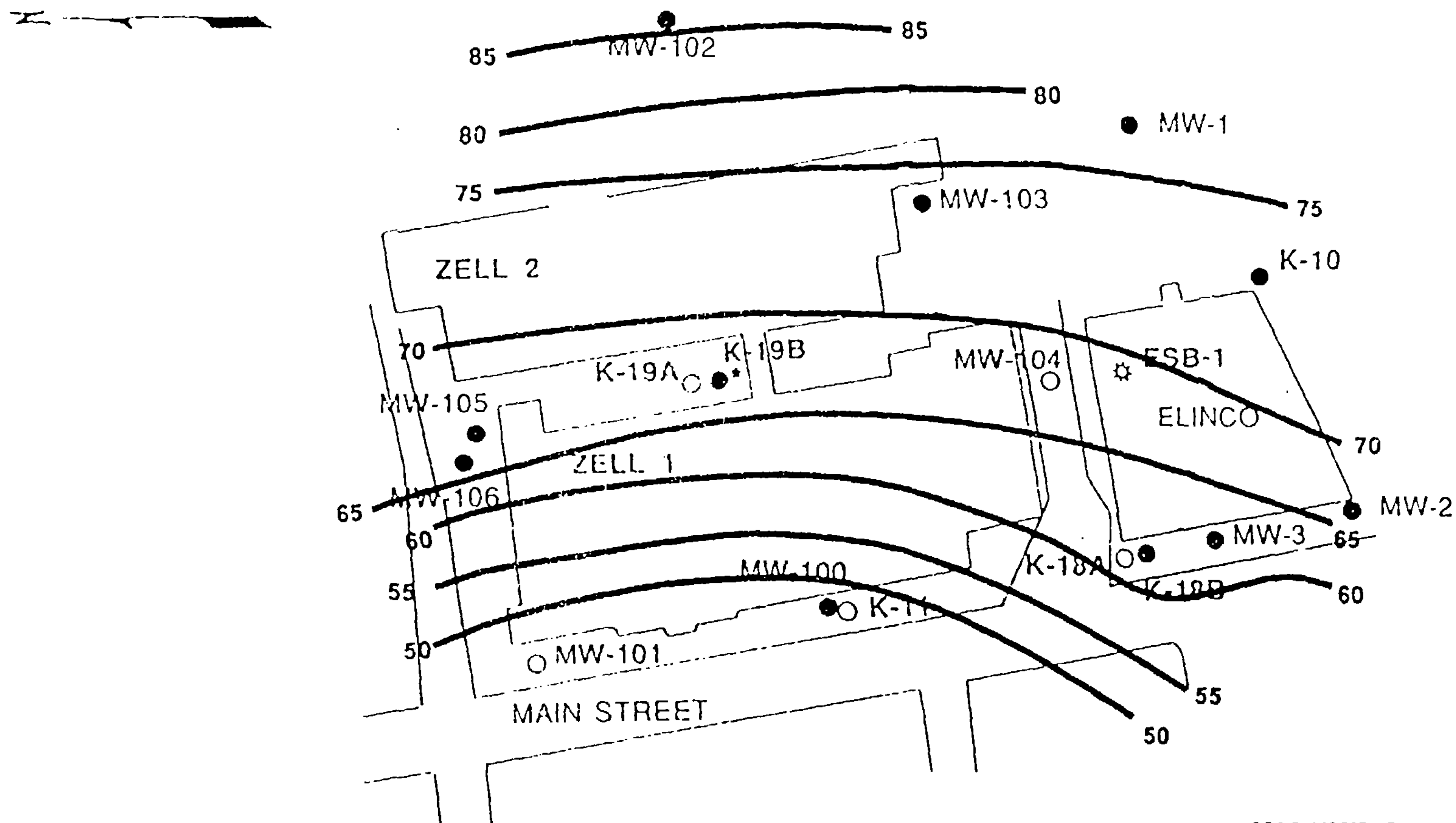
SITE BEDROCK SURFACE RELIEF

FIGURE 5
Dames & Moore



WATER TABLE MAP
4/27/88

FIGURE 6
Dames & Moore



WATER TABLE MAP
5/2/88

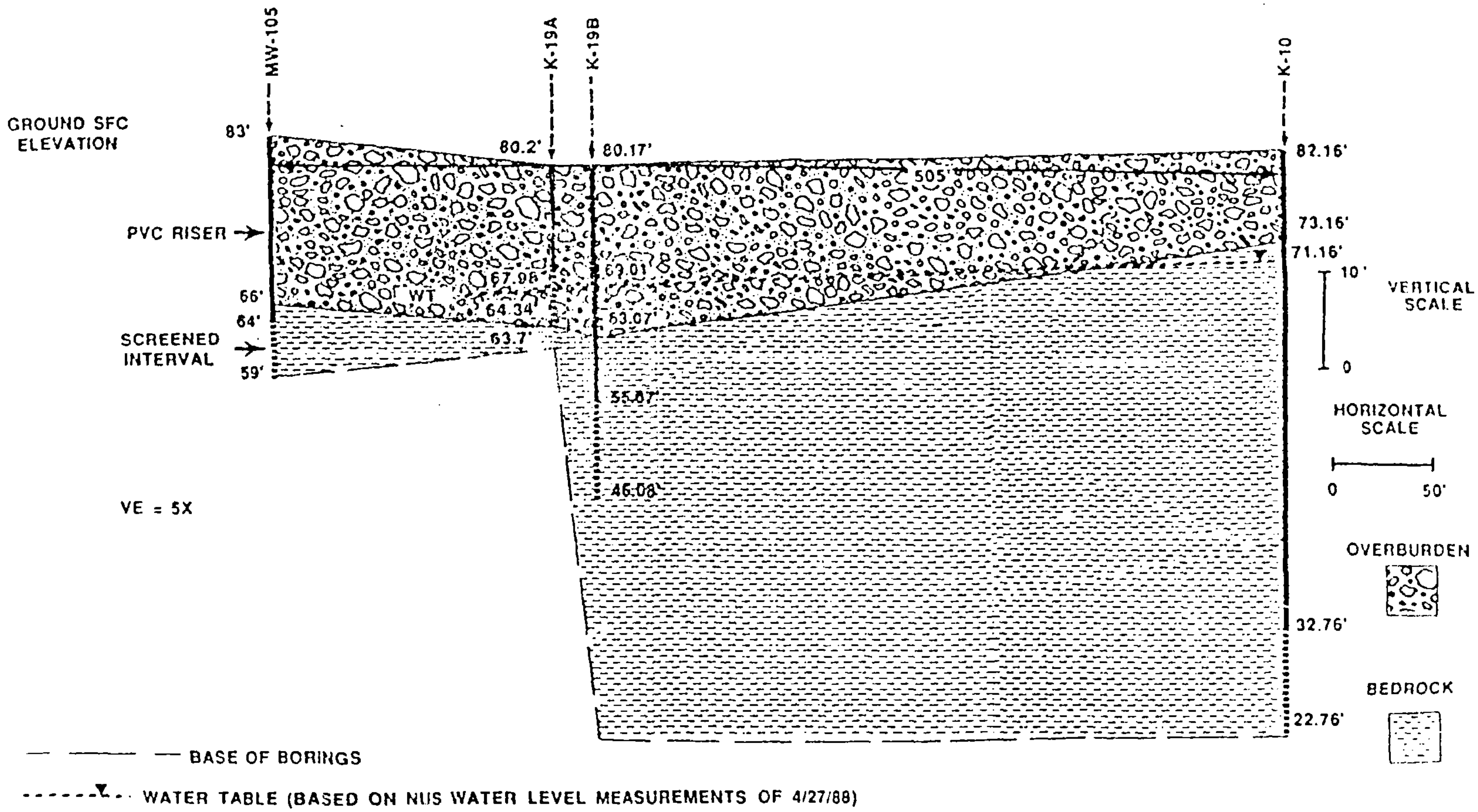
○ OVERBURDEN WELL
● BEDROCK WELL
☼ BORING LOCATION

1 ▬ **WATER TABLE CONTOUR**

APPROXIMATE SCALE

0 100 FT

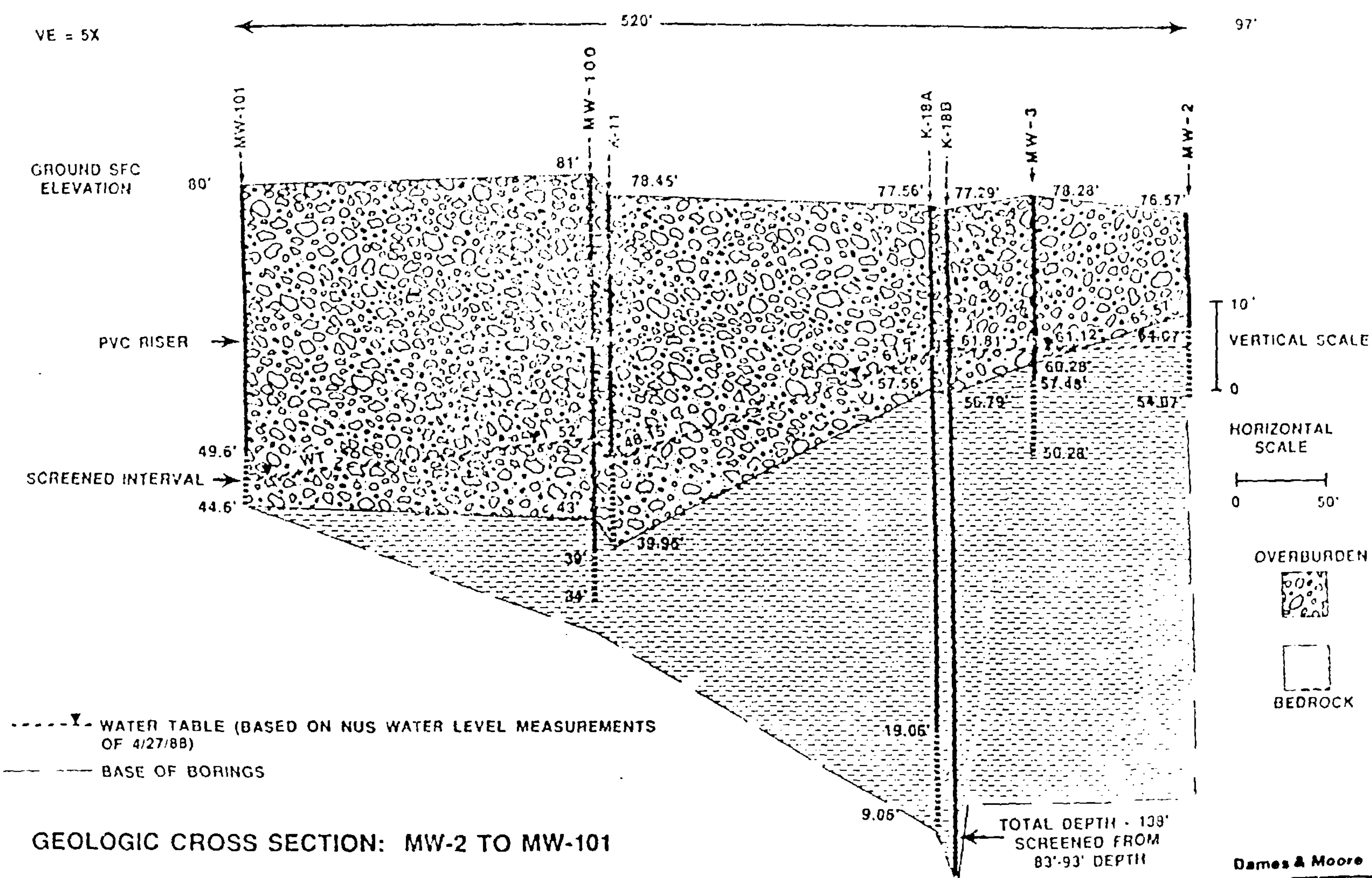
FIGURE 7
Dames & Moore



GEOLOGIC CROSS SECTION: K-10 TO MW-105

Dames & Moore

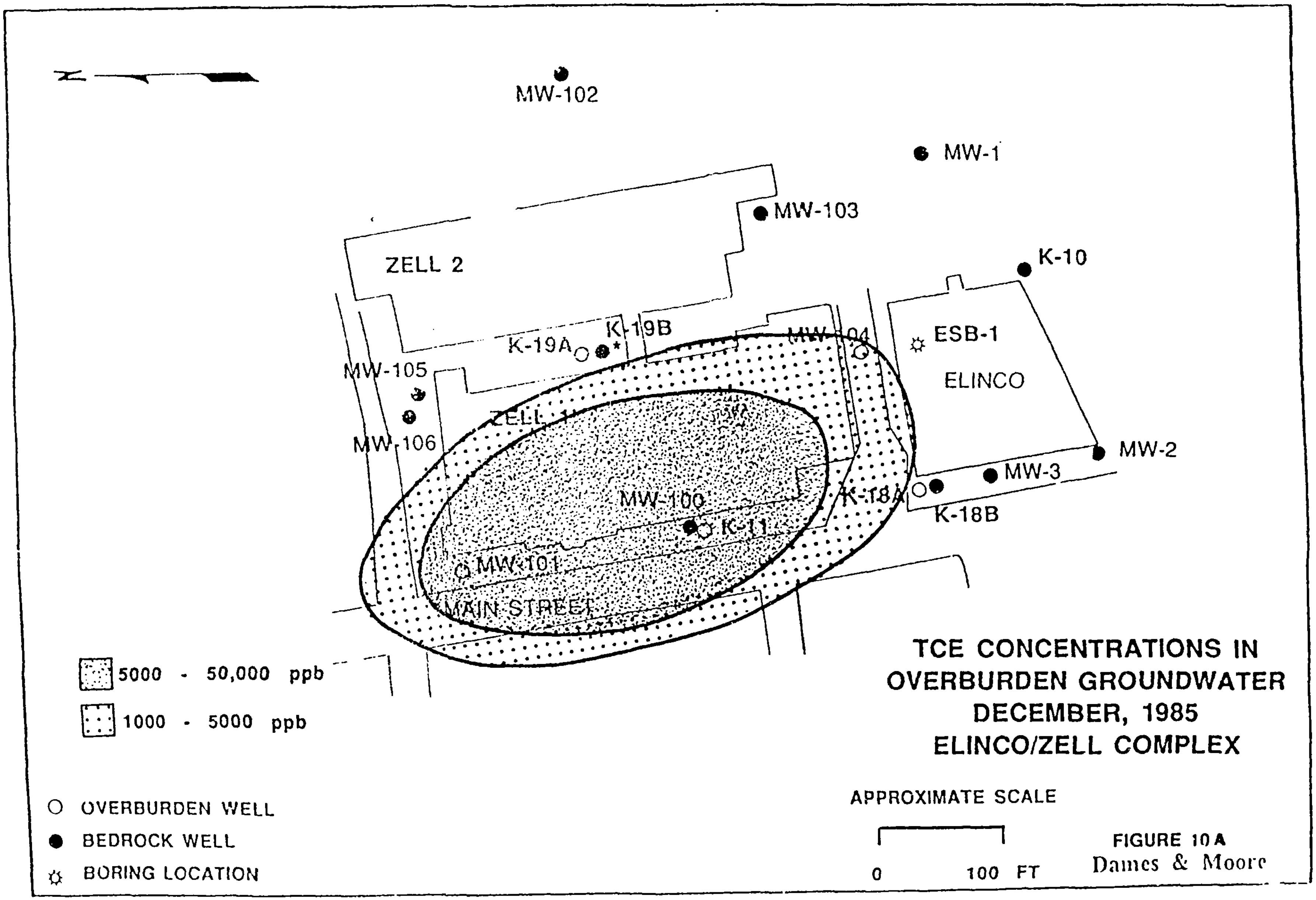
FIGURE 8



GEOLOGIC CROSS SECTION: MW-2 TO MW-101

Dames & Moore

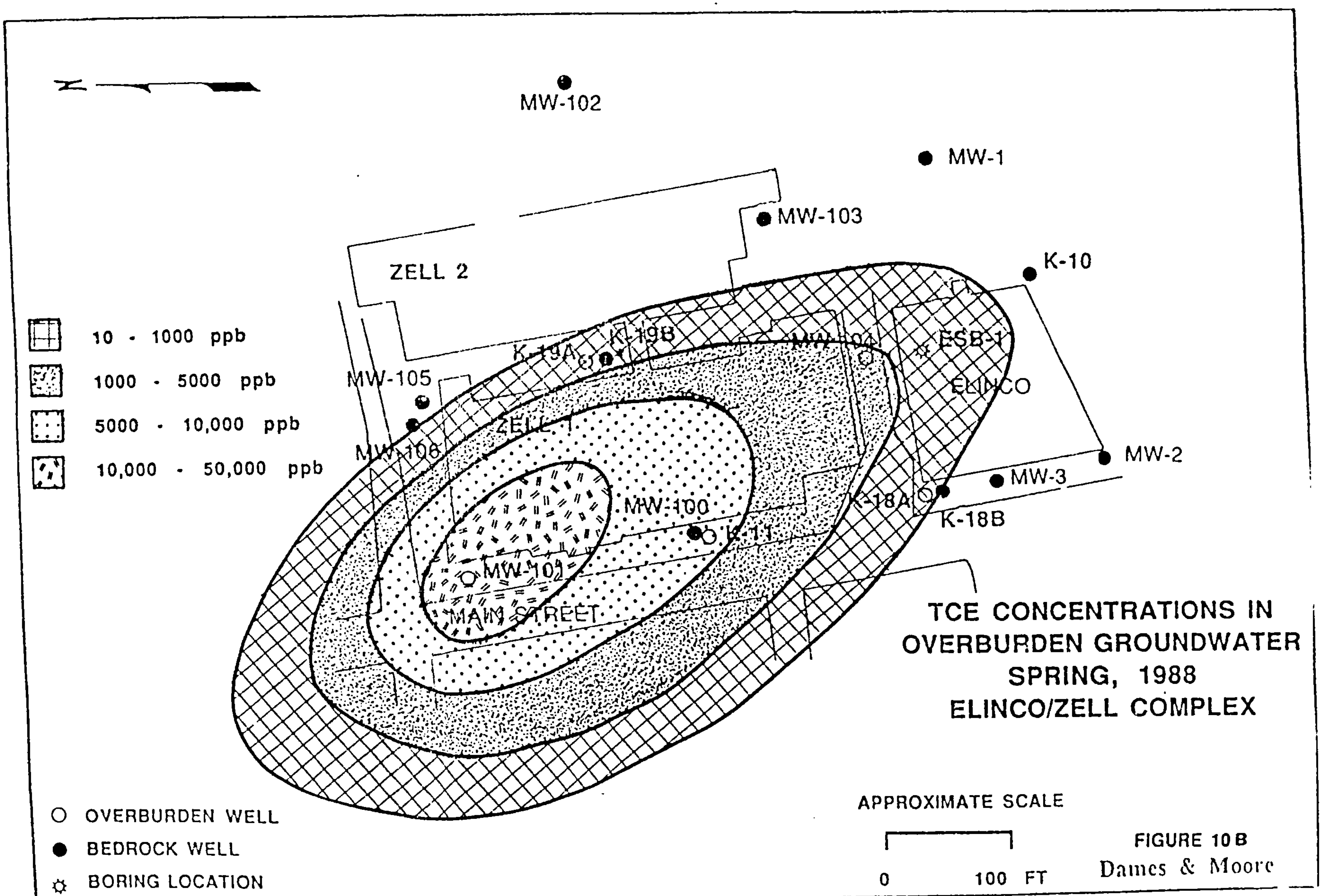
FIGURE 9



TCE CONCENTRATIONS IN OVERBURDEN GROUNDWATER DECEMBER, 1985 ELINCO/ZELL COMPLEX

FIGURE 10 A

Dames & Moore

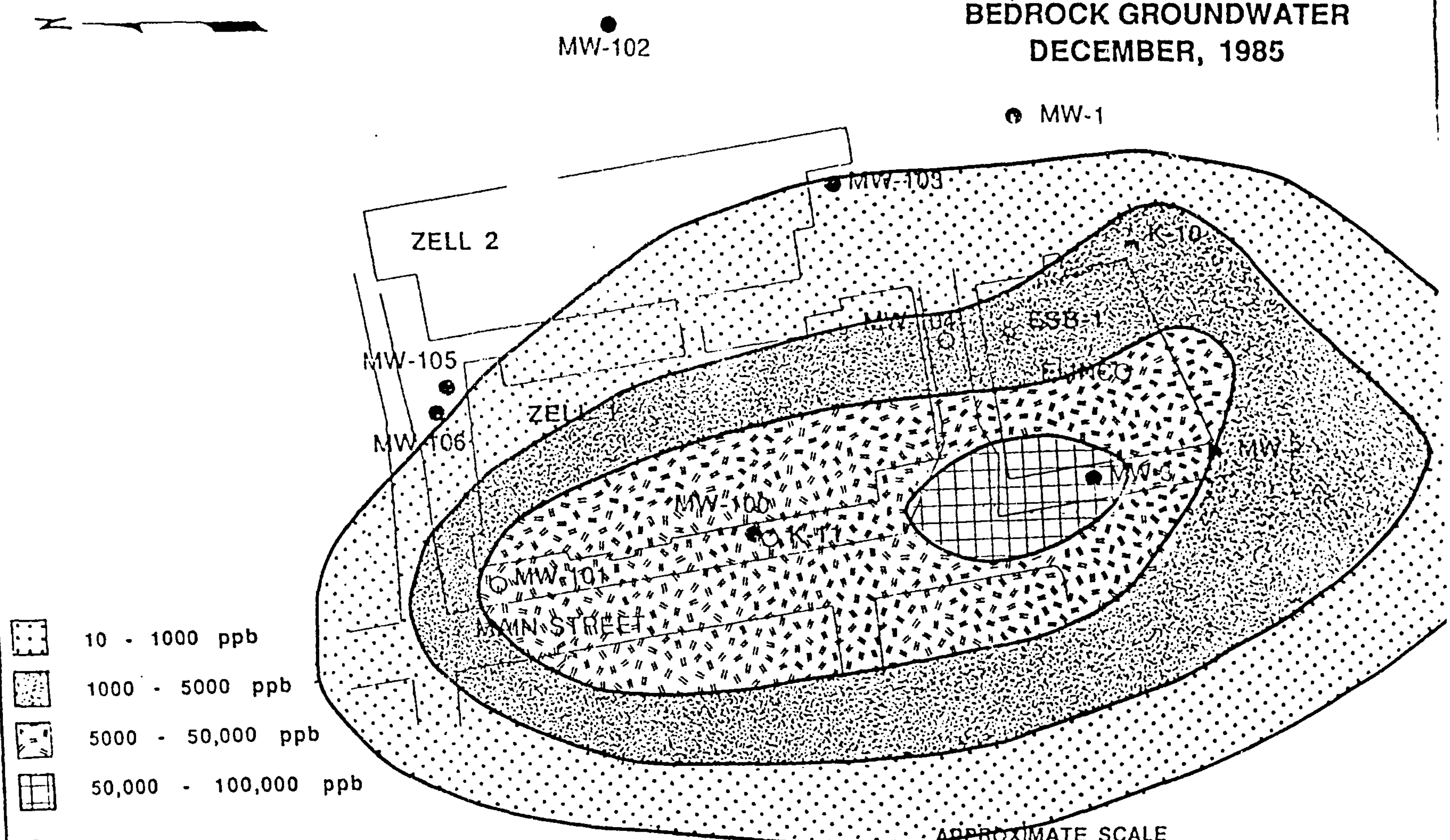


TCE CONCENTRATIONS IN OVERBURDEN GROUNDWATER SPRING, 1988 ELINCO/ZELL COMPLEX

FIGURE 10 B

Dames & Moore

*TCE CONCENTRATIONS IN BEDROCK GROUNDWATER DECEMBER, 1985



10 - 1000 ppb
1000 - 5000 ppb
5000 - 50,000 ppb
50,000 - 100,000 ppb

○ OVERBURDEN WELL
● BEDROCK WELL
☼ BORING LOCATION

*BASED ON DATA OBTAINED FROM NUS CORPORATION

APPROXIMATE SCALE

0 100 FT

FIGURE 10 C

Dames & Moore

TCE CONCENTRATIONS IN BEDROCK GROUNDWATER SPRING, 1988

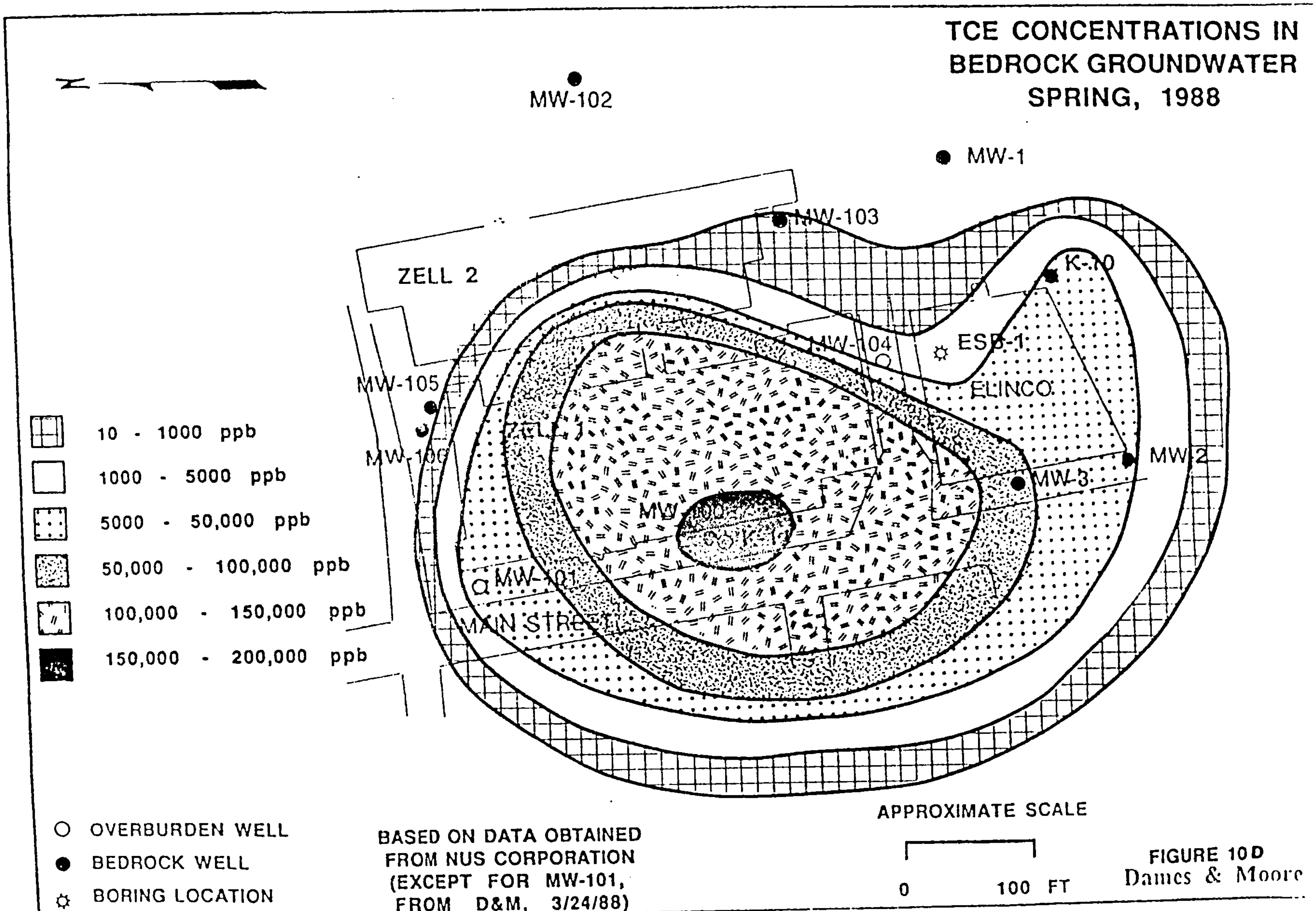
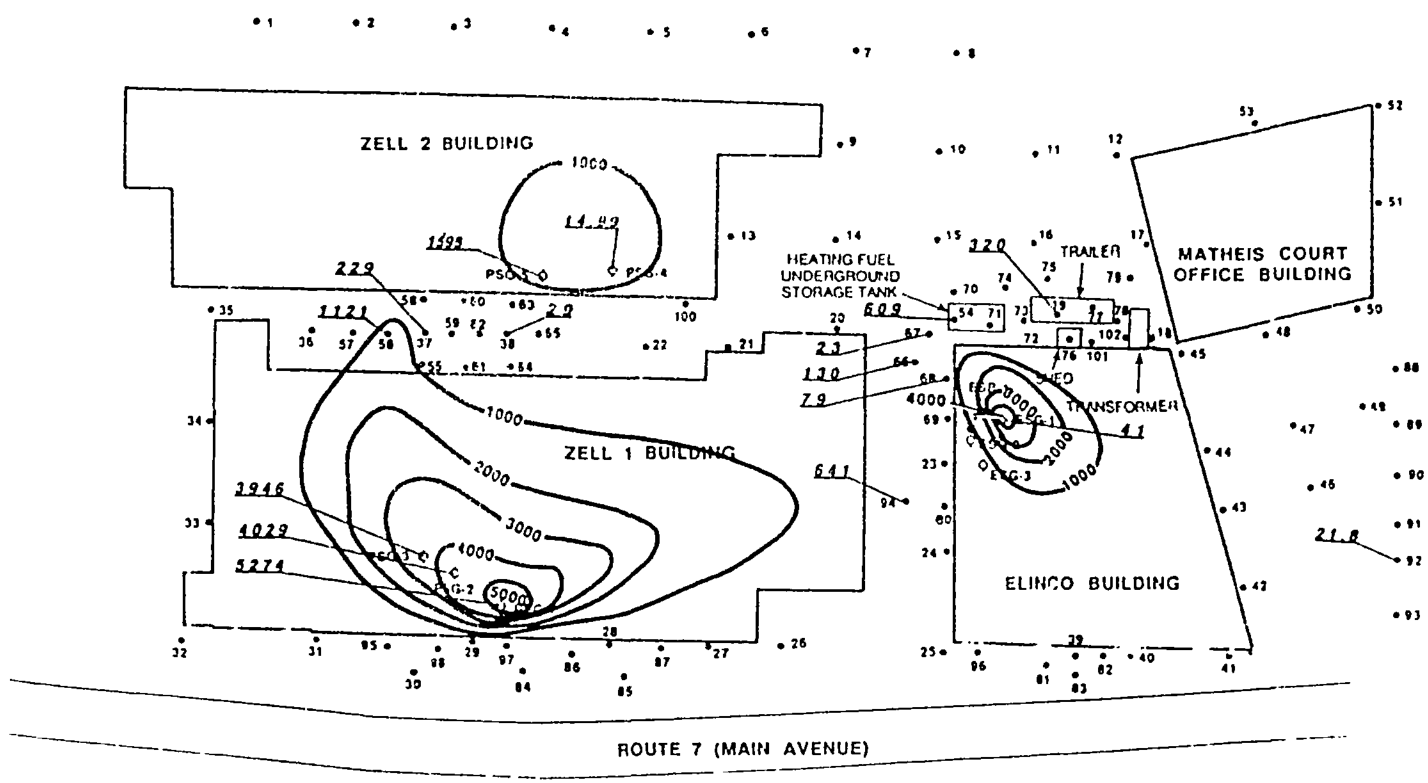


FIGURE 10D
Dames & Moore

SOIL GAS SURVEY
SAMPLING LOCATIONS AND
CONCENTRATION CONTOUR MAP



SCALE
0 60 FT

LEGEND

1000 TCE CONCENTRATIONS

7.6 ISOLATED TCE CONCENTRATIONS DETECTED

93 • - SOIL GAS SAMPLING LOCATIONS (OUTSIDE)

ESG-1 - SOIL GAS SAMPLING LOCATIONS (INSIDE)

ESB-1 - BORING LOCATIONS

FIGURE 11
Dames & Moore

REFERENCES

Dames & Moore, Kellogg-Deering Well Field Zell Building Evaluation, Norwalk, CT. Prepared for Murtha, Cullina, Richter and Pinney (December 4, 1987).

Day, Berry, and Howard (letter) "Re: Public Comment Kellogg-Deering Site Operable Unit No. 1 Norwalk, Connecticut EPA Work Assignment Number 58-1656" (August 7,1986).

Ebasco, 1989; Final Supplemental Remedial Investigation and Feasibility Study, Kellogg-Deering Superfund Site, Norwalk, Connecticut. Volume I.

EPA Region I Administrator, Michael R. Deland, Record of Decision Remedial Alternative Selection Operable Unit 1 (data illegible).

Geraythy & Miller, Inc., "Hydrogeology and Ground Water Quality Study 1982-1983 Connecticut Light and Power Company Landfill Smith Well Field Norwalk, Connecticut" (June, 1983).

HRP Associates, Inc., "Hydrogeologic and Engineering Report on the Extent of Contamination and Remedial Options Available for the Elinco Division of EDO Corporation 272 Main Avenue, Norwalk, Connecticut".

Versar, Inc., "Evaluation of Hydrogeologic Aspects of the Remedial Investigation Conducted by the U.S. Environmental Protection Agency for the Kellogg-Deering Site, Norwalk, Connecticut" (July, 1986).

APPENDIX A

BORING AND WELL CONSTRUCTION LOGS

FUSS&O'NEILL
consulting engineers
210 Main Street, Manchester, Conn. 06040/(203) 646-2469

LETTER OF TRANSMITTAL

Date 3/9/88	Project No. 86-100
Attention:	
RE:	

TO GREGORY A. DelMASTRO
HYDROGEOLOGIST
DAMES AND MOORE
ONE BLUE HILL PLAZA, SUITE 530
PEARL RIVER, NEW YORK 10965-8668

We are sending you the following items: ☒ Attached ☐ Under separate cover via ________

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of Letter ☐ Change Order ☐ Other

Copies	Date	No.	Description
1	6/86		ATTACHMENT II OF JUNE 1986 HYDROGEOLOGIC
			INVESTIGATION - 272 MAIN AVE, NORWALK, CT.

These are transmitted as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit ___ copies for approval
☒ For your use ☐ Approved as noted ☐ Submit ___ copies for distribution
☒ As requested ☐ Returned for corrections ☐ Return ___ corrected prints
☐ For review and comment
☐ For Bids Due ________ 19___ ☐ Prints returned after loan to us

REMARKS

AS WE DISCUSSED. I HOPE THESE WILL ASSIST YOU IN YOUR EVALUATION.

C to KARL BOURDEAU, ESQ.

SIGNED: Bob [signature]

ATTACHMENT II

GEOLOGIC LOGS AND MONITOR WELL COMPLETION REPORTS

East Coast Drilling, Inc.

APR 16 1984

P. O. BOX 961 - WALLINGFORD, CONN. 06492

Bit # ______ Fig ______

Bit # ______ Fig ______

SHEET	1 OF 1
DATE	4/9/84
HOLE NO.	MW-1
LINE & STA.	
OFFSET	

TO HRP Associates — ADDRESS New Britain, Connecticut

PROJECT NAME Elinco — LOCATION Norwalk, Connecticut

REPORT SENT TO Client — PROJ. NO. 83-86-10

SAMPLES SENT TO Taken at Site — OUR JOB NO. 83-176A

GROUND WATER OBSERVATIONS

At 6.5' after 24 Hours

At ______ after ______ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW	S-S	BXST
Size I.D.	3"	1 3/8"	
Hammer Wt.		140lb.	BIT
Hammer Fall		30"	Diamond

SURFACE ELEV. ______

DATE STARTED 4/3/84

DATE COMPL. 4/3/84

BORING FOREMAN Quagliaroli II

INSPECTOR P. Misluk

SOILS ENGR. ______

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		0.5'-2.0'	D	15	10	9	Moist	.5'	Macadam.	1	1.5'	1.0'
							Medium		Brown fine-medium Sand,			
							Dense		some medium-fine Gravel,			
									trace Silt.			
		5.0'	D	50/0								
							3	5.5'				
		5.5'-8.5'	C				4		Cored White Gneiss, weather-	C1	3.0'	.6'
							4		ed.			
							4					
		8.5'-10.5'	C				6.5		Cored Gray weathered Gneiss.	C2	2.0'	.8'
		10.5'-13.5'	C				5		" "	C3	3.0'	.6'
							4					
		13.5'-16.5'	C				5		" "	C4	3.0'	3.0'
							7					
							6					
		16.5'-18.5'	C				5		" "	C5	2.0'	1.5'
							5					
							5					
		18.5'-22.5'	C				6		" "	C6	4.0'	2.6'
							5					
							6					
		22.5'-24.5'	C				3		" "	C7	2.0'	1.7'
							5		(reamed in 15.0' of casing)			
							5					
		24.5'-26.5'	C				4		" "	C8	2.0'	1.6'
							6	26.5'				
									Bottom of Boring 26.5'			
									Installed 2" PVC Rock Well @ 26.5'			
									17.0' Riser Pipe			
									1 Curb Box			

GROUND SURFACE TO 5.5' USED NW "CASING: THEN Cored to 26.5'

Hole Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used	
trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

SUMMARY
Earth Boring 5.5'
Rock Coring 21.0'
Samples 1

HOLE NO MW-1

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: ELINCO

Monitoring Point I.D. No.: MW-1

Date of completion: 4/4/84

DEP/WPC I.D. No:

Monitoring Point Location (relative to site features): UPGRADIENT SEE SITE MAP

Drilling Contractor: EAST COAST DRILLING INC.

Supervising Engineer/Geologist: P. MISLUK

Well Construction Method: AUGERED AND CORED

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL):

Well depth below ground surface: 26.5

Refusal: ____ Yes ____ No

Top of casing elevation (MSL):

Screened interval:

Length of Screen:

Length of riser pipe: 17.0'

Screen type:

Screen Slot size:

Filter fabric: ____ Yes ____ No

Screen packing: ____ Yes ____ No

If yes, Thickness:

Material:

grain size:

Well inside diameter: 2"

Impermeable Backfill: Bentonite

Well casing material and schedule: 40 PVC

Estimated K screened interval:

Method of well development: PUMP

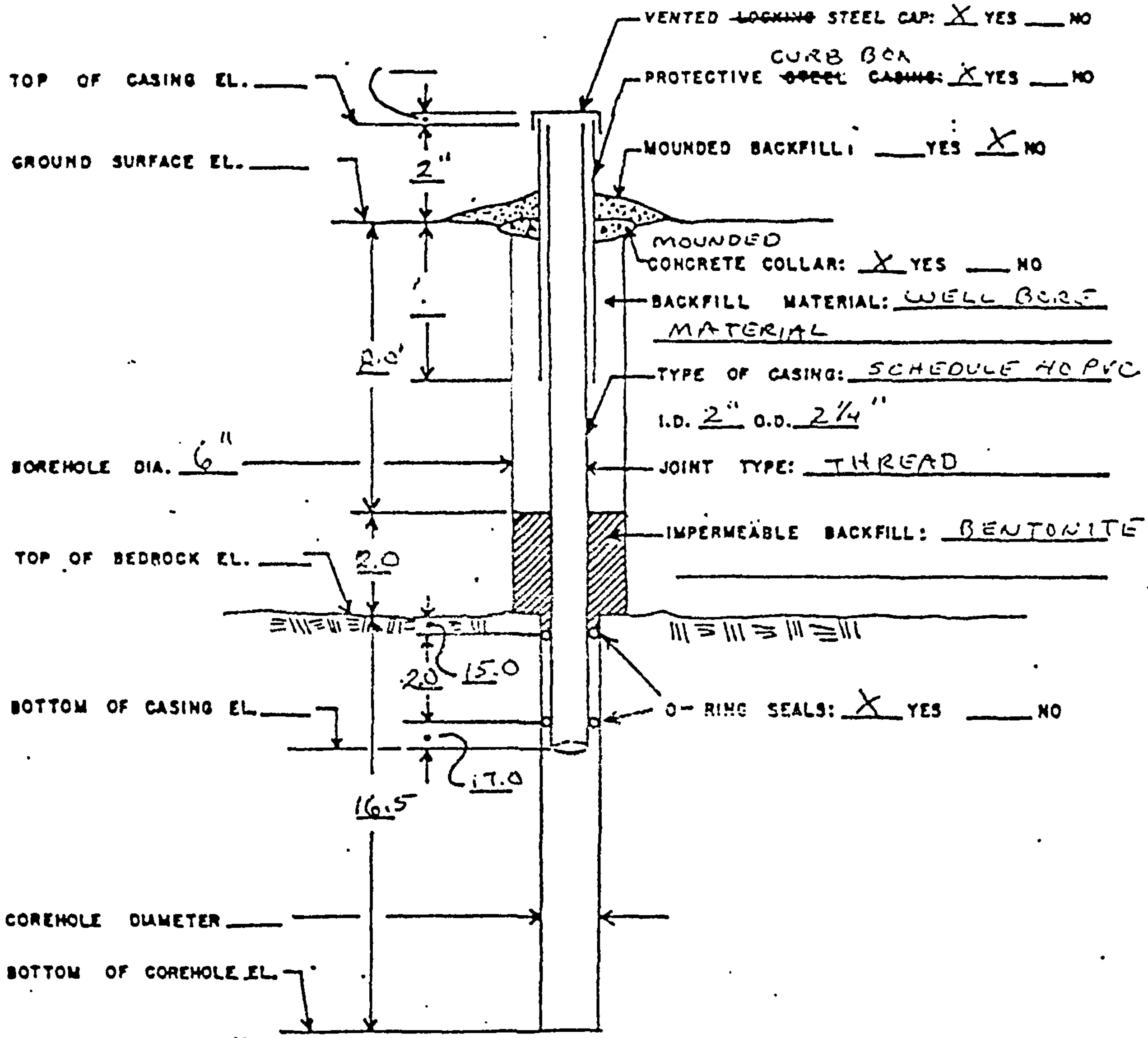
Time spent developing: 1 HR

Locking ____ or threaded cap X
Curb Box

Impermeable backfill: CONCRETE COLLAR

MONITOR WELL INSTALLATION DETAIL
FOR WELL IN BEDROCK

MW-1



Bedrock wells

Casing length: 17.0'

Water-bearing rock unit: FRACTURED FELSIC GNEISS

Water bearing sections (depths and approximate yields): 10' - 26.5'

Length of rock core: 16.5'

Diameter of core hole: 2 3/8"

Thickness and depth of impermeable backfill: 2' 8'-10' 2' 1'-3'

O-rings seals: X Yes ___ No

GEOLOGIC INFORMATION

Aquifer:

Inferred relationship to plume: ___ Within ___ Outside ___ Edge

Watershed (plume discharge watercourse):

Aquifer materials (attach boring log):

Attach maps and plans required of G.1.j. and G.4.

East Coast Drilling, Inc.

P. O. BOX 961 - WALLINGFORD, CONN. 06492

Bit # ______ Ftg ______

Bit # ______ Ftg ______

TO HRP Associates

ADDRESS New Britain, Connecticut

PROJECT NAME Elinco

LOCATION Norwalk, Connecticut

REPORT SENT TO Client

PROJ. NO. 83-86-10

SAMPLES SENT TO Taken at Site

OUR JOB NO. 83-176A

SHEET 1 OF 1

DATE 4/9/84

HOLE NO. MW-2

LINE & STA. ______

OFFSET ______

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR.	
At ______ after ______ Hours	Type	HSA	S-S		SURFACE ELEV. ______
	Size I.D.	3¼"	1 3/8"		DATE STARTED 4/4/84
At ______ after ______ hours	Hammer Wt.		140lb.	BIT	DATE COMPL. 4/4/84
	Hammer Fall		30"		BORING FOREMAN Quagliaroli II
					INSPECTOR P. Misluk
					SOILS ENGR. ______

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	6-12	To 12-18	Moisture Density or Consist	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		0.5'-2.0'	D	10	4	6	Moist	.5'	Macadam.	1	1.5'	1.3'
							Loose		Light Brown fine Sand, little Silt.			
							Moist	5.0'				
		5.0'-6.5'	D	10	28	37	Very Dense		Multi-color fine-coarse Sand and fine-medium Gravel.	2	1.5'	1.3'
							Moist		Gray Brown fine-coarse Sand,			
		10.0'-10.5'	D	61/.5			V/Dense	11.0'	some fine-coarse Gravel, trace Silt, Cobbles.	3	.5'	.5'
		11.0'-16.0'	C				7 5 8 7 6		Grayish White Gneiss, (from 14.0'-14.5' seams).	C1	5.0'	4.6'
		16.0'-21.0'	C				5 4 4 3 5	21.0'	Gray Gneiss with fractured joints.	C2	5.0'	5.0'
								23.0'	Roller Bit to 23.0'			
									Bottom of Boring 23.0'			
									Installed 2" PVC Monitor Well @ 22.5'			
									12.5' Riser Pipe			
									10.0' Screen			
									1 Curb Box			

GROUND SURFACE TO 11.0' USED HSA CASING: THEN Roller Bit to 23.0'

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density
0-10 Loose
10-30 Med. Dense
30-50 Dense
50 + Very Dense

Cohesive Consistency
0-4 Soft
4-8 M/Stiff
8-15 Stiff
15-30 V-Stiff
30 + Hard

SUMMARY
Earth Boring 13.0'
Rock Coring 10.0'
Samples 3

HOLE NO MW-2

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: ELINCO

Monitoring Point I.D. No.: MW-2

Date of completion: 4/4/84

DEP/WPC I.D. No:

Monitoring Point Location (relative to site features): DOWNGRADIENT SEE SITE MAP

Drilling Contractor: EAST COAST DRILLING, INC.

Supervising Engineer/Geologist:

Well Construction Method: AUGERED

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL):

Well depth below ground surface: 22.5'

Refusal: X Yes ___ No

Top of casing elevation (MSL):

Screened interval: 12.5-22.5'

Length of Screen: 10.0'

Length of riser pipe: 12.5'

Screen type: PVC

Screen Slot size: .010"

Filter fabric: ___ Yes X No

Screen packing: X Yes ___ No

If yes, Thickness: 10.0'

Material: OTTOWA SAND

grain size: #12 SAND

Well inside diameter: 2"

Impermeable Backfill: Bentonite

Well casing material and schedule: 40 PVC

Estimated K screened interval:

Method of well development: PUMP

Time spent developing: 1 HR

Locking ___ or threaded cap X
Curb Box

Impermeable backfill: CONCRETE COLLAR

Bedrock wells

Casing length: 22.5'
+ SCREEN

Water-bearing rock unit: FRACTURED FELSIC GNEISS

Water bearing sections (depths and approximate yields): 13.0' - 22.5'

Length of rock core: 12.0'

Diameter of core hole: 2 1/2"

Thickness and depth of impermeable backfill: 2' 10.5-12.5' 2' 1-3'

O-rings seals: ____Yes _X_ No

GEOLOGIC INFORMATION

Aquifer:

Inferred relationship to plume: ____ Within ____ Outside ____ Edge

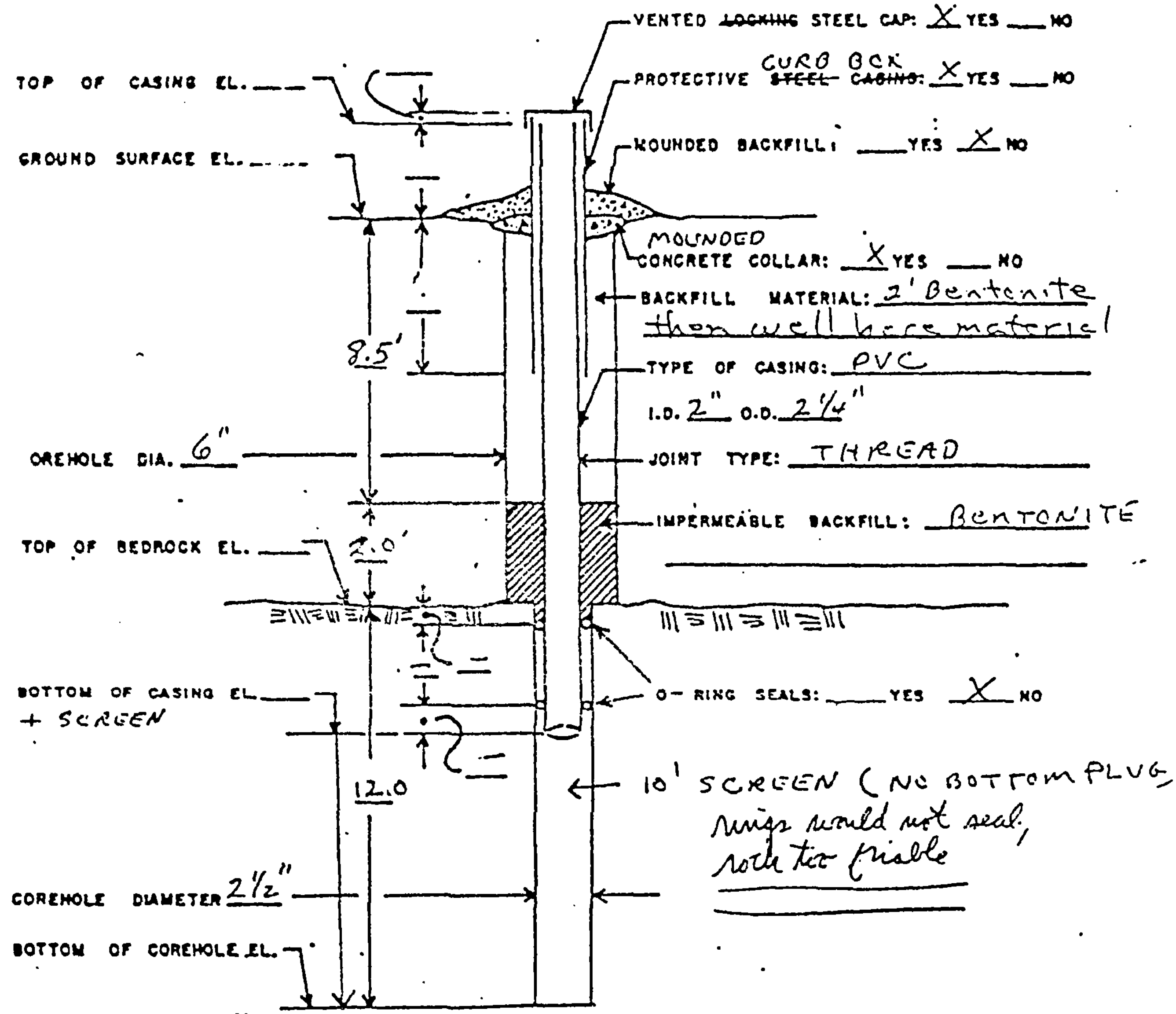
Watershed (plume discharge watercourse):

Aquifer materials (attach boring log):

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL FOR WELL IN BEDROCK

mw-2



East Coast Drilling, Inc.

P. O. BOX 961 - WALLINGFORD, CONN. 06492

Bit # ______ Ftg ______

Bit # ______ Ftg ______

TO HRP Associates | ADDRESS New Britain, Connecticut

PROJECT NAME Elinco | LOCATION Norwalk, Connecticut

REPORT SENT TO Client | PROJ. NO. 83-86-10

SAMPLES SENT TO Taken at Site | OUR JOB NO. 83-176A

SHEET 1 OF 1
DATE 4/9/84
HOLE NO. MW-3
LINE & STA. ______
OFFSET ______

GROUND WATER OBSERVATIONS

At 19.0' after 0 Hours

At ______ after ______ Hours

	CASING	SAMPLER	CORE BAR.
Type	HSA	S-S	
Size I.D.	3¼"	1 3/8"	
Hammer Wt.		140lb.	BIT
Hammer Fall		30"	

SURFACE ELEV. ______
DATE STARTED 4/4/84
DATE COMPL. 4/5/84
BORING FOREMAN Quagliaroli II
INSPECTOR P. Misluk
SOILS ENGR. ______

LOCATION OF BORING: ______

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler 0-6	6-12	12-18	Moisture Density or Consist	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		0.5'-2.0'	D	6	5	6	Moist Medium Dense	.5'	Macadam. Brown fine-medium Sand, little fine Gravel, little Silt.	1	1.5'	.5'
		5.0'-6.5'	D	18	58	51	Moist Very Dense		Brown fine-coarse Sand, some fine-coarse Gravel, trace Silt.	2	1.5'	1.0'
		10.0'-11.5'	D	12	31	27	Moist Very Dense		Brown fine-medium Sand, little fine-medium Gravel.	3	1.5'	1.2'
		15.0'-16.5'	D	12	42	85	Moist Very Dense	18.0'	" "	4	1.5'	1.5'
		18.0'-23.0'	C				7 5 7 7		Gray Gneiss. (Reamed Casing to 20.0')	C1	5.0'	4.7'
		23.0'-28.0'	C				6 6 6 7 7 5	28.0'	" "	C2	5.0'	4.7'

Bottom of Boring 28.0'

Installed 2" PVC Rock Well @ 28.0'

20.8' Riser Pipe

1 Curb Box

GROUND SURFACE TO 18.0' USED HSA CASING: THEN Cored to 28.0'

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used	
trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

SUMMARY
Earth Boring 18.0'
Rock Coring 10.0'
Samples 4

HOLE NO MW-3

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: ELINCO

Monitoring Point I.D. No.: MW-3

Date of completion: 4/6/84

DEP/WPC I.D. No:

Monitoring Point Location (relative to site features): DOWNGRADIENT (see site map)

Drilling Contractor: EAST COAST DRILLING, INC.

Supervising Engineer/Geologist: P. MISLUK

Well Construction Method:
AUGERED AND CORED

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): -

Well depth below ground surface: 28.0'

Refusal: ____ Yes ____ No

Top of casing elevation (MSL):

Screened interval: 18' – 28'

Length of Screen:

Length of riser pipe: 20.8'

Screen type: PVC

Screen Slot size: .010"

Filter fabric: ____ Yes X No

Screen packing: X Yes ____ No

If yes, Thickness: 10.0'

Material: ottawa sand

grain size: # 12 sand

Well inside diameter: 2"

Impermeable Backfill: BENTONITE

Well casing material and schedule: 40 PVC

Estimated K screened interval:

Method of well development: PUMP

Time spent developing: 1 hr.

Locking ____ or threaded cap X
Curb Box

Impermeable backfill: CONCRETE COLLAR

Bedrock wells

Casing length: 20.8'

Water-bearing rock unit: FRACTURED FELSIC GNEISS

Water bearing sections (depths and approximate yields): 10' - 28'

Length of rock core: 10'

Diameter of core hole: 2 3/8"

Thickness and depth of impermeable backfill: 2', 16' to 18' and 2', 1' to 3'

O-rings seals: X Yes ____ No

GEOLOGIC INFORMATION

Aquifer:

Inferred relationship to plume: ____ Within ____ Outside ____ Edge

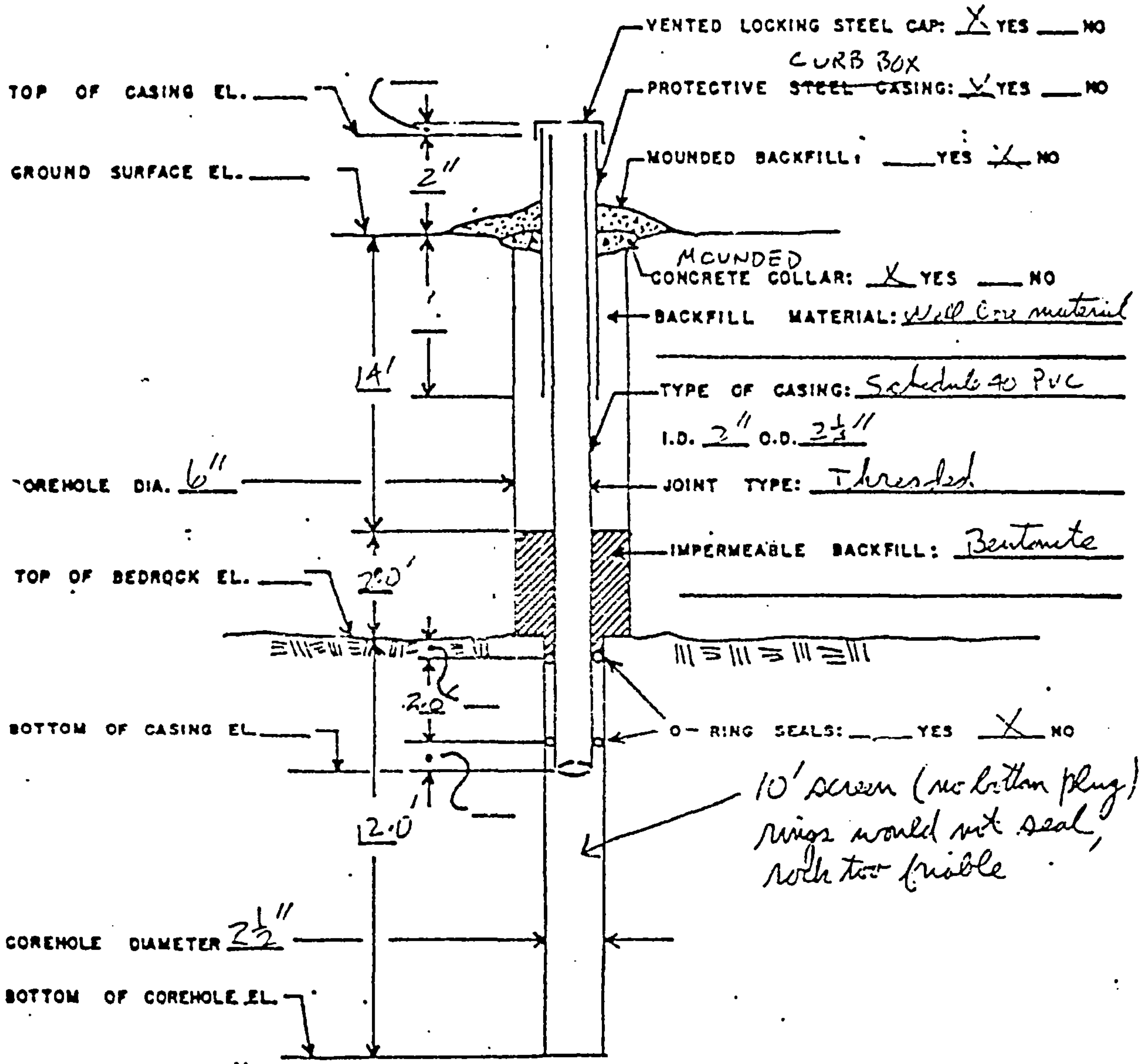
Watershed (plume discharge watercourse):

Aquifer materials (attach boring log):

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL
FOR WELL IN BEDROCK

mw-3



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT Fuss & O'Neill
PROJECT NAME Kesloff / Norwalk
LOCATION Norwalk, Ct.

BORING NUMBER MW-100
SHEET No. 1 of 2

DRILLER Michael Deane
INSPECTOR Bob Potterton
DATE START Sept. 9, 1985
DATE FINISH Sept. 11, 1985

ARCHITECT ENGINEER

	Casing	Sampler	Core Barrel
TYPE	NW	SS	NX
SIZE I.D.	3"	1½"	
HAMMER WT.	300#	140#	
HAMMER FALL	24"	30"	

FILE NO. 926-8540
SURFACE ELEV.
LINE & STATION
OFFSET

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5'	1	5.0'-6.5'	16	36	100	1.1			Brown fine-medium sand. Cobbles Fine-coarse Gravel.
10'	2	10.0'-10.8'	100	100/.3		.7			Boulders. Brown fine-coarse Sand and Gravel.
20'	3	20.0'-22.0'	76 25	67	56	.7			Brown fine-coarse Sand. Medium-coarse Gravel. Cobbles and Boulders
25'	4	25.0'-27.0'	38 27	49	56	.6			
30'	5	30.0'-32.0'	55 38	71	61	.5			Brown fine-medium Sand. Fine-coarse Gravel. Cobbles
35'	6	35.0'-37.0'	33 12	16	12	.5			~~Brown~~ fine-medium Sand. Fine-medium gravel.
	R-1	38.0'-43.0'				1.3	10 8	38.0'	Cored Marble like Rock.

SAMPLE IDENTIFICATION
S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE
A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

REMARKS:
COL. A Coring Time

Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT	Fuss &O'Neill
PROJECT NAME	Kosloff / Norwalk
LOCATION	Norwalk, Ct.
BORING NUMBER	MW_100
SHEET	No. 2 of 2
DRILLER	Michael Deane
INSPECTOR	Bob Potterton
DATE START	Sept. 9, 1985
DATE FINISH	Sept. 11, 1985
ARCHITECT ENGINEER	
FILE NO.	926-8540
SURFACE ELEV.	
LINE & STATION	
OFFSET	

	Casing	Sampler	Core Barrel
TYPE	NW	SS	NX
SIZE I.D.	3"	1½"	2"
HAMMER WT.	300#	140#	
HAMMER FALL	24"	30"	

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
40'							8		
							11		
							13		
	R-2	43.0'-45.0'				1.9	7		Cored Marble like Rock.
							8		
45'	R-3	45.0'-50.0'				3.6	4		
							7		
							9		
							9		
							11	50.0'	
									End of Boring: 50.0'

Installed 2" PVC Monitor Well
Bottom set at47.0'
5.0' Screen
42.0' Riser
1 Protective Cover.

Drilled 10.0' with Augers Moved Hole and Drove Casing.

SAMPLE IDENTIFICATION

S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE
A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A Coring Time

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-100

Date of completion: 9/11/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): WEST OF BUILDING #1 BETWEEN BUILDING & RTE 7

Drilling Contractor: GLENN DRILLING, INC. Supervising Engineer/Geologist: R.S. POTTERTON

Well Construction Method: HOLLOW STEM AUGERS / 3-INCH DRIVEN CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 81'

Well depth below ground surface: 47.7 FEET

Refusal: ____ Yes X No

Top of casing elevation (MSL): 81'

Screened interval: 42.7' - 47.7' BELOW GRADE

Length of Screen: 5 FEET

Length of riser pipe: 42 FEET

Screen type: SLOTTED PVC

Screen Slot size: 10 SLOT

Filter fabric: ____ Yes X No

Screen packing: ____ Yes X No

If yes, Thickness:

Material:

grain size:

Well inside diameter: 2-INCHES

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Well casing material and schedule: SCHEDULE 40 PVC

Estimated K screened interval: NA

Method of well development: BAILING

Time spent developing: 15 MINS.

Locking ____ or threaded cap ____ CURB BOX W/PENTAGONAL BOLT

Impermeable backfill: CEMENT

Bedrock wells

Casing length: 42 FEET

Water-bearing rock unit: GNEISS

Water bearing sections (depths and approximate yields): NA

Length of rock core: 12 FEET

Diameter of core hole: 2 3/8 - INCHES

Thickness and depth of impermeable backfill:

O-rings seals: X Yes ___ No

GEOLOGIC INFORMATION

Aquifer: BEDROCK (GNEISS)

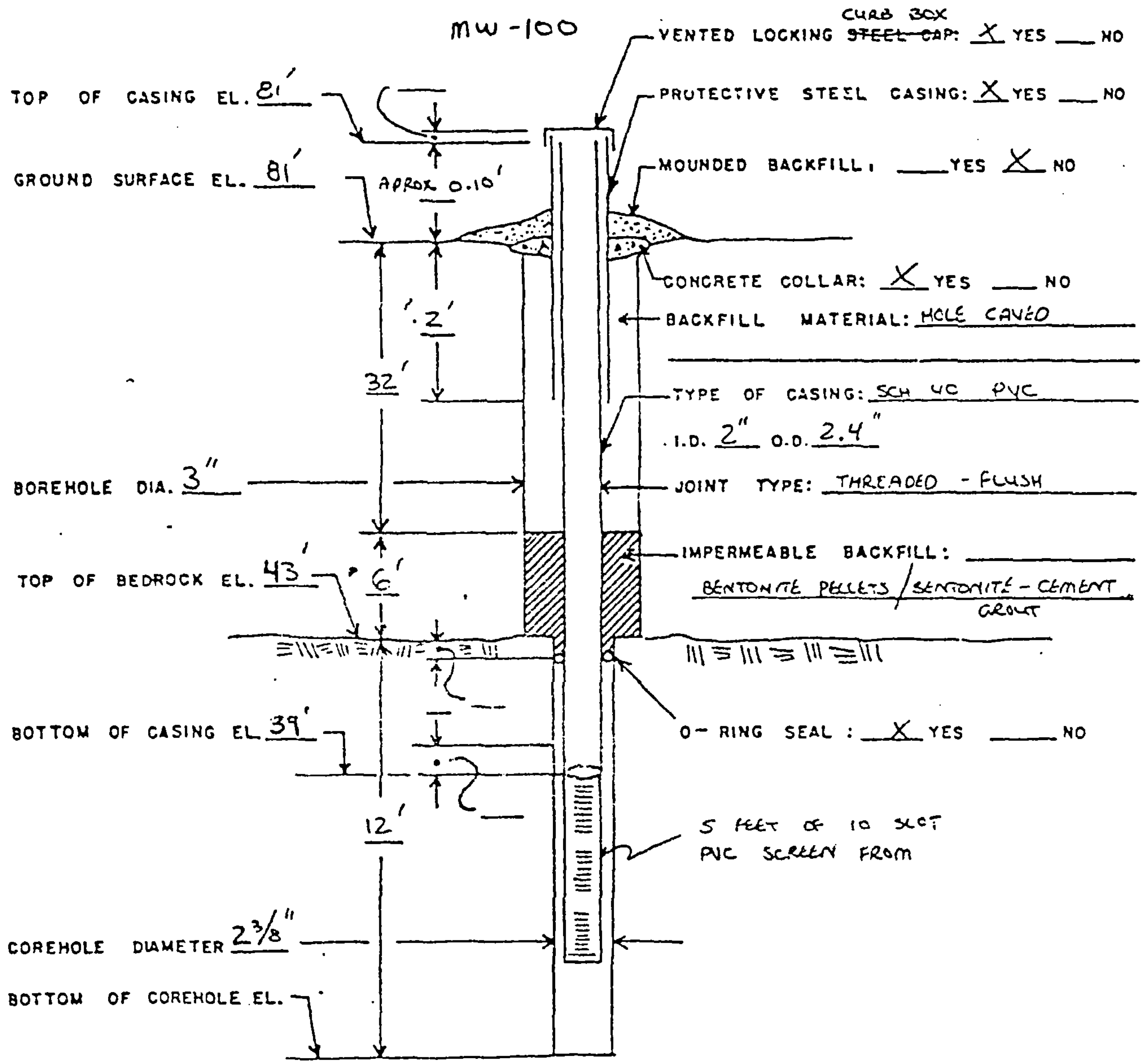
Inferred relationship to plume: ___ Within ___ Outside ___ Edge UNKNOWN

Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): BEDROCK (SEE LOG)

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL
FOR WELL IN BEDROCK



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss & O'Neill
PROJECT NAME: Kossoff / Norwalk
LOCATION: Norwalk, Ct.

BORING NUMBER: MW-101
SHEET No. 1 of 1

DRILLER: Michael Deane
INSPECTOR: Bob Potterton
DATE START: Sept. 12, 1985
DATE FINISH: Sept. 13, 1985

ARCHITECT ENGINEER:

	Casing	Sampler	Core Barrel
TYPE	NW	SS	NX
SIZE I.D.	3"	1 1/2"	2"
HAMMER WT.	300#	140#	
HAMMER FALL	24"	30"	

FILE NO. 926-8540
SURFACE ELEV.
LINE & STATION
OFFSET

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5'	1	5.0'-5.8'	61	100/.3		.8			Brown fine-coarse Sand and Gravel. Cobbles and Boulders.
10'	2	10.0'-10.5'	113			.5			Brown fine-coarse sand. Fine-medium Gravel. Cobbles and Boulders.
									Augered 12.0'. Moved Hole and Drove Casing.
	3	15.0'-16.0'	53	100		.9			
20'		20.0'-							No Sample Recovery.
								25.0'	
25'	4	25.0'-27.0'	33	41	29	.9			Brown fine-coarse Sand. Fine Gravel.
			31						
30'	5	31.0'-33.0'	31	29	31	1.1			Brown fine-medium Sand. Cobbles
			31						
35'	6	35.0'-35.9'	51	100/.4		.5			
	R-1	36.0'-37.0'				.9	10	36.0'	Cored Combination of Mica, Granite and Quartz.
									End of Bring: 37.0'

SAMPLE IDENTIFICATION
- S — SPLIT SPOON
- T — THIN WALL TUBE
- U — UNDISTURBED PISTON
- O — OPEN END ROD
- W — WASH SAMPLE
- A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS: Installed 2" PVC Moniotr Well Bottom at 35.4
5.0' Screen: 35.0' Riser
1 Protective Casing

COL. A Coring Time

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-101

Date of completion: 9/13/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): NORTHWEST CORNER OF BUILDING #1

Drilling Contractor: GLENN DRILLING, INC.

Supervising Engineer/Geologist: R.S. POTTERTON

Well Construction Method: HOLLOW STEM AUGERS - 3-INCH DRIVEN CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 80 FEET

Well depth below ground surface: 35.4'

Refusal: X Yes ___ No

Top of casing elevation (MSL): 80 FEET

Screened interval: 30.4' - 35.4' BELOW GRADE

Length of Screen: 5 FEET

Length of riser pipe: 35 FEET.

Screen type: SLOTTED PVC

Screen Slot size: 10 SLOT

Filter fabric: ___ Yes X No

Screen packing: X Yes ___ No

If yes, Thickness: 1/2-INCH

Material: QUARTZ SAND

grain size: MEDIUM

Well inside diameter: 2-INCHES

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Well casing material and schedule: SCHEDULE 40 PVC

Estimated K screened interval: NA

Method of well development: BAILING

Time spent developing: 15 MINS.

Locking ___ or threaded cap ___ CURB BOX W/PENTAGONAL BOLT

Impermeable backfill: CEMENT

Bedrock wells

Casing length:

Water-bearing rock unit:

Water bearing sections (depths and approximate yields):

Length of rock core:

Diameter of core hole:

Thickness and depth of impermeable backfill:

O-rings seals: ____Yes ____ No

GEOLOGIC INFORMATION

Aquifer: STRATIFIED DRIFT DEPOSITS

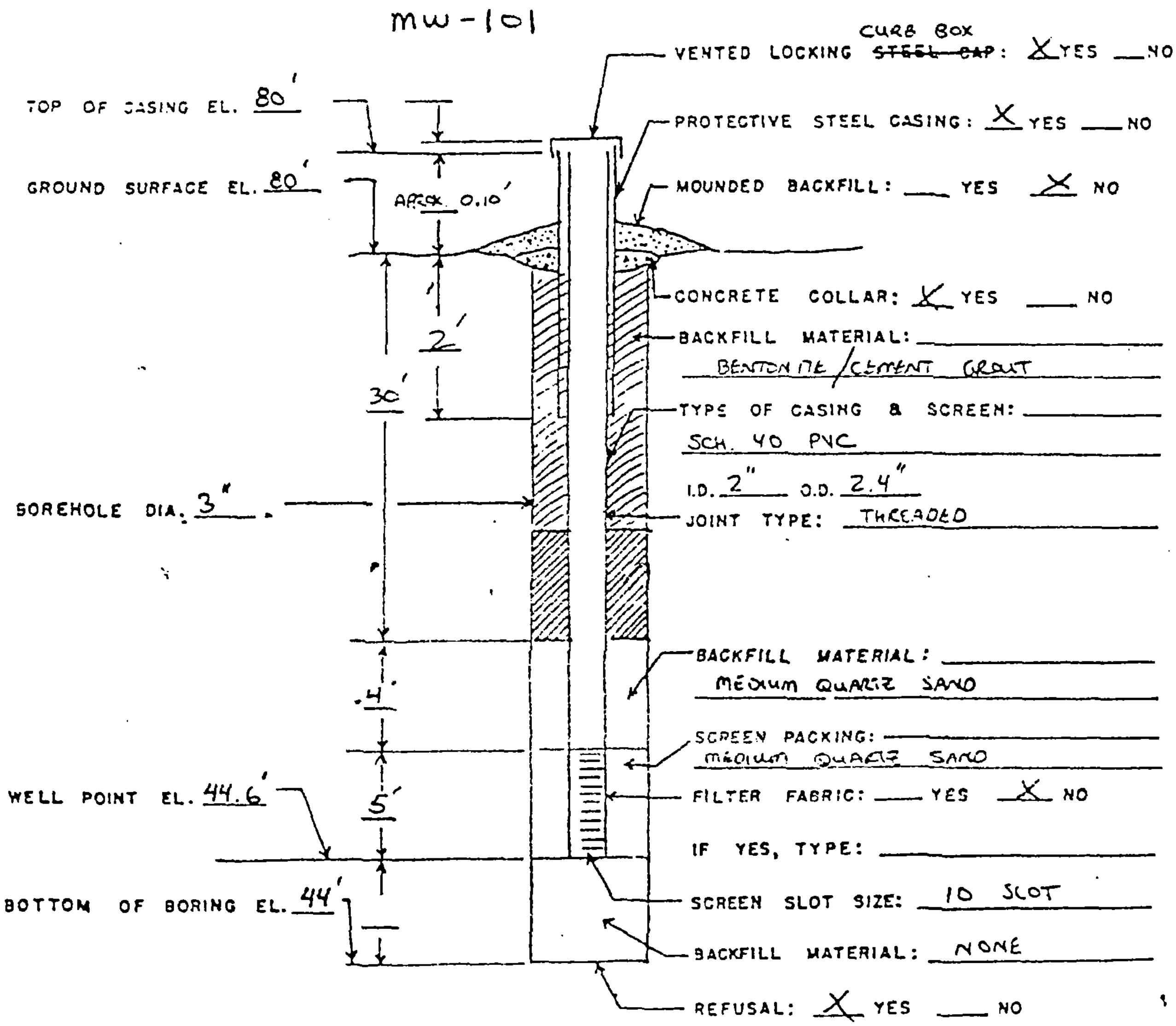
Inferred relationship to plume: ____ Within ____ Outside ____ Edge UNKNOWN

Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): SAND & GRAVEL

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL FOR WELL IN UNCONSOLIDATED DEPOSIT



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss & O'Neill
PROJECT NAME: KOSCOFF/NORWALK
LOCATION: Norwalk, Ct.

BORING NUMBER: MW-102
SHEET No. 1 of 1

LER: Michael Deane
INSPECTOR: Bob Potterton
DATE START: Sept. 16, 1985
DATE FINISH: Sept. 17, 1985

ARCHITECT ENGINEER

FILE NO. 926-8540
SURFACE ELEV.
LINE & STATION
OFFSET

	Casing	Sampler	Core Barrel
TYPE	HW	SS	NX
SIZE I.D.	4"	1½"	2"
HAMMER WT.	300#	140#	
HAMMER FALL	24"	30"	

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5	1	5.0'-6.0'	76	103		.9			Brown fine-coarse Sand. Weathered
	R-1	5.0'-10.0'				1.1	3	5.0'	Rock. Auger to 6.0'. Moved Hole
							4		and Drove Casing.
							4		Cored Rock @ 6'
							4		
10							4		
	R-2	10.0'-15.0'				1.5	3		
							3		
							6		
							5		
							6		
	R-3	15.0'-19.0'				1.3	4		
							3		
							3		
							6	19.0'	
20									End of Boring: 19.0'
									Installed 2" PVC Monitor Well
									Bottom set at 15.5'
									5.0' Screen
									10.0 Riser
									1 Protective Casing and Plug

SAMPLE IDENTIFICATION
S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE
A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50+	Very Dense	16-30	V-Stiff
		31+	Hard

PROPORTIONS USED
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

REMARKS:

COL. A Coring Time

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-102

Date of completion: 9/17/85

DEP/WPC I.D. No: 103 - 092

Monitoring Point Location (relative to site features): 114 FEET EAST OF BUILDING #2

Drilling Contractor: GLENN DRILLING, INC.

Supervising Engineer/Geologist: R.S. POTTERTON

Well Construction Method: HOLLOW STEM AUGERS - AND 4 - INCH DRIVEN CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 101 FEET

Well depth below ground surface: 15.5'

Refusal: ____ Yes X No

Top of casing elevation (MSL): 101 FEET

Screened interval: 10.5 - 15.5 FEET BELOW GRADE

Length of Screen: 5 FEET

Length of riser pipe: 10 FEET

Screen type: SLOTTED PVC

Screen Slot size: 10 SLOT

Filter fabric: ____ Yes X No

Screen packing: ____ Yes X No

If yes, Thickness:

Material:

grain size:

Well inside diameter: 2 - INCHES

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Well casing material and schedule: SCHEDULE 40 PVC

Estimated K screened interval: NA

Method of well development: BAILING

Time spent developing: 15 MINS.

Locking ____ or threaded cap ____ CURB BOX W/PENTAGONAL BOLT

Impermeable backfill: CEMENT

Bedrock wells

Casing length: 10 FEET

Water-bearing rock unit: GNEISS

Water bearing sections (depths and approximate yields): NA

Length of rock core: 13 FEET

Diameter of core hole: 2 3/8"

Thickness and depth of impermeable backfill: 0.8" THICK FROM 9 FEET BELOW GRADE TO GRADE.

O-rings seals: X Yes ____ No

GEOLOGIC INFORMATION

Aquifer: BEDROCK (GNEISS)

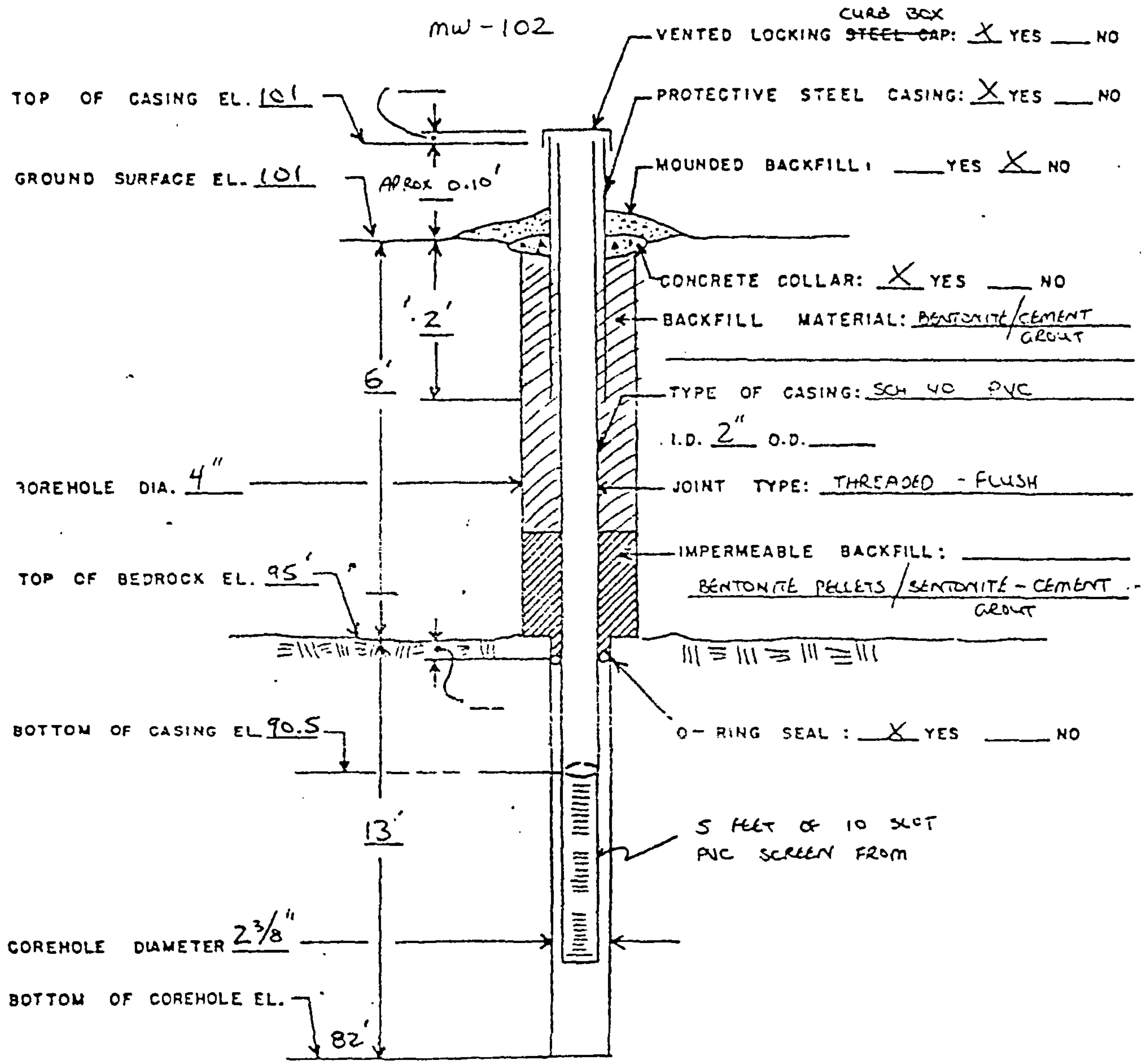
Inferred relationship to plume: ____ Within ____ Outside ____ Edge UNKNOWN

Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): BEDROCK

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL
FOR WELL IN BEDROCK



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT Fuss & O'Neill
PROJECT NAME Kosloff / Norwalk
LOCATION Norwalk, Ct.

BORING NUMBER MW-103
SHEET No. 1 of 1

DRILLER Michael Deane
INSPECTOR Bob Potterton
DATE START Sept. 17, 1985
DATE FINISH Sept. 18, 1985

ARCHITECT ENGINEER

	Casing	Sampler	Core Barrel
TYPE	HW	SS	NX
SIZE I.D.	4"	1 3/8"	2"
HAMMER WT.	300#	140#	
HAMMER FALL	24"	30"	

FILE NO. 926-8510
SURFACE ELEV.
LINE & STATION
OFFSET

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5	1	5.0'-7.0'	6	8	16	1.2			Brown fine sand.
			37						
10	R-1	10.0'-15.0'				2.5	3	10.0'	Cored Granite, Quartz.
							5		
							8		
							13		
							5		
	R-2	15.0'-20.0'				1.2	4		
							9		
							7		
							11		
							4	20.0'	
									End of Boring: 20.0'
									Installed 2" PVC Monitor Well Bottom set at 15.8' 5.0' Screen 10.8' Riser 1 Protective Casing with Plug

SAMPLE IDENTIFICATION
- — SPLIT SPOON
- T — THIN WALL TUBE
- U — UNDISTURBED PISTON
- O — OPEN END ROD
- W — WASH SAMPLE
- A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A Coring Time

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-103

Date of completion: 9/18/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): 17' SOUTH OF BUILDING 2

Drilling Contractor: GLENN DRILLING, INC.

Supervising Engineer/Geologist: R.S. POTTERTON

Well Construction Method: HOLLOW STEM AUGERS AND 4-INCH DRIVEN CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 83'

Top of casing elevation (MSL): 83'

Length of Screen: 5 FEET

Length of riser pipe: 10.8 FEET

Screen type: SLOTTED PVC

Filter fabric: ____ Yes X No

Well inside diameter: 2-INCHES

Well casing material and schedule: SCHEDULE 40 PVC

Method of well development: BAILING

Locking ____ or threaded cap ____ CURB BOX W/ PENTAGONAL BOLT

Well depth below ground surface:

Refusal: ____ Yes X No

Screened interval: 10.8-15.8 FEET BELOW GRADE

Screen Slot size: 10 SLOT

Screen packing: ____ Yes X No

If yes, Thickness:

Material:

grain size:

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Estimated K screened interval:

Time spent developing: 15 MINS.

Impermeable backfill: CEMENT

Bedrock wells

Casing length: 10.8 FEET

Water-bearing rock unit: GNEISS

Water bearing sections (depths and approximate yields): NA

Length of rock core: 10 FEET

Diameter of core hole: 2 3/8 -INCHES

Thickness and depth of impermeable backfill: 10.5' THICK (FROM 10.5 FEET TO GRADE)

~~O-rings~~ ~~seals~~: X Yes ___ No

GEOLOGIC INFORMATION

Aquifer: BEDROCK (GNEISS)

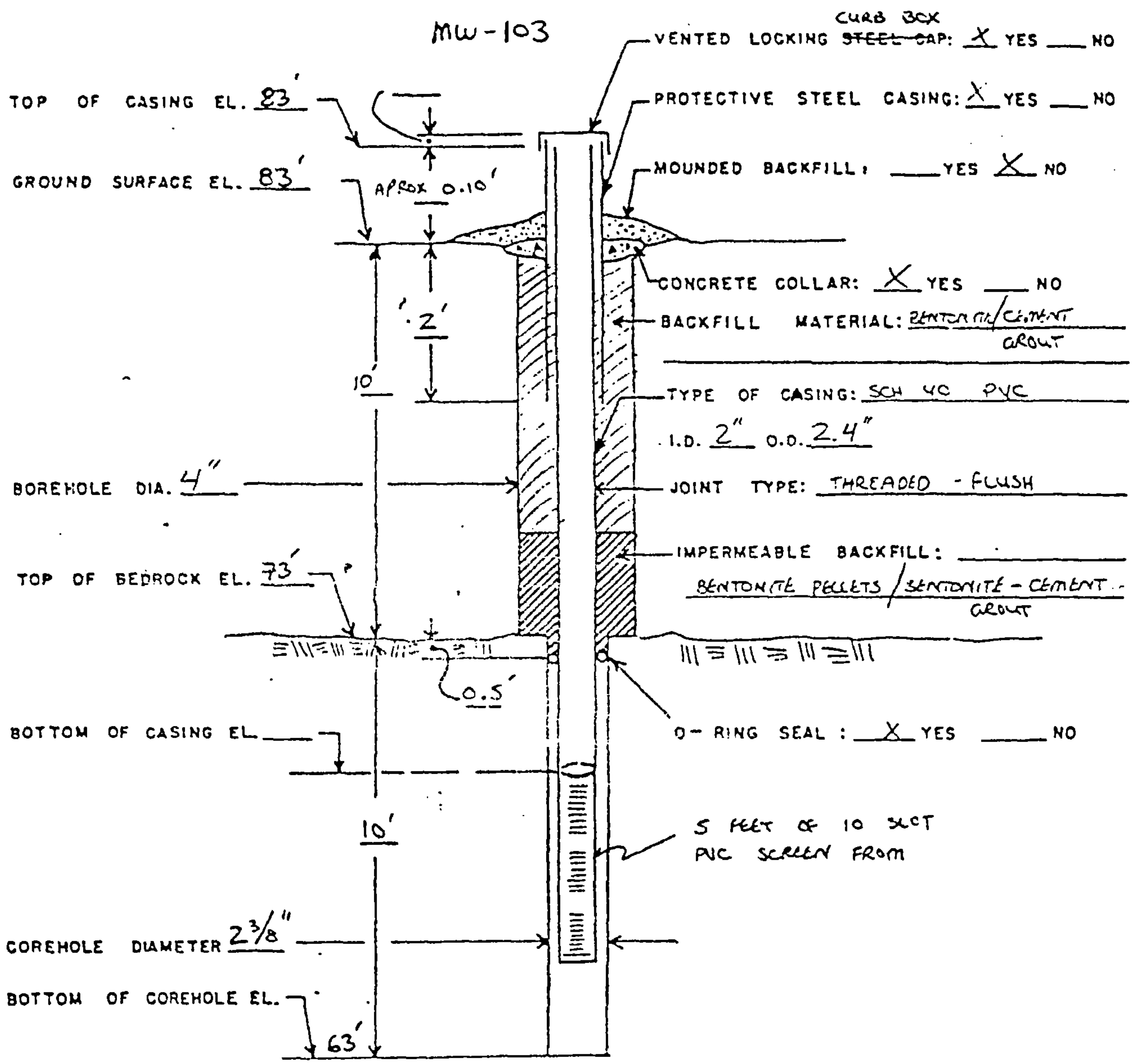
Inferred relationship to plume: ___ Within ___ Outside ___ Edge UNKNOWN

Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): BEDROCK

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL FOR WELL IN BEDROCK



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss & O'Neill
PROJECT NAME: Kosloff/Norwalk
LOCATION: Norwalk, Ct.

BORING NUMBER: MW-104
SHEET No. 1 of 1

DRILLER: Michael Deane
INSPECTOR: Bob Potterton
DATE START: Sept. 17, 1985
DATE FINISH: Sept. 18, 1985

ARCHITECT ENGINEER:

	Casing	Sampler	Core Barrel
TYPE	HW	SS	NX
SIZE I.D.	4"	1½"	2"
HAMMER WT.	300#	140#	
HAMMER FALL	24"	30"	

FILE NO. 926-8540
SURFACE ELEV.:
LINE & STATION:
OFFSET:

DEPTH	SAMPLE NO.	SAMPLE DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
	1	5.0'-5.6'	65	100/.1		.6			Brown fine-coarse Sand. Fine-medium
5'	R-1	6.0'-11.0'				1.7	5	6.0'	gravel. Cobbles and Boulders.
							11		
							15		Cored Rock.
							13		
							25		
10'	R-2	11.0'-13.0'				.8	[illegible]		
							21		
							33		
	R-3	13.0'-15.7'				1.0	17		
							19		
15'							19	15.7'	

End of Boring: 15.7'

Installed 2" PVC Monitor Well
Bottom set at 14.2'
5.0' Screen
9.8' Riser
1 Protective Casing and Plug.

SAMPLE IDENTIFICATION
- S — SPLIT SPOON
- T — THIN WALL TUBE
- U — UNDISTURBED PISTON
- O — OPEN END ROD
- W — WASH SAMPLE
- A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A: Coring Time

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-104

Date of completion: 9/18/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): 5 FEET SOUTH OF BUILDING # 1

Drilling Contractor: GLENN DRILLING, INC. Supervising Engineer/Geologist: R.S. PETTERSON

Well Construction Method: HOLLOW STEM AUGERS - AND 4-INCH DRIVEN CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 81 FEET

Well depth below ground surface:

Refusal: ____ Yes X No

Top of casing elevation (MSL): 81 FEET

Screened interval: 9.2 - 14.2 FEET BELOW GRADE

Length of Screen: 5 FEET

Length of riser pipe: 9.8 FEET

Screen type: SLOTTED PVC

Screen Slot size: 10 SLOT

Filter fabric: ____ Yes X No

Screen packing: ____ Yes X No

If yes, Thickness:

Material:

grain size:

Well inside diameter: 2-INCHES

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Well casing material and schedule: SCHEDULE 40 PVC

Estimated K screened interval: NA

Method of well development: BAILING

Time spent developing: 15 MINS.

Locking ____ or threaded cap ____ CURB BOX W/PENTAGONAL BOLT

Impermeable backfill: CEMENT

Bedrock wells

Casing length: 9.8 FEET

Water-bearing rock unit: GNEISS

Water bearing sections (depths and approximate yields): NA

Length of rock core: 9.7 FEET

Diameter of core hole: 2 3/8 - INCHES

Thickness and depth of impermeable backfill: 4 FEET (FROM 7' TO 3' BELOW GRADE)

O-ring seal : X Yes ____ No

GEOLOGIC INFORMATION

Aquifer: BEDROCK (GNEISS)

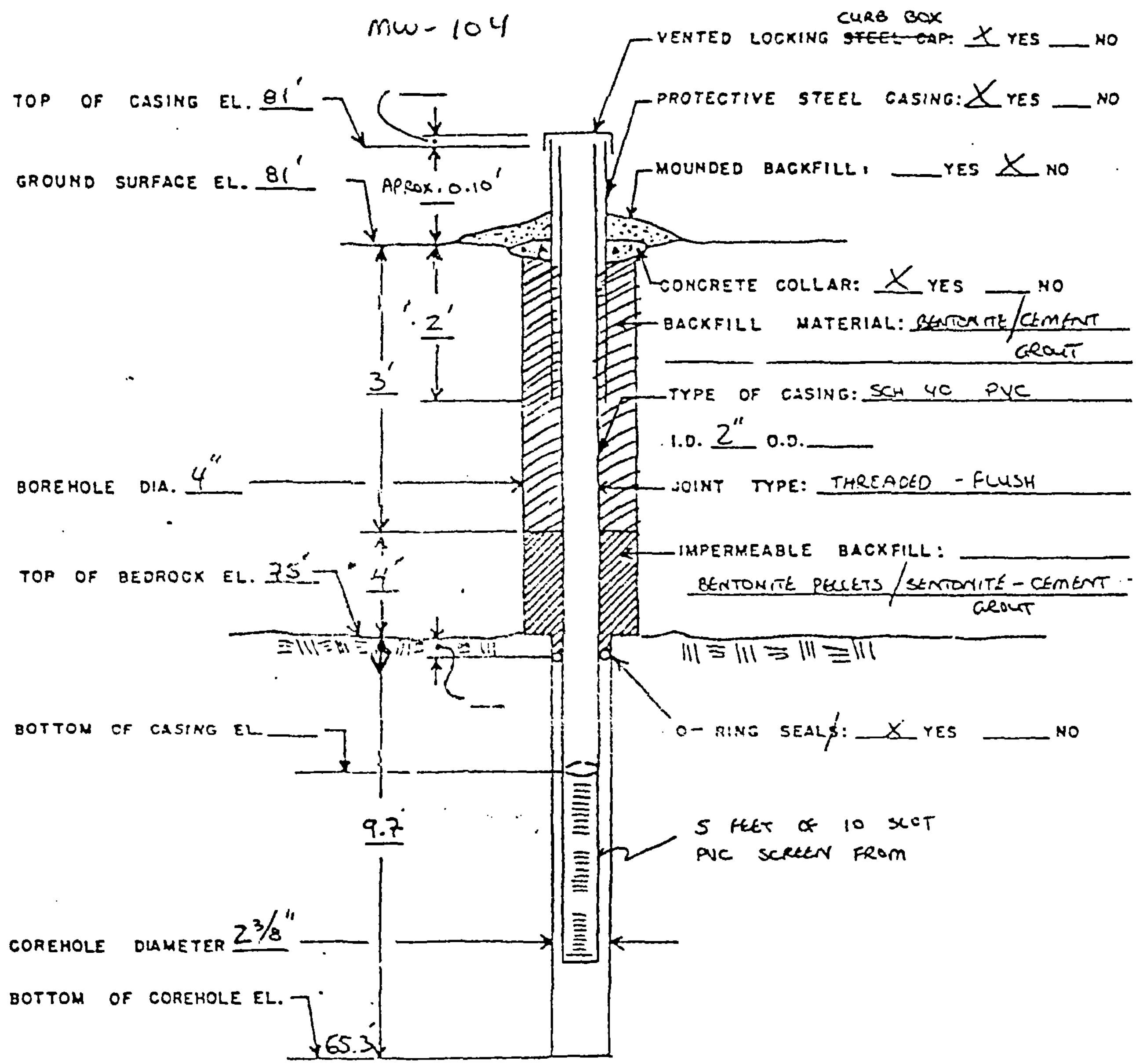
Inferred relationship to plume: X Within ____ Outside ____ Edge

Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): BEDROCK

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL FOR WELL IN BEDROCK



Glenn Drilling Inc.

R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss & O"Neill
PROJECT NAME: KOSLOFF/NORWALK
LOCATION: Norwalk, Ct.

BORING NUMBER: MW-105
SHEET No. 1 of 1

DRILLER: Michael Deane
INSPECTOR: BOB POTTERTON / Tim BINGHAM
DATE START: Sept. 20, 1985
DATE FINISH: Sept. 23, 1985

ARCHITECT ENGINEER:

FILE NO. 926-8540
SURFACE ELEV.
LINE & STATION
OFFSET

	Casing	Sampler	Core Barrel
TYPE	HW	SS	NX
SIZE I.D.	4"	1⅜"	
HAMMER WT.	300#	140#	
HAMMER FALL	24"	30"	

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5'	1	5.0'-7.0'	48	90	56	1.2			Brown fine-coarse sand and gravel Weathered Rock.
			75						
10'	2	10.0'-10.8'	54	100/3		.9			Brown fine-coarse sand and gravel. Weathered Rock.
15'	3	15.0'-16.5'	31	33	102	.9		17'	Dark Brown fine-coarse Sand and Gravel. Weathered Rock.
	R-1	18.0'-23.0'				1.9	17		ROCK AT 17'
20'							16		
							18		
							19		
							23		
	R-2	23.0'-27.5'							
25'								27.5'	
									End of Boring: 27.5'

Installed 2" PVC Monitor Well
Bottom set at 24.0'
5.0' Screen
19.0' Riser
1 Protective Casing and Plug

Reamed hole with Roller Bit to 25.0'
Telescoped NW Casing to maintain Hole.

SAMPLE IDENTIFICATION

S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE
A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A: Corring Time

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-105

Date of completion: 9/23/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): 10 FEET NORTH OF BUILDING 1

Drilling Contractor: GLENN DRILLING, INC.

Supervising Engineer/Geologist: R.S POTTERTON

Well Construction Method: DRIVE 4-INCH CASING/NX CORING IN BEDROCK

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 83'

Top of casing elevation (MSL): 83'

Length of Screen: 5 FEET

Length of riser pipe: 19 FEET.

Screen type: SLOTTED PVC

Filter fabric: ___ Yes X No

Well inside diameter: 2-INCHES

Well casing material and schedule: SCHEDULE 40 PVC

Method of well development: BAILING

Locking ____ or threaded cap ____ CURB BOX W/PENTAGONAL BOLT

Well depth below ground surface:

Refusal: ___ Yes X No

Screened interval: 19.5'-24.5' BELOW GRADE

Screen Slot size: 10 SLOT

Screen packing: ___ Yes X No

If yes, Thickness:

Material:

grain size:

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Estimated K screened interval: NA

Time spent developing: 15 MINS.

Impermeable backfill: CEMENT

Bedrock wells

Casing length: 19 FEET

Water-bearing rock unit: GNEISS

Water bearing sections (depths and approximate yields): NA

Length of rock core: 8 FEET

Diameter of core hole: 2 3/8 - INCHES

Thickness and depth of impermeable backfill: 9 FEET (10'-19' BELOW GRADE)

O-rings seals: X Yes ____ No

GEOLOGIC INFORMATION

Aquifer: BEDROCK (GNEISS)

Inferred relationship to plume: ____ Within ____ Outside ____ Edge UNKNOWN

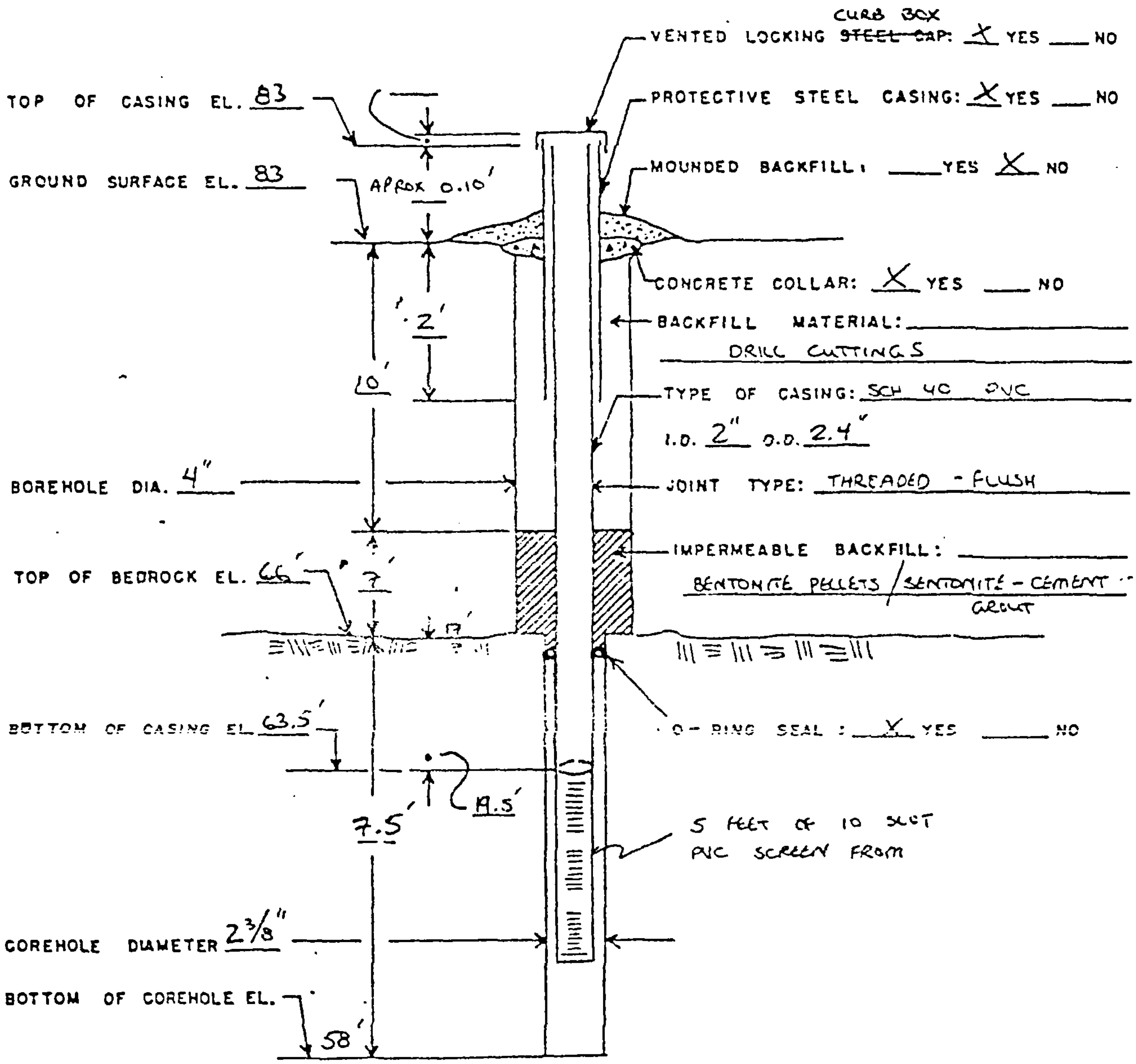
Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): SAND & GRAVEL / BEDROCK

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL FOR WELL IN BEDROCK

MW - 105



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss & O'Neill
PROJECT NAME: KCSLCH/NORWALK
LOCATION: Norwalk, Ct.

BORING NUMBER: MW-106
SHEET No. 1 of 1

DRILLER: Michael Deane
INSPECTOR: Bob Potterton
DATE START: Sept. 23, 1985
DATE FINISH: Sept. 24, 1985

ARCHITECT ENGINEER:

	Casing	Sampler	Core Barrel
TYPE	HW		
SIZE I.D.	4"		
HAMMER WT.	300#		
HAMMER FALL	24"		

FILE NO. 926-8540
SURFACE ELEV.
LINE & STATION
OFFSET

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5'									Drove Casing to 16.5'.
10'									
								16.5'	
									End of Boring: 16.5'
									Installed 2" PVC Monitor Well Bottom set at 16.0' 5.0' Screen 11.0' Riser 1 Protective Casing and Plug.

SAMPLE IDENTIFICATION
S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE
A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-106

Date of completion: 9/24/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): NORTH OF BUILDING #1

Drilling Contractor: GLENN DRILLING, INC.

Supervising Engineer/Geologist: R.S. PETTERSON

Well Construction Method: DROVE 4-INCH CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 83'

Well depth below ground surface:

Refusal: ____ Yes X No

Top of casing elevation (MSL): 83'

Screened interval: 11.5'-16.5' BELOW GRADE

Length of Screen: 5 FEET

Length of riser pipe: 11 FEET

Screen type: SLOTTED PVC

Screen Slot size: 10 SLOT

Filter fabric: ____ Yes X No

Screen packing: X Yes ____ No

If yes, Thickness: 5 1/2 - FEET

Material: QUARTZ SAND

grain size: MEDIUM

Well inside diameter: 2-INCHES

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Well casing material and schedule: SCHEDULE 40 PVC

Estimated K screened interval: NA

Method of well development: BAILING

Time spent developing: 15 MINS.

Locking ____ or threaded cap ____ CURB BOX W/PENTAGONAL BOLT

Impermeable backfill: CEMENT

Bedrock wells

Casing length:

Water-bearing rock unit:

Water bearing sections (depths and approximate yields):

Length of rock core:

Diameter of core hole:

Thickness and depth of impermeable backfill:

O-rings seals: ____ Yes ____ No

GEOLOGIC INFORMATION

Aquifer: SAND & GRAVEL

Inferred relationship to plume: ____ Within ____ Outside ____ Edge UNKNOWN

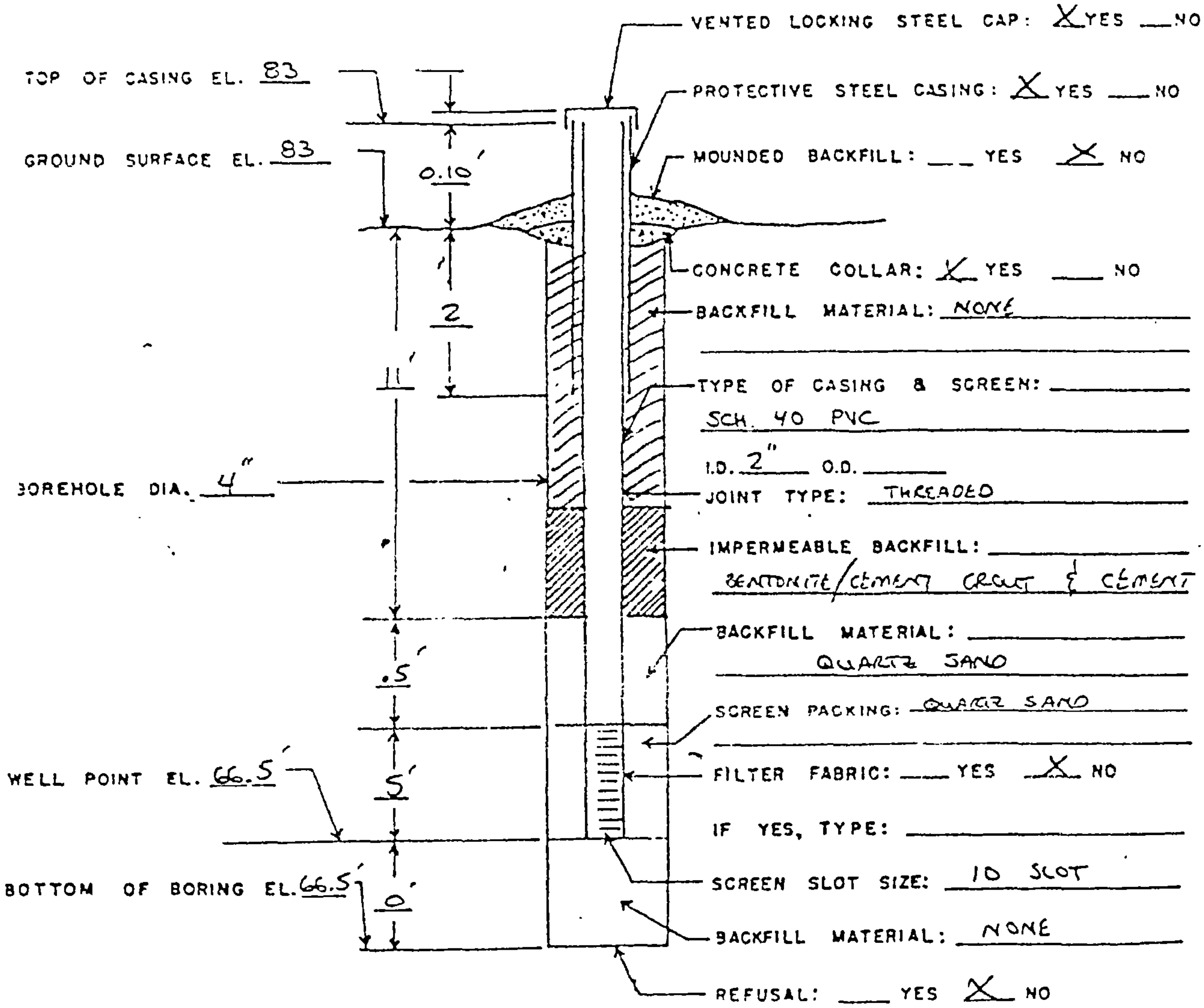
Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): SAND & GRAVEL (ASSORTED SIZES)

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL FOR WELL IN UNCONSOLIDATED DEPOSIT

MW-106



NUS CORPORATION
A Halliburton Company

PROJECT KELLOGG-DEERING
PROJECT NO. 3781.16 BORING K-10
ELEVATION 82.16' msl DATE 2/20/85
FIELD GEOLOGIST JEFF ORIENT

SAMPLE NO., TYPE* & DEPTH(ft)	BLOWS/SIX INCHES OR RQD(%)	SAMPLE RECOVERY/ SAMPLE LENGTH(ft)	MATERIAL MOISTURE & WATER DEPTH(ft)	MATERIAL DESCRIPTION*: SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
						SAND GRAVEL, COBBLES		
								DRILLED TO 16.0' THEN MOVED & RE-DRILLED - GROUTED UP ORIGINAL BORING
						9.0' 9.0'		
						FELSIC GNEISS		
								CASING SET TO 15.0'

REMARKS BORING LOCATED BEHIND NEW ENGLAND QUARTZ

BORING K-10

*SEE LEGEND ON BACK

PAGE 1 OF 3

NUS CORPORATION
A Halliburton Company

PROJECT KELLOGG-DEERING
PROJECT NO. 5781.16 BORING K-10
ELEVATION 82.16' msl DATE 2/20/85
FIELD GEOLOGIST JEFF ORIENT

SAMPLE NO., TYPE* & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION*: SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
						FELSIC GNEISS (CONT)		
						FRACT @ 41'		

REMARKS

BORING K-10

*SEE LEGEND ON BACK

PAGE 2 OF 3

NUS CORPORATION
A Halliburton Company

PROJECT KELLOGG-DEERING
PROJECT NO. [illegible]
BORING K-10
ELEVATION 82.1[illegible]' msl
DATE 2/20/85
FIELD GEOLOGIST JEFF ORIENT

SAMPLE NO.,TYPE* & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
						FELSIC GNEISS (CONT)		
						FRACT'D 55'		WATER BETWEEN 50-50.4'
						59.4' ↓ TOTAL DEPTH 59.4'		

REMARKS BORING MADE INTO WELL K-10

BORING K-10

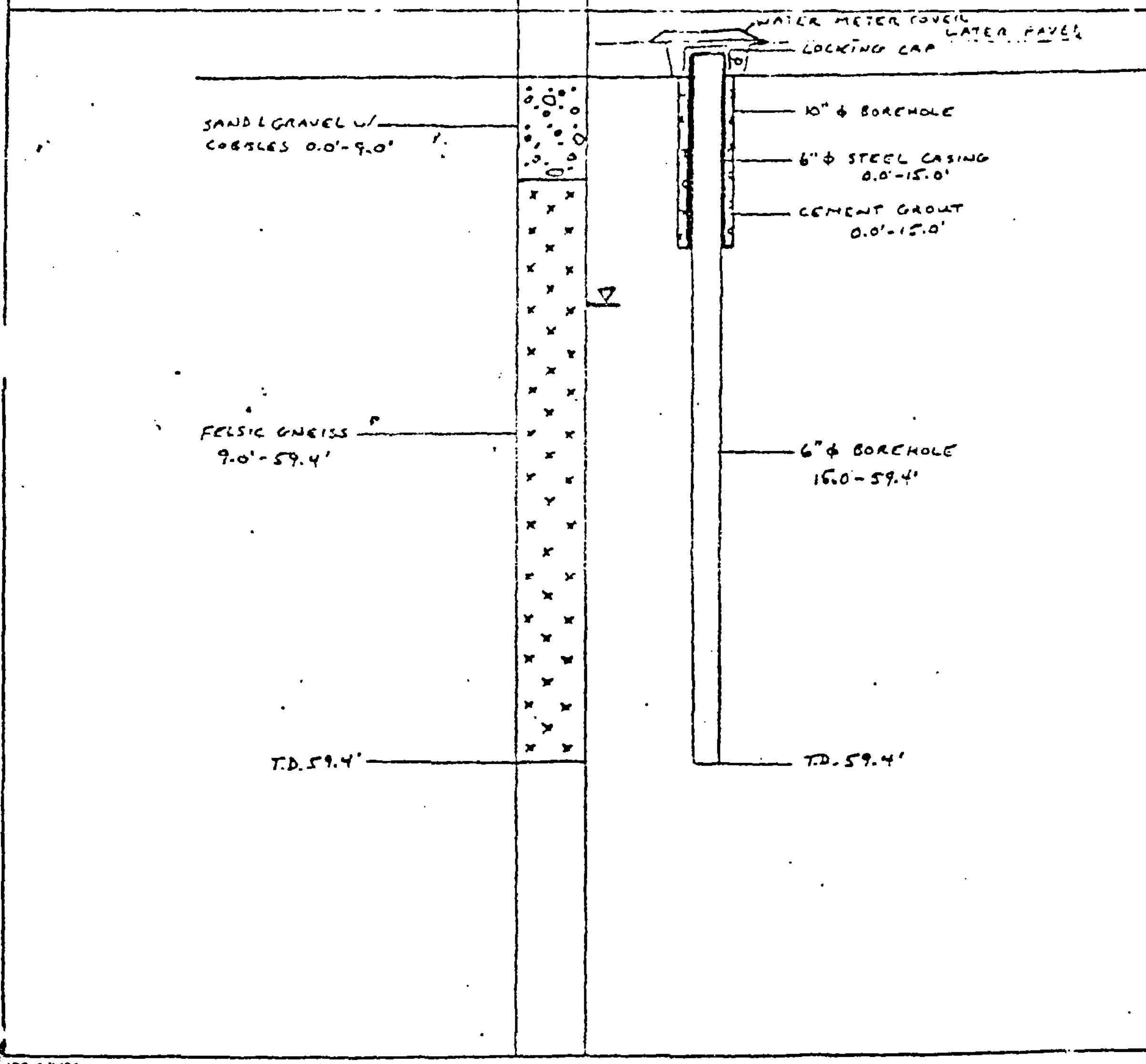
*SEE LEGEND ON BACK

PAGE 3 OF 3

WELL LOG SHEET

WELL NO. K-10 PROJECT NO. 5781.16	PROJECT NAME KELLOGG - DEERING
LOCATION BEHIND NEW ENGLAND QUARTZ	GEOLOGIST JEFF ORIENT
DRILLING DATE 2/20/85	DRILLING CONTRACTOR EARTH ENGINEERING & SCIENCES, INC.
DRILLING METHOD AIR ROTARY/AIR HAMMER DRILLER L. FINDORAK	INSTALLATION DATE 2/20/85
WATER LEVEL BEFORE INSTALLATION 20.85'	WATER LEVEL AFTER INSTALLATION 20.85'
DEVELOPMENT METHOD AIR LIFT	GROUND ELEVATION

LITHOLOGY DESCRIPTION	SYMBOL	CONSTRUCTION DETAILS DESCRIPTION	DEPTH



NUS CORPORATION
A Halliburton Company

PROJECT KELLOGG-DEERING
PROJECT NO. 5791.16 BORING K-11
ELEVATION 78.45' msl DATE 2/20-2/21/85
FIELD GEOLOGIST JEFF ORIENT

Depth	SAMPLE NO., TYPE* & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION*: SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	MATERIAL DESCRIPTION*: COLOR	MATERIAL DESCRIPTION*: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
0							ASPHALT 0.0-1.0'		
							MED TO COARSE SAND & GRAV.		
							GRAVEL ROUNDED TO SUBANG[illegible]		
							UP TO 1"Ø		
5									
10									
15									
20									
25									

REMARKS BORING LOCATED IN FRONT OF PITNEY BOWES

BORING K-11

*SEE LEGEND ON BACK

PAGE 1 OF 2

NUS CORPORATION
A Halliburton Company

PROJECT KELLOGG - DEERING
PROJECT NO. 5781.16 BORING K-11
ELEVATION 79.45' msl DATE 2/20-2/21/85
FIELD GEOLOGIST JEFF ORIENT

Depth	SAMPLE NO.,TYPE* & DEPTH(ft)	BLOWS/SIX INCHES OR RQD(%)	SAMPLE RECOVERY/ SAMPLE LENGTH(ft)	MATERIAL MOISTURE & WATER DEPTH(ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
25							SAND & GRAVEL (CONT)		
30									
35									
									BEDROCK @
							38.5 ▽ TOTAL DEPTH ▽ 38.5'		38.5'
40									
45									
50									

REMARKS INSTALLED WELL K-11 IN BORING

BORING K-11

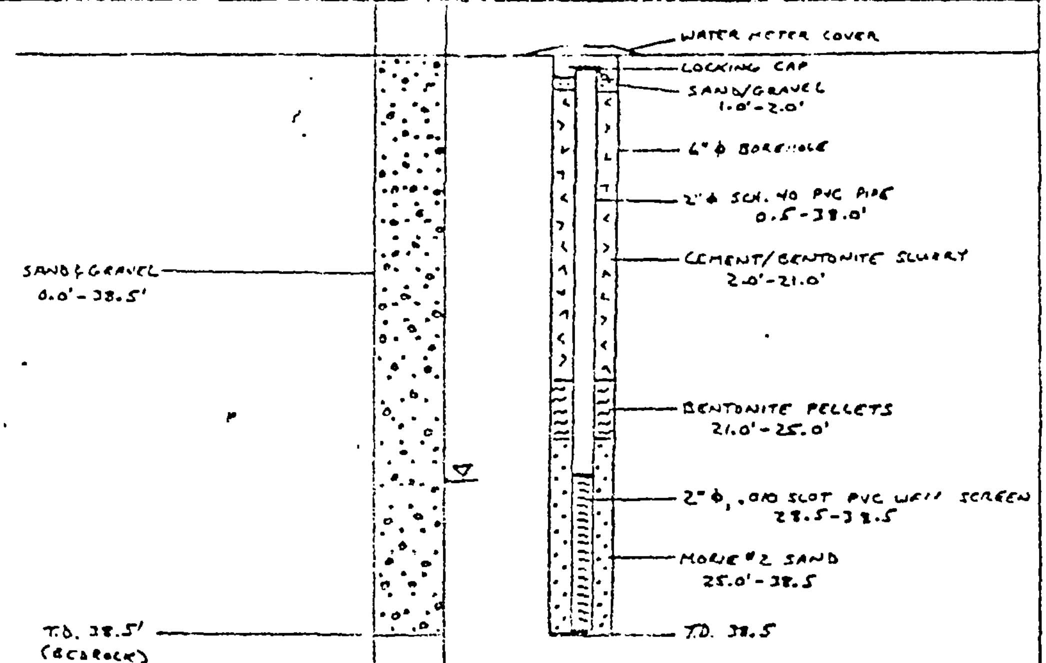
*SEE LEGEND ON BACK

PAGE 2 OF 2

WELL LOG SHEET

WELL NO. K-11	PROJECT NO 5781.16	PROJECT NAME KELLOGG-DEERING
LOCATION IN FRONT OF PITNEY-BOWES		GEOLOGIST JEFF ORIENT/M. COCHRAN
DRILLING DATE 2/20-2/21/85	DRILLING CONTRACTOR EARTH ENGINEERING & SCIENCES, INC	
DRILLING METHOD AIR ROTARY	DRILLER L. FINDORAK	INSTALLATION DATE 2/21/85
WATER LEVEL BEFORE INSTALLATION 28'		WATER LEVEL AFTER INSTALLATION
DEVELOPMENT METHOD		GROUND ELEVATION

LITHOLOGY DESCRIPTION	SYMBOL	CONSTRUCTION DETAILS DESCRIPTION	DEPTH



SOIL BORING LOGS

BORING LOG — NUS CORPORATION

PROJECT: Kellogg - Deering — BORING NO.: SSB1
PROJECT NO.: L670 — DATE: 4-18-88 — DRILLER: Vince Prue, Empire Soils
ELEVATION: — FIELD GEOLOGIST: Scott M. Krall
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth Ft.)	SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1 1130	0-2'	7 8 2	0.3/2.0		LOOSE	BR TAN	SAND (fine-med) trace gravel (fill)	SW	ASPHALT TO .3 HNU=0ppm
1135	2'-4'	10 10 6 4	1.1/2.0		LOOSE		RR bricks		HNU=0ppm DAMP TO DRY
1140	4'-6'	10 7 10 9	1.2/2.0	5.0	LOOSE	DK BR	SANDY SILT - GRAVEL (fill)	SM	HNU=0ppm DAMP TO DRY
1150	6'-8'	12 7 7 5	0.2/2.0		LOOSE				HNU=0ppm DRY
1205	8'-10'	7 4 15 12	1.0/2.0		LOOSE				HNU=0ppm DRY
1320	10'-12'	16 14 15 41	1.2/2.0	11.5	M DENSE	BR	SILTY MED-COARSE SAND AND GRAVEL 1/4"-2"	SW	HNU=0ppm DRY
S-3 1425	12'-14'	23 47 34 107	1.1/2.0		DENSE				HNU=0ppm DAMP-DRY
1445	14'-16'	13 19 20 24	1.4/2.0		M DENSE				HNU=0ppm DAMP DRY
1455	16'-18'	21 [illegible] [illegible] 62	1.6/2.0		V DENSE				HNU=0ppm DAMP
1520	18'-20'	100	0.2/2.4		V DENSE		HIGH GRAVEL ZONE 1"-2" 18'-20'		100/.4 HNU=0 NO SAMPLE OBTAINED GRAVEL
S-4 1535	20'-22'	49 100	0.2/0.7		V DENSE				100/.2 HNU=0ppm
1610	22'-24'	23 43 43 55	1.2/2.0		DENSE				HNU=0ppm DAMP
1630	24-26	52 43	1.1/2.0		DENSE				HNU=0 DAMP

REMARKS: 2" OD Splitspoon Driven w/140 lb Hammer Falling 30"
Photo # 15 Roll # 2 pg 207 TB1017 Acker Soil Mech Rig
Stopped for 1 1/2 HR due to rain

* See Legend on Back

BORING: SSB1

PAGE 1 OF 2

BORING LOG | NUS CORPORATION

PROJECT: Kellogg - Deerins
PROJECT NO.: L670
ELEVATION:
WATER LEVEL DATA:
(Date, Time & Conditions)

BORING NO. SS B1
DATE: 4-18-88
DRILLER: Vince Prue
FIELD GEOLOGIST: Scott M. Krall

SAMPLE NO & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (DEPTH FT)	SOIL DENSITY CONSISTENCY OR ROCK HARDNESS (MATERIAL DESCRIPTION*)	COLOR (MATERIAL DESCRIPTION*)	MATERIAL CLASSIFICATION (MATERIAL DESCRIPTION*)	USCS	REMARKS
		45 38							OCD
1700	26'28'	47 71	0.6/1.7		V DENSE				100/.3' HNU: .
		85 100							
1715	28'30	24 54	1.4/2.0		V DENSE				100/.3'
		71 30							
	30'32	21 110	0.2/0.9		V DENSE				110/.4'
							Refusal at 31'		
							STOPPED AT		TD 31'

REMARKS No sample obtained after 30'

BORING SS B1

PAGE 2 OF 2

* See Legend on Back

BORING LOG NUS CORPORATION

PROJECT: Kellogg - Deering BORING NO.: SSB2
PROJECT NO.: L670 DATE: 4-19-88 DRILLER: Vince Prue Empire Soils
ELEVATION: FIELD GEOLOGIST: Scott M. Krall
WATER LEVEL DATA (Date, Time & Conditions):

SAMPLE NO. & TYPE	DEPTH (FT.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth Ft.)	MATERIAL DESCRIPTION*: SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1 0900	0.5-2.0	16 / 14 / 14	0.6 / 2.0		M DENSE	BL TO TAN	SILTY SAND AND GRAVEL (FILL) [illegible] GRAVEL ¼"-1"	SM	ASPHALT TO .6 HNU = 0ppm DAMP
0909	2'-4	7 / 5 / 5 / 4	0.6 / 2.0		LOOSE				HNU = 0ppm DAMP
0910	4'-6'	7 / 4 / 4 / 6	1.0 / 2.0		LOOSE				HNU = 0ppm DAMP
0915	6'-8'	7 / 7 / 6 / 5	0.7 / 2.0		LOOSE				HNU = 0ppm DAMP
S-2 0935	8-10'	8 / 5 / 7 / 4	0.7 / 2.0		LOOSE				HNU = 0.3 [illegible] odor DAMP
0940	10'-12	10 / 9 / 7 / 15	0.4 / 2.0		[illegible]				HNU = 0ppm DAMP TO DRY
0950	12-14	20 / 12 / 9 / 3	0.9 / 2.0		M DENSE				HNU 0ppm [illegible] ON GRAVEL AT 13
S-3 1020	14'-16	23 / 48 / 50 / 36	1.4 / 2.0	15'	DENSE		CONCRETE [illegible] AT 14'		HNU = 0ppm DAMP
						BE	Silty Sand (M-C), Gravel ¼"-2"	SW	
1030	16'-18	45 / 36 / 20 / 31	1.3 / 2.0		DENSE		TRACE COBBLES		HNU = 0ppm DAMP
S-4 1050	18'-20	26 / 33 / 27 / 48	1.2 / 2.0		DENSE				HNU = 0ppm DAMP
1110	20'-22'	35 / 95 / 43 / 31	0.6 / 2.0		DENSE				HNU = 0ppm DAMP TO DRY
1115	22'-24	29 / 40 / 34 / 23	1.1 / 2.0		DENSE		GRAVEL ZONE 19-20 23-24		HNU = 0ppm DAMP TO DRY
S-5 1140	24'-26	14 / 31	0.7 / 2.0		M DENSE				HNU = 0ppm DAMP TO DRY

REMARKS: 2" OD SPLITSPOON DRIVEN W/140 lb Hammer falling 30"
Acker Soil Max Rig

BORING SSB2

PAGE 1 OF 2

* See Legend on Back

BORING LOG

NUS CORPORATION

PROJECT: Kellogg - Deering BORING NO. SSB2
PROJECT NO.: L670 DATE: 4-19-88 DRILLER: VINCE PRUE
ELEVATION: FIELD GEOLOGIST: Scott M Krall Empire Soils
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (Ft.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft.)	MATERIAL DESCRIPTION* SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
		23 / 16							
1145	26-28'	33 / 41	1.7/2.0		DENSE				HNU=0 DAMP
		52 / 67							
							Auger Refusal at 28.3'		
							STOPPED AT 28.3'		TD 28.3'

REMARKS

BORING SSB2

PAGE 2 OF 2

* See Legend on Back

BORING LOG — NUS CORPORATION

PROJECT: Kellogs - Deering BORING NO.: SSB3
PROJECT NO.: L670 DATE: 4-19-88 DRILLER: Vince Ave
ELEVATION: FIELD GEOLOGIST: Scott M Krall Empire Soils
WATER LEVEL DATA:
(Date, Time & Conditions)

Sample No. & Type	Depth (ft)	Blows 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/ft)	Soil Density/Consistency or Rock Hardness	Color	Material Classification	USCS	Remarks
						B'r	SILTY SAND (F-C), GRAVEL (FILL) Gravel 1/4"-1"	SM	Asphalt ~0.5'
S-1 1410	6'-8'	18, 12, 18, 12	0.2/2.0		m Dense				HNU = 0 ppm DAMP
1420	8'-10'	8, 9, 8, 12	0.8/2.0		Loose				HNU = 1 ppm DAMP
1430	10'-12	6, 8, 14, 23	1.1/2.0		Loose				HNU = 1 ppm DAMP
S-2 1435	12'-14	19, 43, 41, 36	1.7/2.0		Dense		Concrete at 13.5		HNU = 0 ppm
1450	14'-16	45, 28, 33, 21	1.2/2.0	16.0	m Dense				HNU = 0 ppm
						Lt Br	Silty sand (m-c) Gravel 1/4"-2"	SW	
1500	16-18	47, 100	0.7/0.7		Dense				100/.1 HNU = 0 ppm
S-3 1510	18'20	23, 43, 40, 20	1.6/2.0		Dense				HNU = 0 damp
1535	20-22	62, 105	0.6/0.6		V Dense		Hard Gravel Zone 20-21'		100/0
1550	22'-24	17, 11, 12, 14	1.7/2.0		M Dense				HNU 150 ppm Strong Petrol odor
S-4 1600	24'-26	16, 22	1.7/2.0		M Dense				HNU 20 ppm

REMARKS: Augered to 6' with 6¼ OD Hollow stem
- High HNU Reading at 24'
Samples obtained with a 2" SS Driven w 140" Hammer falling 30"

BORING SSB3

PAGE 1 OF 2

* See Legend on Back

Acker soil Max Rig

BORING LOG | NUS CORPORATION

PROJECT: Kellogg - Deering | BORING NO.: SSB3

PROJECT NO.: L670 | DATE: 4-19-88 | DRILLER: Vinke Pie Empire Soils

ELEVATION: | FIELD GEOLOGIST: Scott M. Krall

WATER LEVEL DATA:

(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (DEPTH/FT)	SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
		20							HNU = 20ppm damp
1700	26-28	35 63 27	0.8/2.0		DENSE				
		19							HNU 70ppm
1715	28-30	25 15 43	0.7/1.1		DENSE				100/.1 DAMP
		100							
S-5 1730	30-32	16 37	0.8/1.7		DENSE				100/.3 Damp
		71 100					31.4 BOH		
							AUGER REFUSAL		24 - 31.4:
									Level [illegible]

REMARKS: B2 At 24' 20ppm recommended to drillers to back off hole and let it vent. Drillers wearing respirators (Level C) while augering from 24' to BOH

BORING SSB3

PAGE 2 OF 2

* See Legend on Back

31.4

BORING LOG NUS CORPORATION

PROJECT: Kellogg-Deering BORING NO.: SSB4
PROJECT NO.: 6670 DATE: 4-20-88 DRILLER: Vince Prue
ELEVATION: FIELD GEOLOGIST: Scott M Krall
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (Ft.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft.)	SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
				0.5		BK	SANDY SILT TRACE GRAVEL (FILL)	SM	ASPHALT TOP .5
S-1 0915	6-8'	16 17 32	0.3/2.0	7.0	M DENSE	BR-TN	SAND (med-coarse) Gravel 1/4"-1"	SW	HNU=0 MOIST
0920	8'-10'	22 35 20	0.9/2.0		M DENSE				HNU=0ppm DAMP
0930	10'-12'	20 24 30	1.1/2.0		M DENSE				HNU=0ppm DAMP
S-2 0940	12'-14'	27 35 37	1.2/2.0		DENSE		Gravel 1/2"-2"		HNU=0ppm
		53					AUGER REFUSAL 14.4		
							END OF HOLE		

REMARKS Auger to 6' with 6 1/4 OD Hollow Stem
Sample obtained w/ 2" OD SS DRIVEN w 140" Hammer falling 30" BORING SSB4
Acker soil MAX Rig PAGE 1 OF 1

* See Legend on Back

PROJECT: KELLOGG - DEERING
BORING NO: WSB1
PROJECT NO.: L 670
DATE: 11 APRIL 1988
DRILLER: E. Cole of EMPIRE Soils
ELEVATION:
FIELD GEOLOGIST: K T McCREANOR
WATER LEVEL DATA (Date, Time & Conditions): HOLE COLLAPSED TO 12.5' (DRY)

SAMPLE NO & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth ft)	MATERIAL DESCRIPTION*: SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	MATERIAL DESCRIPTION*: COLOR	MATERIAL DESCRIPTION*: MATERIAL CLASSIFICATION	USCS	REMARKS	[illegible]
									DRILLING STARTED 1335	
S-1	1.0			0.5		BLACK	ASPHALT		NOT SAMPLED	
		6 / 5	7/24		COARSE TO MED DENSE	GREY TO BROWN	COARSE SAND - SOME GRAVEL	SP	DRY TO DAMP	C
		6 / 3	9/12				TRACE CLAY			C
	4.0	5 / 5		4.1'						
S-2		3 / 10	15/24		F DENSE TO	BROWN TO	MEDIUM TO COARSE SAND - TRACE	SW	DRY TO DAMP	C
		12 / 15	7/12		V DENSE	TAN	SMALL (≤1"ϕ) GRAVEL			C
	7.0	3 / 10					- GRAVEL ϕ INCREASING		DRY TO DAMP	
S-3		14 / 26	6/18				UP TO ≥ 2"ϕ			C
		55 / 41	8/18							C
	10.0	26 / 20								
S-4		20 / 26	1/18				- GRAVEL/COBBLES BEING		DAMP	O
		24 / 14	10/18				FRAGMENTED BY SPOON			O
	13.0	15 / 6								
S-5		16 / 33	8/18							O
		43 / 31	11/18							O
	16.0	12 / 13					- MATERIAL IS MORE WELL			
S-6		16 / 13	8/18				GRADED			O
		12 / 14	7/18							O
	19.0	14 / 12								
S-7		22 / 21	6/24				- TRACE DECOMPOSED			O
		31 / 20					SCHIST - ORANGE CHR			
		20 / 15	13/24				- SAND ϕ DECREASING		MOIST	O
	23.0	9 / 45								
S-8		26 / 11	5/24				- ORANGE COLORED MOTTLING			O
	25.0	11 / 12								

REMARKS: DRILLER USED FAILING F-10 TRUCK-MOUNTED RIG w/ 6 3/8" O.D. Hollow-Stem AUGERS BETWEEN Samples
[illegible]

* See Legend on Back

BORING WSB1

[illegible]G LOG — NUS CORPORATION

PROJECT: KELLOGG - DEERING — BORING NO.: WS3 1
PROJECT NO.: — DATE: 11 APRIL 1983 — DRILLER: E. COLE / EMARE
ELEVATION: — FIELD GEOLOGIST: KT MC CREANOR
WATER LEVEL DATA
(Date, Time & Conditions)

SAMPLE NO & TYPE	DEPTH (FT)	BLOWS 6" OR ROD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	MATERIAL DESCRIPTION* SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
	26.0	8 / 31	13 / 24		M. DENSE TO	BROWN TO	MEDIUM TO COARSE SAND -	SW	
		17 / 31			V DENSE	TAN	TRACE SMALL (≤1"φ) GRAVEL		
S-9		16 / 16	12 / 24				- SAND φ INCREASING		WET
		23 / 26							
	30.0	55 / 23	17 / 18	30.0					
							BORING COMPLETED TO 30.0' 4/11		
							BACKFILLED TO SURFACE 4/12		
									TD 30'

REMARKS

BORING WS3 1

PAGE 2 OF 2

* See Legend on Back

NUS CORPORATION

PROJECT: Kellogg - Deering BORING NO. WSB2

PROJECT NO.: L 670 DATE: 12 APRIL 1988 DRILLER: E Cole of EMPIRE

ELEVATION: FIELD GEOLOGIST: KT McCREANOR

WATER LEVEL DATA (Date, Time & Conditions) NO WATER ENCOUNTERED

Sample No. & Type	Depth (ft)	Blows 6" on Sampler	Sample Recovery / Sample Length	Lithology Change (Depth ft)	Soil Density / Consistency or Rock Hardness	Color	Material Classification	USCS	Remarks	HNu PP
S-1		15 / 30	10/24		DENSE TO	D BRN TO	COARSE SAND - SOME SMALL	SM	DAMP "FILL" SLIGHT ODOR	C
	2.0	14 / 14			V DENSE	D GRAY	GRAVEL (≤1"φ) TRACE CLAY			
		19 / 12	5/24							C
	4.0	10 / 8		4.0'						
S-2		6 / 12	9/24		M DENSE TO	DK BRN TO BLACK	SANDY CLAY AND ROCK	GC	DAMP PLANT REMAINS	C
	6.0	10 / 6			DENSE		FRAGMENTS (CRUSHED BY		"FILL"	
		5 / 12	7/24				DRIVE SHOE)			C
	8.0	22 / 9		8.0'						
S-3		17 / 16	5/24		M. DENSE TO DENSE	BRN	SAND - SOME GRAVEL	SW	DAMP TO MOIST, NATURAL	O
	10.0	12 / 14					(UP TO 2"φ)		MATERIAL, WELL GRADED	
		14 / 7	8/24						MEDIUM SAND	O
	12.0	4 / 5		12.2'						
S-4		1 / 2	10/24	12.9'	V LOOSE	LT BRN	CLAYEY SILT/FINE SAND	SM		O
	14.0	2 / 14			M DENSE TO	BRN	SAND - TRACE GRAVEL	SM	MOIST	
		23 / 19	5/24		DENSE					O
	16.0	12 / 9								
S-5		5 / 7	6/24				- φ DECREASING TO FINE SAND		MOIST	O
	18.0	2 / 3								
		4 / 3	9/24							O
	20.0	5 / 6								
S-6		2 / 3	13/24							O
	22.0	35 / 25								
S-7		93 / 64	16/24		DENSE TO	BRN	SAND AND GRAVEL (UP TO	SW		O
	24.0	90 / 65			V. DENSE		2"+ φ)			
		40 / 43	9/24							O

REMARKS [illegible]

[illegible] 20" [illegible]

BORING WSB2

PAGE 1 OF 2

* See Legend on Back

PROJECT: Kellogg Deeping BORING NO. WSB2
PROJECT NO.: L 670 DATE: 12 April 1988 DRILLER: E. Cole / Empire
ELEVATION: FIELD GEOLOGIST: KT McCreanor
WATER LEVEL DATA: No water encountered
(Date, Time & Conditions)

Sample No. & Type	Depth (Ft.)	Blows 6" on Rod (%)	Sample Recovery / Sample Length	Lithology Change (Depth Ft.)	Soil Density Consistency or Rock Hardness	Color	Material Classification	USCS	Remarks
	26.0	53 / 58			Dense to	BRN	Sand and Gravel	SW	Moist
S-8		31 / 38	3/24		v. Dense				
	28.0	28 / 24							
		24 / 23	12/24						
	30.0	26 / 22		30.0'					
							Boring Completed to 30.0'	4/12	
							Backfilled to surface 4/12		
									TD 30'

MATERIAL DESCRIPTION*

REMARKS

* See Legend on Back

BORING WSB 2

BORING LOG — NUS CORPORATION

PROJECT: K-D
PROJECT NO. 154-1156 L670
DATE 4/12/88
BORING NO. KD WSB-3
DRILLER ED Coles
ELEVATION:
FIELD GEOLOGIST: KTM
WATER LEVEL DATA (Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS	
S-1		3 / 25	9/24		MD DENSE	DK BRN GREY	Well Graded Sand, Some Gravel/Silt		DAMP "Fill"	C
1540	2.0	6 / 2			LOOSE		≤ 1" ϕ TR CLAY			
1555		70 / 53	3/24		HARD		- Cut Frags (schist)			
	4.0	60 / 27			HARD					
S-2		5 / 2	7/24				- INCR. CLAY NO GRAVEL		DAMP TO MOIST	C
1555	6.0	2 / 2								
1705		1 / 3	10/24	6.6'						C
	8.0	8 / 21		8.0'		DK BRN	BOTTOM 4" - NATURAL - MOIST -		CLAYEY SILT/FINE SAND	
S-3		2 / 31	10/24				TR GRAVEL UP TO 2" ϕ +			C
1710	10.0	24 / 30				M	MED TO COARSE SAND TR GRAVEL ≤ 2"			
1720		23 / 23	12/24			RUST	COARSE SAND 40% FINES		DAMP-MOIST	O
	12.0	27 / 31		12.0'						
S-4		20 / 20	13/24			MOTTL/BRN	Well Graded Sand TR Cut Frags		DAMP	O
1735	14.0	20 / 18								
		33 / 20	10/24				- Some Small (≤1"ϕ) Gravel -			C
	16.0	19 / 6								
S-5		11 / 6	10/24						- DIFFICULTY REMOVING SPOON	C
1755	18.0	14 / 15								
1805		24 / 18	0/24						GRAVEL - STUCK IN SHOE	?
	20.0	24 / 22								
1815		31 / 40	16/24							
	22.0	12 / 10							END 4/12	
S-6	0715	12 / 6	0/24				- DRIVE SHOE PLUGGED w/ SCHIST			?
	24.6	10 / 11								
	0725	10 / 12	10/24							
1810	26.0	12 / 17 / 12 / 23	7/24	Falling F...			MOIST - DRIVESHOE WET			C
	28.0	31 / 28								
1820		33 / 26	4/24			RUSTY	- TR GR ≤ 2" ϕ WET			O

REMARKS

* See Legend on Back

H_2O @ 27.8'

BORING WSB-3

PAGE ___ OF ___

DONE 0830 BACKFILLED 4/13

TD 30'

NUS CORPORATION

PROJECT: K-D BORING NO KD-WSB-4
PROJECT NO.: 154-1L56 L670 DATE: 4/13/89 DRILLER: ED Cole
ELEVATION: FIELD GEOLOGIST: KTM
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO & TYPE	DEPTH (FT)	BLOWS 6" ON 400 (?)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth Ft)	SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS	
S-1		6 / 12	10/24"		M. DENSE TO	BRN GRY RUST	Well Graded Sand TR		DAMP TR Roots	C
1020	2.0	16 / 20			V. DENSE		Gravel (≤1"ϕ) & CLAY			
1035		8 / 25	8/24"				- CUT FRAGS (white) - NO/CLAY		DRY TO DAMP	C
	4.0	32 / 25								
S-2		23 / 20	14/24"							C
1045	6.0	25 / 33								
S-3		30 / 29	8?/24				TR CLAY/SILT		DAMP	C
1055	8.0	34 / 43								
1100		23 / 27	16/24			BRN RUST	ANGULAR SM (≤1"ϕ) GRAVEL		DAMP DUPLICATED	C
	10.0	23 / 27								
S-4		20 / 20	?/24"							C
1110	12.0	23 / 21								
1130		19 / 25	8/24		— 3' OF FINE BRN DAMP SAND					C
	14.0	55 / 31								
S-5		26 / 52	9/24			BRN RUST	SILTY SAND TR CLAY		DAMP	
1140	16.0	26 / 11					NO GRAVEL			
1150		10 / 11	13/24							
	18.0	12 / 11								O
S-6		6 / 6	15/24							
1250	20.0	3 / 6		10.2		TAN	~~Bottom~~ 3" FINE SAND		DAMP	O
1300		8 / 6	18/24			BRN	SILTY SAND TR CLAY			
	22.0	7 / 4					LAMINATION ~20° TO HORIZ			
S-7		4 / 3	10/24						DAMP	O
1305	24.0	6 / 6								
1310		5 / 4	20/24				BOTTOM 14" WET			

	26.0	4 / 4		
REMARKS		3 / 4	2/24	
1315	28.0	4 / 4		
1320	2	2 / 3	22/24	

* See Legend on Back

Failing F'D R's 140# hammer 30" Fall

- LAMINATIONS WHERE SANDY ARE - SOFTER

BACKFILLED 4/13 2-10 M

26.2' - H_2O

BORING WSB-4

PAGE ___ OF ___

TD 30'

B[illegible]G LOG — NUS CORPORATION

PROJECT: KELLOGG DEERING — BORING NO.: KD CSB1

PROJECT NO.: L 670 — DATE: 13 APRIL 1988 — DRILLER: E. Cole of EMPIRE Soils

ELEVATION: — FIELD GEOLOGIST: K.T. McCREANOR

WATER LEVEL DATA

(Date, Time & Conditions)

Sample No. & Type	Depth (ft.)	Blows 6" or RQD (%)	Sample Recovery / Sample Length (Time)	Lithology Change (Depth ft.)	Material Description*: Soil Density / Consistency or Rock Hardness	Color	Material Classification	USCS	Remarks
S-1		4 / 6	9/22		M DENSE	DK GRY DK BRN	COARSE SAND - SOME GRAVEL	SP	TOP 2" ASPHALT. DAMP
	2.0	9 / 16	1640 HRS	2.2	↓	↓	≤2"ϕ ↓	↓	"FILL"
		7 / 6	11/24	2.7	M STIFF	BRN	SILTY CLAY	CL	DAMP "FILL"
	4.0	15 / 12	1650 HRS	4.0	M DENSE	DK GRY DK BRN	COARSE SAND AND GRAVEL ≤2"ϕ	SW	DAMP TO DRY "FILL"
S-2		11 / 53	15/20		M DENSE TO	BRN TO TAN	COARSE SAND - SOME GRAVEL	SW	DAMP TO DRY "NATURAL
	6.0	120 / 100/5"	1705 HRS		V DENSE		≥2"ϕ		MATERIAL"
		26 / 50	16/24						MOIST (AT TOP OF AUGER)
	8.0	66 / 120	1720 HRS						
S-3		17 / 53	10/24						MOIST
	10.0	50 / 53	1730 HRS						
		22 / 24	8/24						DAMP TO MOIST
	12.0	23 / 24	1740 HRS		↓	↓	↓	↓	
S-4		23 / 37	7/20		V. DENSE	BRN	COARSE SAND AND FINE TO MED	SW	MOIST (DRIVE SHOE WET)
	14.0	101 / 100/2	1745 HRS				(≤1½"ϕ) GRAVEL		
		23 / [illegible]	0/[illegible]	14.6	↓	↓	↓	↓	
			1755 HRS						DRILLER REPORTS TOP OF
							BORING COMPLETED TO 14.6' 4/13/88		ROCK @ 14.6' TD
							BACKFILLED/GROUTED TO SURFACE 4/13		

REMARKS: DRILLED w 6"ϕ Hollow AUGERS USING A FAILING F-10 TRUCK-MOUNTED RIG
140# hammer with 30" Fall

BORING CSB1

PAGE 1 OF 1

* See Legend on Back

BORING LOG — NUS CORPORATION

PROJECT: Kellogg- DEERING BORING NO.: KD-CSB2
PROJECT NO.: L670 DATE: 4-14-88 DRILLER: EQ Cole Empiresoils
ELEVATION: FIELD GEOLOGIST: McClennan / Krall
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT.)	BLOWS 6" ON ROD (FT.)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth ft.)	SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1		14					TOP 1" ASPHLT 1.6" CONCRETE		
0755	20	22 / 23	9/18		M DENSE	BRN GRY	COARSE SAND TR GRAVEL	SW	DAMP "Fill"
0805		4 / 5	0/24						
	40	5 / 5			LOOSE				
0813		2 / 24	11/24				- TR CLAY & ROCK CUT FRAGS		DAMP "Fill"
	60	27 / 52							
S-2		23 / 35	16/24		M DENSE				
0822	80	20 / 16							
S-3		70 / 90	2/22		V DENSE				100/.3'
0835	10.0								
0850	10-12'	54 / 59	1.7/2.0'		V DENSE				DAMP
		41 / 49							
0900	12-13.7	53 / 69							
		116 / 100	1.2/2.0		V DENSE				100/.2' SAT (2") Bottom
S-4 0920	14-15	124 / 100	1.0/1.0		V DENSE				100/.3' SAT
0930	16-16.3	150	.3/.3		V DENSE				150/.3' SAT
							BEDROCK 16.3 per Driller		STOPPED
									TD 16.3

REMARKS: Split Spoon sampling 2" SS w 140 lb hammer Falling 30"
Hollow stem augers 6¼ OD Failing F-10 Rig

BORING KD-CSB2

PAGE 1 OF 1

* See Legend on Back

PROJECT: Kellogs - Deering BORING NO CSB-3
PROJECT NO.: L670 DATE: 4-14-88 DRILLER: Ed Cole Empire Soils
ELEVATION: FIELD GEOLOGIST: Scott M Krall
WATER LEVEL DATA
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT.)	BLOWS 6" OF ROD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth Ft.)	SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
							MATERIAL DESCRIPTION*		
S-1	0.5-2'	6	0.7/1.5	0.5	M DENSE	BR, GR	ASPHALT		HNU = 0ppm DRY
1245		6 / 6		2.0		↓	SAND MED/COARSE GRAINED, FILL GRAVEL ½-1" in Ø	SP	
1250	2.0-4.0	— / 12	0.9/2.0		M DENSE	Br, Gray	SAND MED GRAINED GRAVEL	SW	HNU = 0ppm DRY
		16 / 23					½"-1" ...		
1255	4.0'-6.0	12 / 45	1.4/2.0		DENSE				HNU = 0ppm DRY
		53 / 70							
1303	6.0-8.0	26 / 100	0.5/0.5		DENSE		GRAVEL LARGER IN SIZE		100/0, HNU=0ppm DRY-DAMP
S-2							1"-2"		
1320	8.0-10'	122 / 77	1.6/2.0		V DENSE				HNU=0ppm DAMP
		85 / 80							
1330	10'-12'	11 / 44	1.7/2.0		V DENSE				HNU=0ppm DAMP
S-3		104 / 32							
1345	12-14	22 / 31	0.8/1.6		DENSE				100/.1' HNU=0ppm DAMP
		47 / 100							
1355	14-16'	12 / 40	1.4/2.0		M DENSE				HNU = 0.4ppm DAMP
S-4		42 / 44							A 13.5'
1400	16-17	26 / 100	0.0/0.6		V DENSE				100/.1 NO RECOVERY DUE TO GRAVEL
1415	18-20	38 / 36	1.3/2.0		DENSE				HNU= 0.8ppm DAMP
		38 / 47							
14:30	20-22	37 / 42	1.7/2.0		DENSE				HNU = 2ppm MOIST
S-5		53 / 60		22.0'		↓	↓	↓	
1445	22-24	11 / 27	1.1/2.0		M DENSE	BR	SAND COURSE GRAINED TRACE	SW	HNU= 9ppm MOIST
		19 / 25					½-1" GRAVEL		
1500	24-26	23 / 31	1.2/2.0		M DENSE		↓		HNU = 12ppm MOIST

REMARKS LOCATED INFRONT OF Pitney Bowes (33' NORTH OF K11 5' FROM BUILDING) BORING CSB-3
2" SS Driven 20" w/ 140' Hammer
Failing F-10 Rig 140# hammer with 30" Fall PAGE 1 OF 2

* See Legend on Back

BORING LOG

NUS CORPORATION

PROJECT: Kellogg - Deeriny　　BORING NO CSB-3
PROJECT NO.: L670　　DATE: 4-14-88　　DRILLER: ED Cole Empire Soils
ELEVATION:　　FIELD GEOLOGIST: Scott M. Kraft
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR ROD (%)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth ft)	SOIL DENSITY-CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
		21 / 11		26.5					
						Br	Silty sand	SM	
S-6 1520	26-28	9 / 11 / 17 / 35	1.4 / 2.0		m Dense	Br	Fine Grain Sand	SM	HNU = 9ppm mom
1525	28-29	130 / 100	.4' / .6		V Dense				100/c HNU = 1ppm
							Bed rock per driller 28.5		STOPPED
							TD = 28.5		

REMARKS

* See Legend on Back

BORING CSB-3

PAGE 2 OF 2

NUS CORPORATION

PROJECT: Kellogs - Deering BORING NO.: CSB-4
PROJECT NO.: L670 DATE: 4-14-88 DRILLER: ED Cole (Empire Soils)
ELEVATION: FIELD GEOLOGIST: Scott M. Krall
WATER LEVEL DATA
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth Ft.)	MATERIAL DESCRIPTION* SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1	0.5-2.0	15	0.2 / 0.6	.5	m Dense	Br	Asphalt Silty Sand (Fill)	SM	100/0 HNU=0
		100					Boulder ?	↓	No sample obtained
							Auger		STOPPED AT 1.5'
							Refusal		

REMARKS: Located behind Elinco NW corner 30' from Mathies court 30' from Elinco
2" SS Driven 30" w 140# Hammer Failing F10 Rig

BORING CSB-4

PAGE 1 OF 1

* See Legend on Back

BORING LOG NUS CORPORATION

PROJECT: Kellogs - Deerings BORING NO. CSB4A
PROJECT NO.: L670 DATE: 4-14-88 DRILLER: ED Cole (Empire Soils)
ELEVATION: FIELD GEOLOGIST: Scott M Krall
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION (MATERIAL DESCRIPTION*)	USCS	REMARKS
S-1	0520	31		0.5		BL	ASPHALT SAND COURSE GRAINED FILL		
720		14 22	0.7/1.5		m. DENSE		GRAVEL ½"-1"	SM	HNU=0ppm DAMP
1730	2'-4'	33 80	1.1/1.5		DENSE				HNU=0
		162		3.5		BR	Silty SAND; GRAVEL ½"-1"	GM	
1735	4-6	27 109	0.7/0.9		DENSE				100/.3' HNU = 1ppm
									DAMP
1750	6-8	97 105	1.5/1.7		V DENSE				HNU=32 ppm
S-2		111 100		7.5		BR-TAN	SAND (MED-COURSE GR)	GP	100/.3 MOIST AT 7.5'
0745	8-10	43 155	0.6/0.8		V DENSE		GRAVEL ¼"-1"		150/.3' SAT
0755	10'-12'	113 96	1.5/2.0		V DENSE				HNU = 9ppm SAT
		107 53							
S-3 0810	12-14	80 109	1.9/2.0		V DENSE		TR CLAY ~~PIPING~~ NOTICABLE TAN STAINING ON SOME GRAVEL		HNU = 15ppm MOIST-SAT
		118 94							
0830	14-16	4 6	0.7/1.7						
		11 100					TD 15.7		100/.2 HNU 2ppm

REMARKS Located ~ 10' North of KD-CSB4
Stopped at 8' on 4-14-88 Stopped at 15.7
2" SS Driven 30" W 140" Hammer Failing F-10 Rig

BORING CSC-4A

PAGE 1 OF 1

* See Legend on Back

NUS CORPORATION

PROJECT: Kellogg - Deering BORING NO. CSB5
PROJECT NO.: 1670 DATE: 4-15-88 DRILLER: Ed Cok Empire Soils
ELEVATION: FIELD GEOLOGIST: Scott M Krall
WATER LEVEL DATA
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth ft)	MATERIAL DESCRIPTION*: SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1	0-2	7	0.2 / 1.5	0.5	LOOSE	BR	ASPHALT SAND TRACE FINE GRAVEL (Fill)	SM	
0950		8 7							Fill) HNU=0ppm Damp
1000	2'-4'	5	0.7 / 2.0	3.0	M DENSE				
		15 27				TAN	Silt Trace Fine Gravel	GM	HNU = 0.2 ppm DAMP
1005	4'-6'	41 34	1.0 / 2.0	5.0	M DENSE				HNU=0ppm DAMP
		20 101				BR-TAN	Silty Sand w Gravel	GW	
1015	6'-8'	37 62	1.6 / 2.0		DENSE		Gravel 1/4"-1" TRACE cobbles		HNU=0ppm
		72 75							
S-2 1030	8'-10'	30 49	0.8 / 2.0		DENSE				HNU=0ppm no sample obtained due to gravel
		75 50							
1035	10'-12'	42 100	0.2 / 0.8		V DENSE		Gravel 1"-2"		100/.2' HNU=0 No sample obtained
1050	12'-14'	28 50	1.2 / 2.0		V DENSE				HNU=0
		71 60							
							Auger Refusal 15'		
							TD = 15'		

REMARKS 2" OD SS Drive w/140" hammer falling 30"
[illegible]

BORING CSB5

PAGE 1 OF 1

* See Legend on Back

BOF... LOG | NUS CORPORATION

PROJECT: Kellogg-Deering | BORING NO: KDCSG-6
PROJECT NO.: L670 | DATE: 4-18-88 | DRILLER: ED Cole, Empire Drilling
ELEVATION: | FIELD GEOLOGIST: Kim Karl
WATER LEVEL DATA: NOT ENCOUNTERED
(Date, Time & Conditions): 4-18-88, 10 30am, Cloudy Rain ≈50°

	SAMPLE NO & TYPE	DEPTH (ft)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth ft)	SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
		0-.5						ASPHALT		
CH5	S-1	0.5-	61/14	14"/		Granular	Brown	FINE TO COARSE SAND AND	SW-	LOW MOISTURE
		2.0	18	/18		LOOSE		GRAVEL. LITTLE TO NO	GW	HNU 0ppm ABOVE
								ORGANICS HOMOGENEOUS		BACKGROUND
00	S-1	2.0-	19/15	16"/		Cohesive-	Brown	FINE TO COARSE SAND AND	SW-	LOW-MEDIUM MOISTURE
		4.0	6/20	/24"		MEDIUM		GRAVEL, SOME SILT TRACE	GW	HNU 0ppm ABOVE
						DENSE		BLACK ORGANICS		BACKGROUND
								↓		
15	S-2	4.0-	77/112	13"/		Cohesive	Brown	FINE TO COARSE SAND AND	SW-	MEDIUM MOIST
		5.4'	135/10.4	/16"		DENSE		GRAVEL. LITTLE TO NO	GW	HNU 8ppm ABOVE
								ORGANICS.		BACKGROUND
								↓		
30	KC	6.0-	150/.8	0"/	Auger Refusal			NO SAMPLE RECOVERED		
		8.0		/24"	6.8'					TD 6.8'

REMARKS: BOH 6.8' Fading Flo... ; 140# hammer with 30" Fall

BORING: KDCSG6

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* See Legend on Back

BORING LOG — NUS CORPORATION

PROJECT: Keesler-Deering BORING NO: KD-CSB-7
PROJECT NO.: 6670 DATE: 4-18-88 DRILLER: Ed Cole
ELEVATION: FIELD GEOLOGIST: Kim Kahl
WATER LEVEL DATA: Groundwater at 15.5'
(Date, Time & Conditions) 4-18-88 @ 1440 Rain ≈50°

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth Ft.)	SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
	0-.5'						ASPHALT		
S-1	0.5'-	11 / 6	12"/		Granular	Mottled	Fine to coarse sand and	SW-	Low moisture,
	2.0'	4	/15"		Loose	Brown	Gravel, low organics	GW	HNU 0ppm above
							↓		Background
S-1	2.0'-	4 / 4	2"/		Semi-	Dark	Fine to coarse sand and	SW-	Low-medium moisture
	4.0'	3 / 2	/24"		Cohesive	Gray	Silt. Low organics,	ML	HNU 0ppm above
					Loose		Micaceous		Background
							↓		
S-1	4.0'-	4 / 2	5"/		Cohesive	Dark	Fine to coarse sand and	SW-	Medium moisture
	6.0'	4 / 3	/24"		Soft	Gray	Gravel, some silt	GW	HNU 0ppm above
							↓		Background
							↓		
S-1	6.0'-	7 / 6	10"/		Granular	Mottled	Fine to coarse sand and	SW-	Medium moisture
	8.0'	5 / 35	/24"		Medium	Brown	Gravel. No organics	GW	HNU 0ppm above
					Dense	and gray	Micaceous		Background
							↓		
S-1	8.0'-	15 / 25	7"/		Granular	Mottled	Fine to coarse sand and	SW-	Moist sample
	8.8'	/ 13	/9"		Medium dense	Brown	Gravel	GW	HNU 0ppm above Background
							↓		
							↓		
S-1	10.0-	32 / 23	19"/		Granular	Mottled	Fine to coarse sand and	SW-	Moist sample
S-2	11.4	19 / 7.4	/25"		Medium	Brown	Gravel with silt	GW	HNU 0ppm above
					Dense	and	↓		Background
						Gray	↓		
S-2	12.0-	98 / 121	16"/24"		Granular	Mottled	Fine to coarse sand and	SW-	Moist

REMARKS: Failing Fold Rig 140# hammer with 30" fall

BORING KD-CSB-7

PAGE 1 OF 2

* See Legend on Back

BORING LOG | NUS CORPORATION

PROJECT: Kellogg-Deering | BORING NO.: KDCSB-7
PROJECT NO.: 6670 | DATE: 4-18-88 | DRILLER: ED Cole
ELEVATION: | FIELD GEOLOGIST: Kim Karl
WATER LEVEL DATA: WATER AT 16.0
(Date, Time & Conditions) 4-18-88, 1440, Rain 50°

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	SOIL DENSITY / CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
	14.0	75 / 35			DENSE	BROWN	GRAVEL	GW	HNU OPEN ABOVE BACKGROUND
S-7	14.0	8 / 15	9" / 24		[illegible]	MIXED	FINE TO COARSE SAND AND	SW-	* MOIST - WET ~~[illegible]~~
	16.0	19 / 27			DENSE	BROWN	GRAVEL	GW	HNU OPEN ABOVE
									BACKGROUND
				WATER 4-18-88					TD 16.0'

REMARKS Bottom of Hole = 16.0'

BORING KD-CSB7

PAGE 2 OF 2

* See Legend on Back

BORING LOG — NUS CORPORATION

PROJECT: Kellogg Deering — BORING NO.: KDCSB-5
PROJECT NO.: 6670 — DATE: 4-19-88 — DRILLER: Eddie
ELEVATION: — FIELD GEOLOGIST: Kim Karl
WATER LEVEL DATA: (Date, Time & Conditions) 4-19-88, 0800, Sunny 80°

	SAMPLE NO. & TYPE	DEPTH (FT.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft.)	MATERIAL DESCRIPTION: SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
		0-.5						1" asphalt, 5" concrete		
815	S-1	0.5-	2 / 2	.5/		Gran.	Mottled	Fine to coarse sand +	SW	HNU 0 ppm
		2.0	12	/1.7		Semi		Gravel	GW	Moist
						Cohesive		Fill		
820	S-1	2.0	12 / 2	.7/		Gran.	Mottled	Fine to coarse sand	SW	HNU 0 ppm
		4.0	12 / 1	/2.0		Semi	Brn	and gravel, some	GW	AS
						Cohesive		silt no organics		Moist
								micaceous fill		
830	S-2	4.0-	2 2	1.5/		Granular	Mottled	Fine to coarse sand +	SW	HNU 0 ppm AS
	S-1	6.0	150/ 1.4	/2.0		Cohesive	Brn +	Gravel with silt	GW	Moist - wet
							Gray	Silt highly plastic	ML	
								organics Fill (KK)		
845	S-2	5-	15 /	.5/		Gran.	Mottled	Fine to coarse sand and	SW	HNU 0 ppm
		6.5	1.4	/1.5			Brn	Gravel	GW	AS Low moist
		6								
855	S-2	7-	20 / 12	1.5/		Gran.	Mottled	Fine to coarse sand +	SW	HNU 0 ppm AS
		9	27 / 14	/2.0			Brn	Gravel with silt	GW	Med. moist
						Cohesive	+	Silt highly plastic		
							Gray	and organics Fill		TD 9'

REMARKS: Background - 3 ppm on HNU
9.0' Bottom of Hole
[illegible] 140 lb hammer with 30" fall

BORING KDCSB-5

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* See Legend on Back

BORING LOG — NUS CORPORATION

PROJECT: Kellogg-Deering BORING NO.: KDCSB9
PROJECT NO.: L670 DATE: 4-19-88 DRILLER: Ed Cole
ELEVATION: FIELD GEOLOGIST: Kim Kang
WATER LEVEL DATA: Not encountered
(Date, Time & Conditions) 4-19-88 0900 overcast 45°

	Sample No. & Type	Depth (Ft.)	Blows 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.)	Soil Density/Consistency or Rock Hardness	Color	Material Classification	USCS	Remarks
		0.5						ASPHALT		
000	S-1	0.5-	5 / 5	1.0/		Semi-	[illegible]	Fine to coarse Sand and	SW-	Med moist
		2.0	12	/1.5		Compact	Brown	Gravel Some Silt	SM	HNU 3PPM
								Fill Low organics brick.		AB.
005	S-1	2.0-	10 / 4	1.1/		Semi-dense	Brown	Fine to coarse Sandy	SW-	Low moisture
	[illegible]	4.0	4 / 7	/2.0			Brown	Gravel trace silt	GM	HNU 10PPM
								[illegible]		AB
015	S-2	4.0-	65 / 55	2.0/		Very dense	White	Fine to coarse Sand	SW-	HNU 50PPM AB
		6.0	47 / 78	/2.0		Semi-	Brown	Gravel micaceous	GW	Low moisture
						Compact	Gray	Low organics Fill		
025	S-2	6.0-	41 / 53	1.5/		Extremely dense	Med	Fine to coarse Sand +	SW-	HNU 100PPM AB
		8.0	74 / 61	/2.0		Loose	BRN	Gravel, No organics	GW	Low moist.
035	S-3	8-10	[illegible]	2.0/		[illegible]	White	Fine to coarse Sand	SW-	HNU 10PPM AB.
			[illegible]	/2.0		Loose	Brown	Gravel No organics	GW	Low moist
050	S-3	10-	37 / 39	1.5/		[illegible]	Med	Fine to coarse Sand	SW-	HNU 3PPM AB
		12	44 / 47	/2.0		Loose	Brown	Gravel No organics	GW	Low moist
										TD 12'

REMARKS Background 0PPM on HNU BOH = 12'
Falling [illegible] 140# hammer with 30" Fall

BORING KIXSB-9

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* See Legend on Back

BORING LOG — NUS CORPORATION

PROJECT: KELLOGG - DEERING — BORING NO.: KDCSB-10
PROJECT NO.: 4670 — DATE: 4-19-88 — DRILLER: ED Cale
ELEVATION: — FIELD GEOLOGIST: Kim Karl
WATER LEVEL DATA: NOT ENCOUNTERED
(Date, Time & Conditions) 4-19-88, 845, OVERCAST 45°

SAMPLE NO. & TYPE	DEPTH (Ft.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft.)	SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
	0-.5						ASPHALT		
-1	1.5-	4	.7/		LOOSE TO	M-BRO	FINE TO COARSE SAND	SW-	HNU 0PPM AB
	2.0	34	/1.7		M.D.	BRN	AND FINE GRAVEL,	GP	MOIST
					FIRM	BRN	WITH SILT FILL	ML	
-1	2.0-		.4/				FINE TO COARSE	SW-	HNU 0PPM AB
	4.0		/2.0		SILT		SAND & SILT.	ML	MOIST
							LITTLE FINE GRAVEL		
S-1	4.0-	47/113	1.5/				FINE TO COARSE SAND &	SW-	HNU 2PPM AB.
S-2	5.8	1.3	/2.0		SEMI-	BRN	GRAVEL WITH SILT	GW	MOIST
					DENSE	GRAY	NO ORGANICS, MICACEOUS		
-2	6.0-	72	2/				FINE TO COARSE SAND &	SW-	HNU 4PPM AB
	8.0		/2.0		DENSE	BRN	GRAVEL TRACE SILT	GW	MOIST
							NO ORGANICS MICACEOUS		
S-2	8-10	47	1.5/				FINE TO COARSE SAND &	SW-	HNU .2 PPM AB
			/2.0		DENSE	BRN	GRAVEL	GW	MOIST
									TD 10'

REMARKS BOH = 10.0'
Falling Force 140# hammer with 30" Fall

* See Legend on Back

BORING KDCSB-10

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BORING LOG — NUS CORPORATION

PROJECT: KELLOGG - DEEDING BORING NO.: KD CSB-11
PROJECT NO.: L670 DATE: 4-19-88 DRILLER: EDDIE
ELEVATION:
FIELD GEOLOGIST: Kim Karl
WATER LEVEL DATA: NOT ENCOUNTERED
(Date, Time & Conditions) 4-19-88, 1130, OVERCAST, 50°

	SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	SOIL DENSITY, CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
		0-.5						1" ASPHALT & CONCRETE		
1130	S-1	.5-	11/5	.5/		GRANULAR	MTLD	FINE TO COARSE	GW-	HNU 0PPM AB
		2.0	6	/1.5		LOOSE	BRN	SAND + GRAVEL	GW	MOIST SAMPLE
								NO ORGANICS		
35	S-1	2.0-	3/11	.6/		GRANULAR	MTLD	FINE TO COARSE SAND	GW-	HNU 5PPM AB.
		4.0	20/44	/1.5		SEMI	BRN	GRAVEL WITH SILT	GM	MOIST SAMPLE
						COMPACT	BRN	NO ORGANICS FILL	ML	
40	S-1	4-	2/14	1.8/		GRANULAR	MTLD	FINE TO COARSE SAND+	GW-	HNU 0PPM AB
		5.8	64/50	/1.8		SEMI-	BRN	GRAVEL	GW	MOIST SAMPLE
						COMPACT				
1200	S-1	6.0-	42/25	1.6/		GRANULAR	MTLD	FINE TO COARSE SAND+	GW-	1 PPM AB HNU
	S-2	8.0	42/10	/2.0		SEMI	BRN	GRAVEL	GW	MOIST
						COMP.				
	S-2	8.0-	100/12	1.0/		GRANULAR	MTLD	FINE TO COARSE SAND+	GW-	HNU 1PPM AB
		9.0		/1.0			BRN	GRAVEL	GW	TD 9'

REMARKS: BOH 9.0 Fail, End Rig
1130 Begin used 30' Fill

BORING KDC SB-11

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* See Legend on Back

BORING LOG | NUS CORPORATION

PROJECT: Kellogg Spring BORING NO.: KD CSB-12
PROJECT NO.: L670 DATE: 4-19-88 DRILLER: JD Cole
ELEVATION: FIELD GEOLOGIST: Kim Kaal
WATER LEVEL DATA: WATER AT 12.5'
(Date, Time & Conditions) 4-19-88, 1600, OVERCAST, 40°

	SAMPLE NO. & TYPE	DEPTH (FT.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft.)	MATERIAL DESCRIPTION*: SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
		0.5						ASPHALT		
600	S-1	.5-	12 / 16	.4/		Granular	MED	FINE TO COARSE SAND	SW-	
		2.0	8 / 4	/1.5			BRN	AND FINE GRAVEL	GP	HNU 0ppm AB
										Low MOISTURE
610	S-1	2.0-	5 / 6	1.5/		Cohesive	MED	SILT WITH MEDIUM		HNU - 8ppm AB
		4.0	12 / 23	/2.0		Dense	BRN	SAND. MOD. PLASTIC		MOD. MOISTURE
							BRN	MICACEOUS. HIGH ORGANICS?		
620	S-1	4.0-		.8/		Granular	MED	FINE TO COARSE SAND +	SW	8ppm AB
	S-2	5.2		/1.2			BRN	GRAVEL, WITH SILT	GW	Low - MOD MOIST
630	S-2	6.0	100 / 7.4	.4/.4		Granular	MED BRN	FINE TO COARSE SAND GRAVEL	SW	0ppm Low MOIST
		6.4				Dense				
640	S-2	8-10	12 / 24 / 18 / 21	1.1/		Granular	MED	FINE TO COARSE SAND +	SW-	.5ppm ABOVE BKG
				/2.0			BRN	GRAVEL	GW	GROUND
										LOW MOIST
655	S-2	10-12		1.5/		Granular	MED	FINE TO COARSE SAND	SW	5ppm AB
				/2.0			BRN	GRAVEL	GW	Low MOIST
				NA/						
700	S-3	12-14		1.4/2.0		Granular	MED. BRN	WITH SILT FINE TO COARSE SAND + GRAVEL	SW GW	0ppm AB HNU	TDM

REMARKS: BOH = 14' Ending Depth, 140# hammer with 30" Fall

BORING KD CSB-12

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* See Legend on Back

NUS CORPORATION

PROJECT: [illegible] BORING NO.: KDCSB-13
PROJECT NO.: [illegible] DATE: [illegible] DRILLER: [illegible]
ELEVATION: FIELD GEOLOGIST: [illegible]
WATER LEVEL DATA: [illegible]
(Date, Time & Conditions) [illegible]

	SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	MATERIAL DESCRIPTION* SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
		0-.5						Asphalt, 4" Soil		
1730	S-1	.5-	5/133	.5/				4" Concrete		HNU [illegible]
		2.0	7	/1.5				No sample recovered		[illegible]
								[illegible]		No sample
										taken
740	S-1	2.0-	5/3	1.0/		[illegible]	[illegible]	Silt and fine to	ML-	moist [illegible]
		4.0	3/5	1.5		[illegible]	[illegible]	medium sand	OL	[illegible]
						[illegible]	[illegible]	[illegible] moderate		[illegible]
								[illegible]		
50	S-2	4.0-	[illegible]	1.3/		[illegible]	[illegible]	Silt and fine to	ML-	moist - wet
		6.0	115/[illegible]	/2.0		dense	brown	coarse sand with	CL	sample [illegible]
						[illegible]	[illegible]	coarse gravel		above [illegible]
								[illegible], mopskat	SW	3½ vials, 2-8 oz
?0	S-2	6.0-	[illegible]	1.5/		[illegible]	[illegible]	~~[illegible]~~ fine to coarse	SP	HNU .2 ppm AS.
		8.0	[illegible]	/2.0		[illegible]	brown	sand with silt and		3½ vials, 1-8 oz
						[illegible]		gravel, coarse		
[illegible]	S-3	8.0-	[illegible]	.8/	[illegible]	[illegible]	[illegible]	Fine to coarse sand	SW	HNU 0 ppm AS
		10.0	[illegible]	/2.0			brown	and fine gravel	SP	3½ vials
30	S-3	10.0-	35/[illegible]	.8/		[illegible]	[illegible]	Fine to coarse sand	SW	HNU 0 ppm AS.
		11.8	[illegible]	/2.0			brown	fine gravel	GP	3-½ vials
										3 2½ - 8oz
										TD 11.8'

REMARKS Boh 11.8' [illegible]
[illegible] 30" Fall

BORING KD-SB-13

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* See Legend on Back

NUS CORPORATION

PROJECT: KEllogg Deering BORING NO.: KDCSB-14
PROJECT NO.: 6670 DATE: 4-20-88 DRILLER: DCole
ELEVATION: FIELD GEOLOGIST: Kim Kahl
WATER LEVEL DATA:
(Date, Time & Conditions) 4-20-88, 0945, Sunny, windy 40°

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
	0-.5						Asphalt		"
945 S-1	.5-		.5/		Gravel/med		Fine to coarse	SW	HNU .5 PPM AB
	2.0		1.5			BRN	sand and gravel	GW	low moisture
							low organics, mica flecks		1/4 VOA
1000 S-1	2.0-		.3/		med	med	Fine to coarse sand	SW	HNU 0 ppm AB.
	4.0		1.5			Brn.	low organic fill		low moisture
									1 1/2 VOA
1005 S-2	4.0-		.4/		Gravel,	med.	Fine to coarse sand and	SW-	HNU 0 ppm AB
	6.0		1.5			Brn	coarse gravel	GP	low moisture
							Fill		1 1/2 VOA
1010 S-2	6.0		.6/			med	Fine to coarse sand	SW	HNU 0 ppm
	8.0		1.5			Brn	Fill		low moisture
									1 1/2 VOA
	8.0-		.3/			med	Fine to coarse sand	SW	HNU .5 ppm
	9.0		1.0			Brn	Fill		low moisture
									TD 9'

REMARKS: BOH 9.0 Fl... Fire...
140# hammer with 30" fall

BORING KDCSB 14

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BORING LOG — NUS CORPORATION

PROJECT: KELLOGG - DEERING — BORING NO.: KDCSB-15
PROJECT NO.: L670 — DATE: 4-20-88 — DRILLER: EDDIE
ELEVATION: — FIELD GEOLOGIST: Kim Karl
WATER LEVEL DATA: WATER 30.0'
(Date, Time & Conditions) 4-20-88, 1105, Sunny Windy, 50°

	SAMPLE NO. & TYPE	DEPTH (Ft.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft.)	SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
		0-.5						3" asphalt		
110	S-1	.5-	7 / 4	.8/		Gran-Loose	MOD	FINE TO COARSE SAND, SOME	SW	HNU 0ppm AB,
		2.0	5	/2.0		LOOSE	BRN	COARSE WELL ROUNDED		LOW MOISTURE
							GRY	GRAVEL. NO ORGANICS		3 VOAS
115	S-1	2.0	5 / 6	.5/		Gran-Lo	MOD	FINE TO COARSE SAND	SW	HNU 0ppm AB
		4.0	8 / 7	/2.0		LOOSE	BRN	WITH FINE GRAVEL		LOW MOISTURE
										1/2 CTNL
120	S-2	4.0-	11 / 7	.3/		Gran-Lo	MOD	SILT AND FINE TO COARSE	ML-	HNU 0ppm AB
	S-2	6.0	10 / 12	/1.2		MED DEN	BRN	SAND	SW	2 VOAS
										MOIST
130	S-2	6.0-	3 / 4	2.0/		Gran-Lo	MOD	FINE TO COARSE	SP	HNU 0ppm AB
		8.0	4 / 5	/2.0		LOOSE	BRN	SAND + GRAVEL.	SW	1 VOA, 5-FRZ/
									SW	LOW MOIST
145	S-3	8.0-	50 / 12	1.0/		Gran-Lo	MOD	FINE TO COARSE SAND+GRAVEL	SW-	HNU 0ppm AB
		9.0	100 / 2.0	/1.0		LOOSE	BRN		SW	3 VOA, 3/4 metal
210	S-3	10.0-	23 / 45	2.0/		Gran-Lo	MOD	FINE TO COARSE SAND +	SW-	HNU 3ppm AB
		12.0	50 / 50	/2.0		LOOSE	BRN	GRAVEL	SW	2-8 oz.
305	S-4	12.0- 12.9	3 / 100/.4	1.0/1.9		Gran-Lo	MOD	FINE TO COARSE SAND +	SW-	1 ppm AB

REMARKS: Falling Firm Fig
140# hammer with 30" Fall

* See Legend on Back

BORING KDCSB15
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KK 4-26

PROJECT: [illegible] BORING NO. KPESB-15
PROJECT NO.: 6270 DATE: 4-20-88 DRILLER: [illegible]
ELEVATION: FIELD GEOLOGIST: [illegible]
WATER LEVEL DATA: WATER 30.0'
(Date, Time & Conditions) 4-20-88 1305 Sunny windy 50°

	SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/ft)	SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
305	S-4	[illegible]	50 / 63 / 50 / 75			[illegible]	Brn	Gravel	GW	Moist 3 VOA, 1/2 Bag
320	S-4	14.0-16.0	[illegible]	2.0/2.0		[illegible] / Loose	Brn / Mottled	Fine to coarse Sand + Gravel	SW / GW	HNU 0ppm BG; Moist 3-5 [illegible]
330	S-5	16.0-	[illegible]	[illegible]/.4		[illegible]	Brn / [illegible]	Fine to coarse S+G	SW / GW	HNU 4ppm: 3/4 VOA
410	S-5	17.? - 19.0	[illegible]	1.3/2.0		[illegible]	Brn / Mottled	Fine to coarse Sand + Gravel, Trace of [illegible]	SW / GW	HNU 4ppm BG; 2 1/2 VOA / Metal
	S-5	19.0-20.0	[illegible]	1.0/1.0		[illegible] / Loose	Brn / Mottled	Fine to coarse Sand + Gravel	SW / GW	2 [illegible] 1/4 VOA
420	S-6	20.0-22.0	[illegible]	2.0/2.0		[illegible] / Loose	Brn / Mottled	Fine to coarse sand + Gravel	SW / GW	HNU 2ppm BG; 3 VOA, 1 Metal
430	S-6	22-24	[illegible]	2.0/2.0		[illegible] / Loose	Brn / Mottled	Fine to coarse sand + Gravel	SW / GW	HNU 5ppm BG; 2-5 [illegible]
[illegible]	S-7	24-26	[illegible]	0/2.0				No sample recovered		

REMARKS

* See Legend on Back

BORING KPESB-15

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BORING LOG | NUS CORPORATION

PROJECT: [illegible] | BORING NO.: [illegible] S15
PROJECT NO.: [illegible] 70 | DATE: [illegible] | DRILLER: ED [illegible]
ELEVATION: | FIELD GEOLOGIST: [illegible]
WATER LEVEL DATA: WATER 30.0'
(Date, Time & Conditions) [illegible], 1450, Sunny [illegible]

	SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" ON SAMPLER (FT)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (DEPTH/FT)	MATERIAL DESCRIPTION*: SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
1450	S-7	26-	[illegible]	1.0/		[illegible]	[illegible]	Fine to coarse sand	SW	[illegible]
		28	[illegible]	/2.0		Loose	[illegible]	- gravel	SW	[illegible]
										[illegible]
1500	S-8	28-	[illegible]	1.5/		[illegible]	[illegible]	Fine to coarse sand	SW	13 PPM above [illegible]
		30	[illegible]	/2.0		Loose	brn	+ gravel	SW	[illegible]
[illegible]	S-9	30-32	[illegible]	1.5/	Water 30.0	[illegible]	[illegible]	Fine to coarse sand	SW	HNU spike [illegible]
			[illegible]	/2.0		Loose	[illegible]	+ gravel	SW	[illegible]
										TD 32'

REMARKS BOH 32.0'

BORING [illegible]

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BORING LOG

NUS CORPORATION

PROJECT: Kellogs - Deering BORING NO.: CSB/6

PROJECT NO.: L670 DATE: 4-20-88 DRILLER: Vince Prue Empire Soils

ELEVATION: FIELD GEOLOGIST: Scott M. Keall

WATER LEVEL DATA:

(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	MATERIAL DESCRIPTION* SOIL DENSITY-CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
SS 1210	0-2'	13	1.0/1.7	0.3	MED DENSE	Br Bl	SILTY SAND, Gravel ½"-1"	SM	ASPHALT TO 0.3' HNU = 0 ppm
		19					WOOD FRAGM (FILL)		roots DAMP
1220	2'-4'	26 / 21	0.3/1.1		DENSE				HNU = 1 ppm
		43 / 100					STOPPED AT 3.9 (TD)		100/.1
							Auger Refusal		
							Possible Boulder		

REMARKS: Location Behind Elwco
2" SS Driven 30" w/ 140 lb Hammer
Acker Soil Max Rig

BORING CSB16

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* See Legend on Back

BORING LOG

NUS CORPORATION

PROJECT: Kellogg - Deering
BORING NO.: CSB18
PROJECT NO.: 6670
DATE: 4-20-88
DRILLER: Vince Prue
Empire Soils
ELEVATION:
FIELD GEOLOGIST: Scott M. Kroll
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft.)	SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1 1530	0-2'	12	0.7/1.5	.5	M DENSE	BROWN	SAND GRAVEL ¼"-1" (Fill)	SM	ASPHALT .3
		11							HNU = 0 DAMP
1538	2'-4'	16 / 9 / 26	1.4/2.0	2.5 3.0	DENSE	TAN	SILT NO GRAVEL (Fill)	SM	HNU = 0.4 DAMP
		112 / 99					SILTY SAND (F-C) GRAVEL ¼"-1"	SM	
S-2 15..	4-6'	42 / 51 / 42	1.8/2.0		DENSE	BROWN			HNU = 0 ppm
		62							
1615	6'-8'	119	1.3/1.2		V. DENSE				100/.2 HNU = 0 ppm
		100					AUGER REFUSAL 7.9' TD		
S-3	8'-10'								

REMARKS: TRIPOD METHOD FOR SAMPLING DUE TO High Tension wires Above w 2" SS DRIVEN 30" w 140" Hammer Acker Soil Max Rig

BORING CSB18

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* See Legend on Back

BORING LOG

NUS CORPORATION

PROJECT: Kellogg - Deering   BORING NO.: CSB 18

PROJECT NO.: 6670   DATE: 4-20-89   DRILLER: Vince Prue

ELEVATION: FIELD GEOLOGIST: Scott M. Kroll   Empire Soils

WATER LEVEL DATA:

(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" ON SPOON (N)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	MATERIAL DESCRIPTION* SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1 1530	0-2'	12 11	0.7/1.5	.5	M DENSE	BROWN	SAND GRAVEL ¼"-1" (Fill)	SM	[illegible] .3
		16							HNU=0 DAMP
1538	2'-4'	9 24 113	1.4/2.0	2.5 3.0	DENSE	TAN	SILT NO GRAVEL (Fill)	SM	HNU=0.4 DAMP
S-2 1545	4-6'	94 42 51 42	1.8/2.0		DENSE	BROWN	SILTY SAND (F-C) GRAVEL ¼"-1"	SM	
									HNU = 0ppm
1615	6'-8'	62 119 105	1.2/1.2		V. DENSE				100/.2 HNU=0ppm
							AUGER REFUSAL 7.9' TD		
S-3	8'-10'								

REMARKS: TRIPOD METHOD FOR SAMPLING DUE TO High Tension wires above w 2" SS DRIVEN 30" w 140" Hammer Acker Soil Max Rig

BORING CSB18

PAGE 1 OF 1

* See Legend on Back

BORING LOG | NUS CORPORATION

PROJECT: Kellogg - Orzniny BORING NO.: CSB 19
PROJECT NO.: L670 DATE: 4-21-88 DRILLER: Vince Pine
ELEVATION: FIELD GEOLOGIST: Scott M. Kroll Empire Soils
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth Ft.)	MATERIAL DESCRIPTION* SOIL DENSITY, CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1 0800	0-2'	21 / 21	0.6/1.5	0.5	M DENSE	BR	SILTY SAND TRACE GRAVEL (FILL)	SM	AMBIENT OF HNU=10 ppm
0805	2'-4'	7 / 3 / 6 / 4	0.1/2.0	2.5	LOOSE	TAN	SILT (Fill)		HNU=0 ppm Damp
S-2 0810	4'-6'	4 / 42 / 60 / 89	1.0/2.0	3.0	V DENSE	BR	Silty Sand and Gravel 1/4" (Fill) (Wire debris)	SM	HNU=0 Damp
0815	6'-8'	71 / 97 / 100	0.8/0.8	7.0	V DENSE				HNU=0 ppm Dry
						TAN	SAND (med-coarse) Gravel 1/4"-1"	SW	150/.3
S-3 0825	8'-10	43 / 100	0.8/0.8		V. DENSE				100/. ∇~8'
							8' TD		stopped HNU=0 ppm

REMARKS 2" SS DRIVEN 30" W 140 lb Hammer
Acker Soil Mec Rig

BORING CSB19

PAGE 1 OF 1

* See Legend on Back

BORING LOG | NUS CORPORATION

PROJECT: KDOC DEFENS | BORING NO.: KDCSB20
PROJECT NO.: 4470 | DATE: 4-21-88 | DRILLER: ED COLE
ELEVATION: | FIELD GEOLOGIST: Kim KAAL
WATER LEVEL DATA: (Date, Time & Conditions) 4-21-88, 0800, OVERCAST 45°

	SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	SOIL DENSITY / CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
		0.0-0.5						ASPHALT		
835	S-1	.5-	4 / 6	.5/		Granular	MTLD	FINE TO COARSE SAND +	SW	HNU 0 PPM AS
	(0004)	2.0	7	/1.5		LOOSE	BRN	GRAVEL. HIGH ORGAN-	GW	3-1/2 VOAS, 1/2-8 OZ
								ICS		LOW MOIST.
820	S-1	2.0-	7 / 12	1.4/		Granular	MTLD	FINE TO COARSE SAND +	SW-	HNU 0 PPM AS
	(0005)	4.0	6 / 14	/2.0		Loose-	BRN	GRAVEL ~~+~~ SOME SILT	GW	3-1/2 VOAS
						Semi		NO ORGANICS		LOW MOIST 1 1/2-8 OZ
						Cohesive				
830	S2	4.0-	31 / [illegible]	.6/		Granular	MTLD	FINE TO COARSE SAND,	SW	HNU .1 PPM 3 1/2 VOAS
	[illegible]	[illegible]	[illegible]	/0.9		LOOSE	BRN	SOME MEDIUM GRAVEL		LOW MOIST. 1/2-8 OZ
8	S-2	6.0-8	31 / 05	2.0/		Granular	MTLD	FINE TO COARSE SAND	SW-	HNU .3 PPM 3-1/2 VOAS
			100 / 5?	/2.0		LOOSE	BRN	AND GRAVEL	GW	LOW MOIST, 1/2-8 OZ
900	S-3	8.0	[illegible] / 165	1.0/		Gran.	MTLD	FINE TO COARSE SAND +	SW-	HNU 3PPM, 3 1/2 VOA
		9.0		/1.0		LOOSE	BRN	GRAVEL	GW	LOW MOIST 1-8 OZ
930	S3	10-12	55 / 60 / 60 / 125	2.0/		Gran.	MTLD	FINE TO COARSE SAND	SW-	HNU 2 PPM 3-1/2 VOA
				/2.0		LOOSE	BRN	AND GRAVEL	GW	LOW MOIST 1-8 OZ
										TD 12'

REMARKS BOH 12.0' 9:45 - DRILLERS COMPLETE
~~[illegible]~~ (KK)
4-21-88

BORING KDCSB20
PAGE 1 OF 1

* See Legend on Back

Failing F-10 Rig 140# hammer with 30" Fall

PROJECT: Kellogg - Deering BORING NO.: CSB 21
PROJECT NO.: L670 DATE: 4-21-88 DRILLER: Vince Prue Empire Soils
ELEVATION: FIELD GEOLOGIST: Scott McKeall
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1 0950	0-2'	3 4	0.5/1.5	0.5	Loose	BR	Silty Sand Trace Gravel	SM	Asphalt 0.5' HNU = 0ppm
		3					(Fill)		Damp
0955	2'-4'	3 3	0.7/2.0	2.0	Loose	Tan	Silt (Fill)	SM	HNU = 1ppm Damp
		4 3							
S-2 1000	4'-6'	2 2	1.0/2.0		Loose				HNU = 0 Moist
		2							
1015	6'-8'	14 27	1.4/2.0	7.0	M Dense				HNU = 0 Damp
		41 103				BR	Silt, Sand and Gravel	SM	
S-3 1035	8'-10'	38 42	0.8/2.0		V Dense				∇ @ 8' HNU = 0
		55 01							
							TO 10'		

REMARKS: TRIPOD METHOD, 2" OD Splitspoon Driven w/140# Hammer falling 30" Acker Soil Max Rig
Grain Size sample taken 140# hammer falling 30"

BORING CSB21

PAGE 1 OF 1

* See Legend on Back

NUS CORPORATION

PROJECT: [illegible] BORING NO.: [illegible] 22
PROJECT NO.: 4670 DATE: [illegible] DRILLER: [illegible]
ELEVATION: FIELD GEOLOGIST: [illegible]
WATER LEVEL DATA:
(Date, Time & Conditions) 4-21-88, 1030, [illegible] SD

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
							MATERIAL DESCRIPTION*		
	[illegible]						ASPHALT		
S-1	0.5-		.7/		[illegible]	[illegible]	FINE TO COARSE SAND	SW	HNU 0 ppm AS
[illegible]	2.0		1.5		[illegible]	BRN			3½ VOAS [illegible]
									MOIST
S-1	2.0-		.5/		[illegible]	[illegible]	FINE TO COARSE SAND	SW	HNU 0 ppm AS
[illegible]	4.0		2.0		[illegible]	[illegible]			3-½ VOAS
									MOIST
					[illegible]				
S-2	4.0-		.8/		[illegible]	[illegible]	SILT [illegible] ORGANIC	OL	HNU 0 ppm AS
[illegible]	6.0		2.0		[illegible]	[illegible]	[illegible]		MOIST 3 VOAS [illegible]
						[illegible]			
S-2	6-8		1.5/		[illegible]	[illegible]	SILT AND FINE TO COARSE	SW	HNU 0 ppm
[illegible]			2.0		[illegible]	[illegible]	SAND, SOME [illegible]	[illegible]	[illegible]
						[illegible]	[illegible]		MOIST
S-3	8-9		[illegible]		[illegible]	[illegible]	FINE TO COARSE SAND AND	[illegible]	HNU 0 ppm AS
						BRN	GRAVEL	GW	MOIST 2 VOAS
									TD 9'

REMARKS BOH 9.0' [illegible]
140# [illegible] 30"

BORING CSB22
PAGE 1 OF 1

* See Legend on Back

PROJECT: [illegible] BORING NO.: [illegible]
PROJECT NO.: [illegible] DATE: [illegible] DRILLER: [illegible]
ELEVATION: FIELD GEOLOGIST: [illegible]
WATER LEVEL DATA: 11.0' [illegible]
(Date, Time & Conditions) [illegible] Sunny [illegible]

	Sample No. & Type	Depth (Ft.)	Blows 6" on Sampler	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.)	Soil Density/Consistency or Rock Hardness	Color	Material Classification	USCS	Remarks
		0.0-.5						ASPHALT		
300	S-1	0.5-		1.4/		Gran	Med	FINE TO COARSE	SW-	HNU 0 ppm
		2.0		/2.0		Loose	Brown	SAND + GRAVEL	GW	3% [illegible]
							Gray	NO ORGANICS		MOIST
310	S-1	2.0-		.5/		Gran	Med	SAND + GRAVEL	SW-	HNU 0 ppm
		4.0		/2.0		Loose	Brown	FINE TO COARSE	GW	7% [illegible]
							Gray	NO ORGANICS		MOIST
320	S-2	4.0-		.6/		Gran	Med	SAND + GRAVEL	SW-	HNU 0 ppm
		6.0		/2.0		Loose	Brown	FINE TO COARSE	GW	3 [illegible]
								NO ORGANICS		MOIST
3[illegible]	S-2	6.0-		1.7/		Gran	Med	SAND [illegible] FINE TO	SW-	HNU 2 ppm
		8.0		/2.0		Loose	Brown	COARSE	GW	MOIST
		4-2[illegible]						NO ORGANICS		
345	S-3	8.0-		0.0/				NO RECOVERY		NO SAMPLE RECOVERED
		10.0		/2.0						(KK) 4-2[illegible]
400	S-3	10.0-		1.6/		Gran	Med	FINE TO COARSE SAND	SW-	WET SPOON
		12.0		/2.0	[illegible]	Loose	Brown	AND GRAVEL METAL	GW	SATURATED SAMPLE
							Gray	[illegible] FILL		HNU 10 ppm AB
								NO ORGANICS		1 [illegible] 3 [illegible]
										TD 12'

REMARKS [illegible] 30" Drop
[illegible] 12.0 [illegible]

BORING [illegible]

PAGE 1 OF 1

* See Legend on Back

BORING LOG — NUS CORPORATION

PROJECT: Kellogg [illegible] BORING NO.: KDCSB24
PROJECT NO.: 4670 DATE: [illegible] DRILLER: [illegible]
ELEVATION: FIELD GEOLOGIST: Kim Kool
WATER LEVEL DATA: (Date, Time & Conditions) 4-21-88 1600 Sunny Windy 50°

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft)	SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
	0-.5						ASPHALT		
S-1	.5		.6/		[illegible]	MED	SILT AND FINE TO	ML-	HNU [illegible]
	2.0		1.5			BRN	COARSE SAND LOW	SM	MOIST
							PLASTICITY, LOW [illegible]		
S-2	2.0		1.0/			MED	SILT, FINE MED	ML	HNU [illegible]
	4.0		2.0				SAND LOW [illegible]		MOIST
							[illegible] PLASTICITY		
S-2	4.0						NO [illegible] RECOVERED		
	6.0								
S-3	6.0						SILT AND COARSE [illegible]	ML	HNU [illegible]
	8.0		2.0				FINE SAND [illegible]	SM	MOIST - WET
							GRAVEL [illegible]		
							[illegible]		
S-3	8.0						FINE TO	SW	[illegible] AS
	10.0						COARSE SAND		MOIST
							[illegible] GRAVEL		
S-3	10.0		1.3/				FINE TO COARSE SAND	SW	HNU [illegible]
	12.0		2.0						MOIST
									150/4 HNU: 30ppm
									Stained soil (Black)
	13.0								Saturated TD 13'

REMARKS: B-4 13.0 TD
Composite [illegible] SIZE Sample TAKEN From 0.0'-12.0'
[illegible] 140# Hammer falling 30"

* See Legend on Back

BORING CSB24

PAGE 1 OF 1

PROJECT Kellogg- Deering
PROJECT NO 1670
ELEVATION
WATER LEVEL DATA
(Date, Time & Conditions)

DATE 5/2/88
FIELD GEOLOGIST Blackert

BORING NO KDCSB25
DRILLER

SAMPLE NO & TYPE	DEPTH (FT)	BLOWS 6" ON ROD (FT)	SAMPLE RECOVERY SAMPLE LENGTH	LITHOLOGY CHANGE (DEPTH FT)	SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
									0-0.5 pavement NO
S-1	0-2	6, 6, 7	0.7 / 1.5			Brn	Brown med to crs Sand and gravel		surface blows HNU 1 PPM
	2-4	9, 7, 7, 10	0.3 / 2.0			Brn			9 PPM visible black material scattered throughout sample
S-2	4-6	8, 6, 13, 14	0.2 / 2.0			Lt Brn	Lt Brn med to crs Sand w some gravel		7 PPM
	6-8	10, 24, 30, 31	1.5 / 2.0			Lt Brn			3 PPM
S-3	8-10	11, 19, 24, 55	0.3 / 2.0			Brn	Med to crs Sand and gravel		20 PPM Damp in bottom
	10-12	46, 76, 72/.2	0.1 / 1.5 / 2.0				Very small recovery Brn med to crs Sand		probable refusal Auger refusal @ 11.5' TD

REMARKS Aker Soil Max Rig using 140# hammer falling 30" - Tripod used for hammer drop due to hole location beneath power lines. 2" Stainless split spoon sampling device

* See Legend on Back

BORING KDCSB-25
PAGE ___ OF ___

PROJECT: Kellogg Deering
PROJECT NO.: 6670
DATE: 7/3/88
BORING NO.: KD [illegible]
DRILLER: V. Price
ELEVATION:
FIELD GEOLOGIST: Bleckert
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (DEPTH/FT)	MATERIAL DESCRIPTION* SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1	0-2	33 / 30	0.7 / 1.5			Brn	Brn Med to Crs sand and		Top of [illegible]: 0.5 PPM, Duplicate taken
		>100					gravel - Angular to		
	2-4	2 / 100	1.0 / H			Brn	subrounded		0.0 PPM
S-2	4-6	7 / 15	2.0			Brn	Med to Crs Sand and		0.2 PPM
		19 / 100					gravel - Angular to		
	6-8	43 / [illegible]	0.7				subrounded		Auger Refusal @ 6.7
									TD 6.7
S-3	8-10								

REMARKS Acker Soil Max Rig and 140# hammer with 30" fall 2" Stainless Steel split spoon sampling device

BORING KD [illegible]

PAGE ___ OF ___

* See Legend on Back

BORING LOG

NUS CORPORATION

PROJECT: Kellogg - Deering
BORING NO.: CSB-27
PROJECT NO.: L670
DATE: 5/3/88
DRILLER: V. Prue
ELEVATION:
FIELD GEOLOGIST: Blackert
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (DEPTH)	SOIL DENSITY, CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1	0-2	- 3 3 5	1.3/1.5			Brn	Fine to crs sand		0-0.5 Pavement 0.3 PPM
	2-4	5 3 6 5	2.0				Fine to crs sand		0 PPM
S-2	4-6	21 51 115 ...	2.0						0.1 PPM Auger Refusal at 6.2 - TD

REMARKS Acker Soil Max Rig with 2" split spoons and 140# hammer falling 30"

BORING CSB-27

PAGE ___ OF ___

* See Legend on Back

NUS CORPORATION

PROJECT: Kellogg - Deering BORING NO.: KD-CSB 28
PROJECT NO.: 4670 DATE: 5/3/86 DRILLER:
ELEVATION: FIELD GEOLOGIST: Bleckert
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/ft.)	SOIL DENSITY/CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1	0-2	9 / 9 / 14	0.6 / 1.5			Brown	Med to coarse sand		0-0.8 Pavement, 2 PPM @ 0.5-2 ft.
	2-4	16 / 31 / 31 / 38	0.2 / 2.0			Gray Brown	Gray linear material crushed concrete?		6 PPM
S-2	4-6	31 / 47 / 38 / 82	0.7 / 2.0			Brown	Med to coarse sand and gravel		5 PPM
	6-8	50 / 49 / 47 / 35	1.1 / 2.0			Brown	Med to coarse sand and gravel		22 PPM
S3	8-10	49 / 60 / >150	1.2				fine to coarse sand and gravel		21 PPM
	10-12	31 / 47 / 50 / 66	1.0 / 2.0			Brown	Gravel & Pebbles with med to coarse sand		7 PPM
S3	12-14	129 / >150							Refusal at 12.6 Wet from 12.2 Auger to 15' very hard 15' TD

REMARKS Acker Soil Max
140# weight over 30"
2" Split spoons (Stainless Steel)

BORING CSB28
PAGE ___ OF ___

* See Legend on Back

... LOG

NUS CORPORATION

PROJECT: Kellogg-Wearing
BORING NO.: CSB29
PROJECT NO.: 1670
DATE: 5/3/88
DRILLER:
ELEVATION:
FIELD GEOLOGIST: Blackert
WATER LEVEL DATA:
(Date, Time & Conditions)

SAMPLE NO. & TYPE	DEPTH (FT)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/ft)	SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
S-1	0-2	7	0.5/2.0			Brn	Sandy clay and med		2PPM
							to coarse sand		
	2-4	4 13 30 31	0.2/2.0			Brn	silty clay		2PPM
S-2	4-6	44 110 200	0.4/2.0			Brn	Dark to lt Brown sand		1PPM
							and gravel		
	6-8	21 8 14	2.0			Brn	Fine to coarse sand and		2 PPM
							gravel		
S-3	8-10	22 38 42 60	2.0			Brn	Med to coarse sand &		1 PPM
							Gravel		
	14-16	48 90 51 >150	2.0						2PPM
									Auger & Spoon Refusal at 16'
									Bedrock? 13.2-approx
									Refusal @ 16-augered to 23-TD

REMARKS Acker Soil Max drill rig with 140# weight falling over dist. of 30" - 2" OD Stainless Steel split spoons.

* See Legend on Back

BORING CSB29

PAGE ____ OF ____

PROJECT: Kellogg-Deering
PROJECT NO.: L670
ELEVATION:
WATER LEVEL DATA
(Date, Time & Conditions)

DATE: 5/9/88
FIELD GEOLOGIST: Blackert

BORING NO.: KD-CSB30
DRILLER: V. Prue

SAMPLE NO. & TYPE	DEPTH (FT.)	BLOWS 6" OR RQD (%)	SAMPLE RECOVERY / SAMPLE LENGTH	LITHOLOGY CHANGE (Depth/Ft.)	SOIL DENSITY CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS	REMARKS
									Top of pavement 0 PPM HNU background
S-1	0-2	1 / 4 / 10	0.1 / 1.5			Brn	Med to Course Sand		
	2-4	8 / 13 / 8 / 7	0.3 / 2.0			Brn	Sandy clay and med to course gravel sand		2PPM from HNU / Replaced HNU
S-2	4-6	7 / 5 / 4 / 29	2.0			Brn	Sand and clay with some gravel		2PPM
	6-8	13 / 25 / 24 / 40	0.4 / 2.0			Brn	Sand, gravel and cobbles		*250PPM*
S-3	8-10	29 / 74 / 7100					Sand, gravel and cobbles		*200PPM*
	10-12	74 / 7150					Sand, gravel and cobbles		20PPM Water at bottom - Refusal. Refusal at 10.6' Augered to 14.9 Refusal TD 14.9

REMARKS: Acker Soil Max drill Rig 140# weight falling 30"
Stainless Steel 2" Split spoons.
Tripod Used for weight drop due to borehole location under power lines.

* See Legend on Back

BORING KD-CSB30

PAGE ____ OF ____

MONITORING WELL

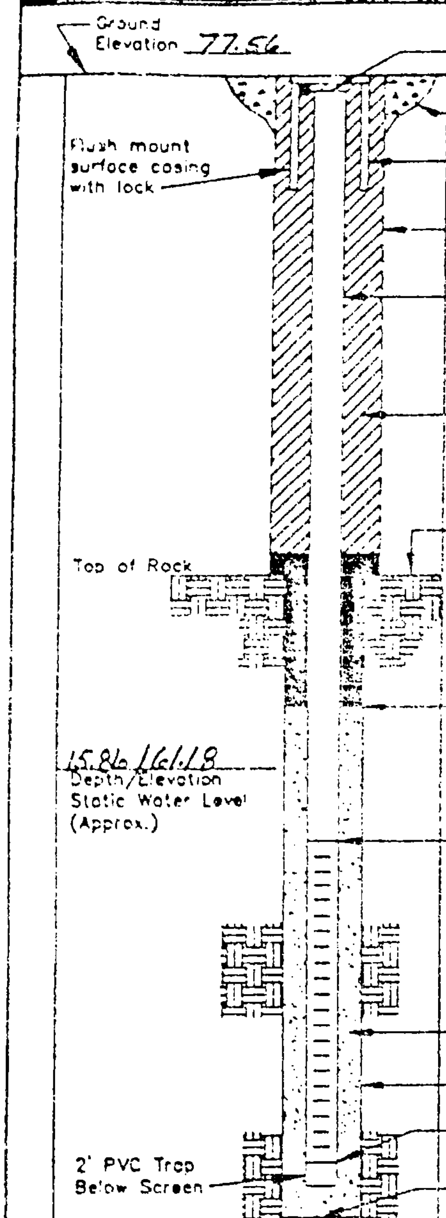
CONSTRUCTION DIAGRAMS

NUS CORPORATION

WELL NO.: K18A

BEDROCK MONITORING WELL SHEET
WELL INSTALLED IN BEDROCK

PROJECT: Kellogg-Deering	LOCATION: Norwalk CT	DRILLER: E. Cole/Empire
PROJECT NO.: L670	BORING: K18A	DRILLING METHOD: H.S. Auger/Core & Ream
ELEVATION: 77.56 (Ground)	DATE: 3/15/88	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: Don Blackert		



ELEVATION TOP OF RISER: 77.04

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

DIAMETER OF HOLE: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Volclay grout from sandpack to bottom of surface seal

DEPTH/ELEVATION TOP OF BEDROCK: 20.00/57.04

DEPTH/ELEVATION TOP OF SAND: 56.00/21.04

DEPTH/ELEVATION TOP OF SCREEN: 58.50/18.54

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: 0.02 x 10'

TYPE OF SAND PACK: #1 Whitehead, Whitbo Inc

DIAMETER OF HOLE IN BEDROCK: 3 7/8"

DEPTH/ELEVATION BOTTOM OF SCREEN: 68.50/8.54

DEPTH/ELEVATION BOTTOM OF SAND: 70.50/6.54

DEPTH/ELEVATION BOTTOM OF HOLE: 70.50/6.54

BACKFILL MATERIAL BELOW SAND: NA

NUS CORPORATION

WELL NO.: K18B

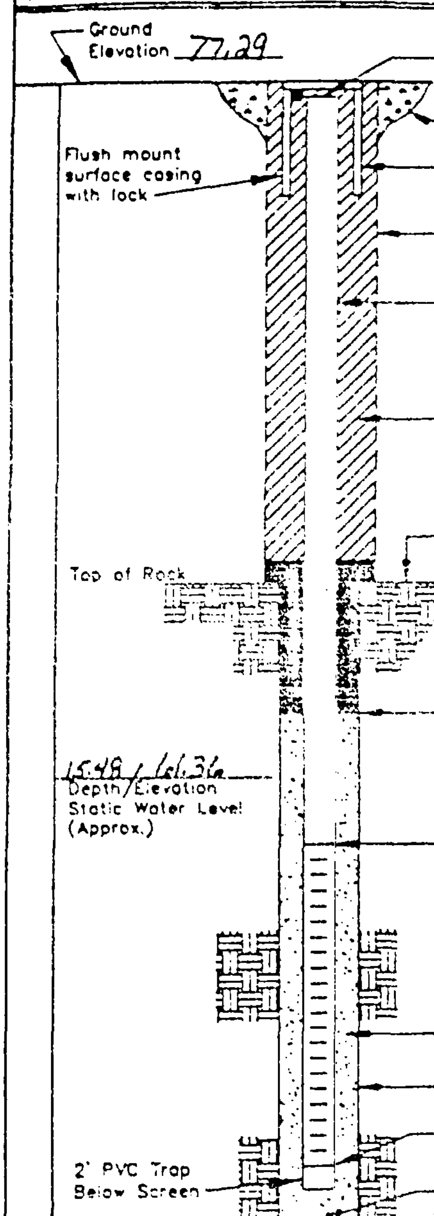
BEDROCK MONITORING WELL SHEET
WELL INSTALLED IN BEDROCK

PROJECT: Kellogg-Deering LOCATION: Norwalk CT DRILLER: E. Cole / Empire

PROJECT NO.: L670 BORING: K18B DRILLING METHOD: H.S. Auger/Core/Ream

ELEVATION: 77.29 (Ground) DATE: 3/22/88 DEVELOPMENT METHOD: Air Lift

FIELD GEOLOGIST: Don Blackert



ELEVATION TOP OF RISER: 76.84

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

DIAMETER OF HOLE: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Volclay grout from sandpack to bottom of surface seal

DEPTH/ELEVATION TOP OF BEDROCK: 20.50'/56.79

DEPTH/ELEVATION TOP OF SAND: 80.00'/-2.71

DEPTH/ELEVATION TOP OF SCREEN: 83.00'/-5.71

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: 0.02 x 10'

TYPE OF SAND PACK: #1 Whitehead, Whitho Inc.

DIAMETER OF HOLE IN BEDROCK: 3 7/8"

DEPTH/ELEVATION BOTTOM OF SCREEN: 93.00'/-15.71

DEPTH/ELEVATION BOTTOM OF SAND: 97.00'/-19.71

DEPTH/ELEVATION BOTTOM OF HOLE: 138.50'/-61.21

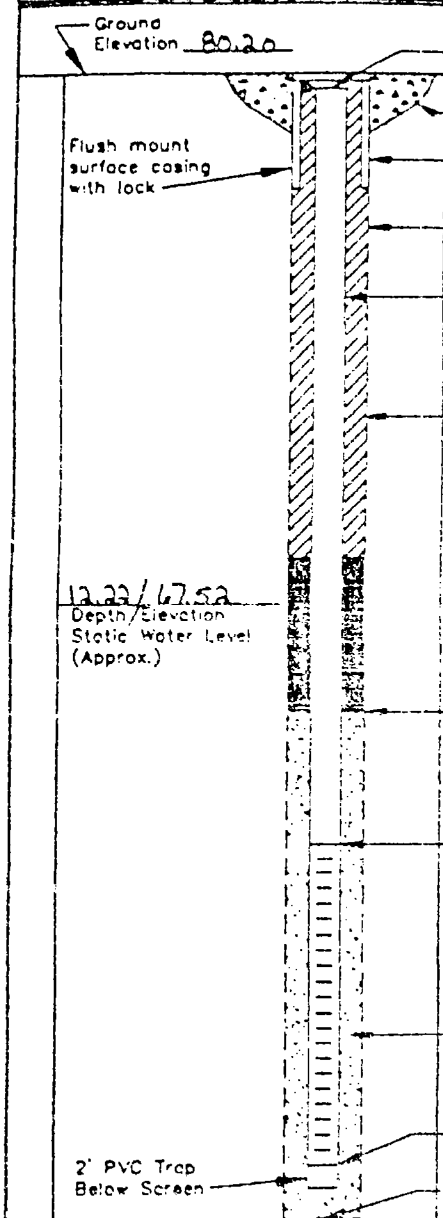
BACKFILL MATERIAL BELOW SAND: Alternating Bentonite & Sand

NUS CORPORATION

WELL NO.: K19A

OVERBURDEN MONITORING WELL SHEET

PROJECT: Kellogg-Deering	LOCATION: Norwalk CT	DRILLER: V Price / Empire
PROJECT NO.: L670	BORING: K19A	DRILLING METHOD: Hollow Stem Auger
ELEVATION: 80.20 (Ground)	DATE: 3/16/88	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: S. Krall		



ELEVATION TOP OF RISER: 79.74

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

BOREHOLE DIAMETER: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Volclay grout from sandpack to bottom of Surface Seal

DEPTH/ELEVATION TOP OF SAND: 9.50 / 70.70

DEPTH/ELEVATION TOP OF SCREEN: 11.40 / 68.80

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: 0.02 x 5'

TYPE OF SAND PACK: #1 Whitehead, Whitbo Inc

DEPTH/ELEVATION BOTTOM OF SCREEN: 16.40 / 63.80

DEPTH/ELEVATION BOTTOM OF SAND: 18.50 / 61.70

DEPTH/ELEVATION BOTTOM OF HOLE: 18.50 / 61.70

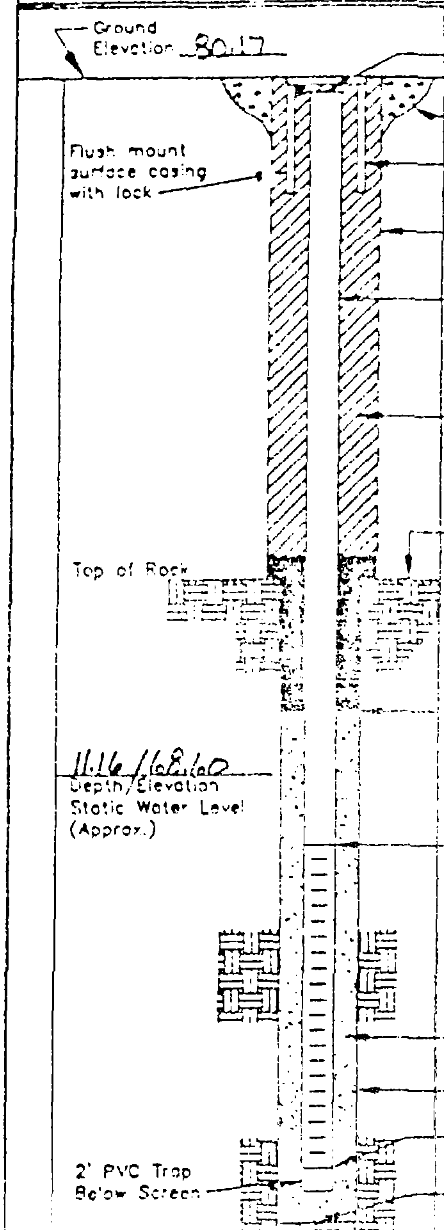
BACKFILL MATERIAL BELOW SAND: NA

NUS CORPORATION

WELL NO.: K19B

BEDROCK MONITORING WELL SHEET
WELL INSTALLED IN BEDROCK

PROJECT: Kellogg-Deering	LOCATION: Norwalk CT	DRILLER: V. Prue / Empire
PROJECT NO.: L670	BORING: K19B	DRILLING METHOD: H.S. Auger/Core & Ream
ELEVATION: 80.17 (Ground)	DATE: 3/15/88	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: S. Krall		



ELEVATION TOP OF RISER: 79.76

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

DIAMETER OF HOLE: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Volclay grout from sandpack to bottom of surface seal

DEPTH/ELEVATION TOP OF BEDROCK: 17.00/63.17

DEPTH/ELEVATION TOP OF SAND: 23.00/57.17

DEPTH/ELEVATION TOP OF SCREEN: 24.50/55.67

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: 0.02 x 10'

TYPE OF SAND PACK: #1 Whitehead, Whitco Inc

DIAMETER OF HOLE IN BEDROCK: 3 7/8"

DEPTH/ELEVATION BOTTOM OF SCREEN: 34.50/45.67

DEPTH/ELEVATION BOTTOM OF SAND: 36.50/43.67

DEPTH/ELEVATION BOTTOM OF HOLE: 58.20/21.97

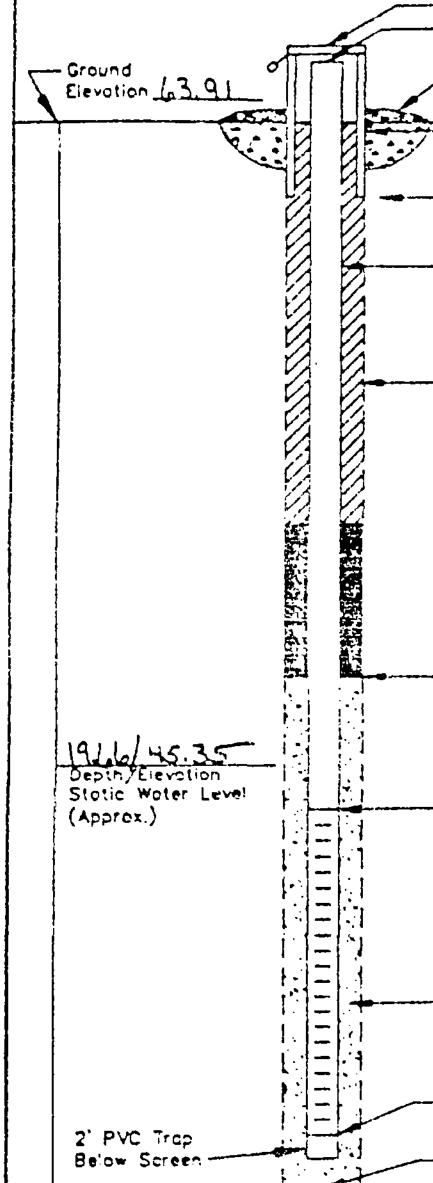
BACKFILL MATERIAL BELOW SAND: Alternating Bentonite & Sand

NUS CORPORATION

WELL NO.: K20A

OVERBURDEN MONITORING WELL SHEET

PROJECT: Kellogg-Deering	LOCATION: Norwalk CT	DRILLER: E. Cole / Empire
PROJECT NO.: L670	BORING: K20A	DRILLING METHOD: Hollow Stem Auger
ELEVATION: 63.91 (Ground)	DATE: 3/29/88	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: S. Krall		



ELEVATION OF TOP OF SURFACE CASING: 66.02

ELEVATION TOP OF RISER: 65.01

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

BOREHOLE DIAMETER: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Volclay grout from top of sandpack to bottom of surface seal

DEPTH/ELEVATION TOP OF SAND: 60.70/3.21

DEPTH/ELEVATION TOP OF SCREEN: 63.60/0.31

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: 0.02 x 10'

TYPE OF SAND PACK: #1 Whitehead, Whitho Inc

DEPTH/ELEVATION BOTTOM OF SCREEN: 73.60/-9.69

DEPTH/ELEVATION BOTTOM OF SAND: 75.60/-11.69

DEPTH/ELEVATION BOTTOM OF HOLE: 77.70/-13.79

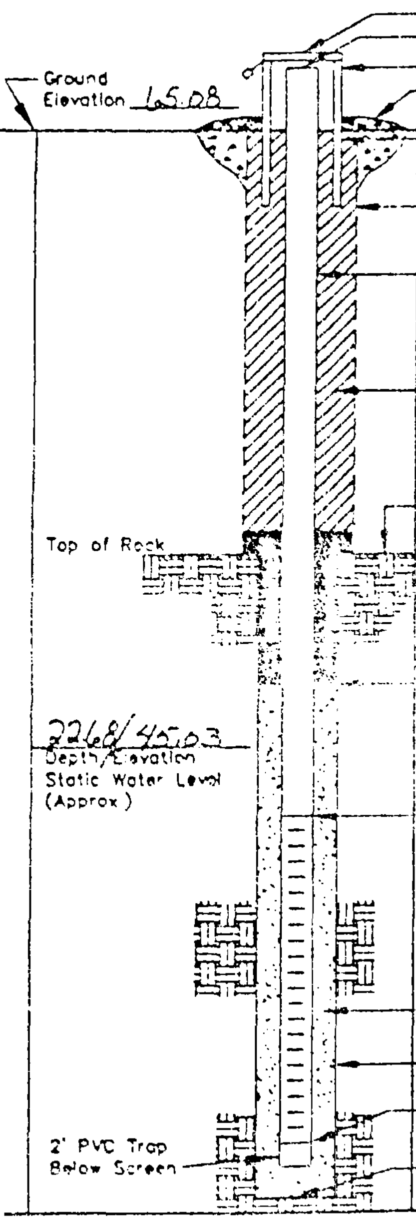
BACKFILL MATERIAL BELOW SAND: Running Sand Bottom 2.1'

NUS CORPORATION

WELL NO.: K20B

BEDROCK MONITORING WELL SHEET
WELL INSTALLED IN BEDROCK

PROJECT: Kellogg-Deering	LOCATION: Norwalk CT	DRILLER: V. Prue / Empire
PROJECT NO.: L670	BORING: K20B	DRILLING METHOD: H.S. Auger Kore & Ream
ELEVATION: 65.08	DATE: 4/6/88	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: Dan Blackert		



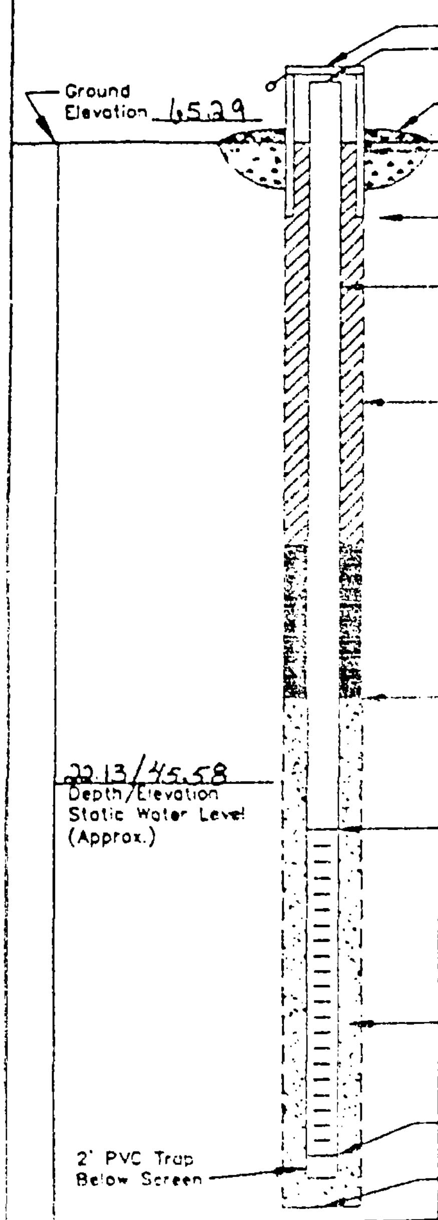
ELEVATION OF TOP OF SURFACE CASING: 67.79
ELEVATION TOP OF RISER: 67.71
STICK UP OF CASING ABOVE GROUND SURFACE: 2.71
TYPE OF SURFACE SEAL: Cement
TYPE OF PROTECTIVE CASING: Steel with Lock
I.D. OF PROTECTIVE CASING: 6"
DIAMETER OF HOLE: 10"
TYPE OF RISER PIPE: Schedule 40 PVC
RISER PIPE I.D.: 2"
TYPE OF BACKFILL/SEAL: Volclay grout from sandpack to bottom of surface seal
DEPTH/ELEVATION TOP OF BEDROCK: 71.00 / -5.92
DEPTH/ELEVATION TOP OF SAND: 98.80 / -33.72
DEPTH/ELEVATION TOP OF SCREEN: 101.00 / -35.92
TYPE OF SCREEN: 2" ID Schedule 40 PVC
SLOT SIZE x LENGTH: 0.02 x 10'
TYPE OF SAND PACK: #1 Whitehead, Whitbo Inc
DIAMETER OF HOLE IN BEDROCK: 3 7/8"
DEPTH/ELEVATION BOTTOM OF SCREEN: 111.00 / -45.92
DEPTH/ELEVATION BOTTOM OF SAND: 113.00 / -47.92
DEPTH/ELEVATION BOTTOM OF HOLE: 113.00 / -47.92
BACKFILL MATERIAL BELOW SAND: NA

NUS CORPORATION

WELL NO.: K20C

OVERBURDEN MONITORING WELL SHEET

PROJECT: Kellogg-Deering	LOCATION: Norwalk CT	DRILLER: E. Cole / Empire
PROJECT NO.: L670	BORING: K20C	DRILLING METHOD: Hollow Stem Auger
ELEVATION: 65.29 (Ground)	DATE: 4/8/88	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: S. Krall		



ELEVATION OF TOP OF SURFACE CASING: 67.94

ELEVATION TOP OF RISER: 67.71

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

BOREHOLE DIAMETER: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Volclay grout from top of sandpack to bottom of surface seal

DEPTH/ELEVATION TOP OF SAND: 14.00/51.29

DEPTH/ELEVATION TOP OF SCREEN: 16.20/49.09

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: 0.02 x 10'

TYPE OF SAND PACK: #1 Whitehead, Whitbo Inc

DEPTH/ELEVATION BOTTOM OF SCREEN: 26.20/39.09

DEPTH/ELEVATION BOTTOM OF SAND: 28.20/37.09

DEPTH/ELEVATION BOTTOM OF HOLE: 29.00/36.29

BACKFILL MATERIAL BELOW SAND: Cuttings

NUS CORPORATION

WELL NO.: K21

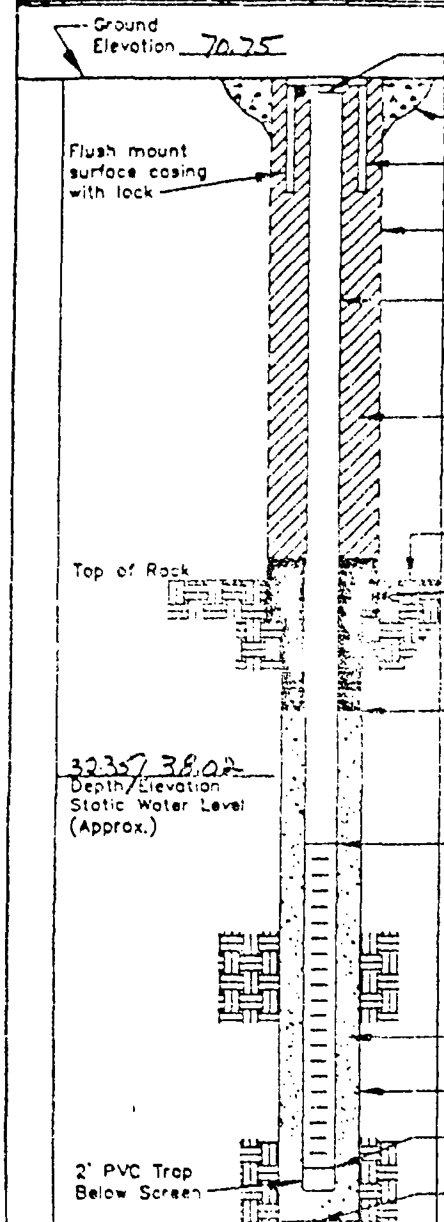
BEDROCK MONITORING WELL SHEET
WELL INSTALLED IN BEDROCK

PROJECT: Kellogg-Deering LOCATION: Norwalk CT DRILLER V. Prue / Empire

PROJECT NO.: 1170 BORING: K21 DRILLING METHOD: H.S. Auger / Core & Ream

ELEVATION: 70.75 (Ground) DATE: 4/15/93 DEVELOPMENT METHOD: Pump

FIELD GEOLOGIST: Don Blackert



ELEVATION TOP OF RISER: 70.37

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

DIAMETER OF HOLE: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Bentonite plug 132-133'
Volclay grout 132' to bottom of steel casing at 48'

DEPTH/ELEVATION TOP OF BEDROCK: 38.5 / 32.25

Steel casing (5" ID) set 9.5' into bedrock

DEPTH/ELEVATION TOP OF SAND: 133.00 / -62.25

DEPTH/ELEVATION TOP OF SCREEN: 137.20 / -66.45

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: 0.02 x 10'

TYPE OF SAND PACK: #1 Whitehead, Whitbo Inc.

DIAMETER OF HOLE IN BEDROCK: 3 7/8

DEPTH/ELEVATION BOTTOM OF SCREEN: 147.20 / -76.45

DEPTH/ELEVATION BOTTOM OF SAND: 149.20 / -78.45

DEPTH/ELEVATION BOTTOM OF HOLE: 161.50 / -90.75

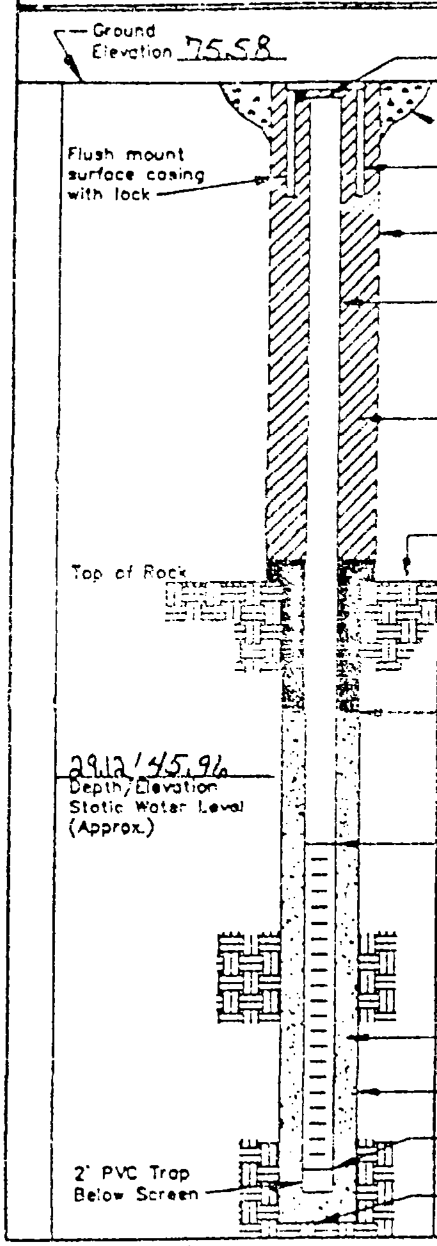
BACKFILL MATERIAL BELOW SAND: Alternating bentonite & sand

NUS CORPORATION

WELL NO.: K22A

BEDROCK MONITORING WELL SHEET
WELL INSTALLED IN BEDROCK

PROJECT: Kellogg-Deering	LOCATION: Norwalk CT	DRILLER: E. Cole / Empire
PROJECT NO.: L670	BORING: K22A	DRILLING METHOD: H.S. Auger / Core & F
ELEVATION: 75.58 (Ground)	DATE: 3/31/88	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: S. Krall		



ELEVATION TOP OF RISER: 75.08

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

DIAMETER OF HOLE: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Volclay grout from sandpack to bottom of surface seal

DEPTH/ELEVATION TOP OF BEDROCK: 19.50/56

DEPTH/ELEVATION TOP OF SAND: 45.00/3(

DEPTH/ELEVATION TOP OF SCREEN: 48.30/27

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: 0.02 x 10'

TYPE OF SAND PACK: #1 Whitehead, Whitbo Inc.

DIAMETER OF HOLE IN BEDROCK: 3 7/8

DEPTH/ELEVATION BOTTOM OF SCREEN: 58.30/17

DEPTH/ELEVATION BOTTOM OF SAND: 60.30/15

DEPTH/ELEVATION BOTTOM OF HOLE: 60.30/15

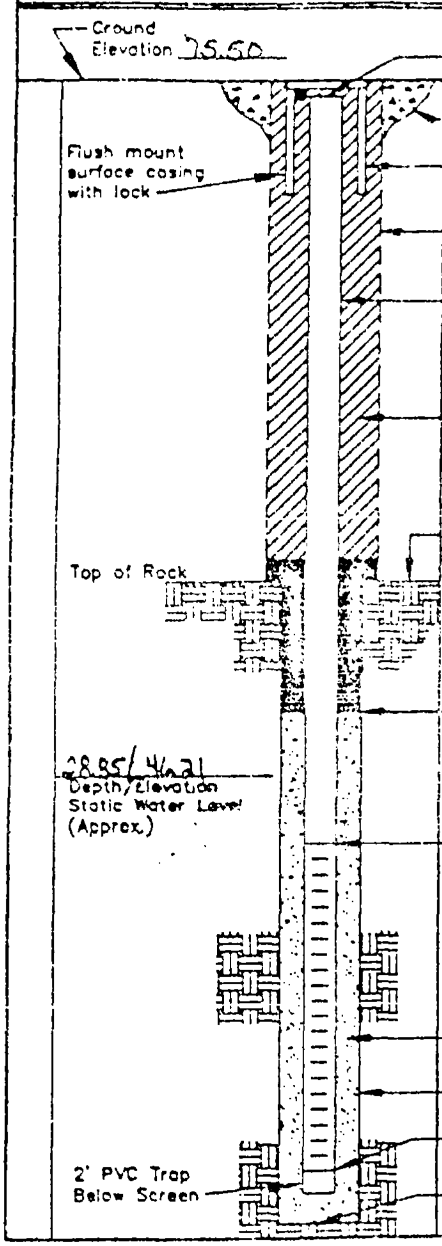
BACKFILL MATERIAL BELOW SAND: NA

NUS CORPORATION

WELL NO.: K22B

BEDROCK MONITORING WELL SHEET
WELL INSTALLED IN BEDROCK

PROJECT: Kellogg-Deering	LOCATION: Norwalk CT	DRILLER: E.Cole / Empire
PROJECT NO.: L670	BORING: K22B	DRILLING METHOD: H.S. Auger / Core & Ream
ELEVATION: 75.50 (Ground)	DATE: 4/7/88	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: Don Blackert		



ELEVATION TOP OF RISER: 75.06

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

DIAMETER OF HOLE: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Volclay Grout from Sandpack to bottom of surface seal

DEPTH/ELEVATION TOP OF BEDROCK: 18.0 / 57.50

DEPTH/ELEVATION TOP OF SAND: 99.0 / -23.50

DEPTH/ELEVATION TOP OF SCREEN: 101.30 / -25.80

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: 0.02 x 10'

TYPE OF SAND PACK: #1 Whitehead, Whitbo Inc.

DIAMETER OF HOLE IN BEDROCK: 3 7/8"

DEPTH/ELEVATION BOTTOM OF SCREEN: 111.3 / -35.80

DEPTH/ELEVATION BOTTOM OF SAND: 113.3 / -37.80

DEPTH/ELEVATION BOTTOM OF HOLE: 113.5 / -38.00

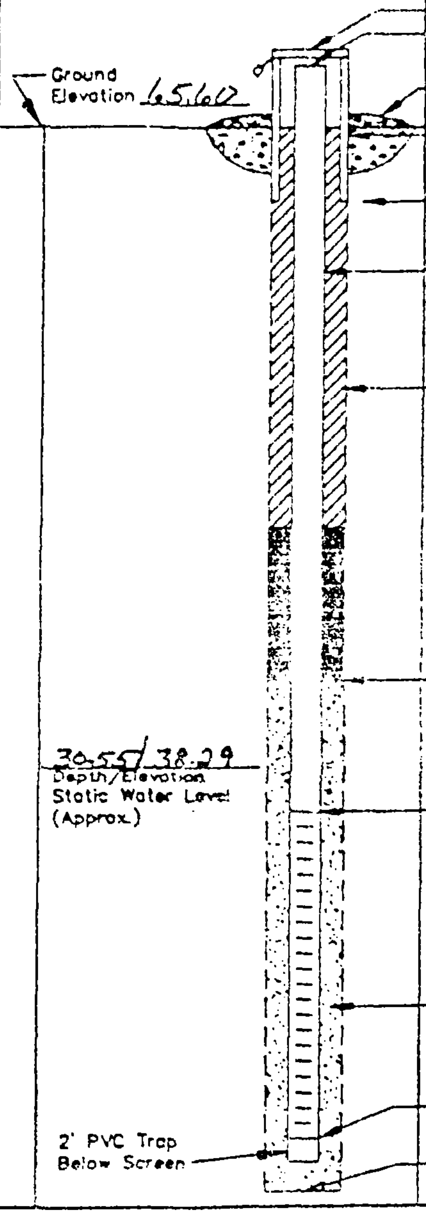
BACKFILL MATERIAL BELOW SAND: NA

NUS CORPORATION

WELL NO.: K23A

OVERBURDEN MONITORING WELL SHEET

PROJECT: Kellogg-Deering	LOCATION: Norwalk CT	DRILLER: V. Prue / Empire
PROJECT NO.: L67D	BORING: K23A	DRILLING METHOD: Hollow Stem Auger
ELEVATION: 65.60 (Ground)	DATE: 3/17/88	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: S. Krall		



Ground Elevation 65.60

30.55 / 38.29
Depth/Elevation Static Water Level (Approx.)

2' PVC Trap Below Screen

ELEVATION OF TOP OF SURFACE CASING: 69.00

ELEVATION TOP OF RISER: 68.89

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

BOREHOLE DIAMETER: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Volclay grout from top of sandpack to bottom of surface seal

DEPTH/ELEVATION TOP OF SAND: 22.00/43.60

DEPTH/ELEVATION TOP OF SCREEN: 23.50/42.10

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: 0.02 x 10'

TYPE OF SAND PACK: #1 Whitehead, Whitco Inc.

DEPTH/ELEVATION BOTTOM OF SCREEN: 33.50/32.10

DEPTH/ELEVATION BOTTOM OF SAND: 35.50/30.10

DEPTH/ELEVATION BOTTOM OF HOLE: 36.60/29.00

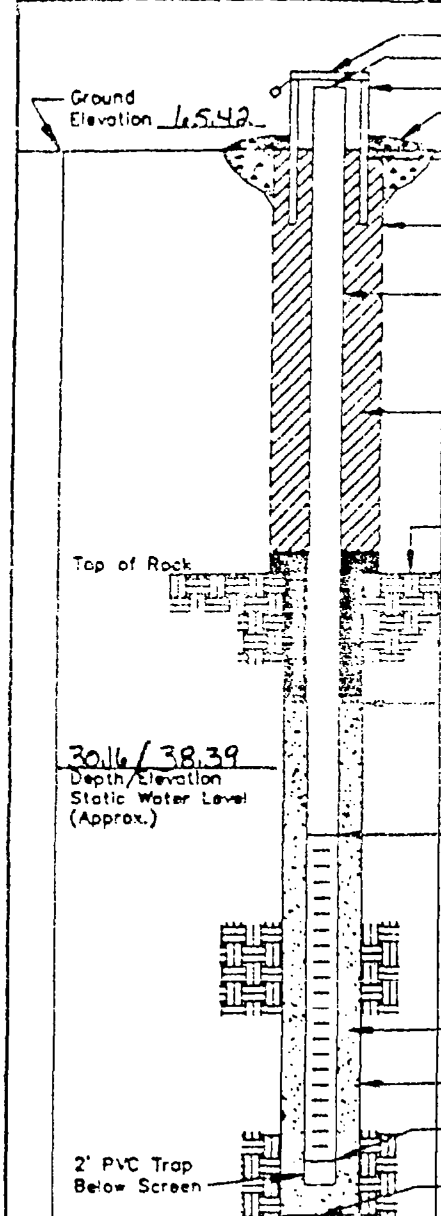
BACKFILL MATERIAL BELOW SAND: Running Sand Bottom 1.1'

NUS CORPORATION

WELL NO.: K23B

BEDROCK
MONITORING WELL SHEET
WELL INSTALLED IN BEDROCK

PROJECT: Kellogg-Deering	LOCATION: Norwalk CT	DRILLER: V. Prue / Empire
PROJECT NO.: L670	BORING: K23B	DRILLING METHOD: H.S. Auger/Core & Ream
ELEVATION: 65.42	DATE: 3/22/88	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: Rick Bethel		



ELEVATION OF TOP OF SURFACE CASING: 68.68

ELEVATION TOP OF RISER: 68.55

STICK UP OF CASING ABOVE GROUND SURFACE: 3.26

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

DIAMETER OF HOLE: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Volclay grout from sandpack to bottom of surface seal

DEPTH/ELEVATION TOP OF BEDROCK: 36.50 / 28.92

DEPTH/ELEVATION TOP OF SAND: 47.00 / 18.42

DEPTH/ELEVATION TOP OF SCREEN: 49.00 / 16.42

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: 0.02 X 10'

TYPE OF SAND PACK: #1 Whitehead, Whitbo Inc.

DIAMETER OF HOLE IN BEDROCK: 3 7/8"

DEPTH/ELEVATION BOTTOM OF SCREEN: 59.00 / 6.42

DEPTH/ELEVATION BOTTOM OF SAND: 61.40 / 4.02

DEPTH/ELEVATION BOTTOM OF HOLE: 64.00 / 1.42

BACKFILL MATERIAL BELOW SAND: Cuttings bottom 2.6'

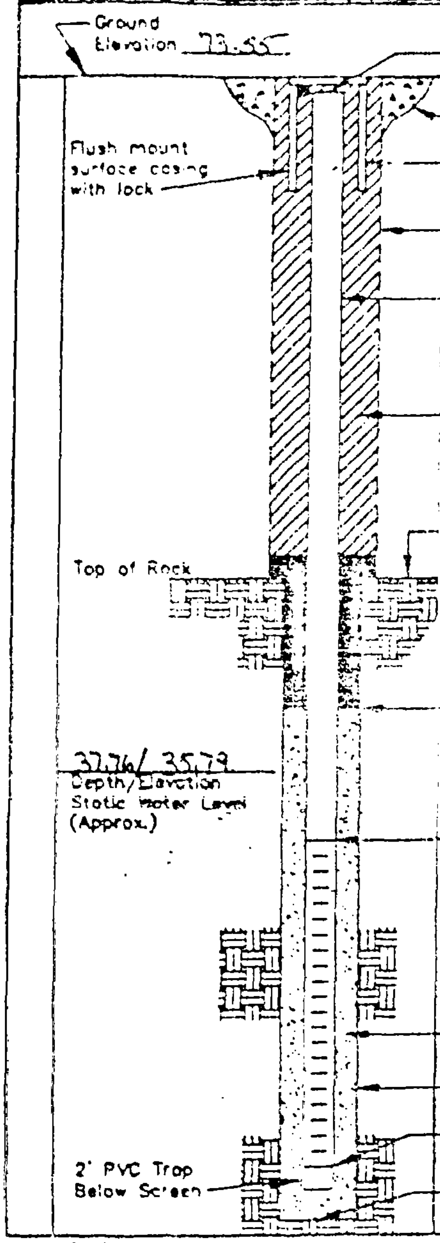
ACPLE LETO\GEOL\PROFILE

NUS CORPORATION

WELL NO.: K24

BEDROCK MONITORING WELL SHEET
WELL INSTALLED IN BEDROCK

PROJECT: Kellogg-Deering	LOCATION: Norwalk CT	DRILLER: V.Price / Empire
PROJECT NO.: L670	BORING: K24	DRILLING METHOD: H.S. Auger / Core
ELEVATION: 73.55 (Ground)	DATE: 4/28/88	DEVELOPMENT METHOD: Air Lift
FIELD GEOLOGIST: Dan Blackert		



ELEVATION TOP OF RISER: 72.98

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Steel with Lock

I.D. OF PROTECTIVE CASING: 6"

DIAMETER OF HOLE: 10"

TYPE OF RISER PIPE: Schedule 40 PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Bentonite chips and sand mix from top of sand to 33', Volclay grout from 33' up to bottom of surface seal

DEPTH/ELEVATION TOP OF BEDROCK: 33.00 / 40.55

DEPTH/ELEVATION TOP OF SAND: 171.80 / -98.25

DEPTH/ELEVATION TOP OF SCREEN: 174.20 / -100.65

TYPE OF SCREEN: 2" ID Schedule 40 PVC

SLOT SIZE x LENGTH: .002 x 10'

TYPE OF SAND PACK: #1 Whitehead, Whitehead Inc.

DIAMETER OF HOLE IN BEDROCK: 3" (NX Core) Not Reamed

DEPTH/ELEVATION BOTTOM OF SCREEN: 184.20 / -110.65

DEPTH/ELEVATION BOTTOM OF SAND: 190.00 / -116.45

DEPTH/ELEVATION BOTTOM OF HOLE: 190.00 / -116.45

BACKFILL MATERIAL BELOW SAND: NA

ACN/L U:\??\GEOL\BEDRK.DWG

FUSS&O'NEILL
consulting engineers
210 Main Street, Manchester, Conn 06040/(203) 646-2469

LETTER OF TRANSMITTAL

Date 3/9/88	Project No. 86-100
Attention:	
RE:	

TO GREGORY A. DelMASTRO
HYDROGEOLOGIST
DAMES AND MOORE
ONE BLUE HILL PLAZA, SUITE 530
PEARL RIVER, NEW YORK 10965-8668

We are sending you the following items: ☒ Attached ☐ Under separate cover via ______

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of Letter ☐ Change Order ☐ Other

Copies	Date	No.	Description
1	6/86		ATTACHMENT II OF JUNE 1986 HYDROGEOLOGIC
			INVESTIGATION - 272 MAIN AVE, NORWALK, CT.

These are transmitted as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit ___ copies for approval
☒ For your use ☐ Approved as noted ☐ Submit ___ copies for distribution
☒ As requested ☐ Returned for corrections ☐ Return ___ corrected prints
☐ For review and comment
☐ For Bids Due ________ 19___ ☐ Prints returned after loan to us

REMARKS

AS WE DISCUSSED. I HOPE THESE WILL ASSIST YOU IN YOUR EVALUATION.

Copy to KARL BOURDEAU, ESQ.

SIGNED: [signature]

ATTACHMENT II

GEOLOGIC LOGS AND MONITOR WELL COMPLETION REPORTS

East Coast Drilling, Inc.

APR 16 1984

P. O. BOX 961 - WALLINGFORD, CONN. 06492

Bit # ______ Ftg ______
Bit # ______ Ftg ______

SHEET 1 OF 1
DATE 4/9/84
HOLE NO. MW-1
LINE & STA. ______
OFFSET ______

TO HRP Associates
ADDRESS New Britain, Connecticut
PROJECT NAME Elinco
LOCATION Norwalk, Connecticut
REPORT SENT TO Client
PROJ. NO. 83-86-10
SAMPLES SENT TO Taken at Site
OUR JOB NO. 83-176A

GROUND WATER OBSERVATIONS
At 6.5' after 24 Hours
At ______ after ______ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW	S-S	BXST
Size I.D.	3"	1 3/8"	
Hammer Wt.		140lb.	Bit
Hammer Fall		30"	Diamond

SURFACE ELEV. ______
DATE STARTED 4/3/84
DATE COMPL. 4/3/84
BORING FOREMAN Quagliaroli II
INSPECTOR P. Misluk
SOILS ENGR. ______

LOCATION OF BORING: ______

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		0.5'-2.0'	D	15	10	9	Moist	.5'	Macadam.	1	1.5'	1.0'
							Medium		Brown fine-medium Sand,			
							Dense		some medium-fine Gravel,			
									trace Silt.			
		5.0'	D	50/0								
							3	5.5'				
		5.5'-8.5'	C				4		Cored White Gneiss, weathered.	C1	3.0'	.6'
							4					
							4					
		8.5'-10.5'	C				6.5		Cored Gray weathered Gneiss.	C2	2.0'	.8'
		10.5'-13.5'	C				5		" "	C3	3.0'	.6'
							4					
		13.5'-16.5'	C				5		" "	C4	3.0'	3.0'
							7					
							6					
		16.5'-18.5'	C				5		" "	C5	2.0'	1.5'
							5					
							5					
		18.5'-22.5'	C				6		" "	C6	4.0'	2.6'
							5					
							6					
		22.5'-24.5'	C				3		" "	C7	2.0'	1.7'
							5		(reamed in 15.0' of casing)			
							5					
		24.5'-26.5'	C				4		" "	C8	2.0'	1.6'
							6	26.5'				
									Bottom of Boring 26.5'			
									Installed 2" PVC Rock Well @ 26.5'			
									17.0' Riser Pipe			
									1 Curb Box			

GROUND SURFACE TO 5.5' USED NW CASING: THEN Cored to 26.5'

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring 5.5'
Rock Coring 21.0'
Samples 1

HOLE NO MW-1

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: ELINCO

Monitoring Point I.D. No.: MW-1

Date of completion: 4/4/84

DEP/WPC I.D. No:

Monitoring Point Location (relative to site features): UPGRADIENT SEE SITE MAP

Drilling Contractor: EAST COAST DRILLING INC.

Supervising Engineer/Geologist: P. MISLUK

Well Construction Method: AUGERED AND CORED

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL):

Well depth below ground surface: 26.5

Refusal: ____ Yes ____ No

Top of casing elevation (MSL):

Screened interval:

Length of Screen:

Length of riser pipe: 17.0'

Screen type:

Screen Slot size:

Filter fabric: ____ Yes ____ No

Screen packing: ____ Yes ____ No

If yes, Thickness:

Material:

grain size:

Well inside diameter: 2"

Impermeable Backfill: Bentonite

Well casing material and schedule: 40 PVC

Estimated K screened interval:

Method of well development: PUMP

Time spent developing: 1 HR

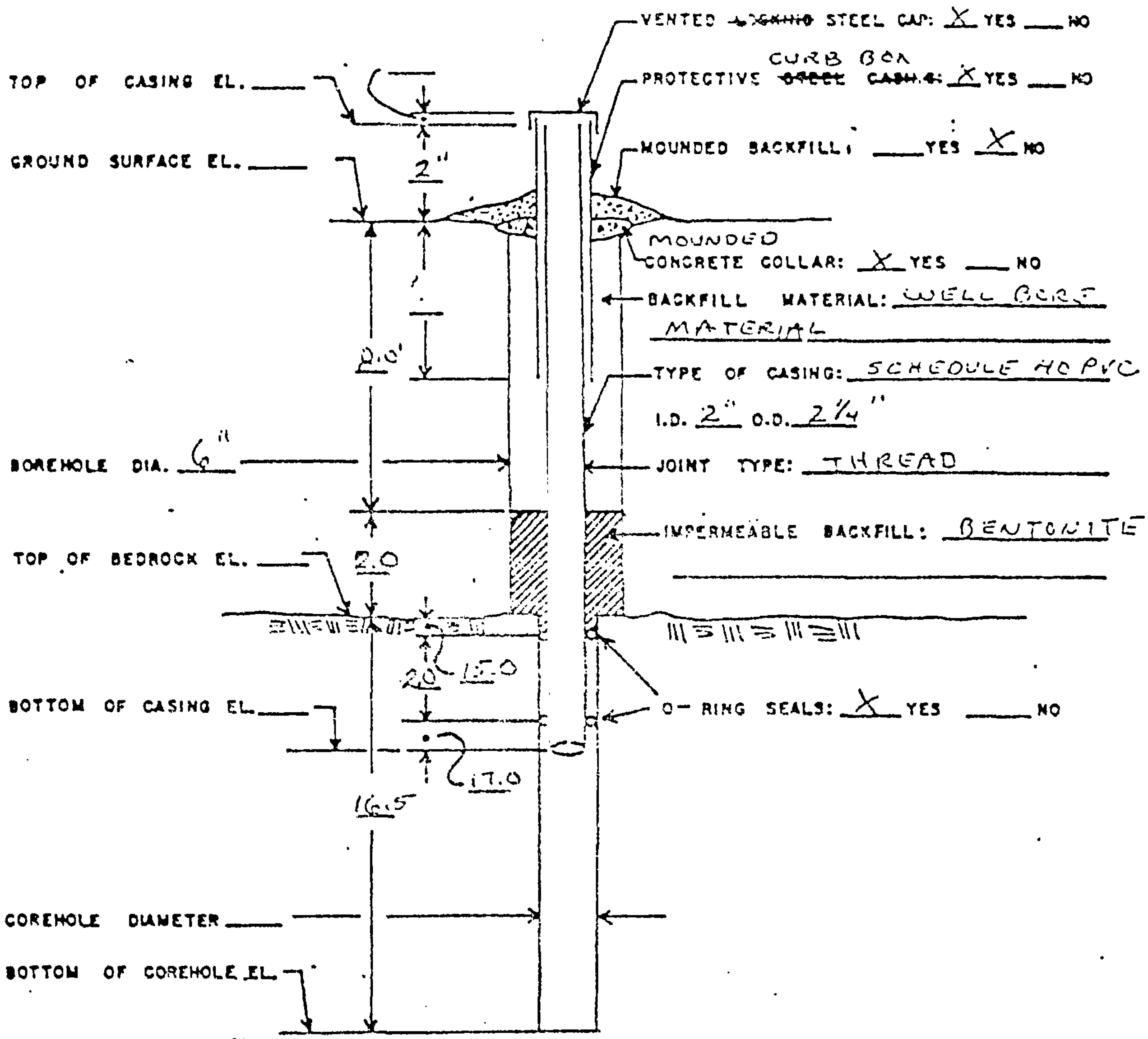
Locking ____ or threaded cap X

Curb Box

Impermeable backfill: CONCRETE COLLAR

MONITOR WELL INSTALLATION DETAIL FOR WELL IN BEDROCK

MW-1



Bedrock wells

Casing length: 17.0'

Water-bearing rock unit: FRACTURED FELSIC GNEISS

Water bearing sections (depths and approximate yields): 10' - 26.5'

Length of rock core: 16.5'

Diameter of core hole: 2 3/8"

Thickness and depth of impermeable backfill: 2' 8'-10' 2' 1'-3'

O-rings seals: X Yes ___ No

GEOLOGIC INFORMATION

Aquifer:

Inferred relationship to plume: ___ Within ___ Outside ___ Edge

Watershed (plume discharge watercourse):

Aquifer materials (attach boring log):

Attach maps and plans required of G.1.j. and G.4.

East Coast Drilling, Inc.

P. O. BOX 961 - WALLINGFORD, CONN. 06492

Bit # ______ Ftg ______
Bit # ______ Ftg ______

SHEET	1 OF 1
DATE	4/9/84
HOLE NO	MW-2
LINE & STA.	
OFFSET	

TO HRP Associates — ADDRESS New Britain, Connecticut
PROJECT NAME Elinco — LOCATION Norwalk, Connecticut
REPORT SENT TO Client — PROJ. NO. 83-86-10
SAMPLES SENT TO Taken at Site — OUR JOB NO. 83-176A

GROUND WATER OBSERVATIONS
At ______ after ______ Hours
At ______ after ______ Hours

	CASING	SAMPLER	CORE BAR.
Type	HSA	S-S	
Size I.D.	3¼"	1 3/8"	
Hammer Wt.		140lb.	BIT
Hammer Fall		30"	

SURFACE ELEV. ______
DATE STARTED 4/4/84
DATE COMPL. 4/4/84
BORING FOREMAN Quagliaroli II
INSPECTOR P. Misluk
SOILS ENGR. ______

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		0.5'-2.0'	D	10	4	6	Moist	.5'	Macadam.	1	1.5'	1.3'
							Loose		Light Brown fine Sand, little Silt.			
							Moist	5.0'				
		5.0'-6.5'	D	10	28	37	Very Dense		Multi-color fine-coarse Sand and fine-medium Gravel.	2	1.5'	1.3'
							Moist		Gray Brown fine-coarse Sand,			
		10.0'-10.5'	D	61/.5			V/Dense	11.0'	some fine-coarse Gravel, trace Silt, Cobbles.	3	.5'	.5'
		11.0'-16.0'	C				7 5 8 7 6		Grayish White Gneiss, (from 14.0'-14.5' seams).	C1	5.0'	4.6'
		16.0'-21.0'	C				5 4 4 3 5	21.0'	Gray Gneiss with fractured joints.	C2	5.0'	5.0'
								23.0'	Roller Bit to 23.0'			
									Bottom of Boring 23.0'			
									Installed 2" PVC Monitor Well @ 22.5'			
									12.5' Riser Pipe			
									10.0' Screen			
									1 Curb Box			

GROUND SURFACE TO 11.0' USED HSA CASING: THEN Roller Bit to 23.0'

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

SUMMARY
Earth Boring 13.0'
Rock Coring 10.0'
Samples 3

HOLE NO MW-2

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: ELINCO

Monitoring Point I.D. No.: MW - 2

Date of completion: 4/4/84

DEP/WPC I.D. No:

Monitoring Point Location (relative to site features): DOWNGRADIENT SEE SITE MAP

Drilling Contractor: EAST COAST DRILLING, INC.

Supervising Engineer/Geologist:

Well Construction Method: AUGERED

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL):

Well depth below ground surface: 22.5'

Refusal: X Yes ____ No

Top of casing elevation (MSL):

Screened interval: 12.5 - 22.5'

Length of Screen: 10.0'

Length of riser pipe: 12.5'

Screen type: PVC

Screen Slot size: .010"

Filter fabric: ____ Yes X No

Screen packing: X Yes ____ No

If yes, Thickness: 10.0'

Well inside diameter: 2"

Material: OTTOWA SAND

grain size: #12 SAND

Impermeable Backfill: Bentonite

Well casing material and schedule: 40 PVC

Estimated K screened interval:

Method of well development: PUMP

Time spent developing: 1 HR

Locking ____ or threaded cap X
Curb Box

Impermeable backfill: CONCRETE COLLAR

Bedrock wells

Casing length: 22.5'
+ SCREEN

Water-bearing rock unit: FRACTURED FELSIC GNEISS

Water bearing sections (depths and approximate yields): 13.0' - 22.5'

Length of rock core: 12.0'

Diameter of core hole: 2 1/2"

Thickness and depth of impermeable backfill: 2' 10.5-12.5' 2' 1-3'

O-rings seals: ____ Yes __X__ No

GEOLOGIC INFORMATION

Aquifer:

Inferred relationship to plume: ____ Within ____ Outside ____ Edge

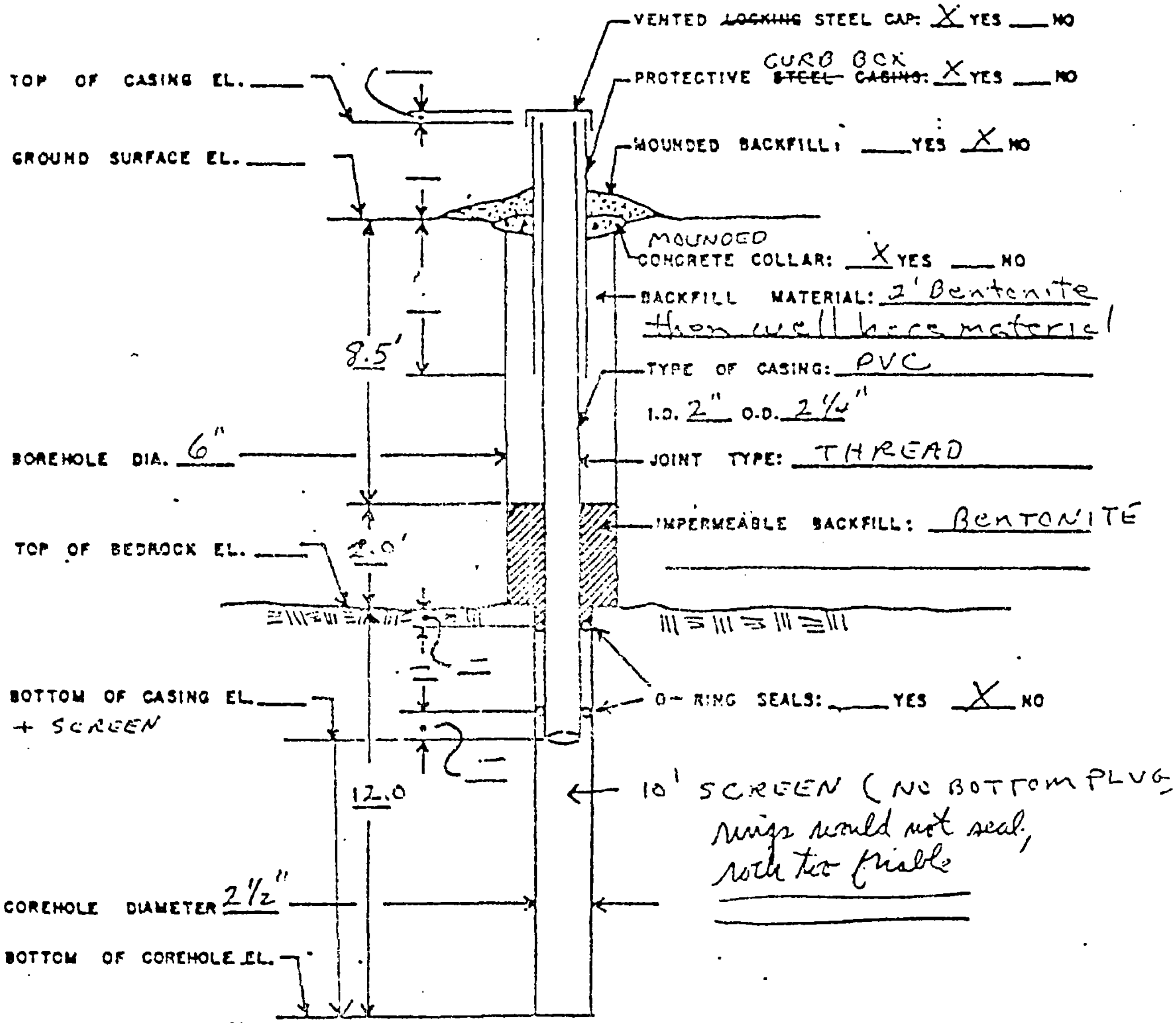
Watershed (plume discharge watercourse):

Aquifer materials (attach boring log):

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL
FOR WELL IN BEDROCK

MW-2



East Coast Drilling, Inc.

P. O. BOX 961 - WALLINGFORD, CONN. 06492

Bit # ______ Ftg ______

Bit # ______ Ftg ______

TO HRP Associates | ADDRESS New Britain, Connecticut

PROJECT NAME Elinco | LOCATION Norwalk, Connecticut

REPORT SENT TO Client | PROJ. NO. 83-86-10

SAMPLES SENT TO Taken at Site | OUR JOB NO. 83-176A

SHEET 1 OF 1
DATE 4/9/84
HOLE NO. MW-3
LINE & STA.
OFFSET

GROUND WATER OBSERVATIONS

At 19.0' after 0 Hours

At ______ after ______ Hours

	CASING	SAMPLER	CORE BAR.
Type	HSA	S-S	
Size I.D.	3¼"	1 3/8"	
Hammer Wt.		140lb.	BIT
Hammer Fall		30"	

SURFACE ELEV.
DATE STARTED 4/4/84
DATE COMPL. 4/5/84
BORING FOREMAN Quagliaroli II
INSPECTOR P. Misluk
SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler 0-6	6-12	12-18	Moisture Density or Consist	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		0.5'-2.0'	D	6	5	6	Moist Medium Dense	.5'	Macadam. Brown fine-medium Sand, little fine Gravel, little Silt.	1	1.5'	.5'
		5.0'-6.5'	D	18	58	51	Moist Very Dense		Brown fine-coarse Sand, some fine-coarse Gravel, trace Silt.	2	1.5'	1.0'
		10.0'-11.5'	D	12	31	27	Moist Very Dense		Brown fine-medium Sand, little fine-medium Gravel.	3	1.5'	1.2'
		15.0'-16.5'	D	12	42	85	Moist Very Dense	18.0'	" "	4	1.5'	1.5'
		18.0'-23.0'	C				7 5 7 7		Gray Gneiss. (Reamed Casing to 20.0')	C1	5.0'	4.7'
		23.0'-28.0'	C				6 6 6 7 7 5	28.0'	" "	C2	5.0'	4.7'
									Bottom of Boring 28.0'			
									Installed 2" PVC Rock Well @ 28.0'			
									20.8' Riser Pipe			
									1 Curb Box			

GROUND SURFACE TO 18.0' USED HSA CASING: THEN Cored to 28.0'

Sample Type
D: Dry C: Cored W: Washed
UP: Undisturbed Piston
TP: Test Pit A: Auger V: Vane Test
UT: Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

SUMMARY
Earth Boring 18.0'
Rock Coring 10.0'
Samples 4

HOLE NO MW-3

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: ELINCO

Monitoring Point I.D. No.: MW-3

Date of completion: 4/6/84

DEP/WPC I.D. No:

Monitoring Point Location (relative to site features): DOWNGRADIENT (see site map)

Drilling Contractor: EAST COAST DRILLING, INC.

Supervising Engineer/Geologist: P. MISLUK

Well Construction Method:
AUGERED AND CORED

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL):

Well depth below ground surface: 28.0'

Refusal: ____ Yes ____ No

Top of casing elevation (MSL):

Screened interval: 18' – 28'

Length of Screen:

Length of riser pipe: 20.8'

Screen type: PVC

Screen Slot size: .010"

Filter fabric: ____ Yes X No

Screen packing: X Yes ____ No

If yes, Thickness: 10.0'

Well inside diameter: 2"

Material: ottowa sand

grain size: # 12 sand

Impermeable Backfill: BENTONITE

Well casing material and schedule: 40 PVC

Estimated K screened interval:

Method of well development: PUMP

Time spent developing: 1 hr.

Locking ____ or threaded cap X
Curb Box

Impermeable backfill: CONCRETE COLLAR

Bedrock wells

Casing length: 20.8'

Water-bearing rock unit: FRACTURED FELSIC GNEISS

Water bearing sections (depths and approximate yields): 10' - 28'

Length of rock core: 10'

Diameter of core hole: 2 3/8"

Thickness and depth of impermeable backfill: 2', 16' to 18' and 2', 1' to 3'

O-rings seals: X Yes ____ No

GEOLOGIC INFORMATION

Aquifer:

Inferred relationship to plume: ____ Within ____ Outside ____ Edge

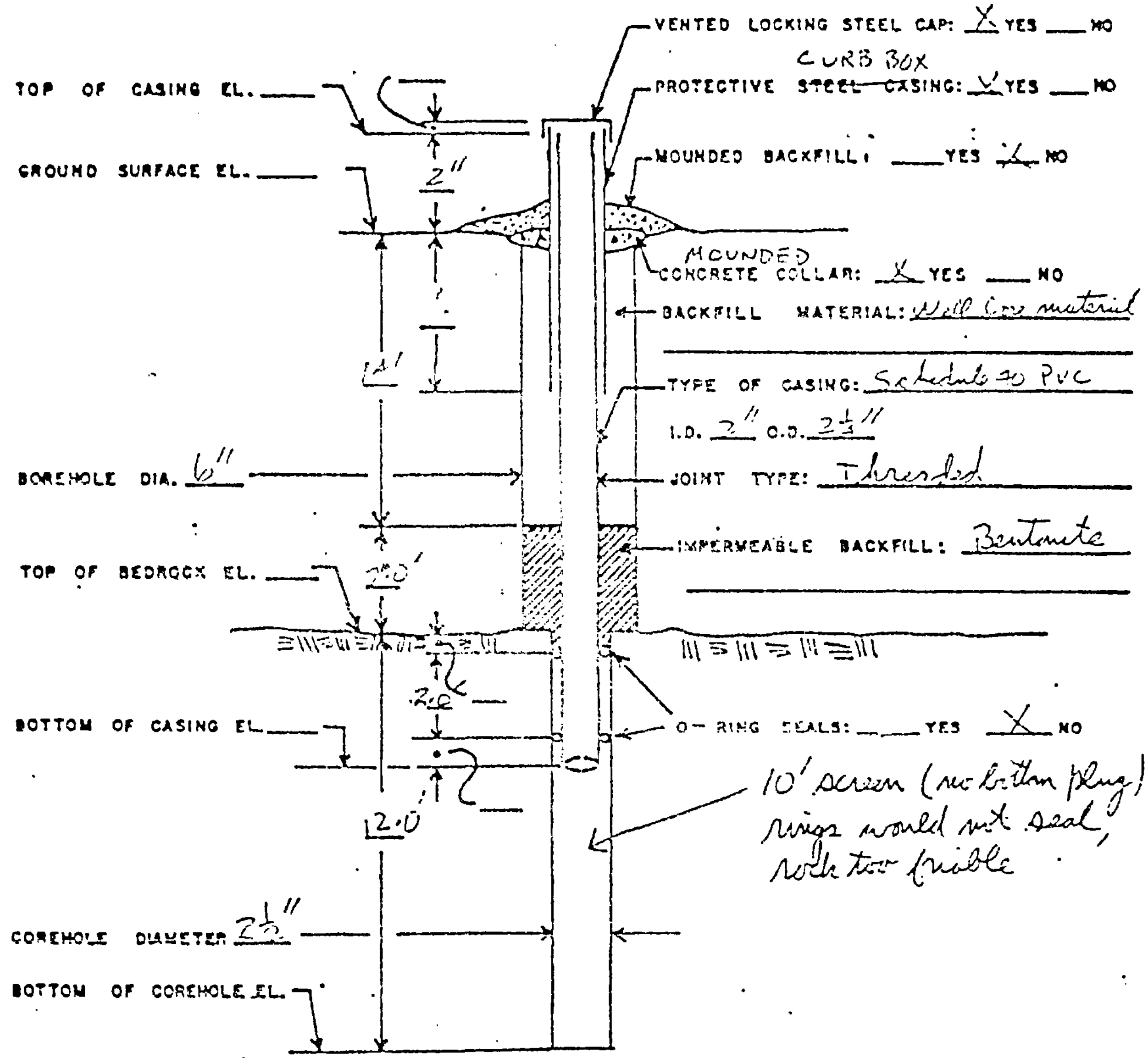
Watershed (plume discharge watercourse):

Aquifer materials (attach boring log):

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL
FOR WELL IN BEDROCK

mw-3



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT	Dunn & O'Neill
PROJECT NAME	KOSLOFF / NORWALK
LOCATION	Norwalk, Ct.
BORING NUMBER	MW-100
SHEET	No. 1 of 2
FILE NO.	926-8540

DRILLER	Michael Deane
INSPECTOR	Bob Potterton
DATE START	Sept. 9, 1986
DATE FINISH	Sept. 11, 1986
ARCHITECT ENGINEER	
SURFACE ELEV.	
LINE & STATION	
OFFSET	

	Casing	Sampler	Core Barrel
TYPE	NW	SS	NX
SIZE I.D.	3"	1 1/2"	
HAMMER WT.	300#	140#	
HAMMER FALL	24"	30"	

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5'	1	5.0'-6.5'	16	36	100	1.1			Brown fine-medium sand. Cobbles Fine-coarse Gravel.
10'	2	10.0'-10.8'	100	100/.3		.7			Boulders. Brown fine-coarse Sand and Gravel.
15'									
20'	3	20.0'-22.0'	76	67	56	.7			Brown fine-coarse Sand. Medium-coarse Gravel. Cobbles and Boulders
			25						
25'	4	25.0'-27.0'	38	49	56	.6			
			27						
30'	5	30.0'-32.0'	55	71	61	.5			Brown fine-medium Sand. Fine-coarse Gravel. Cobbles
			38						
35'	6	35.0'-37.0'	33	16	12	.5			~~Brown~~ fine-medium Sand. Fine-medium gravel.
			12						
	R-1	38.0'-43.0'				1.3	10	38.0'	
							8		Cored Marble like Rock.

SAMPLE IDENTIFICATION

S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE
A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A Coring Time

Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss &O'Neill
PROJECT NAME: Kosloff/Norwalk
LOCATION: Norwalk, Ct.

BORING NUMBER: MW_100
SHEET No. 2 of 2

DRILLER: Michael Deane
INSPECTOR: Bob Potterton
DATE START: Sept. 9, 1985
DATE FINISH: Sept. 11, 1985

ARCHITECT ENGINEER:

	Casing	Sampler	Core Barrel
TYPE	NW	SS	NX
SIZE I.D.	3"	1 1/2"	2"
HAMMER WT	300#	140#	
HAMMER FALL	24"	30"	

FILE NO. 026-8540
SURFACE ELEV.
LINE & STATION
OFFSET

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
40'							8		
							11		
							13		
	R-2	43.0'-45.0'				1.9'	7		Cored Marble like Rock.
							8		
45'	R-3	45.0'-50.0'				3.6'	4		
							7		
							9		
							9		
							11	50.0'	
									End of Boring: 50.0'
									Installed 2" PVC Monitor Well Bottom set at47.0' 5.0' Screen 42.0' Riser 1 Protective Cover.
									Drilled 10.0' with Augers Moved Hole and Drove Casing.

SAMPLE IDENTIFICATION
- — SPLIT SPOON
- T — THIN WALL TUBE
- U — UNDISTURBED PISTON
- O — OPEN END ROD
- W — WASH SAMPLE
- A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A Coring Time

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-100

Date of completion: 9/11/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): WEST OF BUILDING #1 BETWEEN BUILDING & RTE 7

Drilling Contractor: GLENN DRILLING, INC.

Supervising Engineer/Geologist: R.S POTTERTON

Well Construction Method: HOLLOW STEM AUGERS / 3-INCH DRIVEN CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 81'

Well depth below ground surface: 47.7 FEET

Refusal: ____ Yes X No

Top of casing elevation (MSL): 81'

Screened interval: 42.7' - 47.7' BELOW GRADE

Length of Screen: 5 FEET

Length of riser pipe: 42 FEET

Screen type: SLOTTED PVC

Screen Slot size: 10 SLOT

Filter fabric: ____ Yes X No

Screen packing: ____ Yes X No

If yes, Thickness:

Material:

grain size:

Well inside diameter: 2-INCHES

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Well casing material and schedule: SCHEDULE 40 PVC

Estimated K screened interval: NA

Method of well development: BAILING

Time spent developing: 15 MINS.

Locking ____ or threaded cap ____ CURB BOX W/PENTAGONAL BOLT

Impermeable backfill: CEMENT

Bedrock wells

Casing length: 42 FEET

Water-bearing rock unit: GNEISS

Water bearing sections (depths and approximate yields): NA

Length of rock core: 12 FEET

Diameter of core hole: 2 3/8 - INCHES

Thickness and depth of impermeable backfill:

O-ring~~s~~ seal~~s~~: X Yes ___ No

GEOLOGIC INFORMATION

Aquifer: BEDROCK (GNEISS)

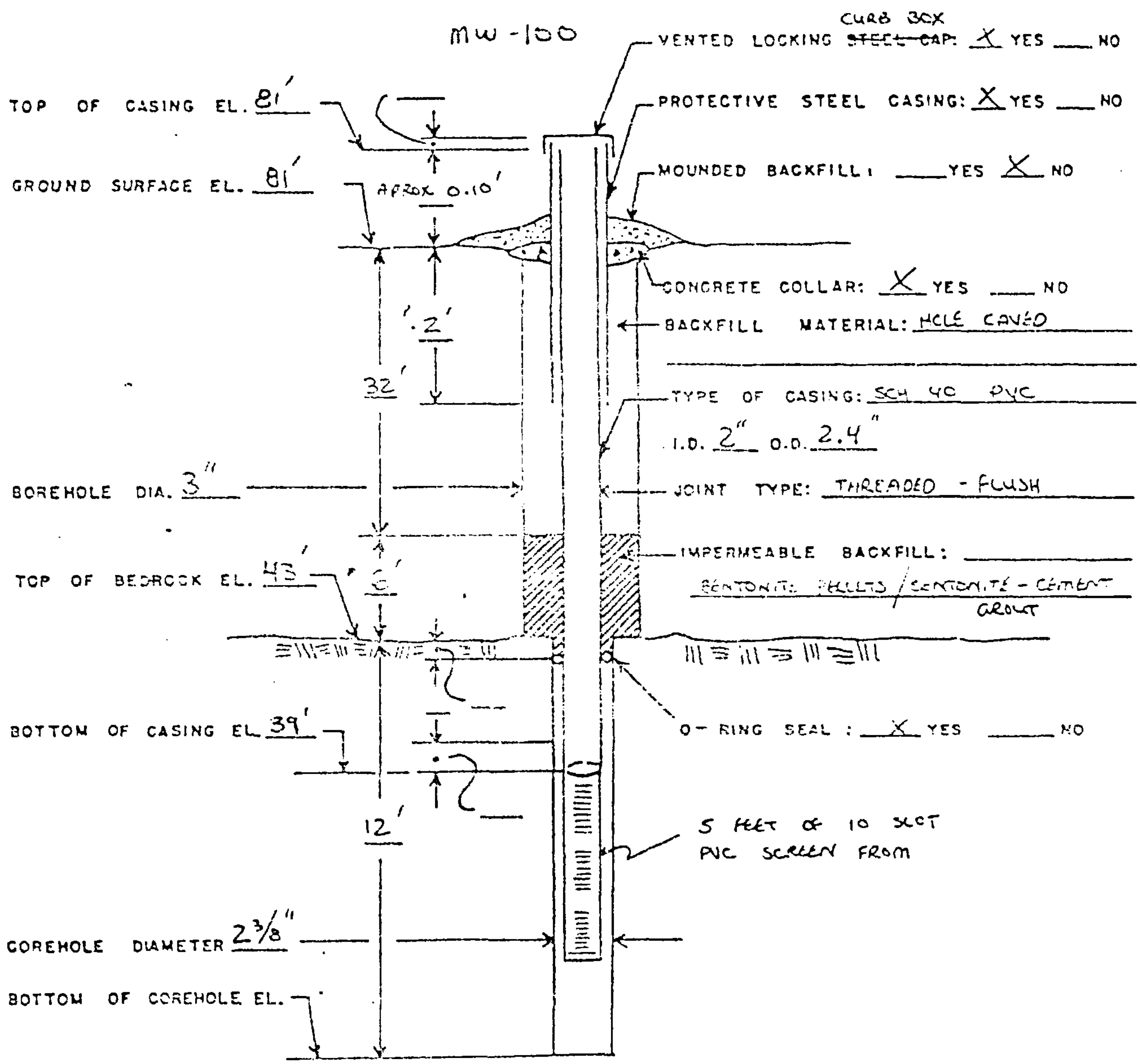
Inferred relationship to plume: ___ Within ___ Outside ___ Edge UNKNOWN

Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): BEDROCK (SEE LOG)

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL
FOR WELL IN BEDROCK



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss & O'Neill
PROJECT NAME: Kchoff/Norwalk
LOCATION: Norwalk, Ct.

BORING NUMBER: MW-101
SHEET No. 1 of 1

DRILLER: Michael Deane
INSPECTOR: Bob Potterton
DATE START: Sept. 12, 1985
DATE FINISH: Sept. 13, 1985

ARCHITECT ENGINEER:

	Casing	Sampler	Core Barrel
TYPE	NW	SS	NX
SIZE I D	3"	1½"	2"
HAMMER WT	300#	140#	
HAMMER FALL	24"	30"	

FILE NO. 926-8540
SURFACE ELEV.
LINE & STATION
OFFSET

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5'	1	5.0'-5.8'	61	100/.3		.8			Brown fine-coarse Sand and Gravel. Cobbles and Boulders.
10'	2	10.0'-10.5'	113			.5			Brown fine-coarse sand. Fine-medium Gravel. Cobbles and Boulders.
									Augered 12.0'. Moved Hole and Drove Casing.
15'	3	15.0'-16.0'	53	100		.9			
20'		20.0'-							No Sample Recovery.
25'	4	25.0'-27.0'	33	41	29	.9		25.0'	Brown fine-coarse Sand. Fine Gravel.
			31						
30'	5	31.0'-33.0'	31	29	31	1.1			Brown fine-medium Sand. Cobbles
			31						
35'	6	35.0'-35.9'	51	100/.4		.5			
	R-1	36.0'-37.0'				.9	10	36.0'	Cored Combination of Mica, Granite and Quartz.
									End of Bring: 37.0'

SAMPLE IDENTIFICATION

- S — SPLIT SPOON
- T — THIN WALL TUBE
- U — UNDISTURBED PISTON
- O — OPEN END ROD
- W — WASH SAMPLE
- A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS: Installed 2" PVC Moniotr Well Bottom at 35.4
5.0' Screen: 35.0' Riser
1 Protective Casing
COL. A Coring Time

being filmed

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-101

Date of completion: 9/13/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): NORTHWEST CORNER OF BUILDING #1

Drilling Contractor: GLENN DRILLING, INC. Supervising Engineer/Geologist: R.S. PETTERSON

Well Construction Method: HOLLOW STEM AUGERS - 3-INCH DRIVEN CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 80 FEET

Well depth below ground surface: 35.4'

Refusal: X Yes ___ No

Top of casing elevation (MSL): 80 FEET

Screened interval: 30.4' - 35.4' BELOW GRADE

Length of Screen: 5 FEET

Length of riser pipe: 35 FEET.

Screen type: SLOTTED PVC

Screen Slot size: 10 SLOT

Filter fabric: ___ Yes X No

Screen packing: X Yes ___ No

If yes, Thickness: 1/2-INCH

Material: QUARTZ SAND

grain size: MEDIUM

Well inside diameter: 2-INCHES

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Well casing material and schedule: SCHEDULE 40 PVC

Estimated K screened interval: NA

Method of well development: BAILING

Time spent developing: 15 MINS.

Locking ___ or threaded cap ___ CURB BOX W/PENTAGONAL BOLT

Impermeable backfill: CEMENT

Bedrock wells

Casing length:

Water-bearing rock unit:

Water bearing sections (depths and approximate yields):

Length of rock core:

Diameter of core hole:

Thickness and depth of impermeable backfill:

O-rings seals: ____Yes ____ No

GEOLOGIC INFORMATION

Aquifer: STRATIFIED DRIFT DEPOSITS

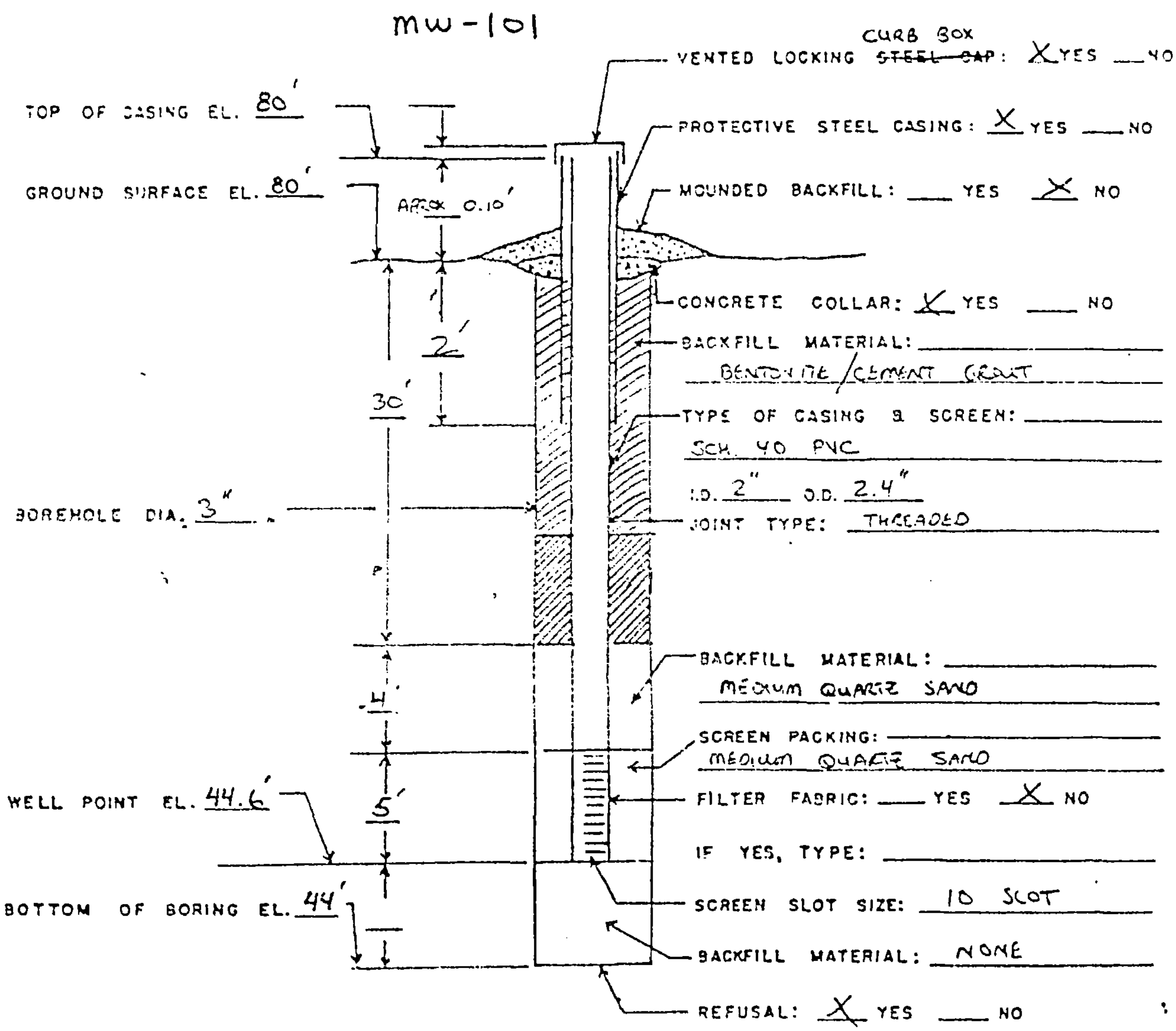
Inferred relationship to plume: ____ Within ____ Outside ____ Edge UNKNOWN

Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): SAND & GRAVEL

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL
FOR WELL IN UNCONSOLIDATED DEPOSIT



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss & O'Neill
PROJECT NAME: KOSLOFF/NORWALK
LOCATION: Norwalk, Ct.
BORING NUMBER: MW-102
SHEET No. 1 of 1

DRILLER: Michael Deane
INSPECTOR: Bob Potterton
DATE START: Sept. 16, 1985
DATE FINISH: Sept. 17, 1985
ARCHITECT ENGINEER:
FILE NO.: 926-8540
SURFACE ELEV.:
LINE & STATION:
OFFSET:

	Casing	Sampler	Core Barrel
TYPE	HW	SS	NX
SIZE I.D.	4"	1 1/2"	2"
HAMMER WT	300#	140#	
HAMMER FALL	24"	30"	

DEPTH	NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5	1	5.0'-6.0'	76	103		.9			Brown fine-coarse Sand. Weathered Rock. Auger to 6.0'. Moved Hole and Drove Casing.
	R-1	5.0'-10.0'				1.1	3	5.0'	
							4		
							4		Cored Rock @ 6'
							4		
10							4		
	R-2	10.0'-15.0'				1.5	3		
							3		
							6		
							5		
							6		
	R-3	15.0'-19.0'				1.3	4		
							3		
							3		
							6	19.0'	
20									End of Boring: 19.0' Installed 2" PVC Monitor Well Bottom set at 15.5' 5.0' Screen 10.0 Riser 1 Protective Casing and Plug

SAMPLE IDENTIFICATION
- — SPLIT SPOON
- T — THIN WALL TUBE
- U — UNDISTURBED PISTON
- O — OPEN END ROD
- W — WASH SAMPLE
- A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A: Coring Time

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-102

Date of completion: 6/17/85

DEP/WPC I.D. No: 103 - 092

Monitoring Point Location (relative to site features): 114 FEET EAST OF BUILDING #2

Drilling Contracto : GLENN DRILLING, INC. Supervising Engineer/Geologist: R.S. POTTERTON

Well Construction Method: HOLLOW STEM AUGERS - AND 4 - INCH DRIVEN CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 101 FEET

Well depth below ground surface: 15.5'

Refusal: ____ Yes X No

Top of casing elevation (MSL): 101 FEET

Screened interval: 10.5 - 15.5 FEET BELOW GRADE

Length of Screen: 5 FEET

Length of riser pipe: 10 FEET

Screen type: SLOTTED PVC

Screen Slot size: 10 SLOT

Filter fabric: ____ Yes X No

Screen packing: ____ Yes X No

If yes, Thickness:

Material:

grain size:

Well inside diameter: 2 - INCHES

Impermeable Backfill: BENTONITE PELLETS CEMENT / BENTONITE GROUT

Well casing material and schedule: SCHEDULE 40 PVC

Estimated K screened interval: NA

Method of well development: BAILING

Time spent developing: 15 MINS.

Locking ____ or threaded cap ____
CURB BOX W/PENTAGONAL BOLT

Impermeable backfill: CEMENT

Bedrock wells

Casing length: 10 FEET

Water-bearing rock unit: GNEISS

Water bearing sections (depths and approximate yields): NA

Length of rock core: 13 FEET

Diameter of core hole: 2 3/8"

Thickness and depth of impermeable backfill: 0.8" THICK FROM 9 FEET BELOW GRADE TO GRADE.

O-rings seals: X Yes ____ No

GEOLOGIC INFORMATION

Aquifer: BEDROCK (GNEISS)

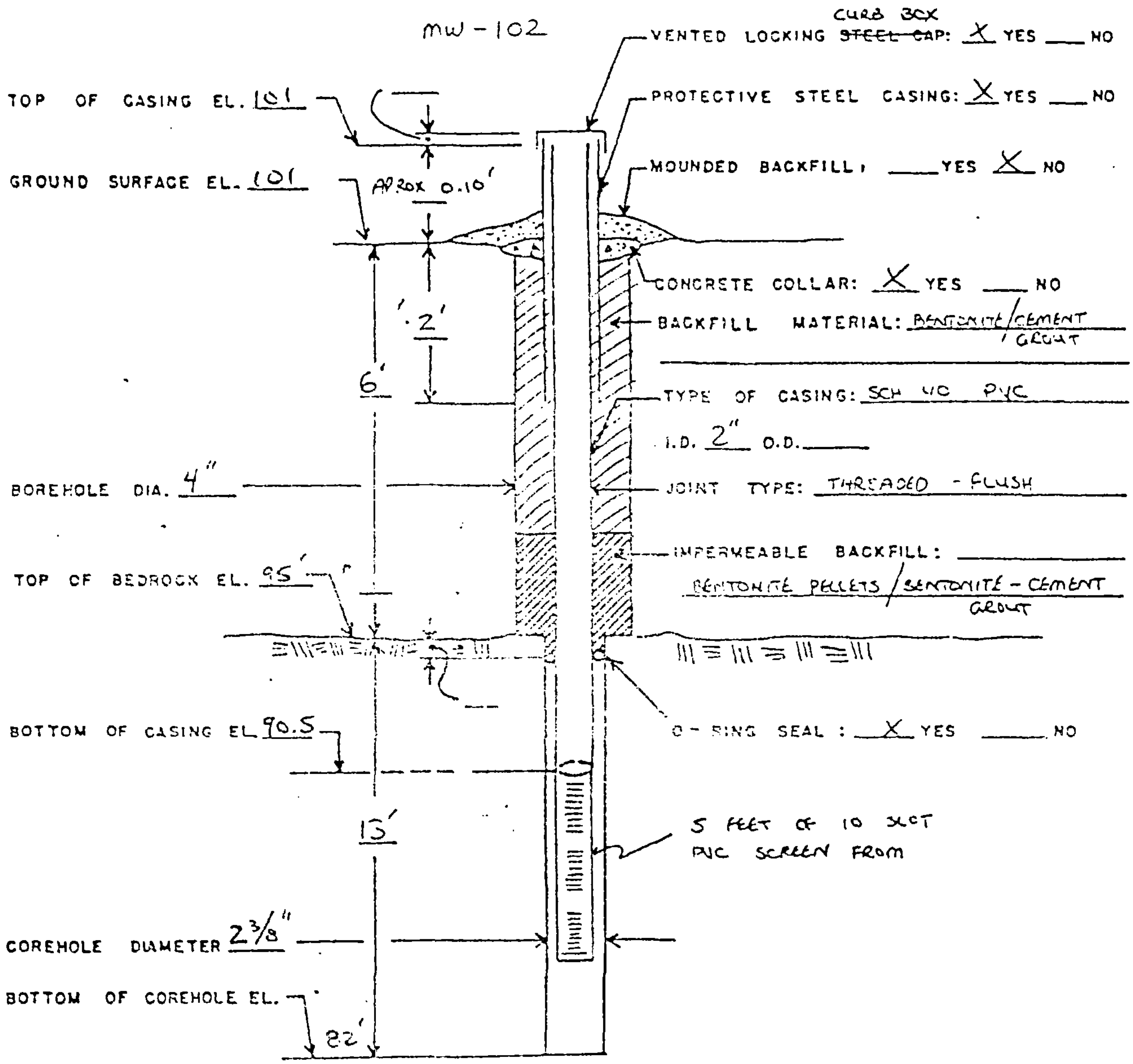
Inferred relationship to plume: ____ Within ____ Outside ____ Edge UNKNOWN

Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): BEDROCK

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL
FOR WELL IN BEDROCK



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss & O'Neill
PROJECT NAME: Koslof / Norwalk
LOCATION: Norwalk, Ct.

BORING NUMBER: MW-103
SHEET No. 1 of 1

DRILLER: Michael Deane
INSPECTOR: Bob Potterton
DATE START: Sept. 17, 1985
DATE FINISH: Sept. 18, 1985

ARCHITECT ENGINEER

	Casing	Sampler	Core Barrel
TYPE	HW	SS	NX
SIZE I.D.	4"	1½"	2"
HAMMER WT	300#	140#	
HAMMER FALL	24"	30"	

FILE NO. 026-8540
SURFACE ELEV.
LINE & STATION
OFFSET

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5	1	5.0'-7.0'	6	8	16	1.2			Brown fine sand.
			37						
10	R-1	10.0'-15.0'				2.5	2	10.0'	Cored Granite, Quartz.
							5		
							8		
							13		
							5		
	R-2	15.0'-20.0'				1.2	4		
							9		
							7		
							11		
							4	20.0'	
									End of Boring: 20.0'
									Installed 2" PVC Monitor Well
									Bottom set at 15.8'
									5.0' Screen
									10.8' Riser
									1 Protective Casing with Plug

SAMPLE IDENTIFICATION
- S — SPLIT SPOON
- T — THIN WALL TUBE
- U — UNDISTURBED PISTON
- O — OPEN END ROD
- W — WASH SAMPLE
- A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:
COL. A: Coring Time

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-103

Date of completion: 9/18/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): 17' SOUTH OF BUILDING 2

Drilling Contractor: GLENN DRILLING, INC. Supervising Engineer/Geologist: R.S. PATTERSON

Well Construction Method: HOLLOW STEM AUGERS AND 4-INCH DRIVEN CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 83'

Well depth below ground surface:

Refusal: ____ Yes X No

Top of casing elevation (MSL): 83'

Screened interval: 10.8 - 15.8 FEET BELOW GRADE

Length of Screen: 5 FEET

Length of riser pipe: 10.8 FEET

Screen type: SLOTTED PVC

Screen Slot size: 10 SLOT

Filter fabric: ____ Yes X No

Screen packing: ____ Yes X No

If yes, Thickness:

Material:

grain size:

Well inside diameter: 2-INCHES

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Well casing material and schedule: SCHEDULE 40 PVC

Estimated K screened interval:

Method of well development: BAILING

Time spent developing: 15 MINS.

Locking ____ or threaded cap ____
CURB BOX W/PENTAGONAL BOLT

Impermeable backfill: CEMENT

Bedrock wells

Casing length: 10.8 FEET

Water-bearing rock unit: GNEISS

Water bearing sections (depths and approximate yields): NA

Length of rock core: 10 FEET

Diameter of core hole: 2 3/8 -INCHES

Thickness and depth of impermeable backfill: 10.5′ THICK (FROM 10.5 FEET TO GRADE)

O-ring~~s~~ seal~~s~~: _X_ Yes ____ No

GEOLOGIC INFORMATION

Aquifer: BEDROCK (GNEISS)

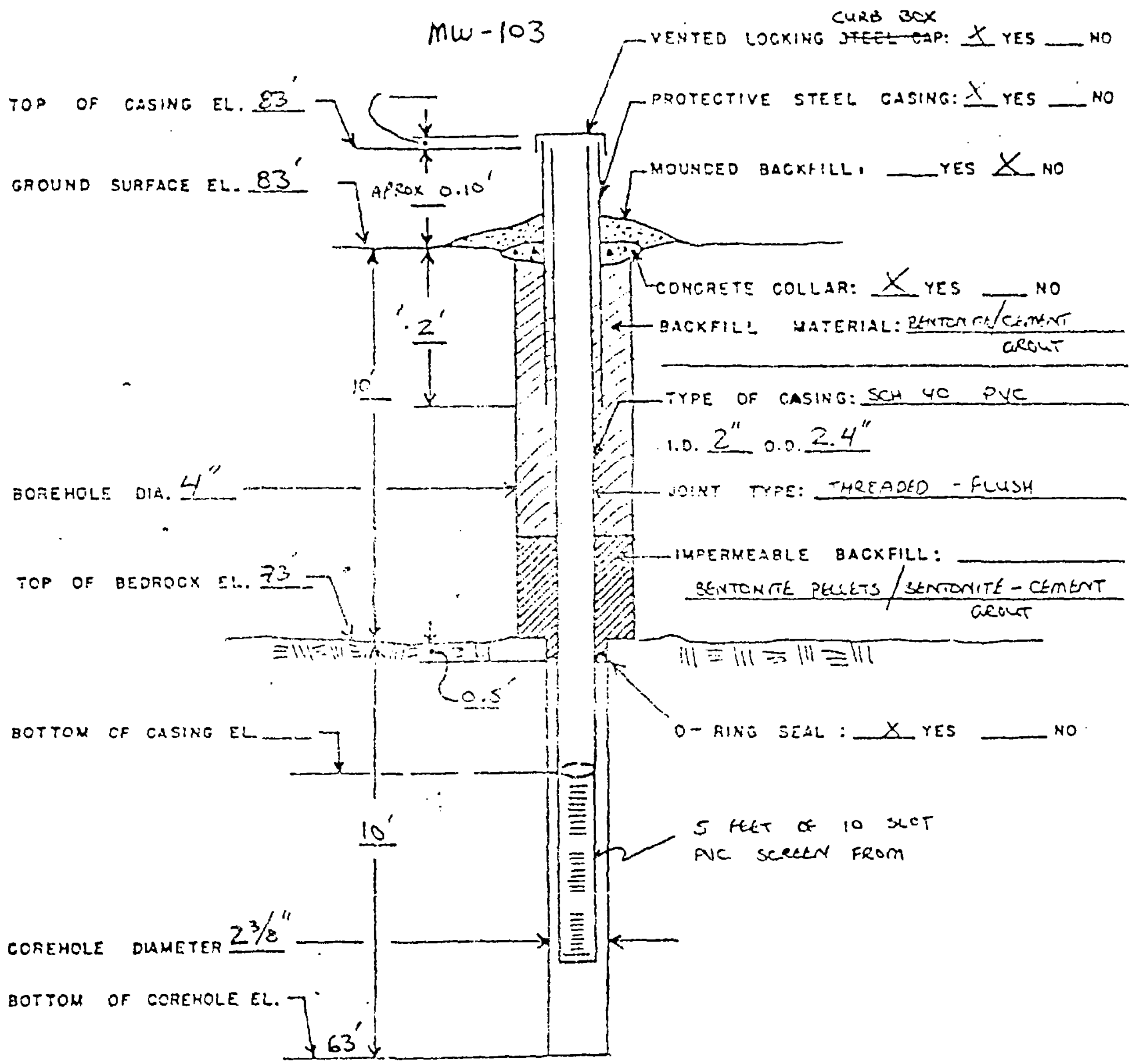
Inferred relationship to plume: ____ Within ____ Outside ____ Edge UNKNOWN

Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): BEDROCK

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL
FOR WELL IN BEDROCK



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss & O'Neill
PROJECT NAME: Kosleff/Norwalk
LOCATION: Norwalk, Ct.

BORING NUMBER: MW-104
SHEET No. 1 of 1

DRILLER: Michael Deane
INSPECTOR: Bob Potterton
DATE START: Sept. 17, 1985
DATE FINISH: Sept. 18, 1985

ARCHITECT ENGINEER:

	Casing	Sampler	Core Barrel
TYPE	HW	SS	NX
SIZE I.D.	4"	1⅜"	2"
HAMMER WT	300#	140#	
HAMMER FALL	24"	30"	

FILE NO. 926-8540
SURFACE ELEV.
LINE & STATION
OFFSET

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5'	1	5.0'-5.6'	65	100/.1		.6			Brown fine-coarse Sand, Fine-medium gravel, Cobbles and Boulders.
	R-1	6.0'-11.0'				4.7	5	6.0'	
							11		
							15		Cored Rock.
							13		
							25		
10'	R-2	11.0'-13.0'				.8	15		
							21		
							33		
	R-3	13.0'-15.7'				1.0	17		
							19		
							19	15.7'	

End of Boring: 15.7'

Installed 2" PVC Monitor Well
Bottom set at 14.2'
5.0' Screen
9.8' Riser
1 Protective Casing and Plug.

SAMPLE IDENTIFICATION
S — SPLIT SPOON
T — THIN WALL TUBE
U — UNDISTURBED PISTON
O — OPEN END ROD
W — WASH SAMPLE
A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

REMARKS:
COL. A Coring Time

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-104

Date of completion: 9/18/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): 5 FEET SOUTH OF BUILDING # 1

Drilling Contractor: GLENN DRILLING, INC.

Supervising Engineer/Geologist: R.S. PETTERTON

Well Construction Method: HOLLOW STEM AUGERS - AND 4-INCH DRIVEN CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 81 FEET

Well depth below ground surface:

Refusal: ____ Yes X No

Top of casing elevation (MSL): 81 FEET

Screened interval: 9.2 - 14.2 FEET BELOW GRADE

Length of Screen: 5 FEET

Length of riser pipe: 9.8 FEET

Screen type: SLOTTED PVC

Screen Slot size: 10 SLOT

Filter fabric: ____ Yes X No

Screen packing: ____ Yes X No

If yes, Thickness:

Material:

grain size:

Well inside diameter: 2-INCHES

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Well casing material and schedule: SCHEDULE 40 PVC

Estimated K screened interval: NA

Method of well development: BAILING

Time spent developing: 15 MINS

Locking ____ or threaded cap ____ CURB BOX W/PENTAGONAL BOLT

Impermeable backfill: CEMENT

Bedrock wells

Casing length: 9.8 FEET

Water-bearing rock unit: GNEISS

Water bearing sections (depths and approximate yields): NA

Length of rock core: 9.7 FEET

Diameter of core hole: 2 3/8 - INCHES

Thickness and depth of impermeable backfill: 4 FEET (FROM 7' TO 3' BELOW GRADE)

O-ring seal : X Yes ____ No

GEOLOGIC INFORMATION

Aquifer: BEDROCK (GNEISS)

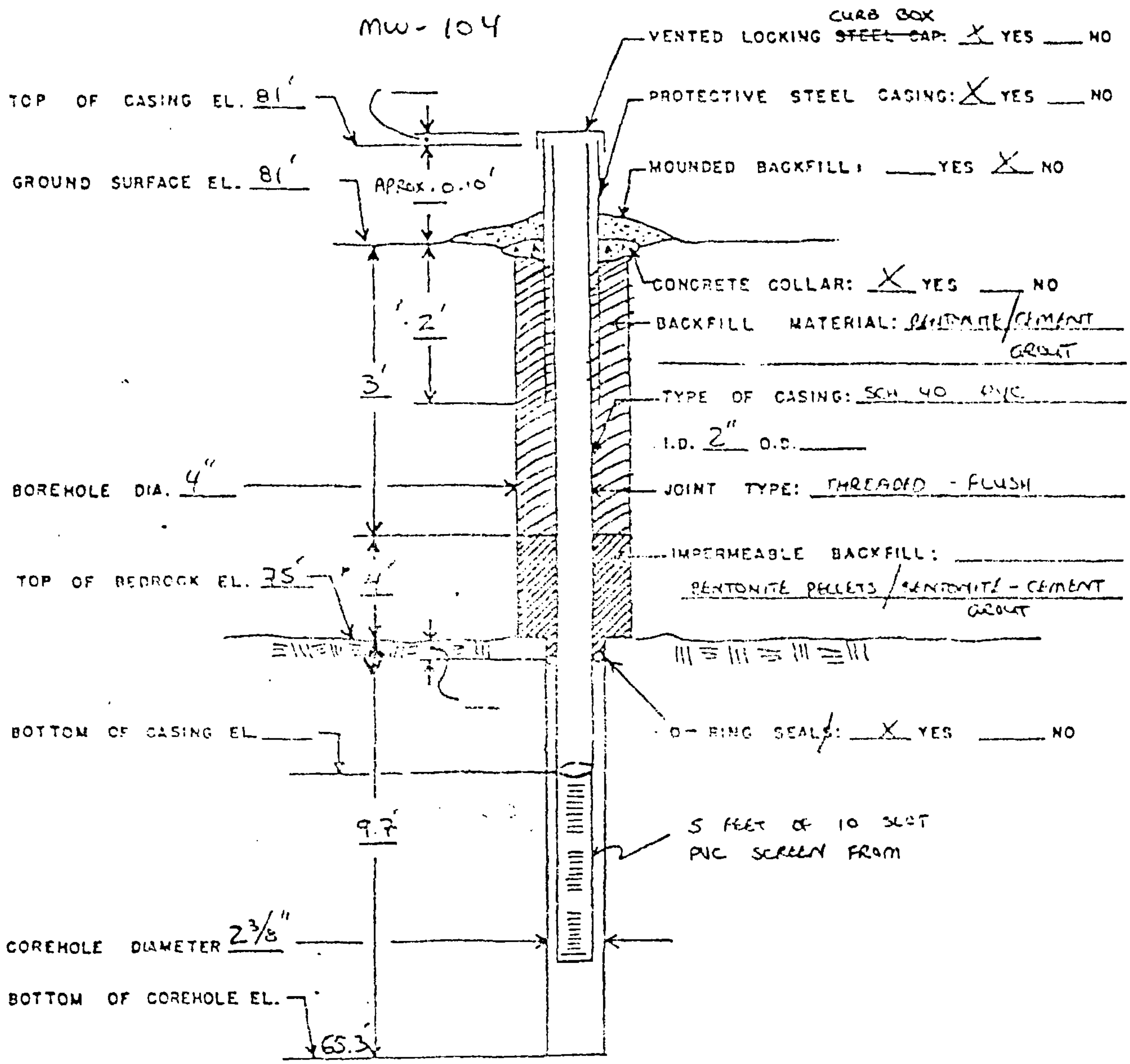
Inferred relationship to plume: X Within ____ Outside ____ Edge

Watershed (plume discharge water/surface): NORWALK RIVER

Aquifer materials (attach boring log): BEDROCK

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL FOR WELL IN BEDROCK



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss & O'Neill
PROJECT NAME: KOSLOFF/NORWALK
LOCATION: Norwalk, Ct.

BORING NUMBER: MW-105
SHEET No. 1 of 1

DRILLER: Michael Deane
INSPECTOR: BOB POTTERTON / Tim BINGHAM
DATE START: Sept. 20, 1985
DATE FINISH: Sept. 23, 1985

ARCHITECT ENGINEER:

	Casing	Sampler	Core Barrel
TYPE	HW	SS	NX
SIZE I.D.	4"	1 3/8"	
HAMMER WT.	300#	140#	
HAMMER FALL	24"	30"	

FILE NO. 926-8540
SURFACE ELEV.
LINE & STATION
OFFSET

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5'	1	5.0'-7.0'	48 / 75	90	56	1.2			Brown fine-coarse sand and gravel Weathered Rock.
10'	2	10.0'-10.8'	54	100/3		.8			Brown fine-coarse sand and gravel. Weathered Rock.
	3	15.0'-16.5'	31	33	102	.9		17'	Dark Brown fine-coarse Sand and Gravel. Weathered Rock.
20'	R-1	18.0'-23.0'				1.0	17 / 16 / 18 / 19 / 22		ROCK AT 17'
25'	R-2	23.0'-27.5'						27.5'	

End of Boring: 27.5'

Installed 2" PVC Monitor Well
Bottom set at 24.0'
5.0' Screen
19.0' Riser
1 Protective Casing and Plug

Reamed hole with Roller Bit to 25.0'
Telescoped NW Casing to maintain Hole.

SAMPLE IDENTIFICATION
- S — SPLIT SPOON
- T — THIN WALL TUBE
- U — UNDISTURBED PISTON
- O — OPEN END ROD
- W — WASH SAMPLE
- A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistancy	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A Corring Time

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARDANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-105

Date of completion: 9/23/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): 10 FEET NORTH OF BUILDING I

Drilling Contractor: GLENN DRILLING, INC.

Supervising Engineer/Geologist: R.S. POTTERTON

Well Construction Method: DROVE 4-INCH CASING / NX CORING IN BEDROCK

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 83'

Top of casing elevation (MSL): 83'

Length of Screen: 5 FEET

Length of riser pipe: 19 FEET

Screen type: SLOTTED PVC

Filter fabric: ___ Yes X No

Well inside diameter: 2-INCHES

Well casing material and schedule: SCHEDULE 40 PVC

Method of well development: BAILING

Locking ___ or threaded cap ___
CURB BOX W/PENTAGONAL BOLT

Well depth below ground surface:

Refusal: ___ Yes X No

Screened interval:

19.5' - 24.5' BELOW GRADE

Screen Slot size: 10 SLOT

Screen packing: ___ Yes X No

If yes, Thickness:

Material:

grain size:

Impermeable Backfill: BENTONITE PELLETS CEMENT/BENTONITE GROUT

Estimated K screened interval: NA

Time spent developing: 15 MINS.

Impermeable backfill: CEMENT

Bedrock wells

Casing length: 19 FEET

Water-bearing rock unit: GNEISS

Water bearing sections (depths and approximate yields): NA

Length of rock core: 8 FEET

Diameter of core hole: 2 3/8 - INCHES

Thickness and depth of impermeable backfill: 9 FEET (10'-19' BELOW GRADE)

O-rings seals: X Yes ____ No

GEOLOGIC INFORMATION

Aquifer: BEDROCK (GNEISS)

Inferred relationship to plume: ____ Within ____ Outside ____ Edge UNKNOWN

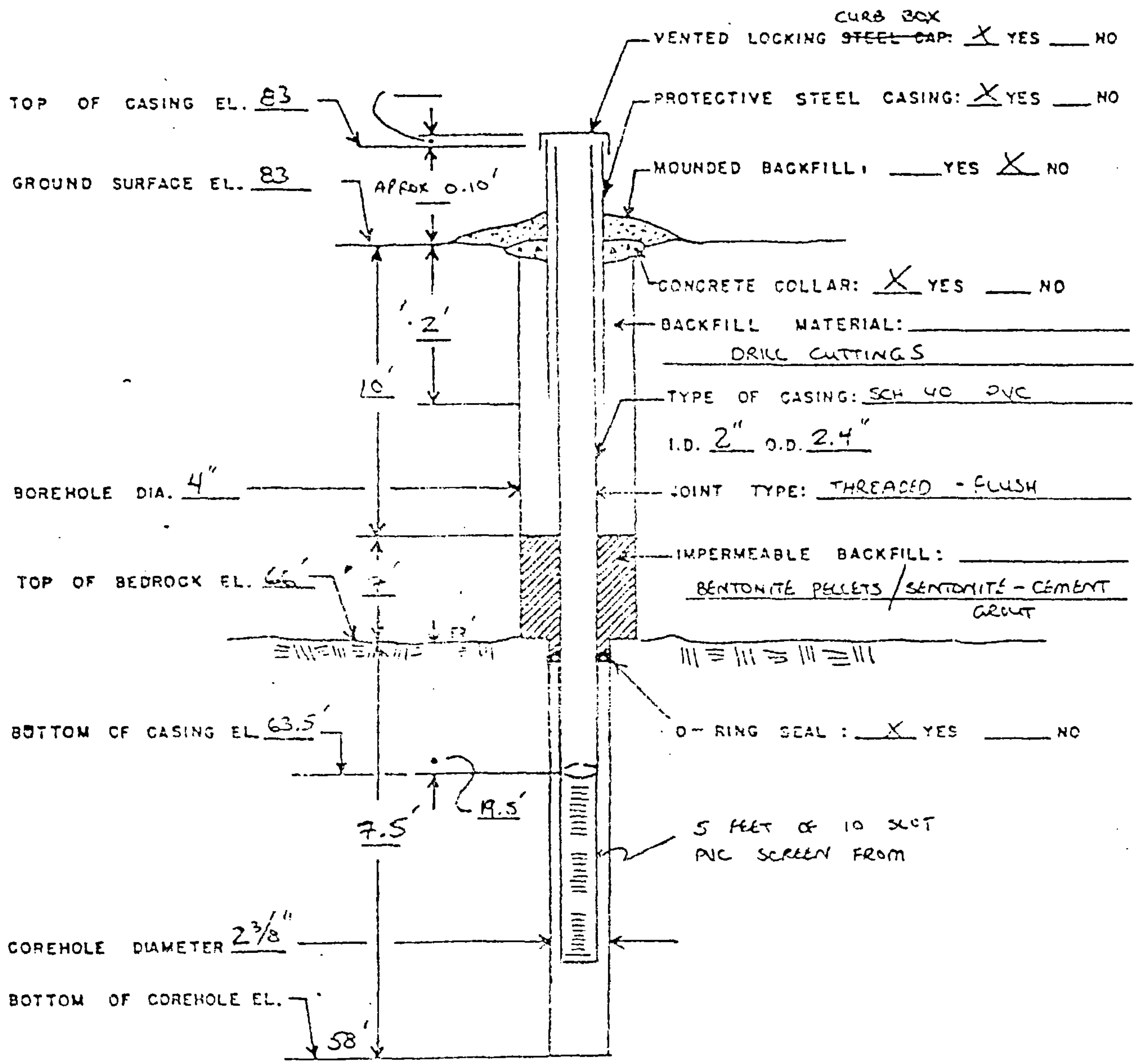
Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): SAND & GRAVEL / BEDROCK

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL FOR WELL IN BEDROCK

MW-105



Glenn Drilling Inc.
R.F.D. #1, Lake Road
Fitchville, CT 06334
(203) 887-3621

CLIENT: Fuss & O'Neill
PROJECT NAME: KOSLOFF/NORWALK
LOCATION: Norwalk, Ct.

BORING NUMBER: MW-106
SHEET No. 1 of 1

DRILLER: Michael Deane
INSPECTOR: Bob Potterton
DATE START: Sept. 23, 1985
DATE FINISH: Sept. 24, 1985

ARCHITECT ENGINEER:

	Casing	Sampler	Core Barrel
TYPE	HW		
SIZE I.D.	4"		
HAMMER WT.	300#		
HAMMER FALL	24"		

FILE NO. 926-8540
SURFACE ELEV.
LINE & STATION
OFFSET

DEPTH	SAMPLE NO.	DEPTH RANGE	BLOWS PER 6" ON SAMPLER 0-6	6-12	12-18	REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS
5'									Drove Casing to 16.5'.
10'									
								16.5'	End of Boring: 16.5'
									Installed 2" PVC Monitor Well Bottom set at 16.0' 5.0' Screen 11.0' Riser 1 Protective Casing and Plug.

SAMPLE IDENTIFICATION
- SPLIT SPOON
- T — THIN WALL TUBE
- U — UNDISTURBED PISTON
- O — OPEN END ROD
- W — WASH SAMPLE
- A — AUGER SAMPLE

PENETRATION RESISTANCE
140 lb. Wt. falling 30" on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50 +	Very Dense	16-30	V-Stiff
		31 +	Hard

PROPORTIONS USED

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

REMARKS:

COL. A

MONITOR WELL COMPLETION REPORT

GENERAL INFORMATION

Town: NORWALK

Site: BARCANISE BUILDINGS 276 MAIN AVE.

Monitoring Point I.D. No.: MW-106

Date of completion: 9/24/85

DEP/WPC I.D. No: 103-092

Monitoring Point Location (relative to site features): NORTH OF BUILDING #1

Drilling Contractor: GLENN DRILLING, INC.

Supervising Engineer/Geologist: R.S. PETTERSON

Well Construction Method: DROVE 4-INCH CASING

WELL INFORMATION (ELEVATIONS TO NEAREST 0.1 FEET)

Ground surface elevation (MSL): 83'

Well depth below ground surface:

Refusal: ____ Yes X No

Top of casing elevation (MSL): 83'

Screened interval: 11.5' - 16.5' BELOW GRADE

Length of Screen: 5 FEET

Length of riser pipe: 11 FEET

Screen type: SLOTTED PVC

Screen Slot size: 10 SLOT

Filter fabric: ____ Yes X No

Screen packing: X Yes ____ No

If yes, Thickness: 5 1/2 - FEET

Material: QUARTZ SAND

grain size: MEDIUM

Well inside diameter: 2 - INCHES

Impermeable Backfill: BENTONITE PELLETS CEMENT / BENTONITE GROUT

Well casing material and schedule: SCHEDULE 40 PVC

Estimated K screened interval: NA

Method of well development: BAILING

Time spent developing: 15 MINS.

Locking ____ or threaded cap ____
CURB BOX W/ PENTAGONAL BOLT

Impermeable backfill: CEMENT

Bedrock wells

Casing length:

Water-bearing rock unit:

Water bearing sections (depths and approximate yields):

Length of rock core:

Diameter of core hole:

Thickness and depth of impermeable backfill:

O-rings seals: ____Yes ____ No

GEOLOGIC INFORMATION

Aquifer: SAND & GRAVEL

Inferred relationship to plume: ____ Within ____ Outside ____ Edge UNKNOWN

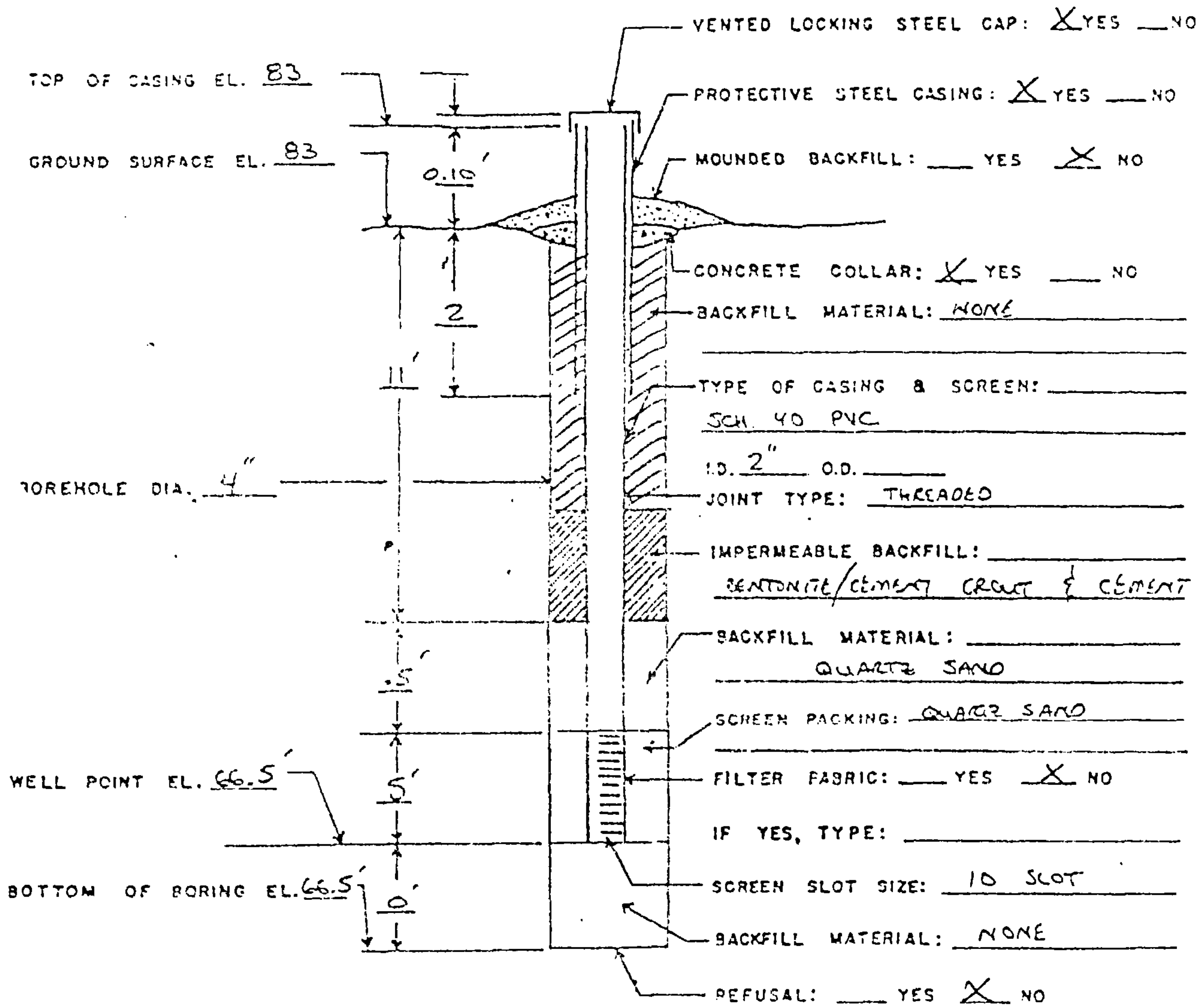
Watershed (plume discharge watercourse): NORWALK RIVER

Aquifer materials (attach boring log): SAND & GRAVEL (ASSORTED SIZES)

Attach maps and plans required of G.1.j. and G.4.

MONITOR WELL INSTALLATION DETAIL FOR WELL IN UNCONSOLIDATED DEPOSIT

MW-106



NUS CORPORATION
A Halliburton Company

PROJECT: KELLOGG-DEERING
PROJECT NO.: 5781.16 BORING: K-10
ELEVATION: 83.16' msl DATE: 2/20/85
FIELD GEOLOGIST: JEFF ORIENT

SAMPLE NO., TYPE * & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
						SAND GRAVEL, & COBBLES		
								DRILLED TO
								16.0' THEN
								MOVED & RE-
								DRILLED -
								GROUTED UP
								ORIGINAL
								BORING
						9.0' 9.0'		
						FELSIC GNEISS		
								CASING SET
								TO 15.0'

REMARKS: BORING LOCATED BEHIND NEW ENGLAND QUARTZ

BORING: K-10

*SEE LEGEND ON BACK

PAGE 1 OF 3

NUS CORPORATION
A Halliburton Company

PROJECT KELLOGG-DEERING
PROJECT NO. 5781.16 BORING K-10
ELEVATION 82.16' msl DATE 2/20/95
FIELD GEOLOGIST JEFF ORIENT

SAMPLE NO., TYPE* & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
						FELSIC GNEISS (CONT)		
						FRACT @ 41'		

REMARKS
BORING K-10

*SEE LEGEND ON BACK
PAGE 2 OF 3

NUS CORPORATION
A Halliburton Company

PROJECT KELLOGG-DEERING
PROJECT NO. 578L.16 BORING K-10
ELEVATION 82.16' msl DATE 2/20/85
FIELD GEOLOGIST JEFF ORIENT

SAMPLE NO., TYPE* & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
						FELSIC GNEISS (CONT)		
						FRACT @ 55'		
								WATER
								BETWEEN
								50-50.4'
						59.4 TOTAL DEPTH 59.4'		

REMARKS BORING MADE INTO WELL K-10

BORING K-10

*SEE LEGEND ON BACK

PAGE 3 OF 3

WELL LOG SHEET

WELL NO. K-10 PROJECT NO. 5781.16 PROJECT NAME KELLOGG - DEERING

LOCATION DEERING NEW ENGLAND QUARTZ GEOLOGIST JEFF ORIENT

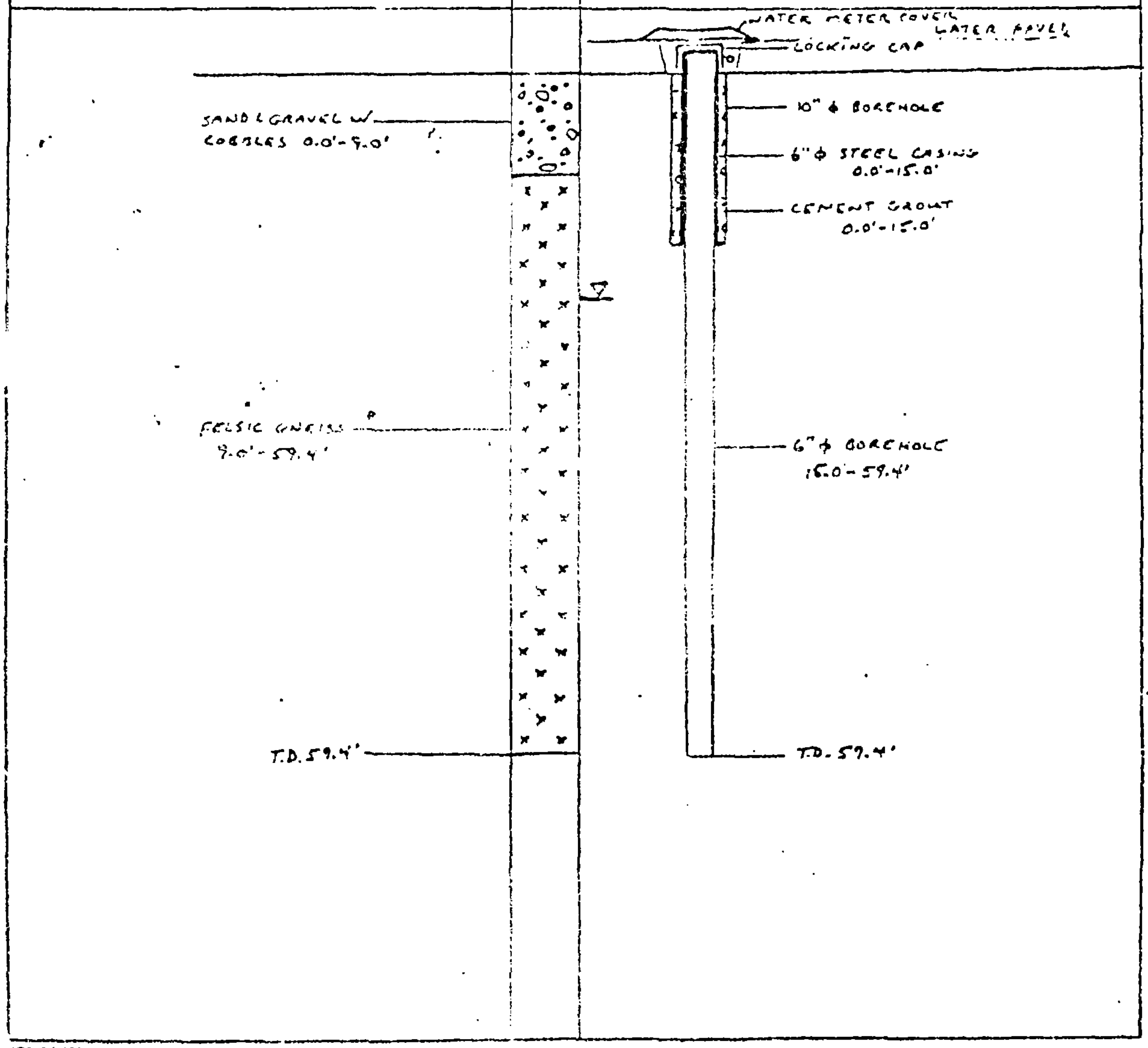
DRILLING DATE 2/20/85 DRILLING CONTRACTOR EARTH ENGINEERING & SCIENCES, INC.

DRILLING METHOD AIR ROTARY/AIR HAMMER DRILLER L. FINDORAK INSTALLATION DATE 2/20/85

WATER LEVEL BEFORE INSTALLATION 20.85' WATER LEVEL AFTER INSTALLATION 20.85'

DEVELOPMENT METHOD AIR LIFT GROUND ELEVATION

LITHOLOGY DESCRIPTION	SYMBOL	CONSTRUCTION DETAILS DESCRIPTION	DEPTH



NUS CORPORATION
A Halliburton Company

PROJECT KELLOGG-DEERING
PROJECT NO. 3781.16 BORING K-11
ELEVATION 78.45' msl DATE 2/20-2/21/85
FIELD GEOLOGIST JEFF ORIENT

SAMPLE NO., TYPE* & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
0						ASPHALT 0.0-1.0'		
						MED TO COARSE SAND & GRAVEL		
						GRAVEL ROUNDED TO SUBANGULAR		
						UP TO 1"Ø		
5								
10								
15								
20								
25								

REMARKS BORING LOCATED IN FRONT OF PITNEY BOWES

BORING K-11

*SEE LEGEND ON BACK

PAGE 1 OF 2

NUS CORPORATION
A Halliburton Company

PROJECT KELLOGG-DEERING
PROJECT NO. 5781.16 BORING K-11
ELEVATION 78.45' msl DATE 2/20-2/21/85
FIELD GEOLOGIST JEFF ORIENT

Depth	SAMPLE NO., TYPE* & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
25							SAND & GRAVEL (CONT)		
30									
35									BEDROCK @ 38.5'
40									
45									
50									

REMARKS INSTALLED WELL K-11 IN BORING

BORING K-11

*SEE LEGEND ON BACK

PAGE 2 OF 2

WELL LOG SHEET

WELL Nº. K-11 PROJECT Nº 5781.16 PROJECT NAME KELLOGG-DEERING

LOCATION IN FRONT OF PITNEY-BOWES GEOLOGIST JEFF ORIENT/M. COCHRAN

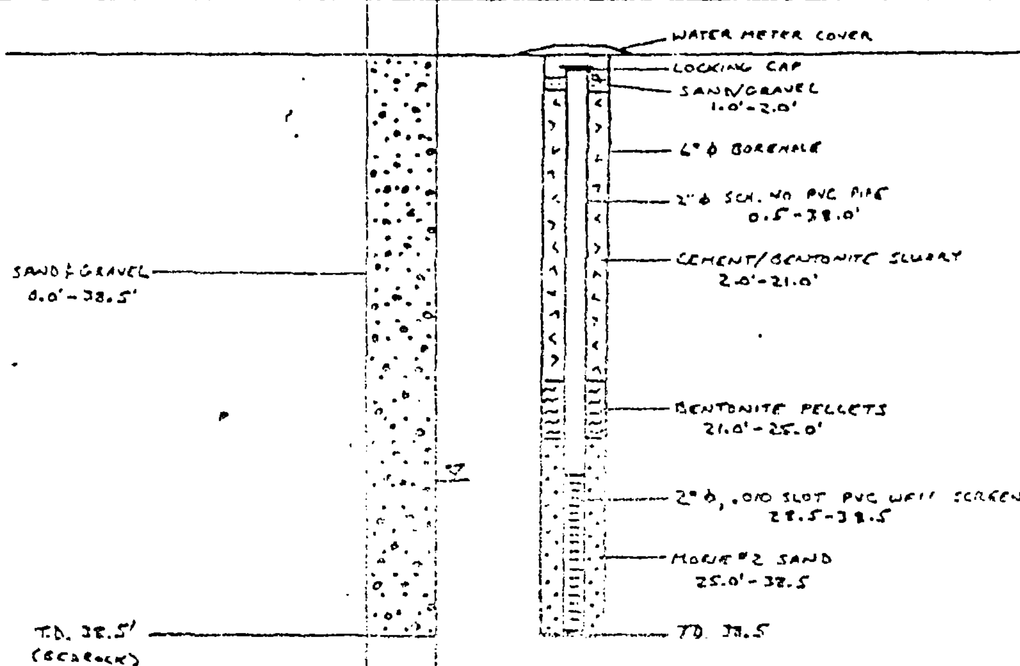
DRILLING DATE 2/20-2/21/85 DRILLING CONTRACTOR EARTH ENGINEERING & SCIENCES, INC

DRILLING METHOD AIR ROTARY DRILLER L. FINCORAK INSTALLATION DATE 2/21/85

WATER LEVEL BEFORE INSTALLATION 28' WATER LEVEL AFTER INSTALLATION

DEVELOPMENT METHOD GROUND ELEVATION

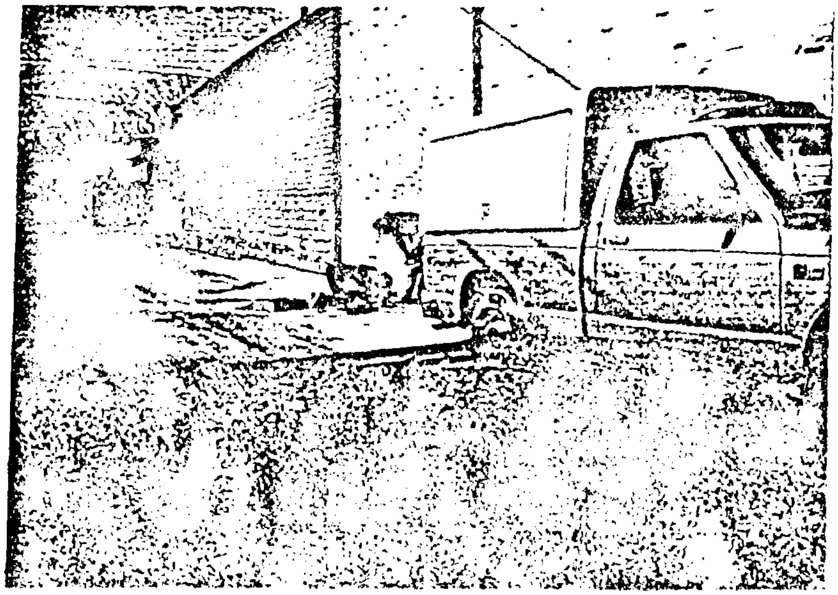
LITHOLOGY DESCRIPTION	SYMBOL	CONSTRUCTION DETAILS DESCRIPTION	DEPTH



APPENDIX B

PROJECT PHOTO LOG

PROJECT PHOTO LOG



CLIENT Pitney-Bowes JOB # 15262-005

SITE LOCATION Zell 1 Bldg Norwalk, CT

DATE OF PHOTO [illegible] TYPE OF CAMERA 110 ___ 35mm X

OTHER ______

DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

Two Fuss + O'Neil personnel installing a new flush protector casing on MW-10?. The well is located on the south side of the Zell 1 Bldg. The photographer is looking west in this photo.

PROJECT PHOTO LOG

CLIENT Pitney - Bowes JOB # 15263-005

SITE LOCATION Between Bell Buildings Norwalk, CT

DATE OF PHOTO 3-9-88 TYPE OF CAMERA 110 ___ 35mm X

OTHER ______

DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

This photo is taken between the Bell 1 & 2 Buildings. Empire Drilling in progress with well K-17B, a bedrock well. Noticed the cuttings being stacked under the drilling rig, they were not put in drums. Notice the placement of the wash & rinse buckets (blue) right next to the drilling rig. Contaminated tyvex & gloves lying on the ground.

Most of the water is coming from a melting snow bank to the left of this photograph.

PROJECT PHOTO LOG

CLIENT [illegible] JOB # 15262-005

SITE LOCATION Behind [illegible] Bldg

DATE OF PHOTO 3-[illegible]-86 TYPE OF CAMERA 110 ___ 35mm ✓

OTHER ______

DESCRIPTION

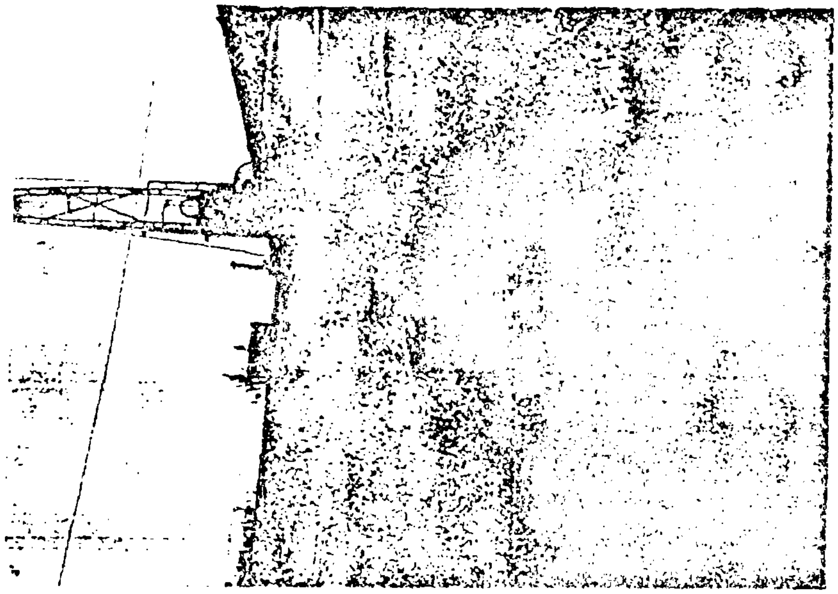
INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

This is a close up from behind the drilling rig. Again observing the extent of the [illegible] (blue) in relation to the rig & the cuttings piled under the rig and tyvex on the ground.

Close up of photo page 2. K-19B location

DAMES & MOORE
PAGE 3 OF 15

PROJECT PHOTO LOG



CLIENT Pitney - Bowes JOB # 15262-005

SITE LOCATION [illegible] 2-11 142 Norwalk CT

DATE OF PHOTO [illegible] TYPE OF CAMERA 110 ___ 35mm ✓

OTHER ___

DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

Photo looking back (southward) to the drilling rig on K-19B. The rig is setting casing at the point. Muddy water [illegible] is [illegible] running down draining to the sewer

DAMES & MOORE
PAGE 4 OF 15

PROJECT PHOTO LOG

CLIENT [illegible] JOB # 15263-005

SITE LOCATION [illegible] Norwalk, CT

DATE OF PHOTO 3-4-[illegible] TYPE OF CAMERA 110 ___ 35mm X

OTHER ______

DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

Close up of [illegible] water from settling area at K-13B. Water is muddy [illegible] with a "slight" film on it.

Close up of photo on page 4

DAMES & MOORE
PAGE 9 OF 15

PROJECT PHOTO LOG

CLIENT: Pilgrim-Bower [illegible] JOB #: 15262-005

SITE LOCATION: [illegible]

DATE OF PHOTO: [illegible] TYPE OF CAMERA: 110 ___ 35mm ✓

OTHER ______

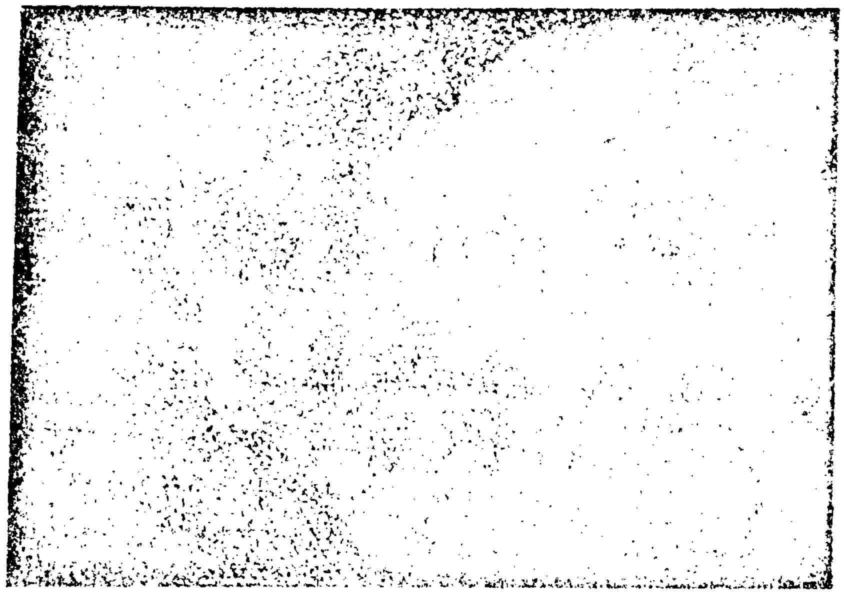
DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

This is looking directly north down driveway from I-176.
Photographer has turned around since the (photo on page
5.) The [illegible] the contractor used is
going to a corner approx 46 yds down driveway.
This photo is taken before the [illegible] [illegible] [illegible].

DAMES & MOORE
PAGE [illegible] OF [illegible]

PROJECT PHOTO LOG



CLIENT Pitney-Bowes JOB # 15262-005

SITE LOCATION [illegible]

DATE OF PHOTO [illegible] TYPE OF CAMERA 110 ___ 35mm X

OTHER ______

DESCRIPTION

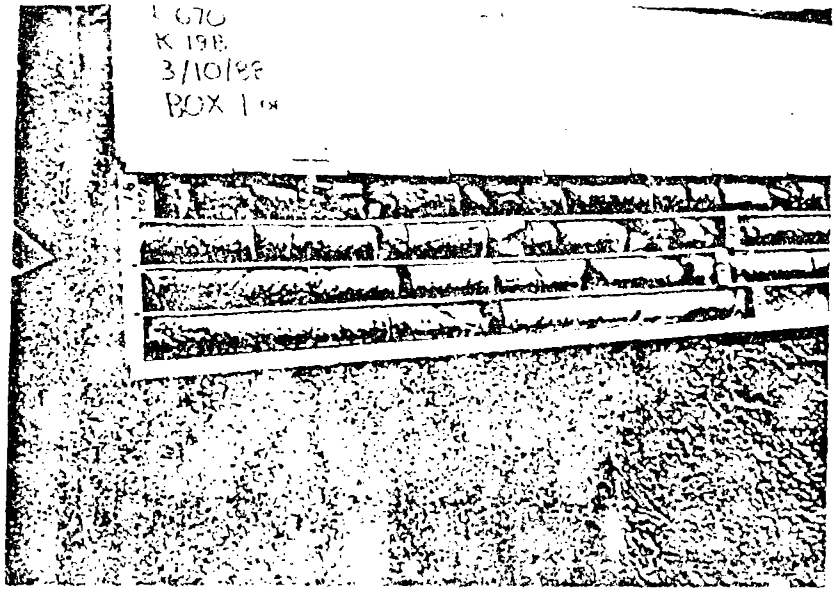
INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

This photo shows the contaminated water flowing into a sewer drain. The photo was taken when the crew was done at. Notice the amount of dark-brown water leaving the sewer.

DAMES & MOORE

PAGE [illegible] OF [illegible]

PROJECT PHOTO LOG



CLIENT P. [illegible] - B[illegible] JOB # 15262.005

SITE LOCATION K-19B [illegible], CT

DATE OF PHOTO [illegible] TYPE OF CAMERA 110 ___ 35mm ✓

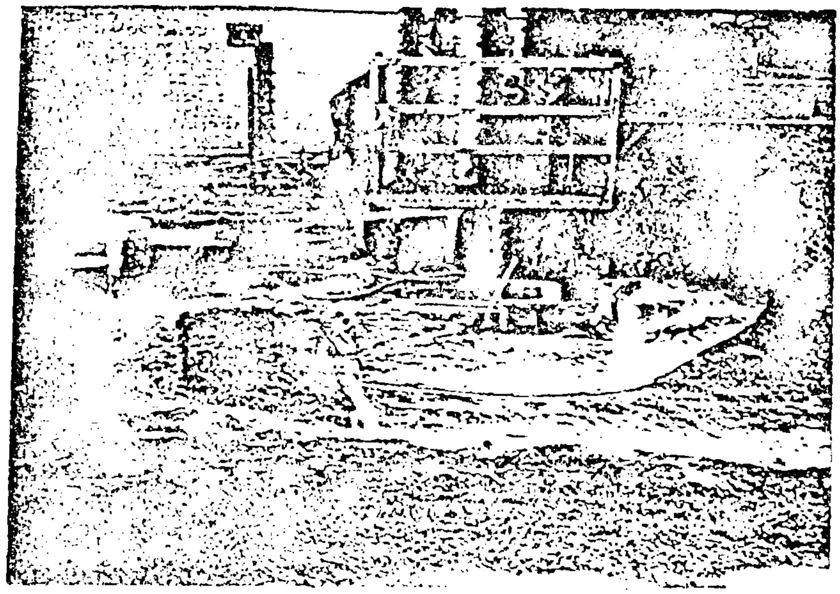
OTHER ______

DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

Looking at the coring runs C-1 & C-4 (11'-32') on K-19B.
Photo on page 10 shows the other end of the box.
Rock is a gray banded felsic gneiss.
Some fractured zones near the top (weathered). See drilling log for specifics.

PROJECT PHOTO LOG



CLIENT Pitney-Bowes [illegible] JOB # 15262-005

SITE LOCATION [illegible]

DATE OF PHOTO 3/10-[illegible] TYPE OF CAMERA 110 ___ 35mm X

OTHER ______

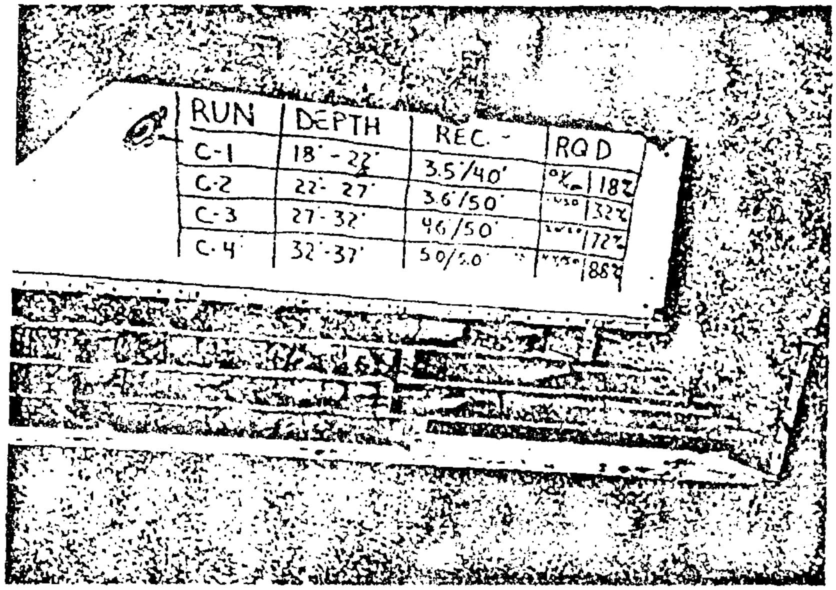
DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

Photograph is looking directly west. They are coring the well [illegible]-19B. Within the extent of the muddy water around the drilling rig [illegible] [illegible] [illegible] plastic setting [illegible] [illegible] [illegible]. [illegible] also under the rig where the cuttings are settling.

DAMES & MOORE

PROJECT PHOTO LOG



CLIENT [illegible]

JOB # 15262-005

SITE LOCATION K-19B [illegible] CT

DATE OF PHOTO 3-11-88 TYPE OF CAMERA 110 ___ 35mm X

OTHER ______

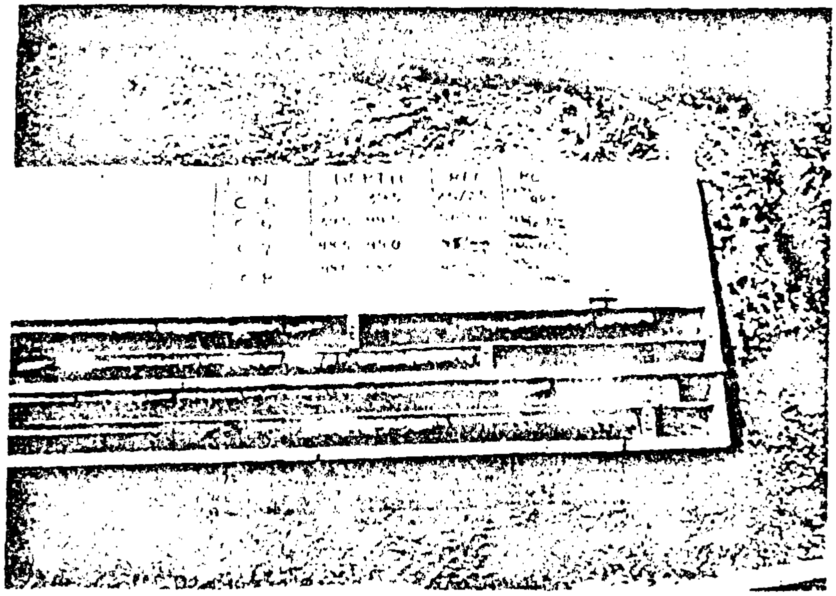
DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

Looking at coring runs C-1 to C-4 (18-37') on K-19B. Photo #9 shows other end of the box. Run, depth, recovery and Rock Quality Designation listed on box. Bedrock: fine grained, banded.

DAMES & MOORE
PAGE __ OF 15

PROJECT PHOTO LOG



CLIENT [illegible] JOB # [illegible]

SITE LOCATION [illegible]

DATE OF PHOTO [illegible] TYPE OF CAMERA 110 ___ 35mm ✓

OTHER ______

DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

[illegible]

[illegible] ... and ... [illegible]

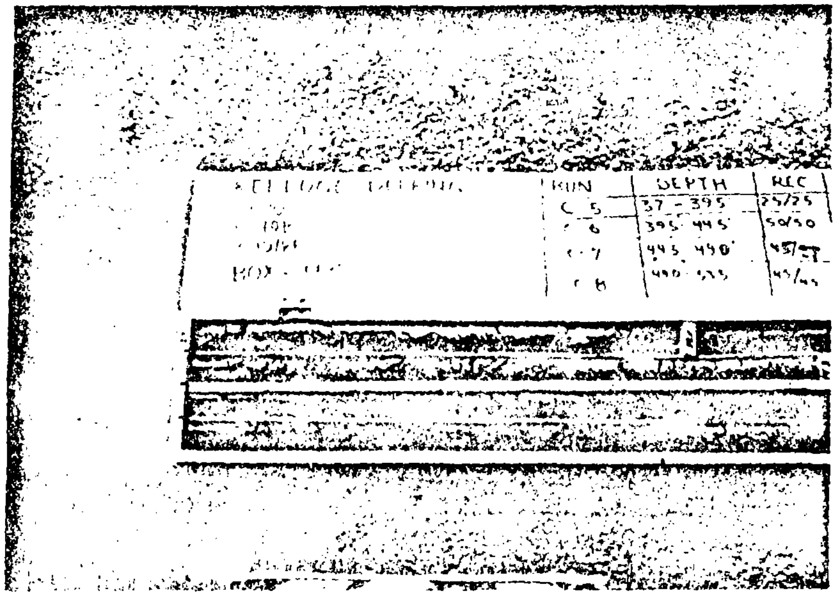
[illegible]

[illegible] ... for more detail

DAMES & MOORE

PAGE [illegible] OF [illegible]

PROJECT PHOTO LOG



CLIENT [illegible] JOB # [illegible]

SITE LOCATION [illegible]

DATE OF PHOTO [illegible] TYPE OF CAMERA 110 —— 35mm ——

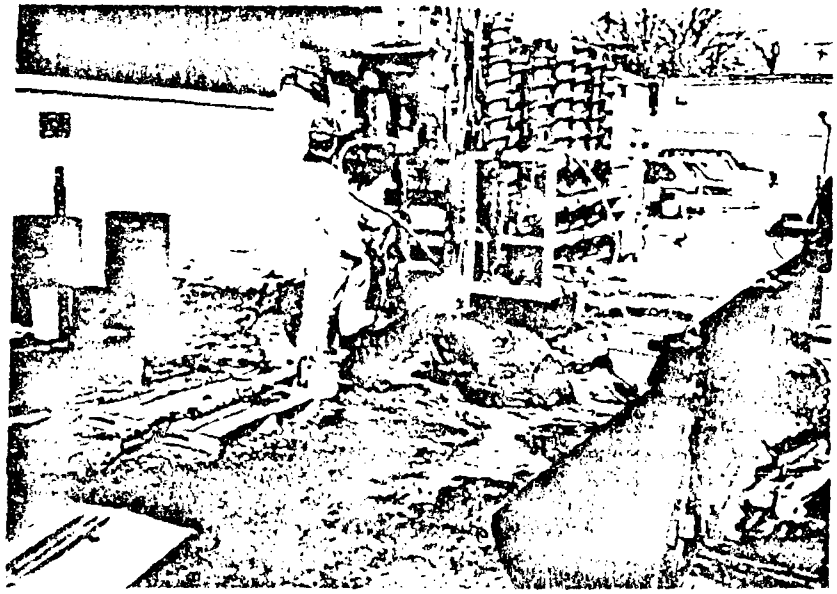
OTHER ——

DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

[illegible]

PROJECT PHOTO LOG



CLIENT ______________________ JOB # ______________

SITE LOCATION ______________________________

DATE OF PHOTO 11 ______________ TYPE OF CAMERA 110 ___ 35mm ___

OTHER ________

DESCRIPTION

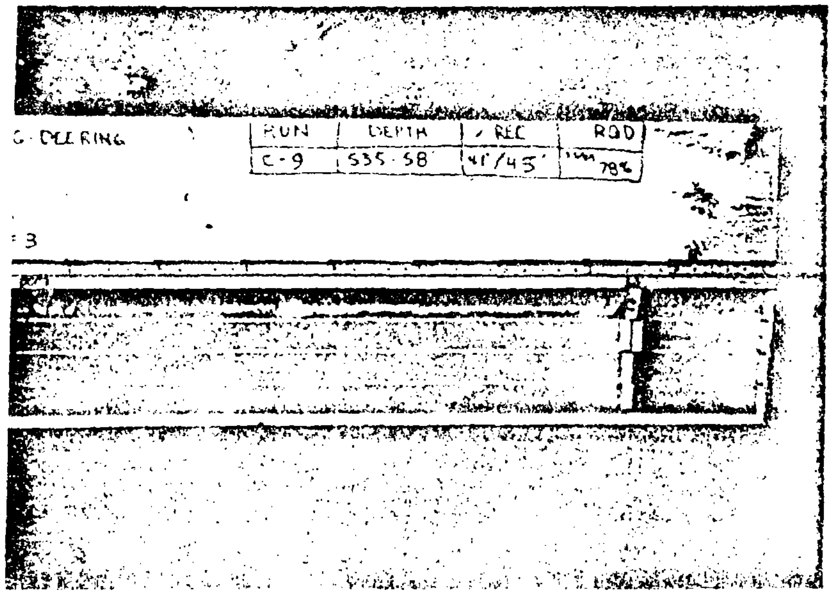
INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

[illegible]

DAMES & MOORE

PAGE ___ OF ___

PROJECT PHOTO LOG



CLIENT ______________________ JOB # ______________

SITE LOCATION ______________________________

DATE OF PHOTO ______________ TYPE OF CAMERA 110 ___ 35mm ___

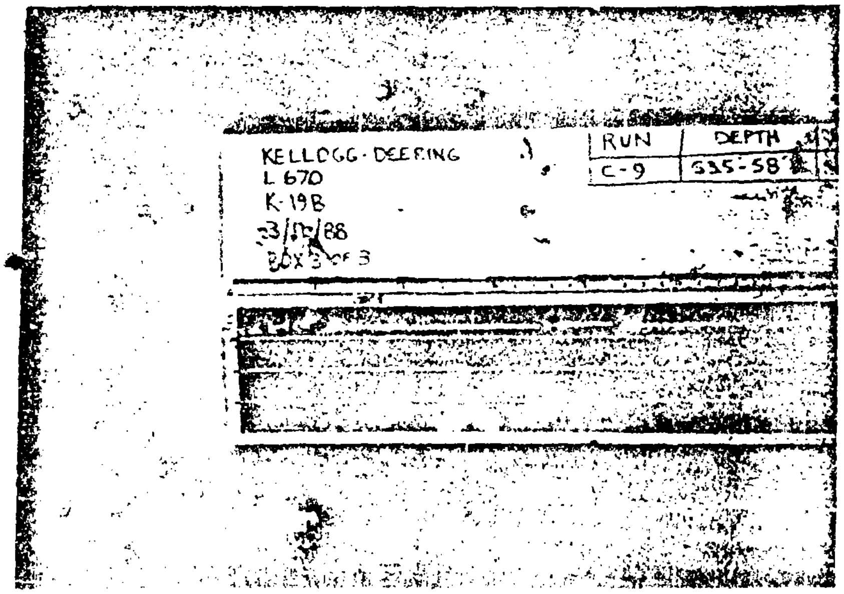
OTHER ________

DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

DAMES & MOORE
PAGE ___ OF ___

PROJECT PHOTO LOG



CLIENT [illegible] JOB # [illegible]

SITE LOCATION [illegible]

DATE OF PHOTO [illegible] TYPE OF CAMERA 110 ___ 35mm ✓

OTHER ______

DESCRIPTION

INCLUDE NAMES/ACTIVITY OF PEOPLE IN PHOTO, WHY PHOTO WAS TAKEN, ORIENTATION OF PHOTO (LOOKING EAST, ETC.), WHERE ON-SITE PHOTO WAS TAKEN, PERTINENT PHYSICAL FEATURES, OTHER INFORMATION AS NEEDED TO EXPLAIN THE PHOTO.

[illegible]

DAMES & MOORE
PAGE 17 OF [illegible]

APPENDIX C

DAMES & MOORE FIELD OBSERVATION LOGS
FEBRUARY 24 - APRIL 14, 1988

Pitney Bowes Site Visit 2-24-88

Arrived on site at 2:00 PM. [illegible]

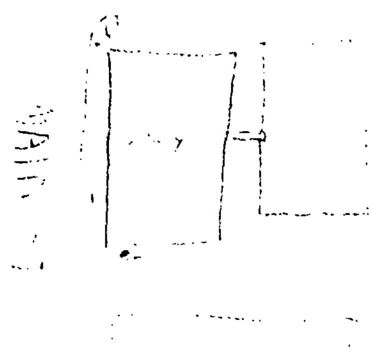
Called into office. Talked w/ Blanelt and said they (Firstlock [illegible] Drilling) is putting in a well.

I spoke with Mr Bob Pellerton of [illegible] / O'Neill's in Manchester (203) 646 2469. They are installing 2 interceptor wells as part of a DEP Consent Order a so called response action since they do not want to use the words remedial action. The order was issued to ELINCO.

The wells are

[illegible] 6" [illegible] tap [illegible] 2 [illegible] GPM

[illegible] 6" [illegible] which well [illegible] (drilling)



The wells will be pumped to [illegible] the ground water [illegible] They would [illegible] [illegible] before the EPA [illegible] pumping tests do not interfere [illegible] [illegible]

[illegible]

Dames & Moore

PLATE [illegible]

BY ____ DATE ____ CHECKED BY ____ DATE ____ FILE ____ REVISIONS BY ____ DATE ____

246.7 (REV. 6-61)

March 8, 1988
Pitney - Bowes
Norwalk, CT
G. DelMastro

Re. Observation of USEPA contractors

12:05 pm Arrive at the Pitney-Bowes Zell Building. Drive to north side of building where the proposed K-19A, B wells are to be installed. Area is blocked off but no sign of drillers, contractors or EPA.

12:10 p. Drive around to south side of Pitney-Bowes Zell Building. Two field personnel for (Fuss + O'Neil)? are doing work on MW-104. Seem to be clearing an area down around the PVC pipe where they are installing a protective pipe. (see photo)

12:20 p. Called Bob Potterton of Fuss + O'Neil. Asked him what the status was on the well logs (MW-100 to 106) around the Pitney-Bowes building. He had contacted the attorney and then he missed the attorney's call but He again entered that it shouldn't be a problem. He had already made the copies and would put them in the mail after talking again w/the attorney.

1:50P Two men from EPA arrive at Pitney-Bowes K-19 site and look around. They leave at 1:55P.

2:30 P Get message at P-B front desk. To Call [illegible] office Call Mr. Don Blackert at NUS Trailer to discuss drilling schedule 203 849-9721

3:00 P Found NUS ~~trailer~~ (Don Blackert) and met other NUS representatives - Driller from Empire Also.

The steam cleaner broke down and they are bringing one down from upstate. Should begin P-B drilling on Wednesday around 12:00 (noon) or later.

Directions to Trailer:

Go North on Main St.
Turn by some Auto Body Place w/ big yellow arrow
1/4 mile after underpass
Brown CTDEP mobile home - next to it.

3:30 P. Left and went and Called D+M.
Get 6 sets of Bottles
For TCL soil + a QA/QC
Ship to P-B Wednesday.

3:40 Then stopped at P-B and told them to expect Fed Exp package (cooler) for Charlie Broadhurst

3:45 Left for D+M office

Pitney-Bowes
Zell Bldg.
Norwalk, CT
3-9-88
G DelMastro

10:00A Meeting going thru Zell 1 + Zell 2 (see meeting notes)

11:10 A. Have been given message that coolers from Nanco have arrived

11:15 A call DeM office [illegible]. I am going to start sampling K-19B and leave the meeting. I will take 2 samples. (0-2' + 5-7')

11:25 A Empire drilling crew (David Bartlett - Vince Prue.) suiting up and getting ready to drill K-19B. Drilling crew dressed in Level D (yellow tyvex, overboots, surgical gloves, taped ankles and wrists, hard hats and eyewear. green outer gloves

Rick Bethel, NUS field geologist

Steam cleaned augers on wooden pallet
Wash + rinse buckets layed out on plastic.
I put on a white tyvex. NUS wears nothing (tyvex).

11:55 Encountered ½ foot of asphalt + concrete. 1st Sample from 0.5-2.5'

12:15 Took 2nd Sample 5-7'. They sample every 5 feet. The cutting are piled under the rig no drums.

2:00 Called in D+M office
2:15 Auger refusal 17.1' They (drillers) take a break.

3:50 Begin to set casing 4" into bedrock. During the setting of the casing water comes out of augers (5 gal) there is nothing to contain water. Water [illegible] out and sprays over

Pitney-Bowes
2011 Bldg
3-9-88
Norwalk, CT

cuttings, piled under rig. The water is able to flow down the driveway and mixes w/ water from melting snow.

4:15p Begin setting 4" casing and are down a few tenths of a foot water flows out of top of augers and also coming up outside of augers.
Water is muddy brown. They stop after about a gallon comes out.
The water flowing down driveway about 40 yds and runs down sewer.

4:45p They plug outside of augers, between augers & hole, with bentonite pellets.
Before this they pull up augers 6 inches.
After applying bentonite pellets they put mud tub in place.

I asked Rich Bartell (NUS) about getting a copy of the drilling logs. He told me to call Joan Rios to ask him.

5:00 P After tying plastic around augers to let water flow into mud tub they begin setting casing. Alot (>10gal) of water flows out outside of auger flights and runs into sewer. Water is muddy brown w/ a little film on it.

5:45p They are still setting casing & are down to 1' into rock. Approximately 75-100 gal of water has washed down the sewer. Fines have also been observed coming out of borehole. Bottom of casing is at 18'

'08 Left site

FIELD MEMORANDUM

ACTION	INFO	
To: Present Rod Walsh T.D		File: Pitney-Bowes
Juan Rios [illegible]		
Don Blackert		Drilling - Zell Building
Jim Ferrelli NUS		
John Javorus		X-Ref:
Myself		
Kevin Kenney NUS		
		Date: 3-9-88

From: G. DelMastro

Reply Required By:

Subject: MEETing to discuss Drilling in Buildings

Reference(s): 10 holes each building

* Chrome, copper, nickel, gold etc. cosmetic compacts.

Zell 2 Bldg (1957)

① Thru doors to the right Plating operations.* Was a pit. Filled in w/ fill and then concrete. Will have to penetrate through 2 layers. Original outline of plating will have wooden ceiling above.

Zell 1 Bldg (19[illegible])

② North Central section of Zell 1. Another plating operation. no wooden deck over. Smaller plating operation than Zell 2.

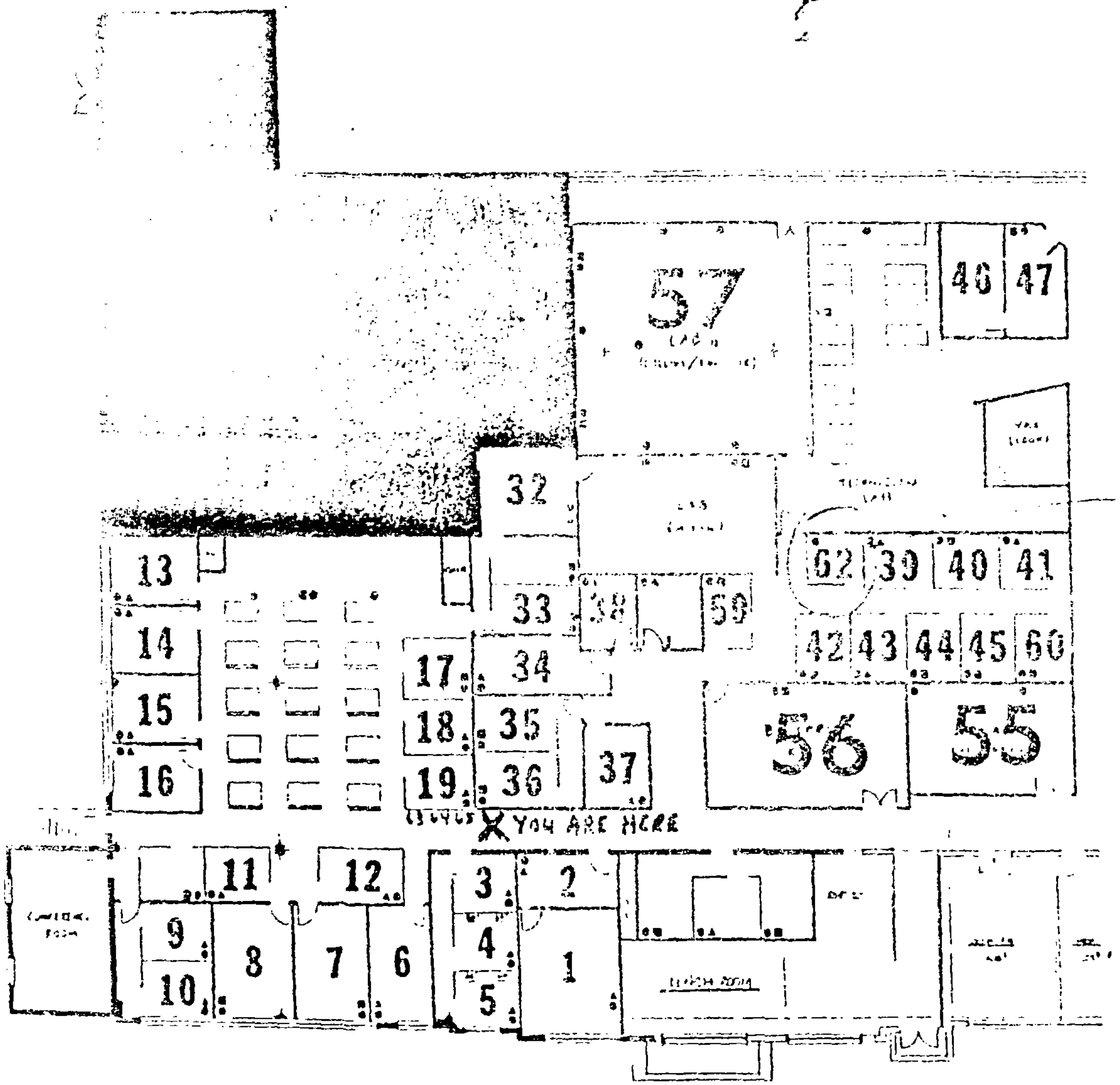
Trenches were open and so were bathroom. All these (plating, sewer, etc) fed a drain and exited the building.

I leave site tour/meeting at 11:15a to observe Empire drilling, K-19B.

ROUTING

114.3 (REV. 5-68)

DAMES & MOORE



X = You Are Here

Pitney-Bowes
Zell Bldg
Norwalk, CT
3-10-88
(1)
G Delmastro

7:00 A Arrive at Pitney-Bowes Zell Building (K-19B) Location
Empire is here suited up and getting set up for ~~[illegible]~~ ream

7:15 NUS Corp Rick Bethel field geologist shows up on site
Weather cond: Cloudy cold, 30s. Ground wet, alot of drilling fines and mud still present, leading to sewer. Didn't wash away from rain.

7:40 A Begin ~~[illegible]~~ reaming K-19B

7:45 Jim Forelli (NUS) shows up. I ask him about copy of drilling log & tells me I should check w/ Ivan Rios (EPA).

I also inquired about yesterday's meeting concerning the indoor soil-gas survey. He & Rios have to sit down & think about it some more. They probably will make some changes, go with fewer holes. Forelli will call me.

7:50 A Finished reaming and put core barrel together. Will start coring at 18'
1st Run 18-22' Recovery 3.5/4.0'
RQD - Rock Quality Designation
Measure the lengths of cored rock >4" and add them up. Answer in tenths. Divide by length of core run

10:00 Began 2nd Rock coring run.
22-27' Rec. 3.6/5.0'

:30 Began 3rd Rock coring run

Spoke w/ Ivan Rios earlier and he said I could make copies of the ~~[illegible]~~ well logs from these wells. Rick Bethel told Rios that they were going to wash

Pitney - Bowes
2011 Bldg
CT
Norwalk, CT
3-10-88

the driveway down after they were finished. He said that was ok.

11:35 coring water is being recirculated for the coring. Empire just pumped the water from the mud tub into a 55 gal drum. They are using clean coring water now.

During the coring, the coring water splashes out of the mud tub and flows down the driveway. (see photo)

3rd Run 27'-32' Rec 4.6/5.0

1.15 Have began 4th coring run

2:00 Finished up 4th coring run 32-37' Rec. 5/5.0'

2:15 Began coring run 5
Barrel wasn't coring. Pull out of hole and try to free trapped rock in end of core barrel.

3:30 Call D-M office

3:45 Began recoring run -5

4:30 Pull out core barrel on run 5
27-29.5 2.5/2.5 Rec.
Coring water was grey in color. Very easy to core hit a large void.

:5 Begin another coring run to retrieve what was lost in hole from last run.

5:15 Finished Run 6 34.5-44.5 5/5 Rec.

Pitney - Bowes
Zell Bldg
Norwalk, CT
3-11-88
G DelMastro

6:55A Arrive at Pitney-Bowes Zell Bldg. All soils with on ground from 3-11-88 is frozen.

7:10A Empire Soils Arrives + sets up.

7:40 NUS Field Geologist shows up then leaves.

7:45 Begin coring run 7

8.25 Finished coring run 7 44.5' - 49.0' Rec 4.5/4.5'

8:35 Begin coring run 8

8:45 NUS field geo (Rich Bullil) shows up w/ Don Blackat.

9:05 Finished coring run 8 49-53.5 Rec 4.5/4.5 (see photo)

9:30 Begin coring run 9. (see photo) Drillers during coring operation

[illegible] Finished last coring run #9 53.5-58' 4.1/4.5 Rec.

Began breaking down drilling rods. Was going to packer test the formation. Am missing 1 piece and will postpone test to Monday.

11:15 Began reaming hole

12:20 Finished reaming hole 18-28' w/ 3⅞" roller bit

12:35 Leave Site Will begin work around 8AM on Monday

Pitney - Bowes
Zell Bldg.
Norwalk, CT
3-14-88

G. DelMastro

7:50A. Arrive at Zell Bldg.

8:15A Don Blackert (NUS Corp) meets me at K-19B.

8:50A Empire Drilling shows up, leaves to drop off supplies

9:30A Begin to set up to ream out hole after 1st washing it out.

9:45A Begin to clean out hole

10:15A Begin to ream out the borehole, using a 3 7/8" roller bit.
Progressing at approx. 6 min/ft.
Reaming water is being recirculated into a mud tub.
A fair amt. of water is splashing outside of tub. ≅ 1 gal / 10 min.

; A Reaming is progressing at about 6-7 min / ft. Rock is very hard!
Met Scott (NUS field geologist) sitting rig.
Ebasco will be on-site the week of 3-21-88.

11:45A Have reamed down to 34 feet

12:15P Break for Lunch. Had to change roller bit because the first bit was badly worn. Outside ring of teeth was worn away. New bit ~~was~~ is 3 7/8" but a fraction larger than worn bit, therefore had to re-ream hole and are presently down to 34'. Drillers are not pleased with the progress and would like to change and use a button bit.

1:30P Change to a button bit.

2:30P Making progress, down to approx. 41-42'

Pitney-Bowes
2011 Bldg
Norwalk, CT

3-18-88

2:15P Down to 45' another 13' to ream. K-19B

3:10P Have advanced button bit down to 55' on K-19B.

3:40 P Finished reaming out hole to 57.7' Begin to set up
for packer test on K-19B.

4:20 P D.T.W 9.3' erroneous value since the water level hasn't stabilized
from reaming

Packer Test - reamed hole

4:50 P Set Packer bottom at 46'. Above interval that is fractured.
Begin pumping water into hole until it starts flowing out of
casing. Inflate Packer (220 psi) after it seals borehole flow
of water out of casing should cease. Higher psi in reamed hole because
of unsmooth borehole. Adjust waterflow to desired pressure (20psi).
Then take readings of water volume being pumped into formation
every 30 sec for 10min

Ran test at 20 - 40 psi. No flow.

5 20P Possible problem with flow meter. Clean it out.
Alot of fine sand found inside. Rerun test at 20psi
No flow observed on meter. Bottom 12' of hole (46-58')
must be tight. Tomorrow will raise packer 10' and
rerun test.

5:50 P Left from Pitney-Bowes.

Pitney-Bowes
Zell Bldg
Norwalk, CT
3-15-88

G. DelMastro

7:05A Arrive at Zell Bldg K-19B
Empire setting up.

7:20A NUS Arrives

7:45A Pull Packer setup 10' uphole. Bottom of packer is at 36'
7:55A Begin test at 20psi. No movement in the flow meter.

8:10A Shutdown packer test after 15 minutes at 20psi. No flow.
In discussion w/ Empire (Vinny) Drilling, he believes fractures are up near the top of the bedrock. This is where he lost water previously, not near the bottom.

8:20A NUS decides to abort packer test. They propose to core another 10' into the bedrock, ream this interval out and then rerun the packer test.

9:00A NUS changes their earlier decision about coring deeper. They are going to set up a double packer from 25-35' interval
9:20A Call into DEM
9:55A Setting up packer in the borehole.

1[illegible]A Begin packer test Flow of water into the rock is very slow at 20psi.

10:20A Finished packer test at 20psi Formation was taking water at about 0.6 Gal/min. Log shows a possible fault at 39.5' This

[illegible]
Zell Bldg
Norwalk, CT
3-15-88

9:20 (con't) Was written down incorrectly. Fault? is at approx 29.5. The packer is set over this zone now

10:25A Increase water pressure to 40psi and begin test again.

10:35A Finished packer test at 40psi. Flow approx 1½ gal/min. into rock. They are going to set the well from 25-35' (screen). ~~[illegible]~~ Bentonite pellets and ~~[illegible]~~ from 57.7 up to sand pack.
Install a 2' trap below screen: 35-37'
Screened interval: 25-35'
Sand pack: 23-39
Volclay: ~~[illegible]~~ + 23 up to top ~~[illegible]~~ (3')

11:15A Begin to add a sand & bentonite balls into borehole.

12:10P Broke for lunch, Leaving sand + bentonite to settle out.

1:00P Installed screen and casing (riser pipe) + trap

1:30P Mixing volclay to grout hole.

1:45P Finished tremie grouting hole to surface w/volclay
Trying to remove 4" casing which was spun into bedrock
Water displaced in borehole during tremie grouting was not contained and flow out onto driveway.

2:00P Left site to return to D-M office

Pitney - Bowes
Zell Building
Norwalk, CT
3-16 88
G. DelMastro

7.20 A Drillers have setup on K-19A. On 3-15-88 they advanced the augers to 14 feet on K-19A.

7:40 A Meet Nus Field geologist (Scott) and Empire at K-19A.

8:00 A On observation of drilling site, Empire has changed auger sizes 6¼" ID to 4¼" ID for K-19A. The cuttings and soil was removed and barrelled from K-19B on 3-15-88.

Water in hole (K-19A) at 12.2' Cuttings are drummed as they come out of borehole
DTW 11.22' on K-19B K-19A ≅ 3½' North of K-19B.

8:10 A ~~Auger refusal on~~ bedrock 15.5'
The borehole will be advanced 2' into the bedrock w/ a button bit. A 2' trap will be installed from the bedrock surface and below. The trap will be surrounded w/ bentonite balls. A 5' screen will be installed w/ a surrounding sand pak, a layer of bentonite balls on top w/ the rest of the borehole filled w/ volclay to w/in 3' of surface.
Drillers leave to get supplies.

9:05A Drillers setup to ream 2' into bedrock. Auger refusal at 16.5'
Ream from 16.5 - 18.5'

10:00 Begin coring out a borehole in the bedrock. Progress is very slow. Loosing alot of water, the water is coming up the outside of the augers, unable to contain. Water is running into sewer

Pitney Bowes
2nd Building
Norwalk, CT
3-16-88

10 30 A Finished reaming out bedrock to 18.5'
Began cleaning out cuttings in borehole. Approx 80-100 gal of water lost in ground, to sewer
Cuttings also observed on ground leading away from borehole.

10:50A Finished cleaning out borehole and began to pull rods and install well
Discussion w/ Scott + Don Blackert
Soil-Gas - Mon
GC lab - Mon afternoon
Indoor Soil-Gas - March 26th
Tracer Study late next week or at least 4 days after FurreO Neil pay test

K-19A
TD 18.5
Trap 16.4-18.4
Screen 11.4-16.4
Sand Pack 9.4 - T.D.

11:50A Sand Pack around screen to 8.9' Pulling auger flights.

12:00 Left to go to NUS trailer for logs. Well finished w/ installation except to put in volclay w/in 3' of surface.

Pitney-Bowes
Observation of EPA Con
March 24, 1988 (1)

Greg DelMastro

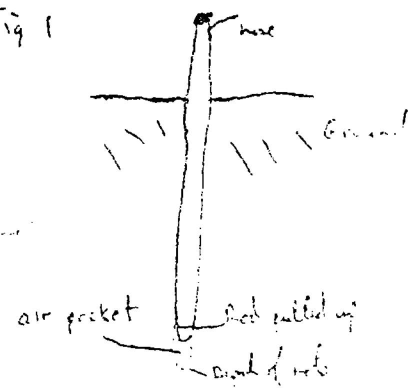
7:15 A Arrive at Pitney-Bowes Zell Building. Go to NUS Trailer. Meet Empire drillers on the way (Dave Viney). The bedrock on NW corner of Elmira Bldg they drilled to approx 160' no fractures then moved back up hole & did packer test around 90'. NUS was satisfied with results and set screen. Backfilled from 90 - 160'.

7:30A Arrive at NUS trailer. They are getting ready to go to Elmira + do some soil-gas work. K-19A,B and MW-100 + K-11 were developed on 3-23-88. They will take ground water samples today.

7:45 A Setup for soil gas survey behind Elmira bldg. The following explains the procedure they are using which I observed:

Take an approx. 3' long steel rod (Diameter 5/8") and using an electric hammer pound it into the asphalt until it goes through the asphalt and a little into the soil. Total depth ≈ 6". Remove steel rod and place another rod 5/8" diameter ≈ 5' long into hole. This rod has a tapered tip w/ holes in the end. A long plastic hose is connected to the tip inside the rod and comes out on top. End of plastic hose is not covered. Drive this rod ≈ 1-1.5 feet into the ground w/ the electric hammer. Then pull the rod up a few inches to create an air pocket in the ground. See Fig 1.

Fig 1



Connect hose from rod to a glass jar and also hook up bicycle pump to the jar. Pump is used to see if there is a vacuum and that the tip and hose are not clogged.

Pilary Bowes
March 24, 1988
2

Soil-Gas Survey Observation

Take a sample bag and place in a tupperware bowl and connect up hoses See Fig 2 Open valve on sampling bag and begin pumping very

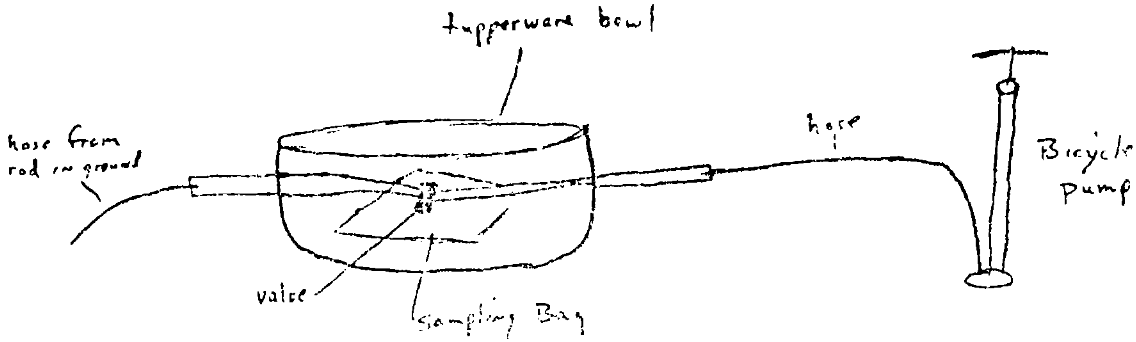


Fig 2. Sampling Bag Setup.

slowly. Tupperware bowl acts like a vacuum. Sample Bag fills up. Disconnect outside hose. Open bowl and close valve on bag and disconnect hoses. Take a background reading of HNU then take a reading of sample in the bag. Record and label sample bag.

Remove the rod from the ground. Clean off rod with paper towel. unscrew tip on rod and disconnect hose. Clean tip w/ Alconox (soapy water), distilled water, methanol and distilled water. Decon liquids are not collected. Put tip together. hook up hose to bottle and the bottle is hooked up to bicycle pump. Give pump a few pushes (10) to clean air in tube and tip. You will see condensation in bottle. Remove tubing from bottle and begin process at next sampling point.

Pitney - Bowes
March 24, 1988

(3)

9:15 A. NUS has finished three sampling locations for soil-gas.
SG - 17, 12 + 11. SG-17 (70ppm w/ HNU)
and are returning to their trailer.

9:30 A Return and take a few more soil-gas samples. A few ppm in a few holes but others were 0.

10:00 A Return to NUS trailer to get ground water sampling equipment.

10:30 A Set up for Sampling K-11 MW-[illegible]

12:15 P Break for lunch

1:15 P NUS [illegible] at K-[illegible] [illegible] and setting up for sampling
[illegible] [illegible] K-[illegible] [illegible] [illegible] VOA - 3 MS/MSD samples.

Pitney - Bowes
Zell Bldg
Norwalk, CT
4-14-88 (1)
G. DelMastro

6 45A Arrive on site, go for breakfast

7:00 A drive back to Pitney-Bowes and speak with Vinny from Empire. They are on the 300' hole by the truck sales company. Hit a large fracture, vertical ≅ 3' and is having trouble keeping enough water in the hole w/ the valves wide open. They have been on stand-by because last sample was 1000ppm (at 155'). Don't know if they (EPA) want to continue, possibly causing cross-contamination.

7:15A. Both Empire Soils crews show up and begin setup — next boring location, approx 3' East of K-198. Finished a boring last night approx 30' north of K-198. Auger refusal at 14.6' $\boxed{SB-1}$

7:50A. NUS representatives arrive at site. Empire Drilling begins taking split spoon samples. [illegible] McG[illegible], taking samples for NUS. $\boxed{SB-2}$

8:20 A Spoke w/ Scott Kraft of NUS. Said they are just GW sampling, test boring and the tracer study is what is left. They will be doing borings also on Monday. Asked about the other Empire drilling crew, & Scott said they were on stand-by. They are on the 300' hole at Wiretec and around 150' they hit a large fracture. EPA wants NUS to sample these fractures. The GW sample was analyzed + resulted in a reading of 1000ppb TCE. Fracture zone 147-155' filled w/ calcite, pyrite. Bedrock below fracture is solid. Core barrel dropped 8' over interval.

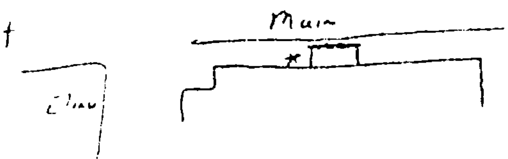
? A. First District ... [illegible] ... verify water lines around the Zell Bldgs.

Pitney-Bowes
Zell Bldg
4-14-98
Norwalk CT
G. DelMastri
(2)

9:50 A Finished boring and began to cement up borehole.

10:30 A Left site to steam clean tools, augers, etc.

11:15 A Setting up along Main St
See star on map.



Go to lunch

12:30 p Begin the next soil boring. $\boxed{SB-3}$

1:30 p Finished taking the 10-12' spoon

± 2:25 left site they were down to 20'

APPENDIX D

DAMES & MOORE FIELD SAMPLING RECORDS

DAMES & MOORE
FIELD SAMPLING RECORD

Job ______ Date [illegible]

Job# 5262

Well# MW-104 Well Diameter 2"

Location [illegible]

I Water level measurements (From Top of Casing) in Feet.

Total Well Depth: 14.60

Depth to Water: 8.35'

Height of Water Column: 6.25'

Volume Conversion Factor: 0.16

Gallons in the Well: 1.00

Conversion Factor

0.16 = 2" ID

0.65 = 4" ID

1.47 = 6" ID

II Well Evacuation

Pumping: Submersible
Nitrogen
Centrifugal

Bailing: Kemmerer
: Stainless Steel
: Bucket Bailer
: Other (Describe)

Pump On:

Pump Off:

Pumping Time:

Pumping Rate:

Gallons Removed:

Bailing Started: 1:40 P

Bailing Stoped: 1:45 P

Gallons Removed 3 gal

III Sampling

Withdrawal: Pumped (describe)
Bailed (describe)

Time: 1:50 P Date: 2-26-88

Sample I.D. #: MW-104

Trip Blank #:

No. of Containers Filled (primary lab.): 3

No. of Containers Filled (replicate samples): _

Physical appearance and odor: No odor [illegible] lightly cloudy

Refrigerated: Date: 2-26-88
Time: 1:54 P

Field Tests (Before After Evacuation)

Temperature (C / F) 9.5

pH: [illegible]

Spec Cond (umhos / cm) 430

Dissolved oxygen (mg / l)

Weather: [illegible]

Comments: [illegible]

DAMES & MOORE
FIELD SAMPLING RECORD

Job ______ Date 2-7-88

Job# 15266

Well# MW-105 Well Diameter 2"

Location [illegible]

I Water level measurements (From Top of Casing) in Feet.

Total Well Depth: 16

Depth to Water: 10.9

Height of Water Column: 5.1

Volume Conversion Factor: 0.16

Gallons in the Well: [illegible]

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II Well Evacuation

Pumping: Submersible
Nitrogen
Centrifugal

Bailing: Kemmerer
: Stainless Steel
: Bucket Bailer
: Other (Describe)

Pump On:

Pump Off:

Pumping Time:

Pumping Rate:

Gallons Removed

Bailing Started: 11:50A

Bailing Stoped: 11:55A

Gallons Removed [illegible]

III Sampling

Withdrawal: Pumped (describe)

Bailed (describe) [illegible]

Time: 12:10 Date: 2-26-88

Sample I.D. #: [illegible]

Trip Blank #:

No. of Containers Filled (primary lab.): 3

No. of Containers Filled (replicate samples): _

Physical appearance and odor: [illegible]

Refrigerated: Date: 2-26-88

Time: 12:15

Field Tests (Before After Evacuation)

Temperature (C / F) [illegible] C

pH: [illegible]

Spec. Cond (umhos / cm): 530

Dissolved oxygen (mg / l)

Weather [illegible]

Comments [illegible]

DAMES & MOORE
FIELD SAMPLING RECORD

Job ______ Date [illegible]

Job# 15262

Well# [illegible]

Well Diameter 2"

Location [illegible]

I Water level measurements (From Top of Casing) in Feet.

Total Well Depth: [illegible]

Depth to Water: [illegible]

Height of Water Column: 6.19

Volume Conversion Factor: 0.16

Gallons in the Well: 0.9904

Conversion Factor

0.16 = 2" ID

0.65 = 4" ID

1.47 = 6" ID

II Well Evacuation

Pumping: Submersible

Nitrogen

Centrifugal

Pump On:

Pump Off:

Pumping Time:

Pumping Rate:

Gallons Removed:

Bailing: Kemmerer

: Stainless Steel

: Bucket Bailer

: Other (Describe)

Bailing Started: [illegible]

Bailing Stoped: [illegible]

Gallons Removed [illegible]

III Sampling

Withdrawal: Pumped (describe)

Bailed (describe) [illegible]

Time: [illegible]

Date: [illegible]

Sample I.D. #: [illegible]

Trip Blank #:

No. of Containers Filled (primary lab.): 3

No. of Containers Filled (replicate samples): _

Physical appearance and odor: [illegible]

Refrigerated: Date: 2-26-[illegible]

Time: 12:4[illegible]

Field Tests (Before After Evacuation)

Temperature (C / F) [illegible]

pH: [illegible]

Spec. Cond. (umhos / cm) [illegible]

Dissolved oxygen (mg / l)

Weather [illegible]

Comments

DAMES & MOORE
FIELD SAMPLING RECORD

Job ______ Date 2-26-88
Job# 15222
Well# MW-100 Well Diameter 2"
Location [illegible] CT

I Water level measurements (From Top of Casing) in Feet.
Total Well Depth: 46.9
Depth to Water: 28.15
Height of Water Column: 18.75
Volume Conversion Factor: 0.16
Gallons in the Well: 3.0

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II Well Evacuation
Pumping: Submersible
Nitrogen
Centrifugal

Bailing: Kemmerer
: Stainless Steel
: Bucket Bailer
: Other (Describe)

Pump On:
Pump Off:
Pumping Time:
Pumping Rate:
Gallons Removed:

Bailing Started: 1:05 P
Bailing Stoped: 1:20 P
Gallons Removed 9.0

III Sampling
Withdrawal: Pumped (describe)
Bailed (describe)
Time: 1:20 P Date: 2-26-88
Sample I.D. #: MW-100
Trip Blank #: [illegible]
No. of Containers Filled (primary lab.): 3
No. of Containers Filled (replicate samples): _
Physical appearance and odor: [illegible] light brown sandy
Refrigerated: Date: 2-26-88
Time: 1:25 P
Field Tests (Before After Evacuation)
Temperature (C / F) 14°C
pH. [illegible]
Spec. Cond. (umhos / cm). 150
Dissolved oxygen (mg / l)
Weather [illegible]
Comments

DAMES & MOORE CHAIN-OF-CUSTODY RECORD

Sample Source & Client Pitney Bowes

Project Title Pitney Bowes Bell Building

Job No.

Field Personnel (Signature) [illegible]

Date	Time	Sample I.D. No.	Sample Type	No. of Containers	Sampling Site	Remarks
[illegible]	12:10 P	MW-105	GW	3	MW-105	TCL [illegible]
[illegible]	12:35 P	MW-101	GW	3	MW-101	
[illegible]	1:20 P	MW-100	GW	3	MW-100	
[illegible]	1:35 P	MW-104	GW	3	MW-104	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[illegible]	2-26-[illegible]	2:00 P									
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

DAMES & MOORE
FIELD SAMPLING RECORD

Job [illegible] | Date 3-24-88
Job# [illegible]
Well# K-11A | Well Diameter 2"
Location Norwalk, CT

I Water level measurements (From Top of Casing) in Feet.

Total Well Depth: [illegible]
Depth to Water: [illegible]
Height of Water Column: 6.35'
Volume Conversion Factor: 0.16
Gallons in the Well: 1.02 gal

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II Well Evacuation

Pumping: Submersible
Nitrogen
Centrifugal

Bailing: Kemmerer
Stainless Steel
: Bucket Bailer
: Other (Describe)

Pump On:
Pump Off:
Pumping Time:
Pumping Rate:
Gallons Removed:

Bailing Started: [illegible]
Bailing Stoped: [illegible]
Gallons Removed 6 gal

III Sampling

Withdrawal: Pumped (describe)
Bailed (describe) [illegible]
Time: 1:55 P | Date: 3-24-88
Sample I.D #: K-11A
Trip Blank #:
No. of Containers Filled (primary lab.): 6 [illegible]
No. of Containers Filled (replicate samples):
Physical appearance and odor: [illegible] no odor light br/tan
Refrigerated. Date: 3-24-88
Time: 2:00 P

Field Tests (Before After Evacuation)

Temperature (C / F) 19°C
pH: [illegible]
Spec. Cond (umhos / cm) [illegible]
Dissolved oxygen (mg / l)

Weather [illegible]
Comments [illegible]

DAMES & MOORE
FIELD SAMPLING RECORD

Job [illegible]　　　　Date 3-24-88
Job# [illegible]
Well# MW-100　　　　Well Diameter 2"
Location Norwalk, CT

I　Water level measurements (From Top of Casing) in Feet.

Total Well Depth: 47'
Depth to Water: 28.5
Height of Water Column: 18.5'
Volume Conversion Factor: 0.16
Gallons in the Well: 2.95

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II　Well Evacuation

Pumping: Submersible
　　Nitrogen
　　Centrifugal

Pump On:
Pump Off:
Pumping Time:
Pumping Rate:
Gallons Removed:

Bailing: Kemmerer
　Stainless Steel
　: Bucket Bailer
　: Other (Describe)
Bailing Started: 11:30 A
Bailing Stoped: 12:05 P
Gallons Removed 10 gal

III　Sampling

Withdrawal: Pumped (describe)
　Bailed (describe) [illegible] Bailer
Time: [illegible] P　　　Date: 3-24-88
Sample I.D. #: MW-100
Trip Blank #:
No. of Containers Filled (primary lab.): 3
No. of Containers Filled (replicate samples): _
Physical appearance and odor: Clear [illegible]
Refrigerated: Date 3-24-88
　Time: 12:15 P
Field Tests (Before After Evacuation)
　Temperature (C / F) 20°C
　pH 6.70
　Spec Cond (umhos / cm) 340
　Dissolved oxygen (mg / l)
Weather [illegible] 65
Comments [illegible]

DAMES & MOORE
FIELD SAMPLING RECORD

Job Pitney-Bowes Date 3-24-88
Job # 15726-005
Well # K-11 Well Diameter 2"
Location Norwalk, CT

I Water level measurements (From Top of Casing) in Feet.

Total Well Depth: 38.5'
Depth to Water: 27.8'
Height of Water Column: 10.7'
Volume Conversion Factor: 0.16
Gallons in the Well: 1.71

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II Well Evacuation

Pumping: Submersible
Nitrogen
Centrifugal

Pump On:
Pump Off:
Pumping Time:
Pumping Rate:
Gallons Removed:

Bailing: Kemmerer
: Stainless Steel
: Bucket Bailer
: Other (Describe)
Bailing Started: 11:05A
Bailing Stoped: 11:20A
Gallons Removed 9 gal

III Sampling

Withdrawal: Pumped (describe)
Bailed (describe) By hand [illegible] bailer
Time: 11:25A Date: 3-24-88
Sample I.D. #: K-11
Trip Blank #:
No. of Containers Filled (primary lab.): 3
No. of Containers Filled (replicate samples): _
Physical appearance and odor: medium brown no odor
Refrigerated: Date: 3-24-88
Time: 11:30A
Field Tests (Before After Evacuation)
Temperature (C / F) 20°C
pH: 6.80
Spec Cond (umhos / cm) 230
Dissolved oxygen (mg / l)
Weather cloudy - cool [illegible] 40°-50°
Comments Very silty

DAMES & MOORE
FIELD SAMPLING RECORD

Job [illegible] Date [illegible]
Job# 15262-005
Well# [illegible] Well Diameter 2"
Location Norwalk CT

I Water level measurements (From Top of Casing) in Feet.
Total Well Depth: 36.5
Depth to Water: 10.7'
Height of Water Column: 25.8'
Volume Conversion Factor: 0.16
Gallons in the Well: 4.13 gal

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II Well Evacuation
Pumping: Submersible
Nitrogen
Centrifugal

Bailing: Kemmerer
: Stainless Steel
: Bucket Bailer
: Other (Describe)

Pump On:
Pump Off:
Pumping Time:
Pumping Rate:
Gallons Removed:

Bailing Started: 2 25 P
Bailing Stoped: 2. 50 P
Gallons Removed 12 gal

III Sampling
Withdrawal: Pumped (describe)
Bailed (describe) [illegible]
Time: 2:55 P Date: 3-24-88
Sample I.D. #: K-19B
Trip Blank #:
No. of Containers Filled (primary lab.): 3
No. of Containers Filled (replicate samples): _
Physical appearance and odor: no odor clear sample
Refrigerated: Date: 3-24-88
Time: 3 00 P
Field Tests (Before After Evacuation)
Temperature (C / F) 19 °C
pH: 7.1
Spec Cond (umhos / cm) 320
Dissolved oxygen (mg / l)
Weather [illegible]
Comments

DAMES & MOORE CHAIN-OF-CUSTODY RECORD

Sample Source & Client: Pitney Bowes Norwalk CT

Project Title: Kellogg - Deering Project

Job No. 15262-005

Field Personnel (Signature): [signature]

Date	Time	Sample I.D. No.	Sample Type	No. of Containers	Sampling Site	Remarks
3/24/88	11:25A	K-11	GW	3	K-11	TCL VOA Volatiles
3/24/88	12:10P	MW-100	GW	3	MW-100	
3/24/88	1:55P	K-19A	GW	3	K-19A	
3/24/88	2:55P	K-19B	GW	3	K-19B	
3/24/88	1:55P	MS/MSD	GW	3		

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	3-24-88	3:05P									

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

ENVIRONMENTAL PROTECTION AGENCY
Region I Waste Management Division

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME	NO. OF CONTAINERS	40ml vial VOA's					REMARKS
	Kellogg Deering							

SAMPLERS (Signature) Mark L. Mengel

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	40ml vial VOA's					REMARKS
K 11	3/24	1120		X	~~KDM~~ K-11	3	3					
MW-100	3/24	1205		X	MW-100	3	3					
K-19A	3/24	1350		X	K-19A	6	6					
K-19B	3/24	1450		X	K-19B	3	3					

Relinquished by: (Signature)	Date / Time		Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Mark L. Mengel	3/24/88	1455	[signature]			
Relinquished by: (Signature)	Date / Time		Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time		Received for Laboratory by: (Signature)	Date / Time	Remarks	
					Split samples collected for Dames & Moore.	

Distribution: Original Accompanies Shipment, Copy to Coordinator Field Files

16575

DAMES & MOORE
FIELD SAMPLING RECORD

Job Pitney-Bowes Date 3-29-88
Job# 15202
Well# MW-104 Well Diameter 2"
Location Pitney Bowes
2011 Building

I Water level measurements (From Top of Casing) in Feet.
Total Well Depth: 14.6'
Depth to Water: 8.7'
Height of Water Column: 5.9
Volume Conversion Factor: .016
Gallons in the Well: .94

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II Well Evacuation
Pumping: Submersible
Nitrogen
Centrifugal

Bailing: Kemmerer
: Stainless Steel
: Bucket Bailer
: Other (Describe)

Pump On:
Pump Off:
Pumping Time:
Pumping Rate:
Gallons Removed:

Bailing Started: 2:25 P
Bailing Stoped: 2:55
Gallons Removed 3 gal

III Sampling
Withdrawal: Pumped (describe)
Bailed (describe) Dedicated Bailer
Time: 2:35 P Date: 3-29-88
Sample I.D. #: MW-104
Trip Blank #:
No of Containers Filled (primary lab.): 3
No. of Containers Filled (replicate samples): _
Physical appearance and odor:
Refrigerated: Date: 3-29-88
Time: 2:40 P
Field Tests (Before After Evacuation)
Temperature (C / F) 19 °C
pH: 7.
Spec Cond (umhos / cm)
Dissolved oxygen (mg / l)
Weather Sunny 70°
Comments

DAMES & MOORE
FIELD SAMPLING RECORD

Job Pitney-Bowes
Date 3-29-88
Job# 15262
Well# MW-105
Well Diameter 2"
Location Pitney-Bowes Norwalk CT
2011 Building

I Water level measurements (From Top of Casing) in Feet.

Total Well Depth: 16.0'
Depth to Water: 12.3
Height of Water Column: 3.7
Volume Conversion Factor: 0.16
Gallons in the Well: .59

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II Well Evacuation

Pumping: Submersible
Nitrogen
Centrifugal

Bailing: Kemmerer
: Stainless Steel
: Bucket Bailer
: Other (Describe)

Pump On:
Pump Off:
Pumping Time:
Pumping Rate:
Gallons Removed:

Bailing Started: 2:05P
Bailing Stoped: 2:10P
Gallons Removed 2 gal.

III Sampling

Withdrawal: Pumped (describe)
Bailed (describe) dedicated bailer
Time: 2:10P
Date: 3-29-88
Sample I.D #: MW-105
Trip Blank #:
No. of Containers Filled (primary lab.): 2
No. of Containers Filled (replicate samples): –
Physical appearance and odor: Brown in color, no odor, sand, silt and small pebbles.
Refrigerated: Date: 3-29-88
Time: 2:15P
Field Tests (Before After Evacuation)
Temperature (C / F) 12°C
pH: 7.0
Spec. Cond. (umhos / cm) 810
Dissolved oxygen (mg / l)
Weather: Sunny 20s
Comments:

DAMES & MOORE
FIELD SAMPLING RECORD

Job Pitney-Bowes	Date 3-29-88
Job# 15762
Well# MW-101	Well Diameter 2"
Location Norwalk CT Pitney-Bowes
Bell Building

I Water level measurements (From Top of Casing) in Feet
Total Well Depth: 35.1
Depth to Water: 29.8
Height of Water Column: 5.3
Volume Conversion Factor: 0.16
Gallons in the Well: .85 gal

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II Well Evacuation
Pumping: Submersible
Nitrogen
Centrifugal

Pump On:
Pump Off:
Pumping Time:
Pumping Rate:
Gallons Removed:

Bailing: Kemmerer
: Stainless Steel
: Bucket Bailer
: Other (Describe)
Bailing Started: 1:35 P
Bailing Stoped: 1:45
Gallons Removed 3 gal

III Sampling
Withdrawal: Pumped (describe)
Bailed (describe) Dedicated Bailer
Time: 1:50 P	Date: 3-29-88
Sample I.D. #: MW-101
Trip Blank #:
No. of Containers Filled (primary lab.): 3
No. of Containers Filled (replicate samples): _
Physical appearance and odor: Tan in color have silt
Refrigerated: Date: 3-29-88
Time: 1:55 P
Field Tests (Before After Evacuation)
Temperature (C / F) 16.5
pH: 6.8
Spec. Cond. (umhos / cm) 950
Dissolved oxygen (mg / l)
Weather
Comments

DAMES & MOORE
FIELD SAMPLING RECORD

Job [illegible] Date 3-29-88
Job# [illegible]
Well# [illegible] Well Diameter 2"
Location [illegible]

I Water level measurements (From Top of Casing) in Feet.
Total Well Depth : 46.9
Depth to Water : 28.7
Height of Water Column : 18.2
Volume Conversion Factor : 0.16
Gallons in the Well : 2.91 gal

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II Well Evacuation
Pumping : Submersible
Nitrogen
Centrifugal

Bailing : Kemmerer
Stainless Steel
: Bucket Bailer
: Other (Describe)

Pump On :
Pump Off :
Pumping Time :
Pumping Rate :
Gallons Removed :

Bailing Started : 12:45 P
Bailing Stoped : 1:05 P
Gallons Removed 9 gal

III Sampling
Withdrawal : Pumped (describe)
Bailed (describe) [illegible] bailer
Time : 1:10 P Date : 3-29-88
Sample I.D. #: [illegible]
Trip Blank #:
No. of Containers Filled (primary lab.) : 6
No. of Containers Filled (replicate samples) : _
Physical appearance and odor : no odor
Refrigerated . Date . 3/29/88
Time : 1:15 P
Field Tests (Before After Evacuation)
Temperature (C / F) [illegible] °C
pH . 7.4
Spec Cond (umhos / cm) [illegible]
Dissolved oxygen (mg / l)
Weather [illegible]
Comments [illegible]

DAMES & MOORE CHAIN-OF-CUSTODY RECORD

Sample Source & Client: Pitney Bowes

Project Title: Pitney Bowes' Zell Building

Job No. 15262.

Field Personnel (Signature): [illegible]

Date	Time	Sample I.D. No.	Sample Type	No. of Containers	Sampling Site	Remarks
3-14-88	1:10P	MW-100	GW	6	MW-100	MS/MSD TCL VOA CLP Deliverables
3-14-88	1:50P	MW-101	GW	3	MW-101	
3-14-88	2:10P	MW-105	GW	3	MW-105	
3-14-88	2:30P	MW-104	GW	3	MW-104	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

DAMES & MOORE
FIELD SAMPLING RECORD

Client PITNEY BOWES
Job# 15262
Well # [illegible]W-10D
Location [illegible] BLDG., NORWALK, CT

Date 12-23-[illegible]

Well Diameter 2"

I. Water level measurements (from top of casing) in Feet.

Total Well Depth :
Depth to Water :
Height of Water Column :
Volume Conversion Factor :
Gallons in the Well :

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II. Well Evacuation

Pumping : Submersible
Positive Displacement
Centrifugal

Bailing : Teflon
: Stainless Steel
: Combination
: Other (Describe)

Pump On :
Pump Off :
Pumping Time :
Pumping Rate :
Gallons Removed :

Bailing Started :
Bailing Stopped :
Gallons Removed :

III. Sampling

Withdrawal : Pumped (describe)

Bailed (describe)

Time :

Date :

Sample I.D. #:
Trip Blank #:
No. of Containers Filled (primary lab.) :
No. of Containers Filled (replicate samples) :
Physical appearance and odor :
Refrigerated : Date :
Time :
Field Tests (Before After Evacuation)
Temperature (°C / °F) :
pH
Spec. Cond. (umhos / cm) :

Weather:

Comments: [illegible]; WELL LOCKED & [illegible]

DAMES & MOORE
FIELD SAMPLING RECORD

Client: PITNEY BOWES   Date: 12-23-88
Job#: 15252
Well #: MW-104   Well Diameter: 2"
Location: REAL BLDG, NORWALK, CT

I. Water level measurements (from top of casing) in Feet.

Total Well Depth: 14.6'
Depth to Water: 11.20'
Height of Water Column: 3.4'
Volume Conversion Factor: 0.16
Gallons in the Well: 0.544

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II. Well Evacuation

Pumping: Submersible
Positive Displacement
Centrifugal

Bailing: Teflon
: Stainless Steel
x: Combination
: Other (Describe)

Pump On:
Pump Off:
Pumping Time:
Pumping Rate:
Gallons Removed:

Bailing Started:
Bailing Stopped:
Gallons Removed: 2 gallons

III. Sampling

Withdrawal: Pumped (describe)

x Bailed (describe) S.S. BAILER W/TEFLON CK VALVE

Time: 1:00 PM   Date: 12-23-88
Sample I.D. #: MW-104
Trip Blank #: N/A
No. of Containers Filled (primary lab.): 3
No. of Containers Filled (replicate samples): N/A
Physical appearance and odor: NO ODOR, SILTY
Refrigerated: Date: 12-23-88
Time: 2:00 PM
Field Tests (Before, After Evacuation)
Temperature (°C / °F): 15°C
pH: 7.5
Spec. Cond. (umhos / cm): 302

Weather: COLD RAINY

Comments:

DAMES & MOORE
FIELD SAMPLING RECORD

Client PITNEY BOWES — Date 12-23-88
Job# 15262
Well # MW-105 — Well Diameter 2"
Location ZEUL BLDG, NORWALK, CT

I. Water level measurements (from top of casing) in Feet.
Total Well Depth : 15.90
Depth to Water : 13.90'
Height of Water Column : 2'
Volume Conversion Factor : 0.16
Gallons in the Well : 0.32

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II. Well Evacuation
Pumping : Submersible
Positive Displacement
Centrifugal

Bailing : Teflon
: Stainless Steel
x : Combination
: Other (Describe)

Pump On :
Pump Off :
Pumping Time :
Pumping Rate :
Gallons Removed :

Bailing Started :
Bailing Stopped :
Gallons Removed : 1 gallon

III. Sampling
Withdrawal : Pumped (Describe)

x Bailed (describe) S.S. BAILER w/ TEFLON CK. VALVE

Time : [illegible] — Date : 12-23-88
Sample I.D. #: MW-105
Trip Blank #: N/A
No. of Containers Filled (primary lab.) : 3
No. of Containers Filled (replicate samples) : N/A
Physical appearance and odor : NO ODOR, SILTY
Refrigerated : Date : 12-23-88
Time : 2:00pm
Field Tests (Before After Evacuation)
Temperature (°C / °F) : [illegible]
pH [illegible]
Spec. Cond. (umhos / cm) : 243

Weather: [illegible]

Comments:

DAMES & MOORE
FIELD SAMPLING RECORD

Client: PITNEY BOWES
Job#: 15262
Well #: MW-101
Location: ZELL BLDG, [illegible], CT

Date: 12-23-88
Well Diameter: 2"

I. Water level measurements (from top of casing) in Feet.

Total Well Depth : [illegible]
Depth to Water : [illegible]
Height of Water Column : [illegible]
Volume Conversion Factor : [illegible]
Gallons in the Well : [illegible]

Conversion Factor
0.16 = 2" ID
0.65 = 4" ID
1.47 = 6" ID

II. Well Evacuation

Pumping : Submersible
Positive Displacement
Centrifugal

Bailing : Teflon
: Stainless Steel
X : Combination
: Other (Describe)

Pump On :
Pump Off :
Pumping Time :
Pumping Rate :
Gallons Removed :

Bailing Started :
Bailing Stopped :
Gallons Removed : 2 gallons

III. Sampling

Withdrawal : Pumped (describe)

X Bailed (describe) S.S. BAILER W/ TEFLON CK VALVE

Time : 1:10 PM
Date :
Sample I.D. #: MW-101
Trip Blank #: N/A
No. of Containers Filled (primary lab.) : 3
No. of Containers Filled (replicate samples) : N/A
Physical appearance and odor : NO ODOR, SILTY
Refrigerated : Date : 12-23-88
Time : 2:00 PM
Field Tests (Before After Evacuation)
Temperature (°C / °F) : 14°C
pH 6.7
Spec. Cond. (umhos / cm) : 24

Weather: RAINY, COLD

Comments:

FIELD SAMPLING RECORD

FOR CLIENT USE

SAMPLE ID (characters)	DATE SAMPLED	LAB SMPL #	VOA VIALS (HCl)
105	[illegible]		3
107	[illegible]		3
108	[illegible]		3
	/ /		2
	/ /		2
	/ /		2

For Lab Use Only

REF. #:

RELINQUISHED BY: [illegible] DATE: [illegible] TIME: [illegible] CUSTODY TRANSFERRED TO: [illegible] DATE: [illegible]

COOLER SEALED ? (YES) NO

SIGNATURE: [illegible] SEAL #: [illegible] SIGNATURE: [illegible]

RECEIVED BY: [illegible] DATE: [illegible] TIME: [illegible] COOLER RE-SEALED BY: [illegible] DATE: [illegible]

SEAL INTACT ? (YES) NO N/A

SIGNATURE: [illegible] SEAL #: [illegible] SIGNATURE: [illegible]

RECEIVED BY: [illegible] DATE: [illegible] TIME: [illegible] RECEIVED BY LAB BY:

SIGNATURE: [illegible] SAMPLES CHILLED? YES NO SIGNATURE:

SAMPLE SPLIT WITH ANOTHER PARTY? [ ] YES [ ] NO

IF YES IDENTIFY: COOLER TAG: [illegible]

APPENDIX E

KELLOGG-DEERING WELL FIELD SITE SUPPLEMENTAL RI, FIELD GC LABORATORY, GROUND WATER ANALYSIS RESULTS, SECOND ROUND

NO. 2

KELLOGG-DEERING WELL FIELD SITE
SUPPLEMENTAL RI

FIELD GC LABORATORY

GROUNDWATER ANALYSIS RESULTS
SECOND ROUND

L GG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABO. JN
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	K23A K23B	K14A K14B	K18A K18B	MW100-2	MW100-2	MW100-2	MW100-2
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene	*		770 J					500
1,1,1-Trichloroethane	*							
Trichloroethene	*		2840 J	320		[illegible]	131000 J	
Vinyl chloride								
EPA METHOD 602								
Benzene	*							
Ethylbenzene	*		12					
Toluene	*		170					
o-Xylene								
DILUTION		x1	x1	x1	x1	x1000	x500	x100
DATE SAMPLED								
DATE ANALYZED		4-1-88	4-1-88	4-1-88	4-5-88	4-6-88	4-6-88	4-6-88
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING

ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	[illegible]-2	KW-2	KW 2	KW-[illegible]	KW-[illegible]		
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene								
1,1,1-Trichloroethane								
Trichloroethene			[illegible]	[illegible] J	[illegible] J			
Vinyl chloride								
EPA METHOD 602								
Benzene		22				23 •		
Ethylbenzene		23				24 •		
Toluene								
o-Xylene								
DILUTION		x1	x1000	x50	x25	x1		
DATE SAMPLED								
DATE ANALYZED		4-6-88	4-6-88	4-6-88	4-6-88	4-6-88		
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	K11-2	Y11-2	MW3, 2	MW3-2	MW3 2	MW10-2	K21
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene			3800 J		990 •			
1,1,1-Trichloroethane						37 •		
Trichloroethene		135050J		2300 •				
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene								
o-Xylene								
DILUTION		x500	x50	x500	x25	x1	x1	x1
DATE SAMPLED								
DATE ANALYZED		4-7-88	4-7-88	4-7-88	4-7-88	4-7-88	4-7-88	4-7-88
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	MW10 3-2	MW104-2	[illegible]	[illegible]	[illegible]	[illegible]	K18A-2
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene			83 •			320 •		
1,1,1-Trichloroethane			21.3			3.1 •		94 •
Trichloroethene		[illegible] •			[illegible] •		21900 •	
Vinyl chloride								
EPA METHOD 602								
Benzene								28 •
Ethylbenzene								
Toluene								114 •
o-Xylene								
DILUTION		X1	X1	X500	X50	X1	X100	X1
DATE SAMPLED								
DATE ANALYZED		4-7-88	4-8-88	4-8-88	4-8-88	4-8-88	4-8-88	4-8-88
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	K18A-2	K18A-2	K18B-2A	K18B-2A	K19A-2	K[illegible]-2	K10-2
Carbon tetrachloride								
Chloroform								
1,1 Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2 dichloroethene								
Methylene chloride								
Tetrachloroethene		[illegible]		[illegible] •	[illegible] •		[illegible] •
1,1,1-Trichloroethane								
Trichloroethene		120,400 •		220,200 •		115	17040 •	
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene					5800 •			
Toluene								28 •
o-Xylene								
DILUTION		x1000	x 25	x1000	x 500	x1	x100	x 1
DATE SAMPLED								
DATE ANALYZED		4-9-88	4-9-88	4-9-88	4-9-88	4-9-88	4-9-88	4-9-88
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	K88B 2	K88B 2	K[illegible] 2	[illegible]	K[illegible] 2	[illegible]	K[illegible]
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2 Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene			3200 •		11460 •			
1,1,1-Trichloroethane								
Trichloroethene		1170000 •		113400 •				57
Vinyl chloride								
EPA METHOD 602								
Benzene						13 •	65 •	
Ethylbenzene						11 •	28 •	
Toluene					1800 •	21 •	400 J •	
o-Xylene								
DILUTION		X1000	X50	X1000	X100	X1	X1	X1
DATE SAMPLED								
DATE ANALYZED		4-10-88	4-10-88	4-10-88	4-10-88	4-11-88	4-11-88	4-11-88
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	K21-93.5	K21-112	K20C-0	K20A	K21([illegible])	K2([illegible])	K2([illegible])
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene							17 •	
1,1,1-Trichloroethane				48 •	22 •			
Trichloroethene					[illegible] •			10,100 •
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene							9 •	
o-Xylene								
DILUTION		x1	x1	x1	x1	x1	x1	x100
DATE SAMPLED								
DATE ANALYZED		4-11-88	4-12-88	4-12-88	4-12-88	4-13-88	4-13-88	4-13-88
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	K[illegible]	K22B	K22A	K[illegible]	K[illegible]	K[illegible]	[illegible]
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethene								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene								
1,1,1-Trichloroethane		9.[illegible]			1.0	9.0		10.0
Trichloroethene		52.[illegible]			430.0		6100.0	
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene					9.0			
o-Xylene								
DILUTION		<1	<1	<1	<1	<1	<10	<1
DATE SAMPLED								
DATE ANALYZED		4-13-88	4-13-88	4-14-88	4-[illegible]-88	4-[illegible]-88	4-11-88	4-11-88
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	16S	16R	16B	16D	16D	6A	6B
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene			9 •					
1,1,1-Trichloroethane			7 •		11 •			
Trichloroethene		550 •		540 •		530 •	70 •	260 •
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene								
o-Xylene								
DILUTION		x10	x1	x10	x1	x10	x1	x1
DATE SAMPLED								
DATE ANALYZED		4-19-88						
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	K22B	K22A	FB1	FB2	K4A-2	K-1	15-2
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene								
1,1,1-Trichloroethane						28.0		11.0
Trichloroethene						530		
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene								
o-Xylene								
DILUTION		x1	x1	x1	x1	x1	x1	x1
DATE SAMPLED								
DATE ANALYZED		4-17-88	4-19-88	4-19-88	4-21-88			
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	15-2	15R-2	15R-2	K[illegible]-2	K[illegible]-2	K[illegible]-2	K[illegible]-3
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene								
1,1,1-Trichloroethane			16? •		200 •		42 •	9 •
Trichloroethene		5600? •		710 •	21 •			49 •
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene								
o-Xylene								
DILUTION		x10	x1	x10	x1	x1	x1	x1
DATE SAMPLED								
DATE ANALYZED		4-21-88						
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	K2-5(63-?)	KDM MWK2A-2	KDM MWK2B-2	KDM MWK1	MWK3A-2	MWK3A-2A	MWK3B-2
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene								
1,1,1-Trichloroethane								
Trichloroethene					32*	4840*	4490*	4420*
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene								
o-Xylene								
DILUTION		x1	x1	x1	x1	x50	x50	x100
DATE SAMPLED								
DATE ANALYZED		4-26-88	4-27-88	4-27-88	4-27-88	4-27-88	4-27-88	4-27-88
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	MWK 3B-2	MW Z 21A-C	MW Z 21A-C	MW [illegible] 3S-2	MW [illegible]2-2	MW [illegible]2-2	MW [illegible]1-2
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis 1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene		87 ●	[illegible]					
1,1,1-Trichloroethane		92 ●	9[illegible] ●			190 ●		
Trichloroethene		1480 E		4470 E				
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene			3.1 ●					
o-Xylene								
DILUTION		x10	x1	x10	x1	x1	x1	x1
DATE SAMPLED								
DATE ANALYZED		4-27-88						
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	MWK 7A-2	MWK 7B-2	KDM MWK 5-2	KDM [illegible] 2-2	KDM [illegible]	KDM [illegible] 9B-2	KDM [illegible] P-2
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis 1,2 dichloroethene								
Methylene chloride								
Tetrachloroethene						71 *	70 *	70
1,1,1-Trichloroethane			50 *			68 *	17 *	
Trichloroethene		59 *	190 *	62 *		2075 J*		3108 J*
Vinyl chloride								
EPA METHOD 502								
Benzene								
Ethylbenzene								
Toluene								
o-Xylene								
DILUTION		x1	x1	x1	x1	x10	x1	x10
DATE SAMPLED								
DATE ANALYZED		7-27-88				7-28-88		
RUN NUMBER								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L67U

COMPOUND	TARGET DETECTION LIMITS	KDM MW9B-2A	KDM MW25-2	KDM FP3-2	KDM MW24-2	KDM L2 MW22-2	MWZ21A-2	MWX21A-2
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene		800						81
1,1,1-Trichloroethane		16.5				9		
Trichloroethene		[illegible]				37	52[illegible]	
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene								
o-Xylene								
DILUTION		X10	X1	X1	X1	X1	X1000	X10
DATE SAMPLED								
DATE ANALYZED		4-28-88				2		
RUN NUMBER								
REPORT NUMBER								

KELLOGG DEERING
NALYTICAL RESULTS (in ug/l)

MOBILE LA[illegible]RATORY
PROJECT N[illegible] R L670

COMPOUND	TARGET DETECTION LIMITS	MW 2M-2	MW 2M-2	MWLD-2	MWLD-2	MWUM-3	MWUS-2	MWL2-3
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene								
1,1,1-Trichloroethane								
Trichloroethene			8.0					
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene								
o-Xylene								
DILUTION		x100	x1	x5	x1	x1	x1	x1
DATE SAMPLED								
DATE ANALYZED		4-28-88						→
RUN NUMBER								
REPORT NUMBER								
COMMENTS								
REPORT NUMBER								
COMMENTS								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L670

COMPOUND	TARGET DETECTION LIMITS	KDM MWD1-3	KZ0ABL DEVELOP	K21 DEVELOP	K21 DEVELOP	K24 DEVELOP	MWK24-0	MWK24-0
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene				9 •			158 •	
1,1,1-Trichloroethane			10 •					
Trichloroethene					1103 •			18200 •
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene						11 •	65 •	
o-Xylene								
DILUTION		X1	X1	X1	X5	X1	X1	X100
DATE SAMPLED								
DATE ANALYZED		4-29-88	5-2-88	5-2-88	5-2-88	5-6-88	5-6-88	5-6-88
RUN NUMBER								
REPORT NUMBER								

KELLOGG DEERING
ANALYTICAL RESULTS (in ug/l)

MOBILE LABORATORY
PROJECT NUMBER L67U

COMPOUND	TARGET DETECTION LIMITS	MW MW1-2	MWMW1-2A	MWK13A-2	MWK5B-2	MWK8 2		
Carbon tetrachloride								
Chloroform								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethene								
cis-1,2-dichloroethene								
Methylene chloride								
Tetrachloroethene						890 J •		
1,1,1-Trichloroethane								
Trichloroethene				685•		37840J•		
Vinyl chloride								
EPA METHOD 602								
Benzene								
Ethylbenzene								
Toluene								
o-Xylene								
DILUTION		x1	x1	x5	x1	x100		
DATE SAMPLED								
DATE ANALYZED		5-6-88						
RUN NUMBER								
REPORT NUMBER								

APPENDIX F

NUS SOIL SAMPLING DESCRIPTION

Further discussion on the selection and application of the groundwater model is found in Section 4.5 Task 5 - Data Evaluation.

3.2.3 Zone 1 Investigation

Previous studies at the ELINCO property, within Zone 1, have confirmed the presence of TCE in soils adjacent to the building. The lateral and vertical extent of contaminated soils and the locations of these soil contamination areas are presently unknown. In addition, the history of waste disposal operations by Zell Products Corporation (former occupants of the ELINCO and Pitney Bowes buildings), as well as those of Pitney Bowes and ELINCO, have not been defined. hrp Associates, Inc. indicated that floor drain discharges may have occurred from all three buildings on the property. Also, it is reported that disposal of spent solvents on the adjacent Matheis Court property may have occurred. The NUS FIT investigation lends some support to this allegation (see Section 2.3.5).

The general technical approach to source characterization within Zone 1 includes a 1 preliminary external soil gas survey to identify areas warranting further study, 2 a refined external soil gas survey to delineate the extent of sources, 3 an internal soil gas survey to identify subsurface soil contamination beneath the buildings, and 4 confirmatory soil boring, sampling and analysis.

A soil-gas survey for tetrachloroethene (PCE), trichloroethene (TCE), and 1,1,1-trichloroethane (TCA) will be conducted at the ELINCO/Pitney Bowes/Matheis Court complex. Previous investigations have shown that these are the primary contaminants in both soil and groundwater in this area. Soil-gas testing is proposed for the entire complex area, and includes sampling inside the ELINCO and Pitney Bowes buildings, as well as through the floor of the parking garage in the Matheis Court building.

The external soil-gas survey at the complex will be conducted in the following manner. The preliminary survey will be based on an unbiased 50-foot grid (Figure 3-2). The survey will commence in the area previously identified as a source of solvent contamination (i.e., behind the ELINCO Building). Data from this initial survey is expected to reveal the efficacy of the soil-gas survey. If inconclusive results are obtained in this known source area, the soil-gas survey will be abandoned, and a soil boring/sampling and analysis program will be implemented instead. If the soil-gas survey provides acceptable results (i.e., a demonstrated soil-gas concentration gradient), the 50-foot soil-gas grid will be completed.

The data from the preliminary survey will be reviewed and isoconcentration plots will be generated. Contaminant source areas should be identifiable, based on the isoconcentration plots. A refined soil-gas survey grid will be generated, and sampling will be conducted to further define source areas. As shown on Figure 3-2, 47 preliminary external soil-gas survey points have been identified. The number of grid points included in the refined survey cannot be determined at this time. Four background soil samples will be obtained from the soil-gas borings to the east of the complex during drilling. These samples will be submitted for CLP TCL analysis. For costing purposes it has been assumed that 20 additional nodes will be specified. Soil-gas data will be used to focus a soil boring program. The soil-gas data corresponds to DQO Level II.

Once the external soil-gas survey is completed, soil boring will be conducted and subsurface soil samples will be collected at depths of approximately 3, 6, and 9 feet in contaminated areas. For costing purposes it has been estimated that approximately 20 such borings will be completed. Thus a total of 60 subsurface soil samples will be collected. These samples will ~~also be~~ analyzed for the selected volatile organics using the field GC (DQO Level II: engineering purposes). Selected samples will also be split and submitted for confirmatory Contract Laboratory Program (CLP) Target Compound List (TCL) analysis (DQO Level IV: risk assessment and enforcement purposes). It is proposed that 25 percent of samples showing positive detections, and 25 percent of samples with no detectable analytes be submitted for confirmatory analysis. For costing purposes, it has been assumed that 15 samples will be submitted to CLP laboratories.

In addition to the external soil gas surveys and boring programs, an investigatory program has also been developed for the interior of the ELINCO and Pitney Bowes buildings. Interior soil gas and subsurface soil sampling will commence upon completion of the external soil-gas survey. Internal sampling will be biased; boring will be conducted near floor drains, dry wells, or sumps, or in areas that the external survey shows to be potentially contaminated (e.g., the portion of the ELINCO Building nearest the virgin TCE tank and drum storage areas). To minimize interruption of activities in the buildings, subsurface soil sampling will be conducted at the same time as the interior soil gas survey, via the same boreholes. It has been estimated that a total of 30 soil gas samples (10 per building) and 60 subsurface soil samples (2 per borehole) will be collected during the interior investigation. Soil gas and soil samples will be analyzed for PCE/TCE/TCA using the field GC (DQO Level II). It is anticipated that 15 subsurface soil samples will be submitted for CLP TCL analysis (DQO Level IV: enforcement support/risk assessment).

In the event that a preliminary reconnaissance of the buildings reveals the presence of sumps, etc. holding liquid materials, or the presence of potential contaminated surfaces, wipe or waste sampling may also be conducted. These potential activities are considered outside the present scope of work and would require additional funding. Such activities could be initiated through a Technical Direction Memorandum (TDM), if necessary. Any

APPENDIX G

AQUIFER TESTING DATA

AQUIFER TESTING

DATA

$$T = \frac{1.0\, r_c^2}{t}$$ (Cooper, et. al, 1967)

K6B Falling Head Test

$$T = \frac{1.0(.25)^2}{.48}$$

$r_c = .25$ ft

$t = .48$ min

$= 0.13\ ft^2/min$

$= 187.5\ ft^2/day$

$K = 187.5\ ft^2/day \div 18.2$ ft (Open Interval)

$= 10.3$ ft/day

$= 3.6 \times 10^{-3}$ cm/sec

K6B Rising Head Test

$$T = \frac{1.0(.25)^2}{.9}$$

$r_c = .25$ ft

$t = .9$ min.

$= .069\ ft^2/min.$

$= 100\ ft^2/day$

$K = 100\ ft^2/day \div 18.2$ ft

$= 5.5$ ft/day

$= 1.9 \times 10^{-3}$ cm/sec.

US CORPORATION AND SUBSIDIARIES | STANDARD CALCULATION SHEET

CLIENT: USEPA	FILE NO.: L670	BY: JPO	PAGE 2 OF 2
SUBJECT: Kellogg Deering Slug Tests		CHECKED BY: DWB 6/20/88	DATE: 6/14/88

K 9B Falling Head Test

$T = \frac{1.0 (r_c)^2}{t}$ (Cooper, et al, 1967)

$T = \frac{1.0 (0.25)^2}{2.9}$ $r_c = 0.25$ FT, $t = 2.9$ min

= .0216 ft^2/min

= 31 ft^2/day

K = 31 ft^2/day ÷ 28.8 ft (open interval)

= 1.1 ft/day

= 3.8 $\times 10^{-4}$ cm/sec

K 9B Rising Head Test

$T = \frac{1.0 (r_c)^2}{t}$ (Cooper, et. al., 1967)

$T = \frac{1.0 (.25)^2}{1.9}$ $r_c = 0.25$ ft, $t = 1.9$ min.

= .033 ft^2/min

= 47.5 ft^2/day

K = 47.5 ft^2/day ÷ 28.8 ft (open interval)

= 1.65 ft/day

= 5.8 $\times 10^{-4}$ cm/sec

NUS 156A REVISED 0288

ATION AND SUBSIDIARIES — STANDARD CALCULATION SHEET

USEPA	FILE NO.: L670	BY: JPB	PAGE 1 OF 1
SUBJECT: Kellogg Deering Slug Tests		CHECKED BY: DWB 6/20/88	DATE: 6/17/88

K18A Falling Head Test

TIME (MIN)	ΔH (FT)	H/H_o
0	3.06	1
.1	2.93	.96
.7	2.90	.95
1.7	2.85	.93
5.4	2.65	.87
8.4	2.5	.82
18	2.06	.67
26	1.74	.57
32	1.52	.50
40	1.26	.41

$T = \frac{1.0\, r_c^2}{t}$ (Cooper, et. al, 1967)

$r_c = .0833$ ft ✓

$t = 20$ MIN ✓

$= 3.47 \times 10^{-4}$ ft²/min ✓

$= 0.5$ ft²/day ✓

K = 0.5 ft²/day ÷ 14.5 Feet (sand pack interval) ✓

K = .034 ft/day ✓

$= 1.2 \times 10^{-5}$ cm/sec ✓

HUB 186A REVISED 0288

NUS CORPORATION AND SUBSIDIARIES — STANDARD CALCULATION SHEET

CLIENT: US EPA	FILE NO.: L670	BY: DWD	PAGE 1 OF 1
SUBJECT: Kellogg-Deering Packer Test K18A		CHECKED BY: JPO 6/22/88	DATE: 6/21/88

$K = C_p \frac{Q}{H}$ $\quad C_p = \frac{1}{2\pi L} \ln\left(\frac{L}{r}\right) 70315$ $\quad L = 12'$, $r = 0.125'$, PSI = 20

Test Interval 58.5 - 70.5

$= 0.013 \times 4.56 \times 70315$ ✓

$= 4168$ ✓

$H = h_p + h_g$

$= (20 \times 2.31) + 16.4$ ft ✓

$= 62.6$ ft ✓

$Q = 4.76$ gpm ✓

$K = 4168 \times \frac{4.76}{62.6}$ ✓

$= 316.92$ Ft/Yr ✓

$= 0.868$ Ft/day ✓

or 3.06×10^{-4} cm/sec. ✓

NUS 155A REVISED 0285

NUS CORPORATION AND SUBSIDIARIES

STANDARD CALCULATION SHEET

CLIENT: USEPA	FILE NO.: L670	BY: DWB	PAGE 1 OF 1
SUBJECT: Kellogg-Deering Packer Test K18A		CHECKED BY: JPO 6/22/88	DATE: 6/21/88

$K = C_p \, Q/H \qquad C_p = \frac{1}{2\pi L} \ln(L/r)\ 70315$

$L = 12'$
$r = .125'$
$PSI = 30$

$= 0.013 \times 4.56 \times 70315$

Test Interval
58.5 - 70.5

$= 4168$ ✓

$H = h_p + h_g$

$= (30 \times 2.31) + 16.4$ Ft ✓

$= 85.7$ Ft ✓

$Q = 7.43$ gpm ✓

$K = 4168 \times \frac{7.43}{85.7}$ ✓

$= 361.36$ Ft/Yr ✓

$= 0.99$ Ft/day ✓

or 3.49×10^{-4} cm/sec ✓

NUS 155A REVISED 0285

NUS CORPORATION

DATE 6/6/88

CLIENT USEPA FILE NO. L670 BY D.B.

SUBJECT Kellogg-Deering Slug Tests Checked By JFO 6/7 88

K19A Rising Head Test (2)

Time (min)	ΔH (FT)	$\Delta H / H_o$
.01	1.76	.91
.02	1.62	.84
.06	1.18	.61
.11	0.75	.39
.16	0.45	.23
.21	0.25	.13
.26	0.14	.07
.31	0.07	.04

$H_o = 1.93$

$r = 0.0833$ FT
$R = 0.0833$ FT
$L = 4.13$ FT
$T_o = 0.107$ min

$$K = \frac{r^2 \ln(L/R)}{2 L T_o} \quad \text{(Hvorslev, 1951)}$$

$$= \frac{.027}{.884}$$ ✓

$= .0305$ Ft/min ✓

$= 1.83$ Ft/Hr ✓

$= 43.98$ Ft/day ✓

$= 1.6 \times 10^{-2}$ cm/sec. ✓

NUS CORPORATION

Page 1 of 1
DATE 6/16/88

CLIENT USEPA FILE NO. L670 BY DWB
SUBJECT Kellogg Deering Slug Tests Checked By JPO 6/17/88

K19A Rising Head Test (1)

$H_o = 2.1$

Time (min)	ΔH (ft)	ΔH/Ho
0	2.1	1
.01	1.82	.87
.02	1.70	.81
.06	1.26	.60
.11	0.83	.39
.16	0.52	.25
.21	0.31	.15
.26	0.18	.09
.31	0.10	.05

r = 0.0833 FT
R = 0.0833 FT
L = 4.13 FT
To = 0.11 MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o}$$ (Hvorslev, 1951)

$$= \frac{6.94^{-3} \ln(\cancel{50.18}\ 49.58)}{.91}$$ ✓ ✓ JPO

= 0.03 Ft/min ✓

= 1.79 Ft/Hr ✓

= 43 Ft/day ✓

= 1.5×10^{-2} cm/sec. ✓

NUS CORPORATION AND SUBSIDIARIES — STANDARD CALCULATION SHEET

CLIENT: USEPA	FILE NO.: L670	BY: DLWB	PAGE 1 OF 1
SUBJECT: Kellogg-Deering Packer Test K19B		CHECKED BY: JPO 6/20/88	DATE: 6/17/88

$K = C_p\ Q/H \qquad C_p = \frac{1}{2\pi L} \ln(L/r)\ 70315$

L = 10.7
r = 0.125
PSI = 40

= 0.015 × 4.45 × 70315 ✓

TEST INTERVAL - 25'-35.7'

= 4693.19 ✓

H = hp + hg

= (40×2.31) + (13.8+10.24) ✓

= 92.4 + 24.04 ✓

= 116.4 Ft ✓

Q = 1.22 gpm ✓

$K = 4693.19\ \frac{1.22}{116.4}$ ✓

= 49.19 Ft/~~day~~ Year ✓

= 0.13 Ft/day ✓

or 4.75×10^{-5} cm/sec ✓

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA	FILE NO.: L670	BY: DWB	PAGE 1 OF 1
SUBJECT: Kellogg-Deering Packer Test K19B		CHECKED BY: JPO 6/20/88	DATE: 6/17/88

$L = 16.7$
$r = 0.125$
PSI = 20

$K = C_p \, Q/H$ $\quad C_p = 1/2\pi L \, \ln(L/r) \, 70315$

$= 0.015 \times 4.45 \times 70315$ ✓

TEST INTERVAL- 25'-35.7'

$= 4693.19$ ✓

$H = h_p + h_g$

$= 20 \times 2.31 + 24.04$ ✓
$= 46.2 + 24.04$ ✓
$= 70.24$ Ft ✓

$Q = 0.71$ gpm ✓

$K = 4693.19 \dfrac{0.71}{70.24}$ ✓

$= 47.44$ Ft/Yr ✓

$= 0.13$ Ft/day ✓

or 4.59×10^{-5} cm/sec ✓

NUS CORPORATION

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DATE 6/16/88

CLIENT USEPA FILE NO. L670 BY DWB

SUBJECT Kellogg-Deering Slug Tests Checked By JPO 6/17/88

K20A Falling Head Test

Time (MIN)	ΔH (FT)	ΔH/H.
0	2.20	1
.05	2.04	.93
.1	1.91	.87
.15	1.79	.81
.2	1.69	.77
.4	1.35	.61
.65	1.03	.47
.9	0.79	.36
1.15	0.61	.28
1.45	0.48	.22
1.65	0.37	.17
1.90	0.29	.13
2.40	0.18	.08
2.90	0.12	.05

$H_0 = 2.20$

r = 0.0833 FT
R = 0.0333 FT
L = 10 FT
T_0 = 0.90 MIN

$$K = \frac{r^2 \ln L/R}{2 L T_0}$$ (Hvorslev, 1951)

$$= \frac{0.033}{18}$$ ✓

$= 1.8 \times 10^{-3}$ Ft/min ✓

$= 0.11$ Ft/Hr ✓

$= 2.64$ Ft/day ✓

$= 9.3 \times 10^{-4}$ cm/sec ✓

being filmed

HALLIBURTON NUS CORPORATION AND SUBSIDIARIES — STANDARD CALCULATION SHEET

CLIENT: USEPA	FILE NO.: L670	BY: DWB	PAGE 1 OF 1
SUBJECT: Kellogg- Deering Slug Tests		CHECKED BY: JPO 6/17/88	DATE: 6/16/88

K20A Rising Head Test

$H_0 = 2.75$

Time (MIN)	ΔH (FT)	ΔH/H₀
0	2.75	1
.04	2.47	.90
.09	2.27	.83
.14	2.12	.77
.19	1.99	.72
.24	1.87	.68
.29	1.76	.64
.64	1.20	.44
.97	0.85	.31
1.14	0.71	.26
1.39	0.55	.20
1.64	0.43	.16
1.97	0.30	.11
2.97	0.11	.04

$r = 0.0833$ FT
$R = 0.0833$ FT
$L = 10$ FT
$T_0 = 0.82$ MIN

$$K = \frac{r^2 \ln(L/R)}{2L\,T_0} \quad \text{(Hvorslev, 1951)}$$

$$= \frac{0.033}{16.4}$$

$= 2.03 \times 10^{-3}$ Ft/min

$= 0.12$ Ft/Hr

$= 2.9$ Ft/day

$= 1.0 \times 10^{-3}$ cm/sec

NUS 155A REVISED 0288

NUS CORPORATION AND SUBSIDIARIES | STANDARD CALCULATION SHEET

CLIENT: USEPA	FILE NO.: L670	BY: DWB	PAGE 1 OF 1
SUBJECT: Kellogg-Deering Packer Test K20B		CHECKED BY: JPO 6/20/88	DATE: 6/17/88

$L = 12'$
$r = 0.125$
PSI = 40

$K = C_p \; Q/H \qquad C_p = \frac{1}{2\pi L} \ln\left(\frac{L}{r}\right) 70315$

$= 0.613 \times 4.56 \times 70315$ ✓

TEST INTERVAL - 101'-113'

$= 4172$ ✓

$H = h_p + h_g$

$= (40 \times 2.31) + 20.5 + 10.5$ ✓

$= 92.4 + 31$ ✓

$= 123.4$ FT ✓

$Q = 0.24$ gpm ✓

$K = 4172 \frac{0.24}{123.4}$ ✓

$= 8.11$ Ft/Yr ✓

$= 0.022$ Ft/day ✓

$= 7.84 \times 10^{-6}$ cm/sec ✓

NUS 1564 REVISED 0288

NUS CORPORATION AND SUBSIDIARIES — STANDARD CALCULATION SHEET

CLIENT: USEPA	FILE NO.: L670	BY: DWB	PAGE 1 OF 1
SUBJECT: Kellogg-Deering Packer Test K20B		CHECKED BY: JPO 6/20/88	DATE: 6/17/88

$K = C_p\, Q/H$

$C_p = 1/2\pi L \ \ln(L/r)\ 70315$ $\quad L = 12'$ $\quad r = 0.125$ $\quad PSI = 60$

$= 0.013 \times 4.56 \times 70315$ ✓

TEST INTERVAL - 101'-113'

$= 4172$ ✓

$H = h_p + h_g$

$= (60 \times 2.31) + 20.5 + 10.5$ ✓

$= 138.6 + 31$ ✓

$= 169.6$ Ft ✓

$Q = 0.32$ gpm ✓

$K = 4172 \frac{0.32}{169.6}$ ✓

$= 7.87$ Ft/Yr ✓

$= 0.022$ Ft/day ✓

or 7.6×10^{-6} cm/sec ✓

NUS 188A REVISED 0283

NUS CORPORATION

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DATE 6/16/88

CLIENT USEPA FILE NO. L670 BY DWB

SUBJECT Kellogg-Deering Slug Tests Checked By JPO 6/17/88

K20C Rising Head Test (2)

$H_o = 1.87$

Time (MIN)	ΔH (FT)	ΔH/H₀
0	1.87	1
.01	1.77	.95
.05	1.53	.82
.10	1.34	.72
.15	1.18	.63
.2	1.04	.56
.25	.91	.49
.30	.81	.43
.40	.63	.33
.57	.44	.24
.65	.36	.19

r = 0.0833 FT
R = 0.0833 FT
L = 3.87 FT
T_o = .36 MIN

$$K = \frac{r^2 \ln(L/R)}{2L\,T_o} \quad \text{(Hvorslev, 1951)}$$

$$= \frac{6.94^{-3} \times 3.84}{7.74 \times .36} \quad ✓$$

$$= 9.6 \times 10^{-3}\ \text{Ft/min} \quad ✓$$

$$= 0.57\ \text{Ft/Hr} \quad ✓$$

$$= 13.77\ \text{Ft/day} \quad ✓$$

$$= 4.9 \times 10^{-3}\ \text{cm/sec} \quad ✓$$

NUS CORPORATION

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DATE 6/16/88

CLIENT USEPA FILE NO L670 BY DWB

SUBJECT Kellogg-Deering Slug Tests Checked By JPO 6/17/88

K20C Rising Head Test (1)

Time (MIN)	ΔH (FT)	ΔH/Ho
0	1.96	1
0.01	1.78	.91
0.02	1.66	.85
0.07	1.33	.68
0.12	1.12	.57
0.17	0.95	.48
0.22	0.82	.42
0.32	0.60	.31

$H_o = 1.96$

r = 0.0833 FT
R = 0.0833 FT
L = 26.20-22.33
= 3.87 FT
T_o = 0.23 MIN

$$K = \frac{r^2 \ln(L/R)}{2 L T_o} \quad \text{(Hvorslev, 1951)}$$

$$= \frac{6.94^{-3} \ln(3.87/.0833)}{7.74 \times 0.23}$$

$$= \frac{6.94^{-3} \times 3.84}{1.78}$$

= 0.015 Ft/min

= 0.~~89~~ .90 JPO Ft/Hr

= 21.56 Ft/day

= 7.6×10^{-3} Cm/Sec

CLIENT: USEPA	FILE NO.: L670	BY: DWB	PAGE 1 OF 1
SUBJECT: Kellogg-Deering Slug Tests		CHECKED BY: JPO 6/17/88	DATE: 6/16/88

K21 Rising Head Test *

$H_o = 2.74$

Time (MIN)	ΔH (FT)	ΔH/Ho
0	2.74	1
.01	2.52	.92
.03	2.05	.75
.08	1.17	.43
.13	0.62	.23
.18	0.31	.11
.23	0.14	.05
.28	0.06	.02

$r = 0.0833$ FT
$R = 0.0833$ FT
$L = 10.0$ FT
$T_o = 0.036$ MIN

$$K = \frac{r^2 \ln(L/R)}{2L\ T_o} \quad \text{(Hvorslev, 1951)}$$

$$= \frac{0.0332}{1.72}$$ ✓

$= 0.019$ Ft/min ✓

$= 1.16$ Ft/hr ✓

$= 27.8$ Ft/day ✓

$= 9.8 \times 10^{-3}$ cm/sec ** ✓

* Bedrock Well
** When calculated using $L = 5'$ $K = 1.9 \times 10^{-2}$
(5' Approx. fractured interval)

NUS CORPORATION AND SUBSIDIARIES		STANDARD CALCULATION SHEET	
CLIENT: USEPA	FILE NO.: L670	BY: JPO	PAGE 1 OF 1
SUBJECT: Kellogg Deering Slug Tests		CHECKED BY:	DATE: 6/22/88

K 21 Falling Head Test *

$r = .0833$ ft
$R = .0833$ ft
$L = 10.0$ ft
$T_0 = .08$ min

$$K = \frac{r^2 \ln(L/R)}{2LT_0} \quad \text{(Hvorslev, 1951)}$$

$$= \frac{.0332 \text{ ft}^2}{1.6 \text{ ft/min}}$$

$$= .021 \text{ ft/min}$$

$$= 29.88 \text{ ft/day}$$

$$= 1.05 \times 10^{-2} \text{ cm/sec.}$$

* - Bedrock well

NUS CORPORATION AND SUBSIDIARIES — STANDARD CALCULATION SHEET

CLIENT: USEPA	FILE NO.: L670 OPSI Read only	BY: DWB	PAGE 1 OF 1
SUBJECT: Hydraulic Conductivity K21		CHECKED BY: JPO 6/21/88	DATE: 6/17/88

$$K = C_p \frac{Q}{H}$$

$$C_p = \frac{1}{2\pi L} \ln \frac{L}{r} \; 70315.5 \qquad L = 5' \quad r = .125$$

$$= \frac{1}{31.42} (3.69) \; 70315.5$$ ✓

$$= 8257.\cancel{88}\,93$$ ✓

$$H = H_g = 32'$$ ✓

$$Q = 50 \text{ gpm}$$ ✓

$$K = 8257.\cancel{88}\,93 \; \frac{50}{32}$$ ✓

$$= 12903 \text{ ft/yr}$$ ✓

$$= 35.35 \text{ ft/day}$$ ✓

$$= 1.2 \times 10^{-2} \text{ cm/sec}$$ ✓

Assumes:
- L = 5' actual probably less
- Q = 50 actual probably more
- H = 32 actual probably less
- No appreciable amount entered higher fractures

Based on observation of 4/14/88 in which drillers attempted to wash hole for cutting removal. With rig pump on maximum speed (± 50 gpm capacity) no water was returned to the surface during 11 minutes of pumping. Calculations assume that 50 gpm was pumped into the formation through a five foot fractured interval under the pressure of a column of water extending from the original water table to the ground surface.

NUS FILES REVISED 0285

NUS CORPORATION AND SUBSIDIARIES — STANDARD CALCULATION SHEET

CLIENT: USEPA	FILE NO.: L670	BY: DWB	PAGE 1 OF 1
SUBJECT: Kellogg-Deering Packer Test K22A		CHECKED BY: JPO 6/20/88	DATE: 6/17/88

$$K = C_p \, Q/H \qquad C_p = \frac{1}{2\pi L} \ln(L/r)\, 70315$$

L = 12'
r = 0.125
PSI = 40

$= 0.013 \times 4.56 \times 70315$ ✓

TEST INTERVAL - 48.3' - 60.3'

$= 4172$ ✓

$H = h_g + h_p$

$= (29 + 3.3) + (40 \times 2.31)$ ✓

$= 32.3 + 92.4$ ✓

$= 124.\cancel{3}7$ FT ✓

$Q = 0.98$ GPM ✓

$$K = 4172 \times \frac{0.98}{124.7}$$ ✓

$= 32.79$ Ft/Yr ✓

$= 0.09$ Ft/day ✓

or 3.17×10^{-5} cm/sec ✓

NUS 138A REVISED 0285

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA	FILE NO.: L670	BY: DWB	PAGE 1 OF 1
SUBJECT: Kellogg-Deering Packer Test K22A		CHECKED BY: JPO 6/20/88	DATE: 6/17/88

$$K = C_p \, Q/H \qquad C_p = \frac{1}{2\pi L} \ln\left(\frac{L}{r}\right) 70315$$

L = 12'
r = 0.125
PSI = 20

TEST INTERVAL – 48.3' - 60.3'

$= 0.013 \times 4.56 \times 70315$ ✓

$= 4172$ ✓

$H = H_p + H_g$

$= (20 \times 2.31) + 29 + 3.3$ ✓

$= 46.2 + 32.3$ ✓

$= 78.5$ Ft ✓

$Q = 0.47$ gpm ✓

$$K = 4172 \frac{0.47}{78.5}$$ ✓

$= 24.98$ Ft/Yr ✓

$= 0.068$ Ft/day ✓

or 2.41×10^{-5} cm/sec ✓

NUS 196A REVISED 0288

NUS CORPORATION AND SUBSIDIARIES		STANDARD CALCULATION SHEET	
CLIENT: USB2A	FILE NO.: L47A	BY: DWB	PAGE 1 OF 1
SUBJECT: Kellogg-Deering Packer Tests K22B		CHECKED BY: JPO 6/22/88	DATE: 6/21/88

$K = C_p \, Q/H$ $\quad C_p = \frac{1}{2\pi L} \ln(L/r)$ 70315

$L = 12'$
$r = 0.125'$
PSI = 20

$= 0.013 \times 4.56 \times 70315$ ✓

Test Interval
101.5 - 113.5

$= 4168$ ✓

$H = hp + hg$

$= (20 \times 2.31) + 3.8 + 28.85$ ✓

$= 78.85$ Ft ✓

$Q = 0.20$ gpm ✓

$K = 4168 \frac{0.20}{78.85}$ ✓

$= 10.57$ Ft/Yr ✓

$= 0.029$ Ft/day ✓

or 1.02×10^{-5} cm/sec. ✓

NUS 155A REVISED 0285

NUS CORPORATION AND SUBSIDIARIES			STANDARD CALCULATION SHEET
CLIENT: USEPA	FILE NO.: L670	BY: DWB	PAGE 1 OF 1
SUBJECT: Kellogg-Deering Packer Test K22B		CHECKED BY: JPO 6/22/88	DATE: 6/21/88

$K = C_p \, Q/H \qquad C_p = \frac{1}{2\pi L} \ln\left(\frac{L}{r}\right) 70315$

$L = 12'$
$r = 0.125'$
$PSI = 40$

$= 0.013 \times 4.56 \times 70315$ ✓

Test Interval
101.5 - 113.5

$= 4168$ ✓

$H = hp + hq$

$= (40 \times 2.31) + 3.80 + 28.85$ ✓

$= 125.05$ FT ✓

$Q = 0.25$ gpm ✓

$K = 4168 \times \frac{0.25}{125.05}$ ✓

$= 8.33$ Ft/Yr ✓

$= 0.02$ Ft/day ✓

or 8.05×10^{-6} cm/sec ✓

NUS 155A REVISED 0285

NUS CORPORATION

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DATE 6/16/88

CLIENT USEPA FILE NO. L670 BY DWB

SUBJECT Kellogg-Deering Slug Tests Checked By JPD 6/17/88

K23 A Rising Head Test (2)

Time (MIN)	ΔH (FT)	ΔH/H₀
0	1.68	1
.01	1.46	.87
.03	1.26	.75
.08	0.92	.55
.13	0.69	.41
.18	0.52	.31
.23	0.38	.23
.23	0.29	.17
.43	0.11	.07
.73	0.05	.03

$H_0 = 1.68$

r = 0.0833 FT
R = 0.0833 FT
L = 2.17 FT
T_0 = 0.147 MIN

$$K = \frac{r^2 \ln L/R}{2 L T_0}$$ (Hvorslev, 1951)

$$= \frac{6.94^{-3} \times 3.26}{4.34 \times .147}$$ ✓

$$= \frac{0.023}{.638}$$ ✓

= 0.036 Ft/Min ✓

= 2.16 Ft/Hr ✓

= 51.9 Ft/day ✓

= 1.8×10^{-2} cm/sec ✓

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DATE 6/16/88
USEPA FILE NO. 6670 BY Dw3
SUBJECT Kellogg-Deering Slug Tests Checked By JPO 6/17/88

K23A Rising Head Test (1)

$H_o = 1.77$

Time (min)	ΔH (FT)	$\Delta H/H_o$
0	1.77	1
.01	1.48	.84
.03	1.26	.71
.08	0.94	.53
.13	0.71	.40
.18	0.54	.31
.23	0.40	.23
.28	0.30	.17
.48	0.12	.07
.73	0.05	.03

r = 0.0833 FT
R = 0.0833 FT
L = 2.17 FT
T_o = 0.145 MIN

$$K = \frac{r^2 \ln(L/R)}{2L\,T_o}$$ (Hvorslev, 1951)

$$K = \frac{0.023}{0.629}$$

= 0.037 Ft/min

= 2.19 Ft/Hr

= 52.66 Ft/day

= 1.9×10^{-2} cm/sec

US CORPORATION

DATE 6/15/88

CLIENT USEPA FILE NO. L670 BY DWB

SUBJECT Kellogg-Deering Slug Tests Checked By JPO 6/17/88

K23B Rising Head Test

Time (MIN)	ΔH (FT)	H/Ho (Ho = 3.11)
0	3.11	1
0.02	3.01	0.97
0.13	2.75	0.88
0.32	2.53	0.80
0.90	2.01	0.65
1.40	1.49	0.48
1.90	1.10	0.35
2.98	0.57	0.18
3.98	0.31	0.10
6.98	0.05	0.02

$T = \frac{1.0 r_c^2}{t}$ (Cooper, et. al., 1967)

r_c = .0833 ft ✓

$= \frac{.00694}{.54}$ t = 0.54 min ✓

✓

= .0128 ft²/min ✓

= 18.5 ft²/day ✓

K = 18.5 ft²/day ÷ 17 ft (sand pack interval) ✓

= 1.1 ft/day ✓

= 3.9×10^{-4} cm/sec ✓

NUS CORPORATION

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DATE 6/16/88

CLIENT USEPA FILE NO. L670 BY DWB

SUBJECT Kellogg-Deering Slug Tests Checked By JPO 6/17/88

K23B Falling Head Test

Time (MIN)	ΔH (FT)	H/Ho
0	2.04	1
.1	1.95	.96
.15	1.89	.93
.3	1.76	.86
.63	1.50	.74
.96	1.28	.63
1.13	1.19	.58
1.38	1.06	.52
1.72	0.90	.44
2.88	0.53	.26
4.88	0.21	.10
6.38	0.08	.04
7.88	0.05	.03
9.38	0.02	.01
12.00	0.00	0.00

$T = \frac{1.0\, r_c^2}{t}$ (Cooper, et. al., 1967)

$r_c = .0833$ ft ✓

$t = 0.69$ min ✓

$= \frac{.00694}{0.69}$ ✓

$= .010$ ft²/min ✓

$= 14.5$ ft²/day ✓

K = 14.5 ft²/day ÷ 17 ft (sand pack interval) ✓

= 0.85 ft/day ✓

= 3.0×10^{-4} cm/sec ✓

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DATE 6/15/88

US CORPORATION

CLIENT USEPA FILE NO. L670 BY DWB

SUBJECT Kellogg-Deering Slug Tests Checked By JPO 6/17/88

K24 Falling Head Tests

Time (min)	ΔH (ft)	H/H_o (H_o = 3.07)
0	3.07	1
.05	3.03	.99
.15	3.00	.98
.25	2.98	.97
.45	2.96	.96
.95	2.93	.95
1.95	2.90	.94
4.95	2.83	.92
9.95	2.73	.89
19.95	2.56	.83
29.95	2.37	.77
35.95	2.29	.75

$T = \frac{1.0\, r_c^2}{t}$ (Cooper, et. al., 1967)

$r_c = .0833$ ft

$t = 95$ min. @ $Tt/r_c^2 = 1$

$T = \frac{(.0833)^2}{95}$

$= 7.3 \times 10^{-5}$ ft²/min

$= .11$ ft²/day

$K = .11$ ft²/day $\div$ 18.2 ft (sand pack interval)

$= .006$ ft/day

$= 2.1 \times 10^{-6}$ cm/sec

NUS CORPORATION AND SUBSIDIARIES — STANDARD CALCULATION SHEET

CLIENT: USEPA	FILE NO.: L670 20PSI K24	BY: DkasR	PAGE 1 OF 1
SUBJECT: Hydraulic Conductivity K24		CHECKED BY: JPO 6/21/88	DATE: 6/17/88

$$K = C_p\left(\frac{Q}{H}\right)$$

TEST INTERVAL - 173.85'-184.5'

$C_p = (1/2\pi L)\ \ln(L/r)\ (70315.5)$ L = 10.65 r = 0.1432

$= \left(\frac{1}{66.92}\right)\ (4.31)\ (70315.5)$ ✓

$= 4528.69$ ✓

$H = h_p + h_g$ $h_p = 20 \times 2.31 = 46.2$ $h_g = 40.6$ ✓ ✓

$H = 86.8$ FT ✓

$Q = 3.6$ gpm ✓

$$K = (4528.69)\ \frac{3.6}{86.8}$$ ✓

$= (4528.69)\ (0.0415)$ ✓

$= 187.83$ Ft/Yr ✓

$= 0.512$ Ft/Day ✓

or ~~1.878~~ 1.81 $\times 10^{-4}$ cm/sec. ✓

NUS 1984 REVISED 0285

PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K18A
DEPTH OF CASING: ______ FEET

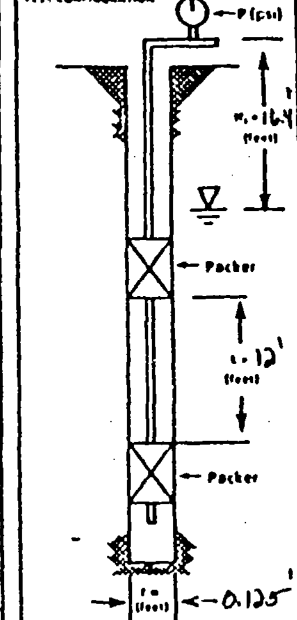
PROJECT NO.: L670
CONTRACTOR: Empire Soils
BY: D. Blackert

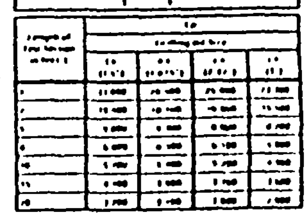
Flow Test					Calculated Results							
Pressure P (psi)	Elapsed Time (min)	Flow Reading	Δ Flow ΔQ (ft^3)	Δ Flow ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	Hp = 2.31 p	H_2* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67 × 10⁻⁷ K (ft/yr)
30	0.0	300.0										
	0.5	303.9										
	1.0	307.8										
	1.5	311.6										
	2.0	315.4										
	2.5	319.2										
	3.0	323.0										
	3.5	326.7										
	4.0	330.5										
	4.5	334.1										
	5.0	337.9										
	5.5	341.6										
	6.0	345.1										
	6.5	349.0										
	7.0	352.6										
	7.5	356.5										
	8.0	360.0										
	8.5	363.5										
	9.0	367.3										
	9.5	371.2										
	10.0	374.3	—	74.3	7.43	16.4	69.3	—	85.7	4168	3613.6	3.49×10^{-4}

CP = (1/(2 π L)) ln(L/r) (70321)
7.48 Gallons = 1 ft³
1 psi = 2.31 ft head
Remarks: ______

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

TEST CONFIGURATION





PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K18A
DEPTH OF CASING: ______ FEET

PROJECT NO.: L670
CONTRACTOR: Empire Soils
BY: D. Blackert

PAGE 1 OF 1

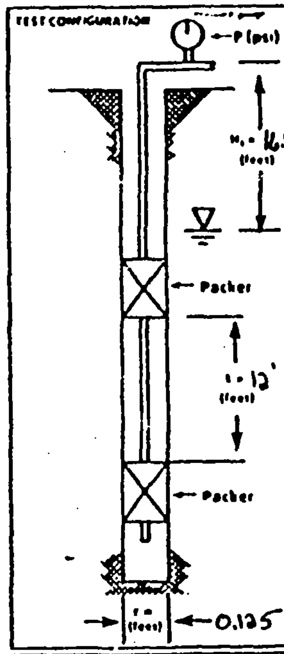
Flow Test					Calculated Results							
Pressure (psi)	Elapsed Time (min)	Flow Reading	Δ Flow, ΔQ (ft^3)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	Hp = 2.31 p	H_2* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67 x 10⁻⁷ K (ft/yr)
20	0.0	385.0										
	0.5	387.6										
	1.0	389.6										
	1.5	392.1										
	2.0	394.4										
	2.5	396.8										
	3.0	399.2										
	3.5	401.6										
	4.0	404.0										
	4.5	406.5										
	5.0	408.8										
	5.5	411.3										
	6.0	413.5										
	6.5	416.0										
	7.0	418.3										
	7.5	420.6										
	8.0	423.1										
	8.5	425.3										
	9.0	427.3										
	9.5	430.2										
	10.0	432.6	—	47.6	4.76	16.4	46.2	—	62.6	4168	316.92	3.06×10^{-4}

CP = (1/(2 π L)) ln (L/r) (70321)
7.48 Gallons = 1 ft^3
1 psi = 2.31 ft head

Remarks: Test Interval 58.5-70.5 SWL 15.5' Swivel Height 0.9'
Packer Pressure 180 PSI Borehole Diameter 3"

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

TEST CONFIGURATION



Length of Test Section	Cp			
	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K19B
DEPTH OF CASING: ______ FEET

PROJECT NO.: 1670
CONTRACTOR: Empire Soils
BY: S. Krall

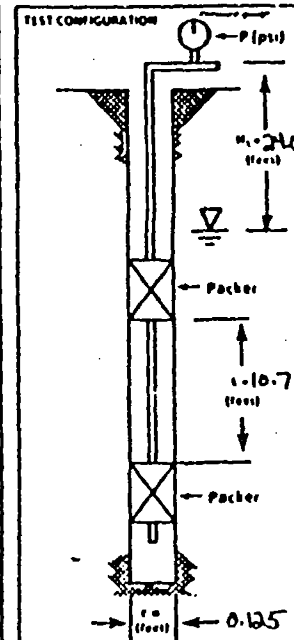
Flow Test					Calculated Results							
Pressure (psi)	Elapsed Time (min)	Flow Reading	Δ Flow, ΔQ (ft^3)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	H_p = 2.31 p	H_2* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67 x 10⁻⁷ K (ft/yr)
40	0.0	550.0										
	0.5	550.7										
	1.0	551.4										
	1.5	552.1										
	2.0	552.7										
	2.5	553.3										
	3.0	553.9										
38	3.5	554.5										
	4.0	555.1										
	4.5	555.8										
36	5.0	556.3										
	5.5	556.8										
	6.0	557.4										
	6.5	558.0										
	7.0	558.6										
	7.5	559.2										
	8.0	559.8										
	8.5	560.4										
	9.0	561.0										
	9.5	561.6										
	10.0	562.2	—	12.2	1.22	24.04	92.4	—	116.44	4693.19	49.19	4.75x10⁻⁵

CP = (1/(2 π L)) ln (L/r) (70321)
7.48 Gallons = 1 Ft^3
1 psi = 2.31 ft head

Remarks: Test Interval = 25-35.7 SWL = 13.80 Swivel Height = 10.24
Packer Pressure 240 PSI Borehole Diameter 3"

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

TEST CONFIGURATION



Length of Test Section (feet)	Cp			
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

C

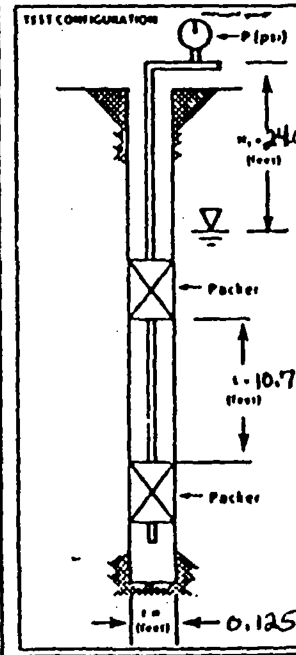
PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K19-B
DEPTH OF CASING: ______ FEET

PROJECT NO.: L170
CONTRACTOR: Empire Soils
BY: S. Krall

PAGE 1 OF 1

Flow Test					Calculated Results							
Pressure P (psi)	Elapsed Time (min)	Flow Reading	Δ Flow, ΔQ (ft^3)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	Hp = 2.31 p	H_2* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67 x 10^{-7} K (ft/yr)
20	0.0	539.0										
↓	0.5	539.5										
↓	1.0	540.0										
18	1.5	540.3										
16	2.0	540.5										
↓	2.5	540.7										
20	3.0	541.4										
	3.5	541.6										
	4.0	541.9										
	4.5	542.4										
	5.0	542.8										
	5.5	543.2										
	6.0	543.4										
	6.5	543.8										
	7.0	544.2										
	7.5	544.5										
	8.0	544.8										
	8.5	545.2										
	9.0	545.6										
	9.5	545.8										
↓	10.0	546.1	—	7.1	0.71	24.04	46.2	—	70.24	4693		



Length of Test Section (feet)	Cp			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CP = (1/(2πL)) ln(L/r) (70321)
7.48 Gallons = 1 ft^3
1 psi = 2.31 ft head

Remarks: Test Interval: 25-35.7' SWL = 13.80 Swivel Height = 10.24
Packer Pressure = 240 PSI Borehole Diameter = 3"

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K20B
DEPTH OF CASING: ______ FEET

PROJECT NO.: 6670
CONTRACTOR: Empire Soils
BY: D. Blackert

PAGE 1 OF 1

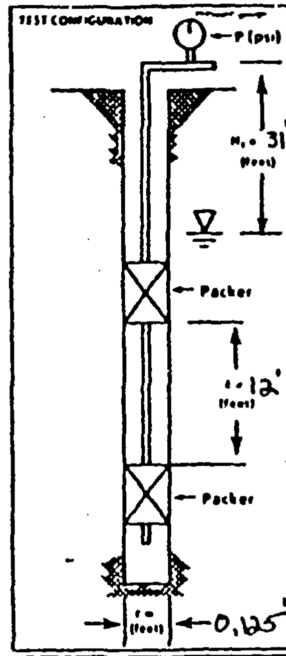
Flow Test					Calculated Results							
Pressure P (psi)	Elapsed Time (min)	Flow Reading	Δ Flow ΔQ (ft³)	Δ Flow ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	Hp = 2.31 p	H_2* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67 × 10⁻⁷ K (ft/yr)
40	0.00	262.2										
	0.25	262.3										
	0.50	262.4										
	0.75	262.4										
	1.00	262.5										
	1.25	262.5										
	1.50	262.6										
	1.75	262.6										
	2.00	262.7										
	2.25	262.8										
	2.50	262.8										
	2.75	262.9										
	3.00	262.9										
	3.25	263.0										
	3.50	263.0										
	3.25	263.1										
	4.00	263.2										
	4.25	263.2										
	4.50	263.3										
	4.75	263.4										
	5.00	263.4	—	1.2	0.24	31	92.4	—	123.4	4168	8.11	7.84×10^{-6}

CP = (1/(2πL)) ln(L/r) (70321)
7.48 Gallons = 1 ft³
1 psi = 2.31 ft head

Remarks: Test Interval = 101-113 SWL 20.5 Swivel Height 10.5
Packer Pressure 150 PSI Borehole Diameter 3"

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

TEST CONFIGURATION



Length of test section (feet)	Cp			
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

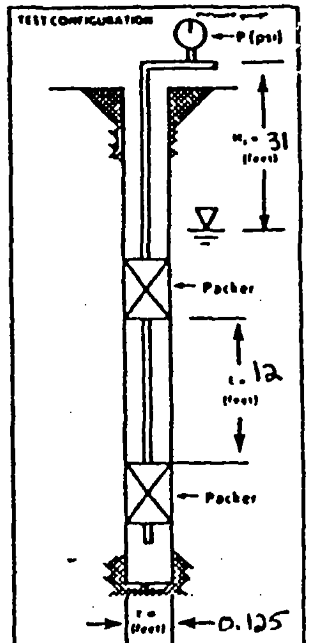
PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K20B
DEPTH OF CASING: ______ FEET

PROJECT NO.: 1670
CONTRACTOR: Empire Soils
BY: D. Blackert

PAGE 1 OF 1

Flow Test					Calculated Results							
Pressure P (psi)	Elapsed Time (min)	Flow Reading	Δ Flow, ΔQ (ft^3)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	$H_p = 2.31\,p$	H_2* (ft)	$H = H_p + (H_1 \text{ or } H_2)$	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67×10^{-7} K (ft/yr)
60	0.00	264.0										
	0.25	264.1										
	0.50	264.2										
	0.75	264.2										
	1.00	264.3										
	1.25	264.4										
	1.50	264.5										
	1.75	264.5										
	2.00	264.6										
	2.25	264.7										
	2.50	264.8										
	2.75	264.9										
	3.00	265.0										
	3.25	265.0										
	3.50	265.1										
	3.75	265.2										
	4.00	265.3										
	4.25	265.4										
	4.50	265.4										
	4.75	265.5										
	5.00	265.6	—	1.6	0.32	31	138.6	—	169.6	4168	7.86	7.6×10^{-6}



Length of test section (feet)	Cp			
	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CP = (1/(2 π L)) ln (L/r) (70321)
7.48 Gallons = 1 ft^3
1 psi = 2.31 ft head

Remarks: Test Interval 101-113 SWL = 20.5 Swivel Height = 10.5
Packer Pressure = 150 PSI Borehole Diameter = 3"

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

C

PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K22A
DEPTH OF CASING: ______ FEET

PROJECT NO.: 1170
CONTRACTOR: Empire Soils
BY: S. Krall

PAGE 1 OF 1

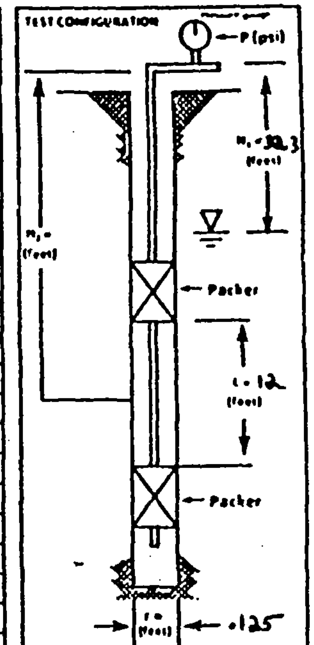
Flow Test					Calculated Results							
Pressure, P (psi)	Elapsed Time (min)	Flow Reading	Δ Flow, ΔQ (ft^3)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	Hp = 2.31 p	H_2* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67×10^{-7} K (ft/yr)
20PSI	0.0	145.2										
	0.5	145.5										
	1.0	145.7										
	1.5	146.0										
	2.0	146.2										
	2.5	146.4										
	3.0	146.7										
	3.5	146.9										
	4.0	147.1										
	4.5	147.3										
	5.0	147.6										
	5.5	147.8										
	6.0	148.0										
	6.5	148.3										
	7.0	148.5										
	7.5	148.7										
	8.0	148.9										
	8.5	149.2										
	9.0	149.5										
	9.5	149.7										
	10.0	149.9		4.7	0.47	32.3	46.2		78.5	4168	24.95	2.41×10^{-5}

CP = (1/(2 π L)) ln (L/r) (70321)
7.48 Gallons = 1 ft^3
1 psi = 2.31 ft head

Remarks: Test Interval 48.3-60.3 SWL = 29.0' Swivel Height = 3.3'
Packer Pressure 225 PSI Borehole diameter 3"

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

TEST CONFIGURATION



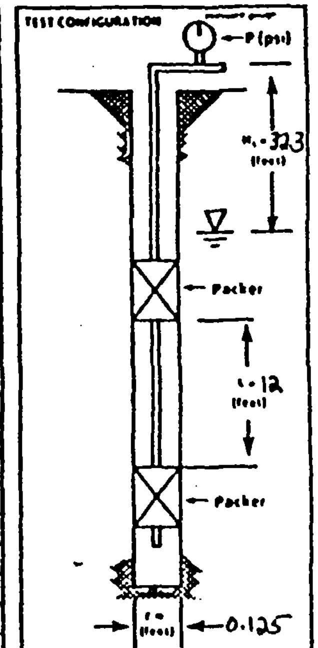
Length of Test Section	Cp			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K22R
DEPTH OF CASING: ______ FEET

PROJECT NO.: L670
CONTRACTOR: Empire Soils
BY: S. Krall

Flow Test					Calculated Results							
Pressure P (psi)	Elapsed Time (min)	Flow Reading	Δ Flow, ΔQ (ft³)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	$H_p = 2.31\,p$	H_2* (ft)	$H = H_p + (H_1$ or $H_2)$	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67 x 10⁻⁷ K (ft/yr)
40	0	151.0										
	0.5	151.6										
	1.0	152.1										
	1.5	152.6										
	2.0	153.1										
	2.5	153.6										
	3.0	154.0										
	3.5	154.5										
	4.0	155.0										
	4.5	155.4										
	5.0	155.9										
	5.5	156.4										
	6.0	156.9	—	5.9	0.98	32.3	92.4	—	124.7	4168	32.76	3.17×10^{-5}



CP = (1/(2 π L)) ln (L/r) (70321)
7.48 Gallons = 1 ft³
1 psi = 2.31 ft head

Remarks: Test Interval = 48.3 - 60.3   SWL = 29'   Swivel Height = 3.3'
Packer Pressure = 225 PSI   Borehole Diameter = 3"

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

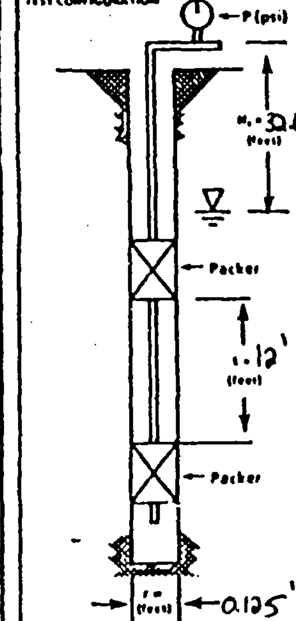
PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K22B
DEPTH OF CASING: ______ FEET

PROJECT NO.: L670
CONTRACTOR: Empire Soils
BY: S. Keall

Flow Test					Calculated Results							
Pressure P (psi)	Elapsed Time (min)	Flow Reading	Δ Flow, ΔQ (ft³)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	Hp = 2.31 p	H_2* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67 x 10⁻⁷ K (ft/yr)
20	0.0	310.5										
↓	0.5	310.6										
	1.0	310.7										
	1.5	310.8										
	2.0	310.9										
	2.5	311.0										
	3.0	311.1										
	3.5	311.2										
	4.0	311.3										
	4.5	311.4										
	5.0	311.5	—	1.0	0.20	32.65	46.2	—	78.85	4168	10.57	1.02×10^{-5}

TEST CONFIGURATION



Length of Test Section in feet L	Cp			
	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	[illegible]	[illegible]	[illegible]	[illegible]
15	[illegible]	[illegible]	[illegible]	[illegible]
20	[illegible]	[illegible]	[illegible]	[illegible]

CP = (1/(2 π L)) ln (L/r) (70321)
7.48 Gallons = 1 ft³
1 psi = 2.31 ft head
Remarks: Test Interval 101.5-113.5 SWL 28.85 Swivel Height 3.8
Packer Pressure 210 PSI Borehole Diameter 3"

* H_1 is used when the test length is below the water table.
H_2 is used when the test length is above the water table.

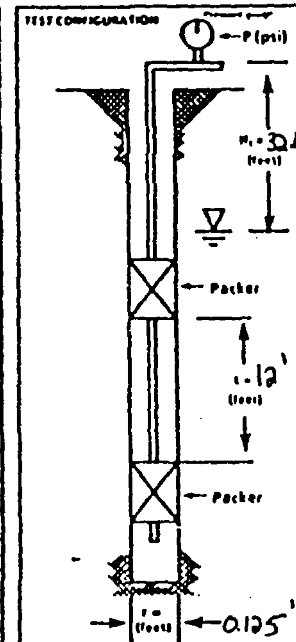
PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K22B
DEPTH OF CASING: ________ FEET

PROJECT NO.: 1670
CONTRACTOR: Empire Soils
BY: S. Kcall

Flow Test					Calculated Results							
Pressure P (psi)	Elapsed Time (min)	Flow Reading	Δ Flow, ΔQ (ft³)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	Hp = 2.31 p	H_2* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67 × 10⁻⁷ K (ft/yr)
20	0.0	310.5										
↓	0.5	310.6										
	1.0	310.7										
	1.5	310.8										
	2.0	310.9										
	2.5	311.0										
	3.0	311.1										
	3.5	311.2										
	4.0	311.3										
	4.5	311.4										
	5.0	311.5	—	1.0	0.20	32.65	46.2	—	78.85	4168	10.57	1.02×10^{-5}

TEST CONFIGURATION



Length of Test Section (feet)	Cp			
	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CP = {1/(2 π L)} ln (L/r) (70321)
7.48 Gallons = 1 ft³
1 psi = 2.31 ft head

Remarks: Test Interval 101.5-113.5 SWL 28.85 Swivel Height 3.8
Packer Pressure 210 PSI Borehole Diameter 3"

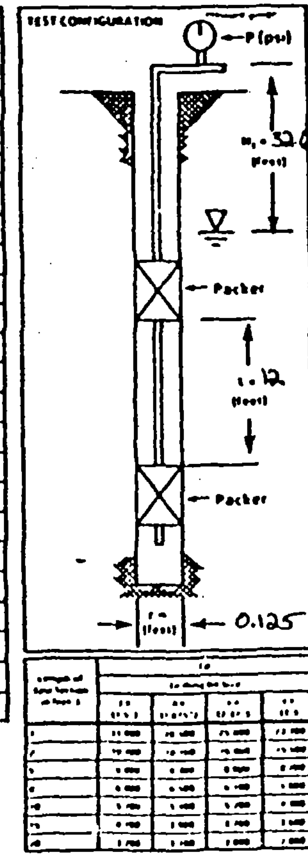
* H_1 is used when the test length is below the water table.
H_2 is used when the test length is above the water table.

PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K22B
DEPTH OF CASING: ______ FEET

PROJECT NO.: 1670
CONTRACTOR: Empire Soils
BY: S. Krall

Flow Test					Calculated Results							
Pressure P (psi)	Elapsed Time (min)	Flow Reading	Δ Flow, ΔQ (ft³)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	Hp = 2.31 p	H_2* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67 × 10⁻⁷ K (ft/yr)
40	0.0	312.40										
	0.5	312.55										
	1.0	312.65										
	1.5	312.80										
	2.0	312.90										
	2.5	313.05										
	3.0	313.15										
	3.5	313.30										
	4.0	313.40										
	4.5	313.55										
	5.0	313.65	—	1.25	0.25	32.65	92.4	—	125.05	4168	8.33	8.05x10⁻⁶



CP = (1/(2 π L)) ln (L/r) (70321)
7.48 Gallons = 1 ft³
1 psi = 2.31 ft head

Remarks: Test Interval = 101.5' - 113.5' SWL = 28.85' Swivel Height = 3.8'
Packer Pressure = 210 PSI Borehole Diameter = 3"

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K24
DEPTH OF CASING: ______ FEET

PROJECT NO.: L670
CONTRACTOR: Empire Soils
BY: D. Blackert

PAGE 1 OF 1

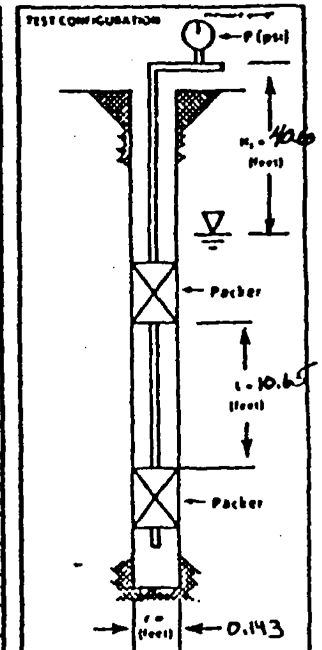
Flow Test					Calculated Results							
Pressure p (psi)	Elapsed Time (min)	Flow Reading	Δ Flow ΔQ (ft³)	Δ Flow ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	Hp = 2.31 p	H_2* (ft)	H = Hp + (H_1 or H_2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67 x 10⁻⁷ K (ft/yr)
20	0.00	365.0										
	0.25	366.0										
	0.50	367.0										
	0.75	367.8										
	1.00	368.8										
	1.25	369.7										
	1.50	370.6										
	1.75	371.5										
	2.00	372.5										
	2.25	373.4										
	2.50	374.2										
	2.75	375.1										
	3.00	376.1										
	3.25	377.0										
	3.50	377.9										
	3.75	378.5										
	4.00	379.3										
	4.25	380.2										
	4.50	381.1										
	4.75	382.0										
	5.00	383.0	—	18.0	3.60	40.6	46.2	—	86.8	4528.69	187.83	1.81×10^{-4}

CP = (1/(2πL)) ln(L/r) (70321)
7.48 Gallons = 1 ft³
1 psi = 2.31 ft head

Remarks: Test Interval 173.5-184.5 SWL = 33.5' Swivel Height = 21'
Packer Pressure = 210 PSI Borehole Diameter = 3.4"

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

TEST CONFIGURATION



PACKER TEST REPORT

PROJECT: L670 Kellogg-Dreiss
BORING NO.: K19B
DEPTH OF CASING: 18 FEET

PROJECT NO.: L670
CONTRACTOR: NUS
BY: Scott M Krall 3-15-89

Flow Test					Calculated Results							
Pressure, P (psi)	Elapsed Time (min)	Flow Reading (gal)	Δ Flow, ΔQ (ft³)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	Hp = 2.31 p	H_2* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.87 x 10 K (ft/yr)
20 psi	0	10519.5	0.0	0.0								
	0 5	10519.5	0.0	0 0								
	1 0	10519.5	0.0	0.0								
	1.5	10519.5	0.0	0.0								
	2 0	10519.5	0.0	0.0								
	2.5	10519.5	0.0	0.0								
	3 0	10519.5	0.0	0 0								
	3.5	10519.5	0.0	0.0								
	4 0	10519.5	0.0	0.0								
	4 5	10519.5	0.0	0.0								
	5 0	10519.5	0 0	0 0								
	5 5	10519.5	0.0	0.0								
	6 0	10519.5	0.0	0.0								
	6 5	10519.5	0.0	0.0								
	7 0	10519.5	0.0	0 0								
	7 5	10519.5	0.0	0 0								
	8 0	10519.5	0 0	0 0								
	8 5	10519.5	0.0	0.0								
	9 0	10519.5	0.0	0 0								
	9 5	10519.5	0.0	0.0								
	10 00	10519.5	0 0	0.0								

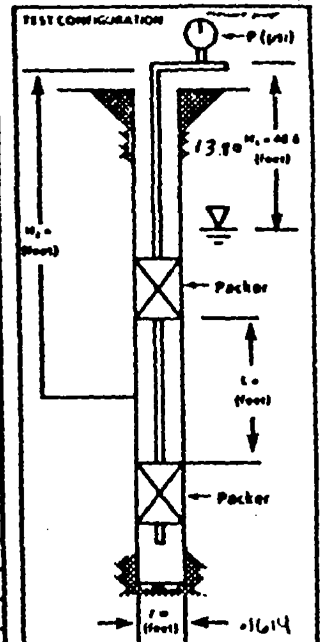
CP = (1/(2 x L)) ln (L/r) (70321)
7.48 Gallons = 1 ft³
1 psi = 2.31 ft head

0 gpm

Remarks: PACKER INTERVAL 36'-58' Packer pressure 240 psi
Swivel to ground 4.7 ft, [illegible] obtained because packer still in hole from yesterday [illegible] 3 1/4 hrs (1530)
NO WATER Flow into Aquifer

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

TEST CONFIGURATION



Length of Test Section (feet)	Cp			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

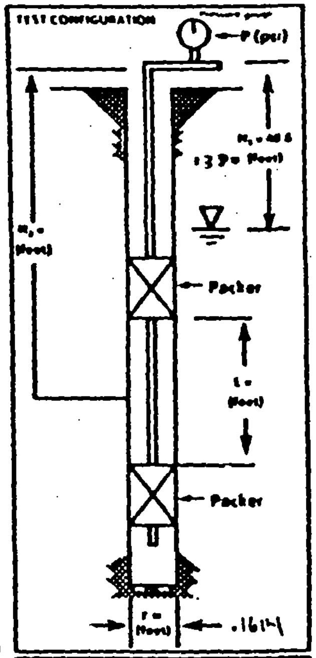
PACKER TEST REPORT

PROJECT: L670 Kellogg-Deering
BORING NO.: K193
DEPTH OF CASING: 18 FEET

PROJECT NO.: L670 03
CONTRACTOR: NDS
BY: Scott M. Krall 3-14-88

Flow Test					Calculated Results							
Pressure, P (psi)	Elapsed Time (min)	Flow Reading GAL	Δ Flow, ΔQ (ft³)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	Hp = 2.31 p	H_2* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = 9.67 x 10⁻⁷ K (ft/yr)
20	0	10476.0	0.0	0.0								
	0.5	10476.0	0.0	0.0								
	1.0	10476.0	0.0	0.0								
	1.5	10476.0	0.0	0.0								
	2.0	10476.0	0.0	0.0								
	2.5	10476.0	0.0	0.0								
	3.0	10476.0	0.0	0.0								
	3.5	10476.0	0.0	0.0								
	4.0	10476.0	0.0	0.0								
	4.5	10476.0	0.0	0.0								
	5.0	10476.0	0.0	0.0								
	5.5	10476.0	0.0	0.0								
	6.0	10476.0	0.0	0.0								
	6.5	10476.0	0.0	0.0								
	7.0	10476.0	0.0	0.0								
	7.5	10476.0	0.0	0.0								
	8.0	10476.0	0.0	0.0								
	8.5	10476.0	0.0	0.0								
	9.0	10476.0	0.0	0.0								
	9.5	10476.0	0.0	0.0								
	10.0	10476.0	0.0	0.0								

TEST CONFIGURATION



Length of Test Section in Feet L	Cp			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CP = (1/(2 π L)) ln(L/r) (70321)

7.48 Gallons = 1 ft³

1 psi = 2.31 ft head

0 gpm

Remarks: Swivel to grd level 4.7, Packer interval 46'-58', Packer pressure 220 PSI
SWL 13.80
AQUIFER TAKES NO WATER

* H_1 is used when the test length is below the water table
H_2 is used when the test length is above the water table

PACKER TEST REPORT

PROJECT: Kellogg-Deering
BORING NO.: K1BB
DEPTH OF CASING: Packer Bottom 82.5 FEET

PROJECT NO.: L670
CONTRACTOR: Empire
BY: Dan Blackadi

PAGE 1 OF 1

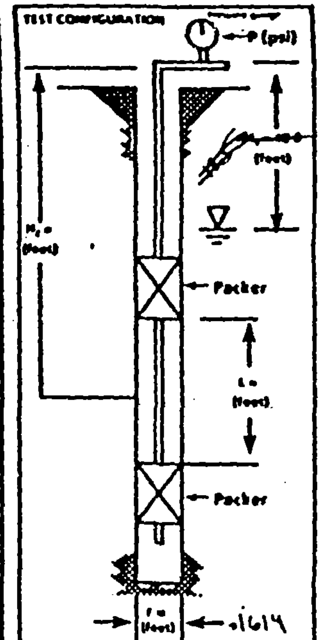
Flow Test					Calculated Results							
Pressure (psi)	Elapsed Time (min)	Flow Reading	Δ Flow, ΔQ (ft³)	Δ Flow, ΔQ (gal)	Flow Rate Q (gal/min)	H_1* (ft)	H_2 = 2.31 p	H_3* (ft)	H = Hp + (H1 or H2)	Cp	K (ft/yr) = Cp Q/H	K (cm/sec) = [illegible] K (ft/yr)
20	0	0										
	0.25											
	0.50											
	0.75											
	1.00											
	1.25											
	1.50											
	1.75											
	2.00											
	2.25											
	2.50											
	2.75											
	3.00											
	3.25											
	3.50											
	3.75											
	4.00											
	4.25											
	4.50											
	4.75											
	5.00											

0 gpm

CP = (1/(2 π L)) ln(L/r) (70321)
7.48 Gallons = 1 ft³
1 psi = 2.31 ft head

Remarks: Swivel height 5.6' Packer Pressure 165PSI Depth to bottom of packer 82.6'
FORMATION DID NOT TAKE WATER Stick 15.3'

* H_1 is used when the test length is below the water table.
H_2 is used when the test length is above the water table



Length of test section in feet L	Cp			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET	NUS CORPORATION

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K18A
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1
STATIC WATER LEVEL (Depth/Elevation): 15.68 / 61.62 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Falling Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1518	0.00 Min	~~15.68~~ NA	0	~~15.68~~ NA	3.06	Data Collected Using
	0.10				2.93	Hermit Environmental Da
	0.70				2.90	Logger, Model SE1000B
	1.70				2.85	
	5.40				2.65	Only Data Used For
	8.40				2.50	Graphing Purposes is
	18.00				2.06	Listed. Additional
	26.00				1.74	Data was Recorded
	32.00				1.52	by the Instrument.
	40.00				1.26	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET **NUS CORPORATION**

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K6B
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 6" SCREEN LENGTH/DEPTH: Open Borehole Saturated Elev. 23.10 to 4.9 TEST NO.: 1
STATIC WATER LEVEL (Depth/Elevation): 33.37 145.61 DATE: 6/9/88
TEST TYPE (Rising/Falling/Constant Head): Falling Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1052	0.00 min	~~33.37~~ NA	0	~~33.37~~ NA	1.22	Data Collected Using
	0.01				1.06	Hermit Environmental Data
	0.06				0.91	Logger, Model SE1000B
	0.11				0.86	
	0.16				0.75	Only Data Used For
	0.26				0.62	Graphing Purposes is
	0.31				0.57	Listed. Additional
	0.48				0.45	Data was Recorded
	0.73				0.34	by the Instrument.
	0.89				0.27	
	1.06				0.21	
	1.39				0.14	
	1.81				0.09	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET — **NUS CORPORATION**

PROJECT NAME: Kellogg-Deering — WELL/BORING NO: K6B
PROJECT NO: L670 — GEOLOGIST: Don Blackert
WELL DIAMETER: 6" — SCREEN LENGTH/DEPTH: Open Borehole Saturated 3.26 to 4.90 — TEST NO.: 2
STATIC WATER LEVEL (Depth/Elevation): 33.37 / 45.61 — DATE: 6/9/88
TEST TYPE (Rising/Falling/Constant Head): Rising Head — CHECKED:
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug — PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1109	0.00 min	33.37	0	33.37	1.20	Data Collected Using
	0.01				0.96	Hermit Environmental Data
	0.06				0.81	Logger, Model SE1000B
	0.11				0.73	
	0.16				0.67	Only Data Used For
	0.26				0.57	Graphing Purposes is
	0.39				0.46	Listed. Additional
	0.56				0.37	Data was Recorded
	0.81				0.26	by the Instrument.
	1.23				0.16	
	1.81				0.08	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET — **NUS CORPORATION**

PROJECT NAME: Kellogg-Deering — WELL/BORING NO.: K21
PROJECT NO.: L670 — GEOLOGIST: Don Blackert
WELL DIAMETER: 2" — SCREEN LENGTH/DEPTH: 10' — TEST NO.: 1
STATIC WATER LEVEL (Depth/Elevation): 33.47 / 36.93 — DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Falling Head — CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug — PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1819	0.01min	~~33.47~~ NA	0	~~33.47~~ NA	1.11	Data Collected Using
	0.12				0.91	Hermit Environmental Data
	0.13				0.75	Logger, Model SE1000B.
	0.15				0.61	
	0.17				0.50	Only Data Used For
	0.18				0.40	Graphing Purposes is
	0.20				0.32	Listed. Additional
	0.25				0.16	Data was Recorded
	0.30				0.08	by the Instrument
	0.50				0.03	
	0.75				0.02	
	1.00				0.01	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET	NUS CORPORATION

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K23B
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 2
STATIC WATER LEVEL (Depth/Elevation): 33.48 / 35.20 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Rising Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1923	0.00 min	~~33.48~~ NA	0	~~33.48~~ NA	3.11	Data Collected Using
	0.02				3.01	Hermit Environmental Data
	0.13				2.75	Logger, Model SE1000B.
	0.32				2.53	
	0.90				2.01	Only Data Used For
	1.40				1.49	Graphing Purposes is
	1.90				1.10	Listed. Additional
	2.98				0.57	Data was Recorded
	3.98				0.31	by the Instrument.
	6.98				0.05	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET **NUS CORPORATION**

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K23B
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1
STATIC WATER LEVEL (Depth/Elevation): 33.48 / 35.20 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Falling Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1910	0.00 min	NA ~~33.48~~	0	NA ~~33.48~~	2.04	Data Collected Using
	0.10	↓	↓	↓	1.95	Hermit Environmental Data
	0.15				1.89	Logger, Model SE1000B.
	0.30				1.76	
	0.63				1.50	Only Data Used For
	0.96				1.28	Graphing Purposes is
	1.13				1.19	Listed. Additional
	1.38				1.06	Data was Recorded
	1.72				0.90	by the Instrument.
	2.88				0.53	
	4.88				0.21	
	6.38				0.10 JPO ~~0.08~~	
	7.88				0.05	
	9.38				0.02	
	12.00				0.00	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET	NUS CORPORATION

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K24
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1
STATIC WATER LEVEL (Depth/Elevation): 37.76 / 35.22 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Falling Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1643	0.00 min	~~37.76~~ NA	0	~~37.76~~ NA	3.07	Data Collected Using
	0.05	↓	↓	↓	3.03	Hermit Environmental Data
	0.15				3.00	Logger, Model SE1000B.
	0.25				2.98	
	0.45				2.96	Only Data Used For
	0.95				2.93	Graphing Purposes is
	1.95				2.90	Listed. Additional
	4.95				2.83	Data was Recorded
	9.95				2.73	by the Instrument.
	19.95				2.56	
	29.95				2.37	
	35.95				2.29	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET — NUS CORPORATION

PROJECT NAME: Kellogg-Deering — WELL/BORING NO.: K9B

PROJECT NO.: L670 — GEOLOGIST: Don Blackert

WELL DIAMETER: 6" — SCREEN LENGTH/DEPTH: Open borehole Saturated 0.51 to 28.29 — TEST NO.: 1

STATIC WATER LEVEL (Depth/Elevation): 26.97 / 44.32 — DATE: 6/9/88

TEST TYPE (Rising/Falling/Constant Head): Falling Head — CHECKED: JPO 7/8/88

METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug — PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1150	0.00 Min	~~26.97~~ NA	0	~~26.97~~ NA	1.09	Data Collected Using
	0.10				0.91	Hermit Environmental Data
	0.20				0.85	Logger, Model SE1000B.
	0.30				0.81	
	0.55				0.72	Only Data Used For
	0.80				0.66	Graphing Purposes is
	1.30				0.56	Listed. Additional
	1.80				0.48	Data was Recorded
	2.47				0.39	by the Instrument.
	3.47				0.31	
	4.47				0.24	
	5.47				0.19	
	7.47				0.12	
	9.47				0.08	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET **NUS CORPORATION**

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K9 B

PROJECT NO.: L670 GEOLOGIST: Don Blackert

WELL DIAMETER: 6" SCREEN LENGTH/DEPTH: Open borehole Saturated 0.51 to 28.29 TEST NO.: 2

STATIC WATER LEVEL (Depth/Elevation): 26.97 / 44.32 DATE: 6/9/88

TEST TYPE (Rising/Falling/Constant Head): Rising Head CHECKED:

METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1217	0.00 min	26.97	0	26.97	0.79	Data Collected Using
	0.14				0.71	Hermit Environmental Data
	0.24				0.68	Logger, Model SE1000B.
	0.64				0.59	
	1.14				0.51	Only Data Used For
	1.64				0.45	Graphing Purposes is
	2.47				0.37	Listed. Additional
	3.47				0.29	Data was Recorded
	4.47				0.23	by the Instrument.
	5.97				0.17	
	8.47				0.10	
	11.97				0.05	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET — **NUS CORPORATION**

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K21
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 2
STATIC WATER LEVEL (Depth/Elevation): 33.47 / 36.93 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Rising Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1832	0.00 Min	~~33.47~~ NA	0	~~33.47~~ NA	2.74	Data Collected Using
	0.01	↓	↓	↓	2.52	Hermit Environmental Data
	0.03				2.05	Logger, Model SE1000B.
	0.08				1.17	
	0.13				0.62	Only Data Used For
	0.18				0.31	Graphing Purposes is
	0.23				0.14	Listed. Additional
	0.28				0.06	Data was Recorded
						by the Instrument.

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET — **NUS CORPORATION**

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K20A
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: TEST NO.: 2
STATIC WATER LEVEL (Depth/Elevation): 20.92 / 45.10 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Falling Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1200	0.00 Min	~~20.92~~ NA	0	~~20.92~~ NA	2.20	Data Collected Using
	0.05				2.04	Hermit Environmental Data
	0.10				1.91	Logger, Model SE1000B.
	0.15				1.79	
	0.20				1.69	Only Data Used For
	0.40				1.35	Graphing Purposes is
	0.65				1.03	Listed. Additional
	0.90				0.79	Data was Recorded
	1.15				0.61	by the Instrument.
	~~1.15~~ 1.40 JPO				0.48	
	1.65				0.37	
	1.90				0.29	
	2.40				0.18	
	2.90				0.12	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET **NUS CORPORATION**

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K20A
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 10' TEST NO.: 1
STATIC WATER LEVEL (Depth/Elevation): 20.92 / 45.10 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Rising Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1313	0.00 Min.	~~20.92~~ NA	0	~~20.92~~ NA	2.75	Data Collected Using
	0.04				2.47	Hermit Environmental Data
	0.09				2.27	Logger, Model SE1000B.
	0.14				2.12	
	0.19				1.99	Only Data Used For
	0.24				1.87	Graphing Purposes is
	0.29				1.76	Listed. Additional
	0.64				1.20	Data was Recorded
	0.97				0.85	by the Instrument.
	1.14				0.71	
	1.39				0.55	
	1.64				0.43	
	1.97				0.30	
	2.97				0.11	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET — **NUS CORPORATION**

PROJECT NAME: Kellogg-Deering — WELL/BORING NO.: K23A
PROJECT NO.: L670 — GEOLOGIST: Don Blackert
WELL DIAMETER: 2" — SCREEN LENGTH/DEPTH: 2.17' Below SWL — TEST NO.: 2
STATIC WATER LEVEL (Depth/Elevation): 31.33 / 37.67 — DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Rising Head — CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug — PAGE 1 OF 1

TIME	ELAPSED TIME (min. or sec.)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
2007	0.00 Min	~~31.33~~ NA	0	~~31.33~~ NA	1.68	Data Collected Using
	0.01				1.46	Hermit Environmental Data
	0.03				1.26	Logger, Model SE1000B
	0.08				0.92	
	0.13				0.69	Only Data Points Used
	0.18				0.52	For Graphing Purposes are
	0.23				0.38	shown. Additional Data
	0.28				0.29	was Recorded by the
	0.48				0.11	Instrument.
	0.73				0.05	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET	NUS CORPORATION

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K23A
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 2.17' Below SWL TEST NO.: 1
STATIC WATER LEVEL (Depth/Elevation): 31.33 / 37.67 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Rising Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min. or sec.)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1951	0.00 Min.	NA ~~31.33~~	0	NA ~~31.33~~	1.77	Data Collected Using
	0.01				1.48	Hermit Environmental Data
	0.03				1.26	Logger, Model SE1000B
	0.08				0.94	
	0.13				0.71	Only Data Used For
	0.18				0.54	Graphing Purposes is
	0.23				0.40	Listed. Additional
	0.28				0.30	Data Was Recorded By
	0.48				0.12	the Instrument
	0.73				0.05	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET	NUS CORPORATION

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K20C
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 3.87' Below SWL TEST NO.: 2
STATIC WATER LEVEL (Depth/Elevation): 22.33 / 145.61 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Rising Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min. or sec.)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1155	0.00 Min.	~~22.33~~ NA	0	~~22.33~~ NA	1.87	Data Collected Using
	0.01	↓	↓	↓	1.77	Hermit Environmental Data
	0.05				1.53	Logger, Model SE1000B
	0.10				1.34	
	0.15				1.18	Only Data Used For
	0.20				1.04	Graphing Purposes is
	0.25				0.91	Listed. Additional
	0.30				0.81	Data Was Recorded by
	0.40				0.63	the Instrument
	0.57				0.44	
	0.65				0.36	

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET	NUS CORPORATION

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K20C
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 3.87' Below SWL TEST NO.: 1
STATIC WATER LEVEL (Depth/Elevation): 22.33 145.61 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Rising Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min. or sec.)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1245	0.00 min	~~22.33~~ NA	0	~~22.33~~ NA	1.96	Data Collected Using
	0.01	↓	↓	↓	1.78	Hermit Environmental Data
	0.02				1.66	Logger, Model SE1000B
	0.07				1.33	
	0.12				1.12	Only Data Used For
	0.17				0.95	Graphing Purposes is
	0.22				0.82	Listed. Additional
	0.32				0.60	Data Was Recorded by
						the Instrument

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET — **NUS CORPORATION**

PROJECT NAME: Kellogg-Deering WELL/BORING NO.: K19A
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 4.13' Below SWL TEST NO.: 2
STATIC WATER LEVEL (Depth/Elevation): 12.27 / 67.70 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Rising Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1450	0.00m	~~12.27~~ NA	0	~~12.27~~ NA	1.93	Data Collected Using
	0.01				1.76	Hermit Environmental Data
	0.02				1.62	Logger, Model SE1000B
	0.06				1.18	
	0.11				0.75	Only Data Used For
	0.16				0.45	Graphing Purposes is
	0.21				0.25	Listed. Additional
	0.26				0.14	Data Was Recorded by
	0.31				0.07	the Instrument

HYDRAULIC CONDUCTIVITY TESTING DATA SHEET — **NUS CORPORATION**

PROJECT NAME: Kellogg - Deering WELL/BORING NO.: K19A
PROJECT NO.: L670 GEOLOGIST: Don Blackert
WELL DIAMETER: 2" SCREEN LENGTH/DEPTH: 4.13' Below SWL TEST NO.: 1
STATIC WATER LEVEL (Depth/Elevation): 12.27 / 67.70 DATE: 6/8/88
TEST TYPE (Rising/Falling/Constant Head): Rising Head CHECKED: JPO 7/11/88
METHOD OF INDUCING WATER LEVEL CHANGE: Solid Slug PAGE 1 OF 1

TIME	ELAPSED TIME (min or sec)	MEASURED DEPTH TO WATER (ft.)	CORRECTION	DEPTH TO WATER (ft.)	DRAWDOWN OR HEAD (ft.)	REMARKS
1453	0 min.	~~12.27~~ NA	0	~~12.27~~ NA	2.10	Data collected using
	0.01				1.82	Hermit Environmental
	0.02				1.70	Data logger Model
	0.06				1.26	SE 1000B
	0.11				0.83	
	0.16				0.52	Only Data Points Used
	0.21				0.31	For Graphing Purposes
	0.26				0.18	is listed. Additional
	0.31				0.10	Data Was Recorded by
						the Instrument

SE10008
Environmental Logger
06/14 14:25

Unit# 00000 Test# 9

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.04
Offset	0.00

K9B Rising Head

Step# 1 06/09 12:17

Elapsed Time	Value
0.0000	- 0.41
0.0033	- 0.17
0.0066	- 0.35
0.0099	- 0.50
0.0133	- 0.66
0.0166	- 0.74
0.0200	- 0.79
0.0233	- 0.78
0.0266	- 0.79
0.0300	- 0.77
0.0333	- 0.77
0.0500	- 0.75
0.0666	- 0.75
0.0833	- 0.74
0.1000	- 0.73
0.1166	- 0.72
0.1333	- 0.72
0.1500	- 0.71
0.1666	- 0.71
0.1833	- 0.70
0.2000	- 0.69
0.2166	- 0.69
0.2333	- 0.69
0.2500	- 0.68
0.2666	- 0.68
0.2833	- 0.67
0.3000	- 0.67
0.3166	- 0.66
0.3333	- 0.66
0.4167	- 0.64
0.5000	- 0.62
0.5833	- 0.61
0.6667	- 0.59
0.7500	- 0.57
0.8333	- 0.56
0.9167	- 0.55
1.0000	- 0.53
1.0833	- 0.52
1.1667	- 0.51
1.2500	- 0.50
1.3333	- 0.49
1.4166	- 0.48
1.5000	- 0.47
1.5833	- 0.46
1.6667	- 0.45
1.7500	- 0.44
1.8333	- 0.43

2.0000	- 0.42
2.5000	- 0.37
3.0000	- 0.32
3.5000	- 0.29
4.0000	- 0.26
4.5000	- 0.23
5.0000	- 0.21
5.5000	- 0.19
6.0000	- 0.17
6.5000	- 0.15
7.0000	- 0.14
7.5000	- 0.13
8.0000	- 0.12
8.5000	- 0.10
9.0000	- 0.09
9.5000	- 0.09
10.0000	- 0.07
12.0000	- 0.05

END

SE10006
Environmental Logger
06/14 14:22

Unit# 00000 Test# 9

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.04
Offset	0.00

Step# 0 06/05 11:50

K 19 B Falling Head

Elapsed Time	Value
0.0000	1.37
0.0033	- 0.11
0.0066	0.52
0.0099	1.01
0.0133	0.96
0.0166	1.04
0.0200	0.92
0.0233	1.00
0.0266	1.04
0.0300	1.07
0.0333	1.09
0.0500	1.06
0.0666	0.95
0.0833	0.94
0.1000	0.93
0.1166	0.92
0.1333	0.91
0.1500	0.90
0.1666	0.82
0.1833	0.88
0.2000	0.86
0.2166	0.86
0.2333	0.85
0.2500	0.84
0.2666	0.83
0.2833	0.82
0.3000	0.82
0.3166	0.81
0.3333	0.81
0.4167	0.77
0.5000	0.75
0.5833	0.72
0.6667	0.70
0.7500	0.68
0.8333	0.66
0.9167	0.64
1.0000	0.62
1.0833	0.60
1.1667	0.59
1.2500	0.57
1.3333	0.56
1.4166	0.54
1.5000	0.52
1.5833	0.51
1.6667	0.50
1.7500	0.49
1.8333	0.48

2.0000	0.45
2.5000	0.39
3.0000	0.35
3.5000	0.31
4.0000	0.27
4.5000	0.24
5.0000	0.21
5.5000	0.19
6.0000	0.17
6.5000	0.15
7.0000	0.14
7.5000	0.12
8.0000	0.11
8.5000	0.10
9.0000	0.09
9.5000	0.08
10.0000	0.08
12.0000	0.06
14.0000	0.04
16.0000	0.03
18.0000	0.02
20.0000	0.02
22.0000	0.02
24.0000	0.01
26.0000	0.01

END

SE10006
Environmental Logger
06/14 14:21

Unit# 00000 Test# 6

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.04
Offset	0.00

Step# 1 06/09 11:09

KGB Rising Head

Elapsed Time		Value
0.0000		0.00
0.0033	-	0.50
0.0066	-	0.55
0.0099	-	0.00
0.0133	-	0.55
0.0166	-	1.01
0.0200	-	0.32
0.0233	-	1.20
0.0266	-	0.72
0.0300	-	0.79
0.0333	-	0.96
0.0500	-	0.86
0.0666	-	0.84
0.0833	-	0.81
0.1000	-	0.78
0.1166	-	0.75
0.1333	-	0.73
0.1500	-	0.71
0.1666	-	0.69
0.1833	-	0.67
0.2000	-	0.65
0.2166	-	0.63
0.2333	-	0.62
0.2500	-	0.60
0.2666	-	0.58
0.2833	-	0.57
0.3000	-	0.56
0.3166	-	0.54
0.3333	-	0.53
0.4167	-	0.46
0.5000	-	0.42
0.5833	-	0.37
0.6667	-	0.33
0.7500	-	0.30
0.8333	-	0.26
0.9167	-	0.24
1.0000	-	0.22
1.0833	-	0.19
1.1667	-	0.18
1.2500	-	0.16
1.3333	-	0.14
1.4166	-	0.13
1.5000	-	0.12
1.5833	-	0.11
1.6667	-	0.10
1.7500	-	0.09
1.8[illegible]	-	0.0[illegible]

2.0000	-0.06
2.5000	-0.03
3.0000	-0.02
3.5000	-0.00
4.0000	-0.00
4.5000	0.00
5.0000	0.00
5.5000	0.00
6.0000	0.00
6.5000	0.00
7.0000	0.00
7.5000	0.01
8.0000	0.00
8.5000	0.00
9.0000	0.00
9.5000	0.00
10.0000	0.00

END

SE1000G
Environmental Logger
06/14 14:15

Unit# 00000 Test# 6

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.04
Offset	0.00

Step# 0 06/09 10:52

KGB Falling Head

Elapsed Time	Value
0.0000	0.00
0.0033	0.00
0.0066	0.00
0.0099	0.33
0.0133	0.63
0.0166	0.73
0.0200	0.62
0.0233	1.22
0.0266	1.15
0.0300	1.10
0.0333	1.06
0.0500	1.02
0.0666	0.95
0.0633	0.91
0.1000	0.90
0.1166	0.65
0.1333	0.66
0.1500	0.74
0.1666	0.76
0.1633	0.75
0.2000	0.72
0.2166	0.69
0.2333	0.66
0.2500	0.66
0.2666	0.64
0.2633	0.62
0.3000	0.61
0.3166	0.59
0.3333	0.57
0.4167	0.50
0.5000	0.45
0.5633	0.44
0.6667	0.36
0.7500	0.34
0.6333	0.30
0.5167	0.27
1.0000	0.24
1.0633	0.21
1.1667	0.19
1.2500	0.16
1.3333	0.16
1.4166	0.14
1.5000	0.13
1.5633	0.12
1.6667	0.11
1.7500	0.10
1.6333	0.09

2.0000	0.07
2.5000	0.05
3.0000	0.03
3.5000	0.02
4.0000	0.02
4.5000	0.01
5.0000	0.01
5.5000	0.01
6.0000	0.01
6.5000	0.01
7.0000	0.01
7.5000	0.01
8.0000	0.01
8.5000	0.01
9.0000	0.01
9.5000	0.01
10.0000	0.01
12.0000	0.01
14.0000	0.01
16.0000	0.01

END

SE10006
Environmental Logger
06/14 14:17

Unit# 00000 Test# 7

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.04
Offset	0.00

Step# 1 06/06 20:07

K23A Rising Head

Elapsed Time	Value
0.0000	- 2.27
0.0033	- 2.06
0.0066	- 1.96
0.0099	- 0.86
0.0133	- 0.79
0.0166	- 1.46
0.0200	- 1.66
0.0233	- 1.57
0.0266	- 1.51
0.0300	- 1.46
0.0333	- 1.41
0.0500	- 1.26
0.0666	- 1.11
0.0833	- 1.02
0.1000	- 0.92
0.1166	- 0.84
0.1333	- 0.76
0.1500	- 0.68
0.1666	- 0.63
0.1833	- 0.57
0.2000	- 0.52
0.2166	- 0.47
0.2333	- 0.43
0.2500	- 0.38
0.2666	- 0.35
0.2833	- 0.32
0.3000	- 0.29
0.3166	- 0.26
0.3333	- 0.24
0.4167	- 0.15
0.5000	- 0.11
0.5833	- 0.08
0.6667	- 0.06
0.7500	- 0.05
0.8333	- 0.04
0.9167	- 0.03
1.0000	- 0.02
1.0833	- 0.02
1.1667	- 0.01
1.2500	- 0.01
1.3333	- 0.01
1.4166	- 0.00
1.5000	- 0.00
1.5833	- 0.00
1.6667	- 0.00
1.7500	- 0.00
1.8333	- 0.00

SE1000B
Environmental Logger
06/14 14:16

Unit# 00000 Test# 7

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.04
Offset	0.00

Step 0 06/06 19:51

~~K23B~~
K23A Rising Head

Elapsed Time	Value
0.0000	- 0.51
0.0033	- 1.97
0.0066	- 1.99
0.0099	- 0.25
0.0133	- 0.93
0.0166	- 1.22
0.0200	- 1.77
0.0233	- 1.61
0.0266	- 1.54
0.0300	- 1.46
0.0333	- 1.44
0.0500	- 1.26
0.0666	- 1.14
0.0833	- 1.04
0.1000	- 0.94
0.1166	- 0.85
0.1333	- 0.76
0.1500	- 0.71
0.1666	- 0.65
0.1833	- 0.59
0.2000	- 0.54
0.2166	- 0.48
0.2333	- 0.44
0.2500	- 0.40
0.2666	- 0.36
0.2833	- 0.32
0.3000	- 0.30
0.3166	- 0.27
0.3333	- 0.25
0.4167	- 0.16
0.5000	- 0.12
0.5833	- 0.06
0.6667	- 0.07
0.7500	- 0.05
0.8333	- 0.04
0.9167	- 0.03
1.0000	- 0.03
1.0833	- 0.02
1.1667	- 0.02
1.2500	- 0.02
1.3333	- 0.01
1.4166	- 0.01
1.5000	- 0.01
1.5833	- 0.01
1.6667	- 0.01
1.7500	- 0.01
1.8333	- 0.01

2.0000	-0.01
2.5000	-0.01
3.0000	-0.01
3.5000	-0.01
4.0000	-0.01
4.5000	-0.01
5.0000	-0.01
5.5000	-0.01
6.0000	-0.01
6.5000	-0.01
7.0000	-0.01
7.5000	-0.01
8.0000	-0.01
8.5000	-0.01
9.0000	-0.01
9.5000	-0.01
10.0000	-0.01
12.0000	-0.01
14.0000	0.02
16.0000	0.01

END

SE1000B
Environmental Logger
06/14 14:13

Unit# 00000 Test# 5

INPUT 1: Level (F)

Reference 0.00
Scale factor 10.04
Offset 0.00

Step# 0 06/08 16:43

K24 Falling Head

Elapsed Time	Value
0.0000	- 1.64
0.0033	- 3.66
0.0066	- 4.27
0.0099	- 0.74
0.0133	- 1.86
0.0166	- 2.13
0.0200	- 2.97
0.0233	- 3.15
0.0266	- 3.13
0.0300	- 3.14
0.0333	- 3.13
0.0500	- 3.07
0.0666	- 3.05
0.0833	- 3.03
0.1000	- 3.03
0.1166	- 3.02
0.1333	- 3.02
0.1500	- 3.01
0.1666	- 3.00
0.1833	- 3.00
0.2000	- 3.00
0.2166	- 2.99
0.2333	- 2.99
0.2500	- 2.99
0.2666	- 2.96
0.2833	- 2.98
0.3000	- 2.96
0.3166	- 2.97
0.3333	- 2.97
0.4167	- 2.96
0.5000	- 2.96
0.5833	- 2.95
0.6667	- 2.93
0.7500	- 2.94
0.8333	- 2.93
0.9167	- 2.93
1.0000	- 2.93
1.0833	- 2.92
1.1667	- 2.92
1.2500	- 2.92
1.3333	- 2.91
1.4166	- 2.91
1.5000	- 2.91
1.5833	- 2.91
1.6667	- 2.90
1.7500	- 2.90
1.8333	- 2.90

2.0000	- 2.90
2.5000	- 2.88
3.0000	- 2.87
3.5000	- 2.86
4.0000	- 2.85
4.5000	- 2.84
5.0000	- 2.83
5.5000	- 2.82
6.0000	- 2.81
6.5000	- 2.80
7.0000	- 2.79
7.5000	- 2.78
8.0000	- 2.77
8.5000	- 2.76
9.0000	- 2.75
9.5000	- 2.74
10.0000	- 2.73
12.0000	- 2.70
14.0000	- 2.66
16.0000	- 2.63
18.0000	- 2.59
20.0000	- 2.56
22.0000	- 2.52
24.0000	- 2.49
26.0000	- 2.43
28.0000	- 2.39
30.0000	- 2.37
32.0000	- 2.34
34.0000	- 2.32
36.0000	- 2.29
38.0000	0.63
40.0000	0.57
42.0000	0.53
44.0000	0.46
46.0000	0.36
48.0000	0.29

END

SE1000B
Environmental Logger
06/14 14:06

Unit# 00000 Test# 4

INPUT 1: Level (F)

Reference 0.00
Scale factor 10.04
Offset 0.00

Step# 0 06/06 15:16

KIBA Falling Head

Elapsed Time	Value
0.0000	- 0.01
0.0033	- 0.01
0.0066	- 0.02
0.0099	- 0.01
0.0133	- 0.00
0.0166	7.50
0.0200	- 0.64
0.0233	7.69
0.0266	2.47
0.0300	4.51
0.0333	3.97
0.0500	2.67
0.0666	2.92
0.0833	2.91
0.1000	2.84
0.1166	3.02
0.1333	3.06
0.1500	2.92
0.1666	2.94
0.1833	2.93
0.2000	2.92
0.2166	2.94
0.2333	2.93
0.2500	2.94
0.2666	2.93
0.2833	2.93
0.3000	2.93
0.3166	2.93
0.3333	2.93
0.4167	2.93
0.5000	2.92
0.5833	2.92
0.6667	2.91
0.7500	2.91
0.8333	2.90
0.9167	2.90
1.0000	2.90
1.0833	2.89
1.1667	2.85
1.2500	2.88
1.3333	2.88
1.4166	2.87
1.5000	2.87
1.5833	2.86
1.6667	2.86
1.7500	2.85
[illegible]	[illegible]

2.0000	2.83
2.5000	2.81
3.0000	2.78
3.5000	2.75
4.0000	2.73
4.5000	2.70
5.0000	2.67
5.5000	2.65
6.0000	2.62
6.5000	2.60
7.0000	2.57
7.5000	2.55
8.0000	2.52
8.5000	2.50
9.0000	2.47
9.5000	2.45
10.0000	2.43
12.0000	2.33
14.0000	2.24
16.0000	2.14
18.0000	2.06
20.0000	1.98
22.0000	1.90
24.0000	1.82
26.0000	1.74
28.0000	1.66
30.0000	1.59
32.0000	1.52
34.0000	1.45
36.0000	1.39
38.0000	1.32
40.0000	1.26

END

SE1000B
Environmental Logger
06/14 14:06

Unit# 00000 Test# 3

INPUT 1: Level (F)

Reference 0.00
Scale factor 10.04
Offset 0.00

Step# 1 06/06 14:44

K19A

Elapsed Time	Value
0.0000	- 9.86
0.0033	- 10.68
0.0066	- 11.36
0.0099	- 11.30
0.0133	- 11.25
0.0166	- 11.20
0.0200	- 11.16
0.0233	- 11.12
0.0266	- 11.07
0.0300	- 11.02
0.0333	- 10.98
0.0500	- 10.75
0.0666	- 10.62
0.0833	- 10.47
0.1000	- 10.33
0.1166	- 10.20
0.1333	- 10.06
0.1500	- 9.99
0.1666	- 9.90
0.1833	- 9.82
0.2000	- 9.75
0.2166	- 9.70
0.2333	- 9.65
0.2500	- 9.62
0.2666	- 9.59
0.2833	- 9.56
0.3000	- 9.54
0.3166	- 9.52
0.3333	- 9.51
0.4167	- 9.47
0.5000	- 9.46
0.5833	- 9.45
0.6667	- 9.45
0.7500	- 9.45
0.8333	- 9.45
0.9167	- 9.45
1.0000	- 9.45
1.0833	- 9.44
1.1667	- 9.44
1.2500	- 9.45
1.3333	- 9.45
1.4166	- 9.45
1.5000	- 9.45
1.5833	- 9.45
1.6667	- 9.45
1.7500	- 9.45
1.8333	- 9.45

See Strip Charts

2.0000 - 9.45

END

SE1000B
Environmental Logger
06/14 14:59

Unit# 00000 Test# 3

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.04
Offset	0.00

Step# 0 06/06 14:31

K19A

Elapsed Time	Value
0.0000	- 13.52
0.0033	- 10.73
0.0066	- 11.55
0.0099	- 11.40
0.0133	- 11.31
0.0166	- 11.27
0.0200	- 11.23
0.0233	- 11.18
0.0266	- 11.14
0.0300	- 11.10
0.0333	- 11.06
0.0500	- 10.87
0.0666	- 10.70
0.0833	- 10.55
0.1000	- 10.41
0.1166	- 10.28
0.1333	- 10.16
0.1500	- 10.06
0.1666	- 9.9[illegible]
0.1833	- 9.89
0.2000	- 9.8[illegible]
0.2166	- 9.7[illegible]
0.2333	- 9.7[illegible]
0.2500	- 9.65
0.2666	- 9.6[illegible]
0.2833	- 9.5[illegible]
0.3000	- 9.5[illegible]
0.3166	- 9.5[illegible]
0.3333	- 9.5[illegible]
0.4167	- 9.[illegible]
0.5000	- 9.[illegible]
0.5833	- 9.[illegible]
0.6667	- 9.[illegible]
0.7500	- 9.[illegible]
0.8333	- 9.4[illegible]
0.9167	- 9.4[illegible]
1.0000	- 9.45
1.0833	- 9.45
1.1667	- 9.45
1.2500	- 9.45
1.3333	- 9.46
1.4166	- 9.45
1.5000	- 9.45
1.5833	- 9.45
1.6667	- 9.45
1.7500	- 9.45
[illegible]	- 9.45

? see strip charts

2.0000	- 9.45
2.5000	- 9.45
3.0000	- 9.45
3.5000	- 9.45
4.0000	- 9.45
4.5000	- 9.45
5.0000	- 9.45
5.5000	- 9.46
6.0000	- 9.45
6.5000	- 9.45
7.0000	- 9.45
7.5000	- 9.45
8.0000	- 9.45
8.5000	- 9.45
9.0000	- 9.45
9.5000	- 9.45
10.0000	- 9.45
12.0000	- 9.40

END

SE10006
Environmental Logger
06/14 13:59

Unit# 00000 Test# 6

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.04
Offset	0.00

Step# 1 06/06 16:32

K21 Rising Head

Elapsed Time	Value
0.0000	- 0.35
0.0033	- 4.95
0.0066	- 2.54
0.0099	- 0.67
0.0133	- 2.16
0.0166	- 2.76
0.0200	- 2.74
0.0233	- 2.66
0.0266	- 2.60
0.0300	- 2.52
0.0333	- 2.44
0.0500	- 2.05
0.0666	- 1.71
0.0833	- 1.42
0.1000	- 1.17
0.1166	- 0.96
0.1333	- 0.76
0.1500	- 0.62
0.1666	- 0.50
0.1833	- 0.39
0.2000	- 0.31
0.2166	- 0.23
0.2333	- 0.19
0.2500	- 0.14
0.2666	- 0.11
0.2833	- 0.08
0.3000	- 0.06
0.3166	- 0.05
0.3333	- 0.04
0.4167	- 0.01
0.5000	- 0.01
0.5833	- 0.01
0.6667	- 0.00
0.7500	- 0.00
0.8333	- 0.00
0.9167	- 0.00
1.0000	- 0.00
1.0833	- 0.00
1.1667	- 0.00
1.2500	- 0.00
1.3333	- 0.00
1.4166	- 0.00
1.5000	- 0.00
1.5833	- 0.00
1.6667	- 0.00
1.7500	- 0.00
1.8333	- 0.00

2.0000	0.00
2.5000	0.00
3.0000	0.00
3.5000	0.00
4.0000	0.00

END

SE1000B
Environmental Logger
06/14 13:45

Unit# 00000 Test# 1

INPUT 1: Level (F)

Reference 0.00
Scale factor 10.04
Offset 0.00

Step# 1 06/06 11:55

20 c Rising Head

Elapsed Time	Value
0.0000	- 0.96
0.0033	- 1.63
0.0066	- 1.99
0.0099	- 1.99
0.0133	- 1.95
0.0166	- 1.67
0.0200	- 1.63
0.0233	- 1.60
0.0266	- 1.77
0.0300	- 1.75
0.0333	- 1.72
0.0500	- 1.62
0.0666	- 1.53
0.0833	- 1.47
0.1000	- 1.40
0.1166	- 1.34
0.1333	- 1.26
0.1500	- 1.23
0.1666	- 1.16
0.1633	- 1.13
0.2000	- 1.06
0.2166	- 1.04
0.2333	- 0.99
0.2500	- 0.95
0.2666	- 0.91
0.2633	- 0.86
0.3000	- 0.84
0.3166	- 0.81
0.3333	- 0.77
0.4167	- 0.63
0.5000	- 0.52
0.5833	- 0.44
0.6667	- 0.36
0.7500	- 0.33
0.8333	- 0.30
0.9167	- 0.27
1.0000	- 0.25
1.0633	- 0.23
1.1667	- 0.22
1.2500	- 0.21
1.3333	- 0.21
1.4166	- 0.20
1.5000	- 0.20
1.5833	- 0.20
1.6667	- 0.20
1.7500	- 0.20
1.8333	- 0.20

```
 2.0000     - 0.20
 2.5000     - 0.20
 3.0000     - 0.20
 3.5000     - 0.20
 4.0000     - 0.20
END
```

SE1000B
Environmental Logger
06/14 13:53

Unit# 00000 Test# 6

INPUT 1: Level (F)

Reference 0.00
Scale factor 10.04
Offset 0.00

Step# 0 06/06 16:19

R21 Falling Head

Elapsed Time	Value
0.0000	0.00
0.0033	0.62
0.0066	3.15
0.0099	4.57
0.0133	4.46
0.0166	2.12
0.0200	3.05
0.0233	2.40
0.0266	0.95
0.0300	1.51
0.0333	2.44
0.0500	1.92
0.0666	1.56
0.0833	1.34
0.1000	1.11
0.1166	0.91
0.1333	0.75
0.1500	0.61
0.1666	0.50
0.1833	0.40
0.2000	0.32
0.2166	0.25
0.2333	0.20
0.2500	0.16
0.2666	0.12
0.2833	0.10
0.3000	0.06
0.3166	0.06
0.3333	0.05
0.4167	0.03
0.5000	0.03
0.5833	0.02
0.6667	0.02
0.7500	0.02
0.8333	0.02
0.9167	0.02
1.0000	0.01
1.0833	0.01
1.1667	0.01
1.2500	0.01
1.3333	0.01
1.4166	0.01
1.5000	0.01
1.5833	0.01
1.6667	0.01
1.7500	0.01
[illegible]	0.01

2.0000	0.01
2.5000	0.01
3.0000	0.02
3.5000	0.00
4.0000	0.00
4.5000	0.00
5.0000	0.00
5.5000	0.00
6.0000	0.00
6.5000	0.00
7.0000	0.00
7.5000	0.00
8.0000	0.00
8.5000	0.00
9.0000	0.00
9.5000	0.00
10.0000	0.00
12.0000	0.00

END

SE1000B
Environmental Logger
06/14 13:43

Unit# 00000 Test# 1

INPUT 1: Level (F)

Reference 0.00
Scale factor 10.04
Offset 0.00

Step# 0 06/06 11:40

20 c Rising Head

Elapsed Time	Value
0.0000	- 2.77
0.0033	- 2.30
0.0066	- 0.52
0.0099	- 2.11
0.0133	- 1.56
0.0166	- 1.67
0.0200	- 1.76
0.0233	- 1.76
0.0266	- 1.73
0.0300	- 1.70
0.0333	- 1.66
0.0500	- 1.52
0.0666	- 1.42
0.0833	- 1.33
0.1000	- 1.25
0.1166	- 1.18
0.1333	- 1.12
0.1500	- 1.06
0.1666	- 1.00
0.1833	- 0.95
0.2000	- 0.90
0.2166	- 0.86
0.2333	- 0.82
0.2500	- 0.77
0.2666	- 0.74
0.2833	- 0.70
0.3000	- 0.66
0.3166	- 0.63
0.3333	- 0.60
0.4167	- 0.47
0.5000	- 0.36
0.5833	- 0.31
0.6667	- 0.26
0.7500	- 0.23
0.8333	- 0.21
0.9167	- 0.19
1.0000	- 0.18
1.0833	- 0.18
1.1667	- 0.17
1.2500	- 0.18
1.3333	- 0.17
1.4166	- 0.17
1.5000	- 0.17
1.5833	- 0.17
1.6667	- 0.17
1.7500	- 0.17
1.8333	- 0.17

2.0000	- 0.17
2.5000	- 0.17
3.0000	- 0.17
3.5000	- 0.18
4.0000	- 0.16
4.5000	- 0.16
5.0000	- 0.16
5.5000	- 0.19
6.0000	- 0.19
6.5000	- 0.16
7.0000	- 0.16
7.5000	- 0.16
8.0000	- 0.16
8.5000	- 0.16
9.0000	- 0.19
9.5000	- 0.19
10.0000	- 0.16
12.0000	- 0.19
14.0000	0.00

END

SE1000C
Environmental Logger
06/14 12:41

Unit# 00000 Test# 0

INPUT 1: Level (F)

Reference 0.00
Scale factor 10.04
Offset 0.00

K20A Falling Head

Step# 1 06/06 11:06

Elapsed Time	Value
0.0000	- 2.34
0.0033	- 1.67
0.0066	- 1.55
0.0099	- 1.89
0.0133	- 2.36
0.0166	- 2.81
0.0200	- 2.75
0.0233	- 2.77
0.0266	- 2.75
0.0300	- 2.71
0.0333	- 2.67
0.0500	- 2.55
0.0666	- 2.47
0.0833	- 2.39
0.1000	- 2.33
0.1166	- 2.27
0.1333	- 2.22
0.1500	- 2.17
0.1666	- 2.12
0.1833	- 2.07
0.2000	- 2.03
0.2166	- 1.99
0.2333	- 1.95
0.2500	- 1.91
0.2666	- 1.87
0.2833	- 1.83
0.3000	- 1.80
0.3166	- 1.76
0.3333	- 1.73
0.4167	- 1.57
0.5000	- 1.44
0.5833	- 1.32
0.6667	- 1.20
0.7500	- 1.10
0.8333	- 1.01
0.9167	- 0.92
1.0000	- 0.85
1.0833	- 0.78
1.1667	- 0.71
1.2500	- 0.65
1.3333	- 0.60
1.4166	- 0.55
1.5000	- 0.50
1.5833	- 0.46
1.6667	- 0.42
1.7500	- 0.39
1.8333	- 0.36

2.0000	- 0.30
2.5000	- 0.16
3.0000	- 0.11
3.5000	- 0.06
4.0000	- 0.04
4.5000	- 0.02
5.0000	- 0.01
5.5000	- 0.00
6.0000	0.00
6.5000	0.00
7.0000	0.00
7.5000	0.00
8.0000	0.01
8.5000	0.01
9.0000	0.00
9.5000	0.00
10.0000	0.01

END

SE1000B
Environmental Logger
05/14 13:39

Unit# 00000 Test# 0

INPUT 1: Level (F)

K20A Falling Head

Reference	0.00
Scale factor	10.04
Offset	0.00

Step# 0 05/06 10:54

Elapsed Time	Value
0.0000	1.49
0.0033	1.75
0.0066	2.56
0.0099	1.53
0.0133	2.72
0.0166	3.24
0.0200	3.54
0.0233	3.55
0.0266	3.25
0.0300	1.49
0.0333	1.69
0.0500	2.26
0.0666	2.40
0.0833	2.20
0.1000	2.20
0.1166	2.17
0.1333	2.25
0.1500	2.04
0.1666	1.99
0.1833	1.95
0.2000	1.91
0.2166	1.87
0.2333	1.83
0.2500	1.79
0.2666	1.76
0.2833	1.72
0.3000	1.69
0.3166	1.66
0.3333	1.63
0.4167	1.48
0.5000	1.35
0.5833	1.23
0.6667	1.13
0.7500	1.03
0.8333	0.95
0.9167	0.87
1.0000	0.79
1.0833	0.72
1.1667	0.67
1.2500	0.61
1.3333	0.56
1.4166	0.52
1.5000	0.48
1.5833	0.44
1.6667	0.40
1.7500	0.37
[illegible]	[illegible]

2.0000	0.29
2.5000	0.18
3.0000	0.12
3.5000	0.07
4.0000	0.05
4.5000	0.03
5.0000	0.03
5.5000	0.02
6.0000	0.01
5.5000	0.01
7.0000	0.01
7.5000	0.01
8.0000	0.00
8.5000	0.00
9.0000	0.00
9.5000	0.00
10.0000	0.00

END

KELLOGG-DEERING WELL FIELD
ZELL BUILDING EVALUATION
NORWALK, CT

PREPARED FOR:

MURTHA, CULLINA, RICHTER AND PINNEY

DECEMBER 4, 1987

Dames & Moore
ONE BLUE HILL PLAZA, SUITE 530, PEARL RIVER, NY 10965

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DAMES & MOORE

ONE BLUE HILL PLAZA, STE 530 PEARL RIVER, NEW YORK 10965

December 4, 1987

Mr. Mark R. Sussman
Murtha, Cullina, Richter and Pinney
City Place
P.O. Box 3157
Hartford, CT 06103

Re: Final Report
Pitney Bowes (Zell Building)
Kellogg-Deering Wellfield

Dear Mr. Sussman:

Dames & Moore has been retained by Murtha, Cullina, Richter and Pinney to collect and evaluate data relating to Pitney Bowes Zell Building operations. As you know, Pitney Bowes was recently named as a PRP for the Kellogg-Deering well field contamination in Norwalk, CT by Region I - USEPA.

Enclosed are two (2) copies of our report describing the results of our work at this facility. In summary we find that:

- Pitney Bowes operations at the Zell Building location could not have caused or contributed to TCE contamination at the Kellogg Deering well field; and
- Data were not present in either Region I - USEPA files or CT-DEP files that indicated Pitney Bowes caused or contributed to the problem. Pitney Bowes identification as a PRP was solely based on the speculative comment of HRP Associates in a report prepared for the ELINCO Corp., an adjoining property owner which is also a PRP.

We are prepared to fully support the above conclusions in discussions with Region I-USEPA. Let me know how you wish to proceed.

Sincerely,
Dames & Moore

Robert P. Blauvelt

Robert P. Blauvelt
Associate

cc: Mr. John T. Schmidt
Assistant General Counsel
Pitney Bowes

1.0 INTRODUCTION

The Kellogg-Deering well field is a public water supply ground water system located in southwestern Fairfield County, along the western bank of the Norwalk River in Norwalk, Connecticut (Figure 1). It is owned and operated by the Norwalk First Taxing District and provides between 15 percent and 35 percent of Norwalk's water supply.

In 1975, trichloroethene (TCE), a chlorinated solvent, was discovered in the groundwater of the Kellogg-Deering well field. Based on findings from a study conducted by the Center for Disease Control, the Kellogg-Deering well field became a federal Superfund site (#316) and was placed on the National Priorities List (NPL) in September of 1983.

A Remedial Investigation/Feasibility Study (RI/FS) for the site was completed by an EPA contractor in April, 1986. The RI concluded that the source (s) of TCE was to the east of the well field. The FS evaluated five remedial alternatives including no action (with continued monitoring) as well as several different types of treatment technologies (e.g., air stripping, activated carbon).

In September, 1986 the U.S. Environmental Protection Agency (USEPA) issued a Record of Decision (ROD) selecting air stripping as the cost-effective remedy for the TCE contamination. The air-stripping system became operational at the well field at the end of June, 1987. The cost for installation of the system was estimated to be approximately $400,000, exclusive of RI/FS and enforcement action costs.

1.1 Project Background

Pitney Bowes recently was notified by Region I of the USEPA that a building leased by Pitney Bowes at 276 Main Street in Norwalk (the Zell Building) may have contributed to the well field contamination and that Pitney Bowes was now considered a Potentially Responsible Party (PRP) as described in Section 122 of the Superfund Amendments and Reauthorization Act of 1986.

This notification was based on several speculative comments made in an consulting engineers report (prepared by HRP Associates of New Britain, CT) for the Elinco Corporation, a company located at 272 Main Street, next door to the Pitney Bowes leased building. The Elinco Corporation has a well documented history of TCE releases and also has been named by Region I of the USEPA as a PRP for the Kellogg-Deering site.

1.2 Objectives of the Report

In December, 1986 Dames & Moore was retained by Murtha, Cullina, Richter and Pinney to characterize the types of activities taking place at 276 Main Street and evaluate the potential for the release of TCE and TCE related chemicals from the facility.

Dames & Moore completed project activities in mid-June, 1987. This work had been performed in accordance with the Dames & Moore letter proposal of December 17, 1986 as modified at a meeting with Pitney Bowes corporate staff and outside counsel on April 3, 1987.

This report presents findings and conclusions developed during the course of that work and includes the results of:

- Interviews with key Pitney Bowes technical staff responsible for maintenance and building operations at 276 Main Street between the late 1960's and late 1970's.
- Review of Pitney Bowes internal records and memoranda relating to the purchase and handling of chemicals at 276 Main Street.
- Evaluation of existing structural information and the results of a site reconnaissance of the facility.

Conclusions are presented in Section 4.0 of the Report.

2.0 ZELL BUILDING CHARACTERISTICS

This section of the report provides information on the physiographic setting of the Zell Building, its usage by Pitney Bowes and the past and current waste handling practices utilized at the building.

2.1 Physiographic Setting

The Pitney Bowes leased building at 276 Main Street (the Zell Building) in Norwalk, Connecticut is located in an area dominated by light industrial and commercial establishments. The Zell Building actually consists of two buildings (Figure 2) joined by a common lobby and surrounded by a paved parking area with associated loading docks.

To the east of the Zell Building complex is an elevated bedrock ridge upon which a small housing development has been built. To the south is the manufacturing operation of the Elinco Corporation. Along the Zell Building's northern border is a small undeveloped wooded area and to the west (across Main Street) is a row of small commercial (retail) businesses. The Kellogg-Deering well field is located approximately one half mile to the west of the Zell Building.

Topographically, the site can be divided into two parts: a lower level which contains the buildings and associated service areas and an upper level, approximately 15 feet to 20 feet higher, present along the eastern half of the property which contains most of the parking areas. In both the lower and upper levels, the land slopes west and southwest towards Main Street. Bedrock at the property is close to the ground surface (approximately 5 to 10 feet below grade) and is overlain by glacial till. Till is a heterogeneous mixture of boulders, cobbles, gravel, sand, silt, and clay. Groundwater in the bedrock underlying the Zell Building is assumed to follow regional flow patterns and be moving westward towards the Norwalk River.

2.2 Building Usage

The information presented in this sub-section has been developed by interviews with Pitney Bowes technical staff familiar with operation/history of the Zell Building.

The Zell 1 Building (Figure 2) was built approximately in 1945 by the Zell Products Corporation and was used in the production of metal cosmetic cases and handbag frames. Sometime in 1955, the Zell 2 Building was added apparently to expand production and warehouse capabilities. Zell 1 operated until approximately 1968-1969 and Zell 2 operated until about 1973 or 1974.

The Zell 1 Building contained a depressed floor area in which the Zell Products Corporation conducted its metal plating operation. Open earth trenches were used apparently by the Zell Products Corporation to drain spillage from this operation to an underground conduit which led eventually to the sanitary sewer system. Information is not available about the Zell 2 Building operation.

In 1969, Pitney Bowes leased the Zell 1 Building as a warehouse for the storage of machine parts, plastics and plastics regrindings. Before occupying the building, the depressed floor area and associated trenches were filled with gravel and cement block and capped with concrete. This was done to provide a uniform, level floor. No solvents were stored or used during this phase of building occupancy by Pitney Bowes. No production operations were carried out in this building. This building was used solely as a warehouse for the storage of machine parts, plastics and plastics regrindings.

In 1977, (two years after the discovery of TCE in the Kellogg-Deering well field ground water) the Zell Building was renovated into a combination of office space, plastic storage warehouse and small (5 bench) research and development laboratory.

In 1974 Pitney Bowes occupied the Zell 2 Building with the intention of housing a parts assembly line. However, this assembly line was subsequently moved to Pitney Bowes' Danbury, CT operations and in 1975 the current model shop and engineering offices were installed in the building. Also in 1975, Pitney Bowes constructed a lobby between the two buildings and paved the lobby area. The Zell 2 Building currently acts as the main receiving point for Pitney Bowes' Norwalk operations, a cardboard storage warehouse, a model (prototype) shop and as engineering offices.

2.3 Chemical/Waste Handling Practices

Based on Dames & Moore interviews and the review of internal Pitney Bowes records, only one type of operation involved the use, handling and disposal of chemicals (including solvents) at the Zell Building complex. This was the small research and development laboratory present in the Zell 1 Building.

The research and development laboratory was moved into the Zell 1 Building in 1977, two years after the presence of TCE was detected in the ground water from the Kellogg-Deering well field. Laboratory facilities consist of 4 wet chemistry benches and 1 bench for physical testing. Approximately 6 to 8 employees are assigned to research work in this lab. The laboratory is dedicated to ink research, the testing and development of photo polymers, thermal printing and paper coating products.

Although a wide variety of chemicals have been used in the laboratory, the quantities and handling practices for these chemicals would not be expected to lead to their release into the ground water.

Chemicals used in the laboratory research at the Zell Building have been stored since 1977 in a locked storage room. A flood drain present in this storage room was sealed during Pitney Bowes renovation of the building in 1977 and was still sealed at the time of a Dames & Moore site visit in mid-March, 1987. Typical quantities used in the laboratory range from 1 liter bottles to 20 liter bottles for liquids and between 5 kg and 10 kg packages for solids. Although the types of chemicals have changed over the years as research efforts are redirected, the typical quantities used have remained the same.

In order to demonstrate the consistency of chemical quantities utilized at the Zell Building, a review of Pitney Bowes purchasing records for the Zell Building between 1979 and 1984 was made. During the review of approximately 50,000 purchase orders, those indicating chemicals delivered to the Zell Building were segregated and copied. Table 1 summarizes the data gathered from the review. From this table it can be seen that:

- For the seven year period between 1978 and 1984, approximately 90 gallons of several types of chlorinated solvents were purchased.* This is an average usage rate of approximately 13 gallons a year or about 1 gal a month.

- Typical quantities purchased ranged from 1 pint to 1 gallon. Occasionally a 5 gallon or 10 gallon container was purchased.

- Of these 90 gallons, approximately 56 gallons (one-1 gallon bottle purchased in 1983 and one-55 gallon drum purchased in 1984) were TCE.

From the purchase order records, it is apparent that chemicals were not used in bulk at this facility and that the type of chlorinated solvent usage needed to cause or contribute to the extensive ground water contamination present at the Kellogg-Deering well field was not being done during Pitney Bowes occupancy of the Zell Building. Chlorinated solvents purchased for use at the Zell Building were used up in laboratory experiments. Residual's amounts were either evaporated in hoods or drummed and shipped off-site for disposal.

The amounts of waste generated by the research and development laboratory prior to 1980 are not known. However, more recent waste generation rates would be representative of past activities, as the basic operations and scale of the laboratory has not changed. Approximately one 55 gallon drum of hazardous waste (which would include chlorinated solvents) is removed from the building every three months. Two 55 gallon drums of neutralized aqueous waste (acids) are disposed of every year. These low volumes of wastes are consistent with chemical usage described for the facility.

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* It is chlorinated solvent (TCE) which is the principal contaminant in the Kellogg-Deering well field ground water.

3.0 PATHWAYS EVALUATION

As part of the Dames & Moore characterization of Zell Building activities, an evaluation was made as to potential pathways into the environment for chemicals that may have been released from the facility. Although the information presented in Section 2.0 clearly indicates that laboratory research and development activities would not have resulted in the handling and/or discharge to the environment of quantities of solvents to the ground water of the well field, the facility characterization would not be complete without this type of pathways evaluation.

Information presented in this section has been developed from a site reconnaissance survey, a review of facility engineering drawings and interviews with key Pitney Bowes Zell Building personnel.

3.1 Floor Drains

Prior to Pitney Bowes occupancy of 276 Main Street, floor drains and trenches were used to divert spillage from both metal plating operations and from building bathrooms to the sanitary sewer system. Trenches were filled and sealed before Pitney Bowes occupied the building. After moving into the building, Pitney Bowes piped the building bathrooms to the sanitary sewer and sealed remaining flood drains at the surface. This was done shortly after building occupancy in 1969. Laboratory sink drainage is discharged to the sanitary sewer after passing through a neutralizer trap. Drainage from the building has been directly into the sanitary sewer systems since the early days of Pitney Bowes occupancy.

Figure 2 is a copy of an engineering drawing describing some revisions to plant utilities for the Zell 2 Building. This drawing also provides the following information on the Zell 1 Building drainage system:

- Roof and parking lot/pavement runoff is channeled to the storm sewer system (Location A on Figure 2).

- Subsurface tile drains (apparently used for building dewatering) also are connected to the storm sewer system (Location B on Figure 2).

- The Zell 1 Building is connected to the sanitary sewer system (Location C on Figure 2). This tends to confirm the presence of the previously described drainage patterns.

This drawing does not indicate the presence of floor drains or sumps which are not connected to the sanitary/storm sewer system.

3.2 Other Potential Release Points

The following paragraphs describe other pathways by which chemicals could enter the environment from the Zell Building facility.

Surface Runoff -Pitney Bowes receives and stores its chemicals in a fully enclosed warehouse area. According to several long-term employees no spillage of chemicals has occurred outside the facility.

A site reconnaissance by Dames & Moore has not indicated the presence of areas where spillage may have occurred (i.e. discolored or soft asphalt).

Spillage or breakage in the receiving area would not be environmentally significant because of the small quantities of chemicals typically used at the building (500 ml to 4 liter amounts).

Tanks- Prior to Pitney Bowes occupancy, Zell Products Corporation maintained 1 vertical and 2 horizontal outside above ground tanks. These were removed prior to Pitney Bowes paving of Zell Building property. Pitney Bowes currently has in use one 15K gallon tank for No. 4 fuel oil. No tanks, either above ground or below ground have been used by Pitney Bowes for the storage of disposal of wastes in this building since its occupancy in 1969.

Discharges to Ground-The Zell Building property was paved by Pitney Bowes in 1977. Prior to this paving, long-term Pitney Bowes employees can recall no discharge of waste or waste related materials to the ground at the site. Before paving of the parking lot, there was no Pitney Bowes laboratory in this building. Pitney Bowes operated a storage warehouse at this location.

4.0 CONCLUSIONS

It is Dames & Moore conclusion that based on the information presented in this Report, Pitney Bowes operations at 276 Main Street (Zell Building) could not have been responsible for, or contributed to the ground water contamination detected in the Kellogg-Deering well field.

This conclusion is supported by the following findings:

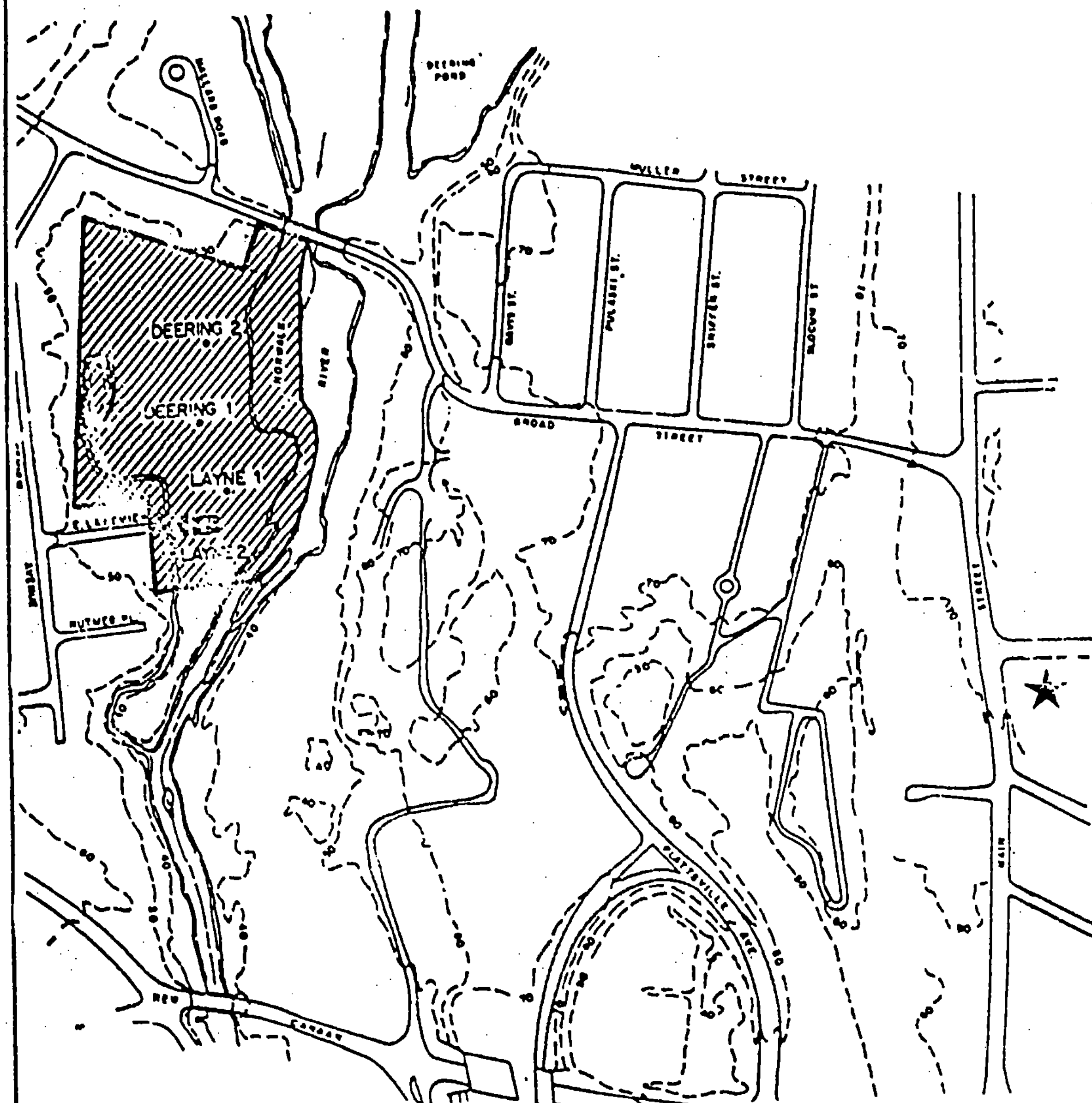
- Operations at the Zell Building since its occupancy by Pitney Bowes have been consistently those of general office and warehouse and a small research and development laboratory;

- The only Pitney Bowes operation at the Zell Building which utilized TCE was a small research and development laboratory established there in 1977, two years after TCE was detected in the Kellogg-Deering well field groundwater;

- Only small quantities of chlorinated solvents (approximately 1 gallon per month) and even smaller quantities of TCE (approximately 56 gallons in 7 years) were used by the Pitney Bowes laboratory in this building;

- Prior to operation of the laboratory, floor drains had been sealed. Laboratory drainage has always been to the sanitary sewer and residual amounts of chlorinated solvents not used up in the experiments were evaporated or drummed and sent off-site for disposal.

SITE LOCATION MAP



KELLOGG-DEERING WELL FIELD

ZELL BUILDING

SCALE: 1" = 400'

Dames & Moore

FIGURE 1

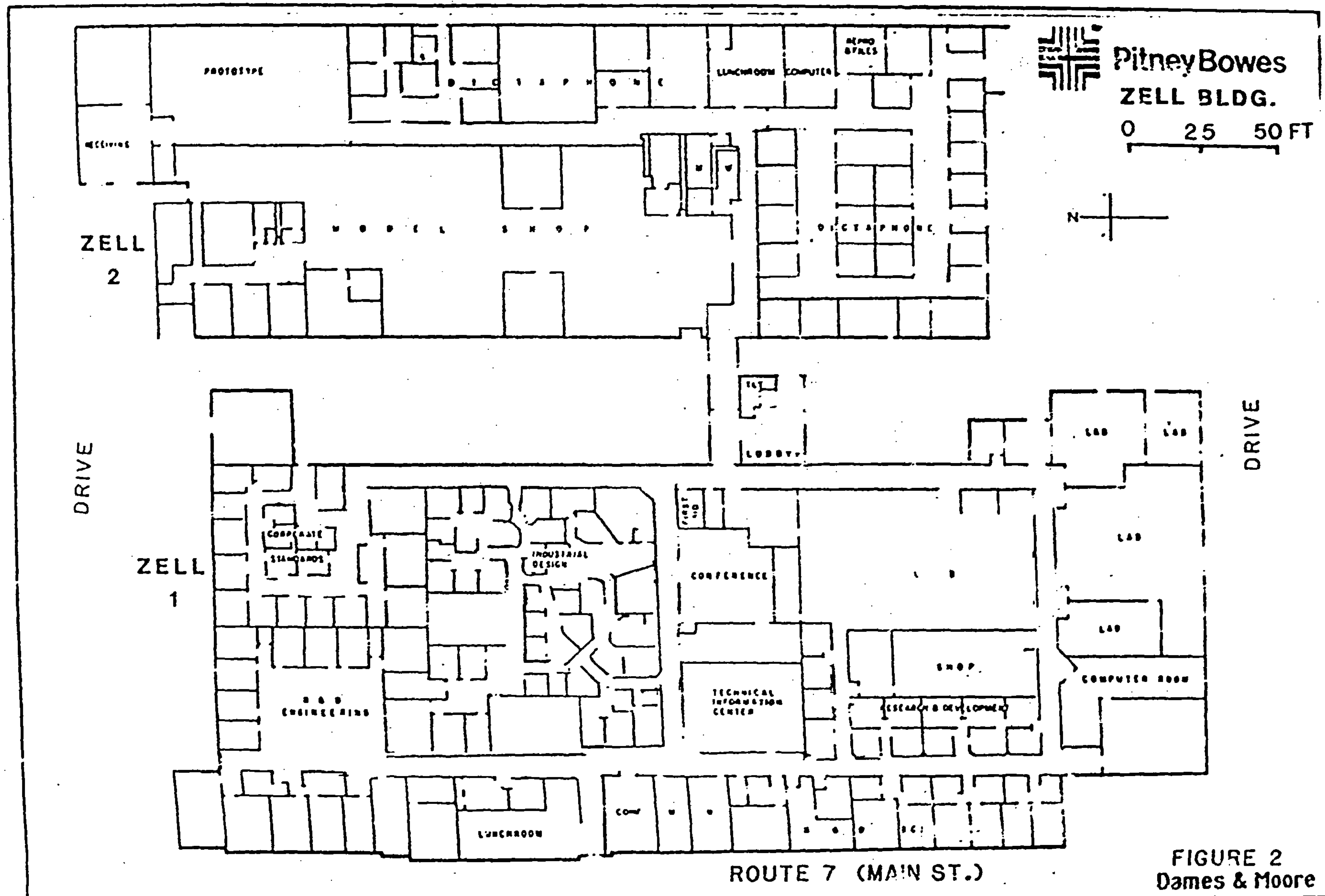


FIGURE 2
Dames & Moore

Table 1

	Quantity	Chemical Name	P. O. #	Date
1	12 qts	8790 micro cleaning solution	79224	3/6/78
2	55 gallon	Perolin	80847	3/21/78
3	2 gal	IPA	80869	3/22/78
4	100 lbs	Tri-7	83264	6/1/78
5	32 pts	Methyl Alcohol, anhydrous	48171	11/22/78
6	4 gal	Acetone AR ACS	12885	2/13/79
7	144 oz	Flux Remover MS-190	18723	4/26/79
8	12 oz	Contact RK-MU MS-24	18723	4/26/79
9	24 oz	Quick Freeze MS-240	18723	4/26/79
10	144 oz	Flux Remover MS-190HD	21765	8/1/79
11	5 gal	Clean-it Solvent	21755	8/6/79
12	288 oz	Flux Cleaner	25166	9/26/79
13	144 oz	Contact Cleaner	25166	9/26/79
14	55 gal	Ethylene Glycol	25247	10/8/79
15	288 oz	Flux Remover	26919	11/8/79
16	288 oz	Flux remover	27397	12/2/79
17	12 kg	Ethylenediamine	28810	1/4/80
18	100 lb	Marion M-50	28813	1/4/80
19	12 kg	N-Butylamine	28810	1/4/80
20	15 gal	Tetrahydrofuran	30958	1/29/80
21	3 pts	DC200 Fluid 100 cs	30990	1/31/80
22	30 gal	7200 Water Boiler Treatment	31208	2/5/80
23	3 kg	Triethylene Gycol	30988	2/6/80
24	25 lb	P-Diethylaminobenzaldehyde a	31275	2/12/80
25	1 kg	2346 Cyclohexylamine	31292	2/13/80
26	100 gm	FX 1300 Polyvinylpyrrolidinen	31531	2/20/80
27	100 gm	Polyvinylpyrrolidinene	31531	2/20/80
28	100 gm	FX 1301 Polyvinylpyrrolidinen	31531	2/20/80
29	5 gal	Methanol	23779	2/28/80
30	15 gal	tetrahydrofuran	32712	2/28/80
31	5 gal	Acetone	23779	2/28/80
32	55 gallons	Perotec 2116	32789	3/5/80
33	12 pts	Acetone	32793	3/10/80
34	500 gm	Methylsulfoxide	32793	3/10/80
35	10 gal	Methylene Chloride	50536	3/16/80 *
36	10 gal	Tetrahydrofuran	50536	3/16/80
37	5 gal	Methyl Ethyl Ketone	33680	3/19/80
38	2 liters	Carbon Disulfide	35170	4/9/80

* Chlorinated Solvent

Table 1 (cont.)

	Quantity	Chemical Name	P. O. #	Date
39	1 gal	Hexane	35170	4/9/80
40	20 gal	Tetrahydrofuran	35169	4/9/80
41	1 pt	Benzaldehyde	35170	4/9/80
42	1 pt	Butyl Alcohol	35170	4/9/80
43	1 gal	Methanol	35170	4/9/80
44	24 kg	Ethylenediamine	370208	5/12/80
45	48 pts	Ethylene Ol Amine	37252	5/27/80
46	25	Tetrahydrofuran	37253	5/28/80
47	100 gm	N-Methylmorpholine	55760	6/26/80
48	1 kg	MCB Ligoine	39512	7/2/80
49	4 pts	MCB Petroleum Ether	39512	7/2/80
50	5 gal	Methyl Ethyl Ketone	39496	7/2/80
51	1 gal	Acetonitrile	39582	7/14/80
52	1 gal	Tetrahydrofuran	39582	7/14/80
53	1 gm	Dimethylindoaniline	39605	7/14/80
54	1 gal	Methanol	39582	7/14/80
55	100 gm	Trifluoropropylsiloxane	39610	7/15/80
56	2 gal	Methyl Ethyl Ketone	56757	7/17/80
57	1 pt	Trichloroethylene	42717	8/1/80 *
58	1 pt	Reagent Alcohol	42717	8/1/80
59	1 kg	Thiodiethanol	40972	8/5/80
60	500 gm	Tetrahydrothiophene	40972	8/5/80
61	500 gm	Hydracrylonitrile	40972	8/5/80
62	4 gal	Methyl Alcohol, Anhydrous	42756	8/9/80
63	2 kg	Methylsulfoxide	41000	8/12/80
64	4 kg	Oxidiethanol	41000	8/12/80
65	1 gal	Toluene	41117	8/12/80
66	1 kg	Triethylene glycol	41000	8/12/80
67	1000 gm	Pyrrolidinone	41117	8/12/80
68	1 gal	Methyl Ethyl Ketone	41117	8/12/80
69	2 gal	Acetonitrile	41238	8/22/80
70	250 gm	Hydroxypropionitrile	41234	8/22/80
71	500 gm	Thiodiethanol	41234	8/22/80
72	2 qts	Propanol-2	41238	8/22/80
73	20 gal	Tetrahydrofuran	41356	8/26/80
74	2 gm	Squarulium dye	41371	8/28/80
75	10 gm	Diethylthiatricarbocyanine	41366	8/28/80
76	5 gm	Quinoline Hydrochloride	41371	8/28/80

* Chlorinated Solvent

Table 1 (cont.)

	Quantity	Chemical Name	P. O. #	Date	
77	1 gal	Acetonitrile	43015	9/3/80	
78	1 gal	Hexane	43015	9/3/80	
79	55 gal	Methyl Ethyl Ketone (MEK)	41500	9/4/80	
80	25 lb.	Diethylaminobenzaldehyde	41387	9/4/80	
81	1 gal	Chloroform, unstabilized	43053	9/15/80	*
82	5 gm	Tetrocyanoquinodimethane	43038	9/15/80	
83	1 gal	Chloroform, stabilized	43053	9/15/80	*
84	500 gm	Hexamethyldisilazane	43642	9/30/80	
85	3 kg	Ethylene diamine	47705	9/30/80	
86	4 qts	Tetrahydrofuran	43823	10/17/80	
87	5 gal	Toluene	43860	10/17/80	
88	20 gal	Tetrahydrofuran	43860	10/17/80	
89	8 qts	Hexane	43823	10/17/80	
90	4 qts	Propanol-2	43823	10/17/80	
91	4 qts	Chloroform, stabilized	43823	10/17/80	*
92	5 gal	Methylene Chloride	43860	10/17/80	*
93	4 qts	Chloroform, unstabilized	43823	10/17/80	*
94	10 gal	Tetrahydrofuran	47766	11/10/80	
95	4 gal	Ethyl alcohol	47799	11/10/80	
96	1 gal	Ethyl Acetate	47799	11/10/80	
97	14 lb.	Fluorinert	47845	11/19/80	
98	14 lb.	Fluorud	47845	11/19/80	
99	500 gm	Ethylhexylamine	48020	12/12/80	
100	530 lb	Perotec #2116	48109	12/23/80	
101	10 gm	Toluene	55769	6/2/81	
102	500 gm	Mercaptoethanol	55769	6/2/81	
103	200 gm	Taurine (amino acid)	55770	6/2/81	
104	500 gm	Sulfanilic Acid	55769	6/2/81	
105	200 gm	Perylenetetracarboxylic	55770	6/2/81	
106	500 ml	Tetrahydrofuryl Alcohol	55769	6/2/81	
107	288 oz	Flux Remover	55797	6/5/81	
108	500 gm	Mesitylene	79106	6/14/81	
109	4 liter	Acetone, Em grade	56575	6/16/81	
110	4 gal	Activator-Versachem	56581	6/18/81	
111	6 lb	TFE #12290-3	56609	6/22/81	
112	288 oz	MSD 190HD	56644	6/29/81	
113	5 gal	Methyl Ethyl Ketone	56677	7/7/81	
114	5 gal	Acetone	56677	7/7/81	

* Chlorinated Solvent

Table 1 (cont.)

	Quantity	Chemical Name	P. O. #	Date	
115	5 gal	IPA	56677	7/7/81	
116	15 gal	Tetrahydrofuran	56677	7/7/81	
117	48 kg.	Toluene, ACS Reagent	56706	7/7/81	
118	288 oz	Flux Remover	56681	7/7/81	
119	50 kg	Dimercaptosuccinic Acid	56718	7/13/81	
120	1 gal	Acetone	56757	7/17/81	
121	1 gal	Toluene	56757	7/17/81	
122	250 gm	Dimethylaminoethanol	5686	8/3/81	
123	250 gm	Tetramethylquanidine	56862	8/3/81	
124	250 gm	Diacetone Acrylamide	56939	8/13/81	
125	500 gm	Hydroxyethyl Methacrylate	56939	8/13/81	
126	4 kg	2,2'-Oxiethanol	56994	8/19/81	
127	1000 gm	N-Methyldiethanolamine	56992	8/19/81	
128	1 liter	Methyl Sulfoxide	56994	8/19/81	
129	1000 gm	Nitrilotriethanol	56994	8/19/81	
130	125 gm	Cobalt Chloride	56994	8/19/81	
131	1500 ml	Tetrahydrofurfuryl Alcohol	56994	8/19/81	
132	3 kg	Iminodiethanol	56994	8/19/81	
133	1000 gm	Triethyleneglycol	56994	8/19/81	
134	3 kg	Aminoethanol	56994	8/19/81	
135	1 liter	Gauss Ferrofluid	59505	9/9/81	
136	4 liters	C-574 Chloroform	59539	9/9/81	*
137	25 gm	D-85 S-Diphenyl Carbazide	59539	9/9/81	
138	4 liter	A-18 Acetone	59539	9/9/81	
139	1 liter	Gauss Ferrofluid	59505	9/9/81	
140	120 oz	Nochromix Cleaning Solution	59585	9/15/81	
141	144 oz	Inhibisol penetone	59622	9/15/81	
142	20 gal	Tetrahydrofuran	59655	9/24/81	
143	4 liters	Octacarbomyldicobalt	59851	10/15/81	
144	10 gal	Methylene Chloride	59829	10/15/81	*
145	1 pt	Chloroform	59909	10/20/81	
146	1 lb	Sodium Hydroxide	59909	10/20/81	
147	1 lb.	Sodium Nitrate crystals	59909	10/20/81	
148	1 lb.	Sodium Hydroxide	59909	10/20/81	
149	500 gms	Thiodiethanol	64325	11/17/81	
150	3 kg	Thiodiethanol	64491	12/17/81	
151	500 gm	Dimethylamine Hydrochloride	64609	1/4/82	
152	2 kg	Triethylamine	64609	1/4/82	

* Chlorinated Solvent

Table 1 (cont.)

	Quantity	Chemical Name	P. O. #	Date	
153	200 gm	Methacrylyl Chloride	64609	1/4/82	
154	200 gm	Acryloyl Chloride	64609	1/4/82	
155	2 liters	Nitric Acid	22304	1/20/82	
156	2 liters	Hydrogen Fluoride CH 30301	22304	1/20/82	
157	6 liters	Acetone	22402	2/2/82	
158	6 liters	Sulfuric Acid	22402	2/2/82	
159	55 gal	Ethylene glycol	22454	2/10/82	
160	144 oz	Flux remover & cleaner	22714	3/9/82	
161	12 oz	Aeroduster	22714	3/9/82	
162	100 gm	Imidazolidinone	22797	3/17/82	
163	10 gms	Methyl-2-Pyrrolidine ethanol	22797	3/17/82	
164	20 gm	Methyl-2-Pyrrolidone 98.5%	22797	3/17/82	
165	3 kg	Methyl-2-Pyrrolidone 98%	22797	3/17/82	
166	20 liters	Compound NU-33, M-16	22880	3/26/82	
167	20 liters	Compound NU-55-M-16	22880	3/26/82	
168	15 lbs	H & H White Flux	23154	5/20/82	
169	55 gal	Kerosene	22637	5/21/82	
170	4 kg	Ethylene Glycol	79106	6/14/82	
171	3 kg	Triethylene Glycol	79106	6/14/82	
172	500 gm	Tetralin	79106	6/14/82	
173	500 gm	Decalin	79106	6/14/82	
174	3 kg	Tetraethylene Glycol	79106	6/14/82	
175	2 liter	Formaldehyde	79145	6/22/82	
176	5 gal	Trichlor 50/d	79145	6/22/82	*
177	5 gal	N-Hexane	79145	6/22/82	
178	2 liter	Petrol Hydrocarbons	79145	6/22/82	
179	100 gm	Hydroxyethyl Acetate	79149	7/2/82	
180	1 kg	Hydroxyponyl Methacrylate	79149	7/2/82	
181	500 gm	Hydroxl-2-Butanone	79149	7/2/82	
182	500 gm	Mesitylene	79149	7/2/82	
183	2 gal	Bestine Solvent and Cleaner	79721	7/12/82	
184	144 oz	Inhibisol Solvent Spray	79800	7/27/82	
185	1 kg	Dimethylaminoethanol	79814	7/30/82	
186	250 gm	Nitrilotriethanol	79814	7/30/82	
187	3 kg	Oxydiethanol	79814	7/30/82	
188	500 gm	Dimethylaminoethanol	79814	7/30/82	
189	500 gm	L-mirodiethanol ?	79814	7/30/82	
190	5 gal	Acetone	79964	8/24/82	

* Chlorinated Solvent

Table 1 (cont.)

	Quantity	Chemical Name	P. O. #	Date	
191	5 gal	Cal-clean	84059	9/14/82	
192	4 gal	Cal-clean	84078	9/14/82	
193	2 gal	Microposit 140 Remover	23239	10/1/82	
194	4 liters	ISO Clear Acetone	23238	10/6/82	
195	1 kg	Vinylmethyldichlorosilane	84277	10/17/82	
196	1 kg	Dimethyl Dichloro Silane	84277	10/17/82	
197	750 gm	Trimethylchlorosilane	84277	10/17/82	
198	1 kg	Tetrachlorosilane	84277	10/17/82	
199	1.5 kg	Methyl dichloro Silane	84277	10/17/82	
200	1 gal	IPA	84974	1/4/83	
201	55 gal	acetone (wash)	10590	3/18/83	
202	55 gal	IPA	10590	3/18/83	
203	384 oz	Inhibisol safety solvent	12043	3/30/83	
204	500 gm	2,2'-Thiodiethanol	89896	4/25/83	
205	192 oz	Inhibisol spray penetone	10758	5/19/83	
206	1 qt	Tetrahydrofuran AR	10790	5/26/83	
207	1 gal	IPA AR	10790	5/26/83	
208	2 pts	Dichloromethane spectrar (Met	10790	5/26/83	*
209	4 liters	Hexanes	10840	6/13/83	
210	4 liters	Ethyl Acetate	10840	6/13/83	
211	500 gm	Vinylmethyldichlorosilane	14127	7/6/83	
212	1000 gm	Dimethyldichlorosilane	14127	7/6/83	
213	500 gm	Dimethyldiethoxysilane	14161	7/19/83	
214	1000 gm	Methyltriethoxysilane	14161	7/19/83	
215	1000 gm	Methyltrimethoxysilane	14161	7/19/83	
216	2 liters	Neutralizer S	14172	7/21/83	
217	48 oz	Freon TF (fluorocarbon)	14172	7/21/83	
218	72 oz	Chlorothene NU	14172	7/21/83	*
219	1 liter	Dimethyl Formamide	14292	9/12/83	
220	1 liter	Dichloromethane Spectral	14292	9/12/83	*
221	4 liters	IPA	14292	9/12/83	
222	1 lb.	Synthesis of N-Methyl-p-tolui	14398	9/23/83	
223	132 oz	Trichlorethane	14398	10/6/83	*
224	10 gal	Tetrahydrofuran	47755	11/6/83	
225	1 gal	Fluorinert liquid	93673	11/28/83	
226	1 gal	Sulfuric Acid	94243	1/20/84	
227	10 gal	Acetone	94454	2/24/84	
228	500 gm	Difluorotetrachloroethane	27252	3/19/84	*

* Chlorinated Solvent

Table 1 (cont.)

	Quantity	Chemical Name	P. O. #	Date
229	1 gallon	Triton X-100 surfactant	27384	7/30/84
230	50 lb. drum	CIA-639	27389	8/2/84
231	50 lb	ON-877	27389	8/2/84
232	50 kg	Polymist B-6	27383	8/2/84
233	100 lbs	RH-730 Aluminum Hydroxide	27386	8/2/84
234	50 lb	Vinol 107 Polyvinyl Alcohol	27382	8/2/84
235	50 lb	BIS-Phenol-A Polycarbonate	32812	9/7/84
236	200 gm	Octadecanamide	32814	9/10/84
237	25 gm	Merthiolate	32835	9/24/84
238	144 oz	Inhibisol solvent spray cleane	33814	10/2/84
239	55 gal	Trichloroethane	94189	10/26/84 *

* Chlorinated Solvent