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Report

REMEDIAL INVESTIGATION

ITT SEALECTRO

December 1994

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List of Abbreviations

ACO	Administrative Order on Consent
ARARs	applicable or relevant and appropriate requirement
ASP	Analytical Services protocol
ASTM	American Society for Testing and Materials
bls	below land surface
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CM	chloromethane
CPP	Citizens Participation Plan
CT	carbon tetrachloride
1,1-DCA	1,1 dichloroethane
1,1-DCE	1,1 dichloroethene
1,2-DCE	1,2 dichloroethene
DCM	dichloromethane
DDT	dichlorodiphenyl trichloroethane
DDB	dodecylbenzene
DDE	dichlorodiphenyl dichloroethylene
DNAPL	dense non-aqueous phase liquid
DQO	Data Quality Objectives
EB	ethylbenzene
FRI	Focused Remedial Investigation
FS	Feasibility Study
FSP	Field Sampling Plan
gpd	gallons per day
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
HEAST	Health Effects Summary Table
HI	Hazard Index
IRIS	Integrated Risk Information System (Database)
IRMs	Interim Remedial Measures
ISAS	*in situ* air stripping
LB&G	Leggette, Brashears & Graham, Inc.
LMS	Linearized Multistage Model
NOAEL	No Observed Adverse Effect Level

NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
PCE	Tetrachloroethene
PEF	Particulate Emission Factor
PID	photoionization detector
ppb	parts per billion
ppm	parts per million
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
RA	Risk Assessment
RFDs	Reference Doses
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
SAP	Sampling and Analysis Plan
SARA	Superfund Amendment Reauthorization Act
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCA	1,1,1 trichlorethane
TCE	trichloroethene
VOC	Volatile Organic Compound

Executive Summary

This Remedial Investigation Report fulfills Section 3 of the Administrative Order of Consent (October 8, 1992) for the former ITT Sealectro, Inc. facility (ITT Sealectro). This facility is located at 139 Hoyt Street in Mamaroneck, New York. The site is identified as Site #360027 on the New York State inactive hazardous waste site list.

The site was operated as an electronics parts manufacturing and assembly facility between 1960 to 1990. Prior to 1960 the site was used for jewelry manufacturing. The site is currently owned by 139 Hoyt Street Associates, however foreclosure action by National Westminster Bank of New York, New York is currently pending. Sealectro Corporation and BICC plc are former owners of the property and owners/operators of the electronics parts manufacturing company. ITT Sealectro, an ITT Components, Inc. company, owned and operated the manufacturing company between 1988 and its closure in 1990.

Prior to entering into the ACO, field investigations and six Interim Remedial Measures (IRMs) were voluntarily completed at the site. The IRMs included underground storage tank removal, soil removal, ground water and product recovery, and *in situ* air stripping of soils. The investigations identified five areas of concern: the Solvent UST Area, the Former Drum Storage Pad Area, the Waste Water Treatment Area, the Fuel Oil UST Area, and the Sheldrake River. Volatile organic compounds were identified in the soil and ground water at the site.

The ACO required the completion of a Remedial Investigation to evaluate the site physical characteristics, the nature and extent of contamination, and the risks the site may pose to human health. The previous field investigations fulfilled many of these RI requirements, however some additional data needs were identified and addressed in the RI. These additional data needs included: an evaluation of whether DNAPL was present, an evaluation of the extent of LNAPL surface waters in the Mamaroneck area. At the ITT Sealectro site it is expected that the bedrock ground water is discharging to the unconsolidated deposits adjacent to the Sheldrake River.

The RI Report documents the nature and extent of site compounds of concern at the five areas of concern which were previously identified. In addition, during the implementation of the RI an additional area, the Shed Area, was identified based upon the ground penetrating radar survey and subsurface soil sampling.

The Former Drum Storage Pad Area was used for the storage of drums containing solvents and lubricating oils. The primary compounds of concern in this area are VOCs. Some SVOCs are also present in the soils. The extent of VOCs in the soils was defined during earlier investigations. Based upon the presence of VOCs in the subsurface soil, an *in situ* air stripping IRM was completed in the area. Post IRM sampling completed during the RI documented that the *in situ* air stripping was effective in reducing VOC concentrations.

The Waste Water Treatment Area consists of three closed USTs which were formerly used to contain plating waste water. Some metals, copper and nickel, were detected at concentrations above background in soil samples from this area.

The Fuel Oil UST Area was the former location of a 2,500 gallon UST. The tank and associated stained soil were removed during an IRM in 1992 and a product recovery system was installed. The recovery well is currently operating. The RI and previous investigations have documented that fuel oil is the primary concern in this area. Light non-aqueous phase liquid (LNAPL) is present but is restricted to a small area near the north end of the former tank. Soils with fuel oil are located in the area of the tank and do not extend beneath the building. The fuel oil in this area has not impacted the ground water downgradient of the area.

The Sheldrake River, along the northern edge of the property, was initially identified as an area of concern due to the presence of inorganic parameters and VOCs in the surface water or sediment. Background information, visual observations, and sampling data document that the river has been impacted by upstream sources. The upstream contamination of the river includes metals, petroleum hydrocarbons, and VOCs. In addition the river has been observed to contain scum, suds, foam, oil slicks, and general rubbish. An illegal discharge of gasoline into the river from a neighboring property was observed. Sediment sampling in the vicinity of the site has identified concentrations of copper adjacent to the site which exceed upstream concentrations.

Subsurface soils in the vicinity of the Solvent UST Area and the Shed Area contain VOCs/DNAPL. The VOC/DNAPL contamination is heterogeneously distributed in the subsurface. The distribution of the VOCs/DNAPL is influenced by the macro and micro changes in soil texture. These zones of different grain size can be an inch thick or several feet thick. The VOCS/DNAPL occur within individual lenses and are not uniformly distributed. In some split spoon samples only one small 1/2 inch lens may contain VOCs/DNAPL while other samples may contain multiple lenses of VOCs/DNAPL. The soil borings and soil sampling documented that the lenses of VOC/DNAPL are not horizontally or vertically continuous.

The lenses which contain VOCs/DNAPL show variable degrees of residual saturation. Some lenses appear to be almost fully saturated by DNAPL while other lenses only contain isolated droplets of DNAPL. No pools of DNAPL were detected either in the soil or on top of bedrock.

The Solvent UST Area formerly was the site of eight USTs which reportedly contained lubricating oils, solvents, and waste oils. This area is a source of VOCs/DNAPL in the subsurface soil. The USTs were removed along with soils with DNAPL. The extent of excavation of soils was restricted due the presence of the building and various utilities. A ground water recovery system was installed in the excavation and is currently recovering ground water containing VOCs. VOCs are the compound of concern at this location and have been documented in both the ground water and subsurface soils.

Although the VOCs/DNAPL are heterogeneously distributed in lenses in the subsurface soils, the general extent of the VOC/DNAPL lenses in both the Solvent UST and Shed Areas was defined using data from the soil borings and ground penetrating radar survey. The extent of VOCs/DNAPL was defined based upon the occurrence of lenses of soil with VOC/DNAPL. The majority of soil within the defined extent of VOCs/DNAPL does not show evidence of VOC/DNAPL. The horizontal extent of VOCs/DNAPL is within the site property boundaries and is generally in the vicinity associated with the Fuel Oil UST Area, an assessment of the effectiveness of site IRMs, an evaluation of indoor air quality and an evaluation of seasonal fluctuations in ground water quality.

The RI field activities were completed during the period October 1993 through May 1994. These field activities included a ground penetrating radar survey, soil borings, subsurface soil sampling and analysis, monitoring well installation, ground water quality sampling and analysis, sediment sampling and analyses, and indoor air sampling and analysis. The RI activities were completed in accordance with the RI/FS Work Plan (February 1993) and associated addendum (July 1993).

This RI Report presents the site physical characteristics, the nature of site compounds of concern, the horizontal and vertical extent of site compounds of concern, and a baseline risk assessment of possible adverse impacts to human health and the environment. Information developed during the RI as well as the previous site investigations and IRMs were used to develop this RI Report.

The site is located in a industrial and commercial area of Mamaroneck, New York. This area has been developed since the 1800s. The site borders the Sheldrake River and an automobile scrap yard to the north, a plastics fabricator to the west, a film processing facility and dance studio to the east, and Hoyt Street and Amtrak/Metropolitan Transportation Authority Train lines to the south. Residential properties are present in the vicinity of this industrial/commercial area.

The site is located in a low-lying area between low northeast trending hills. The Sheldrake River, forming the northern border of the site, flows to the northeast and joins the Mamaroneck River about 1500 feet from the site. The Mamaroneck River flows to the south and discharges into part of Long Island Sound about 3000 feet southeast of the site. Potable water for the area is supplied from New York City reservoirs. No potable ground water supplies are reported to exist in the vicinity of the site and an ordinance requires that the public water supply be used.

The site geology consists of three unconsolidated deposits overlying gray gneiss bedrock. At the site, the top of the bedrock is located between 29 feet and 40 feet below the ground surface. The unconsolidated deposit immediately overlying the bedrock is comprised of sand and gravel. This lower unconsolidated unit is 10 to 24 feet thick and is believed to represent fluvial channel deposition. The middle unit of the unconsolidated deposits is comprised of discontinuous, inter-layered clay, silt, and sand. This 8 to 18 foot thick unit was apparently deposited in a channel and flood plain fluvial setting. The uppermost unconsolidated unit consists of two to seven feet of fill. The fill contains silt, sand, gravel, cinders, and slag material. The fill was probably used to make low lying land near the Sheldrake River useable for building.

Ground water occurs between five and eight feet below the ground surface. The depth to ground water varies with seasons and river stage. Two ground water zones in the unconsolidated deposits have been identified. The shallow ground water zone occurs in the upper two unconsolidated units. These units are comprised of fill and discontinuous layers of clay, silt, and sand. The deep ground water zone occurs in the lowest unconsolidated unit which is comprised of sand and gravel. The mean horizontal hydraulic conductivities of both zones are similar apparently due to the presence of sand in both zones. The range in measured hydraulic conductivities in the shallow zone is significantly greater than in the deep zone. The measured vertical hydraulic conductivity of the shallow zone is about 1.5 to 2 orders of magnitude lower than the horizontal hydraulic conductivity.

In the vicinity of the site ground water flow paths in the unconsolidated deposits are constrained by local topography and the underlying bedrock. Ground water recharge occurs in high areas and ground water discharge to surface water occurs near rivers. The presence of hills and rivers in the vicinity of the site physically constrains ground water flow to the area between the Sheldrake and Mamaroneck Rivers. At the site ground water flow in both the shallow and deep zone is toward the Sheldrake River. An upward hydraulic gradient and a good hydraulic connection between the river and ground water zones suggests that the ground water flowing beneath the site discharges to the Sheldrake River. The estimated combined ground water flow beneath the site is between 80 gpd and 700 gpd.

The permeability of the bedrock in the area is reportedly low. Due to the presence of the Sheldrake and Mamaroneck Rivers and Long Island Sound, it is expected that bedrock ground water flow is generally from the bedrock to the unconsolidated deposits and of the sources. The vertical extent of VOC/DNAPL extends into the deep ground water zone, but DNAPL does not appear to have migrated to the top of bedrock. No DNAPL pools were detected on the top of bedrock.

VOCs have been documented in both the shallow and deep ground water zones at the site. Concentrations of inorganic compounds were not related to the site. SVOCs were detected but were not compounds of concern at the site. PCE, TCE, and TCA are the dominant parameters in the deep ground water zone while the shallow zone typically has higher concentrations of degradation products. This difference suggests that biodegradation of VOCs is occurring more readily in the shallow ground water zone.

The source of the VOCs in the ground water is the VOCs/DNAPL in the subsurface soil associated with the Solvent UST and Shed Areas. The highest VOC concentrations in ground water occur in recovery well RW-2 which is located in the Solvent UST Area. VOCs are present in the ground water at the MW-3 and MW-2 well nests. The available information suggests that the site ground water and the VOCs discharge to the Sheldrake River.

Total VOC concentrations in ground water from recovery well RW-2 and the site monitoring wells have generally been declining. This decline may reflect the impact of the various IRMs which have been completed at the site. Ground water concentrations have shown some fluctuations. The cause of these fluctuations may be fluctuations in ground water flow directions.

Indoor air sampling was completed to evaluate potential impacts to air quality from VOCs in the soil and ground water. The sampling did not detect VOCs in the indoor air.

A baseline risk assessment was completed to assess the possible impacts to public health and the environment due to the presence compounds of concern at the site. This risk assessment documented four complete exposure pathways. Incomplete exposure pathways under current conditions included contact with site soils, ground water consumption, and vapor migration to indoor air in off-site buildings. While contact with the water of the Sheldrake River was identified as a complete exposure pathway, the predicted concentrations of compounds of concern are extremely low and therefore do not pose a risk.

The three remaining complete pathways include current and future on-site worker inhalation of vapors migrating from the subsurface soils and ground water to indoor air and future on-site workers contact with ambient dusts, vapors, and direct contact due to soil excavation. For all three of these pathways the estimated Hazard Index and the estimated cancer risk are acceptable.

In conclusion, the ground water and subsurface soils have been impacted by VOCs. In addition, DNAPL has been identified in the subsurface soils. The site investigations have documented the extent of compounds of concern and provided the necessary information for the completion of a baseline risk assessment. The baseline risk assessment demonstrates that the estimated risks to human health are acceptable.

This Remedial Investigation Report represents the completion of the Remedial Investigation component required in the Administrative Order on Consent (October 8, 1992). The nature and extent of site related compounds of concern have been evaluated and a Baseline Risk Assessment was completed. This characterization of the site and potential risks, presented in this RI Report, provides the basis for identifying site areas which require remediation and the basis for an evaluation of remedial technologies which will be completed in the Feasibility Study.

1. Introduction

1.1. General

This document presents the Remedial Investigation (RI) Report for the former ITT Sealectro, Inc. facility (ITT Sealectro) (Site #360027) located at 139 Hoyt Street in Mamaroneck, New York (hereafter, "the site"). This report fulfills Section 3 of the Administrative Order of Consent (ACO) which became effective on October 8, 1992. Figure 1 illustrates the location of the site.

Five previous field investigations, including several phases of due diligence work and a Phase I Focused Remedial Investigation (Phase I RI) were voluntarily implemented at the site. The due diligence work was performed between 1986 and 1990 during several transfers in ownership. Based on the results of the due diligence work, a Phase I RI was conducted in 1991. The Phase I RI Work Plan and Report were submitted to the New York State Department of Environmental Conservation (NYSDEC) in September 1991 and November 1992, respectively. During that period of time, an ACO, which called for a Remedial Investigation/Feasibility Study (RI/FS) at the site, was signed. The NYSDEC commented on the Phase I RI Work Plan and Report in a letter dated November 10, 1992. A RI/FS Work Plan was subsequently developed based upon the existing database and the November 10, 1992 NYSDEC comments. The RI/FS Work Plan was originally due in December 1992, but a 60 day extension was granted to allow incorporation of NYSDEC's comments. The first draft of the RI/FS Work Plan was submitted in February 1993.

The RI/FS Work Plan, which included a Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP), was completed in accordance with the United States Environmental Protection Agency (USEPA) guidelines provided in *Interim Final Guidance for Conducting Remedial Investigations, and Feasibility Studies under*

CERCLA, 6/89/004, October, 1988. A Citizens Participation Plan (CPP) was prepared in accordance with the *New York State Inactive Hazardous Waste Site Participation Plan dated August 1988.* A Health and Safety Plan (HASP) was prepared in accordance with applicable Occupational Health and Safety Administration (OSHA) requirements contained in 19 CFR 1910 and 29 CFR 1926. These plans were submitted to the NYSDEC in February 1993.

The NYSDEC provided comments on the February 1993 RI/FS Work Plan submittal in a letter dated April 1993. A RI Work Plan Addendum, which addressed the NYSDEC comments, and a revised CPP were submitted in July 1993. The RI/FS Work Plan RI Work Plan Addendum and CPP were approved by the NYSDEC in a letter dated September 16, 1993. The RI field activities were initiated in October 1993 with a ground penetrating radar (GPR) survey. As specified in the approved work plan, the results of the GPR survey were analyzed and eight shallow soil boring locations were selected and were subsequently approved by the NYSDEC. Drilling activities were initiated in December 1993. Based on field observations made during the December field work, three additional soil borings were completed at locations approved by the NYSDEC. Based on the results of the soil borings completed in December and January, four locations for additional deep soil borings were proposed to the NYSDEC in a letter dated March 7, 1994. These additional borings were approved by the NYSDEC in a letter dated March 11, 1994 and were subsequently installed in May 1994.

As required in the Work Plan Addendum, an Interim Technical Memorandum (ITM) was prepared at the completion of the field activities. The purpose of the ITM was to summarize the soil and ground water data collected to date and to assess whether bedrock and off-site monitoring wells were required. The ITM was transmitted to the NYSDEC on July 7, 1994. The NYSDEC concurred with the findings of the ITM in a letter dated August 25, 1994 and requested that ITT proceed with the RI Report.

Several Interim Remedial Measures (IRMs) including soil and underground storage tank (UST) removal, ground water and product recovery, and *in situ* air stripping (ISAS) of soils have been initiated at the site. An IRM Program report which summarized these activities was prepared and submitted to the NYSDEC in November 1992. Modifications to the existing IRMs since the 1992 report included upgrading the ground water treatment system and free product recovery system. The NYSDEC approved these modifications.

1.2. Report Organization

This RI Report is organized in accordance with the USEPA *Interim Final Guidance for Conducting Remedial investigations, and Feasibility Studies under CERCLA, 6/89/004, October, 1988.*

The contents of each section of this report are summarized below:

- Section 1 includes an introduction to the RI, presents the report organization, objectives of the RI, and a description of the site setting.
- Section 2 discusses site background and history, and the previous investigations and IRMs completed at the site.
- Section 3 presents the field procedures utilized to collect data during this RI.
- Section 4 includes a discussion of the physical characteristics of the site including demography and land use, meteorology, surface water hydrology, regional geology, regional hydrogeology, site geology, and site hydrogeology.
- Section 5 describes the nature and extent of impacted media at the site. The results of the indoor air sampling program are presented as well as an evaluation of soil, ground water, surface water and sediment quality at the site.
- Section 6 presents the quantitative human health risk assessment.
- Section 7 present the conclusions of the RI.

1.3. Objectives

The overall objective of the RI is to develop the information necessary to characterize the site such that an appropriate remedial alternative can be selected.

During the previous investigations, five areas of concern were identified at the site. These included: the Solvent UST Area, Former Drum Storage Pad Area, Waste Water Treatment Area, Fuel Oil UST Area and the Sheldrake River (Figure 2).

Data from these areas were reviewed during the preparation of the RI/FS Work Plan. Several data gaps were identified, and were subsequently addressed as part of the RI. Data from the previous investigations as well as data collected during the RI were collectively used to evaluate the site hydrogeology, nature and extent of contamination, and the potential contaminant migration pathways and to evaluate risks to human health. This information is contained within this report.

The findings of this RI will be used in the FS to develop and evaluate potential remedial alternatives.

The specific objectives of the RI were to:

- assess if dense non-aqueous phase liquid (DNAPL) is present and evaluate the horizontal and vertical extent of impacted soils at the site;
- evaluate the effectiveness of the shallow ground recovery system in the Solvent UST Area;
- further assess what affect the Solvent UST Area is having on-site ground water quality;
- evaluate the effectiveness of the ISAS IRM and assess if semivolatile compounds (SVOCs) are present in the Former Drum Storage Pad Area;
- assess the horizontal extent of light non-aqueous phase liquids (LNAPL) and impacted soil in the vicinity of the Fuel Oil UST Area and evaluate what affect this area is having on ground water quality;
- evaluate seasonal fluctuations in ground water quality and flow direction;

- assess if the site has impacted the sediment in the Sheldrake River;
- evaluate if indoor air quality within the building has been affected by site activities;
- assess potential risk to human health

1.4. Site Setting

The ITT Sealectro site is located in an industrialized area of Mamaroneck, New York (Figure 1). Industries in the immediate vicinity of the site include Blood Brothers Auto Wrecking Yard which is located to the north across the Sheldrake River; Marvel Industries, Inc. (a plastics fabricator) located to the west, and a photographic and film processing facility and dance studio to the east. Hoyt Street and Amtrak/Metropolitan Transportation Authority Train lines border the site to the south.

The 0.92 acre site is relatively flat. One large vacant building exists on the lot and nearly the entire remaining area consists of paved parking areas (Figure 2). The majority of the site is fenced in order to maintain site security. The Sheldrake River borders the site to the north. The Sheldrake River is a tributary to the Mamaroneck River which drains into Mamaroneck Harbor and Long Island Sound within one mile of the site. Where it flows past the site, the Sheldrake River is about 15 ft wide and is typically 1 ft deep. The river is prone to flooding and is channeled by stone retaining walls that are about 8 ft high. It has been noted that debris, typically consisting of automobile parts, glass and assorted household refuse, is found within the river.

2. Environmental History

2.1. Background and History

The Sealectro Corporation owned and operated an electronics parts manufacturing and assembly facility at the 139 Hoyt Street location from 1960 to 1981. The previous tenant at the building manufactured jewelry. In November 1981, BICC plc acquired Sealectro through a stock purchase. In March 1986, Sealectro-BICC sold the building and land to 139 Hoyt Street Associates, who in turn leased the same property back to Sealectro-BICC. ITT Corporation purchased Sealectro from BICC plc in August 1988. The resulting company was ITT Sealectro, an ITT Electronic Components, Inc. Company (now known as ITT Components, Inc.). The 139 Hoyt Street property is presently owned by 139 Hoyt Street Associates but is managed through Northbrook Management Corporation of White Plains, New York. ITT Sealectro ceased operations at the Mamaroneck facility in November 1990. In July 1991, foreclosure action against 139 Hoyt Street Associates was reportedly initiated by National Westminster Bank in New York, New York and is currently pending. The site is currently under receivership and managed by Alfred Weisman of Weisman Realty, Inc. located in Yonkers, New York.

Several manufacturing operations including screw machine operations, electroplating, and connector assembly were performed at the facility. The screw machine operation was located in the southwestern portion of the building and was discontinued in January 1975. The electroplating department, which was located in the northeastern corner of the building, existed until 1986. Reportedly the amount and type of hazardous waste generated at the facility was considerably reduced after 1986. From 1986 until 1990, the facility was primarily used for assembling small parts and not for manufacturing. Limited quantities trichloroethane (TCA) were used as a contact cleaner and small amounts of machine oil were reportedly used during this period.

2.2. Previous Investigations and IRMs

Five previous studies and several IRMs were voluntarily completed at the facility and are summarized in detail in the following subsections. The results of the previous investigations were used to direct the additional investigations completed during the RI. Data collected during the previous investigations and IRMs were used, in conjunction with the RI data, to evaluate the nature and vertical and horizontal extent of impacted media at the facility. This evaluation is discussed in Section 5.

Based on data collected during the previous studies, five areas of concern were identified (See Figures 2, 3, 4, 5, 6 and 7):

1. Solvent Underground Storage Tank (UST) Area - Former location of eight USTs containing cutting oils, waste oils, and solvents
2. Former Drum Storage Pad Area - Location where drums of solvents and oils were stored.
3. Fuel Oil UST Area - Former location of a 2,500 gallon fuel oil tank.
4. Wastewater Treatment Area - Location of three underground wastewater treatment tanks which were closed in-place in this area.
5. Sheldrake River - Located along the northern edge of the property and may have been impacted by former site operations.

The first study was a Site Assessment completed in 1986 by O'Brien & Gere Engineers, Inc (O'Brien & Gere) as part of the property transfer from Sealectro-BICC to 139 Hoyt Street Associates. The second study was an Environmental Assessment which included a soil and ground water evaluation. This assessment was conducted in 1988 by TRC Environmental Consultants, Inc. (TRC) for ITT Corporation in association with the purchase of Sealectro. The third study was a soil sampling program implemented in August 1989 by O'Brien & Gere. The purpose of the August 1989 study was to evaluate the extent of impacted soil at the Former Drum Storage Pad Area and to document existing ground water quality conditions. The fourth study was a draft Environmental Investigation Report prepared by Leggette, Brashears & Graham, Inc. (LB&G) in May 1991 for BICC plc to verify the existence of solvent USTs and the possible presence of organic vapors in subsurface soils. The existence of the Solvent UST Area (Figure 3) was first recognized in 1990 and therefore was not investigated during the three previous investigations.

The NYSDEC was initially informed about the site in May 1990, advising of site conditions noted during previous investigations. ITT Sealectro, in a letter dated January 15, 1991, notified the NYSDEC of their intent to remove several inactive USTs. On February 6, 1991 documents were filed for the registration of the USTs. During the solvent UST removal, it became evident that the USTs had leaked, and the NYSDEC was immediately notified by ITT Sealectro on May 16, 1991, (Spill # 9101862). A Corrective Action Plan dated August 28, 1991 was then submitted to the NYSDEC. As part of the Corrective Action Plan, quarterly sampling of existing monitoring wells MW-2 and MW-3 (Figure 8) and the preparation of the Phase I RI Work Plan were initiated.

The Phase I RI Work Plan was submitted to the NYSDEC on September 16, 1991. The Phase I RI included the collection of soil and ground water quality samples from the Former Drum Storage Pad Area, Solvent UST Area, Wastewater Treatment Area, Fuel Oil UST Area, and the collection of sediment and surface water samples from the Sheldrake River. The Phase I RI was completed during 1992 and the Phase I RI Report was submitted to the NYSDEC in November 1992. This report presented an evaluation of the site hydrogeology and the nature and extent of site impacts. Based on the conclusions of the Phase I RI, additional investigation was necessary to further evaluate the soil and ground water at the site, and sediment in the Sheldrake River.

2.2.1. Solvent UST Area

The Solvent UST Area is located at the southwest corner of the building as indicated on Figures 2 and 3. This section presents a summary of the history of the Solvent UST Area, including previous investigations and IRMs completed in the area. Specific details about the IRMs are presented in the Interim Remedial Measures Program Report dated November 1992.

The following history of the Solvent UST Area was obtained through conversations with Mr. Joseph Corvo, who worked at the facility from 1960 until 1975. There were eight USTs at this location. Reportedly, benzene and virgin 15-20 weight oil, 25-30 weight oil, and 90 weight oil were stored in separate USTs, while spent oils were stored in two interconnected USTs. Benzene was only stored in an UST until 1963. In 1973, Sealectro began noticing water in the virgin lubricating and cutting oils from the USTs and began purchasing oil in 55-gallon drums. Mr. Corvo was not knowledgeable about the storage of solvents at the UST area during his tenure at the plant.

The area was first identified in late 1990. Since 1990, a number of investigative and remedial actions have been undertaken in this area and are summarized as follows:

1. In December 1990, two USTs were sampled and analyzed; the results indicated that the USTs contained solvents.
2. In May 1991, LB&G issued a draft Environmental Investigation Report.
3. In May 1991, eight USTs were emptied and excavated by OBG Technical Services, Inc. Because several of the tanks were found to be leaking, NYSDEC was immediately notified of the spill (Spill #9101862).
4. In June 1991, post-excavation soil samples were collected.
5. In August 1991, material generated during the May 1991 UST removal was disposed off site.
6. In October 1991, test boring EB-1 was drilled along the side of the excavation.
7. In January and February 1992, five soil borings (B-17, B-18, B-19, B-20 and B-21) were completed in the area as part of the Phase I RI. Soil boring B-17 was located in the excavation. A soil sample from B-17 (11 to 15 ft) was analyzed for NYSDEC target compound list (TCL) parameters which include VOCs, SVOCs, inorganics and PCBs/pesticides.

8. In April 1992, additional soil was excavated and disposed. The ground water recovery system was installed and another round of post-excavation soil samples was collected.
9. The ground water recovery system has been in operation since April 1992.

The following text presents a more detailed summary of these activities.

In December 1990, after vent pipes were identified during a site visit, OBG Technical Services, Inc. collected one sample from each of two identified and accessible tanks. These analyses indicated that tetrachloroethene (PCE) and TCA were the primary constituents in the tanks.

In May 1991, a draft Environmental Report, summarizing the results of the geophysical survey and soil vapor survey, was completed by LB&G. The surface geophysical investigation was conducted to identify the number and location of the USTs, and the soil vapor survey was implemented to assess whether organic vapors were present in subsurface soil. The geophysical survey was completed using a Geonics EM-31 in the in-phase mode. Based on the survey, the locations of several solvent USTs were tentatively identified. To provide further resolution, a magnetic cable indicator survey was completed.

Forty-six soil vapor samples were collected and analyzed for volatile organic compounds (VOC)s including TCA, PCE, trichloroethane (TCE), benzene, ethylbenzene, and toluene. Neither ethylbenzene or xylene were detected. Total VOCs in excess of 10,000 parts per million (ppm) were identified in the Solvent UST Area. Concentrations of VOCs decreased rapidly to the east and south of these tanks. Low levels of VOCs (less than 1 ppm) were observed in samples collected from the eastern and western parking lots.

As a result of the unknown condition of the USTs, ITT Sealectro elected to remove the USTs and dispose of them off-site. Eight USTs were excavated in May 1991 by OBG Technical Services, Inc. Two 275-gallon (Nos. 1 and 3), six 550-gallon tanks (Nos. 2, 4, 5, 6, 7, and 8) and 6200 lbs of impacted soils were removed (Figure 3). The contents of the USTs were pumped into 55-gallon drums, sampled and held on-site until proper disposal methods could be determined. During the removal of Tank No. 4, it was evident that the tank had leaked because it was partially filled with ground water. The NYSDEC was immediately notified of the spill (Spill #9101862). Following the tank removal, a hole three to four feet below ground existed. Post-excavation soil samples collected in June 1991 indicated that concentrations of VOCs in excess of 4800 ppm and TPH concentrations greater than 8200 ppm were present in the soil left in the excavation. These soils were excavated in April 1992.

Based on the analytical data collected, the soil associated with the removal of the USTs and the tank contents was classified as hazardous. In August 1991, 6200 lbs of soil were incinerated at LWD, Inc. located in Calvert City, Kentucky. In addition, 2,800 pounds of solid material consisting of tank bottom sludge and 2,575 gallons of liquid from the USTs were manifested for disposal at the Environmental Waste Resources in Connecticut. Disposal manifests were presented in the IRM Program Report dated November 1992.

In October 1991, test boring EB-1 was drilled along the side of the UST excavation to evaluate the vertical extent of impacted soils in this area. Data collected from split spoons in EB-1 suggested that the highest concentrations of VOCs were limited to the top 14 ft of soil. In January and February 1992, as part of the Phase I RI, five test borings were completed. Boring B-17 was advanced in the excavation pit left after the removal of the USTs. Borings B-18, B-19, B-20, and B-21 were installed around the perimeter of the Solvent UST Area (see Figure 3). The results indicated that the lateral extent of soil contamination had not been fully defined.

As part of an IRM, dewatering well MW-5 was installed in March 1992. In April 1992, additional soil and MW-5 were excavated from the immediate area of the Former USTs. It was originally proposed that soils be excavated to a depth of 15 ft. This depth was selected based on data collected from EB-1. During the excavation activities, running sands were encountered and the depth of excavation was limited to 11.5 ft below the ground surface. Approximately 85 cubic yards of soil were manifested for incineration at LWD, Inc located in Calvert City, Kentucky. Post-excavation soil samples indicated that soils containing primarily PCE and TCA were left in-place.

A ground water recovery system was installed within the excavation to recover ground water, including that portion of the plume which may have migrated under the building. The recovery system consists of six stainless steel horizontal well points installed at a depth of 10.5 ft and driven approximately 15 ft horizontally beneath the building. The well points discharge to a gravel trench which is connected to a 12-inch collection sump designated as RW-2 (Figure 3). The recovery system is currently operating and yields approximately 1 gpm. Between 1992 and September 1993, the ground water was treated by carbon absorption prior to being discharged to the Publicly Owned Treatment Works (POTW). A new treatment system was installed as part of an IRM modification and was operational on September 17, 1993. The treatment system effluent is presently discharged to the POTW.

2.2.2. Former Drum Storage Area

The Former Drum Storage Pad Area is located adjacent to the Sheldrake River along the northwest corner of the building. According to Mr. Joseph Corvo, this area was used for the storage of drums containing solvents including TCA and TCE and various lubricating oils. TCE was used as a degreaser from 1963 until 1968, at which time TCE was replaced with TCA. The TCE and TCA were stored in 55-gallon drums outside on the Drum Storage Pad (see Figure 2 and 4) and buckets were filled on the pad and brought inside for use. Spent solvents were placed in 55-gallon drums which were stored at the Drum Storage Pad prior to removal by a solvent reclamation company. Beginning in 1973, machine and cutting oils were purchased in 55-gallon drums and were also stored in this area. The NYSDEC has records on file which indicate that between 1986 and 1988, improperly labelled drums of TCA were present (TRC, 1988). Apparently, this deficiency was quickly corrected.

A number of investigative programs have been completed in this area. A list of the programs and the samples that were collected during these programs is as follows:

1. Site Assessment (January 1986): Soil samples SB-8 and SB-9
2. Environmental Assessment (June 1988): Soil borings B-1 and B-2
3. Sampling Program (August 1989): Eight soil borings (B-3, B-4, B-5, B-6, B-7, B-8, B-9, and B-10) and two surface soil samples (SS-1 and SS-2).

4. Installation of two inlet wells (IW-1 and IW-2) and extraction well EW-1 for a pilot ISAS test.
5. Soil Vapor Investigation (October 1991): Installation of five inlet wells (IW-3, IW-4, IW-5, IW-6, and IW-7) and two extraction wells (EW-2, EW-3).
6. Phase I RI (January 1992): Installation of three borings (B-11, B-12 and B-13). One sample from B-12 (8 to 10 ft) was analyzed for the NYSDEC - TCL/TAL parameters including VOCs, SVOCs, PCBs/pesticides and inorganics.

The VOC data indicated that TCA, TCE, PCE, 1,2-dichloroethene (1,2-DCE), 1,1-dichloroethene (1,1-DCE), 1,2-dichloroethane (1,2-DCA), xylene, and toluene were found with the highest frequency in the soil.

An ISAS pilot study was performed in July 1990 to assess the overall effectiveness of ISAS technology for removing VOCs from site soils. Various system parameters, including blower speed and the number of open air inlets, were regulated throughout the pilot study to assess the most efficient design for a full scale system. The data from the pilot study was also used to estimate the VOC mass removal rate and areal influence of the system. The conclusions drawn from the pilot test were: 1) that the ISAS was feasible at the site, 2) the areal influence of one extraction well is greater than 20 ft; and 3) the need for air inlet wells was minimized due to the air inflow through the bank of the Sheldrake River. It was estimated based on mass-transfer calculations that a treatment time frame of three to six months was required. The finding of the test were documented in the report entitled *In Situ* Vacuum Extraction Pilot Study Results dated July 1990.

A full scale ISAS was completed as an IRM from May 12, 1992 through October 6, 1992. The data collected during the operation of the ISAS indicated that approximately 18 lbs of VOCs were removed from the soils.

2.2.3. Fuel Oil UST Area

A 2,500-gallon Fuel Oil UST was located on the southwest portion of the facility adjacent to Hoyt Street (see Figures 2 and 5). The tank contained No. 2 fuel oil, which supplied fuel to the boiler for the heating system. Mr. Joseph Corvo reported that an earlier fuel oil UST leaked and was reportedly replaced with a new 2,500-gallon fuel tank in the mid to late 1970's.

As part of the Phase I RI, two test borings, B-22 and B-23, were proposed for installation around the perimeter of the 2,500-gallon UST (Figure 5). While drilling B-22 on February 4, 1992, free-phase fuel oil was observed in the borehole. The NYSDEC was immediately notified of the spill (Spill #9101862). Monitoring well MW-8 was subsequently installed in B-22 (see Figure 5).

Based on this information, an IRM consisting of a recovery well and ground water depression/product recovery system were installed adjacent to MW-8. The recovery system was operational by February 19, 1992. As of October 1994, approximately 232.5 gallons of fuel oil have been recovered (Table 1). For the first month of operation, the system collected an average of 20 gallons of fuel oil per week with a ground water pumping rate of 2 gallons/hour. After removal of the tank and affected soil, which was completed on April 15, 1992 by OBG Technical Services, the fuel oil collection rate stabilized at 1 to 2 gallons per week. Since April 1992 the recovery rate has steadily been decreasing; presently, 1 to 2 gallons of fuel oil are recovered monthly.

The fuel oil tank was 6 ft in diameter and 12 ft in length and was buried 28 inches below ground. The piping from the tank to the building was removed and found to be in good condition. There were no visible leaks in the pipes and the soil surrounding the pipes had no visible staining or noticeable odor. Once the tank was removed, between 50 and 100 holes up to 1 inch diameter were observed in the tank. The majority of the holes were located on the bottom half of the tank. Several areas of stained soils were observed and approximately 60 cubic yards of impacted soil were removed. The final excavation was completed below the ground water table and was 13 ft wide, 14 ft long and about 9 ft deep. The size of the excavation was constrained by overhead and underground utilities and the presence of the building. The material was classified as non-hazardous and disposed at the Mount Hope Asphalt Plant in Calverton, New York for asphalt batching. Presently, the building is heated with natural gas and no fuel oil is stored on-site.

A review of the quantity of oil collected from the product recovery system was completed in September 1992 and indicated that the rate of oil recovery had been decreasing. Since the efficiency of the fuel oil recovery system had decreased, six additional borings (B-25, B-26, B-27, B-28, B-29 and B-30) and two ground water monitoring wells (MW-9 and MW-10) were installed in December 1992 to evaluate a location for a new recovery well (Figure 5). The results indicated that no free phase product was encountered in any borings or monitoring wells and that existing recovery well RW-1 was properly located.

2.2.4. Waste Water Treatment Area

The Waste Water Treatment Area consists of three closed USTs that are located along the northeast portion of the site as indicated in Figure 6. The tanks were part of the waste water treatment operation used by Sealectro to treat their plating waste water. A review of the January 1986 Site Assessment indicates that Sealectro's plating capabilities and therefore their waste water included silver, nickel, tin and copper with gold and silver plating representing the predominant production activity. Waste water from the plating process was pumped to two of the 2,500-gallon USTs, then treated in a precipitation tank which was located within the facility and discharged to the sewer. Waste water which contained cyanide was stored in the third 2,500-gallon UST prior to treatment by an ozone reactor and was then discharged to the sewer. Reportedly, 22,000 gallons/day of process water was pre-treated in this manner. The Waste Water Treatment Area ceased operation in 1986 when the electroplating process at the facility was discontinued. Waste water discharge was in conformance with the Westchester County DEF Industrial Pollutant Program. A permit which was in place during the discharge period was allowed to expire.

The insides of the USTs were visually inspected in 1986 by O'Brien & Gere personnel. All three tanks were accessed through manhole covers and no visual cracks were evident during the inspection. The tanks are 8 ft in diameter and about 13 ft deep, and were constructed of 6-inch thick concrete that was coated with an epoxy liner. The tanks reportedly had a tendency to float as a result of the shallow ground water table at approximately 5 to 8 ft below grade. A concrete sump was once installed in the vicinity of the tanks to remove the water. A concrete pad was later installed to physically weight the tanks down in lieu of pumping ground water. In 1986, the tanks were emptied, thoroughly cleaned and filled with sand in accordance with appropriate State and Federal tank abandonment procedures.

Three previous investigations were completed in this area (Figure 6). No investigations were completed during the RI since the existing data was sufficient to characterize the quality of soil in this area. The samples collected and analyses completed are summarized below.

1. Site Assessment (1986) - Samples were collected from four shallow locations designated as samples 4, 5, 6, and 7. At each location a sample was collected immediately beneath the ground surface and one sample was collected at depth of 1 ft. The samples were analyzed for selected metals. In addition, soil samples were collected from borings B-4, B-5 and B-6 at depths of 12 ft, commensurate with bottom of the USTs. These samples were analyzed for selected metals. Soil borings B-3 and B-7 were advanced to evaluate upgradient and downgradient soil concentrations in the eastern portion of the site. The samples were analyzed for VOCs, PCBs and selected metals.
2. Environmental Assessment (1988) - Two surface soil samples designated as SS-1 and SS-2 were collected and analyzed for selected metals.
3. Phase I RI (February 1992) - Soil samples were collected from borings B-14, B-15, and B-16 and were analyzed for VOCs and metals. One sample from B-15 (2 to 6 ft) was analyzed for the NYSDEC-TCL/TAL parameters including VOCs, SVOCs, PCBs/pesticides and inorganics.

The results of these investigations indicated that impacts to the soil are minimal.

2.2.5. Sheldrake River

The Sheldrake River, which is a Class C river that flows past the site, is approximately 7 miles long and joins the Mamaroneck River about 0.25 miles downstream of the site (Figures 1 and 7). The Mamaroneck River discharges into the Long Island Sound. The Sheldrake River is prone to flooding, and according to Joseph Corvo, who worked at the facility from 1960 to 1975, the facility has been flooded with several feet of water on several occasions. A Feasibility Report for controlling the flooding of the Sheldrake River was completed by the US Army Corps of Engineers in 1977. To date, none of the US Army Corps of Engineers recommendations for flood control have been implemented (Diamond, 1992). The river in this area typically contains automobile parts, glass and assorted refuse. Additionally, on January 31, 1992 at 0830, a gasoline release was observed in to the Sheldrake River by employees of O'Brien & Gere, Empire Soils Investigations, Inc and the Village of Mamaroneck. The gasoline sheen and odor emanated from a nearby facility. The spill was reported to the Mamaroneck Police and Fire departments by employees of the Village of Mamaroneck.

Two surface water samples from locations 12 and 14 and five stream sediment samples from locations 10, 11, 12, 13, and 14 were collected in 1986 by O'Brien & Gere (Figure 7). Samples were analyzed for gold, silver, copper, nickel, cyanide and TCA. TRC collected four stream sediment samples designated SD-1, SD-2, SD-3 and SD-4 as part of the 1988 Environmental Site Assessment for analysis of copper and nickel (Figure 7). No surface water samples were collected by TRC. As part of the Phase I RI, sediment and surface water samples were collected from three locations along the Sheldrake River during February 1992 and April 1992 sampling events. The sediment sample locations were designated SS-1, SS-2, and SS-3 and the surface water locations were designated SW-1, SW-2, and SW-3. The samples were analyzed for VOCs and inorganics.

The results of the previous investigations suggested that the concentrations of copper found in the stream sediment near the site may be elevated. However, there was significant variability between the duplicate sample results for copper, such that it was difficult to evaluate any trends. Therefore, as part of the RI, two additional sediment samples designated as SS-4 and SS-5 were collected and analyzed for copper.

2.2.6. Ground Water
Twelve ground water monitoring wells, one temporary dewatering well and two recovery wells have been installed at the facility. The well locations are illustrated on Figure 8.

The wells were installed during the various investigations and IRMs completed at the site and are summarized below.

1. Environmental Assessment (1988) - Shallow monitoring wells MW-2 and MW-3 were installed.
2. Phase I RI (1992) - Monitoring wells MW-2D and MW-3D were installed adjacent to existing monitoring wells MW-2 and MW-3 to evaluate the hydrogeology and ground water chemistry in the deep zone. Monitoring well nest MW-4 and MW-4D was installed within Hoyt Street to evaluate site hydrogeology and ground water chemistry upgradient of the site. MW-8 was installed near the Fuel Oil UST Area to monitor free-phase product encountered in this area.
3. IRMs (1992) - A temporary well designated as MW-5 was installed in the Solvent UST Area to aid in dewatering soils in this area prior to excavation. This well was subsequently removed when soil was excavated in this area and was immediately replaced with recovery well RW-2. Recovery well RW-1 was installed in the Fuel Oil UST Area to recover free-phase product in this area.
4. December 1992 - Monitoring wells MW-9 and MW-10 were installed to evaluate a new location for a recovery well in the Fuel Oil UST Area.
5. RI (January 1994) - Monitoring wells MW-11 and MW-12 were installed to further evaluate ground water chemistry in the Solvent UST Area. MW-13 was installed to evaluate whether the Fuel Oil UST Area has affected ground water quality.

A quarterly ground water monitoring program was initiated in 1991, as part of a Corrective Measures Program associated with the Solvent UST Area. This program is currently on-going and monitoring wells MW-2, MW-2D, MW-3, MW-3D, MW-4, MW-4D, MW-11, MW-12, and MW-13 are sampled for VOCs. The results of the quarterly sampling are regularly transmitted to the NYSDEC.

- The data collected during the quarterly ground water sampling and during the Phase I RI indicates that VOCs are the primary compounds of concern in the ground water.

3. RI Field Investigation

This section discusses the field investigation activities completed during the RI. Specifically, the objectives and methods for completing each task as well as a summary of the results are presented. A complete discussion of the results are found in Section 5.

The field investigations were completed in accordance with the approved RI/FS Work Plan, and RI Work Plan Addendum. The investigative tasks included a GPR Survey, soil borings and subsurface soil sampling, monitoring well installation, *in situ* hydraulic conductivity testing, ground water sampling, sediment sampling and indoor air monitoring.

3.1. Ground Penetrating Radar Survey

Objective
A GPR survey was completed, as part of Task 1 and Task 5 of the RI Work Plan, in the vicinity of the Solvent UST Area and Fuel Oil UST Area (Figure 9). The survey was completed to evaluate the possible presence of DNAPL and LNAPL in each area and the topography of the bedrock surface. The results of the survey were used in conjunction with previously collected data to direct the location of subsequent soil borings.

Method
The GPR survey was subcontracted by O'Brien & Gere to Detection Sciences, Inc. of Carlisle, Massachusetts and was completed October 1 and 2, 1993 in accordance with procedures presented in the QAPP.

A Geophysical Survey Systems, Inc. Subsurface Interface System-8 was used for the survey. Outside the building, a 120 MHz antennae was pulled over the ground surface to complete the survey. Inside the building, the survey was conducted using both a 120 MHz antennae and a 600 MHz antennae. The 600 Mhz antennae was used to reduce interference from rebar in the concrete floor. Radar data were continually recorded on magnetic tape during the survey. Detection Sciences, Inc. then filtered the data using several proprietary computer programs, and provided a report which described the nature of observed responses. This report is included in Appendix A.

Results
The survey identified areas where light, moderate and strong non-ionic responses were noted. These responses only suggest that affected soils may be present in a given area. It should be recognized that the responses could be indicative of fill material or a change in soil chemistry, moisture content and grain size.

The survey suggested that there were two separate source areas of DNAPL, one previously located source was at the Solvent UST Area. The other newly identified source is the Shed Area located in the northwest portion of the site. The results were used to direct the location of soil borings which were installed. Soil borings were installed in the newly identified source area near the shed. These locations were subsequently approved by the NYSDEC.

In order to optimize the use of the GPR survey, Detection Sciences reinterpreted the survey data after the soil borings were completed. The information collected from the soil borings was used for calibration. The revised GPR anomaly figures are included in Appendix A.

Due to the fine grained nature of the shallow soils, which adsorb the radar signal, the topography of the bedrock was not delineated.

3.2. Soil Boring and Subsurface Soil Sampling

Objectives
Twenty-five soil borings and forty-seven subsurface soil samples were analyzed during the RI. The soil borings were completed in the Solvent UST Area, Shed Area, Fuel Oil UST Area and the Former Drum Solvent Storage Pad Area.

The objectives for completing the soil borings and subsurface soil sampling in each area varied. The specific objectives as well as the borings completed for each area are summarized below.

Solvent UST Area and Shed Area - The objectives of the soil boring and subsurface soil sampling program in this area were to evaluate:

- the possible presence of DNAPL in subsurface soils;
- the horizontal and vertical extent of impacted soils in the Solvent UST Area and Shed Area; and
- the possible presence of DNAPL in depressions on the bedrock interface.

As part of Task 2 of the RI/FS Work Plan, seven shallow soil borings (B-31, B-32, B-33, B-34, B-49, B-50, and B-51) and two deep soil borings (B-35 and B-36) were initially advanced from December 14, 1993 through January 14, 1994. The boring locations were based on the results of the GPR survey and previously collected data (Figure 8). Since DNAPL was identified in small lenses within the soil samples collected from the borings installed in December, four additional deep soil borings designated B-52 through B-55 were completed in May 1994 at locations approved by the NYSDEC.

Former Drum Storage Pad Area - Eight shallow soil borings were installed to evaluate the effectiveness of the ISAS IRM and assess whether SVOCs from various oils stored in the area had impacted the soils. The borings were designated B-41 through B-48 and were advanced according to the procedures outlined in Task 4 of the RI/FS Work Plan (Figure 4).

Fuel Oil UST Area - Four shallow soil borings (B-37, B-38, B-39, and B-40) were completed to the top of the water table as part of Task 6 of the RI/FS Work Plan. The borings were completed to evaluate the potential impact to soils and ground water beneath the building from the former Fuel Oil UST Area (Figure 8). The locations were selected based on the results of the GPR survey and previously collected information in the area.

Drilling and Soil Sampling Methods

The soil borings were advanced by Aquifer Drilling and Testing, Inc. of Long Island, New York and were observed by an O'Brien & Gere hydrogeologist. Field conditions necessitated different drilling methods for the shallow and deep soil borings. The drilling method are discussed below.

<u>Shallow Soil Borings</u> - Nineteen shallow soil borings (B-31, through B-34 and B-37 through B-51) were completed during the RI (Figure 8). The soil borings were advanced using hollow stem auger drilling methods. Continuous soil samples were collected from each shallow boring utilizing a 3-inch diameter split-spoon sampler. The soil samples were examined and moisture, color, grain size, and density characteristics were recorded on boring logs contained in Appendix B. Upon completion, each boring was sealed by installing a thick cement/bentonite grout via a tremie pipe.

Four soil samples from soil borings, B-49 (4 to 4.5 ft), B-49 (4.5 to 6 ft), B-33 (5 to 7 ft) and B-33 (7 to 8 ft), were selected for grain size analyses according to ASTM method 422-90. Two shelby tubes were collected, one from B-49 (4 to 6 ft) and one from B-33 (5 to 7 ft) according to ASTM method 1586-83 to evaluate the vertical hydraulic conductivity permeability of the shallow soils. The vertical permeability was tested according to ASTM method D-5084-90. The results are presented on Table 2 and the laboratory results are contained in Appendix C.

<u>Deep Soil Borings</u> - Six deep soil boring designated as B-35, B-36, B-52, B-53, B-54 and B-55 were completed to the top of bedrock. The top of bedrock varied from approximately 30 to 40 ft below land surface (bls). Permanent steel casing was installed in the shallow overburden to minimize any hydraulic connection between the shallow and deep zones.

Deep soil borings B-35 and B-36, completed in December 1993 and January 1994, were initially advanced using hollow stem auger drilling methods to a depth of 15 ft bls. A permanent 6-inch steel casing was installed and grouted in place via a tremmie pipe. The borings were then advanced using mud rotary drilling methods to the top of bedrock. The mud rotary drilling method was utilized because "running" sands were encountered. Additionally, a 4-inch temporary steel casing was advanced in the borehole to prevent collapsing of the soil. This drilling method was approved by the NYSDEC.

Continuous soil samples were attempted in each deep boring utilizing a 3-inch diameter split-spoon sampler. The occurrence of running sands prevented sample recovery at several intervals. The soil samples were examined and moisture, color, grain size, and density were recorded on the boring logs contained in Appendix B.

The drilling method for deep soil borings B-52, B-53, B-54 and B-55 was slightly different than described above. Specifically four inch permanent steel casing was installed using hollow stem auger drilling methods to a depth of 12 ft. The casing was grouted in place via a tremmie pipe to minimize the hydraulic connection between the shallow and deep overburden zones. Drilling was then continued using mud rotary techniques until the top of bedrock was encountered. Temporary well casing was not utilized. Upon completion each borehole was sealed by installing a thick cement/bentonite grout via a tremmie pipe.

Soil samples were continuously collected utilizing two inch split spoon samplers according to ASTM method D 1586-84. No problems with sample recovery were encountered at soil borings B-52 through B-55. Soil samples were classified as described above.

Field Screening and Laboratory Analyses

The subsurface soil samples collected during drilling were screened in the field in accordance with the QAPP. The field screening was completed using a photoionization detector (PID) with an 10.2 eV lamp and an ultraviolet (UV) light. PID measurements were recorded as the split spoon sample was opened. In addition, a portion of each sample was placed in an 8 oz. jar and capped with aluminum foil. The headspace of each jar was also monitored using a PID. The split spoon sample was also placed under an UV light to evaluate the presence of NAPL. Field screening results are presented on the soil boring logs contained in Appendix B.

After opening each split spoon a portion of each sample was placed in one 4 oz jar for VOC analyses and one 8 oz. jar for SVOC analyses and the jars were placed in a cooler with ice or ice packs. Samples selected for analyses were subsequently transported to OBG Laboratories, Inc. The criteria for selecting samples for laboratory analyses varied between areas and are summarized below. Chain of custody procedures consistent with the work plan were followed.

At the Solvent UST and Shed Areas, samples for laboratory analysis were selected where field screening data suggested that VOCs are present. For each boring, the sample with the highest field screening

(UV light and PID) results was analyzed. At locations where no elevated field screening data were observed, one sample was collected near the water table and the other sample was collected near the bottom of the boring and submitted to the laboratory for analyses.

At the Fuel Oil UST Area, samples for laboratory analyses were selected at depths immediately above and below the water table. If stained soil was encountered, the stained soil sample was submitted.

At the Drum Solvent Pad Area, one sample immediately above the water table (3 to 5 ft) was selected for analyses with the exception of B-47. At B-47 the sample from 4.5 to 6.5 ft was analyzed due to poor sample recovery in the 3 to 5 ft interval.

The samples collected from B-31 through B-51 in December 1993 and January 1994 were submitted to OBG Laboratories (NYS Certification #10155) in Syracuse, NY for analysis of:

- NYSDEC ASP Superfund 91-1 Volatile Organic Method
- NYSDEC ASP Superfund 91-2 Semi-Volatile Organic Method
- Total petroleum hydrocarbons (Method 418.1 modified for soils) (Fuel Oil UST Area B-37 through B-40 only).

Samples from borings B-52 through B-55 installed at the Solvent UST and Shed Area in May 1994 were analyzed for VOCs according to NYSDEC ASP Superfund method 91-1. Samples were not analyzed for SVOCs because only low levels of SVOCs were detected in borings previously completed in this area. This modification was approved by the NYSDEC.

<u>Identification of DNAPL</u> - DNAPL is a nonaqueous phase liquid whose specific gravity is greater than water. Because it is heavier than water it tends to sink and does not necessarily migrate with ground water flow. Typical industrial sources of DNAPLs are chlorinated solvents including TCE, PCE, and TCA. In heterogenous soils such as those encountered at the site, direct visual detection of DNAPL is difficult when it is clear and colorless, present at low saturation or distributed heterogeneously.

The presence of DNAPL in soil borings completed as part of the RI was evaluated by a review of laboratory analytical results, visual observations such as a sheen, and field screening techniques. The field screening techniques included PID measurements of VOCs in split spoon samples, PID readings of VOCs in the headspace in jars containing soil samples, and observation of soils under a UV light.

Many chlorinated DNAPLs can be identified under a UV light because they fluoresce. The UV light is a good screening tool because it enables examination of each split spoon as well as examination of lenses within a sample for fluorescence. However, it should be recognized that UV light field screening is a qualitative screening method.

While the UV light may be a good screening tool for the presence of NAPL in small lenses in the soil sample, the PID measurements may provide a better indication of the overall concentration of VOCs in the soil sample. Since an aliquot of the sample is placed in a jar and the VOCs are allowed to defuse into the headspace, the PID readings give an indication of gross VOC concentrations in the sample rather than VOC concentrations in a small lens of the sample. For example, in a sample where one small lens of sand contains DNAPL, the VOC concentrations in the headspace may be low. In a sample with a widespread distribution of DNAPL high VOC concentration in the headspace may be found.

The propensity for DNAPL to travel along more permeable lenses makes collection and analysis of representative soil sample by the laboratory difficult as well. It is possible that laboratory analysis of a soil sample with DNAPL in a small lens may yield low concentrations of VOCs. As required by both EPA and NYSDEC sample protocols, four ounces of a representative soil sample is collected for laboratory analysis. It is possible that if DNAPL in a small sand lens is included as only a part of the "representative" sample for analyses that low concentrations of VOC will be detected. This problem is further compounded by the fact that the laboratory only uses 10 grams of soil from the four ounce sample jar. Obviously, the concentrations of VOCs may vary widely depending upon the portion of soil sample that is analyzed. The distribution of DNAPL in thin lenses of soil can result in soil samples from the same one inch sample that show VOC concentrations that vary by orders of magnitude.

In view of the difficulties associated with the screening and analytical techniques, both the field screening and analytical data were used in combination to evaluate the presence of DNAPL in the subsurface soils. Based on visual observations, a sheen noted on a soil sample indicates the presence of DNAPL. In addition, studies have shown that VOC concentrations in the percent range indicate the presence of DNAPL (Cohen, 1993). Elevated headspace readings in conjunction with fluorescence indicates that DNAPL is present in a sample. If the sample showed only fluorescence or only elevated headspace readings then the data suggests that DNAPL may be present.

The results of the GPR survey were also used as an additional screening method to evaluate the horizontal and vertical distribution of DNAPL. The GPR survey identified areas of light, moderate, and strong non-ionic responses. Although, these non-ionic responses could be due to other factors including changes in soil chemistry, presence of fill material, or a change in moisture content, there was a reasonable correlation between strong non-ionic responses and DNAPL present in the subsurface soil.

Results
This discussion summarizes the results of the soil boring and subsurface soil sampling completed at the site. A complete discussion of this data is presented in Section 5.

<u>Solvent UST and Shed Areas</u> - DNAPL and elevated VOCs were identified in the vicinity of the Solvent UST Area and Shed Area at B-31, B-34, B-50, and B-52. The primary compounds detected were acetone, 1,1-DCE, 1,1-DCA, 1,2-DCE, TCA, TCE, PCE, benzene, toluene and xylene. The analytical and field screening data indicate that DNAPL is heterogeneously distributed in small lenses to an approximate depth of 28 ft. The majority of the soil does not contain DNAPL and no "pools" of DNAPL were observed in the soil or atop bedrock. The analytical data collected in these areas are summarized in Tables 5 through 9. A complete discussion of these areas are presented in Sections 5.1. and 5.2.

<u>Former Drum Storage Pad Area</u> - Analytical data collected in this area are summarized on Tables 9 through 13. Low levels of VOCs were detected in the eight soil samples analyzed from soil borings B-41 through B-48. The compounds detected with the most frequency

are toluene, acetone, TCE, 1,2-DCE, TCA, and PCE. Total VOC concentrations at seven of the eight samples ranged from 0.014 to 0.661 mg/Kg. The sample at B-44 contained 4.85 mg/Kg of total VOCs.

Low concentrations of SVOCs including pentachlorophenol, phenathrene, flouranthene, pyrene, benzo(a) anthracene, chrysene, benzo(b)flouranthene, and other related compounds were detected at B-41, B-42, B-43, B-44 and B-48 (Table 10). Total SVOC concentrations ranged from non-detectable at B-45, B-46 and B-47 to 5.88 mg/Kg at B-48.

Fuel Oil UST Area - The analytical data collected in this area are summarized on Tables 14, 15, and 16. A review of the tables indicated that soil samples from B-37, B-38/MW-13, B-39, and B-40 contained VOCs including acetone, carbon disulfide, TCA, TCE, PCE and 1,1-DCA. The concentrations of VOCs ranged from non-detectable to 0.20 mg/Kg of total VOCs; likely due to the ground water plume from the Solvent UST Area.

Several SVOCs, typical of fuel oil were found in low concentrations in the soil samples from B-37 through B-40. The highest concentrations of SVOCs were detected in B-37 (4.5 to 6.5 ft) and B-39 (4 to 6 ft). The total SVOC concentrations ranged from 4.096 mg/Kg at B-37 (4.5 to 6.5 ft) to 4.932 mg/Kg at B-39 (4 to 6 ft), respectively. The concentration of SVOCs decreased in B-39 (6 to 8 ft) to 0.140 mg/Kg. This information verifies that SVOCs have not significantly impacted soils under the building and the vertical extent of SVOCs beneath the building is limited to soils near the water table and does not extend below 8 ft.

3.3. Ground Water Monitoring Well Installation

Objectives

Three shallow ground water monitoring wells were installed at the site in accordance with Task 3 and 7 of the RI/FS Work Plan. Two monitoring wells (MW-11 and MW-12) were installed to further evaluate ground water quality downgradient from the Solvent UST Area (Figure 8). Monitoring well MW-13 was installed downgradient of the Fuel Oil UST Area to evaluate if any LNAPL has migrated beneath the building and to evaluate the impact of the Fuel Oil UST Area on ground water quality.

Methods

Borings for the monitoring wells were advanced using 4-1/4 inch hollow stem augers. Continuous split-spoon samples were collected according to ASTM method D-1586-84. The samples were examined and moisture, color, grain size, and density characteristics were recorded on the boring logs contained in Appendix B.

The monitoring wells were constructed using 10 feet of 2-inch I.D. machine slotted PVC (0.010 inch slot size) well screen attached to an appropriate length of two inch I.D. flush joint threaded PVC riser casing. The monitoring well screens were installed to straddle the water table. A washed, graded, silica sand pack was placed around the well screen and extended approximately 2 ft above the top of the screen. A minimum 1 ft bentonite pellet seal was placed above the sand pack. A flush mounted manhole was cemented in place and the well was secured with a locking expansion plug. Monitoring well construction diagrams are presented on the boring logs contained in Appendix B.

After completion, the monitoring wells were developed to enhance the hydraulic connection between the well screen and the aquifer. Development was completed by bailing the well with a decontaminated stainless steel bailer attached to a dedicated polypropylene rope. Due to the fine grained soils surrounding the well, screening it was not possible to develop the wells to a turbidity of less than 50 nephelometric units (NTUs). The development process was continued for a period of two hours to ensure that representative ground water was transmitted into the well. The development water was contained in a 55-gallon steel drum and was subsequently discharged into the on-site ground water treatment system.

In situ hydraulic conductivity tests were completed on each well to evaluate the horizontal hydraulic conductivity of the screened interval. These tests were performed by inserting a pre-cleaned PVC rod into the monitoring well, waiting for the water level to return to static conditions, and then quickly removing the PVC rod from the monitoring well. Removal of the PVC rod created a negative hydraulic potential between the well and the surrounding aquifer.

Water levels were manually collected until static conditions returned. The data obtained from these tests were evaluated using the Bouwer & Rice Method (Bouwer and Rice, 1976). The results of the tests are contained in Appendix D.

Results
The results of the *in-situ* hydraulic conductivity test indicated that the horizontal hydraulic conductivity of the screened materials ranged from 2.9 x 10^{-5} cm/sec to 9.1 x 10^{-5} cm/sec. These values are typical of fine grained sediments. Ground water samples were subsequently collected from each new well and the results are discussed in Section 5.7

3.4. Ground Water Sampling

Objectives
There were two objectives for the RI ground water sampling. One objective was to evaluate whether SVOCs have impacted the ground water. The second objective was an evaluation of the changes in ground water quality since ground water monitoring was initiated in 1991.

Methods
Quarterly ground water monitoring for VOCs was initiated in July 1991 as part of the Corrective Measures Program associated with the Solvent UST Area. Additional wells were incorporated in the quarterly monitoring program as they were installed. The data is summarized in quarterly monitoring reports that are regularly transmitted to the NYSDEC and are also summarized in Table 17.

As part of the RI, ground water samples from seven monitoring wells (MW-2, MW-2D, MW-4, MW-4D, MW-11, MW-12 & MW-13) were collected on February 15, 1994 and submitted to OBG Laboratories, Inc. for the following analyses:

- NYSDEC ASP Superfund 91-1 Volatile Organic Method;
- NYSDEC ASP Superfund 91-2 Semivolatile Organic Method; and
- TPH (MW-13 only).

Monitoring wells MW-3 and MW-3D were not sampled because they were covered with several feet of ice.

Chain of custody procedures consistent with the Work Plan were followed. Appropriate quality control samples including field duplicates, matrix spikes, matrix spike duplicates, field blanks and trip blanks were collected and analyzed as specified in the QAPP. The analytical data was subsequently validated by H2M Labs, Inc. a NYSDEC approved validator

The site monitoring wells (MW-2, MW-2D, MW-3, MW-3D, MW-4, MW-4D, MW-11, MW-12, MW-13) continue to be sampled as part of the on-going quarterly ground water monitoring program. Samples have been collected on three occasions since the RI sampling event (Table 17).

Prior to sampling, ground water elevations were obtained from each well using an electronic water elevation probe. The historical ground water elevations are summarized on Table 3. This data was used to calculate the amount of water to be purged in order to obtain representative samples. Prior to sampling each well, three well volumes of ground water were removed using a dedicated, laboratory cleaned, stainless steel bailer, and a stainless steel leader attached to polypropylene rope. Following the removal of each well volume, ground water pH, dissolved oxygen, salinity, temperature and turbidity readings were collected. Specific details of the RI ground water sampling event are presented on the ground water sampling logs contained in Appendix E. The ground water sampling logs for quarterly sampling events are regularly transmitted to the NYSDEC in the quarterly data monitoring report.

The evacuated ground water was collected in 55-gallon steel drums and disposed in the on-site ground water treatment system.

Results

In general the ground water chemistry data collected during the RI is consistent with the compounds detected in the soil and previously collected ground water quality data. The primary compounds of concern are VOCs. Low concentrations of three SVOCs were detected in the upgradient well nest MW-4/4D (Table 18). No SVOCs were detected at other locations. Low levels of dissolved inorganics were detected in ground water samples collected during the Phase I RI. The highest concentrations of inorganics were observed at well nest MW-4/4D (Table 19). The concentrations are likely naturally occurring or due to upgradient sources.

The highest concentrations of VOCs in the ground water are found in the effluent from recovery well RW-2, installed at the Solvent UST area (Table 20). The compounds detected with the most frequency at this location include 1,1-DCE, 1,2-DCE, PCE, TCE and toluene. The concentrations of total VOCs in RW-2 have ranged from 215 mg/l in April 1992 to 0.735 mg/l in August 1994.

The VOCs detected in the ground water with the most frequency in monitoring wells MW-2 ,MW-2D, MW-3, MW-3D, MW-11, MW-12 which are located downgradient of the Solvent UST Area are PCE, TCA, TCE, 1,1-DCA, 1,2-DCE, 1,1-DCE, benzene and vinyl chloride. The concentrations of PCE have ranged from non-detect at several locations to 1600 μg/l at MW-2D. TCA has ranged from non-detect to 610 μg/l at MW-3, TCE has ranged from non-detect to 75 μg/l at MW-12, 1,1-DCA has ranged from non-detect to 300 μg/l at MW-3, 1,2-DCE has ranged from non-detect to 77 μg/l at MW-11, 1,1-DCE has ranged from non-detect to 670 μg/l at MW-3 (Table 17). The concentrations of vinyl chloride and benzene are highest in MW-2 and have ranged from non-detect to 29 μg/l for benzene and up to 200 μg/l for vinyl chloride. The concentrations of total VOCs at each well have fluctuated, however the data indicates that concentrations of total VOCs have decreased with time, with the exception of MW-2D which as recently increased.

At MW-13, located downgradient of the Fuel Oil UST Area, TCE is detected with the most frequency. The total VOC concentrations have ranged from 3 to 30 μg/l. Occasionally low concentrations of VOCs are periodically detected at the upgradient monitoring well nest MW-4/4D.

3.5. Sheldrake River Sediment Sampling

Objective
Historical sediment sampling data has suggested that copper concentrations may be elevated in the river sediments adjacent to the site. However, there have also been concerns about the reliability of that data. Therefore, two stream sediment samples were collected from the Sheldrake River on June 3, 1994 to further evaluate copper concentrations upstream and downstream of the facility. The sample designated SS-4 was collected 50 ft upstream and sample SS-5 was collected 50 ft downstream from the samples collected during the Phase I RI (Figure 7.)

Method
The samples were collected using the protocol outlined in the RI Work Plan Addendum dated July 13, 1993. Specifically, a laboratory decontaminated stainless steel spatula was used at each location to collect four sub-samples at a depth of three inches. The four sub-samples at each location were composited in a stainless steel mixing bowl using a stainless steel spatula and placed in appropriate containers. The sample jars were placed in a cooler with ice and transported to OBG Laboratories for analyses of copper via NYSDEC ASP methods. Appropriate quality control samples including field duplicates, matrix spikes, matrix spike duplicates, field blanks and trip blanks were collected and analyzed as specified in the QAPP.

Results
The concentrations of copper were similar to those detected in during previous investigations. Copper was detected at 20.6 mg/Kg in the upstream location. SS-5 located downstream of the site indicated highly variable concentrations, since copper ranged from 45.9 mg/Kg in the sample to 289 mg/Kg in a duplicate sample.

3.6. Air Sampling

Objective
Ambient air samples were collected to evaluate the potential presence of VOCs in the building air. The air sampling addressed

potential exposure to building occupants. Two locations within the building, one near the Solvent UST Area and one near the Fuel Oil UST Area, were sampled for VOCs (Figure 10). In addition, one sample was collected outside of the building to evaluate background air quality (Figure 10). The samples were collected on October 8, 1993.

Method
Two samples were collected at each location, one for a total duration of 90 minutes and one for a total duration of 8 hours, utilizing an Alpha 1 programmable personal air sampling pump and charcoal tubes. Samples were collected 4 to 5 ft above the floor to measure concentrations in the breathing zone. Following collection, samples tubes were immediately sealed with plastic caps. In addition, one field blank was collected. The tubes were then placed in a zip-lock bags and placed into a cooler with ice. The cooler was shipped to the Wisconsin State Laboratory an AIHA accredited laboratory.

Results
No VOCs were detected in the air samples. Therefore it can be concluded that the soil and ground water are not impacting indoor air quality in the building. With respect to VOCs, the building air meets OSHA requirements. The results are presented on Table 21.

3.7. Surveying

Each newly completed test boring location, stream sediment sample location new and existing site monitoring wells, recovery well, locations and other pertinent features were surveyed for location and elevation by a licensed New York State Surveyor in September 1994. The horizontal location and elevation were completed to North American Datum (NAD) - New York east zone and the National Geodetic Vertical Datum (NGVD) 1929. The existing monitoring wells were resurveyed because some of the wells were changed from a stick-up protective casing to a flush mounted casing.

3.8. Decontamination Procedures

The drilling rig and other associated equipment including hollow steam augers, drill rods, wrenches, and temporary casing, which may have come into contact with potentially contaminated soils were cleaned with a high pressure steam cleaner. The decontamination procedure was completed prior to initiating work, between each boring and monitoring well location and at the completion of the project at a designated on site location. In addition, well materials and steel casing used during the program were also steam cleaned prior to installation and wrapped in plastic until used.

Split-spoon samplers and other sampling equipment (mixing bowls, spatulas, etc) were field-decontaminated by steam cleaning or by the following procedure:

1. Non-phosphate detergent plus tap water wash
2. Tap water rinse
3. Distilled/deionized water rinse
4. Methanol
5. Air dry completely
6. Distilled/deionized water rinse

Water for decontamination purposes was obtained from an on-site public water supply source.

3.9. Investigation Derived Waste

Investigation derived waste including soil cuttings, decontamination water, disposable health and safety equipment and other disposable equipment were contained and properly disposed.

The drill cuttings were containerized in DOT 17H 55-gallon drums. Twenty-seven drums of drill cuttings were produced during this investigation and were staged near the Former Drum Storage Pad Area. The drums were subsequently disposed of as a hazardous waste solid by Chem Waste Management at their Model City, NY facility. The manifest documents are contained in Appendix F.

Water generated during equipment decontamination and purge water from ground water sampling were contained in 55-gallon drums and subsequently discharged to the on-site ground water treatment facility.

Other equipment including disposable safety equipment and associated refuse were disposed as municipal waste.

3.10. Data Validation Summary

Analytical data from the RI, were validated by H2M Laboratories Inc (H2M), located in Melville, New York in accordance with the approved QAPP. H2M is a NYSDEC approved validator. A detailed validation report was presented under separate cover. During the data validation report, data quality indicators reflective of the uncertainty and useability of the data were assigned to specific analytical methods, and as summarized below.

R	The data were determined to be unusable and were rejected.
J	The analyte was positively identified, the associated numerical value was the approximate concentration.
B	The compound was detected in the associated blank as well as in the sample. Consistent with USEPA Guidance, data qualified with a B were treated as non-detects.

With the exception of the sediment data, the results of the data validation indicated that the analyses met or exceeded the quality control criteria in the NYSDEC ASP methods. Several minor deficiencies were noted in the soil VOC and SVOCs analyses. However, in these instances the concentrations were estimated and no data was rejected.

Two sediment samples were collected and analyzed for copper. These analyses were rejected because the difference between the environmental sample at SS-5 and a field duplicate at SS-5 was 145 percent. In addition, matrix spike recovery in this sample was not within control limits and a recovery of 248% was reported. H2M stated in the Data Validation Report dated August 23, 1994 that the poor matrix spike recovery and difference between the environmental sample SS-5 and a field duplicate collected at SS-5 are likely due to the heterogeneities within the sediment. Similar variations in copper concentrations were noted in samples collected during previous investigations.

4. Physical Characteristics

4.1. Demography and Land Use

The former ITT Sealectro site is located in a highly developed area of Mamaroneck (Figure 1). This area has been developed since the 1800s. The site is located on property that is zoned for industrial and commercial land use and the properties in the immediate vicinity of the site are industrial and commercial. Current and historical land use in the vicinity of site includes: Mamaroneck Chemical, Blood Brothers Auto Wrecking Yard, Westchester Plastic (formerly Westchester Chemical and the site of a former Westchester Electric Power & Light facility), Jeryco Plastics, a city garage, Amtrak, Marvel Industries, gas stations, and a photographic facility.

Information from Environmental Data Resources, Inc. indicates that there are numerous properties within a one-half mile radius of the site whose operations have the potential to impact the environment. These properties include: 1 landfill, 115 leaking USTs, 36 registered USTs, 24 RCRA small quantity generators, and 14 RCRA large quantity generators.

Residential areas are also present immediately north of the site across the Sheldrake River.

The Village of Mamaroneck is supplied with public water. The water is purchased from New York City reservoirs. A local ordinance requires that public water be utilized for potable supplies, provided a supply line is located within 500 ft of the property line (Pocha, 1994).

4.2. Meteorology

The climate of Westchester County is moderate, with an average temperature of 51 degrees Fahrenheit (US Army Corps of Engineers, 1977). The temperature extremes vary from a low of approximately 18 degrees Fahrenheit to a high of approximately 105 degrees Fahrenheit. Average humidity is approximately 67 percent and the prevailing winds are from the northwest, with an velocity of 14 miles per hour (US Army Corps of Engineers, 1977). The average annual precipitation in Westchester County is approximately 45 inches, with observed extremes of 26 to 67 inches. The average annual snow fall in this area is approximately 39 inches with a rainfall equivalent of 4 inches. The seasonal distribution of rainfall in Westchester County is fairly consistent, with slightly higher amounts falling in the summer (US Army Corps of Engineers, 1977).

4.3. Physiography

The site is located in the Manhattan Hills sub-area of the New England Uplands physiographic province (US Army Corps of Engineers, 1977). The terrain is predominantly composed of low-lying plains and flat broad valleys separated by low rolling hills (Figure 1). Elevations in the area of the site range from 20 ft above mean sea level in the low-lying areas to about 65 feet above mean sea level in the northeast trending hills. The site is located in a low-lying area at an elevation of between 20 feet and 25 feet above mean sea level. To the south and east of the site are northeast trending hills. Low-lying areas are present to the north and west of the site. More northeast trending hills are located about 2000 ft to the northwest.

4.4. Surface Water

The Sheldrake River is located along the northern boundary of the site. The Sheldrake River flows to the northeast and joins the Mamaroneck River about 1500 feet from the site (Figure 1). The

Mamaroneck River flows to the south where it discharges into Mamaroneck Harbor. Mamaroneck Harbor, which is part of Long Island Sound, is located about 3000 feet southeast of the site.

The combined drainage area of the Sheldrake and Mamaroneck Rivers is about 23.4 square miles. The Sheldrake River drainage area is 5.33 square miles (USGS & NYSDEC Bulletin 74, 1979). The reported average annual combined discharge for the Mamaroneck and Sheldrake Rivers is 32.7 cubic feet per second (cfs). A peak discharge of 4260 cfs was measured in September 1975. An estimated 1370 cfs of this peak was attributed to the Sheldrake River. The ITT Sealectro site has been flooded on several occasions in the past (personal interview, Joe Corvo).

Surface water and sediment quality data for the Sheldrake River have been collected by the USGS, Westchester County Department of Health, and the Village of Mamaroneck. The data document upgradient sources and elevated levels of organics and inorganics in the surface water and sediment of the Sheldrake River. A summary of the data is presented in Table 4 and the data is contained in Exhibit A.

4.5. Regional Geology and Hydrogeology

The Mamaroneck area is characterized by alternating ridges and depressions in the bedrock surface. These features trend in a northeasterly direction. The bedrock depressions are manifested at the surface by the topographically low-lying areas. The general bedrock structure consists of anticlinal and synclinal features. These features and bedrock foliation also trend in a northeasterly direction.

The bedrock type in the area is variable. The bedrock is believed to be metamorphosed eugeosynclinal sedimentary, volcanic, and intrusive rocks of the Hartland Formation (Pelligrini, 1977). Bedrock beneath the site is mapped as Granitic Gneiss. The Granitic Gneiss is a gray gneiss composed of garnet, biotite and/or hornblende, quartz, and feldspar. This Granitic Gneiss is apparently a larger intrusive body which is generally contemporaneous with the sedimentary and volcanic units. The age of the bedrock is estimated to be early or pre-Ordovician.

Unconsolidated deposits overlie bedrock across much of the Mamaroneck area. In the hilly areas, the bedrock is exposed or mantled by Pleistocene till (Cadwell, 1988). Deposits of clays, silts, sands and gravels typically cover the bedrock in the low-lying areas. Some recent alluvial deposits are present along streams and rivers. The unconsolidated deposits are of variable thickness and limited extent due to the variable bedrock topography. Boring and well information indicate that the thickness of the unconsolidated deposits in the low-lying area in the vicinity of the site ranges from 30 feet to 80 feet (Asselstine and Grossman, 1955).

Ground water is present in the unconsolidated deposits and bedrock. Ground water flow in the Mamaroneck area is generally from higher elevations to lower elevations. Ground water generally discharges to rivers in the low-lying areas. Where ground water in the unconsolidated deposits discharges to the rivers, it is likely that ground water in the bedrock discharges to the unconsolidated deposits.

In the vicinity of the site, ground water flow paths in the unconsolidated deposits are limited due to topography and the underlying bedrock. Southeast of the site, the presence of bedrock hills will prevent ground water from flowing from the site to the Long Island Sound. Where the Mamaroneck River cuts through the higher topographic area northeast of the site, bedrock is reportedly exposed in the river channel (Pelligrini, 1977). This topographically higher area and the exposed bedrock would prevent ground water in the unconsolidated deposits from flowing to the northeast or southeast. Therefore, the movement of ground water in the overburden would be limited to the area between the site the Sheldrake River and the Mamaroneck River. Ground water in the bedrock aquifer in the vicinity of the site would be expected to discharge to either the nearby rivers or Long Island Sound.

The permeability of the bedrock beneath the site and bedrock in the Mamaroneck area is low. Only small amounts of water, ranging from 7 to 30 gallons per minute (gpm) are typically obtained from the bedrock (Asselstine and Grossman, 1955). Some higher yields, over 100 gpm, have been obtained from industrial wells. In order to obtain these higher yields, bedrock wells were completed to depths ranging from 300 to 600 feet deep (Asselstine and Grossman, 1955). Well yields in the unconsolidated deposits range from no yield in the till to hundreds of gallons per minute in permeable sands and gravels.

Due to the generally low well yields, the vulnerability of the shallow ground water, and the poor quality of available surface water sources, the Mamaroneck area is served by public water. The water is purchased from New York City reservoirs. No domestic or public supply wells have been documented in the vicinity of the site or between the site and Long Island Sound (Pocha, 1994).

4.6. Site Geology

The majority of the site is paved or covered by a building. Unconsolidated deposits consisting of fill and stratified deposits overlay the bedrock beneath the site. Bedrock is encountered between 29 feet and 40 feet below ground surface (elevation of 4 feet to 21 feet below mean sea level) (Figure 11). The elevation of the top of bedrock is lower to the west and south of the building.

Two Generalized Hydrogeologic Cross Sections of the site were completed and are illustrated on Figures 12 and 13. The unconsolidated deposits beneath the site are comprised of three basic units. The unit which rests directly on the bedrock surface is predominantly sand with some gravel. The thickness of this unit varies from 10 feet to 24 feet. The unit is thickest in the vicinity of MW-4 and thinnest in the vicinity of MW-3 and under the building. The observed relative percentages of sand and gravel are not uniform and can vary over relatively short distances. The variations in texture appear to represent lenticular layers. The sand and gravel unit probably represents fluvial deposits.

Overlying the sand and gravel is a unit predominantly comprised of silt and sand. This unit is 8 to 18 feet thick, with the thickest portion in the vicinity of the Sheldrake River. This thicker area may represent an area of erosion of the sand and gravel unit followed by deposition of the silt and sand unit. This middle unit is comprised of discontinuous, inter-layered clay, silt, and sand. Individual lenses vary in thickness, texture, and are not laterally extensive. Based on the variability in texture, lenses thickness and extent, this unit is believed to represent fluvial deposition involving channel and flood plain like deposits (Figures 12 and 13).

The upper unconsolidated unit is fill. It is composed of black, fine to coarse grained sand, fine to coarse grained gravel, gravel with cinders, and slag material. The thickness varies from two feet to seven feet. The fill was probably used to make low-lying land near the river useable for building.

4.7. Site Hydrogeology

The depth to ground water beneath the site is generally between 5 and 8 feet below the ground surface. The depth varies across the site and with seasonal ground water elevations. Two ground water zones are identified beneath the site. The ground water zones are defined based on geology and relative depth. The shallow ground water zone encompasses the fill and silt and sand units. The deep ground water zone is comprised of the sand and gravel unit.

The ground water flow direction at the site was evaluated during low ground water conditions (11/17/94) and during high ground water conditions (3/30/94). Ground water flow maps for both the shallow and deep zones for the above referenced dates are presented on Figures 14, 15, 16, and 17. Ground water flow in the shallow zone is generally toward the Sheldrake River. However, the ground water flow direction is variable.

Higher ground water elevations have been documented in the vicinity of MW-9, MW-10 and MW-13. These wells have generally shown higher ground water elevations since they were installed. The higher ground water elevations had not been identified prior to the installation of these wells and consequently previous ground water flow maps did not reflect this anomaly. The source of these higher ground water elevations is not known, but may be due to recharge from the south and east of these wells, leaking utility pipes beneath the building, or lower permeable soils in the vicinity of these wells.

The 3/30/94 shallow ground water map suggests that the higher ground water levels may represent a ground water mound. Ground water elevation data from other dates such as 7/5/94 also suggest a more prominent area of high ground water in the vicinity of MW-13. The 11/27/94 shallow ground water map shows only a small mound and indicates that the size of the mound fluctuates. This mound may influence ground water flow directions on the site. Periods of time when the mound is larger may direct shallow ground water flow from the Solvent UST Area more in the direction of MW-2. Lower water elevations in the MW-13 area may enable shallow ground water to flow more to the north or northeast. The deep ground water flow pattern does not appear to be affected by the elevated ground water levels in the MW-13 area. Continued monitoring of ground water elevations may provide additional insight into this area of high ground water.

The hydraulic gradient in the shallow ground water zone ranges from 0.0011 ft/ft to 0.025 ft/ft. The geometric mean horizontal hydraulic conductivity of the shallow zone is 2.2×10^{-4} cm/sec (4.6 gpd/ft^2). The range is 2.1×10^{-3} to 2.9×10^{-5} cm/sec. This range reflects the range in texture of the unconsolidated deposits in the fill and silt and sand units. Because the mean hydraulic conductivity value is consistent with typical values for fine sand, this suggests that horizontal ground water flow in the shallow zone is controlled by the sandy materials within the zone.

Ground water flow in the deep zone is towards the Sheldrake River. The hydraulic gradient is in the range of 0.001 ft/ft to 0.004 ft/ft. The geometric mean horizontal hydraulic conductivity is 5.3×10^{-4} cm/sec (11.2 gpd/ft^2). The range is 1.7×10^{-3} cm/sec to 1.0×10^{-4} cm/sec. The smaller range in hydraulic conductivity values in the deep zone in comparison to that in the shallow ground water zone probably reflects the generally uniform texture of the sand and gravel deposits in the deep zone. The mean hydraulic conductivity of the deep ground water zone is about the same as the shallow zone due to the presence of sand in both units.

Two laboratory vertical permeability test were completed on soil samples from the shallow zone. The measured vertical hydraulic conductivity ranged from 1.4×10^{-6} cm/sec at B-49 (4 to 6 ft) to 3.6×10^{-5} cm/sec at B-33 (5 to 7 ft). The vertical hydraulic conductivity is about 1.5 to 2 orders of magnitude lower than the horizontal hydraulic conductivity. This would be expected due to the interfingering lenses of sand, silt, and clay. However, due to the discontinuous nature of the clay and silt deposits in the middle geologic unit, the clay and silt lenses may not significantly restrict vertical ground water flow.

Vertical hydraulic gradients have been noted in the three well nests on the site. At the upgradient well nest (MW-4/4D), the vertical hydraulic gradient varies from upward to downward. Along the Sheldrake River, the two well nests (MW-2/2D and MW-3/3D) consistently show an upward hydraulic gradient (Figures 18 and 19). The ground water elevation from the last two years indicates that an average upward hydraulic gradient of 0.025 ft/ft exists at well nest MW-2/2D, and an average upward hydraulic gradient of 0.054 ft/ft exists at well nest MW-3/3D. That is, the ground water elevation in the shallow ground water zone is lower than the hydraulic head in the deep ground water zone. This suggests that there is the potential for ground water in the deep zone to discharge to the shallow zone and to the Sheldrake River. The hydraulic head in the deep zone is consistently above the elevation of the surface water in the river. For much of the year, the hydraulic head in the shallow zone is also above the elevation of the river.

Ground water elevations and surface water elevations were monitored as part of the Phase I RI during a precipitation event. The monitoring data demonstrate that the hydraulic heads in the shallow and deep ground water zones respond to changes in surface water elevations. The ground water elevations in the shallow zone responded rapidly to surface water changes indicating that there is a good hydraulic connection between the shallow ground water zone and the surface water.

Deep ground water elevations also responded to the precipitation events, but not as rapidly as the shallow ground water. Monitoring well MW-3D showed a greater magnitude of response than the shallow monitoring wells. Monitoring well MW-2D showed a smaller magnitude response than the shallow wells. The different magnitude of response in the deep wells may reflect the fact that MW-2D is a deeper well. The response of the deep monitoring wells to the changes in the surface water elevations indicates that there is a hydraulic connection between the surface water and the deep ground water zone.

Based upon the hydraulic gradient and the good hydraulic connection, shallow ground water at the site discharges to the Sheldrake River. The average volume of discharge was calculated using Darcy's Law (Q=KiA) where:

K =	4.6 gpd/ft^2 (mean horizontal hydraulic conductivity)
i =	0.0011 to 0.025 ft/ft (hydraulic gradient)
A =	11 ft thick x 340 ft (cross sectional discharge area)

The calculated discharge is 19 to 430 gpd

The hydraulic gradient and the hydraulic connection suggest that the deep ground water beneath the site also discharges to the Sheldrake River. The average volume of discharge was calculated to be 69 to 274 gpd using Darcy's Law where:

K =	11.2 gpd/ft^2 (mean horizontal hydraulic conductivity)
i =	0.001 to 0.004 ft/ft (hydraulic gradient)
A =	18 ft thick x 340 ft (cross-sectional area)

5. Discussion

5.1. Solvent UST Area

5.1.1. Introduction

As previously stated, several investigations and IRMs have been completed in the Solvent UST Area. As part of these investigations, thirteen soil borings were installed and subsurface soil samples were collected from the vicinity of the Solvent UST area. Information from previous investigations as well as data collected during the RI were collectively used to evaluate the nature, horizontal extent and vertical extent of VOCs in the soil, and the presence of DNAPL.

Specifically, data were used from shallow test borings EB-1, B-17, B-18, B-19, B-20, and B-21 which were completed during previous investigations. Data obtained during the RI, including the GPR survey and the analytical and field screening results from four shallow soil borings (B-31, B-32, B-34 and B-49) and three deep soil borings (B-35, B-52 and B-53) were also used to evaluate the nature and extent of VOCs and DNAPL in the soils.

As previously noted in Section 3, the evaluation of the screening and analytical data from the site was somewhat complicated because the VOC/DNAPL tends to be found in thin zones or lenses in the soil. Consequently, an attempt was made to use all of the screening data and to take into consideration any potential biases that might have been introduced as a result of the sampling or analytical procedures in the evaluation of VOC/DNAPL distribution.

The analytical data from previous investigations and the data from the RI for the Solvent UST Area are summarized on Tables 5, 6, 7, 8, and 9. Soil boring locations are presented on Figure 8.

5.1.2. Source

The former tanks in the Solvent UST Area have been identified as a source of VOCs in the site soil and ground water. This source identification is based upon holes which were observed in some of the USTs during their excavation and removal. Post excavation soil samples collected in April 1992 documented that concentrations of VOCs in excess of 2200 mg/Kg were present in the subsurface soils at this location (Table 8). Soil borings EB-1 and B-17, which were completed at the location of the former USTs, also documented elevated concentrations of VOCs in the soil. VOC concentrations ranged from 202 mg/Kg to 8200 mg/Kg in samples collected from 7.5 ft to 11 ft bls (Table 5).

Laboratory analyses of soil samples from soil borings B-17, EB-1, and post excavation soil samples have documented the nature of the compounds of concern in this source area. VOCs have been identified to be the primary compounds of concern in the Solvent UST Area. The principal VOCs detected in this area include PCE, TCA, breakdown products of PCE and TCA, and toluene. No SVOCs, PCBs or pesticides have been detected in the Solvent UST Area (Tables 6 and 9). Some inorganic parameters were detected, but the concentrations of the inorganics were similar to background concentrations in New York State soils (Table 7) (McGovern, 1980).

5.1.3. Distribution of VOCs/DNAPL in Solvent UST Area

The investigations in the Solvent UST Area have identified a heterogeneous distribution of VOCs/DNAPL in the subsurface soils. The VOCs/DNAPL are not uniformly present in the subsurface soils. Rather the VOCs/DNAPL occurs in discrete lenses. These lenses of VOCs/DNAPL are generally not laterally or vertically continuous.

Field observations during the logging and field screening of split spoon soil samples identified the heterogeneous distribution of VOCs/DNAPL in the subsurface soils. Evidence of VOCs/DNAPL in the form of elevated PID readings or fluorescence typically was not observed throughout each soil sample in the areas where VOCs/DNAPL occur. Rather the field observations indicated that the VOC/DNAPL were located in discrete lenses within the samples. Some of the soil samples contained one thin zone which showed fluorescence while other samples contained multiple zones or thicker zones of fluorescence. The occurrence of the discrete lenses with

VOCs/DNAPL appeared to correlate with the occurrence of lenses of different soil texture, such as a sand lens within silt.

The VOC/DNAPL occur as residual material in the lenses. No pools of DNAPL were encountered during the investigations. The degree of residual saturation of DNAPL in the soils and consequently the VOC concentration found in the soils varies. Some of the lenses encountered had a relatively high residual saturation of DNAPL as evidenced by bright fluorescence, high headspace PID readings, and high VOC concentrations in the laboratory analyses. The 6.5 to 8.5 ft depth interval in boring B-31 showed high fluorescence, a headspace PID reading of 85 ppm, and a laboratory total VOC concentration of 149.5 mg/Kg (Table 5). No sheen or other evidence of DNAPL seeping out of this sample were observed. Therefore, while this lens contains relatively high residual saturation, the DNAPL is immobilized within the pore spaces by soil particles and water.

Other lenses with VOCs/DNAPL showed low residual saturation of DNAPL. Only trace evidence of fluorescence was observed in these lenses and the corresponding low headspace PID readings, and/or low total VOC laboratory results suggest that the VOCs/DNAPL are present, but at relatively low levels. For example the 7 to 9 ft depth sample in boring B-34 showed some fluorescence, a headspace PID reading of 120 ppm, but VOCs were not detected in the laboratory sample (Table 5). This sample interval may contains some isolated droplets of residual DNAPL which were detected by the UV and headspace screening. However, the amount of residual DNAPL was sufficiently small such that no VOCs were detected in the discrete sample analyzed by the laboratory.

A comparison of the data from soil borings B-31/B-35, B-34, and B-52 provides an example of the horizontal heterogeneous distribution of VOCs/DNAPL in the soils (Figure 22 and Appendix B). The fluorescence, headspace PID readings and laboratory results in samples from these borings show limited continuity. For example, the 6.5 to 9 ft intervals in borings B-31 and B-34 showed fluorescence and elevated headspace PID readings. However the same interval in B-52, located about 35 ft to the north, does not show fluorescence or elevated headspace PID readings. Elevated VOC concentrations were detected in the laboratory analyses for B-31 but not for B-34. This also demonstrated limited horizontal continuity.

The data from boring B-35 documents that the vertical distribution of VOCs/DNAPL is also variable (Figure 22 and Appendix B). Discrete zones of fluorescence occur in the 12 to 16 ft depth internal and 23 to 25 ft depth interval with no fluorescence observed between these depths. The headspace PID readings also show elevated readings in these two depth intervals but low readings between the intervals.

The above description of the heterogeneous occurrence of and variable residual saturation by VOCs/DNAPL is consistent with the theoretical understanding of the migration and occurrence of DNAPLs in the subsurface. The current scientific literature documents that DNAPL migration and distribution in the subsurface is not uniform and homogenous (Schwindle, 1988), (Mercer and Cohen, 1990), (USEPA, 1992) (Cohen and Mercer, 1993). Rather the migration and residual presence of DNAPL is controlled by the heterogeneities of the subsurface geology. Both large scale and micro scale heterogeneities can affect DNAPL migration and residual saturation. As DNAPLs migrate through the subsurface, some of the material is retained in the soil it contacts. This residual DNAPL can occur as isolated droplets in an otherwise unaffected soil sample, as films on some soil particles, or can fill the majority of the pores in a soil sample.

The site investigations have provided data for evaluating the extent of VOC/DNAPL in the subsurface soil associated with the Solvent UST Area. However, given the heterogeneous distribution of VOC/DNAPL in the soil, the boundaries were loosely established based upon the occurrence of lenses of VOC/DNAPL within the soil. The horizonal and vertical extent described below does not suggest that the bulk of the soil within the described area contains VOC/DNAPL. Rather lenses with VOCs/DNAPL occur within the described boundaries.

Horizontal Extent

The boundaries of the VOC/DNAPL area are loosely defined by borings B-21 to the east, B-18 to the south, B-49 and B-53 to the west, and B-34 and B-52 to the north.

The eastern extent of VOC/DNAPL lenses associated with the Solvent UST Area is between the UST excavation and boring B-21 (Figures 20 and 22). The soil samples collected from B-21 showed low PID readings and the sample analyzed by the laboratory did not detect VOCs (Table 5, Figure 19, and Appendix B). In addition, the GPR survey did not identify significant anomalies to the east of the former UST location (Appendix A).

The southern extent of VOC/DNAPL lenses is between the former UST location and B-18. PID readings from the soil samples were not elevated and low concentrations of VOCs were detected in the two samples analyzed by the laboratory (Table 5). In addition, the GPR survey did not identify significant anomalies to the south of the former UST location (Appendix A).

The western extent of VOC/DNAPL lenses is in the vicinity of borings B-49 and B-53. Samples from boring B-32, located east of B-53, showed some fluorescent lenses and some moderate headspace PID readings (Appendix B). The laboratory reported low total VOC concentrations (Table 5 and Figure 20). Borings B-49 and B-53 also had some fluorescent lenses, but low headspace PID readings were measured in the sample and low to very low total VOCs were found in the laboratory samples (Figures 20 and 21, Appendix B). The GPR anomalies decrease between B-32 and B-49 (Appendix A).

North of the Solvent UST Area, the soils with VOC/DNAPL lenses intermingle with VOC/DNAPL lenses associated with the Shed Area. The less frequent occurrence of fluorescent zones and elevated headspace PID readings and the lower total VOC concentrations reported by the laboratory suggest that VOC/DNAPL is less common in the B-34, B-52 and MW-11 area (Figures 20, 21, 22, and Appendix B). The GPR survey also suggests that less significant anomalies occur in this area (Appendix A). This area of lower VOC/DNAPL presence may represent the zone of intermingling of VOCs/DNAPL from the two source areas.

Vertical Extent

The data from borings EB-1, B-17, B-31, B-35, B-52 and B-53 were used to evaluate the vertical distribution of VOCs/DNAPL in the Solvent UST Area. There are isolated occurrences of VOC/DNAPL in the soils below a depth of about 16 ft. At boring location B-31-B-35, total VOC concentrations of 149.5 mg/Kg and 16.5 mg/Kg were found at the depths of 6.5 ft to 8.5 ft and 10.5 ft to 12.5 ft respectively. In addition, significant fluorescence and high headspace PID readings characterized the 6 ft to 16 ft depth interval. Below about 16 ft, only sporadic and trace indications of fluorescence and low to moderate headspace PID readings occurred. The total VOC concentration in the 27 ft to 29 ft depth interval was 0.993 mg/Kg. This represents a decrease in total VOC concentrations of over four orders of magnitude from the 6 ft to 16 ft interval (Figures 21 and 22, Appendix B). There is no significant presence of VOC/DNAPL at the overburden/bedrock interface in the vicinity of the Solvent UST Area. There is no evidence of a pool of DNAPL on the top of bedrock.

5.2. Shed Area

5.2.1. Introduction

Prior to the RI, the Shed Area was not recognized as a source area. The GPR survey, compounds of concern detected in soil samples, and the distribution of VOCs/DNAPL in the soil borings completed during the RI identified the Shed Area as a source area. Borings completed during previous investigations supplement the RI results and provide information on the nature and distribution of VOCs/DNAPL in soils associated with this source area.

The analytical data from previous investigations and the data from the RI for the Shed Area are summarized on Tables 5 and 6. Soil boring locations are presented on Figure 8.

5.2.2. Source

The GPR survey completed in October 1993 identified strong non-ionic responses in the Shed area (Appendix A). This information suggested that DNAPL may be present in the area and soil borings were installed in the area to verify the GPR results. Borings B-33 and B-50 documented the presence of VOC/DNAPL in the soil in the Shed Area (Table 5 and 6, Appendix B). The UV screening data collected in the field suggested that DNAPL was present in lenses from 4 to 16 feet bls in B-50/B-55. The fluorescence of some lenses in the soil samples was intense. The 9 to 11 foot sample in B-55 had a rainbow sheen indicative of DNAPL. Total VOC concentrations in the shallow soil samples from these borings were 2.90 mg/Kg and 5.04 mg/Kg.

The primary compounds of concern identified in the Shed Area are VOCs consisting of PCE, TCE, TCA and their breakdown products (Table 5). Laboratory analyses of soils samples did not detect SVOCs in the Shed Area (Table 6).

5.2.3. Distribution of VOCs/DNAPL in Shed Area

The distribution of VOC/DNAPL in the soil in the Shed Area is heterogeneous in the same manner as described for the Solvent UST Area. The VOCs/DNAPL occur in lenses which are generally not laterally or vertically continuous. The VOC/DNAPL lenses occur within individual soil layers such as a sand lenses within silt layers. Residual saturation of VOC/DNAPL in the soil lenses is variable and no DNAPL pools were detected. The field screening data and laboratory data for borings B-50 and B-55 provide examples of the variable distribution and residual saturation of VOC/DNAPL affected soils.

The site investigations have provided data for evaluating the extent of VOC/DNAPL lenses associated with the Shed Area. However given the heterogeneous distribution of VOC/DNAPL, the horizontal and vertical extent described below was loosely established based upon the extent of the occurrence of lenses of VOC/DNAPL. These boundaries do not suggest that the majority of the soil within the described area contain VOCs/DNAPL.

Horizontal Extent

The horizontal extent of VOCs/DNAPL is loosely defined by the Sheldrake River to the north, boring B-51 to the east, borings B-34 and B-52 to the south, and MW-2 to the west.

The eastern extent of VOC/DNAPL lenses associated with the Shed Area is in the vicinity of B-51. Field screening identified fluorescence in soil samples B-51 while the headspace PID readings were very low to moderate. The total VOC concentrations in the laboratory samples were low. These data suggest that trace amounts of VOC/DNAPL may occur in the vicinity of B-51 (Table 5, Figure 20, Appendix B).

To the south of the Shed Area, the shallow soils with VOC/DNAPL lenses associated with the Shed Area intermingle with the VOC/DNAPL lenses associated with the Solvent UST Area. The less frequent occurrence of fluorescent zones and elevated headspace PID readings and the lower total VOC concentrations reported by the laboratory suggest that VOC/DNAPL is less common in the B-34, and MW-11 area (Figures 20, 21, and 22, Appendix B). The GPR survey also suggests that less significant anomalies occur in this area (Appendix A). This area of lower VOC/DNAPL presence may represent the zone of intermingling of VOCs/DNAPL from the two source areas.

Within the deep soil, fluorescence, elevated headspace PID readings and elevated total VOC concentrations in laboratory samples indicate that the VOC/DNAPL lenses associated with the Shed Area extend to boring B-36.

The western extent of VOCs/DNAPL is between B-50 and MW-2. Low headspace PID readings characterize the MW-2D boring. VOC concentrations detected in ground water samples from MW-2 and MW-2D have historically been low and are not indicative of the presence of VOC/DNAPL lenses in the immediate vicinity of the monitoring well. There may be some intermingling of VOCs/DNAPL in soils from the Shed Area with the VOCs in the Former Drum Storage Area.

The northern extent of VOC/DNAPL associated with the Shed Area is believed to be the Sheldrake River. Based upon the available data, it appears that DNAPL migrated in the subsurface from the Shed Area toward B-36. The VOCs detected in the laboratory analyses of soil samples from B-50/B-55 and B-30/B-36 were similar. The presence of VOC/DNAPL in shallow soils near the shed but not in shallow soils near B-36 suggest that the area near B-50/B-55 was the source of DNAPLs. Fluorescent lenses, high headspace PID readings, and elevated total VOC concentrations indicate that DNAPL is present to a depth of about 30 ft at B-36. The field screening and laboratory data do not document the presence of DNAPL at similar depths in B-55. This distribution of DNAPL suggests that DNAPL migration was southward and downward from the shed to B-36. This southward and downward migration pattern would be consistent with gravity driven DNAPL flow. If DNAPL migrated to the south then the impact on soil between B-50/B-55 and the river can be expected to be minimal.

Vertical Extent

In order to evaluate the vertical extent of VOCs in the soils in the Shed Area, data from the deep borings B-36 and B-55 were plotted on a geological cross section of the site and the cross section is shown in Figure 22.

At B-36, the total VOC concentrations increased with depth from less than 1 mg/Kg at the surface to 522.89 mg/Kg at a depth of 25 to 28.5 feet. As a result of problems with sample recovery, it was not possible to retrieve a large enough sample for laboratory analysis from any interval deeper than 28.5 feet (Figure 22). However, it was possible to collect headspace PID readings. The highest headspace PID reading of 500 ppm was found in the interval from 25 to 28.5 feet. The next reading from the 29 to 31 foot interval was 95 ppm which represents a significant decrease in the VOC concentrations in the soils. The headspace PID reading obtained from the deepest sampling interval (35 to 37 ft) was 20 ppm. The headspace data indicated that the occurrence of VOC/DNAPL decreases with depth. Furthermore, no fluorescence was noted in the sample collected from 35 to 37 feet. Although VOCs/DNAPL were found at 25 to 28.5 ft, the screening data indicates a significant decrease in VOC/DNAPL below that depth.

At B-50/B-55 the VOC/DNAPL in the soil decreases with depth. The concentrations of the VOCs in the shallow soils are between 2.90 mg/Kg and 5.05 mg/Kg. At depths of 21 to 23 feet, the total VOC concentration increased to 14.92 mg/Kg. As was the case in B-36, both the field headspace PID measurements and the fluorescence measurements indicate a decrease in VOC/DNAPL between 23 feet and the top of bedrock at 42 feet. None of the soil samples from this interval showed fluorescence and the headspace PID measurements decreased from 114 ppm to 3.3 ppm. Therefore, it is unlikely that VOC/DNAPL migrated to the top of bedrock at this location.

5.3. Former Drum Storage Pad Area

Surface and subsurface soil samples have been collected and analyzed as part of the previous investigations completed in this area. The samples that were collected during the previous investigations are summarized in Section 2.2.2. The nature and extent of VOCs in soils in this area were delineated during the Phase I RI. The focus of the investigative work conducted during the RI was to evaluate the effectiveness of the ISAS IRM completed in this area. In addition, the samples were also analyzed for SVOCs to evaluate if SVOCs from the various oils stored in this area had impacted the soils.

As part of the RI, eight soil borings, B-41 through B-48, were installed in the Former Drum Storage Pad Area. The locations of the borings are illustrated on Figure 4. Soil samples from the borings were analyzed for VOCs and SVOCs and the results are summarized on Tables 9, 10, 11, and 12.

Compounds of Concern

The Former Drum Storage Pad Area was used to store drums containing virgin and spent solvents including TCA and TCE and various virgin lubricating oils. The analytical data collected from this area indicate that TCA, TCE, PCE, 1,2-DCE, 1,1-DCE, 1,1-DCA, xylene, and toluene are the primary VOCs found in the soil (Table 10). The results of the Pesticide/PCB analyses completed at B-12 (8 to 10 ft) indicated that PCB Arochlor 1254 was detected at a concentration below ASP detection limits. The PCB concentration could not be accurately quantified but was estimated to be 0.94 mg/Kg (Table 9). No other PCBs or pesticides were detected.

The data from the RI indicate that low levels of SVOCs including pentachlorophenol, phenathrene, flouranthene, pyrene, benzo(a) anthracene, chrysene, benzo(b)flouranthene, and other related compounds are found sporadically in the area. These SVOCs were detected at B-41, B-42, B-43, B-44 and B-48 (Table 10). Total SVOC concentrations ranged from non-detectable at B-45, B-46 and B-47 to 9.4 mg/Kg at B-48. Soil from B-12 (8 to 10 ft) sampled during the Phase I RI contained bis-(2-ethylhexyl)phthalate, a common plasticizer, at 1.4 mg/Kg. This compound is commonly detected and is attributed to plastic gloves worn by site personnel during sampling. No SVOCs were detected in ground water samples collected from nearby monitoring wells MW-2 and MW-2D. The data illustrate that the SVOC concentrations are not compounds of concern in the area and have not impacted ground water quality.

The data indicate that concentrations of inorganics in the area are similar to background soil concentrations and are not the results of activities in the Former Drum Storage Pad Area. Specifically, chromium, iron, lead, magnesium, nickel, vanadium and zinc were detected in samples from B-11 (10 to 12 ft) and B-12 (10 to 14 ft) at concentrations slightly above NYS background soil concentrations. The concentration are likely naturally occurring because lower concentrations of inorganics were detected at B-11 and B-12 from the 6 to 8 ft interval. Higher concentrations of inorganics would be expected in shallow soils, if this area had been impacted by inorganics from site operations.

In summary, the primary compounds of concern at the Former Drum Storage Pad Area are VOCs.

Source Area
Elevated levels of VOCs were detected in soil samples throughout the Former Drum Storage Pad Area. The compounds detected include TCA, TCE, PCE, 1,2-DCE, 1,1-DCE, 1,1-DCA, benzene, xylene, toluene and several other related compounds. The variety of VOCs observed and their random distribution suggest that several surface spills may have occurred in the area (Table 10 and Figures 23 and 24).

Horizontal Extent of VOCs
The horizontal extent of VOCs, in the Former Drum Storage Pad Area prior to the ISAS was documented in the Phase I RI Report. The following text presents a summary of the extent of VOCs in the soil. The northern extent of VOCs is the Sheldrake River. To the south, the extent of VOCs in the soils from the Former Drum Storage Pad Area is delineated by boring B-13 (4 to 8 ft sample) which contained only 0.060 mg/Kg of total VOCs (Figure 23). The eastern extent is near B-2 where the soil sample from 4 ft to 6 ft contained 0.091 mg/Kg of VOCs. However the presence of a source at the Shed Area makes delineation of the eastern boundary from the Former Drum Storage Area difficult. The western extent is near B-1 where 0.08 mg/Kg of total VOCs were detected in the 4 ft to 6 ft soil sample.

Effectiveness of In Situ Air Stripping of Soils
An ISAS pilot study was performed in 1990 to assess the overall effectiveness of ISAS technology for removing VOCs from site soils. The results of the pilot study indicated that ISAS technology was feasible and information obtained from the pilot test was utilized to design a full scale ISAS IRM. A full scale ISAS IRM was initiated

on May 22,1992 and completed October 6, 1992. Approximately 18 lbs of VOCs were removed during the full scale ISAS IRM. Specific details of the ISAS IRM are presented in the IRM Report dated September 1992.

As part of the RI, eight soil borings (B-41 through B-48) were completed in the Former Drum Storage Area to evaluate the effectiveness of the ISAS IRM.

The results of these confirmatory samples indicated that the ISAS IRM effectively reduced the concentrations of VOCs in the soils (Table 13). At locations IW-4, IW-3, EW-3 elevated concentrations of VOCs were detected prior to the operation of the ISAS of soils. Confirmatory soil samples from borings B-41, B-46 and B-47 located adjacent to IW-4, IW-3 and EW-3 (Figure 4) indicated that VOC concentrations were greatly reduced by ISAS. For example, at IW-4 TCE concentrations prior to implementing the ISAS were 7.80 mg/Kg. Post ISAS sampling at B-41, located adjacent to IW-4, showed that the TCE concentration was 0.190 mg/Kg. This represents over one order of magnitude reduction in TCE concentration due to the operation of the ISAS. At the IW-3/B-46 locations TCE concentrations were reduced over three orders of magnitude from 23.0 mg/Kg to less than 0.025 mg/Kg.

At locations IW-5 and IW-7, where low concentrations of VOCs were detected prior to initiating the ISAS IRM, the concentration of VOCs also decreased but not to the same extent as IW-3 and IW-4 and B-47. A comparison of the pre and post ISAS soil concentrations are presented in Table 13.

Soil boring B-45 was not installed adjacent to a pre ISAS boring, therefore, no comparison could be made. VOC concentrations at B-45 were minimal which suggests that the IRM was also effective in the area of B-45 (Table 10).

VOCs concentrations at B-44 were higher than at B-8 and IW-6 completed prior to ISAS. The VOC concentrations in B-44 were higher than VOC concentrations in the other RI borings installed in the Former Drum Storage Pad Area. This suggests that the B-44 results are anomalous and are not representative of the area.

In summary, the data indicate that the ISAS IRM was effective in removing VOCs from soils at the Former Drum Solvent Storage Pad Area. This data indicates that this area was effectively remediated and is no longer a concern.

5.4. Fuel Oil UST Area

Introduction
A 2,500-gallon Fuel Oil UST was located on the southwest portion of the facility adjacent to Hoyt Street. Several investigations have been completed in this area and are summarized in Section 2.2.3 As part of the RI, a GPR survey was completed to evaluate the presence and extent, if any, of LNAPL in the soil. Subsequently, four soil borings were completed to verify the results of the GPR survey and to evaluate the northern extent of fuel oil. Soil samples from the borings were analyzed for VOCs and SVOCs. Monitoring well MW-13 was installed in soil boring B-38 to evaluate ground water quality in area.

The sample locations are illustrated on Figure 5 and 8 and the soil analytical data collected in this area are summarized in Tables 14, 15, and 16).

Source Area
The source of the fuel oil was a leaking fuel oil UST. The tank and associated piping were removed in April 1992. The piping from the tank to the building was found to be in good condition. There were no visible holes in the piping and the soil surrounding the pipes had no visible staining or noticeable odor. Once the tank was removed, between 50 and 100 holes up to 1 inch in diameter were observed in the tank. The majority of the holes were located on the bottom half of the tank.

During the tank removal, several areas of stained soil were observed and approximately 60 cubic yards of soil were removed. The excavation was completed below the ground water table and was 13 ft wide, 14 ft long and about 9 ft deep. The excavation was constrained by underground and overhead utilities to the south and the building to north. The material was classified as a non hazardous waste and disposed of at the Mount Hope Asphalt plant in Calverton, New York for asphalt batching.

To document post excavation conditions, three bottom samples (B-1, B-2 and B-3) and four side samples (Side 1, Side 2 , Side 3, and Side 4) were collected and analyzed for TPH (Table 16). The bottom sample with the highest TPH reading was analyzed for VOCs and SVOCs. TPH concentrations in the bottom and side samples ranged from 480 to 6,800 mg/Kg. These results were anticipated since some oil stained soil was left in-place as a results of access limitations. The bottom sample B-1 did not contain VOCs or SVOCs.

Prior to removal of the tank, a recovery well was installed adjacent to MW-8. To date 232.5 gallons of free phase fuel oil have been recovered (Table 1).

Horizontal Extent of Fuel Oil in Soils

The extent of soils containing fuel oil in this area has been evaluated through borings and soil samples.

The western extent of petroleum hydrocarbon compounds in this area is between the former fuel oil UST and B-21 (Figure 8). The TPH concentration of 1600 mg/Kg and a headspace reading of 51.5 ppm in the 6 to 8 ft interval of B-21 suggests limited impact in this area. This TPH concentration is likely related to the Solvent UST Area located 15 ft west of B-21. No elevated headspace reading were observed below 8 ft. In addition, no VOCs were detected in B-21 in the 6 to 8 ft and 10 to 12 ft samples.

The eastern extent of stained soils associated with the Fuel Oil UST Area is near B-29. Limited stained soil was observed in the 6 to 8 ft interval. No stained soil was observed above or below this interval.

The extent of soil contamination is limited to the north (Figure 8). Several SVOCs, typical of fuel oil were found in low concentrations in the soil samples from B-37 through B-40. The highest concentrations of SVOCs were detected in B-37 (4.5 to 6.5 ft) and B-39 (4 to 6 ft). The total SVOC concentrations ranged from 4.096 mg/Kg at B-37 (4.5 to 6.5 ft) to 4.932 mg/Kg at B-39 (4 to 6 ft), respectively. The concentration of SVOCs decreased in B-39 (6 to

8 ft) to 0.140 mg/Kg. This information verifies that SVOCs have not significantly impacted soils under the building.

Soil samples from B-37, B-38/MW-13, B-39, and B-40 also contained low concentrations of VOCs (acetone, carbon disulfide, TCA, TCE, PCE and 1,1-DCA). Due to the nature of the VOC compounds detected and their low concentrations, it is likely that the VOCs are associated with VOCs in the ground water migrating from the Solvent UST Area.

The southern extent of soils with fuel oil is near the southern edge of the former UST excavation. A confirmatory sample designated as Side 1 was collected from the southern side of the excavation and contained only 480 mg/Kg of TPH. Soil boring B-23 located further south within Hoyt Street contained no stained soils or headspace readings above background. The TPH concentrations in soil samples from B-23 ranged from 300 to 460 mg/Kg. These TPH concentrations are typical of background conditions.

Vertical Extent of Fuel Oil in Soils

The vertical extent of soils affected by the fuel oil in generally limited to a depth of about 8 ft bls. Low field screening PID readings for soil samples, no visible staining and non-detectable levels of SVOCs in laboratory results B-38 (8.5 to 10.5 ft) document the limited vertical extent of fuel oil. The depth to the ground water table occurs in the 6 to 8 ft range and it is recognized that LNAPLs such as fuel oil do not typically extend below the ground water table.

LNAPL Occurrence

LNAPL at the Fuel Oil UST Area is limited to the area immediately adjacent to MW-8 and the recovery well. LNAPL was not detected to the north beneath building at B-38/MW-13 nor was it observed at B-37, B-39 or B-40 (Figure 5). The eastern extent of LNAPL was defined by MW-9, located approximately 10 ft east of MW-8. LNAPL has not been detected at MW-9 (Figure 5). The southern extent of the LNAPL was determined during the tank removal since no free product was observed along the southern side of the excavation.

A recovery well and ground water depression/product recovery system designated as RW-1 was installed adjacent to MW-8 (Figure 5) and was operational by February 19, 1992. As of November 1994, approximately 232.5 gallons of fuel oil have been recovered. Table

1 presents the quantity of fuel oil recovered to date. For the first month of operation, the system collected an average of 20 gallons per week with a product pumping rate of up to 2 gallons per hour (Table 1). After removal of the UST fuel oil collection stabilized at a rate of between 1 and 2 gallons per week and then began to decrease. Presently the rate of collection has decreased to 1 to 2 gallons per month. This information in conjunction with the limited horizontal extent of LNAPL, indicates that the recovery system has effectively removed the majority of LNAPL from the area.

5.5. Waste Water Treatment Plant Area

The Waste Water Treatment Area consists of three closed USTs that are located along the northeast portion of the site as indicated on Figures 2 and 6. The Waste Water Treatment Area ceased operations in 1986 when electroplating operations at the facility were discontinued. Three previous investigations were completed in this area. The samples collected and the analyses completed during the previous investigations are presented in Section 2.2.4. No investigations were completed during the RI since previously collected data was sufficient to evaluate the nature, vertical and horizontal extent of impacted soil in this area.

The sample locations are illustrated on Figure 6 and the analytical data are presented in Tables 9, 22, 23 and 24.

Compounds of Concern
A review of the 1986 Site Assessment indicates that electroplating capabilities and therefore the waste water included silver, gold, nickel, tin, and copper, with gold and silver representing the predominant production activity.

The primary compounds of concern in this area are metals. Copper and nickel were detected above typical New York State Soil concentrations in surface soil samples at location 4, 5, 6, and 7 (Table 22).

Low concentrations of VOCs were also detected in the soil samples collected in this area (Table 23). VOCs including, 1,1-DCA, TCA, PCE, and toluene were detected at concentrations ranging from 0.001 mg/Kg to 0.141 mg/Kg in B-14, B-15 and B-16 (Table 23). Soil samples from B-3 and B-7 collected in 1986 contained similar VOCs and similar concentrations. These VOCs are likely migrating from the Solvent UST Area in the ground water.

SVOCs including anthracene, phenathrene, flouranthene, pyrene, benzo(a)anthracene, chrysene, and several other associated compounds were detected at B-15 (2 to 6 ft) at a total concentration of 44.3 mg/Kg (Table 24). A review of the boring log from B-15 indicates that the 2 to 6 ft interval consisted of fill material including slag and cinders. The concentrations of SVOCs are significantly higher at B-15 than those detected at B-39 and B-40 installed near the Fuel Oil UST. Based on this information, it can be concluded that the SVOCs at B-15 are from the fill material and are not related to site activities in the Waste Water Treatment Plant Area or the Fuel Oil UST Area. No PCBs/Pesticides were detected in the soil samples from the Waste Water Treatment Area (Table 9).

Inorganics in Surface Soils
The Waste Water Treatment Area is currently paved. The surface soils were collected from immediately beneath the pavement and at a depth of one foot. Copper and nickel were detected at concentrations above typical background concentrations in New York State soils in surface soil samples at locations 4, 5, 6, and 7 (Table 22). Concentrations of copper at a depth of 1 ft ranged from 187 mg/Kg to 510 mg/Kg. Nickel ranged in concentration from 14 mg/Kg at sample 4 to 113 mg/Kg at sample 7. The concentrations of both copper and nickel in samples at a depth of one foot appear to be elevated when compared to collected immediately beneath the pavement. The lower concentrations in the soil sample collected beneath the pavement may be the result of grading of new fill prior to paving the area. The data suggest that a surface spill may have occurred in this area

Lead, mercury iron, magnesium, nickel and zinc were detected at B-15 (0.5 to 2 ft) at concentrations marginally above the typical NYS concentrations. The source of these inorganics is probably the fill material.

Inorganics in Subsurface Soils
The concentrations of inorganics decreased with depth. The inorganic concentrations in the subsurface soils were generally similar

to the typical background concentrations in New York State soils with the exception of B-14 (6 to 8 ft) and B-3 (8 to 10 ft). The highest concentrations of aluminum, chromium, copper, mercury, silver, and zinc in the subsurface were detected in B-14 (6 to 8 ft) (Table 22). Lead was detected at B-3 (8 to 10 ft), an upgradient location, at a concentration of 260 mg/Kg (Table 22). No elevated concentrations of metals were detected at B-14 (16 to 18 ft) or B-16 (10 to 14 ft).

Soil samples were collected from soil boring B-4 installed hydraulically upgradient of the UST and soil borings B-5 and B-6, which were installed hydraulically downgradient of the USTs. Soil samples collected at 12 ft, a depth commensurate with the bottom of the USTs, were analyzed for gold, silver, copper, nickel and cyanide. Gold, silver, and cyanide were not detected. Copper was detected at similar concentrations in each boring which were below typical New York State soil concentrations. Nickel was detected at concentration slightly above typical New York State soil concentrations. Since there was little difference in the concentrations of metals between B-4 and the downgradient borings, the data suggests that USTs had not leaked.

In summary, the impacts to the soil appear to be minimal and are limited to the upper 8 ft in the immediate vicinity of B-14 Furthermore, since metals have limited mobility and the concentrations of dissolved inorganics are not elevated in MW-3 or MW-3D, there is no indication that metals have impacted the ground water.

5.6. Sheldrake River

5.6.1. Surface Water

Surface water samples were collected from the Sheldrake River during two previous investigations. A total of five samples were collected as discussed in Section 2.2.5. The sampling locations are illustrated on Figure 7 and the analytical data are presented in Tables 25 and 26.

No surface water samples were collected as part of the RI investigation because the existing data provided sufficient characterization of the surface water quality. In addition, reports obtained from the USGS, Westchester County Health Department, and the Village of Mamaroneck documented that quality of the Sheldrake River was degraded upstream of the site. The already degraded nature of the river surface water precludes evaluating the affects of site activities on the river.

Background Information

Table 4 presents a summary of a comparison of upstream and downstream concentrations of various inorganics, pesticides and other indicator parameters from the USGS, Westchester County Health Department, and the Village of Mamaroneck reports. These reports document the significant upstream contamination of the Sheldrake River. The reports indicated that the highest turbidity, salinity, emulsified oil readings and total coliform counts were recorded at one of two active drains which are located within 1000 ft of the site. Elevated fecal coliform counts were also detected in these drains. The concentration of fecal coliform decreased near the site, but increased downstream of the site where a drainage pipe from Columbus Park discharges into the river. Table 4 indicates that lead is present, in approximately equal concentrations, both upstream and downstream of the site. PCBs and pesticides (dieldrin, chlordane, DDT, DDB, and DDE) were not detected upstream or downstream of the facility.

The reports indicated that many drain pipes were observed to be directly discharging into the river and that bottles, cans, oil drums, plastic debris, fences, tires, shopping carts and building debris were noted in the river upstream of ITT Sealectro. Portions of the stream contained water which was characterized as containing a scum, suds, foam or oil slicks.

In addition, a gasoline release was observed at 0830 on January 31, 1992 while completing field investigations for the Phase I RI. The release was from Blood Brothers Auto Wrecking Yard located across the Sheldrake River, and was observed by employees of O'Brien & Gere, Empire Soils Investigations, and the Village of Mamaroneck.

Surface Water Quality

The results of the inorganic analyses on surface water samples indicate that the site is not affecting surface quality. Aluminum, iron and silver concentrations in upstream and downstream samples were similar during the Phase I RI. The small variations in concentrations between upstream and downstream locations were attributed to natural variability and did not suggest that the site was a source. For example, in February 1992 aluminum ranged from 113 μg/L in the upstream location to 128 μg/L in the downstream location. Similarly iron concentrations in February ranged from 551 μg/L in the upstream location to 524 μg/L in the downstream location. Silver in April 1992 ranged in concentration from 39.2 μg/L to 40.6 μg/L in the downstream location. An elevated concentrations of zinc was detected at the upstream location SW-1 in February 1992.

Several sets of surface water samples have also been analyzed for copper and the data show some variability. The surface water samples collected in 1986 showed 10 μg/l of copper at the upstream location and 30 μg/l of copper at the location downstream of the site. However, copper was not found in any of the samples collected in 1992 during the Phase I RI. Since the Phase I RI data was validated and the 1986 data was not, it may be that the Phase I data is more accurate. In addition, given the relatively low concentrations of copper in the surface water samples, the small difference between a non-detect (detection limits of 6.9 μg/l and 10.4 μg/l) and 30 μg/l may be within the range of variability introduced by sampling and analytical protocols.

Higher concentrations of VOCs were detected in samples collected upstream of the site than in samples collected downstream of the site (Table 26 and Figure 25). At SW-1, the upstream location, 2 μg/L of 1,2-DCE, 2 μg/L of TCE and 6 μg/L of TCA were detected. Nearly identical concentrations were detected at SW-2 (midpoint of site) during the February sampling event. No VOCs were detected at downstream location SW-3. The concentrations of TCA were slightly higher in the April sampling event, a concentration of 24 μg/L of TCA was detected at SW-1 and SW-2 and 19 μg/L of TCA was detected at SW-3. These data suggest that a source of VOCs is located upstream of the site and that no impact to the Sheldrake River by VOCs from the site was detected.

Total petroleum hydrocarbons concentrations ranged from 10.9 to 11.3 mg/l in the February sampling event but were not detected during the April sampling event (Table 25). The highest concentration of TPH was observed upstream of the site. The TPH analyses further verify that upstream sources of contamination, including a documented gasoline release from Blood Brother Auto Wrecking Yard in 1992, have impacted the river.

5.6.2. Stream Sediment

Sediment samples have been collected from the Sheldrake River during three previous investigations. As part of the RI, two additional sediment samples were collected and analyzed for copper according to NYSDEC ASP protocols. A summary of the stream sediment samples collected and analyses previously completed is discussed in Section 2.2.5.

The sampling locations are illustrated on Figure 26 and the analytical data are presented in Tables 27 and 28.

Background Information

Information from reports prepared by the USGS, Westchester County Health Department and the Village of Mamaroneck indicate that PCBs and dieldrin were detected at upstream locations but were not detected at downstream locations relative to the site. Pesticides including chlordane, DDT, DDB, DDE were detected at higher concentrations upstream of the facility than at downstream locations (Table 4). Lead, arsenic, zinc, and copper were also detected in sediments both upstream and downstream of the site. Arsenic and zinc concentrations were higher upstream of the site. Copper concentrations were higher downstream of the site. As previously mentioned, reports indicate that many drain pipes were observed to be directly discharging into the river and that bottles, cans, oil drums, plastic debris, fences, tires, shopping carts and building debris have been documented in the river upstream of ITT Sealectro. These are potential sources of metals and organics upstream of the site.

Stream Sediment Quality

The results of the inorganic analyses indicate that concentrations of inorganics were similar between upstream and downstream locations which indicates that the site is not contributing these elements to the Sheldrake River. Copper was detected at higher concentrations in the samples collected adjacent to the site than samples collected upstream of the facility (Table 27 and Figure 26). However, the copper data are highly variable and do not document an impact to river sediments by the site. Specifically copper was detected at three upstream locations at concentrations ranging from 56.1 mg/Kg (SD-1) to 20.6 mg/Kg at SS-4. The concentration of copper increased at SS-1 located approximately 100 ft upstream of the facility and ranged from 372 mg/Kg in February 1992 to 218 mg/Kg in April 1992. The average upstream concentration of copper was 143 mg/Kg. The highest concentration of copper was detected at SS-2 located near the middle of the facility. The concentration of copper in February 1992 was 2,790 mg/Kg and 2,400 in a field duplicate. Copper concentrations observed at SS-2 in April 1992 were 318 mg/Kg and 4,710 mg/Kg in the field duplicate. The data indicate that the concentrations of copper at this location are heterogenous. SS-5 collected as part of the RI also indicated highly variable concentrations since copper varied from 45.9 to 289 mg/Kg in a duplicate sample. The average copper concentration adjacent to the site was 2,555 mg/Kg. Concentrations of copper decreased to 158 mg/Kg at SD-4 approximately 600 ft downstream of the facility. While the site may have contributed copper to the river, the fact that sediment copper concentrations are variable and elevated upstream of the Waste Water Treatment Area may suggest contributions from other properties upstream of the site.

Anomalous inorganic concentrations were noted at SS-3 in February 1992 where concentrations were between 4 and 10 times higher than the concentrations in the other samples collected. The sample also had an anonymously low percent total solids of 14 percent. Therefore the sample collected at SS-3 in April 1992 is considered most representative of actual concentrations and the sample collected in February 1993 is anomalous.

Several VOCs were detected at low concentrations in sediment samples both upstream and downstream of the facility as indicated on Figure 27. The VOCs detected include TCE, PCE, chloroform and TCA. At the upstream location, designated SS-1, 0.006 mg/Kg of VOCs were detected in February 1992. Location 11 near the Former Drummed Solvent Storage Pad Area was sampled in 1986 and contained 0.180 mg/Kg of TCA. Analyses were not completed for other VOCs in 1986. At SS-2 located near the midpoint of the facility and downstream, 0.001 mg/Kg of TCE was detected. No VOCs were detected at downstream location SS-3 in February 1992. No VOCs were detected at SS-1 or SS-2 during the April 1992 sampling event, but VOCs were detected at SS-3. The compounds found at SS-3 included, 0.0007 mg/Kg of chloroform, 0.0019 mg/Kg of TCA, and 0.014 mg/Kg of PCE.

The TPH concentrations did increase in the downstream direction from 2550 mg/Kg to 3240 mg/Kg at SS-1 and SS-2, respectively to 23,000 mg/Kg at SS-3 during the February sampling event (Table 27). However, the opposite trend was found during the April sampling event when TPH concentrations were highest at the upstream and midstream sampling locations and decreased at the downstream sampling location. The elevated TPH analyses may be due in part to the gasoline spill which was observed on January 31, 1992.

In summary, the degraded nature of the Sheldrake River sediment has been documented. The observed gasoline discharge into the river, the observed debris and discharge pipes upstream of the facility, and the elevated concentrations of inorganic parameters and organic compounds are evidence of this degradation. The copper concentrations suggest that site operations may have impacted the river sediments. However, the source of copper may be due to other properties bordering the site.

5.7. Ground Water Quality

Introduction
Twelve ground water monitoring wells have been installed at the site. Nine were installed during previous investigations (MW-2, MW-2D, MW-3, MW-3D, MW-4, MW-4D, MW-8, MW-9 and MW-10) and three new monitoring wells (MW-11, MW-12 and MW-13) were installed during the RI. In addition, a ground water recovery sump referred to as RW-2 was installed at the Solvent UST Area in April 1992 and is presently operating. Data from RW-2 are included in this discussion.

The monitoring well and recovery well locations are presented on Figure 28. The ground water analytical collected to date are summarized in Tables 17, 18, 19 and 20.

Quarterly ground water monitoring for VOCs was initiated in July 1991 as part of the Corrective Measures Program associated with the

Solvent UST Area. Additional wells were incorporated in the quarterly monitoring program as they were installed. These data are regularly transmitted to the NYSDEC in quarterly ground water monitoring reports and are summarized in Table 17. As requested by Westchester County DEF, RW-2 is sampled and analyzed for VOCs. These data are summarized on Table 20.

Compounds Detected

The ground water chemistry data indicates that the primary compounds of concern at the site are VOCs and that inorganics and SVOCs are not a concern. The primary VOCs detected include PCE, TCA, TCE, 1,1,-DCA, 1,2-DCE, 1,1-DCE, benzene, and vinyl chloride. Ground water from monitoring wells MW-2, MW-2D, MW-3, MW-3D, MW-4 and MW-4D were analyzed for inorganics as part of the Phase I RI (Table 18). The results of the inorganic analyses detected dissolved antimony, sodium, iron, manganese, and magnesium. However, higher concentrations of these inorganics were detected at upgradient well nest MW-4 and MW-4D as compared to downgradient wells MW-2, MW-2D, MW-3 and MW-3D. It was concluded from this data that the inorganics are naturally occurring or could be due to upgradient sources. As part of the RI, monitoring wells MW-2, MW-2D, MW-4, MW-4D, MW-11, MW-12 and MW-13 were also analyzed for SVOCs per NYSDEC ASP protocol (Table 18). Low concentrations of four SVOCs (4-Methylphenol, phenanthrene, fluoranthene, pyrene) were detected in upgradient wells MW-4, MW-4D. No SVOCs were detected in any other wells (Table 18). Based on these results, and approval by NYSDEC, no additional inorganic or SVOC ground water analyses have been completed at the site.

Source

The site ground water, both shallow and deep zones, contains VOCs. The Solvent UST Area and the Shed Area appear to be the sources of the VOCs in the ground water. The VOCs/DNAPL in the soil in the shallow and deep ground water zones is the source of the dissolved VOCs in the ground water. The highest VOC concentrations in the ground water have been documented in recovery well RW-2 in the Solvent UST Area. Due to the close proximity of the Shed and Former Drum Storage Pad Areas it is not possible to determine whether the latter is a source of ground water impacts.

Distribution of VOCs (June 1994)
Figure 28 presents the VOCs detected in the June 1994 sampling event. The distribution of VOCs presented in this figure is similar to the VOC distribution in previous sampling events and therefore provides a reasonable presentation of site ground water.

The June 1994 data indicate that the highest concentration of VOCs is found at RW-2 which is at the location of the former Solvent USTs. Total VOCs are documented at 16,300 μg/l. Low levels of VOCs are found at MW-4 and MW-4D, which are located upgradient of the site. Low concentrations of VOCs have been periodically detected at this well nest. The source of the VOCs in these wells is not known, but may represent an upgradient source or be the result of reverse ground water flow during high river stages or from mounding in the MW-13 area.

The concentrations of VOCs decrease with distance from RW-2. At shallow wells MW-11 and MW-12, total VOC concentrations were 273 μg/L and 97 μg/L, respectively. The data suggest that during the June sampling event, MW-11 was located more directly downgradient of the Solvent UST Area than MW-12. At MW-2 and MW-2D, located approximately 100 ft downgradient of Solvent USTs and adjacent to the Shed and Former Drum Storage Pad Areas, the total VOCs concentrations were 109 μg/L and 804 μg/L respectively. At MW-3 and MW-3D, located in the northeast portion of the site, 154 μg/L and 157 μg/L, respectively, of total VOCs were detected. These VOCs appear to have migrated from the Solvent UST Area.

Monitoring well MW-13 showed low concentrations of VOCs in June 1994. This documents the Fuel Oil UST Area is not a source of VOCs and that the VOC plume from the Solvent UST Area does not significantly impact the ground water near this monitoring well.

Historical VOC Concentrations
Low levels of VOCs have been periodically detected in the monitoring wells MW-4 and MW-4D upgradient of the site. The primary VOCs detected at MW-4 are 1,2-DCE, TCE and vinyl chloride (see Table 17). The concentrations of 1,2-DCE have ranged from non-detect to 74 μg/L, TCE has ranged from non-detect to 38 μg/L and vinyl chloride has ranged from non-detect to 12 μg/L (Table 17). No VOCs were detected in MW-4 or MW-4D in August 1992 and August 1993. PCE is the primary VOC detected at MW-4D in the deep ground water zone. Other VOCs that have been

detected in MW-4D include TCE and carbon disulfide. The total VOC concentrations range from non-detect to 10 μg/L.

In April 1992, a recovery sump (RW-2) consisting of six lateral well screens was installed at depth of 10.5 ft below grade and extended 15 ft horizontally beneath the building floor. Ground water effluent samples are collected monthly from RW-2. The results indicate that the highest concentrations of VOCs at the site are present at this location. Compounds typically detected include 1,1-DCA, 1,1-DCE, 1,2-DCE, PCE, 1,1,1-TCA, toluene and TCE. Total VOCs have ranged from 215 mg/L to 0.753 mg/L (see Table 20). During the time this recovery well has operated, total VOC concentrations have decreased from 215 mg/l on 4/10/92 to 9.5 mg/l on 10/3/94 (Figure 29). The reduction in VOC concentrations indicates that the recovery well and other IRMs (UST and soil removal) have been effective in reducing VOCs concentrations in the ground water in the vicinity of the Solvent UST Area.

At well MW-11, which has been sampled on three occasions, total VOC concentrations have ranged from 236 to 482 μg/L (Table 17). VOCs detected included acetone, benzene, chloroethane, chloroform, 1,1-DCA, 1,2-DCE, PCE, TCA TCE, methylene chloride and vinyl chloride. VOCs in MW-12 and MW-11 were similar. The total VOC concentrations in MW-12 ranged from 72 to 168 μg/L and have generally been lower than concentrations at MW-11. Both wells are located downgradient of the Solvent UST Area. MW-11 is within the area where VOC/DNAPL lenses are present while MW-12 is adjacent to this area. The historical data indicated that some VOC concentrations in MW-11 have increased while some VOC concentrations have decreased in MW-12. These changes may suggest that variations in ground water flow directions may impact the VOC concentrations in these wells.

MW-2 and MW-2D, which are located near the Former Drum Solvent Storage Pad, have been sampled on numerous occasions. The VOCs detected in MW-2 with the most frequency include benzene, chloroethane, 1,1-DCA, 1,2-DCE, TCE and vinyl chloride. Total VOCs in MW-2 have ranged from 44 to 385 μg/L. Concentrations in monitoring well MW-2D installed in the deep ground water zone have historically been significantly lower than MW-2 with total VOC concentrations ranging from 12 to 110 μg/L. PCE, TCE, TCA were the primary VOCs detected in the deep well while typical degradation products including 1,1,-DCA, 1,2-DCE and vinyl chloride are more prominent in the shallow wells. It is likely that the rate of VOC degradation in the shallow zone is higher than in the deep zone.

Historically VOC concentrations in MW-2 and MW-2D have shown a decline (Table 17, Figures 30 and 31). This decline has been more obvious in MW-2 than in MW-2D. In MW-2 total VOC concentrations have declined from a high of 385 μg/L in August 1989 to the low August 1994 concentration of 64 μg/L. In MW-2D total VOC concentration had declined from 110 μg/L in February 1992 to 25 μg/L in February 1994. However, in the June and August 1994 sampling the total VOC concentrations in MW-2D increased to 804 μg/L and 1860 μg/L respectively. The ongoing quarterly ground water monitoring will document that this increase is a short term fluctuation.

The data from MW-13 indicate that the ground water quality downgradient of the Fuel Oil UST has not been adversely impacted. Monitoring well MW-13, located inside the building and approximately 35 ft downgradient of the UST area, was sampled on three occasions. Several VOCs including carbon disulfide, 1,1-DCA, TCA, and TCE were detected and total VOC concentrations ranged from 3 to 30 μg/L. These compounds are typical of the Solvent UST Area and are not indicative of impact from the Fuel Oil UST Area. No SVOCs, which are indicative of fuel oil, were detected in MW-13 during the February sampling event. The low concentrations of VOCs suggests that this monitoring well is located on the edge of the Solvent UST Area VOC plume.

Downgradient monitoring wells MW-3 and MW-3D, located along the eastern portion of the site adjacent to the Sheldrake River, historically have had higher concentrations of VOCs than MW-2 and MW-2D. In the shallow well 1,1-DCA, 1,1-DCE, and TCA are detected in the greatest concentrations while other VOCs have been detected at less than 50 μg/L. Total VOCs have ranged between 17 μg/L in February 1993 to 1720 μg/L in July 1991 (Table 17).

Concentrations of VOCs in monitoring well MW-3D have been similar to shallow well MW-3, however the primary compounds detected are PCE and TCA. Degradation products were the principle compounds detected in the shallow well. Consistent with well nest MW-2/2D, the data suggest that the shallow ground water zone is more conducive to biological degradation. Total VOCs concentrations in MW-3D have ranged from 129 to 807 μg/L.

Concentrations of VOCs in monitoring wells MW-3 and MW-3D have also shown a decline since the initiation of ground water sampling in 1991 (Table 17 and Figures 33 and 33). Total VOC concentrations in MW-3 have declined from a high of 1720 μg/L in July 1991 to 42 μg/L in August 1994. Likewise total VOC concentrations in MW-3D have declined from a high of 807 μg/L in February 1992 to 269 μg/L in August 1994.

Figures 29 through 33 show the total VOC concentrations versus time in monitoring wells RW-2, MW-2, MW-2D, MW-3, and MW-3D. A review of the figures indicates that total VOC concentrations at RW-2, MW-2, MW-3 and MW-3D have decreased. Total VOC concentrations at MW-2D were decreasing until June of 1994. These data suggest that the ground water recovery system, RW-1, at Solvent UST Area and other IRMs (UST and soil removal) have been effective at reducing the concentration of VOCs in the site ground water.

A review of these figures also indicates that there have been periodic fluctuations in VOC concentrations. These fluctuations represent variations in ground water quality. These variations in concentrations may reflect variations in the direction of ground water flow. As ground water flow directions change, the locations of the monitoring wells with respect to the VOC plume will change.

Extent of VOCs

The southern extent of VOCs in the ground water appears to be between the Solvent UST Area and the MW-4 well nest. Concentrations in these wells have ranged from non-detect to low concentrations. It is possible that the VOCs detected in these wells represent an upgradient off-site source of VOCs.

The eastern and western extent of the site VOC plume occurs near the property boundaries. VOCs are present in the MW-2 and MW-3 monitoring well nests. The VOC concentrations at these well nests, the close proximity of the Sheldrake River, and the ground water discharge to the Sheldrake River suggest that the eastern and western extent of VOCs in the ground water probably does not extent far beyond the property boundaries.

The northern extent of VOCs in the ground water is the Sheldrake River. Both the shallow and deep ground water apparently discharge to the Sheldrake River. The dissolved VOCs will also discharge to the Sheldrake River.

The vertical extent of VOCs is assumed to be defined by the top of bedrock. This vertical extent is based on the upward vertical hydraulic gradient which exists at the site. This upward gradient indicates that ground water in the shallow and deep ground water zones discharge into the Sheldrake River and would not be expected to migrate downward into bedrock. Furthermore, the low permeability of the bedrock which underlies the site would be expected to restrict the migration of ground water and VOCs into the bedrock.

5.8. Air Sampling

Indoor air sampling was completed to evaluate any potential impacts to air quality from VOCs in the soil and ground water. Two locations within the building, one near the Solvent UST Area and one near the Fuel Oil UST Area, were sampled for VOCs (Figure 10). One sample was collected outside the building at an upwind location to evaluate background air quality. The results indicated that no VOCs were detected at any location (Table 21).

6. Risk Assessment

This section presents the results of a baseline risk assessment (BRA) of possible impacts to public health related to the presence of VOCs and inorganics at the site. The following USEPA documents were used as principle guidance in the preparation of the BRA:

- *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A) Interim Final*, EPA/540/1089/002
- *Guidelines for Exposure Assessment* (57 FR 104, May 29, 1992)
- *Guidance on Risk Characterization for Risk Managers and Risk Assessors*, February 26, 1992, USEPA Memorandum from Henry Habicht, Deputy Administrator, to Assistant Administrators and Regional Administrators.

Due to the conservatism inherent in the methods and assumptions presented in the cited guidance, it is the opinion of O'Brien & Gere that the risks calculated and presented in this assessment are not a numerical presentation of actual risks to humans represented by the site. Rather, the values presented are a reflection of the methodology developed by the USEPA. Inherent in this standard methodology for conducting risk assessments is the generation of risk values which are designed to overestimate actual site risks by utilizing standard assumptions and conventions. However, because they are generated by a "standardized" procedure, the risk values are useful as a basis for comparison between sites, as well as a basis for identifying remedial objectives.

6.1. Methodology

A chemical may pose a risk to human health only if sensitive receptor populations have the potential to be exposed to a chemical in sufficient quantities to affect either the health of individuals or the general ecological balance. As such, a site specific BRA involves the identification of potentially hazardous chemicals at the site, the estimation of the concentrations of the chemicals that may be present at locations where receptors may contact them (exposure point concentrations), and the evaluation of potential adverse effects that may result from the estimated dose of the chemicals absorbed by receptors.

USEPA guidance provides methodology for the evaluation of chronic exposures, however, methodology for the evaluation of acute exposures is not available. Therefore, acute exposures are qualitatively discussed where appropriate.

Consistent with the cited guidance, the BRA was conducted in the following five phases:

1. *Site Characterization.* The first step in the assessment process was to characterize the site with respect to its physical characteristics as well as those of the human populations at or near the site. The output of this step was a qualitative evaluation of the site and surrounding populations with respect to those characteristics that influence exposure.

2. *Data Evaluation.* The objective of the data evaluation step was to organize the data into a form appropriate for use in the assessment, to evaluate the quality of the data for BRA purposes and identify chemicals of potential concern (COPCs).

3. *Exposure Assessment.* In the exposure assessment, the pathways by which receptors may be exposed to on-site chemicals were identified, and exposure point concentrations of the chemicals were estimated for each complete exposure pathway. Exposure point concentrations were estimated directly from analytical

data collected at the site as well as through the use of chemical fate and transport models.

4. *Toxicity Assessment.* In the toxicity assessment, available toxicological data for site related compounds were gathered and reviewed. Dose-response relationships between the extent of exposure and the potential occurrence/severity of potential adverse health effects were evaluated.

5. *Risk Characterization.* In the risk characterization step, the toxicity and exposure assessments were integrated into quantitative expressions of potential human health risk. The resultant estimates of potential carcinogenic and non-carcinogenic health effects were characterized.

The Site Characterization, Data Evaluation, Exposure Assessment, Toxicity Assessment, and Risk Characterization are presented and discussed in sections 6.2, 6.3, 6.4, 6.5, and 6.6, respectively.

6.2. Site Characterization

A detailed discussion of the site history and results and conclusions of previous investigations at the site is given in Sections 2 and 5 of this report. The key elements of the site with respect to human health considerations are summarized below.

6.2.1. Chemical and Physical Site Characteristics

The site, approximately one acre in size, is located at 139 Hoyt Street in an industrial commence area of Mamaroneck, NY (Figure 1). A large industrial building is located on-site. Most of the site is paved except for a few small grassy areas. The Sheldrake River, which discharges to the Mamaroneck River approximately ¼ mile downstream, runs along the northern boundary of the site. The surrounding area is generally commercial and residential. Surrounding land uses include: the Blood Brothers Auto Wrecking

Yard to the north (across the Sheldrake River), a plastics fabricator to the west, a photographic film processing facility to the east, and Hoyt Street and the Amtrak/Metropolitan Transport Authority train lines to the south.

The site was used in the manufacture and assembly of electronic parts from 1960 to 1990. Several related applications, including screw machine operations and electroplating and connector assembly, were performed at the facility. The screw machine operation was located in the southwestern portion of the building and was discontinued in 1975. The electroplating department, which was located in the northeast corner of the building, existed until 1986.

Shallow ground water is located 5 to 8 feet below ground surface in the vicinity of the site. A deep ground water zone is located between 14 to 40 feet below the ground surface. Both ground water zones generally flow to the north, toward the Sheldrake River. Ground water discharge from the shallow zone to the Sheldrake River was estimated to range from 19 to 430 gal/day. In the deep zone, the estimated discharge to the Sheldrake was estimated to range from 69 to 274 gal/day. On-site ground water is not used as a potable water source. There are no residential or industrial water supply wells in a 1/2 mile radius of the site. The City of Mamaroneck purchases water from New York City's reservoir system and requires residential and commercial buildings within 500 ft of the public supply be placed on public water.

Based on the previous investigations conducted at the site, five source areas have been identified (Figure 2). These include:

- Solvent Underground Storage Tank (UST) Area
- Former Drum Storage Pad Area
- Fuel Oil UST Area
- Waste Water Treatment Area
- Shed Area.

Each of these source areas is described briefly below.

Solvent UST Area - The Solvent UST Area is located at the southern corner of the building (Figure 3). This area was used for the storage of aromatic solvents, chlorinated aliphatic solvents, virgin oils and waste oils. As part of an IRM conducted at the site in 1991, eight USTs and surrounding soils were removed. A ground water recovery system was also installed to recover ground water including that portion of the ground water which extends under the building on-site.

Former Drum Storage Pad Area - This area is located adjacent to the Sheldrake River along the northwest corner of the building (Figure 4). Chlorinated solvents, lubricating oils and spent solvents were stored in 55-gallons drums in this area. An IRM, consisting of an in-situ air stripper was operated in this area for approximately 5 months during the summer of 1992.

Fuel Oil UST Area - The Fuel Oil UST Area is located on the west side of the facility, between the building and Hoyt Street (Figure 5). A 2,500 gal UST was used to store fuel oil until the mid to late 1970's, when it was reported to be leaking and was replaced with a new 2,500 gal UST. During the Phase I investigation, free-phase fuel oil was observed in one borehole, and TPH was detected in concentrations up to 6,800 mg/kg in other soils. As part of an IRM, the tank and surrounding soils were removed and a ground water/product recovery system was installed.

Waste Water Treatment Area - The Waste Water Treatment Area, located along the northeast portion of the site, consists of three closed USTs (Figure 6). The USTs were part of the waste water treatment operation used at the facility to treat plating waste water. Data from previous investigations of the tanks and surrounding soils suggest that the tanks have not leaked. However, there is evidence that surface spills may have occurred. Copper and nickel have been detected at elevated concentrations in shallow soil samples.

Shed Area - The Shed Area was identified during the RI. This area is located in the northwest corner of the building. Site records indicate that chlorinated solvents were handled in this area, and these chemicals were detected in soil samples from the area.

6.2.2. Future Site Conditions

It is expected that the site conditions and land use in the foreseeable future will remain industrial/commercial based on zoning and land use in the vicinity of the site.

6.2.3. Potential Receptor Populations
Based on the site characterization, potential receptor populations include:

- On-site Workers
- Sheldrake River Recreational Users (adult and child)
- Construction Workers (future exposure).

6.2.4. Summary of Medium Specific Concentrations
A detailed discussion of the nature and extent of compound of concern has been presented in Section 5 of the RI report. Media sampled at the site are soils, ground water, surface water, sediment, and air. A brief discussion of the medium specific concentrations, and the potential application of the data in the risk assessment is presented below.

Soil - The analytes detected in soil samples are summarized on Table 29. Detected analytes include chlorinated volatile organic compounds, BTEX compounds, PAHs and other semi-volatile organic compounds, and metals. Since the soil samples were collected from on-site soils, including source areas, the analytes detected are representative of impacts from operations at the site. Therefore, the soil data were utilized directly in deriving the human health risk estimates at the site.

Ground Water - The analytes detected in ground water samples are summarized on Table 30. Detected analytes include chlorinated volatile organic compounds, BTEX compounds, and metals. Since the ground water samples were collected from the source areas as well as hydraulically downgradient, the detected analyte concentrations are representative of impacts from site operations. Therefore, the ground water data were utilized directly in deriving the human health risk estimates at the site.

Surface Water/Sediment - Surface water and sediment samples were collected from the Sheldrake River adjacent to the site, as well as upstream and downstream of the site. The surface water/sediment sampling results are discussed in detail in Section 5.6 of the RI report. As discussed in Section 5.6, analytes detected in downstream and on-site samples were also detected in the upstream samples. For many of these analytes, the detected concentrations in the downstream and on-site samples were lower than the concentrations in the upstream samples. This suggests that there are multiple sources potentially impacting the Sheldrake River, which is expected considering the Sheldrake is bordered by industrial properties upstream of the site. Since the detected concentrations are not representative of the site contribution to analyte levels in the Sheldrake, the surface water/sediment analytical data from the Sheldrake were not utilized in the risk assessment. To evaluate this potential exposure, site related analyte levels in the Sheldrake were estimated based on the concentrations detected in the ground water, the ground water discharge rate to the Sheldrake, and the surface water flow rate in the Sheldrake. This is discussed in Section 6.4.2.

Air - To evaluate indoor air quality in the on-site building, indoor air samples were collected and analyzed for VOCs. The objective of the indoor air sampling was to evaluate the indoor environment with respect to Occupational Health and Safety Administration (OSHA) standards. The results of the indoor air sampling program are presented in Section 5.8. No VOCs were detected in the air samples at detection limits which are below the OSHA Permissible Exposure Limits (PELs) for those compounds. However, under USEPA risk assessment requirements, the required sensitivity for air data is significantly lower than the sensitivity requirements with respect to OSHA standards. Therefore, in order to conservatively evaluate the potential risk posed by the air pathway under USEPA methodology, a screening procedure for evaluating indoor air impacts was used. This screening model was based on current USEPA guidance, which allows for the estimation of indoor air concentrations of VOCs from the concentrations of these compounds detected in the soil and ground water at the site.

Since the majority of the site is paved, it is unlikely that compounds detected in subsurface soil and ground water are impacting ambient air. However, as discussed in Section 6.4.2 a screening procedure for evaluating outdoor air impacts under potential future conditions was implemented using current USEPA guidance, based on the concentrations of VOCs detected in the soil and ground water at the site.

6.3. Data Evaluation

The results of the BRA are used to determine if remedial actions are necessary and, if appropriate, to identify remedial action objectives and medium specific remedial goals. Therefore, it is important that the risk assessment is based on high quality, technically defensible analytical data with respect to the identification and quantification of site related chemicals. Furthermore, the collected data should provide a reasonably conservative representation of site conditions in order to make remedial decisions that are protective of human health and the environment. The objectives of the data evaluation were to:

- evaluate the quality of existing analytical data,
- evaluate the quantity, spatial coverage, and appropriateness of sample locations,
- evaluate the appropriateness of analytical methods and detection limits,
- identify data gaps, and
- identify chemicals of potential concern (COPCs) for the site.

Media that are unlikely to be impacted by the site and chemicals that are attributable to naturally occurring conditions are eliminated from further consideration in the BRA. The data evaluation process was conducted in the following four steps:

- Data compilation and general review
- Data useability assessment
- Comparison of on-site concentrations with background concentrations
- Identification of COPCs for use in the risk assessment.

6.3.1. Data Compilation and General Review

As previously discussed, analytical data were available from several rounds of sampling and analysis. The majority of the previous data is taken from the Phase I RI and the IRM Program. The data collected as part of this RI were intended to supplement the previous data as well as to evaluate the effectiveness of the IRMs initiated to date. As part of the Data Evaluation, the data were reviewed with respect to the factors discussed below.

Number of Samples/Sampling Locations - As shown on Figures 3 through 6, 81 soil samples were collected from across the site, including source areas, at depths ranging from 0 to 30 ft. Therefore, the available soil data are adequate to complete the risk assessment at the site. Likewise since the ground water samples were collected from the shallow and deep ground water zones at and downgradient of source areas, the available ground water data are adequate to complete the human health risk assessment. As previously discussed in Section 6.2.4, since surface water and sediments in the Sheldrake River have been impacted by sources other than the site, the surface water and sediment data cannot be used to evaluate potential risks posed by the site via these media. In addition, in order to provide a conservative evaluation of the indoor air pathway, potential risks were estimated based on modeled indoor air concentrations. The indoor air sampling program data was used in conjunction with the modeled data to evaluate potential risks.

Possible Temporal Trends/Variability - Analyte-specific data from ground water and soil across sampling rounds were examined for indications of temporal trends. Although temporal trends appear to indicate decreasing analyte concentrations over time, these changes in concentration were not significant with respect to the risk assessment. Therefore, all the available data, including previous sampling rounds were utilized in the risk assessment.

6.3.2. Data Usability Assessment

The data useability assessment was conducted in general conformance with guidance presented in *Guidance for Assessing Data Useability in Risk Assessment* (USEPA 1992). Consistent with USEPA guidance, the following factors were evaluated in the Data Usability Assessment:

- availability of data reports and site information,
- sampled media,
- analytical methods and detection limits, and
- data quality indicators.

Availability of Data Reports and Site Information - Sufficient background reports and information regarding the site and surrounding area were available to complete the human health risk assessment.

Sampled Media - A discussion of the media sampled at the site, and the data used in this risk assessment is presented in Section 6.2.4 and 6.3.1 of this report.

Analytical Methods - A detailed discussion of analytical methods is presented in Section 3.10 of the report. Samples were analyzed according to USEPA or NYSDEC methods required by the approved project QAPP and therefore, are considered usable for the BRA.

Data Quality Indicators - The data collected during the RI were validated prior to use in the BRA. The detailed data validation report for the analytical data is presented under separate cover. During the data validation, data quality indicators reflective of the uncertainty and useability of the reported result were assigned to specific analytical results. The following actions were taken during the risk assessment in response to the assigned data quality indicators:
R - The data were determined to be unusable for qualitative and quantitative purposes. Rejected data were not utilized in the risk assessment.

J - The analyte was positively identified; the associated numerical value was the approximate concentration of the analyte in the sample. However, according to USEPA guidance, this was used quantitatively in the risk assessment.

B - The compound was detected in the associated blank, as well as in the sample, at a concentration less than the action limit. Consistent with USEPA guidance, it was assumed that "B" qualified data may be attributable to extraneous contamination. As such, "B" qualified data were treated as non-detects, and the reported concentration was assumed to be the detection limit for the sample.

6.3.3. Comparison of Detected Concentrations with Background

Consistent with USEPA guidance (USEPA 1989), the concentrations of naturally occurring analytes detected in on-site soil, and ground water were compared to background concentrations in these media. A comparison of site concentrations to background is presented in Section 5. Based on this evaluation, copper and nickel were determined to be present at elevated concentrations, and were carried through the risk assessment.

6.3.4. Selection of Compounds of Potential Concern

A list of COPCs for the risk assessment was developed based on the data evaluation. An initial list of COPCs, consisting of the organic chemicals detected at the site, and inorganic chemicals present at concentrations above background, was compiled. Because of the lengthy list of COPCs, compounds were then eliminated from the list based on the frequency of detection. For this assessment, those chemicals which were detected in less than five samples in a given medium were eliminated from the COPC list. The COPCs selected or eliminated from the risk assessment, and the basis for selection/elimination is presented on Tables 29 and 30 for soil and ground water, respectively. The final list of COPCs for the risk assessment is presented on Table 31 which summarizes the range of the detected concentrations and presents the means (including one-half the detection limits for non-detects) in soil and ground water. The chemical and physical constants for the COPCs are summarized on Table 32.

6.4. Exposure Assessment

In the exposure assessment, the mechanisms by which receptors may be exposed to the chemicals of potential concern present at or migrating from the site are identified, and the concentrations of the chemicals to which receptors may be exposed are estimated. The exposure assessment is conducted in the following sections:

- Exposure Pathways Analysis
- Quantification of Exposure.
  - Estimation of Exposure Point Concentrations
  - Identification of Exposure Scenarios

- o Calculation of Chemical Intakes by Receptors

6.4.1. Exposure Pathway Analysis

An exposure pathway describes the course a chemical takes from the source to the exposed individual. An exposure pathway analysis links the sources, locations, and types of environmental releases with population locations and activity patterns to determine the significant pathways of human exposure.

An exposure pathway consists of four elements:

- a source and mechanism of chemical release;
- a retention or transport medium;
- a point of potential human contact with the contaminated medium (referred to as the exposure point); and,
- an exposure route (e.g., ingestion) at the contact point.

A pathway is considered to be **complete** if the conditions listed above exist for that pathway. If one or more of these conditions are not met, there is no physical means by which a receptor may be exposed to the compounds of potential concern, and the pathway is classified as **incomplete**. Incomplete pathways were not considered further in the BRA.

The results of the exposure pathway analysis are summarized on Table 33 and briefly discussed below.

Soil - Because the site is paved, the soil exposure pathway was determined to be **incomplete** under current land uses. However, there is the potential for construction to occur on-site in the future. Therefore, the soil pathway is **complete** for the future construction worker via incidental ingestion and dermal contact.

Ground Water - Under current land uses, it was determined that the ground water exposure pathway is **incomplete**. Although COPCs were detected in ground water samples collected at the site, the ground water is not currently used as a potable water source, and is unlikely to be used in the future because of the proximity of the site to the public water supply. Therefore, no receptors were identified.

Indoor Air - Under current land uses, the indoor air pathway at the on-site building was determined to be **complete** since VOCs in soil and ground water may volatilize to soil vapor and subsequently migrate through the building foundation to the indoor environment. The potential for migration of volatiles from off-site ground water to indoor air in off-site buildings is limited for two reasons. First, the shallow and deep ground water zones likely discharge to the Sheldrake River, therefore off-site migration of site related volatiles is unlikely. Second, buildings in the surrounding area do not have basements since they are located within the flood-plain of the Sheldrake River (Pocha, 1994). Therefore, the indoor air pathway to the off-site buildings is classified as incomplete.

Outdoor Air - Under future land uses, as mentioned above, there is the potential for construction to occur on-site. During construction, COPCs may become airborne as vapors as well as adhered to dusts, and therefore the outdoor air pathway is **complete** for future construction workers.

Surface Water/Sediment - Under current and future land uses, it was concluded that the surface water/sediment pathway at the site is **complete**. Ground water from the site discharges to the Sheldrake River. Therefore, receptors may come into contact with COPCs in the Sheldrake via incidental ingestion and dermal contact.

6.4.2. Quantification of Exposure

The next step in the exposure assessment was to quantify the magnitude, frequency, and duration of exposure for the complete exposure pathways. The quantification of exposure was performed in accordance with the following USEPA guidance for exposure assessment activities:

- *Guidelines for Exposure Assessment* (USEPA 1992)
- *Risk Assessment Guidance for Superfund* (USEPA 1989).

There may be considerable uncertainty relating to the estimated Chronic Daily Intakes (CDIs) for a given receptor group. This uncertainty results from the random variability in exposure parameters, including the estimated exposure point concentrations. Uncertainty in the *exposure point concentration* may arise from spatial and temporal variations in the chemical concentration at the exposure point. Variability in the *exposure parameters* occurs because each individual in the population has differences in activity patterns, behavior, and physical and biological characteristics.

To account for this inherent variability, current USEPA guidance requires that the CDI calculations include the "average" ,"high end", and "upper bound" exposure estimates (USEPA 1992b). Average exposures refer to the estimated CDI for most of the individuals in the exposed population. The average estimate can be derived by using average values (usually the median value) for all the exposure factors. Upper bound estimates represent a "worst case" scenario for the risk estimate. The bounding estimate may be used to develop a statement that the risk "does not exceed" the calculated bounding value. The upper bound estimate is developed by using "highly conservative" assumptions in calculating the risk value. "The actual probability that any individual in the population would be subject to the combination of conservative exposure assumptions is extremely small, and usually so small so as to be a practical impossibility" (USEPA 1992b). High end exposures refer to the top 90th percentile of the calculated risk distribution. The high end estimate is intended to be a plausible estimate of the risk level for those individuals at the upper end of the risk distribution. Theoretically, the 90th percentile high end risk estimate represents the risk level which would be exceeded by only 10% of the population, and 90% of the population would have individual risks below that estimate.

Estimation of the CDI distribution requires specific knowledge of the probability distributions of each of the input parameters. Since it is often difficult to identify specific input distributions for individual exposure parameters, USEPA guidance (USEPA 1989a) presents the concept of the "Reasonable Maximum Exposure " (RME) when evaluating environmental exposures. The RME estimate is derived by combining a series of average and upper bound exposure factor estimates in calculating the CDI, and is approximately comparable to "high end" exposure estimate. For this exposure assessment, and consistent with USEPA guidance, the RME estimates were calculated in the following steps:

- Estimation of exposure point concentrations
- Selection of intake equations and parameter estimates
- Calculation of chemical intakes by receptors.

Estimation of exposure point concentrations - An exposure point is a location where receptors may come into contact with COPCs. Analyte and medium specific exposure point concentrations were estimated for chronic exposures as discussed below.

Soil: Soil exposure point concentrations were estimated from site specific analytical data. USEPA guidance indicates that the arithmetic mean of site wide concentrations may be utilized as the exposure point concentration for estimating soil RMEs (USEPA 1989). However, to compensate for the stochastic uncertainty in estimating the true population mean from the mean of a sub-sample of the population (i.e. the data collected from the site), the USEPA recommends that the upper 95% confidence level (CL) on the arithmetic mean be used in calculating the RME CDI. For this assessment, the arithmetic mean, rather than the upper 95 % CL on the mean was used as the soil exposure point concentration as it was considered to be more representative of soils.

The calculated upper CL on the mean is a useful estimator only if independent random or systematic samples are collected from a single underlying population. At the ITT Sealectro site, the impacted areas are present as specific hot spots which have been sampled at a high frequency in comparison with the non-source areas. Furthermore, the hot spot areas occupy a relatively small fraction of the total site area. Therefore, a site wide arithmetic mean calculated from the source area samples and the non-source area samples represents a conservative estimate of potential future site wide exposures.

The site wide arithmetic mean is appropriate when evaluating potential chronic or sub-chronic exposures, assuming that the receptor is equally likely to be exposed to any given portion of the site during the exposure period. This approach, however, does not consider the potential for short term exposures to hot spot areas which may result in acute toxic effects. Acute exposures are discussed further in Section 6.5, Toxicity Assessment, and Section 6.6, Risk Characterization.

Surface Water/Sediment: As mentioned previously, surface water exposure point concentrations could not be based on analytical data from the Sheldrake River since there are multiple sources of impacts to the river. Therefore, to evaluate the site impacts to the Sheldrake River, the maximum analyte concentrations in ground water at the site were multiplied by a dilution factor to account for dilution in the

Sheldrake River. The dilution factor was calculated as the site ground water discharge rate (2665 l/day) (refer to Section 4.7) divided by the low Sheldrake River flow rate (7.8 x 10^8 l/day) (USACE, 1977). The resultant surface water concentrations are presented on Table 34. It should be noted that because the methodology employed to derive these values used extremely conservative assumptions (i.e., high ground water discharge, maximum detected ground water concentrations and low river flow) and because the COPCs are generally volatile in nature, the resultant estimated concentrations in the river are highly conservative and are likely to over-estimate actual site contributions to COPCs in the river.

Ambient Air: Ambient air concentrations were modeled based on concentrations of COPCs in soil and soil specific characteristics. In order to evaluate ambient air concentrations, the equations presented in Risk Assessment Guidance for Superfund Part B (USEPA 1989) for derivation of a volatilization factor (VF) and particulate emission factor (PEF) were used. The derivation of the VF followed guidance closely, substituting site specific factors were appropriate. The equations, parameter assumptions, and calculated resultant ambient air concentrations are presented on Table 35. The default PEF presented in RAGS Part B (1.3E+09 m3/kg) corresponds to an ambient dust level of 0.0002 (mg/m^3) [1], and represents the potential dust levels at an undisturbed site (via wind suspension only). The default PEF does not consider potential human activities, such as soil excavation which may occur as part of construction activities. Data collected by O'Brien & Gere at various excavation sites indicates that a dust concentration of 0.1 mg/m^3 is representative of the reasonable maximum dust level during typical construction activities. The resultant PEF that would correspond to an ambient dust level of 0.1 mg/m3 is 1.0E+04 m^3/kg, which was used as the PEF for estimating airborne contaminant levels sorbed to dust.

Indoor Air: The evaluation of indoor air was conducted in accordance with the USEPA's *Air/Superfund National Technical Guidance Study*

1

$$Dust\ Level\ (mg/m^3) = \frac{1}{PEF\ (m^3/kg)} * 1{,}000{,}000\ (mg/kg)$$

Series - Assessing Potential Indoor Air Impacts for Superfund Sites (EPA - 451/R-92-002, 1992). A brief discussion of the indoor air migration pathway is presented below.

VOCs in soils and ground water at the site may volatilize to soil gas, and subsequently be transported into indoor air. The primary factors influencing the potential soil vapor concentrations are the ground water concentration of the VOCs at the exposure point, compound specific characteristics (Henry's Law constant, diffusivity coefficient in air), and soil specific characteristics (porosity, moisture, bulk density). VOCs in the soil gas may be transported to indoor air via two principle mechanisms; these are described below.

- **Advection** - Due to differential pressure between the soil gas and the building interior, advective transport may be an important component of VOC transport from soil gas to indoor air. Subsurface building structures may be at a lower pressure than the surrounding soil due to temperature differences between the inside and the outside, wind loading on the building superstructure, and internal building ventilation mechanisms (fans, heating ducts, etc.). The resulting pressure gradient results in the transport of soil gas constituents through cracks in the building foundation or through permeable below grade walls (Johnson and Ettinger 1991). The extent of advective transport is a function of the proportion of the slab that is cracked and the total area of the building slab. Advective transport may be particularly important if the area surrounding the building is paved or overlain by low permeability soils.

- **Diffusion** - Soil gas constituents may diffuse into indoor air through permeable foundation structures. Diffusion may be a relatively important mechanism if porous below grade materials were used in construction (eg. cinder blocks), or if there is no poured foundation. In addition, diffusive transport may be important if the surrounding soils are relatively coarse with a high percentage of unsaturated pore spaces. The primary factors influencing the extent of diffusive transport in the unsaturated zone are compound specific characteristics (diffusivity coefficient in air), and soil specific characteristics (porosity, moisture, bulk density) (Little et. al 1991).

At this site, the advective transport mechanism was identified as the primary soil gas to indoor air migration pathway, since the site is paved around the building, and there is no sub-surface building foundation. The advective transport equations (from USEPA 1992), parameter estimates, and resultant indoor air concentrations are presented on Tables 36 and 37 respectively for ground water and soil sources respectively. Consistent with the RME approach, the arithmetic mean of the soil and ground water analyte concentrations were used to model the indoor air migration pathway, and conservative estimates of the soil and building specific parameters were applied.

Identification of exposure scenarios - Once the chemical concentrations at the exposure points were estimated, the potential activity patterns of receptors at the exposure points were evaluated. This included identifying how often and for how long the receptor may be present at the exposure point, and other specific variables that influence the amount of chemical potentially taken up by the receptor. A summary of the RME scenarios and exposure parameters for the receptors identified in Section 6.2.3 (on-site workers, potential future construction workers, recreational users of the Sheldrake River) is presented on Tables 38 and 39, respectively, and briefly summarized below.

On Site Workers - To evaluate chronic and sub-chronic RMEs for the on-site worker it was assumed that workers may be at the site 8 hours per day 250 days per year for 25 years. The complete exposure pathway for the on-site workers was inhalation of indoor air. Because this exposure occurs via migration of COPCs through soil gas and the building foundation, acute exposures are not expected.

Construction Workers - To evaluate chronic and sub-chronic RMEs for the future construction worker it was assumed that construction workers may be at the site 8 hours per day 60 days per year for one construction season. The complete exposure pathways for construction workers were incidental ingestion and dermal contact with soils, and inhalation of outdoor air. Acute exposures are discussed qualitatively in Sections 6.5 and 6.6.

Recreational users of the Sheldrake River - To evaluate potential health risks associated with site related analytes in the Sheldrake River, the surface water screening concentrations were compared with chemical specific Ambient Water Quality Criteria (AWQC) for the protection of human health. As shown on Table 40, the surface water screening concentrations are significantly lower than their respective AWQCs. As such, it was concluded that the discharge of chemicals from the site to the Sheldrake River is highly unlikely to represent a potential risk to human health, and the analyte specific CDIs for recreational users of the Sheldrake were not calculated.

Calculation of chemical intakes by receptors - Based on the identified exposure scenarios and intake parameters, chemical specific chronic daily intake estimates were developed for potentially exposed receptors. The guidance materials listed below were utilized in completing the exposure assessment.

- USEPA 1989, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part A)*, Interim Final, Office of Emergency and Remedial Response, EPA/540/1-89/002.

- USEPA 1991, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual Supplemental Guidance "Standard Default Exposure Factors"*, Interim Final, Office of Emergency and Remedial Response, OSWER Directive, 9285.6-03.

- USEPA 1989, *Exposure Factors Handbook*, Office of Health and Environmental Assessment, EPA/600/8-89/043.

- USEPA 1992. *Dermal Exposure Assessment: Principles and Applications*, Interim Report, Office of Research and Development, EPA/600/8-91/011B.

- USEPA 1992, *Guidance on Risk Characterization for Risk Managers and Risk Assessors*, Memorandum from F. Henry Habicht II, Deputy Administrator to Assistant and Regional Administrators.

The chronic RME CDIs for the on-site worker via inhalation of indoor air from soil are presented on Table 41. The CDIs for the inhalation of indoor air from ground water are presented on Table 42. For the potential future construction worker, the chronic RME CDIs for incidental ingestion of soils are given on Table 43, for dermal contact with soils on Table 44, and for inhalation of vapors and dusts on Table 45.

6.5. Toxicity Assessment

In the toxicity assessment, available toxicological data summaries for site related compounds are reviewed and the relationship between the extent of exposure to a specific contaminant and the increased likelihood and/or severity of adverse effects are estimated. The potential toxicologic effects induced by a given dose of a chemical are classified according to two criteria: carcinogenic effects, and non-carcinogenic effects.

6.5.1. Non-Carcinogenic Effects

A non-cancer health effect occurs as a result of damage to cells in one or more human organ, which causes the organ(s) to function less efficiently. Due to the body's ability to cope with small doses of a chemical, a non-cancer health effect will not occur if intake of a chemical is less than a certain critical dose. This is referred to as a No Observed Adverse Effect Level (NOAEL) for a chemical. If the calculated intake of a chemical is less than the NOAEL for that chemical in a given species, then no adverse non-cancer health effects are expected as a result of that exposure.

The specific non-carcinogenic toxic effects that may be elicited depend on the exposure concentration and the duration of exposure. If an individual is exposed to very high concentrations of a chemical, severe organ dysfunction can occur in a short period of time. This is termed an acute toxic effect. In general, the body is able to cope with higher exposure concentrations over any given exposure period if the exposure period is brief. If an individual is exposed to lower levels of a chemical regularly for a long period of time, smaller amounts of repeated damage to the organ can accumulate and ultimately cause the organ to malfunction. These are termed sub-chronic and chronic toxic effects (depending on the exposure duration).

Examples of non-cancer health effects on the body can be illustrated by the effects of alcohol. At very high doses, alcohol can have an acute toxic effect on the central nervous system. The symptoms of this effect may be dizziness, nausea, loss of consciousness. If smaller doses of alcohol are consumed regularly for a long period of time, it can result in toxicity to the liver which can lead to impaired liver function and ultimately cirrhosis of the liver. This is a chronic toxic effect of alcohol. Alcohol will have no toxic effects, however, if it is consumed in very small quantities, even for a long period of time. This quantity would represent the chronic NOAEL for alcohol.

Reference Doses (RfDs) - In order to evaluate potential non-carcinogenic effects following exposure of human populations to chemicals, USEPA derives chemical specific "reference doses" (RfDs). If the calculated intake of a chemical is less than the published RfD, then no adverse non-carcinogenic effects are expected in the exposed population. A brief discussion of the methods by which RfDs are derived is presented below.

For some chemicals, RfDs are derived directly from data on human exposures. Such data includes data relating to occupational exposures that are known to have no adverse effects, normal dietary levels of certain chemicals (eg. magnesium), therapeutic doses of certain chemicals (e.g. silver), epidemiologic data relating to populations with background exposures (eg. selenium). For most chemicals USEPA derives RfDs based on laboratory studies in which experimental animals were exposed to different concentrations of a chemical, and a "no observed effect level" (NOAEL) is estimated. If data from several animal studies are available, USEPA seeks to identify the species that is most comparable to humans based on a knowledge of specific biologic properties. However, if adequate comparative data is not available, USEPA selects the study on the most sensitive animal species as the critical study for the basis of the NOAEL. The NOAEL is then used derive a RfD for potential adverse effects in human populations.

RfD Uncertainty Factors - In most cases, there is considerable uncertainty regarding the extension of toxicologic data from animal studies to humans. In other words, the actual RfD for humans or sensitive sub-populations of humans would not be precisely known based on data in animal species. This uncertainty arises because there may be differences between the animal and human species regarding factors such as the metabolism of the chemical, the distribution and clearance rate of the chemical from the body, and the sensitivity of specific organ systems to the chemical. Therefore, the USEPA derives RfDs that are designed to be protective of the public at large, *including sensitive sub-populations*. The USEPA applies a series of "uncertainty" factors to calculate the final RfD values. Depending on the data, the NOAEL may be divided by an uncertainty factor ranging from 0 - 10,000. For human data, in most cases, the uncertainty factor of 10 is applied for the application of data from the public at large to sensitive sub-populations. For animal data a minimum uncertainty factor of 100 (10 for sensitive sub-population, and 10 for animal-human extrapolation) is applied for deriving the human RfD.

6.5.2. Carcinogenic Effects

The other health effect of concern in the exposure of humans to chemicals in the environment is the induction of cancer.

Weight of Evidence - USEPA classifies chemicals according to their potential to induce cancer in humans. In general, USEPA reviews and evaluates available data regarding the potential carcinogenic effects of a chemical, and assigns a "carcinogenicity" classification according to a weight of evidence classification scheme (USEPA 1984, 49 CFR 462394). A chemical may be classified into one of five groups with respect to the weight of evidence for human carcinogenicity. The categories are:

- Group A - Known Human Carcinogen. A chemical is classified in group A if there is sufficient[2] evidence from human observations (epidemiological studies) to support an association between exposure to a chemical agent and cancer in humans.
- Group B - Probable Human Carcinogen. A chemical may be classified as a B1 or a B2 carcinogen. An agent is classified as a B1 carcinogen if there is sufficient evidence for carcinogenicity based on animal studies, and limited[2] (suggestive but not conclusive) evidence based on human observations. A B2 carcinogen is an agent for which there is sufficient

[2] The definition of the terms "sufficient", limited, and adequate are given in U.S.EPA 1986, Guidelines for Carcinogen Risk Assessment, (51 FR 33992).

evidence for carcinogenicity in animals, and inadequate evidence for carcinogenicity in humans.

- Group C - Possible Human Carcinogen. An agent is classified as a group C carcinogen if there is limited evidence for carcinogenicity in animals and inadequate evidence for carcinogenicity in humans.
- Group D - An agent is classified as a group D agent if there is insufficient data available with which to evaluate the carcinogenicity of the chemical.
- Group E - An agent is classified as a group E agent if there no evidence for carcinogenic effects based on at least two technically adequate animal studies.

Slope Factors - For group A, B, or C chemicals, USEPA derives chemical specific cancer slope factors. A cancer slope factor is a number which, when multiplied by the estimated chemical specific CDI, provides an estimate of the "excess cancer risk" associated with that exposure. Theoretically, the excess cancer risk represents the probability (greater than background) that a carcinogenic event would occur in an individual as a result of a given exposure over a lifetime.

In most cases, chemical specific slope factors are derived by USEPA by fitting a mathematical model called the linearized multistage model (LMS)[2] to the dose response data from animal bioassays. The linearized multistage model is formulated based on the concept that there are multiple discreet stages to the carcinogenic process.[3] Furthermore, the model assumes that at low doses, there is a linear relationship between the dose of a chemical and the excess

[2] Essentially, the multistage framework assumes that a tumor develops from a single cell that has undergone a number of distinct transformation stages. A carcinogenic compound may act by independently stimulating one or more of these transformations. Therefore, the probability that a carcinogenic effect may occur following exposure to a carcinogen would be some function of the dose of the potential carcinogen. According to the multistage formula used by U.S.EPA, the probability that a carcinogenic event would occur following exposure to a carcinogen is given by $p(d) = 1 - e^{-(q0 + q1d + q2d2 ...)}$, at low doses, this reduces to $p(d) = q0 + q1d + q2d2 ...$, where d is dose, q0 represents the background cancer rate, and q1, q2 etc. are the coefficients describing the effects of the carcinogenic agent on each of the transformation stages. The U.S.EPA fits the formula in equation 1 (using maximum Likelihood Methods) to the available dose response data from an animal bioassay. At low doses, the risk in equation 1 would be dominated by the linear term (b) in equation 1. Therefore, the U.S.EPA approach is to fit the formula in equation 1 to available animal dose response data, and estimate the 95 % upper confidence limit on parameter b based on the best fit to the data. The upper 95 % confidence limit on parameter b is published as the slope factor for the chemical in question.

[3] The historical development of the multi-stage theory of carcinogenesis and multistage models has been discussed by Whittemore (1978).

cancer risk, and that there is no threshold dose for the induction of cancer. A detailed discussion of the validity of the LMS procedure, as applied by the USEPA, will not be presented here. However, it is important to note that for many chemicals, the LMS procedure may result in a highly conservative estimate of the potential cancer risk associated with a given exposure[4]. Indeed, as acknowledged by USEPA (51 FR 3398), the LMS procedure "does not necessarily give a realistic prediction of the risk. The true value of the risk is unknown, and may be as low as zero".

The USEPA's Guidelines for Carcinogen Risk Assessment indicate that models other than the linearized multistage model should be considered when there is substantial evidence to indicate that the linearized multistage model may not be applicable[5]. However, to date, USEPA has regulated very few chemicals classified as level A, B, or C carcinogens using models other than the linearized multistage procedure. This is probably because the linearized multistage procedure is conservative, simple to use, and use of the linearized multistage model standardizes the risk assessment process. However, the USEPA acknowledges that additional data relating to potential carcinogenic mechanisms would help refine the carcinogen risk assessment process. In particular, USEPA is considering the possibility of including data on cell proliferation rates in the carcinogen evaluation process. Such data, along with data on the potential mutagenicity of a chemical would facilitate the identification of the most appropriate dose response model for a chemical and greatly improve the regulatory risk assessment process.

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4 Examples of such effects are chemicals that cause an increased high dose cancer incidence due to stimulated cell proliferation rates (Cohen and Ellwein 1990, Ames and Gold 1990), chemicals for which metabolic parameters limit the delivered dose to the target organ (discussed in Zeiss et al 1987), promoters (Upton 1988), or in instances where DNA repair mechanisms may be dose dependant (discussed in Zeiss 1987).

5 There are a number of different mathematical models (of varying complexity) that have been developed to describe the carcinogenic process. A detailed discussion of cancer dose response relationships and their application to low-dose cancer risk assessment has been presented in Zeiss et al. 1987. Many of these models incorporate factors such as potential thresholds, variations in cell proliferation rates, and pharmacokinetic considerations. Application of these models may result in (significantly) different estimates of the quantitative relationship between dose of a chemical and the probability of cancer.

6.5.3. Toxicity Profiles

For each chemical of concern, a brief synopsis of the human toxicological effects, including acute effects, and chronic RfDs and cancer slope factors published by USEPA was compiled from the following hierarchy of sources:

- USEPA's Integrated Risk Information System (IRIS) database (USEPA 1994e),
- Health Effects Summary Tables (HEAST),
- Environmental Criteria Office (ECAO), and
- Agency for Toxic Substances and Disease Registry (ATSDR).

This data is summarized on Table 46 and is presented in Appendix G of this report.

6.6. Risk Characterization

In this section of the BRA, the toxicity and exposure assessments are summarized and integrated into numerical values which may be used to evaluate the likelihood of adverse health effects in populations potentially exposed to site related chemicals. RME estimates of potential health risks were developed for each potentially exposed receptor at the site.

Chronic non-cancer health effects were evaluated by comparing the chemical specific CDIs with the respective chronic RfD as given below.

1. For each receptor identified during the exposure assessment, and each individual exposure pathway, the chemical specific hazard quotients (HQs) were calculated where HQ is given by:

   $$\text{Hazard Quotient} = \text{CDI/RfD}$$

2. For each exposure pathway, the chemical specific hazard quotients were summed to calculate the Hazard Index (HI) for that pathway. For each receptor, the pathway specific hazard indexes were summed to obtain the Total HI for that receptor. A total HI of less than one indicates that it is highly unlikely that chronic non-cancer toxic effects would occur for the given receptor.

Potential acute effects were qualitatively evaluated based on consideration of the chemical concentration at hot spots at the site and published information regarding the acute effects of COPCs.

To evaluate carcinogenic effects, the incremental cancer risk associated with exposure to chemicals of concern was calculated using chemical specific slope factors as described below.

1. For each receptor identified during the exposure assessment and each exposure pathway, the chemical specific risk is given by:
   Cancer risk = CDI * slope factor.

2. For each receptor the total incremental excess cancer risk was calculated by summing the pathway specific cancer risk. This calculated risk estimate was then compared with an acceptable excess cancer risk. A total site cancer risk that is less than 1.0E-04 to 1.0E-06 is considered to be acceptable, (NCP, *Federal Register*, March 8 1990, 40 CFR 300).

Summaries of the chemical specific, pathway specific and total RME HIs for the on-site worker and potential future construction worker are given on Tables 47 and 48, respectively. Chemical specific, pathway specific and total RME excess cancer risks are summarized on Tables 49 and 50 for the on-site worker and potential future construction worker, respectively. A brief discussion of the Risk Characterization for receptors at the site is presented below.

6.6.1. On-Site Worker

The calculated RME HI for the on-site worker is 0.6, and the calculated RME cancer risk is 2.1E-05. The primary contributor to the HI is tetrachloroethene in soil (HQ of 0.48), and the primary contributor to the cancer risk is 1,1-DCE in ground water. Since the RME HI is less than 1, and the cancer risk for is within the USEPA's acceptable range of 1.0E-04 to 1.0E-06 set forth in the National Contingency Plan, it is concluded that the site does not represent a significant health risk to workers at the site.

6.6.2. Future Construction Workers

For the potential future construction worker, incidental ingestion and dermal contact of soils and inhalation of vapors and dusts from soil were identified as complete exposure pathways. The chronic HI was estimated to be 0.15 which is within the USEPA's acceptable limit. The estimated cancer risk for this receptor was 6.0E-07 which is less than USEPA's acceptable range of 1.0E-04 to 1.0E-06.

There is a potential for acute effects if unprotected workers are exposed directly to chemical concentrations at hot spot areas which are a minimum of 5 ft below ground surface. In particular, COPCs in soil volatilizing to ambient air when exposed during excavation activities may result in concentrations of COPCs in air which result in acute effects. Such effects may include dermal and ocular irritation, central nervous system depression, and headaches. These effects would be transient and reversible on cessation of the exposure. Use of appropriate personal protective measures when involved in such activities would minimize the potential for acute effects.

6.7. Uncertainty Analysis

The risk measures used in this BRA are not precise, deterministic estimates of risk, but conditional estimates controlled by a considerable number of consecutive upper-bound assumptions regarding exposure and toxicity. They are designed to overestimate the true risk value, as opposed to present a precise, realistic estimate of actual health risks. This is done by convention, consistent with USEPA protocols. There are several categories of uncertainties associated with BRAs: selection of substances, toxicity values for each substance, and exposure assessment.

The main sources of uncertainty in the BRA are the estimation of exposure point concentrations and calculation of CDIs. Uncertainties related to these sources are discussed below.

Calculation of Exposure Point Concentrations - For both receptors quantified in this assessment, exposure point concentrations for some pathways were estimated using fate and transport models. These models are conservative in nature and wherever site-specific data was not available, upper bound estimates of the required parameters were used. As a result, the predicted exposure point concentrations are likely to over-estimate actual site conditions.

Calculation of Chronic Daily Intakes - The CDIs were calculated using conservative estimates of parameter assumptions. As a result, the CDIs are also likely to over-estimate actual intakes of the identified receptors.

6.8. Summary and Conclusions

A BRA was performed using the available analytical data generated by O'Brien & Gere during the various phases of investigation at the site. The cancer risk and hazard index estimates were calculated to highlight potential sources of risk so that they may be considered for inclusion in the remedial process as potential remedial objectives. Two receptors were quantitatively evaluated as part of this assessment, the current on-site worker and the potential future construction worker. Table 33 provides a summary of the exposure pathway analysis. The risks estimated for these receptors are discussed below.

For the on-site worker, inhalation of vapors migrating from subsurface soils and ground water to indoor air was the only identified complete exposure pathway. The resultant HI for this pathway was estimated to be 0.6. This value does not exceed the USEPA's recommended limit of 1. The cancer risk for the on-site worker was estimated to be 2.15E-05. This is within the USEPA's acceptable range of 1.0E-04 to 1.0E-06 set forth in the National Contingency Plan.

For the potential future construction worker, incidental ingestion and dermal contact of soils and inhalation of vapors and dusts from soil were identified as complete exposure pathways. The HI was estimated to be 0.15. The HI is within the USEPA's acceptable limit. The estimated cancer risk for this receptor was 6.0E-07. This is below the USEPA's acceptable range.

There is the potential for acute effects from being exposed for short durations to specific hot-spots which are a minimum of 5 ft below ground. In general, these effects would be transient and reversible on cessation of the exposure. Use of appropriate personal protective measures would minimize the potential for acute effects.

7. Summary and Conclusions

This section presents the summary and conclusions of the RI completed at the former ITT Sealectro facility (Site #360027) located at 139 Hoyt Street in Mamaroneck, New York. The submittal of this RI report is in fulfillment of the Administrative Order of Consent (October 8, 1992) for the site.

1. The former ITT Sealectro site is located in an industrial area of Mamaroneck, New York. The site was operated as an electronics part manufacturing and/or assembly facility from 1960 to 1990.

2. The site is located in an area which has been developed since the 1800s. Various industrial and commercial facilities as well as numerous RCRA facilities and facilities with USTs which have the potential to impact the environment are located in the vicinity of the site. The degraded nature of the Sheldrake River, which is adjacent to the site, is evidence of the impacts of the development of the area. Potable water for the area is supplied from New York City reservoirs. An ordinance requires residents to use the public water supply.

3. Extensive site investigations have been completed at the former ITT Sealectro site. Investigations completed both prior to the RI and including the RI involved over 50 soil borings, soil sampling, installation of 13 monitoring wells, quarterly ground water sampling, and surface water and sediment sampling. In addition, IRMs were completed which involved UST removal, soil removal, the installation and operation of ground water and product recovery systems, and an *in situ* air stripping system.

4. The physiography in the area of the site is composed of low-lying areas separated by low northeast trending

hills. The Sheldrake River forms the northern border of the site. This river flows to the northeast for about 1500 feet where it joins the Mamaroneck River. The Mamaroneck River flows to the south and discharges into part of Long Island Sound about 3000 feet southeast of the site.

5. The site geology consists of three unconsolidated units that overlie gray gneiss bedrock. The bedrock is located between 29 and 40 feet below the ground surface. The unconsolidated deposit immediately above the bedrock is comprised of sand and gravel. The middle unit consists of interlayered discontinuous lenses of sand, silt, and clay. The upper most unconsolidated unit is comprised of fill.

6. Ground water occurs between 5 and 8 feet below the ground surface. The depth to water varies with seasons and river stage. Two ground water zones have been identified. The shallow zone occurs in the silt and sand unit while the deep ground water zone occurs in the sand and gravel unit. Ground water flow in both the shallow and deep zones is to the Sheldrake River. An area of higher ground water elevations in the shallow ground water zone has been identified near the northeastern corner of the facility. The size of this ground water mound appears to vary during the year and may affect the direction of shallow ground water flow.

7. In the vicinity of the site, ground water flow paths in the unconsolidated deposits are constrained due to topography and the underlying bedrock. This shallow ground water flow is physically constrained to the area between the Sheldrake and Mamaroneck Rivers. At the site, ground water flow in both the shallow and deep zone is toward the Sheldrake River. An upward hydraulic gradient and a good hydraulic connection between the river and ground water zones suggests that the ground water flowing beneath the site discharges to the Sheldrake River. The estimated

combined ground water flow beneath the site is between 80 gpd and 700 gpd.

8. The permeability of the bedrock in the area is reportedly low. Due to the presence of the Sheldrake and Mamaroneck Rivers and Long Island Sound, it is expected that bedrock ground water generally flows from the bedrock to the unconsolidated deposits and surface waters in the Mamaroneck area. At the ITT Sealectro site, it is likely that the bedrock ground water is discharging to the unconsolidated deposits adjacent to the Sheldrake River.

9. The extensive investigations at the site have identified the following areas of concern: a) Solvent Underground Storage Tank Area; b) Shed Area; c) Former Drum Storage Pad Area; d) Waste Water Treatment Area; e) Fuel Oil Underground Storage Tank Area; and f) Sheldrake River.

10. Soils which contain VOCs/DNAPL were identified in the Solvent UST and Shed Areas. These VOC/DNAPL are heterogeneously distributed in the subsurface. The VOC/DNAPL occur in small lenses which are not laterally or vertically continuous. The residual saturation of VOC/DNAPL in soil lenses is variable and no DNAPL pools were detected. As presented in this RI Report, the horizontal and vertical extent of VOC/DNAPL in soils is defined by the occurrence of isolated lenses of soil with VOC/DNAPL. This does not indicate that the majority of the soil within the horizontal and vertical extent contains VOC/DNAPL.

11. Eight underground storage tanks were present in the Solvent UST Area. IRMs completed at this location included tank removal and soils excavation and disposal. In addition, a ground water recovery system was installed at the location of the former tanks. Investigations have identified soils containing VOC and DNAPL in the vicinity of the former Solvent UST Area. The VOCs consist of PCE, TCA, associated chlorinated breakdown products, and

toluene. The horizontal and vertical extent of VOCs has been defined based upon borings, soil sampling and a ground penetrating radar survey. For the Solvent UST Area, the northern extent of VOC/DNAPL in soils interfingers with the VOC/DNAPL from the Shed Area. DNAPL is present in the sand and gravel unit, but does not appear to extend to the top of bedrock. No DNAPL pools were identified in the soils or on top of bedrock. The nature and extent of VOCs/DNAPL associated with the Solvent UST Area have been defined.

12. The Shed Area is a source of VOCs/DNAPL in soil. This area was identified and delineated by the GPR survey and soil sampling. The VOCs primarily consist of PCE and TCE. The horizontal and vertical extent of VOCs/DNAPL was defined based upon borings, soil samples and the GPR survey. The western extent of VOCs from the Shed Area merges with the VOCs from Former Drum Storage Pad Area and the southern extent interfingers with the Solvent UST Area. VOCs/DNAPL is present in the sand and gravel unit, but does not appear to extend to the top of bedrock. No DNAPL pool were identified. The nature and extent of VOCs/DNAPL associated with the Shed Area have been defined.

13. The Former Drum Storage Pad Area was used for the storage of drums containing solvents and lubricating oils. The horizontal extent of VOCs, the soil was defined prior to the completion of the RI. In addition, an *in situ* air stripping IRM was completed in this area in 1993. Post IRM sampling indicates that the ISAS was effective in reducing VOC concentrations in the subsurface soil.

14. The Waste Water Treatment Area consists of three closed USTs which contained plating waste water. Metals were detected in soil samples from this area with copper and nickel detected at concentrations above background in one sample from one boring and

three isolated surface soil samples. This area has been characterized.

15. The Fuel Oil UST Area was the former location of a 2,500 gallon UST. The tank and some stained soil were removed during an IRM in 1992 and a product recovery well was installed. The recovery well is currently operating. Investigations have documented that LNAPL is restricted to a small area near the north end of the former tank. The data indicate that soils impacted by petroleum are generally located in the vicinity of the former tank and do not extend beneath the building. The nature and extent of fuel oil associated with the Fuel Oil UST Area has been defined.

16. The Sheldrake River, along the northern edge of the property, is a Class C river. Background information, visual observations, and surface water and sediment sampling data document that the river has been degraded by upstream sources. Data collected during investigations at the Sealectro site indicate concentrations of copper in the sediments at scattered locations adjacent to the site.

17. The site ground water, both shallow and deep zones, has been impacted by VOCs. PCE, TCE, TCA, and associated breakdown products have been identified as the primary compounds. Ground water sampling has demonstrated that the site ground water has not been impacted by SVOCs or inorganics. PCE, TCE, and TCA are the dominant parameters in the deep ground water zone while the shallow ground water zone typically has higher concentrations of degradation products. The difference in parameters suggests that biodegradation of VOCs is occurring more readily in the shallow ground water zone.

18. Total VOC concentrations in the monitoring well nests along the Sheldrake River and recovery well RW-2 have shown a overall decline since the beginning of ground water monitoring. This decline may reflect the impact of the various IRMs which

have been completed at the site. Fluctuations in the VOC concentrations have occurred in site ground water concentrations. The cause of these fluctuations is not clearly known, but may reflect the lateral variations in ground water flow.

19. The Solvent UST Area and the Shed Area appear to be the sources of ground water contamination. The presence of VOC/DNAPL in soil in the shallow and deep ground water zones in both of these areas is the source of the dissolved VOCs in the ground water. The highest VOC concentrations in the ground water have been documented in RW-2 in the Solvent UST Area. The site data indicate that the Fuel Oil UST Area and the Waste Water Treatment Area are not a source of ground water impacts. Due to the close proximity of the Shed and Former Drum Storage Pad Areas it is not possible to determine whether the latter is a source of ground water impacts.

20. Low concentrations of VOCs have been detected sporadically in the upgradient monitoring wells. These data suggest that either there is an upgradient source of VOCs or that ground water flow occasionally is reversed due to elevated river levels or the ground water mound near the northeastern corner of the building.

21. Ground water with VOCs, originating in both the shallow and deep ground water zones, migrates to the Sheldrake River. The documented upward hydraulic gradient and good hydraulic connection between the river and the shallow and deep ground water zones suggest that the Sheldrake River is the ground water discharge area for the site. The western and eastern extent of the VOC plume is believed to be in the vicinity of MW-2 and MW-3 well nests respectively because the principle direction of ground water flow is to the Sheldrake River.

22. Indoor air sampling was completed to evaluate potential impacts to air quality from VOCs in the soil

and ground water. The sampling results indicated that no VOCs were detected.

23. A Baseline Risk Assessment was completed for the site. Potential exposure pathways were evaluated to identify whether the pathways are complete. The incomplete pathways under current conditions included contact with soils, ground water consumption, and vapor migration from soil and ground water to indoor air in off-site buildings. The four complete pathways included future contact with soils, future worker exposure to ambient dust and vapors, vapor migration from soil and ground water to on-site indoor air, and contact with water in the Sheldrake River.

24. For the exposure pathway of contact with water of the Sheldrake River, the predicted concentrations of compounds of concern in the Sheldrake River from site ground water are extremely low. These low predicted concentrations could not be identified during river sampling due to the already degraded nature of the Sheldrake River. The predicted low concentrations do not represent a risk to human health and therefore quantification of this pathway was not necessary.

25. For the on-site worker, inhalation of vapors migrating from the subsurface soils and ground water to indoor air was identified as a complete exposure pathway. The estimated Hazard Index of 0.6 does not exceed the U.S. EPA's recommended limit of 1. The estimated cancer risk for the on-site worker was 2.15E-05 and is within the acceptable range set forth in the National Contingency Plan.

26. For future on-site workers, there is a complete exposure pathway associated with contact with ambient dusts, vapors, and direct contact due to soil excavation. While the contact with specific hot spots may require the use of personal protective measures, both the estimated Hazard Index and cancer risk are

acceptable. The estimated cancer risk is 6.0E-07 and the Hazard Index is 0.15.

27. This Remedial Investigation Report represents the completion of the Remedial Investigation component required in the Administrative Order of Consent (October 8, 1992). The nature and extent of site-related compounds of concern have been evaluated and a Baseline Risk Assessment was completed. This characterization of the site and potential risks will provide the basis for identifying site areas which require remediation. This RI Report provides the basis for an evaluation of remedial technologies which will be completed in the Feasibility Study.

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Tables

O'BRIEN & GERE
ENGINEERS, INC.

Table 1
Fuel Oil Recovery Data

ITT SEALECTRO
MAMARONECK, NEW YORK

Year/Month 1992	Gallons of Oil Collected For Date	Total
February	20	20
March	74.5	94.5
April	13	107.5
May	6	113.5
June	7.5	121
July	3.5	124.5
August	2	126.5
September	0	126.5
October	2	128.5
November (1)	62	190.5
December	1	191.5

Year/Month 1993	Gallons of Oil Collected For Date	Total
January	0	191.5
February	1	192.5
March	3.5	196
April	7.5	203.5
May	3.5	207
June	1.5	208.5
July	0.5	209
August	1	210
September	0	210
October	4.5	214.5
November	4.5	219
December	1	220

Year/Month 1994	Gallons of Oil Collected For Date	Total
January	0	220
February	0	220
March	4.5	224.5
April	1	225.5
May	1	226.5
June	2	228.5
July	2	230.5
August	1	231.5
September	1	232.5
October	0	232.5

Notes:

(1) The 62 gallons of fuel oil recovered during November 1992 consisted of an oil and water mixture.

Table 2
Geotechnical Data

ITT Sealectro
Mamaroneck, New York

Sample	Vertical Permeability Tests	Hydrometer and Seive Analysis	
B-49 4 to 6 ft Shelby Tube	2.8 E-6 ft/min	Sand: Silt: Clay:	18.0% 77.1% 49.0%
		top 6" of tube Gravel: Sand: Silt:	 35.2% 53.9% 10.9%
B-33 5 to 7 ft Shelby Tube	7.0 E-5 ft/min	Sand: Silt:	58.5% 41.5%
B-33 Soil Sample 7 to 8 ft		Sand: Clay:	90.5% 9.5%

TABLE 3
MONITORING WELL SPECIFICATIONS AND GROUND WATER ELEVATIONS

ITT SEALECTRO
MAMARONECK, NY

WELL NO.	BORING DEPTH (FT)	GROUND ELEVATION (FT)	PVC ELEVATION (FT)	HYDRAULIC CONDUCTIVITY (CM/SEC)	SCREENED INTERVAL (FT)	GROUND WATER ELEVATIONS (FT) 2/19/92	4/15/92	4/23/92	6/03/92	6/08/92	6/17/92	6/24/92	7/2/92	8/12/92
MW-2	13.7	21.4	21.02	3.6E-04	13.7 - 3.7	15.85	15.28	14.27	15.27	15.97	15.40	15.27	14.97	15.41
MW-2D	42.5	21.6	21.26	1.0E-04	42.0 - 32.0	16.32	16.05	16.22	16.25	16.85	16.33	16.05	15.87	16.31
MW-3	14.0	22.3	21.87	6.3E-04	14.0 - 4.0	15.12	15.09	14.80	14.89	15.52	14.97	15.06	14.72	15.51
MW-3D	29.0	22.4	22.22	1.7E-03	28.0 - 18.0	15.97	15.93	15.98	16.00	16.55	16.05	15.85	15.67	15.98
MW-4	14.0	21.6	21.27	2.1E-03	14.0 - 4.0	16.21	16.21	16.04	NA	NA	NA	NA	NA	17.00
MW-4D	41.0	21.6	21.34	8.7E-04	40.5 - 30.5	16.24	16.20	16.04	NA	NA	NA	NA	NA	16.04
MW-8	15.0	22.5	22.26	NA	14.5 - 4.5	*	*	*	*	*	*	*	*	*
MW-9	14.0	22.6	22.14	NA	14.5 - 4.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-10	14.0	22.8	22.33	NA	14.0 - 4.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-11	15.0	22.1	21.8	8.4E-05	14.0 - 4.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-12	14.5	23.5	23.23	9.1E-05	14.5 - 4.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-13	14.5	23.5	23.07	2.9E-05	14.5 - 4.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
SWB-1	NA	20.82	NA	NA	NA	NA	NA	NA	14.82	14.47	NA	NA	NA	NA

NOTES:
- * No water level taken due to free product in well.
- ** Recovery well in operation
- NA Not available
- SWB Surface Water Benchmark

Wells surveyed 9/94 by Taylor, Wiseman & Taylor.
Datum - Mean Sea Level.

TABLE 3
MONITORING WELL SPECIFICATIONS AND GROUND WATER ELEVATIONS

ITT SEALECTRO
MAMARONECK, NY

WELL NO.	GROUND WATER ELEVATIONS (FT) 11/5/92	2/17/93	5/24/93	8/18/93	11/9/93	2/15/94	3/30/94	4/26/94	6/1/94	7/5/94	7/27/94	8/23/94	10/3/94	10/26/94	11/17/94
MW-2	15.74	16.24	14.87	15.35	15.62	14.92	16.79	15.87	15.66	15.92	16.12	16.60	15.25	15.02	15.13
MW-2D	16.52	16.97	15.93	15.92	16.43	15.85	17.54	16.69	16.47	16.21	16.19	16.74	15.97	15.67	15.80
MW-3	15.47	16.07	14.47	15.02	15.12	NA	16.06	15.31	14.99	15.4	15.2	13.44	15.17	14.80	14.76
MW-3D	16.18	16.60	15.75	15.63	16.28	NA	17.4	16.57	16.38	16.04	15.9	16.52	15.80	15.59	15.64
MW-4	16.60	16.90	15.79	15.65	16.76	16.25	17.7	NA	16.71	16.51	NA	17.02	16.55	15.83	15.97
MW-4D	16.64	16.74	15.65	15.94	16.66	16.17	18.02	NA	16.64	16.28	NA	17.00	16.12	15.78	15.92
MW-8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-9	NA	NA	NA	NA	NA	NA	18.91	18.88	NA	19.37	19.69	NA	16.25	15.79	15.88
MW-10	NA	NA	NA	NA	NA	NA	19.03	19.07	NA	19.52	19.95	NA	NA	NA	16.21
MW-11	NA	NA	NA	NA	NA	15.89	NA	17.13	17.55	17.64	17.78	17.85	15.94	15.30	15.68
MW-12	NA	NA	NA	NA	NA	17.02	NA	17.61	17.83	17.92	18.05	18.18	15.97	15.65	15.72
MW-13	NA	NA	NA	NA	NA	16.86	NA	18.62	19.09	19.38	19.72	19.46	19.65	16.13	16.15
SWB-1	NA	NA	NA	NA	15.07	NA	15.72	14.99	NA	14.8	14.6	15.51	14.57	14.48	NA

NOTES:
- * No water level taken due to free product in well.
- ** Recovery well in operation
- NA Not available
- SWB Surface Water Benchmark

Wells surveyed 9/94 by Taylor, Wiseman & Taylor.
Datum - Mean Sea Level.

Table 4
Sheldrake River Background Summary

ITT Sealectro
Mamaroneck, NY

	Range in Water Concentrations		Range in Sediment Concentrations	
Parameter	Upstream	Downstream	Upstream	Downstream
Lead	10-20 ppb	ND-30 ppb	28-66 ppm	78 ppm
Arsenic	nondetect	nondetect	1.1-2 ppm	nondetect
Zinc	nondetect	ND-60 ppb	24-90 ppm	77 ppm
Copper	nondetect	20-120 ppb	7.1-17 ppm	110 ppm
PCBs	nondetect	nondetect	ND-310 ppb	nondetect
Dieldrin	nondetect	nondetect	ND-9.3 ppb	nondetect
Chlordane	nondetect	nondetect	46-360 ppb	150 ppb
DDT	nondetect	nondetect	3.3-21 ppb	13 ppb
DDB	nondetect	nondetect	2.6-81 ppb	16 ppb
DDE	nondetect	nondetect	2-27 ppb	14 ppb
Emulsified Oil	ND-4 ppm	ND-0.5 ppm		
Coliform Count	2000-79000	2000-17000		
Fecal Count	0-13000	0-17000		

Many drain pipes were observed discharging to the river upstream from the Sealectro Site.

Other observations upstream of Sealectro Site: scum, shopping cart, debris, oil slicks, bottles, cans, suds, foam, mechanical refuse, tires, boxes, garden debris, plastic debris, gas bubbles, soil mounds, oil drums, fences, and building debris.

TABLE 5
SOIL VOLATILE ORGANIC DATA SUMMARY - SOLVENT UST AREA AND SHED AREA

ITT SEALECTRO
MAMARONECK, NEW YORK

Boring:	B-31	B-31	B-32	B-32	B-32	B-33	B-33	B-33	B-34	B-34	B-35	B-36
Sample:	4	6	3	4	5	2	3	4	3	4	6	6
Depth(ft):	6.5-8.5'	10.5-12.5'	7-7.5'	7.5-8'	9-11'	4-6'	6-8'	8-10'	5-7'	7-9'	27-29'	21-23'
Date Collected:	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
HNU (Head Space - ppm):	85.5	96.8	42	42	4.4	1.5	1	64	4	120	2.4	60
UV (Fluorescent):	Yes	Yes	Yes	Yes	No	No	No	Yes	No	Yes	No	Trace
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.042 J	1.4 J
Benzene	ND	2.6	ND	ND	0.12	ND	ND	0.009 J	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	0.005 J	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	0.009 J	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.008 J	1.3 J
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19 J
1,2-Dichloroethylene (total)	ND	0.36 J	0.71 J	0.33 J	0.057	0.002 J	ND	ND	2.9	ND	0.013 J	3.6
Ethylbenzene	3.5 J	0.39 J	ND	ND	0.007 J	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	ND	1.8	0.66 J	ND	0.027	0.005 J	ND	ND	5.7	ND	0.78	1 J
Toluene	130	9.1	ND	ND	0.023	ND	ND	ND	3.1	ND	ND	0.45 J
1,1,1-Trichloroethane	ND	0.15 J	ND	ND	ND	ND	ND	ND	0.47 J	ND	0.15	2.7
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	ND	0.7 J	ND	ND	0.036	0.042	ND	ND	6.6	ND	ND	0.5 J
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene (total)	16	1.4 J	ND	ND	0.027	ND	ND	ND	ND	ND	ND	ND
Total VOCs	149.5	16.5	1.37	0.33	0.306	0.049	ND	0.014	18.77	ND	0.993	11.14

NOTES: Concentrations reported in mg/kg (ppm).
[shaded] Compound is detected.
J - Indicates Estimated Values.
ND - Not detected.
D - Diluted.
E - Exceeded linear calibration range.
Data validation for B-31 through B-36 and B-49 through B-55 completd by H2M Laboratories, Inc.
Data validation for B-17 through B-21 completed By O'Brien & Gere Engineers, Inc.

TABLE 5
SOIL VOLATILE ORGANIC DATA SUMMARY - SOLVENT UST AREA AND SHED AREA

ITT SEALECTRO
MAMARONECK, NEW YORK

Boring:	B-36	B-36-DL	B-49	B-49	B-49	B-50	B-50	B-50-Dup	B-51	B-51	B-52
Sample:	7	7	3	4	5	1	3	3	5	6	8
Depth(ft):	25-28.5'	25-28.5'	5-7'	7-9'	9-11'	1-3'	7-9'	7-9'	8.5-10.5'	10.5-12.5'	15-17'
Date Collected:	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
HNU (Head Space - ppm):	500	500	1	2	1	60	60	60	1.2	19.1	51.2
UV (Fluorescent):	Yes	Yes	No	No	No	Yes	Yes	Yes	No	Yes	None
Acetone	ND	ND	0.006 J	0.16	0.015	ND	ND	ND	0.065	0.064	ND
Benzene	ND	ND	ND	ND	0.002 J	ND	ND	ND	0.002 J	0.002 J	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ND	ND	ND	0.001 J	0.002 J	ND	ND	ND	ND	0.003 J	0.001 J
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.64 J	ND	ND	ND	ND	ND	ND	ND	0.003 J	0.007 J	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	0.45 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethylene (total)	2.8 J	2.5 JD	ND	ND	0.001 J	ND	0.14 J	ND	0.006 J	0.037	0.005 J
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.001 J
Tetrachloroethylene	440 E	390 D	0.16	0.012 J	ND	2.9	3.5	ND	ND	ND	ND
Toluene	ND	ND	ND	0.003 J	ND	ND	ND	ND	ND	0.018	0.0007 J
1,1,1-Trichloroethane	79 E	110 D	ND	ND	ND	ND	ND	ND	ND	ND	0.0008
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	ND	ND	ND	ND	ND	ND	1.4 J	ND	ND	0.0008 J	0.01 J
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene (total)	ND	ND	ND	0.009 J	ND	ND	ND	ND	ND	ND	ND
Total VOCs	522.89	502.5	0.166	0.185	0.02	2.9	5.04	ND	0.076	0.1318	0.0185

NOTES: Concentrations reported in mg/kg (ppm).
[shaded] Compound is detected.
J - Indicates Estimated Values.
Data validation for B-31 through B-36 and B-49 through B-55 completd by H2M Laboratories, Inc.
Data validation for B-17 through B-21 completed by O'Brien & Gere Engineers, Inc.
ND - Not detected.
D - Diluted.
E - Exceeded linear calibration range.

TABLE 5
SOIL VOLATILE ORGANIC DATA SUMMARY - SOLVENT UST AREA AND SHED AREA

ITT SEALECTRO
MAMARONECK, NEW YORK

Boring:	B-52-DL	B-52	B-52	B-53	B-53	B-54	B-54	B-54	B-55	B-55	B-55	B-55
Sample:	8	12	14	5	6	13	13	16	8	10	101	11
Depth(ft):	15-17'	23-25'	27-28.2'	24-26'	26-28'	25-27'	25-27'	31-33'	15-17'	19-21'	19-21'	21-23'
Date Collected:	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
HNU (Head Space - ppm):	51.2	17.5	60.2	2.5	1.5	37	37	30	17.9	79.5	79.5	114
UV (Fluorescent):	None	None	None	Yes	No	None	None	No	None	No	No	None
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	1.1 J	0.54 J	ND	1.5 J
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	0.15 J	0.15 J	ND	0.084 J
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ND	ND	ND	0.002 J	ND	ND	0.004 J	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	0.001 J	0.021	ND	ND	1.6	0.59 J	2.9
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	0.002 J	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	0.011 J	ND	ND	ND	ND	0.51 J
1,2-Dichloroethylene (total)	0.023 JD	ND	0.0009 J	0.025	ND	0.023	0.32	0.001 J	0.75 J	2.1	1.4 J	4.9
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	0.001 J	ND	0.001 J	ND	0.002 J	ND	ND	ND	ND	ND
Tetrachloroethylene	0.05 D	0.097	0.02	ND	ND	0.018	0.25	0.059	ND	ND	ND	1.1 J
Toluene	0.002 JD	ND	0.001 J	ND	0.0007 J	0.003 J	0.041	0.0007 J	ND	0.12 J	0.41 J	0.59 J
1,1,1-Trichloroethane	0.005 JD	ND	0.006 J	ND	ND	ND	0.088	0.008 J	ND	ND	ND	2.8
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	0.003 J	ND	ND	ND	ND	ND
Trichloroethylene	0.02 JD	0.001 J	ND	0.002 J	ND	0.005 J	0.084	ND	ND	ND	0.097 J	0.54 J
Vinyl Chloride	ND	ND	ND	0.009 J	ND	ND	0.008 J	ND	ND	ND	ND	ND
Xylene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total VOCs	0.1	0.098	0.0289	0.038	0.0017	0.05	0.834	0.0687	2	4.51	2.497	14.924

NOTES: Concentrations reported in mg/kg (ppm).
[shaded] Compound is detected.
J - Indicates Estimated Values.
ND - Not detected.
D - Diluted.
E - Exceeded linear calibration range.
Data validation for B-31 through B-36 and B-49 through B-55 completd by H2M Laboratories, Inc.
Data validation for B-17 through B-21 completed by O'Brien & Gere Engineers, Inc.

TABLE 5

ITT SEALECTRO
MAMARONECK, NEW YORK

SOIL VOLATILE ORGANIC DATA SUMMARY - SOLVENT UST AREA AND SHED AREA

	Solvent UST Area				Phase I RI										
									(FLD DUP)				COMP.		
Sample ID:	EB-1	EB-1	EB-1	EB-1	B-17	B-17	B-17	B-18	B-18	B-18	B-19	B-19	B-20	B-21	B-21
Depth:	7.5-8'	9.5-10'	13-14'	19-20'	3-9'	9-11'	11-15'	6-8'	12-14'	12-14'	8-10'	18-20'	0.5-13'	6-8'	10-12'
Date Collected:	1991	1991	1991	1991	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992
Acetone	ND	ND	ND	NA	ND	ND	74	NA	NA	NA	NA	NA	NA	ND	ND
Benzene	ND	ND	ND	NA	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND	ND
2-Butanone	ND	ND	ND	NA	ND	ND	18	NA	NA	NA	NA	NA	NA	ND	ND
Carbon Disulfide	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	3.7	ND	ND	ND	ND	ND	1.8 J	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethylene (total)	36	3.8	3.2	ND	ND	ND	2.7 J	ND	ND	ND	ND	ND	0.24	ND	ND
Ethylbenzene	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	0.15	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	78	ND	ND	1.7	5,200	6,000	7.2	0.78	0.14	0.002	ND	0.22	2.1	ND	ND
Toluene	ND	3.6	2.3	ND	ND	ND	ND	1.6	1.9	ND	13	ND	4.3	ND	ND
1,1,1-Trichloroethane	67	0.47	ND	0.4	1,100	2200	4.7	ND	ND	ND	ND	0.18	0.55	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	5.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.4	ND	ND
Vinyl Chloride	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene (total)	13	0.48	0.43	ND	ND	ND	ND	ND	ND	ND	0.92	ND	ND	ND	ND
Total Petroleum Hydrocarbons	NA	NA	NA	NA	13,000	2,400	NA	ND	ND	ND	ND	ND	170	ND	ND
Total VOCs	202.9	8.35	5.93	2.1	6300	8200	108.4	2.38	2.04	0.002	14.07	0.4	10.59	ND	ND

NOTES: Concentrations reported in mg/kg (ppm).
[shaded] Compound is detected.
J - Indicates Estimated Values.
ND - Not detected.
D - Diluted.
E - Exceeded linear calibration range.
Data validation for B-31 through B-36 and B-49 through B-55 completd by H2M Laboratories, Inc.
Data validation for B-17 through B-21 completed by O'Brien & Gere Engineers, Inc.

Table 6
Soil Semi-Volatile Data Summary - Solvent UST and Shed Area

ITT Sealectro
Mamaroneck, New York

	Phase I RI											
Boring:	B-17	B-31	B-31	B-32	B-32	B-32	B-33	B-33	B-33	B-34	B-34	B-35
Sample:	11-15'	4	6	3	4	5	2	3	4	3	4	6
Depth:	NA	6.5-8.5ft	10.5-12.5ft	7-7.5ft	7.5-8ft	9-11ft	4-6ft	6-8ft	8-10ft	5-7ft	7-9ft	27-29ft
HNU (Head Space - ppm):	NA	85.5	96.8	42	42	4.4	1.5	1	64	4	120	2.4
UV (Fluorescence):	NA	YES	YES	YES	YES	NO	NO	NO	YES	NO	YES	NO
2-Methylphenol	ND	0.26 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	ND	0.45 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	0.13 J	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	ND	0.2 J	ND	0.18 J	0.18 J	ND	ND	ND	ND	ND	ND	ND
Dimethylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethylphthalate	0.36 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate	0.087 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11 J
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	0.86 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	0.17 J	ND	ND	ND	ND	ND	ND	ND	ND	0.24 J	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes: All concentrations in mg/kg (ppm). J - Indicates an estimated value.
U - Analyzed for but not detected. [shaded] Compound is detected.
Data for B-31 through B-51 validated by H2M Labs, Inc.
B-17 validated by O'Brien & Gere Engineers, Inc.
Analyses completed by OBG Labs.
Analyses completed by OBG Labs.

Table 6

Soil Semi-Volatile Data Summary - Solvent UST and Shed Area

ITT Sealectro

Mamaroneck, New York

Boring:	B-36	B-36	B-49	B-49	B-49	B-50	B-50 RE	B-50	B-50 Dup	B-50 RE	B-51	B-51
Sample:	6	7	3	4	5	1	1	3	3	3	5	6
Depth:	21-23ft	25-28.5ft	5-7ft	7-9ft	9-11ft	1-3ft	1-3ft	7-9ft	7-9ft	7-9ft	8.5-10.5ft	10.5-12.5ft
HNU (Head Space - ppm):	60	500	1	2	1	60	60	60	60	60	1.2	19.1
UV (Fluorescence):	TRACE	YES	NO	NO	NO	YES	YES	YES	YES	YES	NO	YES
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	0.13 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	ND	0.038 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.076 J	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes: All concentrations in mg/kg (ppm). J - Indicates an estimated value.
U - Analyzed for but not detected. [shaded] Compound is detected.
Data for B-31 through B-51 validated by H2M Labs, Inc.
B-17 validated by O'Brien & Gere Engineers, Inc.
Analyses completed by OBG Labs.

TABLE 7
SOIL INORGANIC DATA SUMMARY - SOLVENT UST AND SHED AREA

ITT SEALECTRO
MAMARONECK, NY

		Superfund Analyses				FIELD DUP						
	SAMPLE ID:	B-17	B-17	B-17	B-18	B-18	B-18	B-19	B-19	B-20	B-21	B-21
	DEPTH:	11-15'	3-9'	9-11'	6-8'	6-8'	12-14'	8-10'	18-20'	0.5-13'	6-8'	10-12'
	DATE COLLECTED	2/05/92	2/5/92	2/5/92	2/7/92	2/7/92	2/7/92	1/30/92	1/30/92	2/6/92	2/4/92	2/4/92
	NYS RANGE											
Aluminum	1,000-25,000	16,100	16,900	21,900	24,600	4,450	17,800	10,200	7,490	11,700	13,400	26,100
Antimony	NE	9.1 B	7.3 B	ND	9.7 B	6.3 B	9.9 B	4.3 B	5.2 B	9.8 B	ND	13.1 B
Arsenic	3-12	1.1 B	2.6 B	3.9 B	ND	ND	ND	1.4 B	ND	13	0.85 B	0.59 B
Barium	15-600	149	128	153	186	23.6 B	134	57.3	84.9	119	104	262
Beryllium	0-1.75	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.76 B
Cadmium	0.01-0.88	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	130-35,000	14,800	3,240	7,920	3,550	1,480	2,980	2,700	8,210	1,730	2,350	4,420
Chromium	1.5-40	35.1	24.6	36.2	33.4	6.8	24.7	21.1	18.8	24.6	18.7	53.8
Cobalt	2.5-60	15.8	15 B	19.4 B	11 B	3.4 B	9.2 B	9.2 B	9.3 B	17	8.2 B	22.9
Copper	37.4-112.2	27.5	57.2	35	13.1	3.9 B	10.5	15.8	19.1	34.5	7.9	38.1
Iron	17,500-25,000	28,900	21,700	26,200	14,600	6,780	12,300	14,800	15,500	21,800	9,970	37,100
Lead	1-12.5	6.9	77.7	23.1	8.9	2	6.3	4.3	3.4	21	10.6	8
Magnesium	1,700-6,000	13,200	3,920	7,940	3,770	1,930	2,970	4,500	7,230	5,270	2,530	12,500
Manganese	50-5,000	588	288	353	162	70	133	189	203	305	129	499
Mercury	0.042-0.066	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND
Nickel	8.5-25	23.1	23.1	25.2	18.2	5.6 B	13.6	12	11.6	24.6	11.7	37.7
Potassium	8,500-43,000	5,590	1,560 B	2,790 B	633 B	617 B	492 B	806 B	2,770	5,670	542 B	8,950
Selenium	<0.1-0.125	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	NE	ND	ND	ND	ND	ND	ND	ND	ND	0.9 B	ND	1.3 B
Sodium	6,000-8,000	562 B	372 B	611 B	826 B	287 B	641 B	480 B	323 B	429 B	334 B	645 B
Thallium	NE	ND	ND	ND	ND	ND	ND	ND	0.26 B	ND	ND	ND
Vanadium	25-60	48.6	36.6	50.8	35.6	9.1 B	30.2	30.2	25.8	40.5	24.3	79.6
Zinc	37-60	71.2	142	107	83.2	20.8	66.4	58.4	36.9	72.2	50.2	102

NOTES: NYS Range represents typical concentrations of elements in uncontaminated soils in New York (McGovern).
[shaded] Concentration above typical NYS Range.
All values reported in mg/kg (ppm).
U - Analyzed for but not detected at noted detection limit.
NE - Not established
B - Value is less than Contract Required Detection Limit, but greater than or equal to the Instrument Detection Limit
ND - Not detected

TABLE 8
SOIL POST-EXCAVATION ANALYSES - SOLVENT UST AREA

ITT SEALECTRO
MAMARONECK, NEW YORK

Sample #:	C-4	C-5	C-6	D-5	D-6	D-7	D-8	D-9	D-10	D-11
Date Collected:	4/14/92	4/14/92	4/14/92	4/14/92	4/14/92	4/14/92	4/14/92	4/14/92	4/14/92	4/14/92
1,1-Dichloroethane	ND	0.18	ND	ND	ND	0.15	33	46	13	0.27
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	4.3	ND	ND	ND
1,2-Dichloroethylene (total)	ND	0.22	0.23	ND	3.3	ND	9	100	40	0.31
Dichloromethane	ND	ND	ND	ND	ND	0.2	14	3.6	ND	ND
Ethylbenzene	ND	ND	ND	ND	5.1	ND	ND	ND	1.3	ND
Tetrachloroethylene	0.62	4.1	1.1	ND	730	11	1200	1100	ND	1
Toluene	0.22	ND	1	0.33	79	ND	24	25	71	ND
1,1,1-Trichloroethane	ND	0.41	1.5	ND	ND	3.3	930	68	ND	0.73
Trichloroethylene	ND	ND	ND	ND	ND	0.24	ND	24	ND	ND
Xylenes (total)	ND	ND	6.2	ND	12	ND	ND	ND	4	8.9
Total VOCs	0.84	4.91	10.03	0.33	829.4	14.89	2214.3	1366.6	129.3	11.21
TPH (dry weight)	990	200	1000	ND	2100	ND	280	ND	ND	1600

NOTES: All results are in mg/kg (ppm).
Parameters not listed were below method detection limits.
TPH Total Petroleum Hydrocarbons
ND Below detection limit
C Bottom grab sample - 11.5 ft. below grade
D Side grab sample - 11.0 ft. below grade
[shaded] Compound is detected.
Analyses completed by OBG Labs, Inc.

TABLE 9
SOIL PCB & PESTICIDE DATA

ITT SEALECTRO
MAMARONECK, NY

	Former Drum Storage Pad Area		Wastewater Treatment Area		Solvent UST Area	
SAMPLE ID	B-12		B-15		B-17	
DEPTH	8-10'		2-6'		11-15'	
DATE COLLECTED	1/27/92		2/03/92		2/05/92	
Alpha-BHC	0.051	U	0.089	U	0.0053	U
Beta-BHC	0.051	U	0.089	U	0.0053	U
Delta-BHC	0.051	U	0.089	U	0.0053	U
Gamma-BHC	0.051	U	0.089	U	0.0053	U
Heptachlor	0.051	U	0.089	U	0.0053	U
Aldrin	0.051	U	0.089	U	0.0053	U
Heptachlor Epoxide	0.051	U	0.089	U	0.0053	U
Endosulfan I	0.051	U	0.089	U	0.0053	U
Dieldrin	0.1	U	0.18	U	0.011	U
4-4-DDE	0.1	U	0.18	U	0.011	U
Endrin	0.1	U	0.18	U	0.011	U
Endosulfan II	0.1	U	0.18	U	0.011	U
4-4-DDD	0.1	U	0.18	U	0.011	U
Endosulfan Sulfate	0.1	U	0.18	U	0.011	U
4-4-DDT	0.1	U	0.18	U	0.011	U
Methoxychlor	0.51	U	0.89	U	0.053	U
Endrin Ketone	0.1	U	0.18	U	0.011	U
Alpha Chlordane	0.51	U	0.89	U	0.053	U
Gamma Chlordane	0.51	U	0.89	U	0.053	U
Toxaphene	1	U	1.8	U	0.11	U
Aroclor-1016	0.51	U	0.89	U	0.053	U
Aroclor-1221	0.51	U	0.89	U	0.053	U
Aroclor-1232	0.51	U	0.89	U	0.053	U
Aroclor-1242	0.51	U	0.89	U	0.053	U
Aroclor-1248	0.51	U	0.89	U	0.053	U
Aroclor-1254	0.94	J	1.8	U	0.11	U
Aroclor-1260	1	U	1.8	U	0.11	U

NOTES: Soil data reported in mg/kg (ppm).
U - Analyzed for but not detected
[shaded] Compound is detected.
J - Indicates an estimated value

TABLE 10
SOIL VOLATILE ORGANIC DATA SUMMARY - FORMER DRUM STORAGE PAD AREA

ITT SEALECTRO
MAMARONECK, NEW YORK

Sample ID:	B3-1	B3-2	B4-1	B4-2	B5-1	B5-2	B6-1	B6-2	B7-1	B7-2	B8-1	B8-2	B9-1	B9-2	B10-1
Depth:	0.5-1'	6.5-7'	5-5.5'	6-6.5'	5-5.5'	6.5-7'	2-2.5'	6-6.5'	6.5-7'	5-5.5'	5-5.5'	6.5-7'	5-5.5'	6.5-7'	1.5-2'
Date Collected:	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.061	ND	ND	ND	ND	ND
Dichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	3.1	0.016	ND	ND	ND	ND	ND	ND	ND	ND	3.1	ND
1,1,1-Trichloroethane	1.4	ND	ND	ND	0.045	ND	0.33	1.6	ND	0.018	0.015	ND	0.15	0.26	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5.9	ND	ND	ND	ND	ND	0.63	5.1	ND	0.26	0.035	0.17	0.12	0.019	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	3.4	ND	ND	ND	ND	ND	ND	ND	ND	0.034	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ND	1.5	ND	3.3	ND	0.24	ND	ND	ND	ND	0.055	15	ND	3.3	ND
Total Petroleum Hydrocarbon	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	10.7	1.5	ND	6.4	0.061	0.24	1.08	6.84	ND	0.393	0.105	15.17	0.27	6.679	ND

NOTE: Values reported in mg/kg (ppm)
ND - Not detected
D - Diluted
E - Exceeded liner calibration range.
Analyses completed by OBG Laboratories
[shaded] Compound is detected.
NA - Not analized
J - Estimated value
Data validation for B-11 through B-13 completed by O'Brien & Gere Engineers, Inc.
Data validation for B-41 through B-48 completed by H2M Labs.

TABLE 10
SOIL VOLATILE ORGANIC DATA SUMMARY - FORMER DRUM STORAGE PAD AREA

ITT SEALECTRO
MAMARONECK, NEW YORK

Sample ID:	B10-2	SS-1	SS-2	IW-3	IW-3	IW-4	IW-4	IW-5	IW-5	IW-6	IW-6	IW-7	IW-7
Depth:	6-6.5'	1.5-2'	1.5-2'	0.5-1'	2.5-3'	0.5-1'	2.5-3'	0.5-1'	2.5-3'	0.5-1'	2.5-3'	0.5-1'	2.5-3'
Date Collected:	1989	1989	1989	10/9/91	10/9/91	10/10/91	10/10/91	10/10/91	10/10/91	10/10/91	10/10/91	10/10/91	10/10/91
1,2-Dichloroethene (total)	ND	ND	ND	ND	53	ND	0.74	ND	0.11	0.013	0.29	ND	0.043
Dichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	2.4	3.3	0.012	0.012	0.018	ND	ND	ND
1,1,1-Trichloroethane	ND	16	2.1	0.041	0.7	ND	0.2	0.086	0.082	0.025	0.072	ND	0.019
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	0.69	23	ND	7.6	0.63	0.65	0.13	1	0.024	0.47
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	0.41	ND	74	2.4	0.042	0.034	ND	0.093	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND	ND	4.6	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbon	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND
Total VOCs	ND	16	2.1	1.341	76.7	76.4	19.04	0.77	0.888	0.186	1.455	0.024	0.532

NOTE: Values reported in mg/kg (ppm)
ND - Not detected
D - Diluted
E - Exceeded liner calibration range.
Analyses completed by OBG Laboratories
[shaded box] Compound is detected.
NA - Not analized
J - Estimated value
Data validation for B-11 through B-13 completed by O'Brien & Gere Engineers, Inc.
Data validation for B-41 through B-48 completed by H2M Labs.

TABLE 10
SOIL VOLATILE ORGANIC DATA SUMMARY - FORMER DRUM STORAGE PAD AREA

ITT SEALECTRO
MAMARONECK, NEW YORK

Sample ID:	EW-3	EW-3	B-11	B-11	B-12	Superfund Analyses B-12	B-12	B-13	B-13	B-13
Depth:	0.5-1'	2.5-3'	6-8'	10-12'	6-8'	8-10'	10-14'	4-8'	4-8'	10-12'
Date Collected:	10/10/91	10/10/91	1992	1992	1992	1/27/92	1992	1992	1992	1992
1,2-Dichloroethene (total)	1.7	1.4	ND	ND	ND	0.2 J	ND	0.004	0.004	ND
Dichloromethane	ND	ND	ND	ND	ND	ND	ND	0.003	0.004	0.003
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	0.003	ND	0.004
1,1,1-Trichloroethane	0.16	0.35	ND	ND	ND	0.15 J	ND	0.003	0.004	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	0.13	0.21	0.3
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	13	11	0.7	ND	ND	1.4	ND	0.034	0.042	0.004
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.88	2.4	ND	ND	ND	0.12 J	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ND	ND	1.2	ND	0.7	0.27 J	ND	ND	ND	0.02
Total Petroleum Hydrocarbon	ND	ND	8,800	ND	11,000	ND	140	ND	ND	ND
Total VOCs	15.74	15.15	1.9	0	0.7	2.14	0	0.177	0.264	0.331

NOTE: Values reported in mg/kg (ppm)
ND - Not detected
D - Diluted
E - Exceeded liner calibration range.
Analyses completed by OBG Laboratories
[shaded] Compound is detected.
NA - Not analized
J - Estimated value
Data validation for B-11 through B-13 completed by O'Brien & Gere Engineers, Inc.
Data validation for B-41 through B-48 completed by H2M Labs.

TABLE 10
SOIL VOLATILE ORGANIC DATA SUMMARY - FORMER DRUM STORAGE PAD AREA

ITT SEALECTRO
MAMARONECK, NEW YORK

Sample ID:	B-41	B-42	B-42-RE	B-43	B-44	B-45	B-46	B-47	B-48
Sample:	2	2	2	2	2	2	2	3	2
Depth:	3-5'	3-5'	3-5'	3-5'	3-5'	3-5'	3-5'	4.5-6.5'	3-5'
UNU (Head Space-ppm):	1.8	2.1	2.1	1.2	1.6	1.1	97.8	1.5	1.1
UV (Fluorescent):	No	NA	NA	NA	NA	No	Yes	No	No
Date Collected:	1993	1993	1993	1993	1993	1993	1993	1993	1993
1,2-Dichloroethene (total)	0.03	0.074	0.046 J	0.019 J	0.37 J	ND	0.002 J	0.023	0.002 J
Dichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.001 J	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	0.008 J	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.004 J	0.009 J	0.011 J	0.014 J	0.22 J	0.002 J	ND	0.015	ND
Acetone	0.026	0.014	ND	ND	0.53 J	0.018	0.099	0.006 J	0.008 J
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	0.002	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.19	0.5	0.45	0.18	3.3	0.003 J	ND	0.17	0.004 J
Benzene	0.001 J	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.036	0.062	0.062 J	0.09	0.43	0.012	ND	0.062	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	0.072	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND	ND	0.26	ND	ND
Total Petroleum Hydrocarbon	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total VOCs	0.296	0.661	0.569	0.303	4.85	0.035	0.433	0.276	0.014

NOTE: Values reported in mg/kg (ppm)
ND - Not detected
D - Diluted
E - Exceeded liner calibration range.
Analyses completed by OBG Laboratories
[shaded] Compound is detected.
NA - Not analized
J - Estimated value
Data validation for B-11 through B-13 completed by O'Brien & Gere Engineers, Inc.
Data validation for B-41 through B-48 completed by H2M Labs.

TABLE 11
SOIL SEMI-VOLATILE DATA SUMMARY - FORMER DRUM STORAGE PAD AREA

ITT SEALECTRO
MAMARONECK, NY

	Phase I RI									
Boring:	B-12	B-41	B-41 RE	B-42	B-43	B-44	B-45	B-46	B-47	B-48
Sample:	8-10'	2	2	2	2	2	2	2	3	2
Depth:	1/27/92	3-5ft	3-5ft	3-5ft	3-5ft	3-5ft	3-5ft	3-5ft	4.5-6.5ft	3-5ft
HNU (Head Space - ppm):	NA	1.8	1.8	2.1	1.2	1.6	1.1	97.8	1.5	1.1
UV (Fluorescence):	NA	NO	NO	NA	NA	NA	NO	YES	NO	NO
2-Methylnaphthalene	ND	ND	0.098 J	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	0.11 J	ND	0.18 J	ND	ND	ND	1.9
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.37 J
Di-n-butylphthalate	ND	ND	ND	ND	0.076 J	ND	ND	ND	ND	0.11 J
Fluoranthene	ND	ND	ND	0.17 J	0.15 J	ND	ND	ND	ND	1.2
Pyrene	ND	ND	ND	0.16 J	0.15 J	ND	ND	ND	ND	1.8
Benzo(a)anthracene	ND	ND	ND	0.11 J	0.09 J	ND	ND	ND	ND	0.85
Chrysene	ND	ND	ND	0.14 J	0.12 J	0.15 J	ND	ND	ND	0.84
Bis(2-ethylhexyl)phthalate	1.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	0.39 J	0.44	0.18 J	0.16 J	0.12 J	ND	ND	ND	0.76
Benzo(k)fluoranthene	ND	ND	ND	0.069 J	0.071 J	ND	ND	ND	ND	0.37 J
Benzo(a)pyrene	ND	0.24 J	0.24 J	0.12 J	ND	ND	ND	ND	ND	0.66
Indeno(1,2,3-cd)pyrene	ND	ND	ND	0.074 J	ND	ND	ND	ND	ND	0.28 J
Benzo(g,h,i)perylene	ND	ND	ND	0.067 J	ND	ND	ND	ND	ND	0.24 J

Notes: All concentrations in mg/kg (ppm).
U - Analyzed for but not detected.
J - Indicates an estimated value.
Data for B-41 through B-48
validated by H2M Labs, Inc.
[shaded] Compound is detected.
ND - Not detected.
NA - Not applicable.
Data for B-12 validated by O'Brien & Gere Engineers, Inc.
Analyses completed by OGB Labs, Inc.

TABLE 12
SOIL INORGANIC DATA SUMMARY - FORMER DRUM STORAGE PAD AREA

ITT SEALECTRO
MAMARONECK, NY

					Superfund Analyses		FIELD DUP		
	SAMPLE ID:	B-11	B-11	B-12	B-12	B-12	B-13	B-13	B-13
	DEPTH:	6-8'	10-12'	6-8'	8-10'	10-14'	4-8'	4-8'	10-12'
	DATE COLLECTED:	1/28/92	1/28/92	1/27/92	1/27/92	1/27/92	1/28/92	1/28/92	1/28/92
	NYS RANGE								
Aluminum	1,000-25,000	11,900	17,600	18,200	8,610	22,800	13,200	10,300	6,780
Antimony	NE	6 B	10.8 B	4 B	ND	6.6 B	4.1 B	ND	ND
Arsenic	3-12	0.54 B	1.2 B	2.4 B	3.4	1.4 B	2.8	1.7 B	3.5
Barium	15-600	186	157	112	62.8	195	104	68.3	72.1
Beryllium	0-1.75	ND	ND	0.82 B	ND	0.9 B	ND	ND	ND
Cadmium	0.01-0.88	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	130-35,000	2,160	14,200	11,400	2,210	14,100	3,350	2,980	3,440
Chromium	1.5-40	18.9	38	23.6	19.5	42.2	19.3	25.1	10.9
Cobalt	2.5-60	11.1 B	18.1	12.7	9 B	20.5	9.1 B	10.5 B	6 B
Copper	37.4-112.2	4.9 B	31.5	77.7	14.3	36	7.7	20.2	7.9
Iron	17,500-25,000	10,600	30,800	22,100	16,600	36,300	12,300	15,800	7,760
Lead	1-12.5	4	7.3	18.8	6.6	9.1	7.1	7.3	10.1
Magnesium	1,700-6,000	3,170	13,600	8,530	4,290	14,100	2,480	5,000	1,610
Manganese	50-5,000	138	644	392	152	663	312	182	194
Mercury	0.042-0.066	ND	ND	ND	ND	ND	ND	ND	0.18
Nickel	8.5-25	10.5	29.1	15.5	13	31.2	8.9 B	15.4	4.8 B
Potassium	8,500-43,000	389 B	6,150	1,430	1,330	7,270	349 B	1,560	ND
Selenium	<0.1-0.125	ND	ND	ND	ND	ND	ND	ND	ND
Silver	NE	ND	0.87 B	ND	ND	ND	ND	ND	ND
Sodium	6,000-8,000	325 B	459 B	750 B	308 B	498 B	335 B	343 B	315 B
Thallium	NE	ND	ND	ND	ND	0.28 B	ND	ND	ND
Vanadium	25-60	22	54.1	57.6	24.2	60.9	23.3	36.4	12.9 B
Zinc	37-60	55.8	74.9	73	51.4	86.8	47.4	59.4	33.2

NOTES: NYS Range represents typical concentrations of elements in uncontaminated soils in New York (McGovern).

All values reported in mg/kg (ppm).
U - Analyzed for but not detected at noted detection limit.
NE - Not established
B - Value is less than Contract Required Detection Limit,
but greater than or equal to the Instrument Detection Limit
ND - Not detected
Analyses completed by OGB Laboratories.
Data validation completed by O'Brien & Gere Engineers, Inc.

Table 13
Comparison of Pre and Post ISAS VOC Concentrations

ITT Sealectro
Mamaroneck, New York

	PRE-ISAS	POST-ISAS
	IW-4	B-41
TCE	7.80	0.190
PCE	2.40	0.036
Toluene	3.30	<0.008
Xylene	460.00	<0.12
1,2-Dichloroethene	0.74	0.030
1,1,1-Trichloroethane	0.20	0.004
Acetone	NA	0.026
Total VOCs	474.44	0.286
	IW-3	B-46
Trichlorothene	23.00	<0.025
1,2-Dichloroethene	53.00	0.002J
Trichloroethane	0.70	<0.025
Ascetone	NA	0.099
Ethylbenzene	ND	0.072
Xylene	ND	0.260
Total VOCs	76.7	0.433
	EW-3	B-47
Trichlorothene	11.00	0.170
1,2-Dichloroethene	1.40	0.023
Trichlorothane	0.35	0.015
Tetrachloroethene	2.40	0.006J
Acetone	NA	0.062
Total VOCs	15.15	0.276
	IW-5	B-42
Methylene Chloride	ND	0.002J
Trichloroethene	0.650	0.450
Trichloroethane	0.082	0.011
Tetrachloroethene	0.034	.062J
1,2-Dichloroethene	0.110	0.046
Toluene	0.012	0.014
Total VOCs	0.888	0.571
	IW-7	B-43
Trichloroethene	0.470	0.180
Trichloroethane	0.019	0.014J
Tetrachloroethene	ND	0.090
1,2-Dichloroethene	0.043	0.019J
Acetone	NA	0.006J
Total VOCs	0.532	0.309

Note: Concentration in mg/Kg.
J - Estimated concentration.
NA - Not available.
ND - Not detected.

Table 14

Soil Volatile Organic Data Summary - Fuel Oil UST Area

ITT Sealectro

Mamaroneck, New York

	Phase I RI													
Boring:	B-21	B-21	B-22	B-22	B-23	B-23	B-37	B-37-RE	B-38	B-38	B-39	B-39	B-40	B-40
Sample:	6-8'	10-12'	4-6'	12-14'	4-6'	6-10'	3	3	4	5	3	4	3	4
Depth(ft.):	2/4/92	2/4/92	2/4/92	2/4/92	2/7/92	2/7/92	4.5-6.5'	4.5-6.5'	6.5-8.5'	8.5-10.5'	4-6'	6-8'	4.5-6.5'	6.5-8.5'
HNU (Head Space - ppm):	51.5	<1	120.5	61.5	<1	<1	0.8	0.8	25	1.1	NA	NA	0.7	0.7
UV (Fluorescence):	NA	NA	NA	NA	NA	NA	No	No	Yes	No	No	NA	No	Trace
Vinyl Chloride	ND	ND	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	NA	NA	NA	NA	0.007 J	ND	ND	0.011 J	ND	ND	0.006 J	0.04
Carbon Disulfide	ND	ND	NA	NA	NA	NA	ND	ND	ND	ND	ND	0.001 J	ND	ND
1,1-Dichloroethene	ND	ND	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	0.0008 J
1,1-Dichloroethene (total)	ND	ND	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	NA	NA	NA	NA	ND	0.0008 J	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	NA	NA	NA	NA	0.13	0.082	ND	ND	0.004 J	ND	0.002 J	ND
1,1,2-Trichloroethane	ND	ND	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	NA	NA	NA	NA	0.054 J	0.03 J	ND	ND	ND	ND	0.002 J	ND
Toluene	ND	ND	NA	NA	NA	NA	0.005 J	0.003 J	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	NA	NA	NA	NA	ND J	ND J	ND	ND	ND	ND	ND	ND
Xylene (total)	ND	ND	NA	NA	NA	NA	ND J	ND J	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarb	1,600	ND	23,000	13,000	460	300	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	ND	ND	NA	NA	NA	NA	0.196	0.1158	ND	0.011	0.004	0.001	0.01	0.0408

Notes: All concentrations in mg/kg (pp D - Diluted.

U - Analyzed for but not detected.

B - Analyte is found in the associated blank as well as in the sample.

E - Exceeded liner calibration range.

[shaded box] Compound is detected.

NA - Not Analyzed.

Analyses completed by OBG Labs, Inc.
Data validation completed by H2M Labs, Inc.

Table 15
Soil Semi-Volatile Organic Data Summary - Fuel Oil UST Area

ITT Sealectro
Mamaroneck, New York

Boring:	B-37	B-38	B-38	B-39	B-39	B-40	B-40
Sample:	3	4	5	3	4	3	4
Depth:	4.5-6.5ft	6.5-8.5ft	8.5-10.5ft	4-6ft	6-8ft	4.5-6.5ft	6.5-8.5ft
HNU (Head Space - ppm):	0.8	25	1.1	NA	NA	0.7	0.7
UV (Fluorescence):	NO	YES	NO	NO	NA	NO	TRACE
Naphthalene	0.23 J	ND	ND	0.18 J	ND	ND	ND
2-Methylnaphthalene	0.36 J	ND	ND	0.25 J	ND	ND	ND
Dibenzofuran	0.093 J	ND	ND	ND	ND	ND	ND
Phenanthrene	0.32 J	0.42 J	ND	0.43	ND	ND	ND
Anthracene	0.051 J	ND	ND	0.092 J	ND	ND	ND
Fluoranthene	0.37 J	ND	ND	0.71	ND	ND	0.09 J
Pyrene	0.31 J	ND	ND	0.55	ND	ND	0.081 J
Butylbenzylphthalate	1.1	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	0.16 J	ND	ND	0.32 J	ND	ND	ND
Chrysene	0.18 J	ND	ND	0.39	ND	ND	ND
Bis(2-ethylhexyl)phthalate	0.28 J	ND	ND	0.51	0.14 J	0.29 J	0.23 J
Benzo(b)fluoranthene	0.32 J	ND	ND	0.59	ND	ND	0.1 J
Benzo(k)fluoranthene	0.092 J	ND	ND	0.16 J	ND	ND	ND
Benzo(a)pyrene	0.16 J	ND	ND	0.32 J	ND	ND	ND
Indeno(1,2,3-cd)pyrene	0.07 J	ND	ND	0.23 J	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	0.2 J	ND	ND	ND

Notes:
All concentrations in mg/kg (ppm).
U - Analyzed for but not detected.
J - Indicates an estimated value.
B - Analyte is found in the associated blank as well as in the sample.
Data for B-31 through B-51 validated by H2M Labs, Inc.
Analyses completed by OBG Labs, Inc.

TABLE 16
SOIL POST-EXCAVATION ANALYSES - FUEL OIL UST AREA

ITT SEALECTRO, INC.
MAMARONECK, NEW YORK

Sample #:	B-1	B-2	B-3	Side 1	Side 2	Side 3	Side 4
Date Collected:	4/8/92	4/8/92	4/8/92	4/8/92	4/8/92	4/8/92	4/8/92
Prameter							
TPH	4,600	4,100	3,700	480	6,800	6000	6100

NOTES: All results are in mg/kg (ppm).

TPH Total Petroleum Hydrocarbons (dry weight).

B- Bottom composite sample .

Side Side grab sample .

(shaded) Compound is detected.

Analyses completed by OBG Labs, Inc.

TABLE 17
GROUND WATER VOLATILE ORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID: COLLECTED:	MW-2 6/88	MW-2 8/89	MW-2 7/31/91	FIELD DUP MW-2 7/31/91	MW-2 10/24/91	MW-2 2/19/92	MW-2 4/15/92	MW-2 8/12/92	MW-2 11/5/92	MW-2 2/17/93	MW-2 5/24/93	MW-2 8/19/93	MW-2 11/9/93	MW-2 2/15/94	MW-2 6/1/94	MW-2 8/23/94
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
Benzene	ND	29	17	15	16	ND	ND	17	11	8	10	22	ND	7 J	14	2
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
Chloroethane	ND	18	2	2	2	NA	NA	5	3	8	3	ND	ND	ND	1	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	123	63	47	42	32	22	60	46	22	22	ND	35	14	17	16	11
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	NA	ND	63	55	61	19	ND	24	37	33	18	32	13	19	14	18
Trans-1,3-Dichloropropene	ND	56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31	ND	ND	ND
1,1,1-Trichloroethane	94	16	ND	ND	ND	ND	ND	ND	ND	4	3	ND	ND	ND	2	5
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	4	3	2	2	2	ND	ND	ND	ND	1	1	ND	ND	ND	1	9
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
Vinyl Chloride	ND	200	120	120	120	ND	130	100	100	81	88	120	130	1 J	61	18
Xylene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbon (mg/kg)	NA	NA	3	3	1	11.1	1	1.0	ND	ND	ND	ND	ND	NA	ND	ND
Total VOCs	221	385	251	236	233	41	190	192	173	157	143	209	188	44	109	64

Note: All vales reported in ug/l (ppb), unless noted otherwise.
J - Indicates an estimated value.
D - Identified in analyses at secondary dilution factor.
NA - Not analyzed
[shaded] Compound is detected.

2/92 samples analyzed using GC/MS method (8240).
Other samples analyzed using Method 8010/8020 by OBG Labs.
2/94 Samples analyzed using GC/MS Method (NYSDEC ASP-91-1).
4/92 samples analyzed using GC/MS methods (8010/8020).
6/88 samples collected by TRC.
+ - Elevated detection limit due to matrix interference.
2/94 Samples validated by H2M Labs, Inc.
2/92 and 4/92 samples validated by O'Brien & Gere Engineers, Inc.

TABLE 17
GROUND WATER VOLATILE ORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID:	MW-2D	FIELD DUP MW-2D	MW-2D	MW-2D	MW-2D	MW-2D	MW-2D	MW-2D	MW-2D	MW-2D	MW-2D	MW-2D
COLLECTED:	2/19/92	2/19/92	4/15/92	8/12/92	11/5/92	2/17/93	5/24/93	8/19/93	10/9/93	2/15/94	6/2/94	8/23/94
Acetone	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	ND	5	ND	ND	ND	ND	10	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	6	ND	1	2	1	1	2	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	1	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	22	24	ND	10	8	4	4	7	5	5 J	ND	ND
Trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	28	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	24	28	ND	10	8	2	4	9	10	8 J	710	1600
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	22	27	ND	4	3	3	3	18	5	4 J	94	260
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	18	20	25	9	6	2	5	8	7	8 J	ND	ND
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbon (mg/kg)	11.0	10.9	1	1.0	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	91	110	53	34	27	12	28	44	27	25	804	1860

Note: All vales reported in ug/l (ppb), unless noted otherwise.
J - Indicates an estimated value.
D - Identified in analyses at secondary dilution factor.
NA - Not analyzed
[shaded] Compound is detected.

2/92 samples analyzed using GC/MS method (8240).
Other samples analyzed using Method 8010/8020 by OBG Labs.
2/94 Samples analyzed using GC/MS Method (NYSDEC ASP-91-1).
4/92 samples analyzed using GC/MS methods (8010/8020).
6/88 samples collected by TRC.
+ - Elevated detection limit due to matrix interference.
2/94 Samples validated by H2M Labs, Inc.
2/92 and 4/92 samples validated by O'Brien & Gere Engineers, Inc.

TABLE 17
GROUND WATER VOLATILE ORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID: / COLLECTED:	MW-3 6/88	MW-3 7/31/91	MW-3 10/24/91	MW-3 2/19/92	MW-3DL 2/19/92	MW-3 4/15/92	MW-3 8/12/92	MW-3 11/5/92	MW-3 2/17/93	MW-3 5/24/93	MW-3 8/19/93	MW-3 10/9/93	MW-3 6/1/94	MW-3 8/24/94
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	1 J	ND	ND	ND	1	1	ND	ND	ND	ND	2
Dibromochloromethane	9	2 J	ND	ND	ND	ND	4 J	2 J	ND	ND	1 *	ND	ND	2
1,1-Dichloroethane	154	300	280	220	150	150	20	23	4	170	30	80	31	4
1,2-Dichloroethane	6	ND	ND	ND	ND	17	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	343	550	670	410	290	200	32	33	2	310	62	190	63	1
1,2-Dichloroethene (total)	NA	49	47	34	24	5.9	5	6	ND	38	6	14	6	4
Trans-1,3-Dichloropropene	ND	2 J	ND	ND	ND	ND	4 J	2 J	ND	ND	1 *	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	12	8	6	ND	4	5	2	ND	5	ND	ND	11
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	129	780	610	530	340	90	40	43	8	240	57	130	50	16
1,1,2-Trichloroethane	ND	2 J	ND	10	ND	ND	4 J	2 J	ND	ND	1 *	ND	ND	ND
Trichloroethene	21	35	36	28	20	41	3	3	ND	15	5	ND	4	2
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	ND	NA	NA	ND	ND	ND	NA	ND	ND	ND	ND	ND	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbon (mg/kg)	NA	1	ND	11.3	NA	1	1.0	1	ND	ND	ND	1	1.3	1.1
Total VOCs	662	1720	1655	1241	830	503.9	116	120	17	773	168	414	154	42

Note: All vales reported in ug/l (ppb), unless noted otherwise.
J - Indicates an estimated value.
D - Identified in analyses at secondary dilution factor.
NA - Not analyzed
[shaded] Compound is detected.

2/92 samples analyzed using GC/MS method (8240).
Other samples analyzed using Method 8010/8020 by OBG Labs.
2/94 Samples analyzed using GC/MS Method (NYSDEC ASP-91-1).
4/92 samples analyzed using GC/MS methods (8010/8020).
6/88 samples collected by TRC.
+ - Elevated detection limit due to matrix interference.
2/94 Samples validated by H2M Labs, Inc.
2/92 and 4/92 samples validated by O'Brien & Gere Engineers, Inc.

TABLE 17
GROUND WATER VOLATILE ORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID: / COLLECTED:	MW-3D 2/19/92	MW-3DD 2/19/92	MW-3D 4/15/92	MW-3D 4/15/92	MW-3D 8/12/92	MW-3D 11/5/92	MW-3D 2/17/93	MW-3D 5/24/93	MW-3D 8/19/93	MW-3D 10/9/93	MW-3D 6/1/94	MW-3D 8/24/94
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	16	ND	ND	29	12	25	38	27	18	2	21	39
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	19	9	71	81	17	19	41	13	18	4	11	ND
1,2-Dichloroethene (total)	13	6	ND	ND	15	27	44	13	11	4	9	10
Trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	420	320	190	190	150	150	140	82	60	55	32	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	330	220	57	65	370	370	470	170	210	61	74	220
1,1,2-Trichloroethane	ND	ND	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	9	5	17	17	ND	17	15	ND	ND	3	4	ND
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	ND	ND	ND	1.2	NA	NA	NA	NA	ND	ND	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND
Xylene (total)	ND	ND	ND	9.1	ND	ND	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbon (mg/kg)	12.0	NA	1	1	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	807	560	337.4	392.3	564	608	748	305	317	129	157	269

Note: All vales reported in ug/l (ppb), unless noted otherwise.
J - Indicates an estimated value.
D - Identified in analyses at secondary dilution factor.
NA - Not analyzed
(shaded) Compound is detected.

2/92 samples analyzed using GC/MS method (8240).
Other samples analyzed using Method 8010/8020 by OBG Labs.
2/94 Samples analyzed using GC/MS Method (NYSDEC ASP-91-1).
4/92 samples analyzed using GC/MS methods (8010/8020).
6/88 samples collected by TRC.
+ - Elevated detection limit due to matrix interference.
2/94 Samples validated by H2M Labs, Inc.
2/92 and 4/92 samples validated by O'Brien & Gere Engineers, Inc.

TABLE 17
GROUND WATER VOLATILE ORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID: / COLLECTED:	MW-4 2/20/92	MW-4 4/15/92	MW-4 8/12/92	MW-4 11/5/92	MW-4 2/17/93	MW-4 5/24/93	MW-4 8/19/93	MW-4 10/9/93	MW-4 2/15/94	MW-4 6/2/94
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	1 J	NA
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	4 J	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	74	ND	ND	5	34	2	ND	ND	ND	15
Trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	2 J	38	ND	ND	ND	ND	ND	ND	ND	9
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	14 J	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA
Vinyl Chloride	9 J	ND	ND	11	12	4	ND	2	ND	4
Xylene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbon (mg/kg)	11.4	1	1.0	ND	1	ND	1	2	NA	1.7
Total VOCs	85	38	ND	16	46	6	ND	2	19	28

Note: All vales reported in ug/l (ppb), unless noted otherwise.
J - Indicates an estimated value.
D - Identified in analyses at secondary dilution factor.
NA - Not analyzed
[shaded] Compound is detected.

2/92 samples analyzed using GC/MS method (8240).
Other samples analyzed using Method 8010/8020 by OBG Labs.
2/94 Samples analyzed using GC/MS Method (NYSDEC ASP-91-1).
4/92 samples analyzed using GC/MS methods (8010/8020).
6/88 samples collected by TRC.
+ - Elevated detection limit due to matrix interference.
2/94 Samples validated by H2M Labs, Inc.
2/92 and 4/92 samples validated by O'Brien & Gere Engineers, Inc.

TABLE 17
GROUND WATER VOLATILE ORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID:	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D
COLLECTED:	2/20/92	4/15/92	8/12/92	11/5/92	2/17/93	5/24/93	8/19/93	10/9/93	2/15/94	6/2/94	8/23/94
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	NA	NA	NA	NA	NA	NA	NA	NA	4 J	NA	NA
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	3 J	ND	1	3	1	ND	ND	1	5 J	2	1
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	5	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	1 J	1	ND
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbon (mg/kg)	10.8	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	3	0	1	3	6	ND	ND	1	10	3	1

Note: All vales reported in ug/l (ppb), unless noted otherwise.
J - Indicates an estimated value.
D - Identified in analyses at secondary dilution factor.
NA - Not analyzed
[shaded] Compound is detected.

2/92 samples analyzed using GC/MS method (8240).
Other samples analyzed using Method 8010/8020 by OBG Labs.
2/94 Samples analyzed using GC/MS Method (NYSDEC ASP-91-1).
4/92 samples analyzed using GC/MS methods (8010/8020).
6/88 samples collected by TRC.
+ - Elevated detection limit due to matrix interference.
2/94 Samples validated by H2M Labs, Inc.
2/92 and 4/92 samples validated by O'Brien & Gere Engineers, Inc.

TABLE 17
GROUND WATER VOLATILE ORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID:	MW-11	MW-11D	MW-11	MW-11	MW-12	MW-12	MW-12	MW-13	MW-13D	MW-13	MW-13
COLLECTED:	2/15/94	2/15/94	6/1/94	8/24/94	2/15/94	6/1/94	8/24/94	2/15/94	2/15/94	6/1/94	8/23/94
Acetone	22	21 J	NA	NA	ND	NA	NA	ND	ND	NA	NA
Benzene	20	14 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	1	ND	1	2	ND	ND	ND	ND
Carbon Disulfide	ND	ND	NA	NA	ND	NA	NA	0.7 J	ND	NA	NA
Chloroethane	330 D	330 D	ND	ND	2 J	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	14	15	6 J	18	15	ND	ND	ND	9
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	69	46 J	15	7	10	1	ND	24	25	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	9 J	6 J	77	66	46	20	15	ND	ND	ND	ND
Trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	2 J	ND	88	81	6 J	4	3	ND	ND	1	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	6 J	33 J	28	13	20	3	3	ND	3 J	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	6 J	5 J	51	53	75	50	34	2 J	2 J	2	3
2-Butanone	ND	ND	NA	NA	ND	NA	NA	ND	ND	NA	NA
2-Hexanone	ND	ND	NA	NA	ND	NA	NA	ND	ND	NA	NA
Methylene Chloride	ND	2 J	NA	NA	ND	NA	NA	ND	ND	NA	NA
Styrene	ND	ND	NA	NA	ND	NA	NA	ND	ND	NA	NA
Vinyl Chloride	18	12 J	ND	ND	3 J	ND	ND	ND	ND	ND	ND
Xylene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbon (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND
Total VOCs	482	469	273	236	168	97	72	26.7	30	3	12

Note:

All vales reported in ug/l (ppb), unless noted otherwise.
J - Indicates an estimated value.
D - Identified in analyses at secondary dilution factor.
NA - Not analyzed
(shaded) Compound is detected.

2/92 samples analyzed using GC/MS method (8240).
Other samples analyzed using Method 8010/8020 by OBG Labs.
2/94 Samples analyzed using GC/MS Method (NYSDEC ASP-91-1).
4/92 samples analyzed using GC/MS methods (8010/8020).
6/88 samples collected by TRC.
+ - Elevated detection limit due to matrix interference.
2/94 Samples validated by H2M Labs, Inc.
2/92 and 4/92 samples validated by O'Brien & Gere Engineers, Inc.

Table 18
Ground Water Semi-Volatile Data Summary

ITT Sealectro
Mamaroneck, New York

SAMPLE ID:	MW-1	MW-2	MW-2D	MW-4	MW-4D	MW-4RE	MW-4DRE	MW-11	MW-12	MW-13	EQ BLK
COLLECTED:	2/15/94	2/15/94	2/15/94	2/15/94	2/15/94	2/15/94	2/15/94	2/15/94	2/15/94	2/15/94	2/15/94
4-Methylphenol	ND	ND	ND	1 J	2 J	2 J	2 J	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	3 J	3 J	1 J	1 J	ND	ND	ND	ND
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	1 J	ND	ND
Fluoranthene	ND	ND	ND	3 J	2 J	2 J	2 J	ND	ND	ND	ND
Pyrene	ND	ND	ND	5 J	5 J	3 J	3 J	ND	ND	ND	ND

Notes: All values reported in ug/l (ppb), unless noted ortherwise.
J - Indicates an estimated value.
2/94 Samples analyzed using GC/MS Method (NYSDEC 91-2).
-- No Standards Exists.
ND - Non-detect.
Data validated by H2M Laboratories, Inc.
[shaded] Compound is detected.

TABLE 19
GROUND WATER INORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

	TOTAL MW-2 2/19/92	TOTAL MW-2 4/15/92	FILTERED MW-2 2/19/92	FILTERED MW-2 4/15/92	TOTAL MW-2D 2/19/92	TOTAL MW-2D 4/15/92	FILTERED MW-2D 2/19/92	FILTERED MW-2D 4/15/92	TOTAL FIELD DUP MW-2D 2/19/92	FILTERED FIELD DUP MW-2D 2/19/92
Aluminum	57,100	112,000	49 B	ND	62,200	75,500	44.8 B	ND	61,600	42.4 B
Antimony	95.8	438	46.7 B	ND	97.2	292	ND	ND	60 B	ND
Arsenic	11.5	16.4	5.3 B	ND	5.6 B	ND	ND	ND	6 B	ND
Barium	798	1,330	213	200	862	1,100	144 B	117 B	866	143 B
Beryllium	3.1 B	7	ND	ND	2.6 B	5.1	ND	ND	2.6 B	ND
Cadmium	ND	3.8	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	109,000	140,000	75,800	74,900	121,000	158,000	80,700	75,800	117,000	80,000
Chromium	160	280	ND	ND	194	271	ND	ND	188	ND
Cobalt	73.1	113	ND	ND	68.9	72.2	ND	ND	67.7	ND
Copper	199	240	ND	ND	156	209	ND	ND	155	ND
Iron	120,000	207,000	8,270	4,990	116,000	138,000	119	ND	115,000	124
Lead	34.9	47.8	ND	ND	76.6	82.4	ND	ND	77	ND
Magnesium	70,000	106,000	24,300	21,600	72,500	91,700	26,700	25,700	70,800	26,800
Manganese	2,220	3,570	676	583	1,990	2,420	284	220	1,980	282
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	0.43	ND
Nickel	103	198	ND	ND	139	165	ND	ND	134	ND
Potassium	30,500	49,700	4,640 B	5,840	36,200	43,400	12,300	11,200	36,500	12,400
Sodium	65,000	67,600	60,400	46,600	41,700	47,500	43,900	41,800	41,800	43,800
Vanadium	170	327	ND	ND	186	236	ND	ND	181	ND
Zinc	355	578	6.1 B	9.7 B	335	425	ND	ND	336	ND

NOTES: All values reported in ug/L (ppb).
B - Value is less than the Contract Required Detection Limit, but greater than or equal to the Instrument Detection Limit.
NA - Not analyzed
[shaded] Elevated concentration.
Data validated by O'Brien & Gere Engineers, Inc.

TABLE 19
GROUND WATER INORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

	TOTAL MW-3 2/19/92	TOTAL MW-3 4/15/92	FILTERED MW-3 2/19/92	FILTERED MW-3 4/15/92	TOTAL MW-3D 2/19/92	TOTAL MW-3D 4/15/92	TOTAL FIELD DUP MW-3D 4/15/92	FILTERED MW-3D 2/19/92	FILTERED MW-3D 4/15/92	FILTERED FIELD DUP MW-3D 4/15/92
Aluminum	21,800	103,000	ND	360	247,000	102,000	82,800	ND	ND	ND
Antimony	ND	443	ND	ND	210	411	338	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	350	1,310	122 B	82.8 B	2,550	1,250	1,070	99.4 B	122 B	128 B
Beryllium	ND	9.5	ND	ND	16.4	9.5	8	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	113,000	191,000	104,000	62,900	150,000	130,000	115,000	76,400	86,200	90,500
Chromium	56.6	255	ND	ND	550	249	213	ND	ND	ND
Cobalt	28.4 B	112	ND	ND	218	83.2	70.7	ND	ND	ND
Copper	61.2	321	ND	ND	466	256	221	ND	ND	ND
Iron	41,100	206,000	13.3 B	32.8 B	428,000	183,000	160,000	127	70.9 B	83.4 B
Lead	19.5	83.2	ND	ND	379	93	90.4	ND	ND	ND
Magnesium	50,300	122,000	36,200	21,300	158,000	86,600	75,800	25,900	30,800	32,100
Manganese	3,160	6,110	2,330	671	8,800	4,350	3,760	1,300	285	302
Mercury	ND	ND	ND	ND	0.29	0.27	ND	ND	ND	ND
Nickel	62.2	217	21.9 B	43.9	369	158	142	ND	ND	ND
Potassium	12,600	44,600	4,490 B	3,680 B	108,000	44,700	39,700	5,090	4,060 B	4,110 B
Sodium	38,700	38,700	40,700	37,100	38,300	44,500	41,000	41,700	49,400	51,600
Vanadium	71.2	358	ND	ND	626	273	229	ND	ND	ND
Zinc	122	537	ND	21.4	1,300	533	442	ND	21	21

NOTES: All values reported in ug/L (ppb).
B - Value is less than the Contract Required Detection Limit, but greater than or equal to the Instrument Detection Limit.
NA - Not analyzed
NE - Not established
Elevated concentration.
Data validated by O'Brien & Gere Engineers, Inc.

TABLE 19
GROUND WATER INORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

	TOTAL MW-4 2/20/92	TOTAL MW-4 4/15/92	FILTERED MW-4 2/20/92	FILTERED MW-4 4/15/92	TOTAL MW-4D 2/20/92	TOTAL MW-4D 4/15/92	FILTERED MW-4D 2/20/92	FILTERED MW-4D 4/15/92
Aluminum	164,000	112,000	ND	ND	21,000	26,000	ND	ND
Antimony	149	423	56.2 B	89.2	ND	127	ND	ND
Arsenic	6.9 B	ND	5	ND	ND	ND	ND	ND
Barium	1,620	1,290	285	269	337	427	101 B	121 B
Beryllium	8.5	8.5	ND	ND	ND	2.3 B	ND	1.3 B
Cadmium	ND	4.6 B	ND	ND	ND	ND	ND	ND
Calcium	138,000	113,000	121,000	108,000	83,800	74,500	78,800	64,100
Chromium	376	323	ND	ND	53.6	70.7	ND	ND
Cobalt	166	116	14.5 B	13.3 B	24.8 B	28.4 B	ND	ND
Copper	394	369	ND	ND	53.8	90.6	ND	ND
Iron	245,000	197,000	15,900	28,800	37,000	52,000	ND	28.6 B
Lead	95.6	78.9	ND	ND	15.5	22	ND	ND
Magnesium	98,200	78,900	37,700	35,200	34,300	36,700	22,700	19,600
Manganese	9,050	6,290	6,590	5,190	811	1,600	234	69.7
Mercury	0.68	0.24	ND	ND	ND	ND	ND	ND
Nickel	304	235	ND	ND	41.2	55.1	ND	ND
Potassium	50,400	34,700	11,400	9,140	16,400	16,800	6,180	5,830
Sodium	126,000	134,000	135,000	177,000	32,200	38,900	32,500	47,600
Vanadium	419	314	ND	ND	68.1	82	ND	ND
Zinc	589	480	10.4 B	25.2	135	156	ND	4.6 B

NOTES: All values reported in ug/L (ppb).
B - Value is less than the Contract Required Detection Limit, but greater than or equal to the Instrument Detection Limit.
NA - Not analyzed
[shaded] Elevated concentration.
Data validated by O'Brien & Gere Engineers, Inc.
NE - Not established

Table 20
GROUND WATER ORGANIC DATA - SOLVENT UST AREA (RW-2)

ITT SEALECTRO
MAMARONECK, NEW YORK

PARAMETER	Well-5 3/4/92	RW-2 4/10/92	RW-2 4/30/92	RW-2 5/12/92	RW-2 6/17/92	RW-2 7/15/92	RW-2 8/18/92	RW-2 10/13/92	RW-2 11/17/92
Benzene	ND	ND	1100	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	9300	4800	5500	3500	4100	5000	4800
1,1-Dichloroethylene	ND	ND	1800	ND	1200	1400	ND	ND	11000
1,2-Dichloroethylene (total)	ND	ND	28000	17000	17000	16000	15000	25000	22000
Dichloromethane	ND	ND	1200	ND	ND	ND	1000	ND	59000
Tetrachloroethylene	140000	130000	38000	33000	25000	23000	41000	23000	12000
Toluene	900	ND	8100	ND	3900	3200	2100	4100	3700
1,1,1-Trichloroethane	74000	85000	98000	95000	70000	83000	100000	74000	42000
Trichloroethylene	ND	ND	ND	1400	1000	ND	1600	2000	3100
TOTAL VOC	214900	215000	185500	151200	123600	130100	164800	133100	157600

PARAMETER	RW-2 12/30/92	RW-2 2/24/93	RW-2 3/23/93	RW-2 4/22/93	RW-2 5/20/93	RW-2 6/16/93	RW-2 7/29/93	RW-2 8/22/93	RW-2 8/25/93
1,1-Dichloroethane	500	5200	6000	5800	5700	5100	7500	6400	5600
1,2-Dichloroethylene (total)	30000	ND	27000	23000	29000	25000	46000	24000	36000
Tetrachloroethylene	11000	5300	8100	6500	3300	2400	1100	ND	1600
Toluene	4500	3800	3700	3600	3400	3200	1400	ND	2900
1,1,1-Trichloroethane	59000	41000	46000	46000	44000	41000	36000	ND	31000
Trichloroethylene	1100	ND	1700	2100	ND	ND	ND	11000	ND
Vinyl Chloride	1000	ND	ND	ND	ND	ND	1100	ND	ND
TOTAL VOC	107100	55300	92500	87000	85400	76700	93100	41400	77100

PARAMETER	RW-2 9/22/93	RW-2 10/01/93	RW-2 11/24/93	RW-2 12/14/93	RW-2 1/21/94	RW-2 3/30/94	RW-2 4/25/94	RW-2 5/24/93	RW-2 6/30/94
1,1-Dichloroethane	6400	3000	3100	2000	5400	2500	2900	1700	1900
1,2-Dichloroethylene (total)	24000	13000	19000	6700	17000	14000	17000	11000	10000
Tetrachloroethylene	ND	ND	ND	6300	1800	ND	1400	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	1000	ND	ND
1,1,1-Trichloroethane	11000	6800	15000	7500	18000	14000	17000	5300	4400
Ethylbenzene	ND	980	ND	ND	ND	ND	ND	ND	ND
Xylene (total)	ND	11000	ND	ND	ND	ND	ND	ND	ND
TOTAL VOC	41400	34780	37100	22500	42200	30500	39300	18000	16300

Table 20
GROUND WATER ORGANIC DATA - SOLVENT UST AREA (RW-2)

ITT SEALECTRO
MAMARONECK, NEW YORK

PARAMETER	RW-2 7/27/94	RW-2 8/23/94	RW-2 10/03/94
1,1-Dichloroethane	2100	54	2200
1,2-Dichloroethylene (total)	5600	290	6000
Tetrachloroethylene	200	230	ND
Toluene	120	ND	ND
1,1,1-Trichloroethane	2500	130	1300
Trichloroethylene	100	49	ND
Vinyl Chloride	180	ND	ND
TOTAL VOC	10800	753	9500

Notes:

All values reported in ug/l (ppb)
ND - Below Method Detection Limit
NA - Not analyzed
Sample date 4/22/93: Well RW-2 was removed 04/22/93 during the Solvent Area excavation/sheeting/horizontal well pont insallation and replaced with Ground Water Collection Sump (Corregated pipe connected to pea gravel trench/Horizontal well points).
Sample date 9/22/93: Equalization tank, carbon and sand filters replaced with Ground Water Collection and Treatment Familiy (facility).
Sample date 10/1/93: Xylene (total) and Ethylbenzene analytical results are attrributed to Facility's new PVC piping, glues, primer, and internal tank coating.

TABLE 21
INDOOR AIR MONITORING DATA

ITT SEALECTRO
MAMARONECK, NEW YORK

	AS-1*	AS-2**	AS-3*	AS-4**	AS-5*	AS-6**	Blank
1,1-Dichloroethane	ND	ND	NA	NA	ND	ND	ND
1,2-Dichloroethane	ND	ND	NA	NA	ND	ND	ND
Tetrachloroethene	ND	ND	NA	NA	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	NA	NA	ND	ND	ND
Trichloroethane	ND	ND	NA	NA	ND	ND	ND
Benzene	NA	NA	ND	ND	ND	ND	ND
Ethylbenzene	NA	NA	ND	ND	ND	ND	ND
Toluene	ND	NA	ND	ND	ND	ND	ND
Xylene	NA	NA	ND	ND	ND	ND	ND

Notes: (*) - Samples collected over 8 hour period.
(**) - Samples collected over 90 minute period.
NA - Not analyzed.
ND - Not detected.
All concentrations given in ug/L (ppb).

TABLE 22
SOIL INORGANIC DATA SUMMARY - WASTEWATER TREATMENT AREA

ITT SEALECTRO
MAMARONECK, NY

	Sample ID:	B-3	B-4	B-5	B-6	B-7	4	4	5	5	6	6	7	7	SS-1	SS-2
	Sample Depth (ft):	8-10	12.0	12.0	12.0	7-9	Surface	1.0	Surface	1.0	Surface	1.0	Surface	1.0		
	Date Collected:	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1988	1988
	NYS Concentration Range															
Aluminum	1,000-25,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	3-12	4.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	15-600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	0-1.75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	130-35,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	1.5-40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	2.5-60	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	37.4-112.2	NA	30	18	27	NA	25	510	29	420	14	505	398	187	296.5	465.3
Gold	NE	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	17,500-25,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	1-12.5	260	NA	NA	NA	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Magnesium	1,700-6,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	50-5,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.042-0.066	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	8.5-25	NA	28	20	33	NA	14	107	35	48	17	53	113	90	46.7	26.1
Potassium	8,500-43,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NE	NA	NA	NA	NA	NA	4	5	4	4	2	51	29	17	0.51	0.19
Sodium	6,000-8,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	25-60	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	37-60	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	NE	NA	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA

NOTES: All values reported in mg/kg (ppm), unless noted otherwise.
NA - Not analyzed
NE - Not established
SS-1 and SS-2 collected in 1988 by TRC Environmental Consultants as part of environmental assessment.
Other data collected by O'Brien & Gere Engineers, Inc.
NYS Range represents typical concentrations of elements in uncontaminated soils in New York (McGovern).
[shaded] Concentration above typical NYS Range.
B-14 through B-16 validated by O'Brien & Gere Engineers, Inc.

TABLE 22
SOIL INORGANIC DATA SUMMARY - WASTEWATER TREATMENT AREA

ITT SEALECTRO
MAMARONECK, NY

		Phase I RI							
	Sample ID:	B-14	B-14	B-15	B-15	B-15	B-15	B-16	B-16
	Sample Depth (ft):	6-8'	16-18'	0.5-2'	2-6'	6-8'	6-8'	2-4'	10-14'
	Date Collected:	1992	1992	1992	1992	1992	1992	1992	1992
	NYS Concentration Range								
Aluminum	1,000-25,000	29,400	10,100	15,600	16,700	16,900	14,100	15,600	13,000
Antimony	NE	ND	8.2 B	11.8 B	8.5 B	7.7 B	6.1 B	11.1 B	11.6 B
Arsenic	3-12	0.65 B	0.69 B	1.5 B	4.7	1.6 B	1.5 B	1.6 B	0.6 B
Barium	15-600	156	113	125	94.1	101	96.9	112	121
Beryllium	0-1.75	ND B	ND	ND	0.84 B	ND	ND	ND	ND
Calcium	130-35,000	2,770	3,500	5,220	2,010	2,190	1,570	6,750	15,800
Chromium	1.5-40	53.8	25.2	31.5	56	25.7	20.4	29.5	31.5
Cobalt	2.5-60	12 B	11.7 B	13.8	9.5 B	11.4 B	9 B	12.4	13.8
Copper	37.4-112.2	796	23.4	44.7	155	19.5	7.4	31.4	29.8
Gold	NE	NA	NA	NA	NA	NA	NA	NA	NA
Iron	17,500-25,000	18,400	19,700	26,200	22,600	17,400	12,500	23,100	24,600
Lead	1-12.5	26.5	4.5	25	27.7	96.8	15.5	28.1	5.8
Magnesium	1,700-6,000	4,550	5,410	7,330	4,060	3,790	2,920	7,620	12,100
Manganese	50-5,000	186	415	385	363	175	148	417	376
Mercury	0.042-0.066	0.18	0.13	0.14	ND	ND	ND	ND	ND
Nickel	8.5-25	121	18.5	32.4	21.3	18.6	11.4	26.3	22.7
Potassium	8,500-43,000	680 B	3,820	4,450	1,730	1,650	484 B	3,770	4,510
Silver	NE	13.4	ND	1.1 B	1.4 B	ND	ND	1.1 B	1.3 B
Sodium	6,000-8,000	447 B	365 B	553 B	364 B	425 B	313 B	417 B	582 B
Thallium	NE	ND	ND	ND	ND	ND	0.26	ND	0.26 B
Vanadium	25-60	43.9	32.9	47.8	33.6	41.9	26.4	43.9	47.6
Zinc	37-60	148	48.4	78.7	69.9	55.6	49.4	67.8	63.6
Cyanide	NE	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:

All values reported in mg/kg (ppm), unless noted otherwise.
NA - Not analyzed
NE - Not established
SS-1 and SS-2 collected in 1988 by TRC Environmental Consultants as part of environmental assessment.
Other data collected by O'Brien & Gere Engineers, Inc.
NYS Range represents typical concentrations of elements in uncontaminated soils in New York (McGovern).
[shaded] Concentration above typical NYS Range.
B-14 through B-16 validated by O'Brien & Gere Engineers, Inc.

TABLE 23
SOIL VOLATILE ORGANIC DATA SUMMARY - WASTEWATER TREATMENT AREA

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID:	B-3	B-7	B-14	B-14	B-15	B-15	B-15	B-15 (FLD DUP)	B-16	B-16
			Phase I RI							
DEPTH:	8-10	7-9	6-8'	16-18'	0.5-2'	2-6'	6-8'	6-8'	2-4'	10-14'
DATE COLLECTED:	1986		1992	1992	1992	1992	1992	1992	1992	1992
Acetone	NA	NA	ND	ND	ND	ND	0.14	0.14	ND	ND
1,1-Dichloroethane	NA	NA	ND	ND	ND	0.002 J	ND	ND	ND	0.003
1,1-Dichloroethylene	NA	NA	ND	ND	ND	ND	ND	ND	ND	0.004
1,2-Dichloroethylene (total)	NA	NA	0.002	ND	ND	ND	ND	ND	ND	ND
Dichloromethane	NA	NA	ND	ND	ND	ND	ND	ND	ND	0.001
Methylene Chloride	NA	NA	ND	ND	ND	ND	ND	ND	ND	
Tetrachloroethylene	NA	NA	0.014	0.001	ND	0.011 J	ND	ND	ND	0.003
Toluene	NA	NA	0.006	ND	0.001	0.004 J	ND	0.001	ND	ND
1,1,1-Trichloroethane	0.012	0.053	0.009	0.004	ND	0.001 J	ND	ND	ND	0.005
Trichloroethylene	NA	NA	0.003	ND	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbons	NA	NA	ND	ND	ND	ND	ND	ND	610	ND
Total VOCs	0.012	0.053	0.034	0.005	0.001	0.018	0.14	0.141	0	0.016

NOTES: Concentrations reported in mg/kg (ppm).
[shaded] Compound is detected.
NA - Not Analyzed.
Samples analyzed by OBG Labs, Inc.
B-14 throug B-16 validated by O'Brien & Gere Engineers, Inc.

TABLE 24
SOIL SEMI-VOLATILE ORGANIC DATA SUMMARY
WASTEWATER TREATMENT AREA

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID:	B-15	
DEPTH:	2-6'	
DATE COLLECTED:	2/03/92	
Phenathrene	3	J
Anthracene	0.63	J
Fluoranthene	8	
Pyrene	6.2	
Benzo(a)anthracene	3.8	
Chrysene	3.9	
bis(2-Ethylhexyl)phthalate	0.78	J
Benzo(b)fluoranthene	5.7	
Benzo(k)fluoranthene	2.3	J
Benzo(a)pyrene	4	
Indeno(1,2,3-cd)pyrene	2.6	J

NOTES: Soil data reported in mg/kg (ppm).
U - Analyzed for but not detected
[shaded] Compound is detected.
J - Indicates an estimated value
Analyte is found in the associated blank as well as the sample.
Analyses completed by OBG Labs, Inc.
Data validation completed by O'Brien & Gere Engineers, Inc.

TABLE 25
SURFACE WATER VOLATILE ORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID: DATE COLLECTED:	SW-1 2/20/92	SW-1 4/16/92	SW-2 2/20/92	SW-2 4/16/92	SW-3 2/20/92	SW-3 4/16/92
1,2-Dichloroethene (total)	2 J	ND	2 J	ND	ND	ND
1,1,1-Trichloroethane	6	24	7	24	ND	19
Trichloroethene	2 J	ND	2 J	ND	ND	ND
Total Petroleum Hydrocarbons (mg/l)	11.3	ND	10.9	ND	10.9	ND
Total VOCs	10	24	11	24	ND	19

NOTES: All values reported in ug/l (ppb), unless otherwise noted.
J - Indicates an estimated value
2/92 samples analyzed using GC methods (8240).
4/92 samples analyzed using GC methods (8010/8020).
ND - Not detected
NE - Not established
[shaded] Compound is detected.
Analyses completed by OBG Labs, Inc.
Validation completed by O'Brien & Gere Engineers, Inc.

TABLE 26
SURFACE WATER INORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

Sample ID:	12	14	SW-1	SW-1	SW-2	SW-2	SW-3	SW-3
			Phase I RI					
Date Collected:	1986		2/20/92	4/16/92	2/20/92	4/16/92	2/20/92	4/16/92
Aluminum	NA	NA	113 B	84.2 B	108 B	268	128 B	100 B
Barium	NA	NA	45.5 B	49.2 B	41.2 B	50.5 B	41.2 B	49.2 B
Beryllium	NA	NA	ND	1.3 B	ND	1.3 B	ND	1.3 B
Cadmium	NA	NA	ND	ND	ND	ND	ND	ND
Copper	0.01	0.03	6.6 B	ND	ND	ND	ND	6.7 B
Gold	0.1	0.1	NA	NA	NA	NA	NA	NA
Iron	NA	NA	551	752	473	762	524	672
Lead	NA	NA	3.7	2.6 B	ND	ND	3.5	ND
Magnesium	NA	NA	11,100	12,300	10,700	11,500	10,100	10,600
Manganese	NA	NA	183	332	177	316	169	285
Nickel	0.01	0.01	ND	ND	ND	ND	ND	ND
Potassium	NA	NA	4,110 B	4,440 B	4,450 B	4,710 B	3,260 B	4510 B
Silver	0.01	0.01	23.4	39.2	46.8	37.6	54.1	40.6
Sodium	NA	NA	47900	44600	46100	41900	43800	38700
Zinc	NA	NA	40.4	7.8 B	14.2 B	6.8 B	10 B	11 B
Cyanide	0.05	0.05	NA	ND	NA	ND	NA	ND

NOTES: Concentrations reported in ug/l (ppb)

(U) - Analyzed but not detected.

(B) - Value is less than Contact Required Detection Limit, but greater than or equal to the iInstrument Detection Limit.

[shaded] Elevated concentration.

(NA) - Not analyzed.

(ND) - Not detected.

Analyses completed by OBG Labs, Inc.

Validation completed by O'Brien & Gere Engineers, Inc.

TABLE 27
SEDIMENT INORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID:	12	13	14	SD-1	SD-2	SD-3	SD-4
DATE COLLECTED:	1986	1986	1986	1988	1988	1988	1988
Aluminum	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA
Copper	47	288	740	56.1	114.2	296.4	158
Gold	<10	<10	<10	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA
Nickel	30	12	22	6.28	7.03	6.2	4.57
Potassium	NA	NA	NA	NA	NA	NA	NA
Silver	<1	<1	<1	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA
Cyanide	<5	<5	<5	NA	NA	NA	NA

NOTES: Stream sediment data reported in mg/kg (ppm).
NA - Not Analyzed.
U - Analyzed but not detected.
B - Value is less tha Contract Required Detection Limit, but greater than or equal to the Instrument Detection Limit.
[shaded] Analyte is detected.
R - Analyte is rejected.
SD-1 through SD-4 collected by TRC Environmental Consultants.
Samples 12, 13, 14, SS-1, SS-2, and SS-3 analyzed by OBG Labs, Inc.
SS-1 through SS3 validated by O'Brien & Gere Engineers, Inc.
SS-4 through SS-5 validated by H2M Labs, Inc.

TABLE 27
SEDIMENT INORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

SAMPLE ID: / DATE COLLECTED:	SS-1 2/21/92	SS-1 4/16/92	SS-2 2/21/92	DUP. SS-2 2/21/92	SS-2 4/16/92	DUP. SS-2 4/16/92	SS-3 2/21/92	SS-3 4/16/92	SS-4 6/2/94	SS-5 6/2/94	Dup. SS-5 6/2/94
Aluminum	2,460	3,730	3,710	3,240	4,550	4,030	28,700	2,500	NA	NA	NA
Antimony	ND U	27.8	ND	ND	38.4	43.7	2,170	31.6	NA	NA	NA
Arsenic	3.2	3.6	4.5	3.5	3.5	3.7	38.4	2 B	NA	NA	NA
Barium	25.2 B	63.5	42 B	42.7 B	45.7 B	45.4 B	207 B	30.8 B	NA	NA	NA
Beryllium	1 B	1.1 B	9.3	34.5	1.5	2.5	ND	ND	NA	NA	NA
Cadmium	ND	ND	ND	ND	ND	1.3	ND	ND	NA	NA	NA
Calcium	19,000	10,200	4,170	8,280	6,860	7,310	31,500	4,260	NA	NA	NA
Chromium	9.6	17.5	16.5	37.4	16.5	10	71	10.1	NA	NA	NA
Cobalt	3 B	3.3 B	6.6 B	6.9 B	5.6 B	4.9 B	19.8 B	4.9 B	NA	NA	NA
Copper	372	218	2,790	2,400	318	4,710	347	41	20 R	45.9 R	289 R
Gold	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	8,860	12,500	13,200	12,200	17,700	13,300	73,400	12,800	NA	NA	NA
Lead	108	75.6	116	248	87	275	586	57	NA	NA	NA
Magnesium	2,660	4,240	2,870	4,940	3,630	3,180	15,600	2,330	NA	NA	NA
Manganese	143	205	186	159	199	226	697	253	NA	NA	NA
Mercury	ND	ND	ND	ND	ND	0.13	0.78	ND	NA	NA	NA
Nickel	ND	14	16.5	18.6	25.3	16.6	76.9	20	NA	NA	NA
Potassium	457 B	765 B	1,080 B	505 B	1,400	955 B	ND	566 B	NA	NA	NA
Silver	ND	ND	5.6	ND	41.6	4	ND	ND	NA	NA	NA
Vanadium	9.2 B	12.5 B	13.3	10.5 B	12.5 B	13	76.7	9.1 B	NA	NA	NA
Zinc	286	237	1,380	321	448	2,230	808	128	NA	NA	NA
Cyanide	NA	ND	NA	NA	ND	ND	NA	ND	NA	NA	NA
Percent Solids	77.3	77.0	78.6	75.2	77.8	79.5	14	76			

NOTES: Stream sediment data reported in mg/kg (ppm).
NA - Not Analyzed.
U - Analyzed but not detected.
B - Value is less tha Contract Required Detection Limit, but greater than or equal to the Instrument Detection Limit.
[shaded] Analyte is detected.
R - Analyte is rejected.
SD-1 through SD-4 collected by TRC Environmental Consultants.
Samples 12, 13, 14, SS-1, SS-2, and SS-3 analyzed by OBG Labs, Inc.
SS-1 through SS3 validated by O'Brien & Gere Engineers, Inc.
SS-4 through SS-5 validated by H2M Labs, Inc.

TABLE 28
SEDIMENT VOLATILE ORGANIC DATA SUMMARY

ITT SEALECTRO
MAMARONECK, NY

				PHASE I RI							
							FIELD DUP.		FIELD DUP.		
SAMPLE ID:	10	11	13	SS-1	SS-1	SS-2	SS-2	SS-2	SS-2	SS-3	SS-3
DATE COLLECTED:	1986	1986	1986	2/21/92	4/16/92	2/21/92	2/21/92	4/16/92	4/16/92	2/21/92	4/16/92
1,2-Dichloroethene (total)	NA	NA	NA	0.001 J	ND	ND	ND	ND	ND	ND	ND
Chloroform	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	0.0007 J
1,1,1-Trichloroethane	NA	0.18	NA	ND	ND	ND	ND	ND	ND	ND	0.0019
Trichloroethene	NA	NA	NA	0.001 J	ND	ND	0.001 J	ND	ND	ND	ND
Tetrachloroethene	NA	NA	NA	0.004 J	ND	ND	ND	ND	ND	ND	0.014
Total Petroleum Hydrocarbon	NA	NA	NA	2,550	1,740	3,240	NA	1,030	2,510	23,000	747
Total VOCs	NA	0.18	NA	0.006	ND	ND	0.001	ND	ND	ND	0.0166

NOTES: All values reported in mg/kg (ppm)
J - Indicates an estimated value
NA - Not analyzed
ND - Not detected
2/92 samples analyzed using GC/MS method (8240).
4/92 samples analyzed using GC/MS methods (8010/8020).
Samples 10 through 13 collected by O'Brien & Gere Engineers as part of the 1986 Site Assessment.
No other VOCs analyzed for at 10, 11, and 12.
[shaded] Compound is detected.
Samples analyzed by OBG Labs, Inc.
SS-1 through SS-3 validated by O'Brien & Gere Engineers, Inc.

Table 29
Soil COPCs Data Summary

ITT Sealectro
Mamaroneck, New York

Chemical	Frequency of Detection	Minimum Detected Conc. (mg/kg)	Maximum Detected Conc. (mg/kg)	Mean Conc. * (mg/kg)	Minimum Detection Limit (mg/kg)	Maximum Detection Limit (mg/kg)	Chemical Carried thru BRA
1,1,1-Trichloroethane	35 / 81	0.0008	930	14.97	0.001	8.4	Yes
1,1,2-Trichloroethane	1 / 72	0.003	0.003	0.68	0.001	32	No
1,1-Dichloroethane	21 / 80	0	46	1.62	0.001	32	Yes
1,1-Dichloroethene	5 / 73	0.004	0.51	0.45	0.001	32	No
1,2-Dichloroethane	2 / 74	0.002	4.3	0.72	0.001	32	No
1,2-Dichloroethene (total)	44 / 80	0.0009	100	2.31	0.001	8.4	Yes
2-Methylnaphthalene	7 / 41	0.038	0.36	2.28	0.37	47	No
2-Methylphenol	1 / 41	0.26	0.26	2.29	0.37	47	No
4-Methylphenol	1 / 41	0.45	0.45	2.29	0.37	47	No
Acetone	24 / 73	0.006	1.5	0.72	0.0012	32	Yes
Anthracene	4 / 41	0.051	0.63	2.25	0.37	47	No
Aroclor-1254	1 / 2	0.94	0.94	0.92	1.8	1.8	No
Benzene	11 / 73	0.001	2.6	0.67	0.001	32	Yes
Benzo(a)anthracene	6 / 41	0.09	3.8	2.34	0.37	47	Yes
Benzo(a)pyrene	9 / 41	0.12	4	2.35	0.37	47	Yes
Benzo(b)fluoranthene	10 / 41	0.1	5.7	2.41	0.37	47	Yes
Benzo(g,h,i)perylene	3 / 41	0.067	0.24	2.28	0.37	47	No
Benzo(k)fluoranthene	6 / 41	0.069	2.3	2.29	0.37	47	Yes
Bis(2-ethylhexyl)phthalate	7 / 31	0.14	1.4	2.91	0.38	47	No
Butylbenzylphthalate	1 / 41	1.1	1.1	2.31	0.37	47	No
Carbon Disulfide	8 / 54	0.001	0.005	0.90	0.011	32	Yes
Chloroethane	1 / 73	0.009	0.009	0.68	0.001	32	No
Chrysene	7 / 41	0.12	3.9	2.35	0.37	47	Yes
Copper	41 / 43	7.4	2790	196.67	3.9	4.9	Yes
Di-n-butylphthalate	4 / 35	0.076	0.11	2.62	0.37	47	No
Dibenzofuran	1 / 41	0.093	0.093	2.28	0.37	47	No
Ethylbenzene	8 / 75	0.005	5.1	0.75	0.001	32	Yes
Fluoranthene	7 / 41	0.09	8	2.47	0.37	47	Yes
Indeno(1,2,3-cd)pyrene	5 / 41	0.07	2.6	2.30	0.37	47	No
Methylene Chloride	12 / 76	0.001	14	0.87	0.003	32	Yes
Methylethyl Ketone	1 / 19	6.4	6.4	1.78	0.056	9.1	No
Naphthalene	4 / 41	0.13	0.23	2.28	0.37	47	No
Nickel	39 / 43	10.5	121	30.52	4.8	8.9	Yes
Pentachlorophenol	1 / 41	1.1	1.1	5.99	0.4	120	No
Phenanthrene	7 / 41	0.11	3	2.36	0.37	47	Yes
Pyrene	7 / 41	0.081	6.2	2.43	0.37	47	No
Tetrachloroethene	47 / 81	0.001	1200	48.27	0.001	8.4	Yes
Toluene	35 / 80	0.0007	130	4.90	0.001	32	Yes
Trichloroethene	35 / 75	0.0008	24	1.17	0.001	32	Yes
Vinyl Chloride	2 / 73	0.008	0.009	0.68	0.001	32	No
Xylenes (total)	14 / 77	0.009	16	1.25	0.003	32	Yes

* - Mean concentrations include 1/2 the detection limit for non-detects and therefore may exceed the maximum detected concentration.

Table 30
Ground Water Data Summary

ITT Sealectro
Mamaroneck, New York

Chemical	Frequency of Detection	Minimum Detected Conc. (ug/l)	Maximum Detected Conc. (ug/l)	Mean Conc. * (ug/l)	Minimum Detection Limit (ug/l)	Maximum Detection Limit (ug/l)	Chemical Carried thru BRA
1,1,1-Trichloroethane	82 / 139	1	780	47.9	1	20	Yes
1,1,2,2-Tetrachloroethane	1 / 116	28	28	3.0	1	100	No
1,1,2-Trichloroethane	6 / 116	1	10	2.9	1	100	Yes
1,1-Dichloroethane	63 / 117	1	300	25.2	1	100	Yes
1,1-Dichloroethene	25 / 116	1	670	32.0	1	100	Yes
1,2-Dichloroethane	4 / 116	1	20	3.1	1	100	No
1,2-Dichloroethene (total)	89 / 136	1	77	13.0	1	100	Yes
2-Butanone	2 / 16	14	14	9.3	10	50	No
Acetone	6 / 16	1	22	17.3	5	180	Yes
Benzene	17 / 117	2	29	4.2	1	100	Yes
Bromodichloromethane	6 / 116	1	2	2.8	1	100	Yes
Carbon Disulfide	4 / 16	0.7	4	7.5	10	50	No
Chloroethane	16 / 117	1	330	14.1	1	100	Yes
Chloroform	17 / 116	1	18	4.0	1	100	Yes
Dibromochloromethane	6 / 116	1	9	3.8	1	100	Yes
Methylene Chloride	3 / 83	1.2	2	2.8	1	82	No
Tetrachloroethene	69 / 126	1	1600	38.3	1	50	Yes
Toluene	1 / 116	31	31	3.0	1	100	No
Trans-1,3-Dichloropropene	5 / 117	1	56	3.2	1	100	No
Trichloroethene	68 / 117	1	75	10.4	1	100	Yes
Vinyl Chloride	33 / 117	1	200	15.2	1	100	Yes
Xylene (total)	2 / 117	1	9.1	5.6	1	300	No

* – Mean concentrations include 1/2 the detection limit for non-detects and therefore may exceed the maximum detected concentration.

Table 31
Summary of COPCs Carried Through BRA

ITT Sealectro
Mamaroneck, New York

Chemical	Soils: Mean Conc. (mg/kg)	Soils: Maximum Detected Conc. (mg/kg)	Ground Water: Mean Conc. (ug/l)	Ground Water: Maximum Detected Conc. (ug/l)
1,1,1-Trichloroethane	14.97	930	47.9	780
1,1,2-Trichloroethane			2.9	10
1,1-Dichloroethane	1.62	46	25.2	300
1,1-Dichloroethene			32.0	670
1,2-Dichloroethene (total)	2.31	100	13.0	77
Acetone	0.72	1.5	17.3	22
Benzene	0.67	2.6	4.2	29
Benzo(a)anthracene	2.34	3.8		
Benzo(a)pyrene	2.35	4		
Benzo(b)fluoranthene	2.41	5.7		
Benzo(k)fluoranthene	2.29	2.3		
Bis(2-ethylhexyl)phthalate	2.91	1.4		
Bromodichloromethane			2.8	2
Carbon Disulfide	0.90	0.005		
Chloroethane			14.1	330
Chloroform			4.0	18
Chrysene	2.35	3.9		
Copper	196.67	2790		
Dibromochloromethane			3.8	9
Ethylbenzene	0.75	5.1		
Fluoranthene	2.47	8		
Methylene Chloride	0.87	14		
Nickel	30.52	121		
Phenanthrene	2.36	3		
Tetrachloroethene	48.27	1200	38.3	1600
Toluene	4.90	130		
Trichloroethene	1.17	24	10.4	75
Vinyl Chloride			15.2	200
Xylenes (total)	1.25	16		

Table 32
Summary of Chemical and Physical Properties of COPCs Carried Through the BRA.

ITT Sealectro
Mamaroneck, New York

Chemical	Molecular Weight (g/mol)	Diffusivity in Air (cm2/s)	Boiling Point (C)	Melting Point (C)	Water Solubility (mg/l)	Henry's Law Constant (atm-m3/mol)	Henry's Law Constant (unitless)	Koc (ml/g)
1,1,1-Trichloroethane	133.41	0.07965	74.1	-30.4	1330	0.028	1.148	152
1,1,2-Trichloroethane	133.41	0.07965	113.7	-36.5	4500	0.0012	0.0492	56
1,1-Dichloroethane	98.96	0.0959	57.3	-97	5500	0.0057	0.2337	30
1,1-Dichloroethene	96.94	0.10077	37	-122.1	2250	0.034	1.394	65
1,2-Dichloroethene (total)	96.94	0.0998	47	-50	6300	0.0066	0.2706	59
Acetone	58	0.11498	56.5	-95.4		0.0000367	0.0015047	2.2
Benzene	78	0.0932	80.1	5.53	1750	0.00546	0.22386	65
Benzo(a)anthracene	228.09	0.04654	435	162	0.014	0.0000045	0.0001845	1380000
Benzo(a)pyrene	252.09	0.04653	310	177.8	0.00005	0.0000372	0.0015252	5500000
Benzo(b)fluoranthene	252	0.04392			0.014	0.0000118	0.0004838	550000
Benzo(k)fluoranthene	252.32	0.04392	480	217	0.0043	0.0000394	0.0016154	550000
Bis(2-Ethylhexyl)phthalate	391	0.03542	384	-50	0.4	0.00000044	0.00001804	87400
Bromodichloromethane	163.8	0.08966	90	-57.1	50	0.256	10.496	107
Carbon Disulfide	76.14	0.1045	46.2	-111.5	2940	0.0123	0.5043	54
Chloroethane	64.52	0.1147	12.4	-136.4	5740	0.002	0.082	15
Chloroform	119.38	0.08868	61	-64	7220	0.0038	0.1558	44
Chrysene	228.09	0.04531	448	255.5	0.002	0.00000096	0.00003936	200000
Copper	64			1083				
Dibromochloromethane	208.29	0.08608	116	-20	4540	0.00459	0.18819	107
Ethylbenzene	106.17	0.06667	136.2	-95	153	0.00843	0.34563	220
Fluoranthene	202.08	0.04941	375	111	0.26	0.00000941	0.00038581	38000
Methylene chloride	84.93	0.0858	41	-95.1	18000	0.0026	0.1066	8.8
Nickel	59		2730	1455				
Phenanthrene	178.08	0.0543	340	101	1.29	0.000039	0.001599	14000
Tetrachloroethene	165.85	0.07404	121	-19	484	0.023	0.943	364
Toluene	92.15	0.07828	110.6	-95	1550	0.0066	0.2706	120
Trichloroethene	131.29	0.08116	87	-73	1470	0.0089	0.3649	126
Vinyl Chloride	62.5	0.10726	-13.9	-153.8	2670	0.027	1.107	8.2
Xylenes (total)	106.17	0.07164	138.3	13.3	198	0.00704	0.28864	238

Table 33
Summary of Exposure Pathway Analysis

ITT Sealectro
Manaroneck, New York

Exposure Pathway	Potential Receptor	Complete/ Incomplete	Exposure Route	Exposure Pathway Quantified	Discussion
Contact with Soils	On-Site Worker	Incomplete	NA	NA	The on-site worker is not exposed to COPCs via direct contact with site soils because the site is paved, inhibiting access.
	Potential Future Construction Workers	Complete	Incidental Ingestion and Dermal Contact of Soils	Yes	Construction workers may contact soils during possible future on-site construction activity. This exposure pathway was quantified.
Ambient Dusts and Vapors	Potential Future Construction Workers	Complete	Inhalation of dusts and vapors generated during potential excavation activities	Yes	Disturbance of contaminated soils during possible future construction activities may generate dust and allow for the release of volatile compounds as vapors, potentially exposing construction workers by inhalation to soil contaminants. Thus, this exposure pathway was quantified.
Consumption of Ground Water as Drinking Water	none	Incomplete	NA	NA	Ground water at the site is not used as a potable water supply. Mamaroneck receives its water from the City of New York.
Vapors Migrating from Soil and Ground Water to Indoor Air	On-Site Worker	Complete	Inhalation	Yes	Volatile constituents in subsurface soils and ground water may volatilize to soil gas and subsequently migrate to indoor air. This exposure was quantified.
	Off-Site Buildings	Incomplete	NA	NA	The potential for migration of volatile residues from off-site ground water to indoor air is limited because ground water discharges to the Sheldrake and does not migrate to other locations and because the buildings in the surrounding are do not have basements since they are located in the flood-plain of the Sheldrake River.
Contact with Sheldrake River Waters	Adult and Child Recreational User	Complete	Incidental Ingestion and Dermal Contact with Sheldrake River Water	No	Although the pathway is complete, the predicted concentrations of COPCs in the Sheldrake River from ground water are extremely low and do not represent a risk to human health. Therefore, although complete, this pathway was not quantified.

Table 34
Estimated COPC Concentrations in the Sheldrake River from Site Ground Water.

ITT Sealectro
Mamaroneck, New York

Chemical	Maximum Detected Conc. (ug/l)	Upper Bound Estimate of the site Ground Water Discharge Rate to the Sheldrake River (l/day)	Sheldrake River Low-Flow Rate (l/day)	Estimated Concentration of COPCs in the Sheldrake River (ug/l)
1,1,1-Trichloroethane	780	2665	7.78E+08	0.0027
1,1,2-Trichloroethane	10	2665	7.78E+08	0.000034
1,1-Dichloroethane	300	2665	7.78E+08	0.0010
1,1-Dichloroethene	670	2665	7.78E+08	0.0023
1,2-Dichloroethene (total)	77	2665	7.78E+08	0.00026
Acetone	22	2665	7.78E+08	0.00008
Benzene	29	2665	7.78E+08	0.00010
Bromodichloromethane	2	2665	7.78E+08	0.000007
Chloroethane	330	2665	7.78E+08	0.0011
Chloroform	18	2665	7.78E+08	0.000062
Dibromochloromethane	9	2665	7.78E+08	0.000031
Tetrachloroethene	1600	2665	7.78E+08	0.0055
Trichloroethene	75	2665	7.78E+08	0.00026
Vinyl Chloride	200	2665	7.78E+08	0.0007
		Estimated Total Organic Concentration from Site Ground Water –		0.014

Table 35

Estimation of Ambient (Vapor and Dust) Air Concentrations of COPCs Generated from Soil Excavation Activities

ITT Sealectro

Mamaroneck, New York

Chemical	Mean Conc. (mg/kg)	Di (cm2/s)	H'	Koc (cm2)	OC	Kas (g/cm2)	E	Dei (cm2/s)	Ps (g/cm2)	T (s)	LS (m)	V (m/s)	DH (m)	A (cm2)	VF (m3/kg)	PEF (m3/kg)	Mean Air Conc. (mg/m3)
1,1,1-Trichloroethane	15.0	8.0E-02	1.1E+00	152	0.02	1.5E-04	0.4	5.9E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	6.3E+03	1.0E+04	3.89E-03
1,1-Dichloroethane	1.6	9.6E-02	2.3E-01	30	0.02	1.6E-04	0.4	7.1E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	5.6E+03	1.0E+04	4.51E-04
1,2-Dichloroethene (total)	2.3	1.0E-01	2.7E-01	59	0.02	9.2E-05	0.4	7.4E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	7.2E+03	1.0E+04	5.52E-04
Acetone	0.7	1.1E-01	1.5E-03	2.2	0.02	1.4E-05	0.4	8.5E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	1.7E+04	1.0E+04	1.13E-04
Benzene	0.7	9.3E-02	2.2E-01	65	0.02	6.9E-05	0.4	6.9E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	8.6E+03	1.0E+04	1.46E-04
Benzo(a)anthracene	2.3	4.7E-02	1.8E-04	1380000	0.02	2.7E-12	0.4	3.4E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	6.2E+07	1.0E+04	2.34E-04
Benzo(a)pyrene	2.3	4.7E-02	1.5E-03	5500000	0.02	5.5E-12	0.4	3.4E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	4.3E+07	1.0E+04	2.35E-04
Benzo(b)fluoranthene	2.4	4.4E-02	4.8E-04	550000	0.02	1.8E-11	0.4	3.2E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	2.5E+07	1.0E+04	2.41E-04
Benzo(k)fluoranthene	2.3	4.4E-02	1.6E-03	550000	0.02	5.9E-11	0.4	3.2E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	1.4E+07	1.0E+04	2.29E-04
Bis(2-ethylhexyl)phthalate	3.0	3.5E-02	1.8E-05	87400	0.02	4.1E-12	0.4	2.6E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	5.7E+07	1.0E+04	3.04E-04
Carbon Disulfide	0.9	1.0E-01	5.0E-01	54	0.02	1.9E-04	0.4	7.7E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	4.9E+03	1.0E+04	2.73E-04
Chrysene	2.3	4.5E-02	3.9E-05	200000	0.02	3.9E-12	0.4	3.3E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	5.1E+07	1.0E+04	2.35E-04
Copper	196.7	NA	NA	NA	0.02	NA	0.4	NA	2.65	5.2E+06	61	2.25	2	3.7E+07	NA	1.0E+04	1.97E-02
Ethylbenzene	0.8	6.7E-02	3.5E-01	220	0.02	3.1E-05	0.4	4.9E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	1.5E+04	1.0E+04	1.25E-04
Fluoranthene	2.5	4.9E-02	3.9E-04	38000	0.02	2.0E-10	0.4	3.7E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	6.9E+06	1.0E+04	2.47E-04
Methylene Chloride	0.9	8.6E-02	1.1E-01	8.8	0.02	2.4E-04	0.4	6.3E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	4.8E+03	1.0E+04	2.71E-04
Nickel	30.5	NA	NA	NA	0.02	NA	0.4	NA	2.65	5.2E+06	61	2.25	2	3.7E+07	NA	1.0E+04	3.05E-03
Phenanthrene	2.4	5.4E-02	1.6E-03	14000	0.02	2.3E-09	0.4	4.0E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	1.9E+06	1.0E+04	2.38E-04
Tetrachloroethene	48.3	7.4E-02	9.4E-01	364	0.02	5.2E-05	0.4	5.5E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	1.1E+04	1.0E+04	9.18E-03
Toluene	4.9	6.7E-02	3.5E-01	120	0.02	5.8E-05	0.4	4.9E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	1.1E+04	1.0E+04	9.32E-04
Trichloroethene	1.2	8.1E-02	3.6E-01	126	0.02	5.8E-05	0.4	6.0E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	1.0E+04	1.0E+04	2.33E-04
Xylenes (total)	1.2	7.2E-02	2.9E-01	238	0.02	2.4E-05	0.4	5.3E-02	2.65	5.2E+06	61	2.25	2	3.7E+07	1.6E+04	1.0E+04	2.01E-04

Equation:

$$AirConc. = \left(\frac{1}{VF} + \frac{1}{PEF}\right) * 1E\text{-}06\, mg/kg$$

$$VF = \left(\frac{LS * V * DH}{A}\right) * \frac{\left(3.14 * \left(\frac{D_{ei} * E}{E + (p_s)(1-E)/K_{as}}\right) * T\right)^{1/2}}{\left(2 * D_{ei} * E * K_{as} * 10^{-3} kg/g\right)}$$

Table 35

Estimation of Ambient (Vapor and Dust) Air Concentrations of COPCs Generated from Soil Excavation Activities

ITT Sealectro
Mamaroneck, New York

Parameter	Explanation	Source	Reference
CS	Concentration in Soil	Site Analytical Data	See Table 6-3
Di	Molecular Diffusivity in Air	U.S.EPA's Hazardous Substance Data Base	U.S.EPA, 1994
H'	Dimensionless Henry's Law Constant	U.S.EPA's Hazardous Substance Data Base	U.S.EPA, 1994
Koc	Organic Carbon Coefficient	U.S.EPA's Hazardous Substance Data Base	U.S.EPA, 1994
OC	Fraction Organic Carbon	U.S.EPA Default Value	RAGS Part B, 1991
Kas	Soil to Air Partition Coefficient	H'/(Koc*OC)	
E	Soil Porosity	Site Specific Parameter	
Dei	Effective Diffusivity	Di*E^0.33	
Ps	Soil Density	U.S.EPA Default Value	RAGS Part B, 1991
T	Exposure Interval	Site Specific Parameter	
LS	Length of Side of Contaminated Area	Site Specific Parameter	
V	Wind Speed in Mixing Zone	U.S.EPA Default Value	RAGS Part B, 1991
DH	Diffusion Height	U.S.EPA Default Value	RAGS Part B, 1991
A	Area of Contamination	Site Specific Parameter	
VF	Volatilization Factor	See Equation Above	RAGS Part B, 1991
PEF	Particulate Emission Factor	Based on Data Collected by O'Brien & Gere	See Section 6-3

Table 36
Estimation of Indoor Air Concentrations of COPCs from Ground Water

ITT Sealectro
Mamaroneck, New York

Chemical	Mean Ground Water Conc. (ug/l)	H'	Mean Soil Gas Conc. (mg/m3)	delta-P (kg/m-s2)	k (m2)	Crack Length (Xcrack) (m)	Vapor Viscosity (u) (kg/m-s)	Crack Depth (Zcrack) (m)	Fraction of Basement Cracked (n)	Basement Area (m2)	Qsoil (m3/s)	Ventilation Rate (Qbuilding) (m3/s)	alpha	Predicted Mean Indoor Air Conc. (mg/m3)
1,1,1-Trichloroethane	47.90	1.148	5.50E+01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	2.6E-04
1,1,2-Trichloroethane	2.9	0.0492	1.43E-01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	6.7E-07
1,1-Dichloroethane	25.20	0.2337	5.89E+00	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	2.8E-05
1,1-Dichloroethene	32	1.394	4.46E+01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	2.1E-04
1,2-Dichloroethene (total)	13.00	0.2706	3.52E+00	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	1.6E-05
Acetone	17.30	0.0015047	2.60E-02	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	1.2E-07
Benzene	4.20	0.22386	9.40E-01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	4.4E-06
Bromodichloromethane	2.8	10.496	2.94E+01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	1.4E-04
Chloroethane	14.1	0.082	1.16E+00	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	5.4E-06
Chloroform	4	0.1558	6.23E-01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	2.9E-06
Dibromochloromethane	3.8	0.18819	7.15E-01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	3.3E-06
Tetrachloroethene	38.30	0.943	3.61E+01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	1.7E-04
Trichloroethene	10.40	0.3649	3.79E+00	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	1.8E-05
Vinyl Chloride	15.20	1.107	1.68E+01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	7.9E-05

Equation:

$$IndoorAirConc. = \alpha * CSG$$

$$\alpha = Q_{soil}/Q_{building}$$

$$Q_{soil} = \frac{2\pi * \Delta P * k_v * X_{crack}}{\mu * \ln\left(\frac{2Z_{crack}}{\eta * A_B/X_{crack}}\right)}$$

Parameter	Explanation	Source	Reference
CGW	Concentration in Ground Water	Site Analytical Data	
H'	Dimensionless Henry's Law Constant	U.S.EPA's Hazardous Substance Data Base	U.S.EPA, 1994
CSG	Concentration in Soil Gas	CGW*H'	
delta-P	Pressure Differnce	Long-term Screening Value	Johnson and Ettinger, 1991
k	Soil Permeability	Site Specific Parameter	
X-crack	Crack Length	Site Specific Parameter	
u	Dynamic Vapor Viscosity		
Z-crack	Crack Depth Below Ground Surface	Site Specific Parameter	
n	Percent of Foundation Cracked	Site Specific Parameter	
Area	Foundation Area	Site Specific Parameter	
Q-soil	Soil Gas Entry Rate	See Equation Above	
Q-building	Building Ventilation Rate	Site Specific Paramter	
alpha	Soil Gas to Indoor Air Attenuation Factor	See Equation Above	

Table 37
Estimation of Indoor Air Concentrations of COPCs from On-Site Subsurface Soils

ITT Sealectro
Mamaroneck, New York

Chemical	Mean CD (mg/kg)	H'	Koc (ml/g)	OC	Predicted CSG (mg/m3)	delta-P (kg/m-s2)	k (m2)	Xcrack (m)	u (kg/m-s)	Zcrack (m)	n	A_B (m2)	Qsoil (m3/s)	Qbuilding (m3/s)	alpha	Predicted Mean CIA (mg/m3)
1,1,1-Trichloroethane	14.97	1.1E+00	152	0.02	5.65E+03	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	2.6E-02
1,1-Dichloroethane	1.62	2.3E-01	30	0.02	6.31E+02	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	3.0E-03
1,2-Dichloroethene (total)	2.31	2.7E-01	59	0.02	5.29E+02	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	2.5E-03
Acetone	0.72	1.5E-03	2.2	0.02	2.45E+01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	1.1E-04
Benzene	0.67	2.2E-01	65	0.02	1.16E+02	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	5.4E-04
Carbon Disulfide	0.90	5.0E-01	54	0.02	4.20E+02	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	2.0E-03
Ethyl Benzene	0.75	3.5E-01	220	0.02	5.89E+01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	2.8E-04
Methylene chloride	0.88	1.1E-01	8.8	0.02	5.30E+02	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	2.5E-03
Tetrachloroethene	48.27	9.4E-01	364	0.02	6.25E+03	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	2.9E-02
Toluene	4.90	2.7E-01	120	0.02	5.52E+02	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	2.6E-03
Trichloroethene	1.17	3.6E-01	126	0.02	1.69E+02	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	7.9E-04
Xylenes (total)	1.25	2.9E-01	238	0.02	7.58E+01	10	1.0E-13	173	0.000018	2	0.001	1870	0.00001	2.18	0.000004	3.5E-04

Equation:

$$IndoorAirConc. = \alpha * CSG$$

$$\alpha = Q_{soil}/Q_{building}$$

$$Q_{soil} = \frac{2\pi * \Delta P * k_v * X_{crack}}{\mu * \ln\left(\frac{2Z_{crack}}{\eta * A_B/X_{crack}}\right)}$$

Parameter	Explanation	Source	Reference
CGW	Concentration in Ground Water	Site Analytical Data	
H'	Dimensionless Henry's Law Constant	U.S.EPA's Hazardous Substance Data Base	U.S.EPA, 1994
Koc	Organic Carbon Coefficient	U.S.EPA's Hazardous Substance Data Base	
OC	Organic Carbon	U.S.EPA Default Parameter	
CSG	Concentration in Soil Gas	CGW*H'	
delta-P	Pressure Differnce	Long-term Screening Value	Johnson and Ettinger, 1991
k	Soil Permeability	Site Specific Parameter	
X-crack	Crack Length	Site Specific Parameter	
u	Dynamic Vapor Viscosity		
Z-crack	Crack Depth Below Ground Surface	Site Specific Parameter	
n	Percent of Foundation Cracked	Site Specific Parameter	
Area	Foundation Area	Site Specific Parameter	
Q-soil	Soil Gas Entry Rate	See Equation Above	
Q-building	Building Ventilation Rate	Site Specific Paramter	
alpha	Soil Gas to Indoor Air Attenuation Factor	See Equation Above	

Table 38
Summary of Exposure Parameters for the On-Site Worker

ITT Sealectro
Mamaroneck, New York

Parameter	Description	Units	Upper Bound	Reference
CIA	Chemical Concentration in Indoor Air	mg/m^3	Chemical Specific	See Tables 6-9 through 6-12
IR	Inhalation Rate	m^3/hour	2.1	U.S.EPA 1989
ET	Exposure Time	hours/day	8	Professional Judgement
EF	Exposure Frequency	days/year	250	Professional Judgement
ED	Exposure Duration	years	25	Professional Judgement
BW	Body Weight	kg	70	U.S.EPA, 1989
AT	Averaging time (non-cancer)	days	9125	Professional Judgement
AT	Averaging Time (cancer)	days	25,550	U.S.EPA, 1989

Table 39
Summary of Exposure Parameters for the Future Construction Worker

ITT Sealectro
Mamaroneck, New York

Parameter	Description	Units	Average	Reference
General				
EF	Exposure Frequency	days/year	60	Judgement
ED	Exposure Duration	years	0.17	Judgement
BW	Body Weight	kg	70	U.S. EPA 1989
AT	Averaging time (non-cancer)	days	60	U.S. EPA 1989
AT	Averaging Time (cancer)	days	25,550	U.S. EPA 1989
Incidental Ingestion of Surface Soils				
CS	Chemical Concentration in Soil	mg/kg	Chemical Specific	See Table 6-3
IR	Ingestion Rate	mg/day	200	U.S. EPA 1989
FI	Fraction Ingested from Source	unitless	1	U.S. EPA 1989
Dermal Contact with Surface Soils				
CS	Chemical Concentration in Soil	mg/kg	Chemical Specific	
SA	Skin Surface Area Available for Contact	cm^2/day	5000	USEPA 1992
AF	Soil to Skin Adherence Factor	mg/cm^2	1	USEPA 1992
ABS	Chemical Specific Absorbtion Constant	unitless	Chemical Specific	
Inhalation of Vapors and Dusts in Air				
CA	Chemical Concentration in Air	mg/m^3	Chemical Specific	
InhR	Inhalation Rate	m^3/day	2.1	USEPA 1989
ET	Exposure Time	hour/day	8	USEPA 1989

Table 40
Comparison of Predicted COPC Concentrations in the Sheldrake River with Standards

ITT Sealectro
Mamaroneck, New York

Chemical	Estimated Concentration of COPCs in the Sheldrake River (ug/l)	MCL (ug/l)	MCL Reference	Ambient Water Quality Criteria for Ingestion of Water and Fish (ug/l)	Ambient Water Quality Criteria for Ingestion of Fish Only (ug/l)
1,1,1-Trichloroethane	0.0038	200	56 FR 30266 (01 Jul 91)		
1,1,2-Trichloroethane	0.000049	5	57 FR 31776 (17 Jul 92)	0.6	42
1,1-Dichloroethane	0.0015				
1,1-Dichloroethene	0.0033	7	52 FR 25690 (08 Jul 87)	0.057	3.2
1,2-Dichloroethene (total)	0.00037	70	56 FR 3526 (30 Jan 91)		
Acetone	0.00011				
Benzene	0.00014	5	52 FR 25690	1.2	71
Bromodichloromethane	0.000010	100	56 FR 30266 (01 Jul 91)	0.27	22
Chloroethane	0.0016				
Chloroform	0.000088	100	56 FR 30266 (01 Jul 91)	5.7	470
Dibromochloromethane	0.000044	100	56 FR 30266 (01 Jul 91)	0.41	34
Tetrachloroethene	0.0078	5	56 FR 3526 (30 Jan 91)	0.8	8.85
Trichloroethene	0.00036	5	52 FR 25690 (08 Jul 87)	2.7	81
Vinyl Chloride	0.0010	2	52 FR 25690 (08 Jul 87)	2	525

Table 41
Estimation of the Reasonable Maximum CDI for the On-Site Worker via Inhalation of Indoor Air from Soil

ITT Sealectro
Mamaroneck, New York

Chemical	Predicted Mean CIA (mg/m3)	IR (m^3/hr)	ET (hr/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days) noncancer effects	Intake for noncancer effects (mg/kg-day)	AT (days) cancer effects	Intake for cancer effects (mg/kg-day)
1,1,1-Trichloroethane	2.65E-02	2.1	8	250	25	70	9125	4.4E-03	25550	1.6E-03
1,1-Dichloroethane	2.95E-03	2.1	8	250	25	70	9125	4.9E-04	25550	1.7E-04
1,2-Dichloroethene (total)	2.48E-03	2.1	8	250	25	70	9125	4.1E-04	25550	1.5E-04
Acetone	1.15E-04	2.1	8	250	25	70	9125	1.9E-05	25550	6.7E-06
Benzene	5.42E-04	2.1	8	250	25	70	9125	8.9E-05	25550	3.2E-05
Carbon Disulfide	1.96E-03	2.1	8	250	25	70	9125	3.2E-04	25550	1.2E-04
Ethyl Benzene	2.76E-04	2.1	8	250	25	70	9125	4.5E-05	25550	1.6E-05
Methylene chloride	2.48E-03	2.1	8	250	25	70	9125	4.1E-04	25550	1.5E-04
Tetrachloroethene	2.93E-02	2.1	8	250	25	70	9125	4.8E-03	25550	1.7E-03
Toluene	2.59E-03	2.1	8	250	25	70	9125	4.3E-04	25550	1.5E-04
Trichloroethene	7.91E-04	2.1	8	250	25	70	9125	1.3E-04	25550	4.6E-05
Xylenes (total)	3.55E-04	2.1	8	250	25	70	9125	5.8E-05	25550	2.1E-05

Equation:

$$Intake = \frac{CIA * IR * ET * ED}{BW * AT}$$

Table 42
Estimation of the Reasonable Maximum CDI for the On-Site Worker via Inhalation of Indoor Air from Ground Water

ITT Sealectro
Mamaroneck, New York

Chemical	Predicted Indoor Air Conc. (mg/m3)	IR (m^3/hr)	ET (hr/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days) noncancer effects	Intake for noncancer effects (mg/kg-day)	AT (days) cancer effects	Intake for cancer effects (mg/kg-day)
1,1,1-Trichloroethane	2.57E-04	2.1	8	250	25	70	9125	4.2E-05	25550	1.5E-05
1,1,2-Trichloroethane	6.68E-07	2.1	8	250	25	70	9125	1.1E-07	25550	3.9E-08
1,1-Dichloroethane	2.76E-05	2.1	8	250	25	70	9125	4.5E-06	25550	1.6E-06
1,1-Dichloroethene	2.09E-04	2.1	8	250	25	70	9125	3.4E-05	25550	1.2E-05
1,2-Dichloroethene (total)	1.65E-05	2.1	8	250	25	70	9125	2.7E-06	25550	9.7E-07
Acetone	1.22E-07	2.1	8	250	25	70	9125	2.0E-08	25550	7.2E-09
Benzene	4.40E-06	2.1	8	250	25	70	9125	7.2E-07	25550	2.6E-07
Bromodichloromethane	1.38E-04	2.1	8	250	25	70	9125	2.3E-05	25550	8.1E-06
Chloroethane	5.41E-06	2.1	8	250	25	70	9125	8.9E-07	25550	3.2E-07
Chloroform	2.92E-06	2.1	8	250	25	70	9125	4.8E-07	25550	1.7E-07
Dibromochloromethane	3.35E-06	2.1	8	250	25	70	9125	5.5E-07	25550	2.0E-07
Tetrachloroethene	1.69E-04	2.1	8	250	25	70	9125	2.8E-05	25550	9.9E-06
Trichloroethene	1.78E-05	2.1	8	250	25	70	9125	2.9E-06	25550	1.0E-06
Vinyl Chloride	7.88E-05	2.1	8	250	25	70	9125	1.3E-05	25550	4.6E-06

Equation:

$$Intake = \frac{CIA * IR * ET * ED}{BW * AT}$$

Table 43
Estimation of the Reasonable Maximum CDI for the Future Construction Worker via Incidental Ingestion of Subsurface Soils

ITT Sealectro
Mamaroneck, New York

Chemical	Mean Soil Conc. (mg/kg)	CF (kg/mg)	IR (mg/day)	FI	EF (events/yr)	ED (year)	BW (kg)	AT non-cancer (days)	Intake for non-cancer effects (mg/kg-day)	AT cancer (days)	Intake for cancer effects (mg/kg-day)
1,1,1-Trichloroethane	14.97	1E-06	480	1	90	0.25	70	90	2.57E-05	25550	9.04E-08
1,1-Dichloroethane	1.62	1E-06	480	1	90	0.25	70	90	2.78E-06	25550	9.78E-09
1,2-Dichloroethene (total)	2.31	1E-06	480	1	90	0.25	70	90	3.95E-06	25550	1.39E-08
Acetone	0.72	1E-06	480	1	90	0.25	70	90	1.23E-06	25550	4.32E-09
Benzene	0.67	1E-06	480	1	90	0.25	70	90	1.15E-06	25550	4.06E-09
Benzo(a)anthracene	2.34	1E-06	480	1	90	0.25	70	90	4.02E-06	25550	1.42E-08
Benzo(a)pyrene	2.35	1E-06	480	1	90	0.25	70	90	4.03E-06	25550	1.42E-08
Benzo(b)fluoranthene	2.41	1E-06	480	1	90	0.25	70	90	4.13E-06	25550	1.45E-08
Benzo(k)fluoranthene	2.29	1E-06	480	1	90	0.25	70	90	3.92E-06	25550	1.38E-08
Bis(2-ethylhexyl)phthalate	2.91	1E-06	480	1	90	0.25	70	90	4.99E-06	25550	1.76E-08
Carbon Disulfide	0.90	1E-06	480	1	90	0.25	70	90	1.54E-06	25550	5.43E-09
Chrysene	2.35	1E-06	480	1	90	0.25	70	90	4.02E-06	25550	1.42E-08
Copper	196.67	1E-06	480	1	90	0.25	70	90	3.37E-04	25550	1.19E-06
Ethyl Benzene	0.75	1E-06	480	1	90	0.25	70	90	1.29E-06	25550	4.53E-09
Fluoranthene	2.47	1E-06	480	1	90	0.25	70	90	4.23E-06	25550	1.49E-08
Methylene chloride	0.87	1E-06	480	1	90	0.25	70	90	1.49E-06	25550	5.25E-09
Nickel	30.52	1E-06	480	1	90	0.25	70	90	5.23E-05	25550	1.84E-07
Phenanthrene	2.36	1E-06	480	1	90	0.25	70	90	4.05E-06	25550	1.43E-08
Tetrachloroethene	48.27	1E-06	480	1	90	0.25	70	90	8.27E-05	25550	2.91E-07
Toluene	4.90	1E-06	480	1	90	0.25	70	90	8.40E-06	25550	2.96E-08
Trichloroethene	1.17	1E-06	480	1	90	0.25	70	90	2.00E-06	25550	7.04E-09
Xylenes (total)	1.25	1E-06	480	1	90	0.25	70	90	2.14E-06	25550	7.55E-09

Equation:

$$Intake = \frac{CS * CF * IR * FI * EF * ED}{BW * AT}$$

Table 44
Estimation of the Reasonable Maximum CDI for the Future Construction Worker via Dermal Contact with Subsurface Soils

ITT Sealectro
Mamaroneck, New York

Chemical	Mean Soil Conc. (mg/kg)	CF (kg/mg)	SA (cm^2/event)	AF (mg/cm^2)	ABS	EF (events/yr)	ED (year)	BW (kg)	AT non-cancer (days)	Intake for non-cancer effects (mg/kg-day)	AT cancer (days)	Intake for cancer effects (mg/kg-day)
1,1,1-Trichloroethane	14.97	1E-06	5800	1	0.01	90	0.25	70	90	3.10E-06	25550	1.09E-08
1,1-Dichloroethane	1.62	1E-06	5800	1	0.01	90	0.25	70	90	3.36E-07	25550	1.18E-09
1,2-Dichloroethene (total)	2.31	1E-06	5800	1	0.01	90	0.25	70	90	4.78E-07	25550	1.68E-09
Acetone	0.72	1E-06	5800	1	0.01	90	0.25	70	90	1.48E-07	25550	5.22E-10
Benzene	0.67	1E-06	5800	1	0.01	90	0.25	70	90	1.39E-07	25550	4.90E-10
Benzo(a)anthracene	2.34	1E-06	5800	1	0.01	90	0.25	70	90	4.86E-07	25550	1.71E-09
Benzo(a)pyrene	2.35	1E-06	5800	1	0.01	90	0.25	70	90	4.86E-07	25550	1.71E-09
Benzo(b)fluoranthene	2.41	1E-06	5800	1	0.01	90	0.25	70	90	4.99E-07	25550	1.76E-09
Benzo(k)fluoranthene	2.29	1E-06	5800	1	0.01	90	0.25	70	90	4.74E-07	25550	1.67E-09
Bis(2-ethylhexyl)phthalate	2.91	1E-06	5800	1	0.01	90	0.25	70	90	6.03E-07	25550	2.12E-09
Carbon Disulfide	0.90	1E-06	5800	1	0.01	90	0.25	70	90	1.86E-07	25550	6.56E-10
Chrysene	2.35	1E-06	5800	1	0.01	90	0.25	70	90	4.86E-07	25550	1.71E-09
Copper	196.67	1E-06	5800	1	0.001	90	0.25	70	90	4.07E-06	25550	1.44E-08
Ethyl Benzene	0.75	1E-06	5800	1	0.01	90	0.25	70	90	1.55E-07	25550	5.47E-10
Fluoranthene	2.47	1E-06	5800	1	0.01	90	0.25	70	90	5.12E-07	25550	1.80E-09
Methylene chloride	0.87	1E-06	5800	1	0.01	90	0.25	70	90	1.80E-07	25550	6.35E-10
Nickel	30.52	1E-06	5800	1	0.001	90	0.25	70	90	6.32E-07	25550	2.23E-09
Phenanthrene	2.36	1E-06	5800	1	0.01	90	0.25	70	90	4.90E-07	25550	1.72E-09
Tetrachloroethene	48.27	1E-06	5800	1	0.01	90	0.25	70	90	1.00E-05	25550	3.52E-08
Toluene	4.90	1E-06	5800	1	0.01	90	0.25	70	90	1.01E-06	25550	3.57E-09
Trichloroethene	1.17	1E-06	5800	1	0.01	90	0.25	70	90	2.42E-07	25550	8.51E-10
Xylenes (total)	1.25	1E-06	5800	1	0.01	90	0.25	70	90	2.59E-07	25550	9.12E-10

Equation:

$$Intake = \frac{CS*CF*SA*AF*ABS*EF*ED}{BW*AT}$$

Table 45
Estimation of the Reasonable Maximum CDI for the Future Construction Worker via Inhalation of Vapors and Dust

ITT Sealectro
Mamaroneck, New York

Chemical	Mean Air Conc. (mg/m3)	IR (m^3/hr)	ET (hr/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days) noncancer effects	Intake for noncancer effects (mg/kg-day)	AT (days) cancer effects	Intake for cancer effects (mg/kg-day)
1,1,1-Trichloroethane	3.89E-03	2.1	8	90	0.25	70	90	2.3E-04	25550	8.2E-07
1,1-Dichloroethane	4.51E-04	2.1	8	90	0.25	70	90	2.7E-05	25550	9.5E-08
1,2-Dichloroethene (total)	5.52E-04	2.1	8	90	0.25	70	90	3.3E-05	25550	1.2E-07
Acetone	1.13E-04	2.1	8	90	0.25	70	90	6.8E-06	25550	2.4E-08
Benzene	1.46E-04	2.1	8	90	0.25	70	90	8.7E-06	25550	3.1E-08
Benzo(a)anthracene	2.34E-04	2.1	8	90	0.25	70	90	1.4E-05	25550	5.0E-08
Benzo(a)pyrene	2.35E-04	2.1	8	90	0.25	70	90	1.4E-05	25550	5.0E-08
Benzo(b)fluoranthene	2.41E-04	2.1	8	90	0.25	70	90	1.4E-05	25550	5.1E-08
Benzo(k)fluoranthene	2.29E-04	2.1	8	90	0.25	70	90	1.4E-05	25550	4.8E-08
Bis(2-ethylhexyl)phthalate	3.04E-04	2.1	8	90	0.25	70	90	1.8E-05	25550	6.4E-08
Carbon Disulfide	2.73E-04	2.1	8	90	0.25	70	90	1.6E-05	25550	5.8E-08
Chrysene	2.35E-04	2.1	8	90	0.25	70	90	1.4E-05	25550	5.0E-08
Copper	1.97E-02	2.1	8	90	0.25	70	90	1.2E-03	25550	4.2E-06
Ethylbenzene	1.25E-04	2.1	8	90	0.25	70	90	7.5E-06	25550	2.6E-08
Fluoranthene	2.47E-04	2.1	8	90	0.25	70	90	1.5E-05	25550	5.2E-08
Methylene Chloride	2.71E-04	2.1	8	90	0.25	70	90	1.6E-05	25550	5.7E-08
Nickel	3.05E-03	2.1	8	90	0.25	70	90	1.8E-04	25550	6.4E-07
Phenanthrene	2.38E-04	2.1	8	90	0.25	70	90	1.4E-05	25550	5.0E-08
Tetrachloroethene	9.18E-03	2.1	8	90	0.25	70	90	5.5E-04	25550	1.9E-06
Toluene	9.32E-04	2.1	8	90	0.25	70	90	5.6E-05	25550	2.0E-07
Trichloroethene	2.33E-04	2.1	8	90	0.25	70	90	1.4E-05	25550	4.9E-08
Xylenes (total)	2.01E-04	2.1	8	90	0.25	70	90	1.2E-05	25550	4.2E-08

Equation:

$$Intake = \frac{CIA * IR * ET * ED}{BW * AT}$$

Table 46
Toxicity Data Summary

ITT Sealectro
Mamaroneck, New York

Chemical	Chronic Oral Reference Dose (mg/kg-day)	Chronic Oral Reference Dose Source	Cancer W-o-E Class	Cancer W-o-E Source	Oral Slope Factor (kg-day/mg)	Oral Slope Factor Source	Inhalation Slope Factor (kg-day/mg)	Inhalation Slope Factor Source
1,1,1-Trichloroethane		HEAST (07/93)	D	IRIS (1994)		NA		NA
1,1,2-Trichloroethane	0.004	IRIS (1994)	C	IRIS (1994)	0.057	IRIS (1994)	0.057	HEAST (07/93)
1,1-Dichloroethane	0.1	HEAST (07/93)	C	IRIS (1994)		NA		NA
1,1-Dichloroethene	0.009	IRIS (1994)	C	IRIS (1994)	0.6	IRIS (1994)	1.2	HEAST (07/93)
1,2-Dichloroethene (mixed isomers)	0.009	HEAST (07/93)	NA	NA		NA		NA
Acetone	0.1	IRIS (1994)	D	IRIS (1994)		NA		NA
Benzene		NA	A	IRIS (1994)	0.029	IRIS (1994)	0.029	HEAST (07/93)
Benzo(a)anthracene		NA	B2	IRIS (1994)	0.73	note 1		NA
Benzo(a)pyrene		NA	B2	IRIS (1994)	7.3	IRIS (1994)		HEAST (03/93)
Benzo(b)fluoranthene		NA	B2	IRIS (1994)	0.73	note 1		NA
Benzo(k)fluoranthene		NA	B2	IRIS (1994)	0.073	note 1		NA
Bis(2-ethylhexyl)phthalate	0.02	IRIS (1994)	B2	IRIS (1994)	0.014	IRIS (1994)		NA
Bromodichloromethane	0.02	IRIS (1994)	B2	IRIS (1994)	0.06	IRIS (03/01/93)		NA
Carbon Disulfide	0.1	IRIS (1994)	NA	NA		NA		NA
Chloroethane								
Chloroform	0.01	IRIS (1994)	B2	IRIS (1994)	0.0061	IRIS (1994)	0.081	HEAST (07/93)
Chrysene		HEAST (07/93)	B2	IRIS (1994)	0.0073	note 1		NA
Copper	0.037	HEAST (07/93)	D	IRIS (1994)		NA		NA
Dibromochloromethane	0.02	IRIS (1994)	C	IRIS (1994)	0.084	IRIS (1994)		NA
Dichloromethane								
Ethylbenzene	0.1	IRIS (1994)	D	IRIS (1994)		NA		NA
Fluoranthene	0.04	IRIS (1994)	D	IRIS (1994)		NA		NA
Methylene Chloride	0.06	IRIS (1994)	B2	IRIS (1994)	0.0075	IRIS (1994)	0.0016	IRIS (1994)
Nickel	0.02	IRIS (1994)	NA	NA		IRIS (03/01/94)		IRIS (03/01/94)
Phenanthrene	0.03	note 2	D	IRIS (1994)		NA		NA
Tetrachloroethene	0.01	IRIS (1994)	C-B2	ECAO (1992)	0.052	ECAO (1992)	0.002	ECAO (1992)
Toluene	0.2	IRIS (1994)	D	IRIS (1994)		NA		NA
Trichloroethene		NA	NA	NA		NA		NA
Vinyl Chloride		NA	A	HEAST (07/93)	1.9	HEAST (07/93)	0.3	HEAST (07/93)
Xylenes (total)	2	IRIS (1994)	D	IRIS (1994)		NA		NA

Table 47
Hazard Index (HI) Estimation for the On-Site Worker

ITT Sealectro
Mamaroneck, New York

Pathway	Chemical	Mean CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Mean Chemical HQ	Mean Pathway HI	Hazard Index Total
Inhalation of Indoor Air from Soil	1,1,1-Trichloroethane	4.4E-03				
	1,1-Dichloroethane	4.9E-04	0.1	0.00486		
	1,2-Dichloroethene (total)	4.1E-04	0.009	0.04521		
	Acetone	1.9E-05	0.1	0.00019		
	Benzene	8.9E-05				
	Carbon Disulfide	3.2E-04	0.1	0.00323		
	Ethyl Benzene	4.5E-05	0.1	0.00045		
	Methylene chloride	4.1E-04	0.06	0.00680		
	Tetrachloroethene	4.8E-03	0.01	0.48118		
	Toluene	4.3E-04	0.2	0.00213		
	Trichloroethene	1.3E-04				
	Xylenes (total)	5.8E-05	2	0.00003	0.54407	
Inhalation of Indoor Air from Ground Water	1,1,1-Trichloroethane	4.2E-05				
	1,1,2-Trichloroethane	1.1E-07	0.004	0.00003		
	1,1-Dichloroethane	4.5E-06	0.1	0.00005		
	1,1-Dichloroethene	3.4E-05	0.009	0.00381		
	1,2-Dichloroethene (total)	2.7E-06	0.009	0.00030		
	Acetone	2.0E-08	0.1	0.00000		
	Benzene	7.2E-07				
	Bromodichloromethane	2.3E-05	0.02	0.00113		
	Chloroethane	8.9E-07				
	Chloroform	4.8E-07	0.01	0.00005		
	Dibromochloromethane	5.5E-07	0.02	0.00003		
	Tetrachloroethene	2.8E-05	0.01	0.00278		
	Trichloroethene	2.9E-06				
	Vinyl Chloride	1.3E-05			0.00817	0.6

Table 48
Hazard Index (HI) Estimate for the Future Construction Worker

ITT Sealectro
Mamaroneck, New York

	Chemical	Mean CDI (mg/kg-day)	Oral RfD (mg/kg-day)	Mean Chemical HQ	Mean Pathway HI	Hazard Index Total
Inhalation	1,1,1-Trichloroethane	2.3E-04				
of Vapors	1,1-Dichloroethane	2.7E-05	0.1	0.0003		
and Dusts	1,2-Dichloroethene (total)	3.3E-05	0.009	0.004		
	Acetone	6.8E-06	0.1	0.0001		
	Benzene	8.7E-06				
	Benzo(a)anthracene	1.4E-05				
	Benzo(a)pyrene	1.4E-05				
	Benzo(b)fluoranthene	1.4E-05				
	Benzo(k)fluoranthene	1.4E-05				
	Bis(2-ethylhexyl)phthalate	1.8E-05	0.02	0.0009		
	Carbon Disulfide	1.6E-05	0.1	0.0002		
	Chrysene	1.4E-05				
	Copper	1.2E-03	0.037	0.03		
	Ethyl Benzene	7.5E-06	0.1	0.0001		
	Fluoranthene	1.5E-05	0.04	0.0004		
	Methylene chloride	1.6E-05	0.06	0.0003		
	Nickel	1.8E-04	0.02	0.009		
	Phenanthrene	1.4E-05	0.03	0.0005		
	Tetrachloroethene	5.5E-04	0.01	0.06		
	Toluene	5.6E-05	0.2	0.0003		
	Trichloroethene	1.4E-05				
	Xylenes (total)	1.2E-05	2	0.0000	0.10	0.13

Table 49
Cancer Risk Estimate for the On-Site Worker

ITT Sealectro
Mamaroneck, New York

Pathway	Chemical	Mean CDI (mg/kg-day)	Inhalation Slope Factor (kg-day/mg)	Mean Chemical Risk	Mean Pathway Risk	Cancer Risk Total
Inhalation of Indoor Air from Soil	1,1,1-Trichloroethane	1.6E-03				
	1,1-Dichloroethane	1.7E-04				
	1,2-Dichloroethene (total)	1.5E-04				
	Acetone	6.7E-06				
	Benzene	3.2E-05	0.029	9.23E-07		
	Carbon Disulfide	1.2E-04				
	Ethyl Benzene	1.6E-05				
	Methylene chloride	1.5E-04	0.0016	2.33E-07		
	Tetrachloroethene	1.7E-03	0.002	3.44E-06		
	Toluene	1.5E-04				
	Trichloroethene	4.6E-05	0.006	2.78E-07		
	Xylenes (total)	2.1E-05			4.87E-06	
Inhalation of Indoor Air from Ground Water	1,1,1-Trichloroethane	1.5E-05				
	1,1,2-Trichloroethane	3.9E-08	0.057	2.24E-09		
	1,1-Dichloroethane	1.6E-06				
	1,1-Dichloroethene	1.2E-05	1.2	1.47E-05		
	1,2-Dichloroethene (total)	9.7E-07				
	Acetone	7.2E-09				
	Benzene	2.6E-07	0.029	7.49E-09		
	Bromodichloromethane	8.1E-06	0.06	4.85E-07		
	Chloroethane	3.2E-07				
	Chloroform	1.7E-07	0.081	1.39E-08		
	Dibromochloromethane	2.0E-07	0.084	1.65E-08		
	Tetrachloroethene	9.9E-06	0.002	1.99E-08		
	Trichloroethene	1.0E-06	0.006	6.26E-09		
	Vinyl Chloride	4.6E-06	0.3	1.39E-06	1.67E-05	2.15E-05

Table 50
Cancer Risk Estimate for the Future Construction Worker

ITT Sealectro
Mamaroneck, New York

Pathway	Chemical	Mean CDI (mg/kg-day)	Oral SF (kg-day/mg)	Mean Chemical Risk	Mean Pathway Risk	Cancer Risk Total
Incidental Ingestion of Soils	1,1,1-Trichloroethane	9.04E-08				
	1,1-Dichloroethane	9.78E-09				
	1,2-Dichloroethene (total)	1.39E-08				
	Acetone	4.32E-09				
	Benzene	4.06E-09	0.029	1.2E-10		
	Benzo(a)anthracene	1.42E-08	0.73	1.0E-08		
	Benzo(a)pyrene	1.42E-08	7.3	1.0E-07		
	Benzo(b)fluoranthene	1.45E-08	0.73	1.1E-08		
	Benzo(k)fluoranthene	1.38E-08	0.073	1.0E-09		
	Bis(2-ethylhexyl)phthalate	1.76E-08	0.014	2.5E-10		
	Carbon Disulfide	5.43E-09				
	Chrysene	1.42E-08	0.0073	1.0E-10		
	Copper	1.19E-06				
	Ethyl Benzene	4.53E-09				
	Fluoranthene	1.49E-08				
	Methylene chloride	5.25E-09	0.0075	3.9E-11		
	Nickel	1.84E-07				
	Phenanthrene	1.43E-08				
	Tetrachloroethene	2.91E-07	0.052	1.5E-08		
	Toluene	2.96E-08				
	Trichloroethene	7.04E-09	0.011	7.7E-11		
	Xylenes (total)	7.55E-09			1.4E-07	
Dermal Contact with Soils	1,1,1-Trichloroethane	1.09E-08				
	1,1-Dichloroethane	1.18E-09				
	1,2-Dichloroethene (total)	1.68E-09				
	Acetone	5.22E-10				
	Benzene	4.90E-10	0.029	1.4E-11		
	Benzo(a)anthracene	1.71E-09	0.73	1.2E-09		
	Benzo(a)pyrene	1.71E-09	7.3	1.3E-08		
	Benzo(b)fluoranthene	1.76E-09	0.73	1.3E-09		
	Benzo(k)fluoranthene	1.67E-09	0.073	1.2E-10		
	Bis(2-ethylhexyl)phthalate	2.12E-09	0.014	3.0E-11		
	Carbon Disulfide	6.56E-10				
	Chrysene	1.71E-09	0.0073	1.3E-11		
	Copper	1.44E-08				
	Ethyl Benzene	5.47E-10				
	Fluoranthene	1.80E-09				
	Methylene chloride	6.35E-10	0.0075	4.8E-12		
	Nickel	2.23E-09				
	Phenanthrene	1.72E-09				
	Tetrachloroethene	3.52E-08	0.052	1.8E-09		
	Toluene	3.57E-09				
	Trichloroethene	8.51E-10	0.011	9.4E-12		
	Xylenes (total)	9.12E-10			1.7E-08	

continued

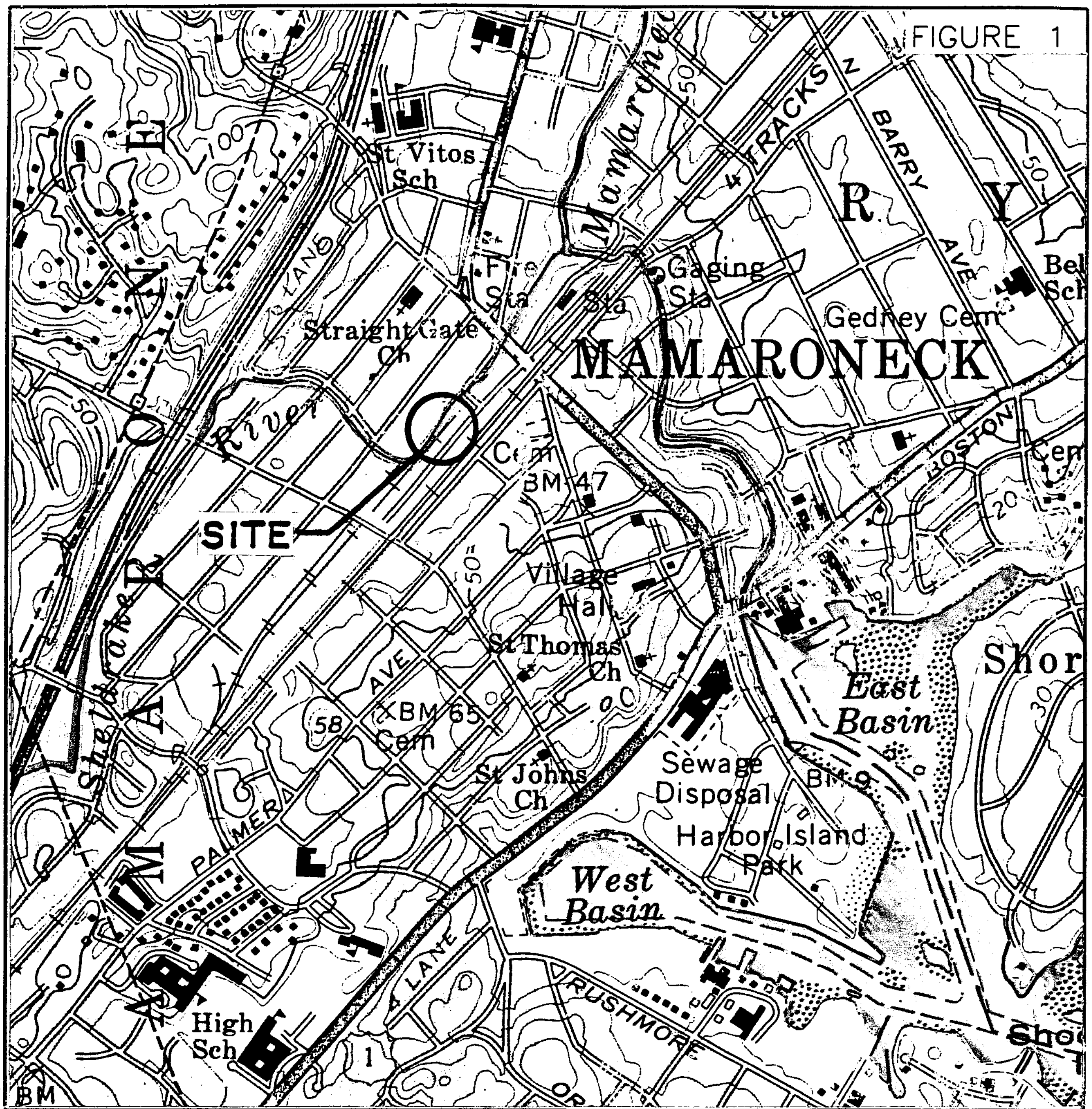
Table 50
Cancer Risk Estimate for the Future Construction Worker

ITT Sealectro
Mamaroneck, New York

	Chemical	Mean CDI (mg/kg-day)	Inhalation SF (kg-day/mg)	Mean Chemical Risk	Mean Pathway Risk	Cancer Risk Total
Inhalation of Vapors and Dusts	1,1,1-Trichloroethane	8.2E-07				
	1,1-Dichloroethane	9.5E-08				
	1,2-Dichloroethene (total)	1.2E-07				
	Acetone	2.4E-08				
	Benzene	3.1E-08	0.029	8.9E-10		
	Benzo(a)anthracene	5.0E-08	0.73	3.6E-08		
	Benzo(a)pyrene	5.0E-08	7.3	3.6E-07		
	Benzo(b)fluoranthene	5.1E-08	0.73	3.7E-08		
	Benzo(k)fluoranthene	4.8E-08	0.073	3.5E-09		
	Bis(2-ethylhexyl)phthalate	6.4E-08	0.014	9.0E-10		
	Carbon Disulfide	5.8E-08				
	Chrysene	5.0E-08	0.0073	3.6E-10		
	Copper	4.2E-06				
	Ethyl Benzene	2.6E-08				
	Fluoranthene	5.2E-08				
	Methylene chloride	5.7E-08	0.0016	9.2E-11		
	Nickel	6.4E-07				
	Phenanthrene	5.0E-08				
	Tetrachloroethene	1.9E-06	0.002	3.9E-09		
	Toluene	2.0E-07				
	Trichloroethene	4.9E-08	0.006	3.0E-10		
	Xylenes (total)	4.2E-08			4.5E-07	6.0E-07

Figures

O'BRIEN & GERE
ENGINEERS, INC.



ITT SEALECTRO
MAMARONECK, NEW YORK

QUADRANGLE LOCATION

SITE LOCATION MAP

0 1000 2000
SCALE IN FEET

ADAPTED FROM U.S.G.S. QUAD. 7.5 MIN. QUAD. MAP, MAMARONECK, NEW YORK

1/28/93
3356.015.25F
8X11

O'BRIEN & GERE ENGINEERS, INC.

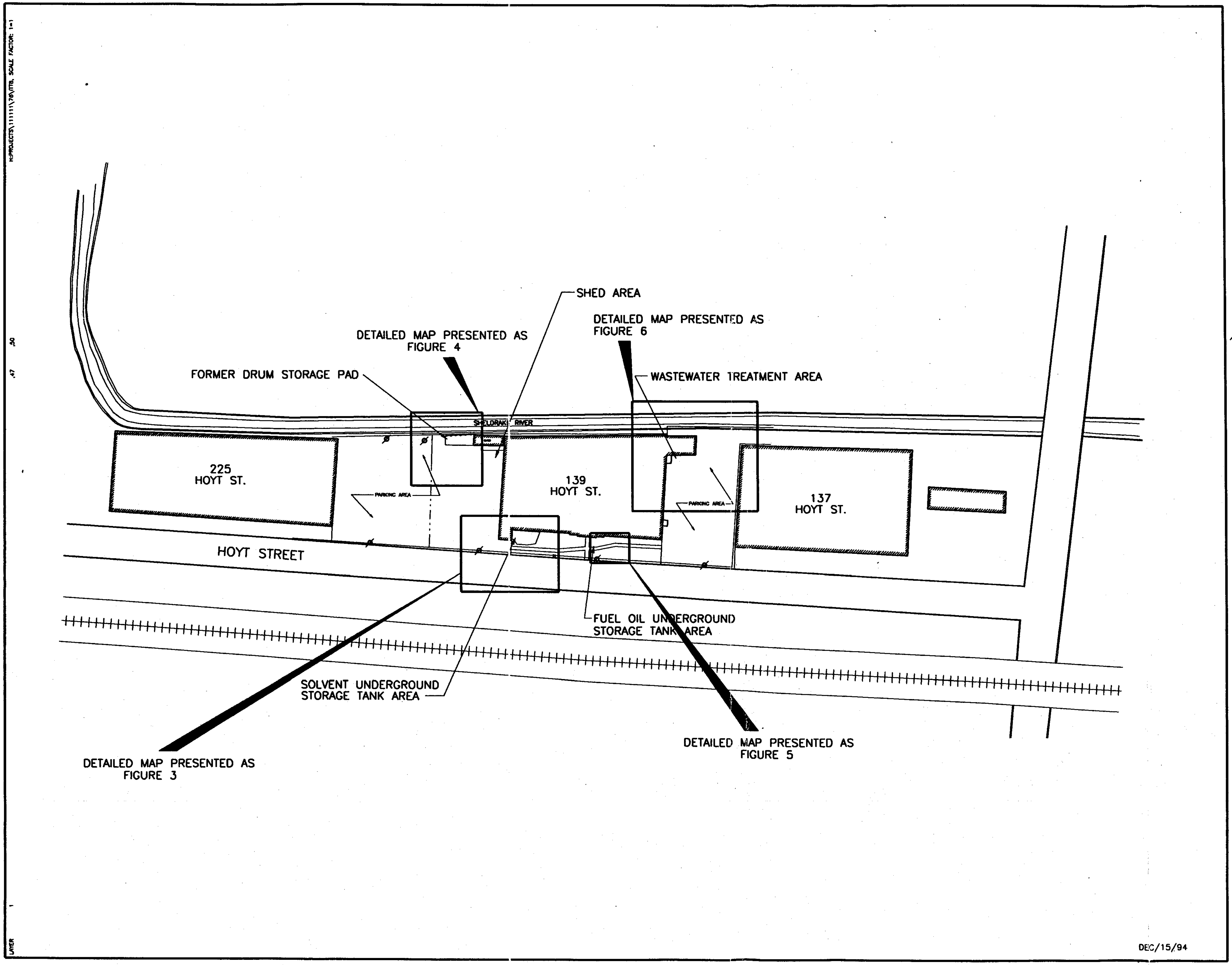


FIGURE 2

ITT SEALECTRO
MAMARONECK, NEW YORK

SITE MAP

3356.015.12F

O'BRIEN & GERE ENGINEERS, INC.

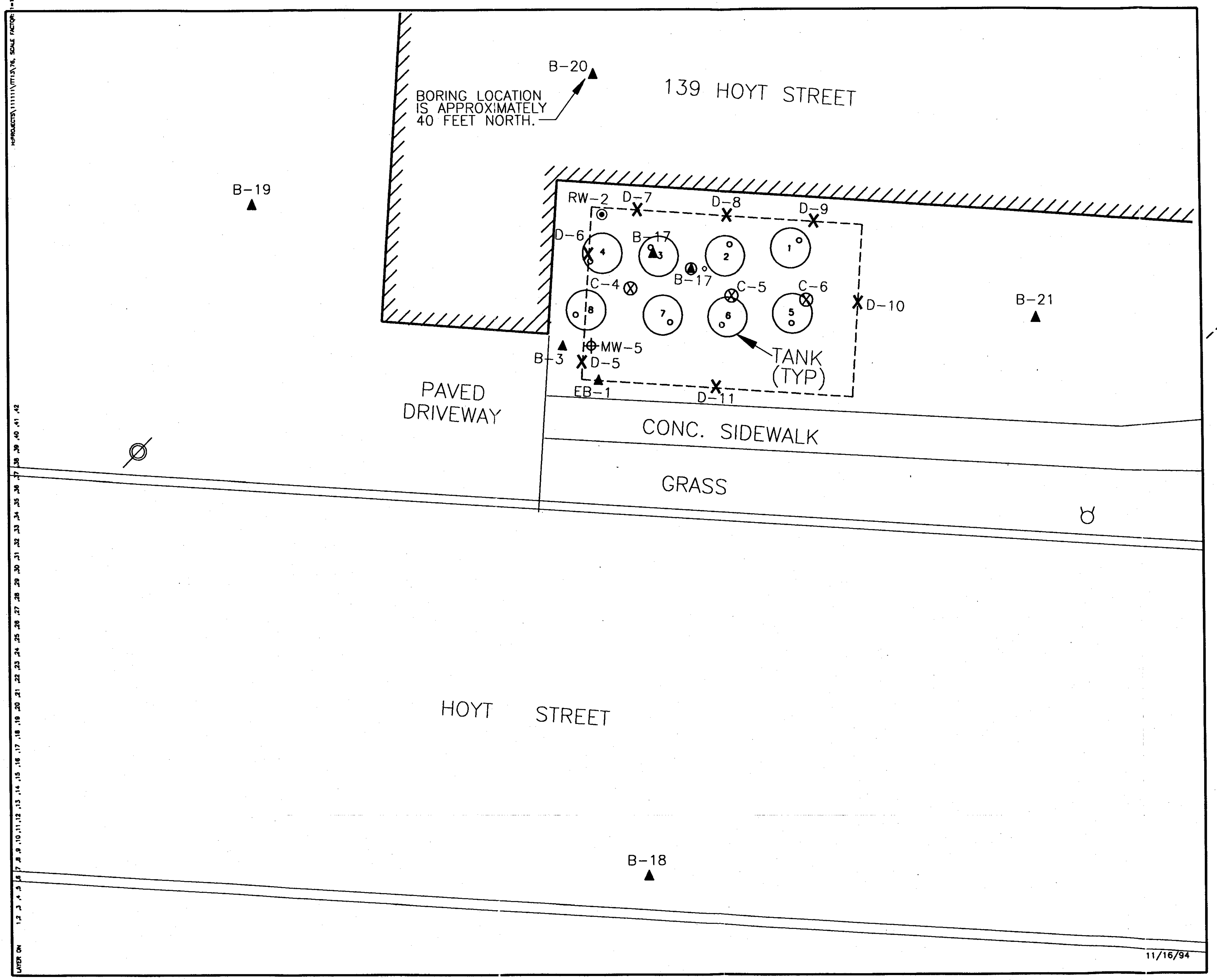


FIGURE 3

ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND

- LIMITS OF EXCAVATION
- SOIL BORING LOCATION (10/91)
- RECOVERY WELL LOCATION
- SOIL BORING (2/92)
- POST EXCAVATION SIDE SOIL SAMPLE (4/92)
- POST EXCAVATION BOTTOM SOIL SAMPLE (4/92)
- FORMER TANK LOCATION (APPROXIMATE)
- FORMER DEWATERING WELL (REMOVED 4/92)

SOLVENT UNDERGROUND STORAGE TANK AREA LOCATION MAP

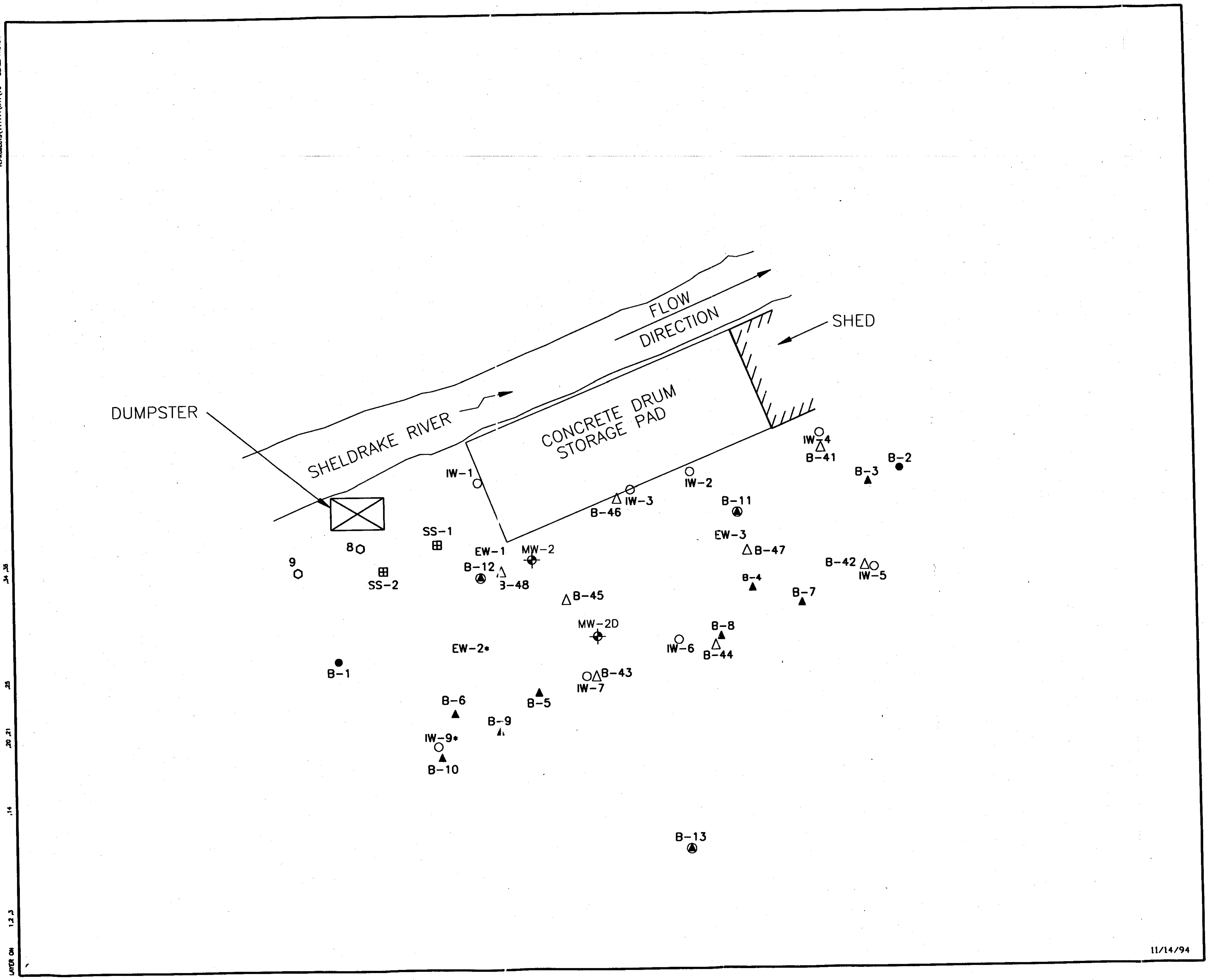
8 0 8
APPROX. SCALE IN FEET

3356.015.15F

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 4

ITT SEALECTRO
MAMARONECK, NEW YORK



LEGEND

- MONITORING WELL
- SOIL BORING (6/88, TRC)
- SOIL BORING (8/89, OBG)
- SOIL BORING (1/92, OBG)
- SOIL SAMPLE (8/89, OBG)
- INLET WELL (10/91, OBG)
- EXTRACTION WELL (10/91, OBG)
- SURFACE SOIL SAMPLE (2/86, OBG)
- OBG SOIL BORING (12/93, OBG)
- * INLET & EXTRACTION WELLS REMOVED

FORMER DRUM STORAGE PAD AREA LOCATION MAP

0 10 20
APPROX. SCALE IN FEET

3356.015.08F

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

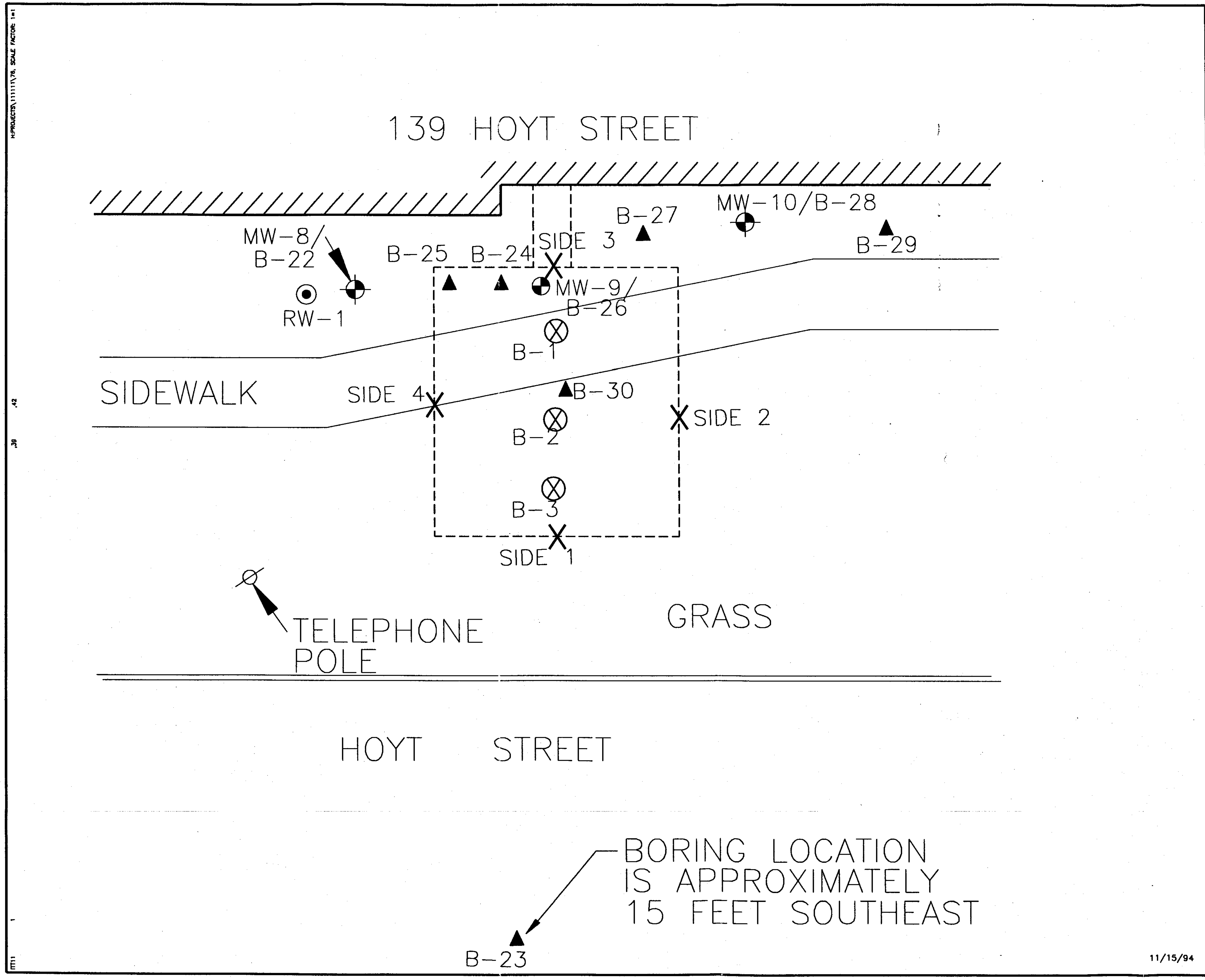


FIGURE 5

ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND

- LIMITS OF EXCAVATION
- MONITORING WELL LOCATION
- SOIL BORING LOCATION (12/92)
- RECOVERY WELL LOCATION
- POST EXCAVATION SIDE SOIL SAMPLE (4/92)
- POST EXCAVATION BOTTOM SOIL SAMPLE (4/92)

FUEL OIL UNDERGROUND
STORAGE TANK AREA
LOCATION MAP

5 0 5
APPROX. SCALE IN FEET

3356.015.11F

O'BRIEN & GERE ENGINEERS, INC.

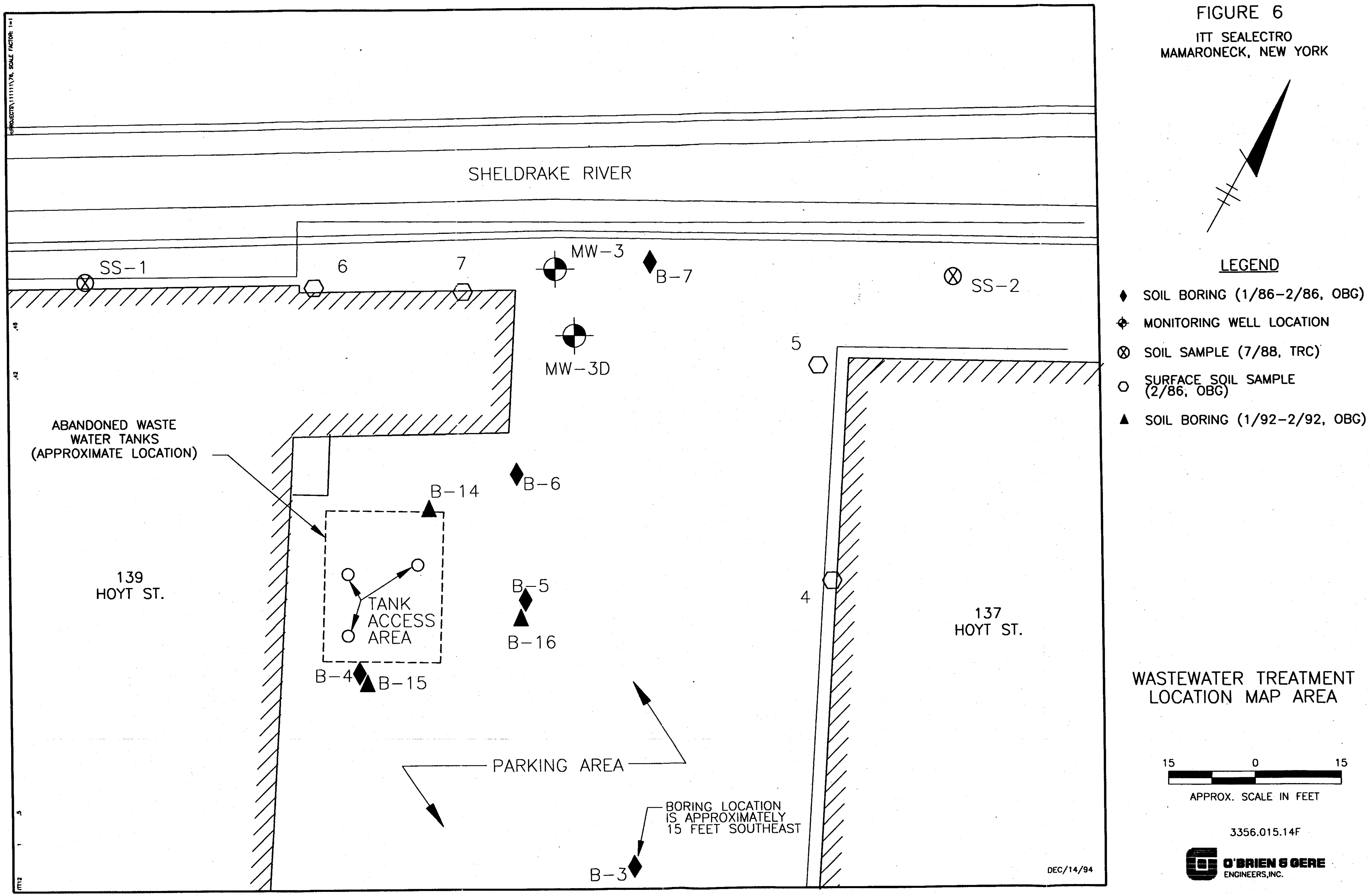


FIGURE 6

ITT SEALECTRO
MAMARONECK, NEW YORK

WASTEWATER TREATMENT
LOCATION MAP AREA

15 0 15
APPROX. SCALE IN FEET

3356.015.14F

O'BRIEN & GERE ENGINEERS, INC.

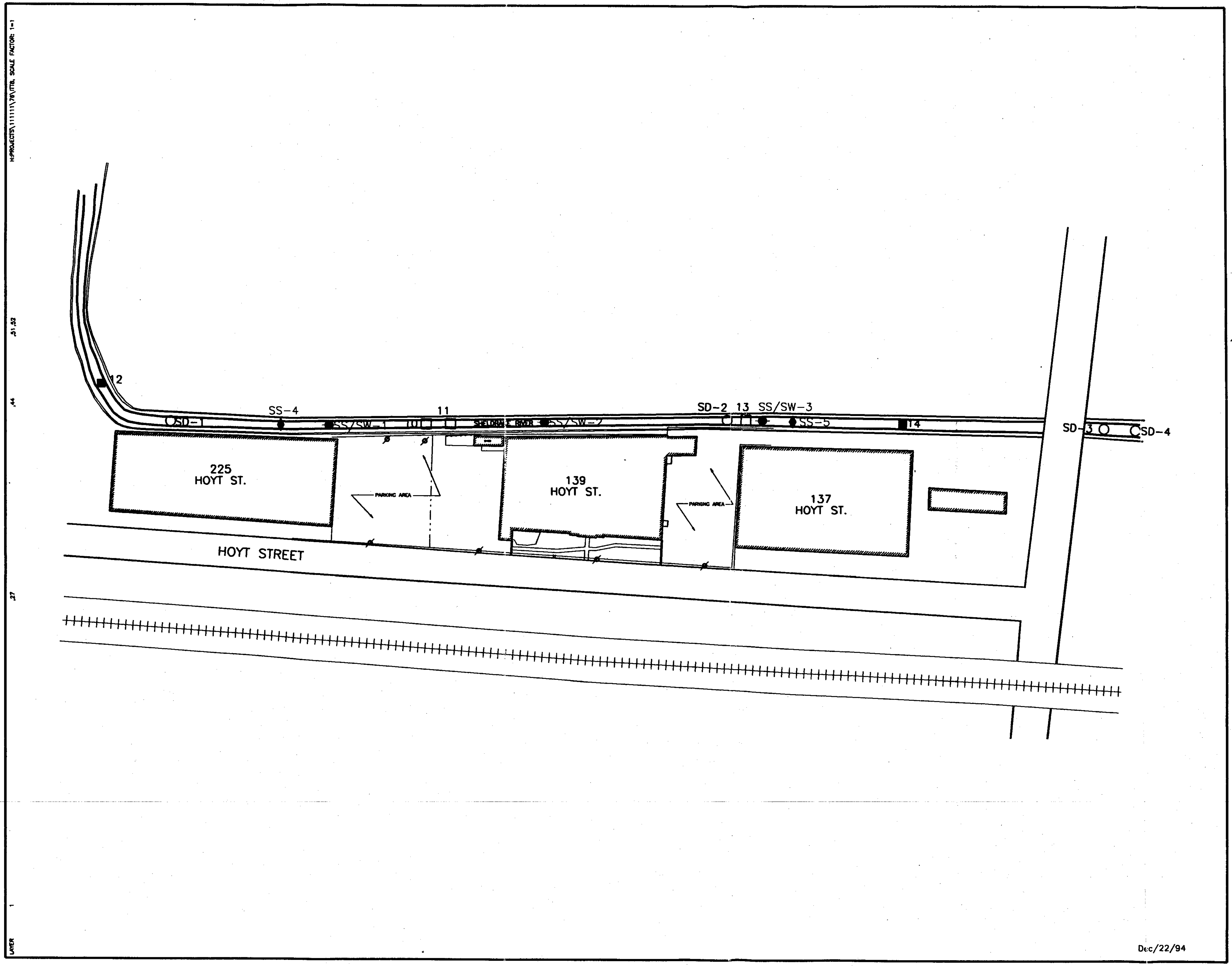


FIGURE 7

ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND

- PROPERTY LINE
- □ SEDIMENT SAMPLE (2/86-OBG)
- UTILITY POLE
- ■ SURFACE WATER/SEDIMENT SAMPLE (2/86, OBG)
- ● SURFACE WATER/SEDIMENT SAMPLE (2/92-4/92, OBG)
- ○ RIVER SEDIMENT SAMPLE (6/88, TRC)
- ♦ SEDIMENT SAMPLE (6/94, OBG)

SHELDRAKE RIVER
SURFACE WATER/SEDIMENT
SAMPLE LOCATION MAP

100 0 100
APPROX. SCALE IN FEET

3356.015.13F

O'BRIEN & GERE ENGINEERS, INC.

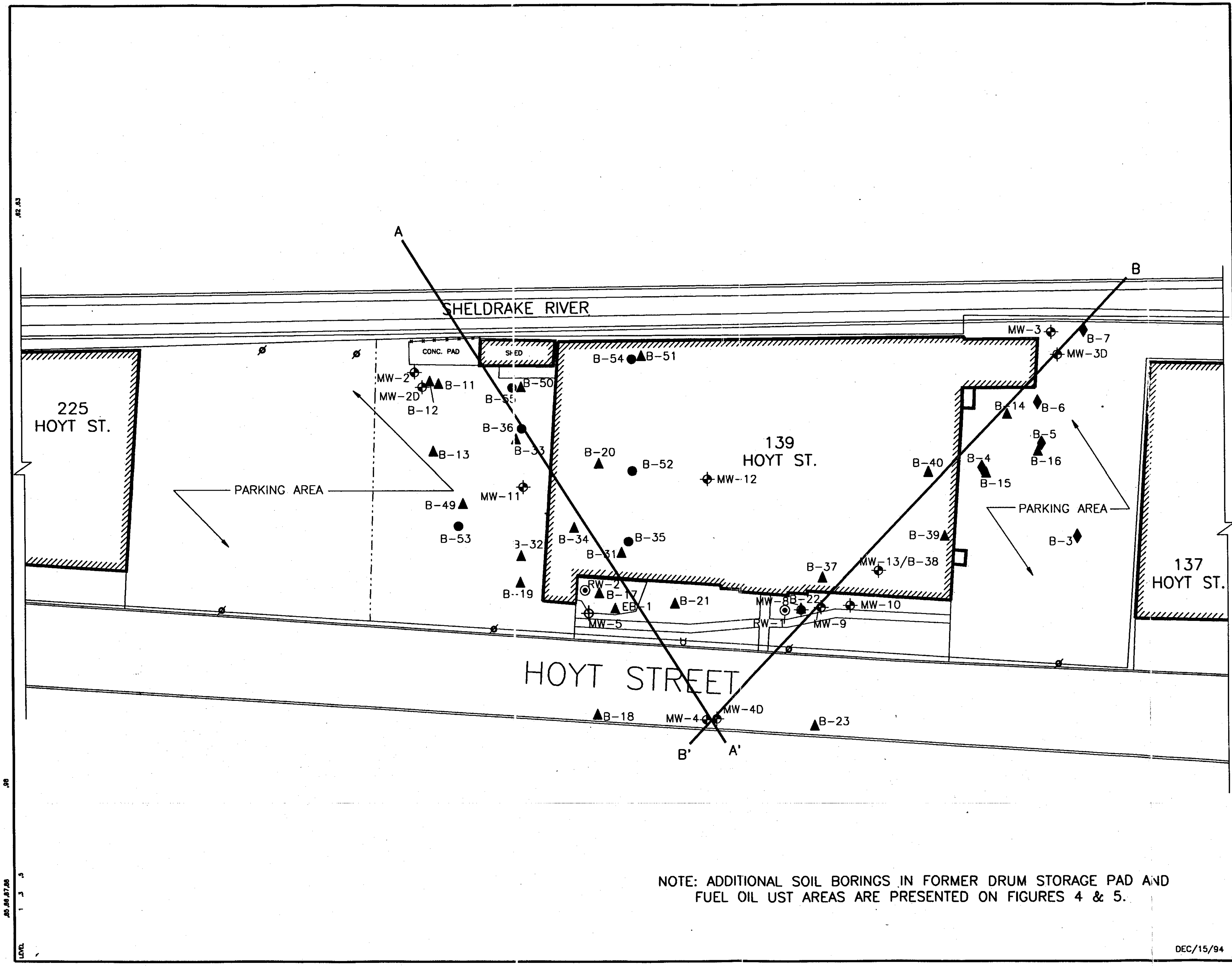


FIGURE 8

ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND

- PROPERTY LINE
- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- UTILITY POLE
- B'—B HYDROGEOLOGIC CROSS SECTION
- FORMER DEWATERING WELL
- SOIL BORING LOCATION
- DEEP SOIL BORING LOCATION
- SOIL BORING (1/86–2/86, OBG)

MONITORING WELL AND SOIL BORING LOCATION MAP

40 0 40

APPROX. SCALE IN FEET

3356.015–04F

O'BRIEN & GERE ENGINEERS, INC.

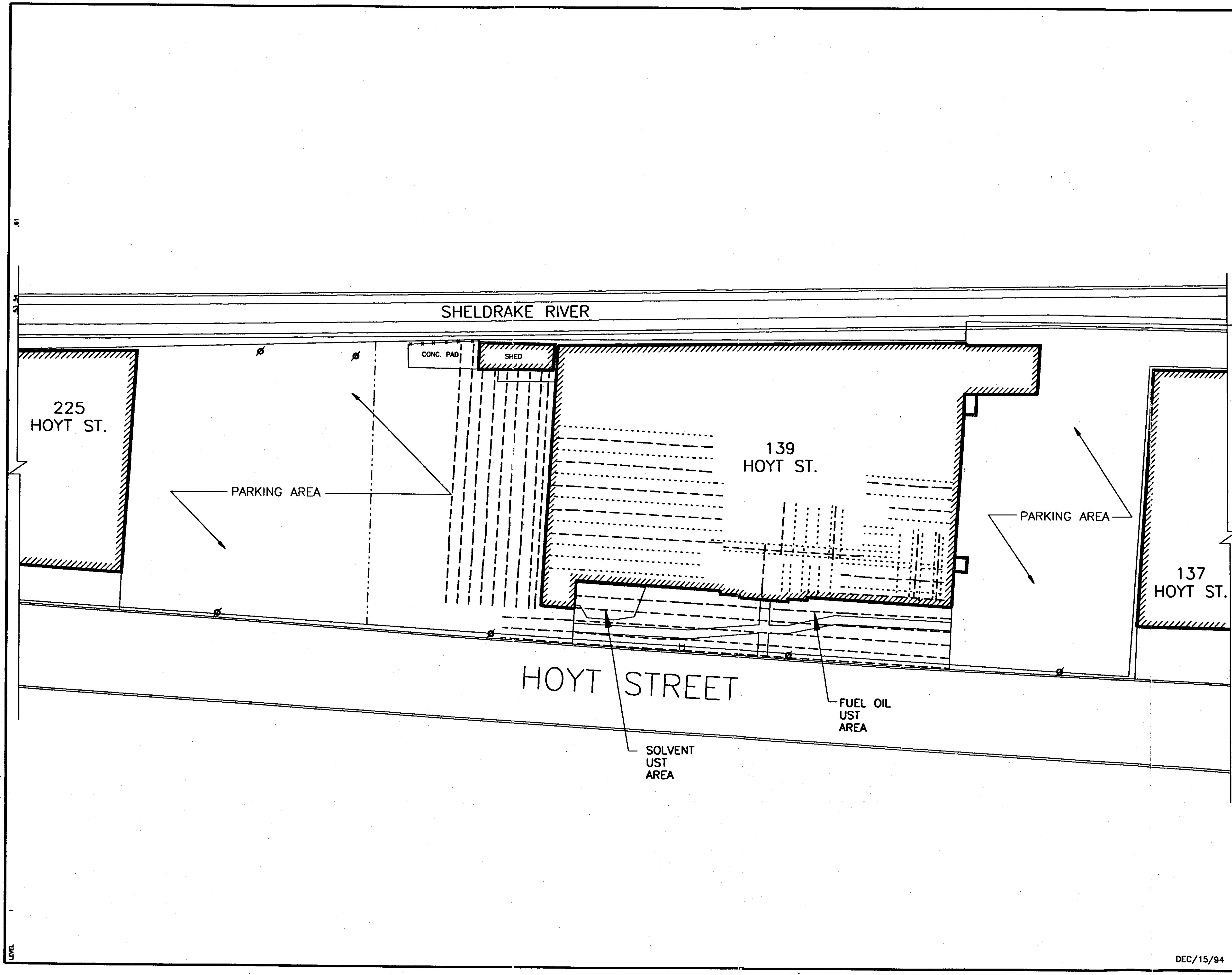


FIGURE 9
ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND
PROPERTY LINE
UTILITY POLE
600 Mhz SURVEY LINE
120 Mhz SURVEY LINE

GPR SURVEY
LOCATION MAP

40 0 40
APPROX. SCALE IN FEET

3356.015-26F

O'BRIEN & GERE ENGINEERS, INC.

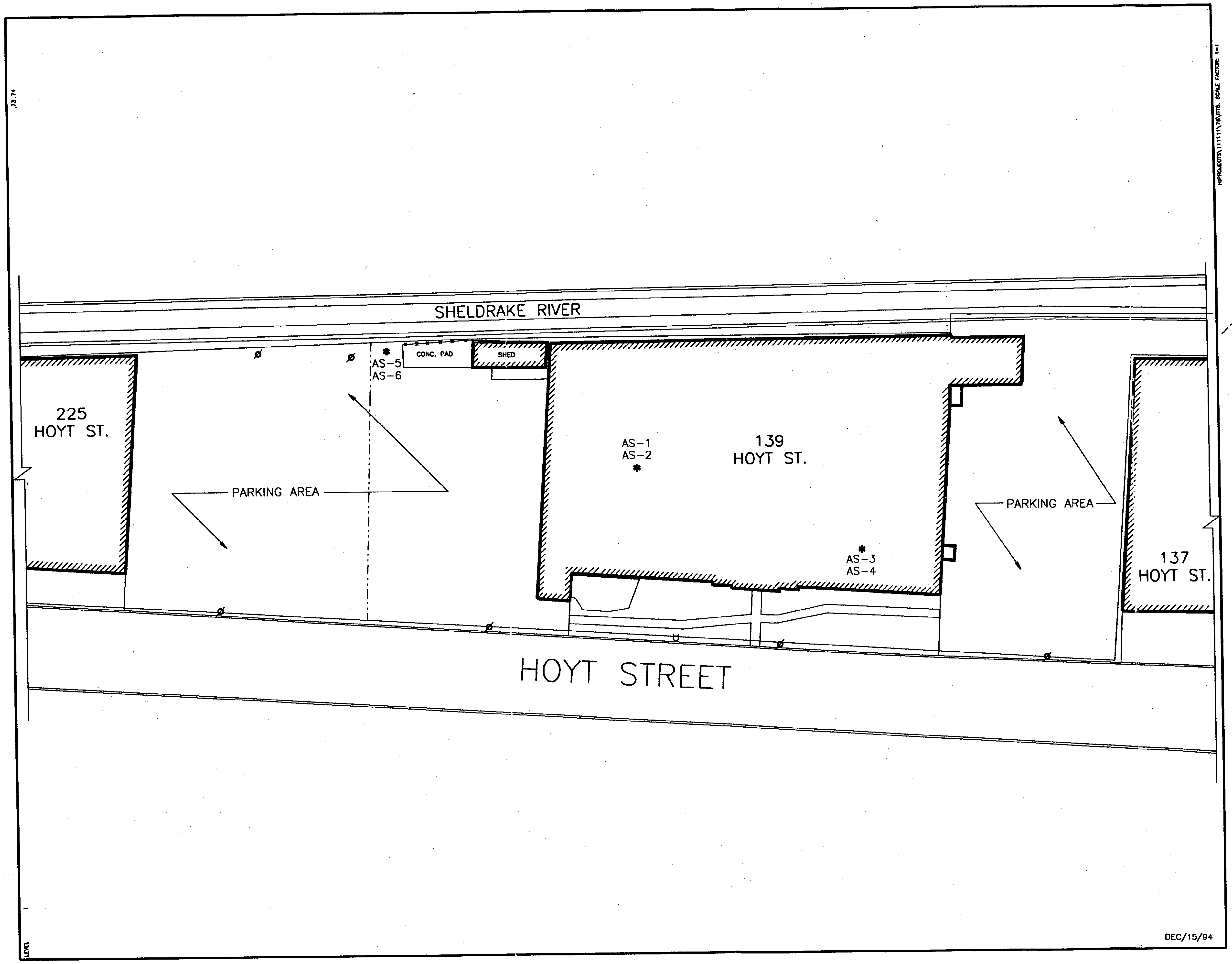


FIGURE 10

ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND

- PROPERTY LINE
- Ø UTILITY POLE
- * AIR SAMPLE LOCATION (LOCATIONS ARE APPROXIMATE)

AIR SAMPLING LOCATION MAP

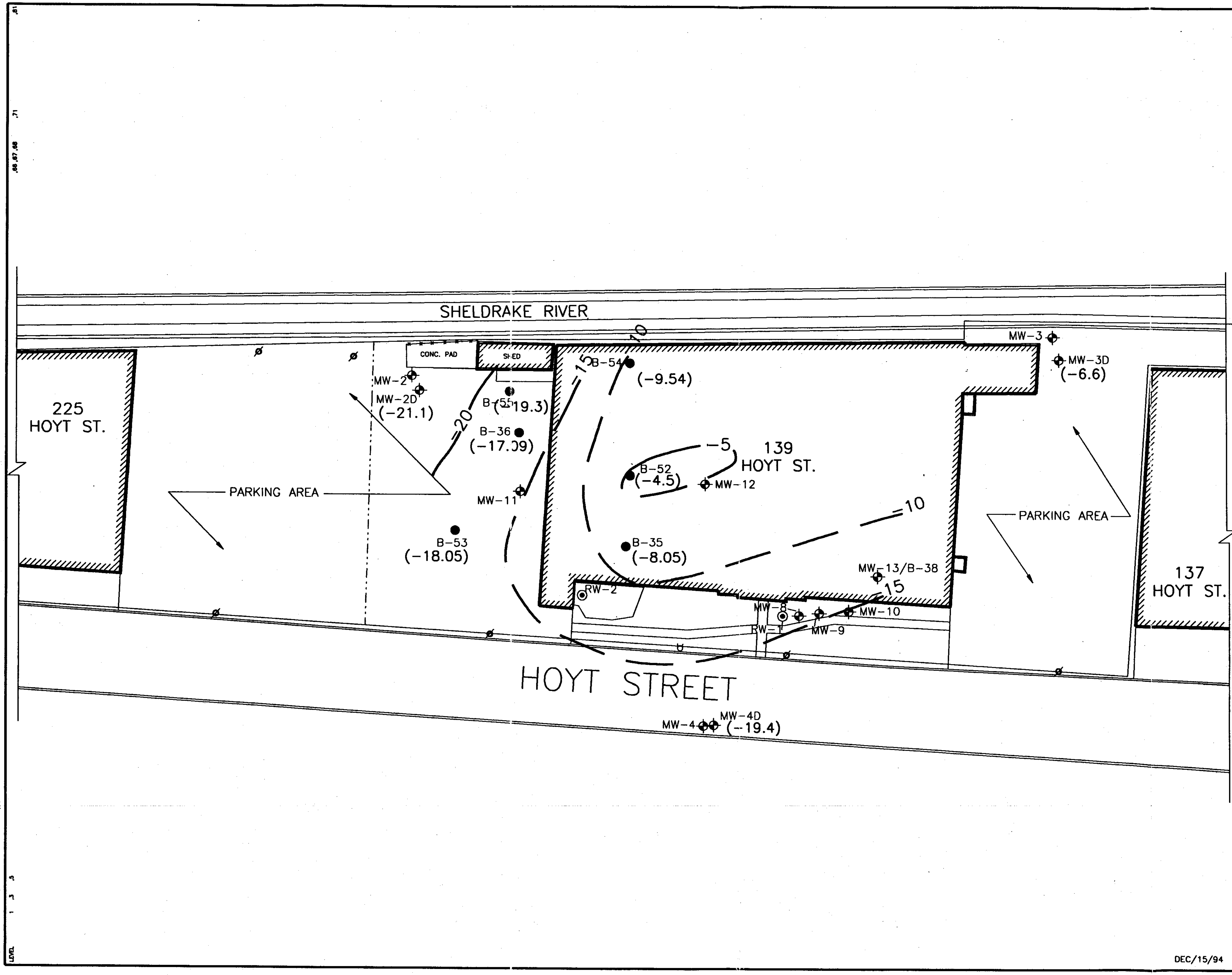
40 0 40
APPROX. SCALE IN FEET

3356.015-03F

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 11

ITT SEALECTRO
MAMARONECK, NEW YORK



LEGEND

- PROPERTY LINE
- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- UTILITY POLE
- DEEP SOIL BORING LOCATION
- -5 TOP OF BEDROCK ELEVATION CONTOUR
- (-6.6) TOP OF BEDROCK ELEVATION (FEET BELOW MEAN SEA LEVEL)

TOP OF BEDROCK CONTOUR MAP

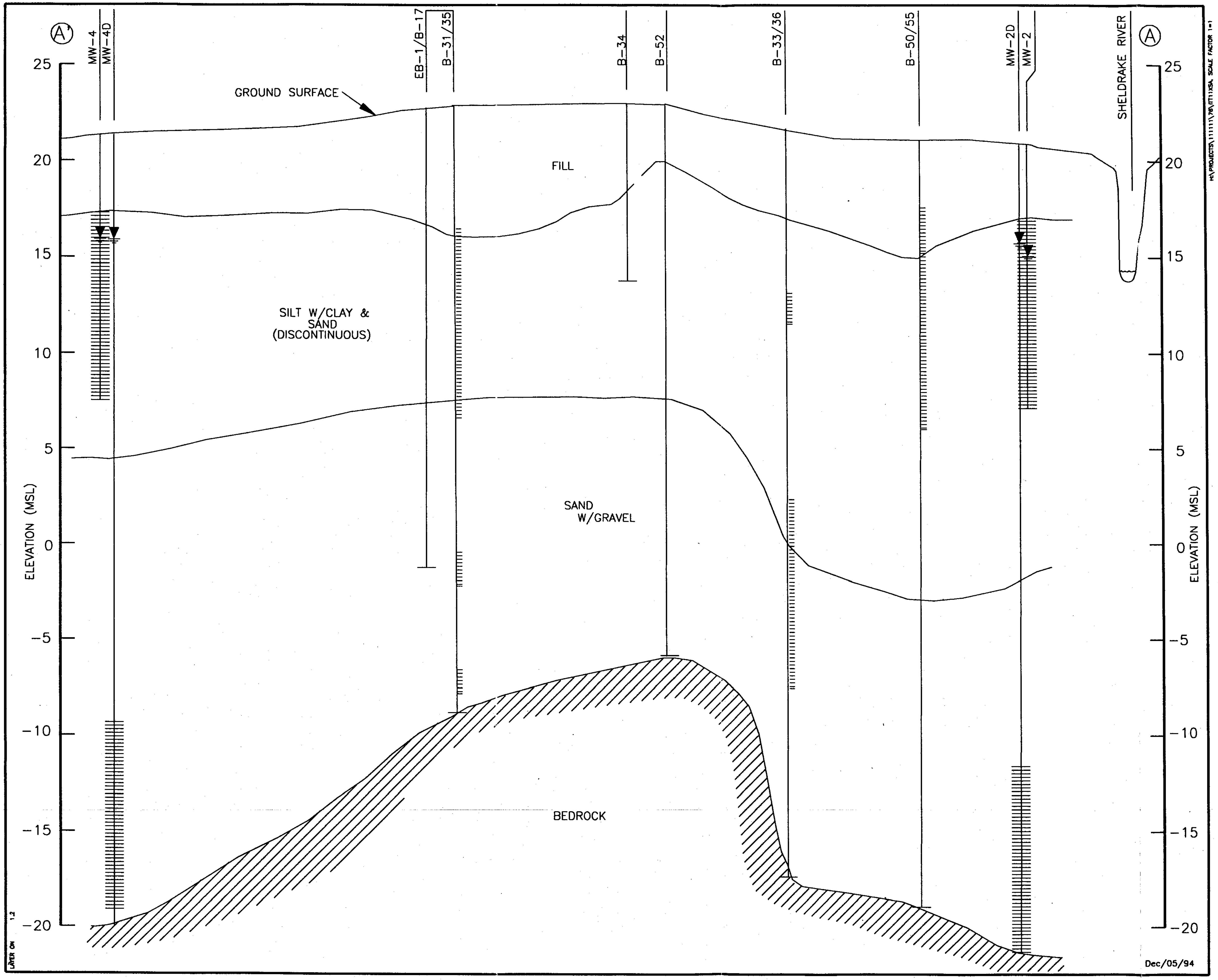
40 0 40
APPROX. SCALE IN FEET

3356.015-05F

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 12

ITT SEALECTRO
MAMARONECK, NEW YORK



LEGEND

MONITORING WELL SCREENED INTERVAL

SOIL BORING LOCATION

GROUND WATER ELEVATION (11/17/94)

NOTE:
VERTICAL EXAGGERATION IS 6X.

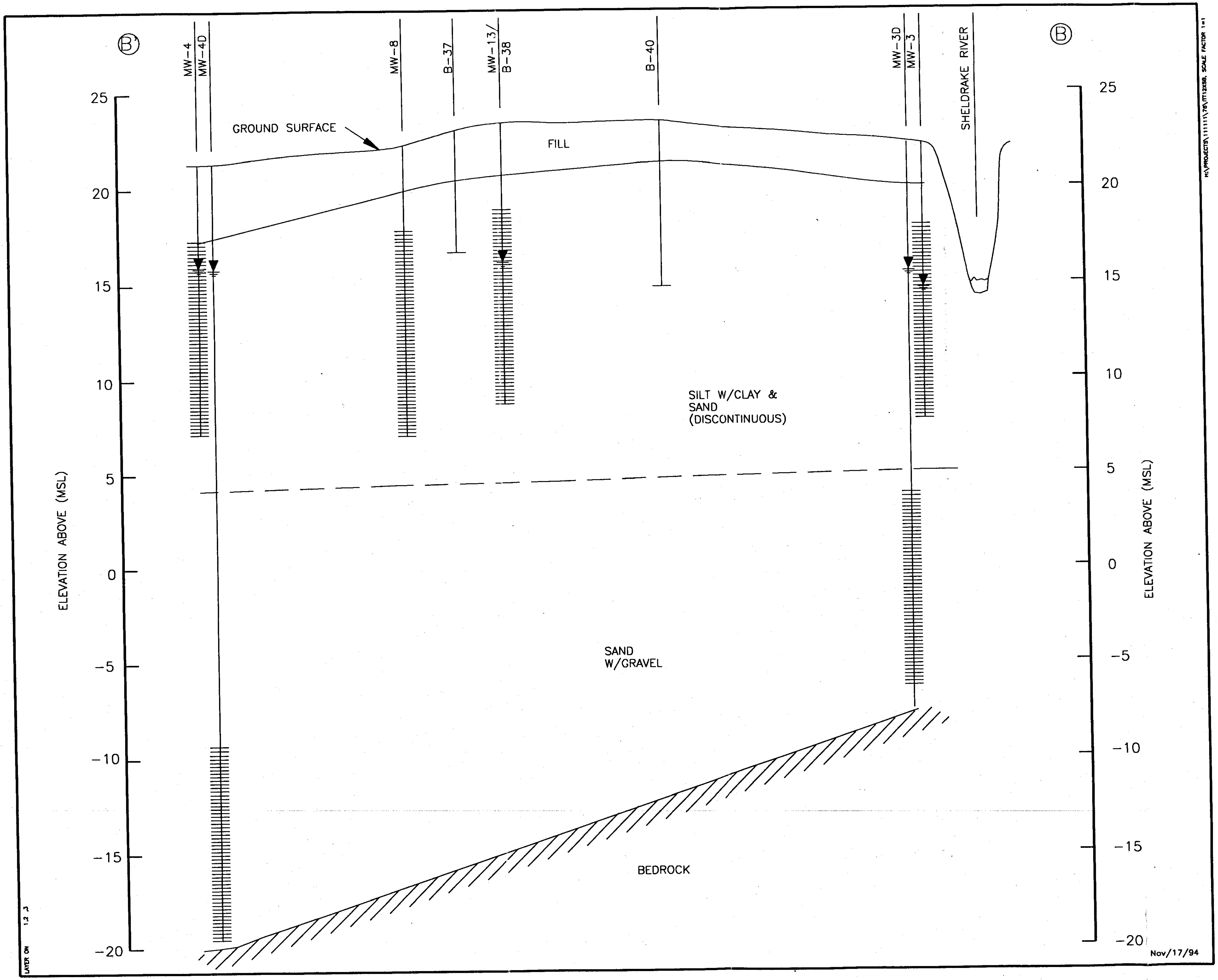
GENERALIZED
HYDROGEOLOGIC
CROSS SECTION A-A'

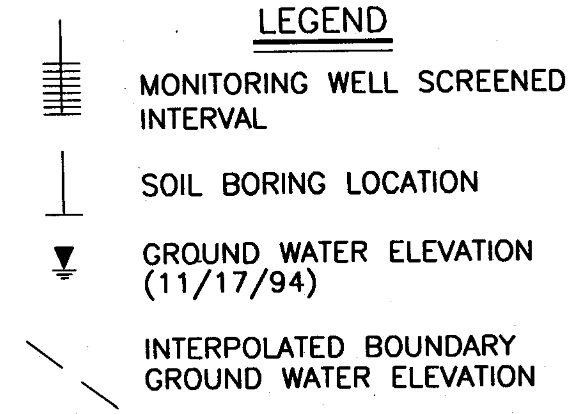
20 0 20
APPROX. HORIZ. SCALE IN FEET

3356.020-01F

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 13





NOTE:
VERTICAL EXAGGERATION IS 6X.

ITT SEALECTRO
MAMARONECK, NEW YORK

GENERALIZED
HYDROGEOLOGIC
CROSS SECTION B–B'

30 0 30
APPROX. HORIZ. SCALE IN FEET

3356.020-02F

O'BRIEN & GERE ENGINEERS, INC.

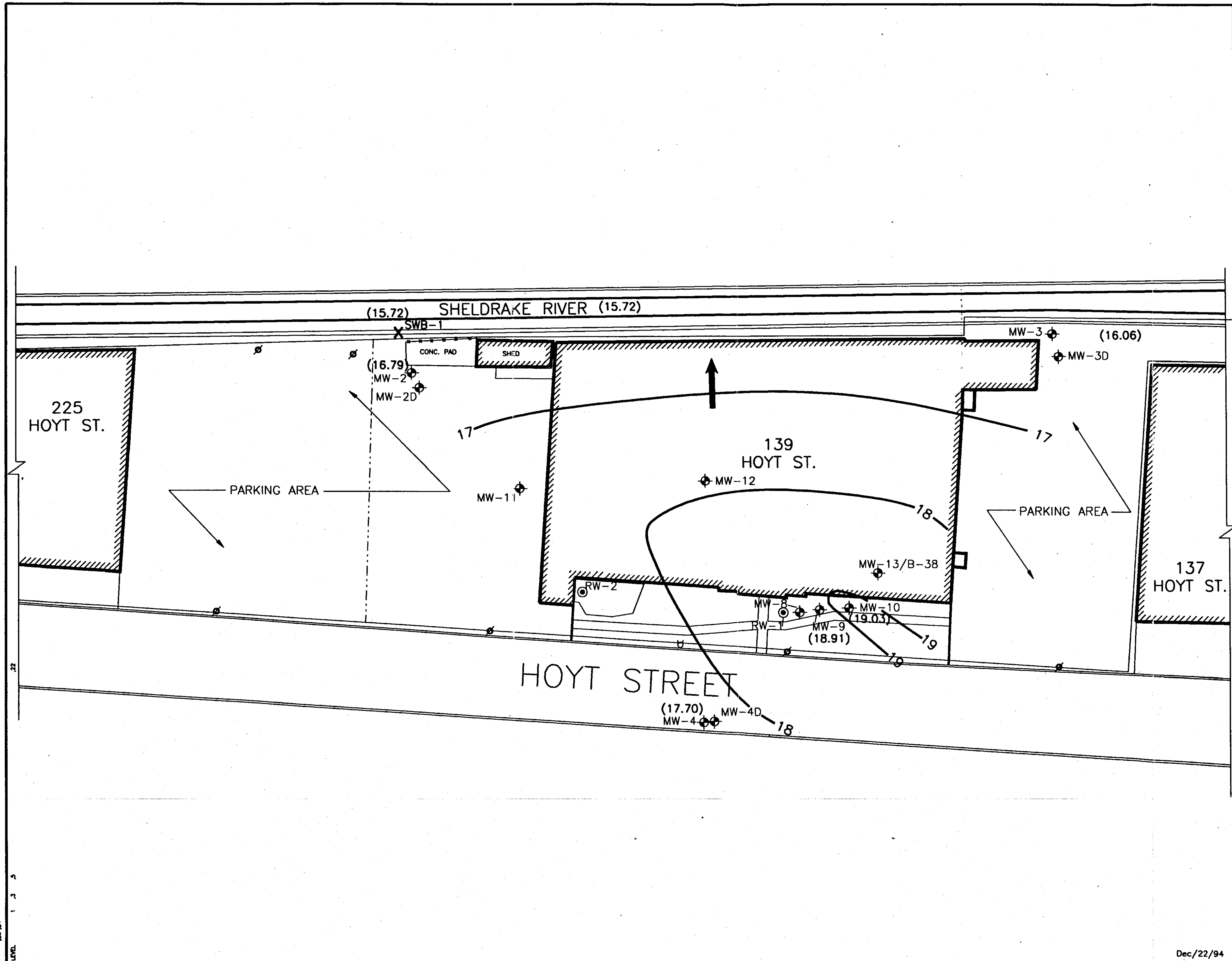


FIGURE 14

ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND

- PROPERTY LINE
- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- UTILITY POLE
- (16.06) GROUND WATER ELEVATION
- 17 GROUND WATER ELEVATION CONTOUR
- GROUND WATER FLOW DIRECTION
- X SURFACE WATER BENCH MARK

SHALLOW GROUND WATER FLOW MAP
3/30/94

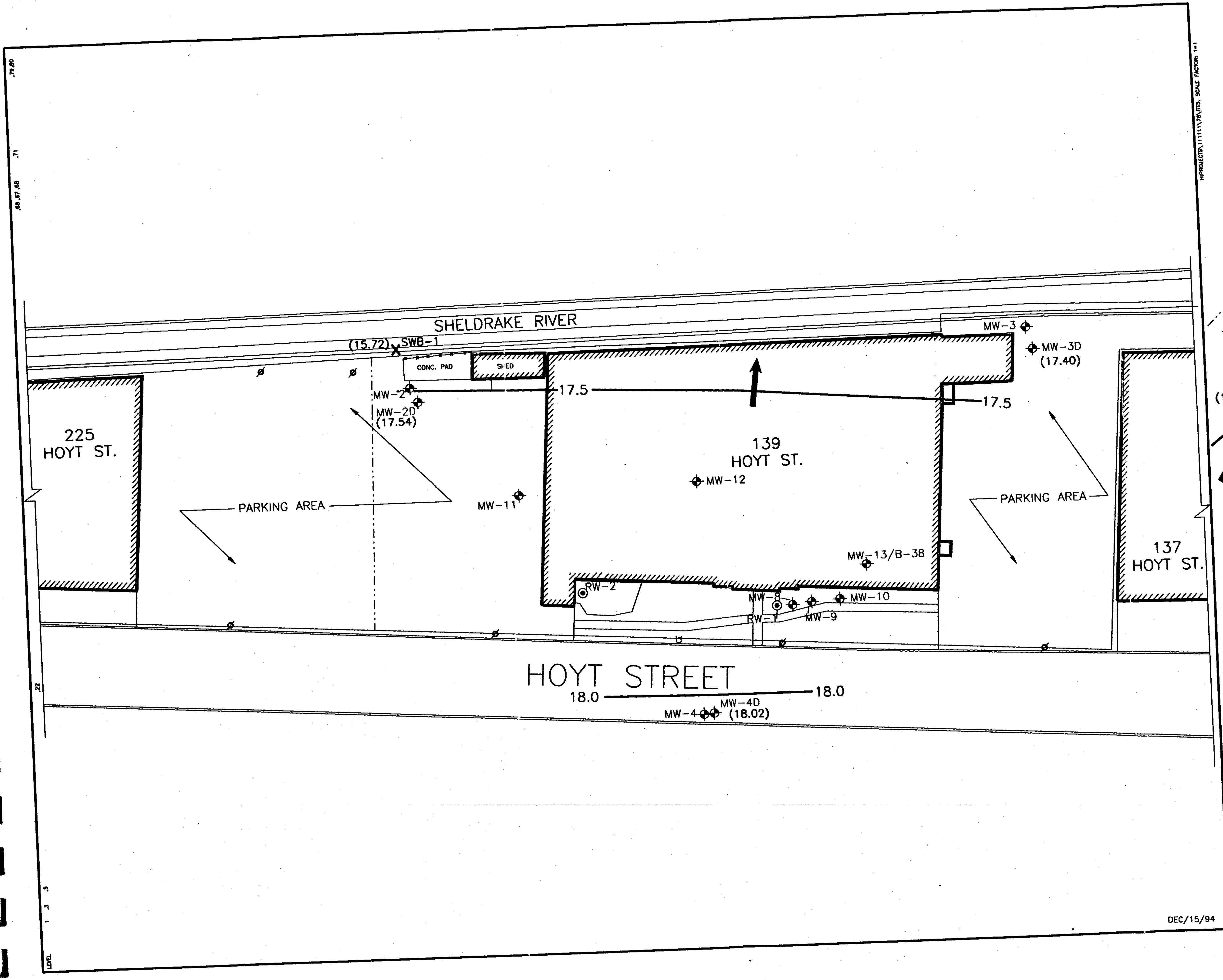
40 0 40
APPROX. SCALE IN FEET

3356.015-22F

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 15

ITT SEALECTRO
MAMARONECK, NEW YORK



LEGEND

- PROPERTY LINE
- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- UTILITY POLE
- (17.4) GROUND WATER ELEVATION
- 17.5 GROUND WATER ELEVATION CONTOUR
- GROUND WATER FLOW DIRECTION
- X SURFACE WATER BENCH MARK

DEEP GROUND WATER
FLOW MAP
3/30/94

40 0 40
APPROX. SCALE IN FEET

3356.015-21F

O'BRIEN & GERE ENGINEERS, INC.

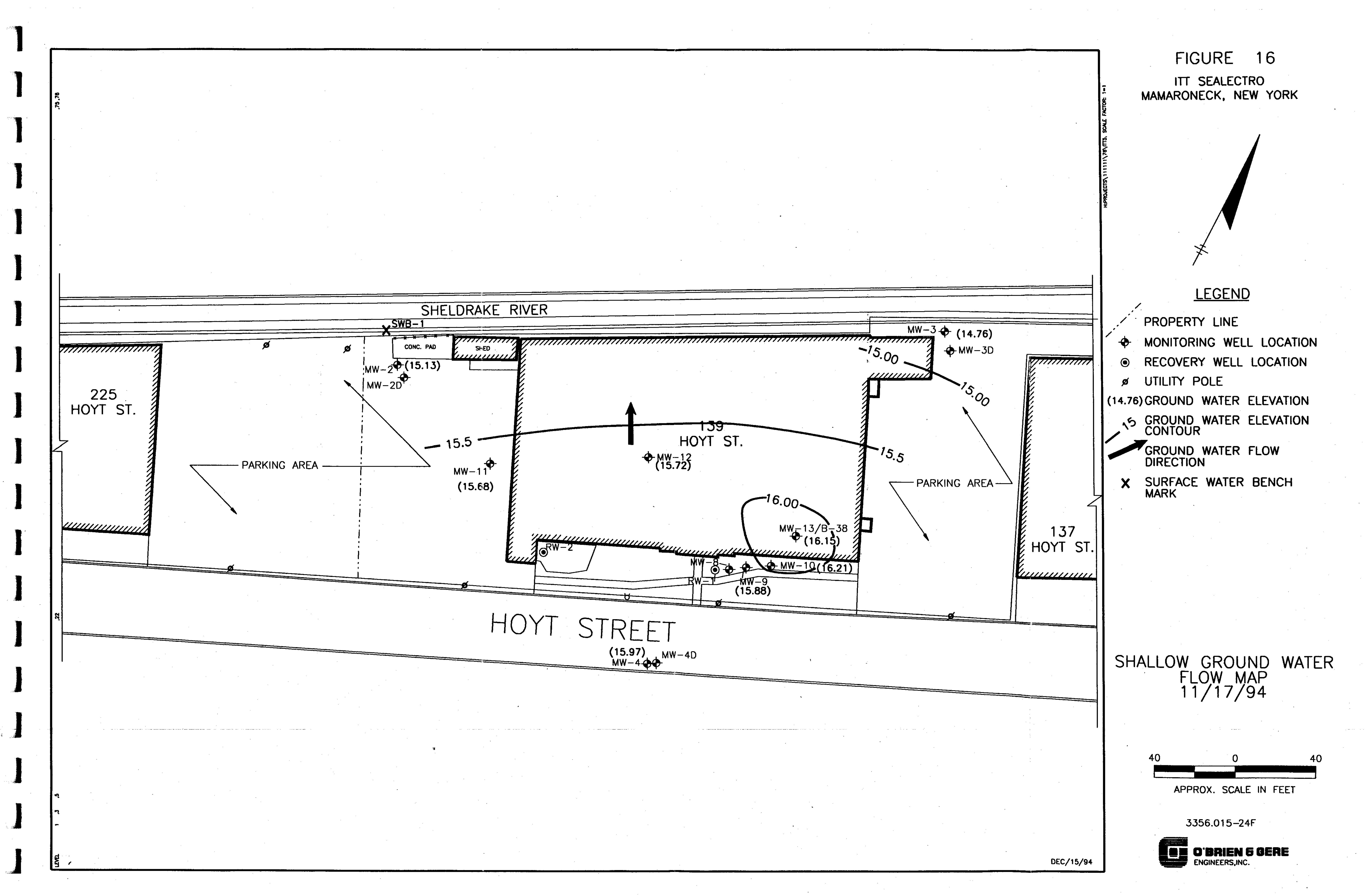
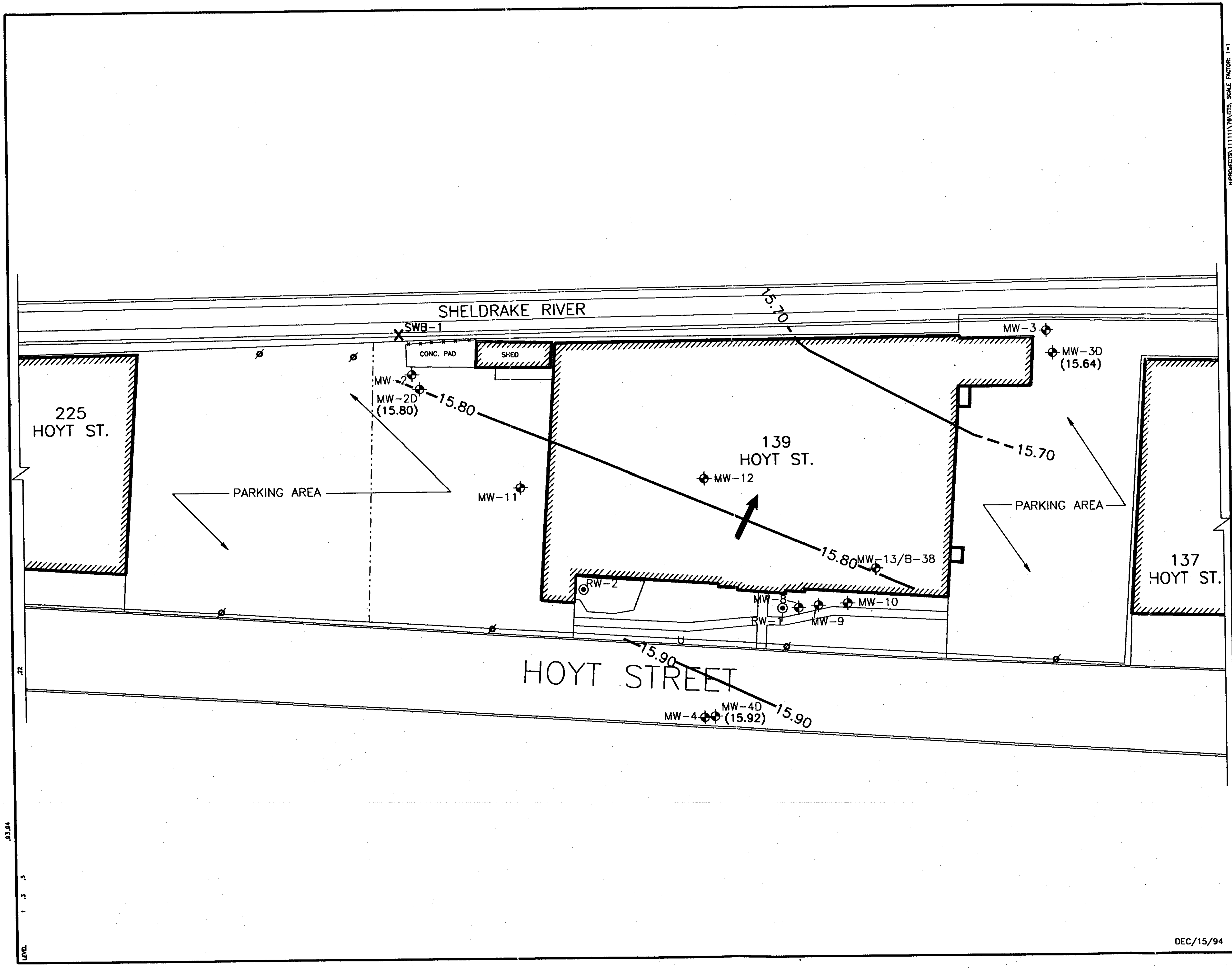
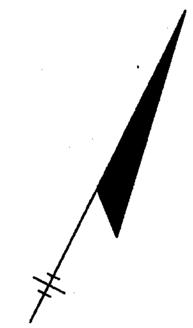

SHELDRAKE RIVER
SWB-1
CONC. PAD
SHED
225 HOYT ST.
PARKING AREA
MW-2 (15.13)
MW-2D
MW-11 (15.68)
15.5
139 HOYT ST.
MW-12 (15.72)
RW-2
MW-8
RW-1
MW-9 (15.88)
MW-10 (16.21)
MW-13/B-38 (16.15)
16.00
15.00
MW-3 (14.76)
MW-3D
PARKING AREA
137 HOYT ST.
HOYT STREET
(15.97) MW-4
MW-4D
DEC/15/94
FIGURE 16
ITT SEALECTRO
MAMARONECK, NEW YORK
LEGEND
PROPERTY LINE
MONITORING WELL LOCATION
RECOVERY WELL LOCATION
UTILITY POLE
(14.76) GROUND WATER ELEVATION
15 GROUND WATER ELEVATION CONTOUR
GROUND WATER FLOW DIRECTION
SURFACE WATER BENCH MARK
SHALLOW GROUND WATER FLOW MAP 11/17/94
40 0 40
APPROX. SCALE IN FEET
3356.015-24F
O'BRIEN & GERE ENGINEERS, INC.

FIGURE 17

ITT SEALECTRO
MAMARONECK, NEW YORK





LEGEND

- PROPERTY LINE
- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- UTILITY POLE
- (15.92) GROUND WATER ELEVATION
- 15.80 GROUND WATER ELEVATION CONTOUR
- GROUND WATER FLOW DIRECTION
- X SURFACE WATER BENCH MARK

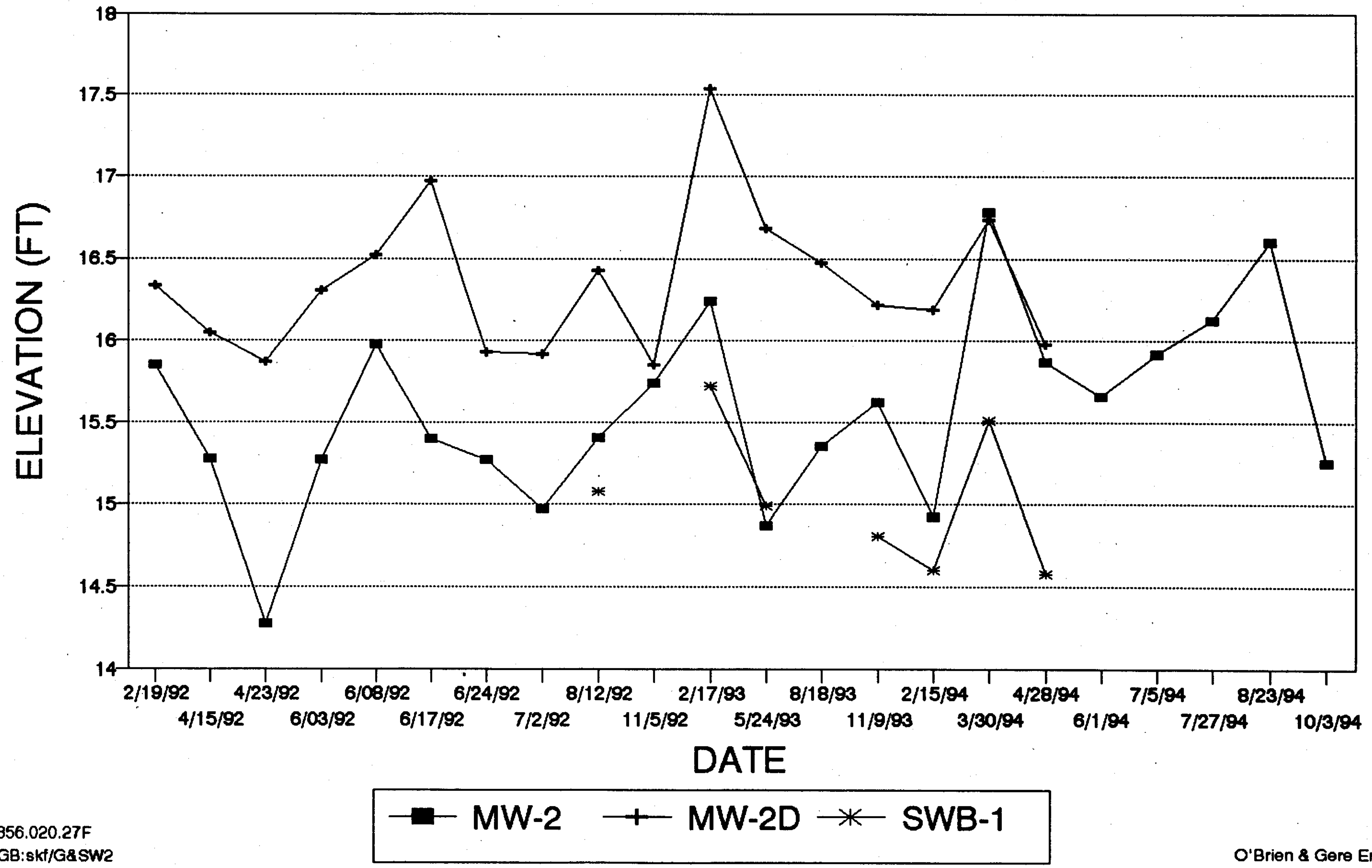
DEEP GROUND WATER FLOW MAP
11/17/94

40 0 40
APPROX. SCALE IN FEET

3356.015-23F

O'BRIEN & GERE ENGINEERS, INC.

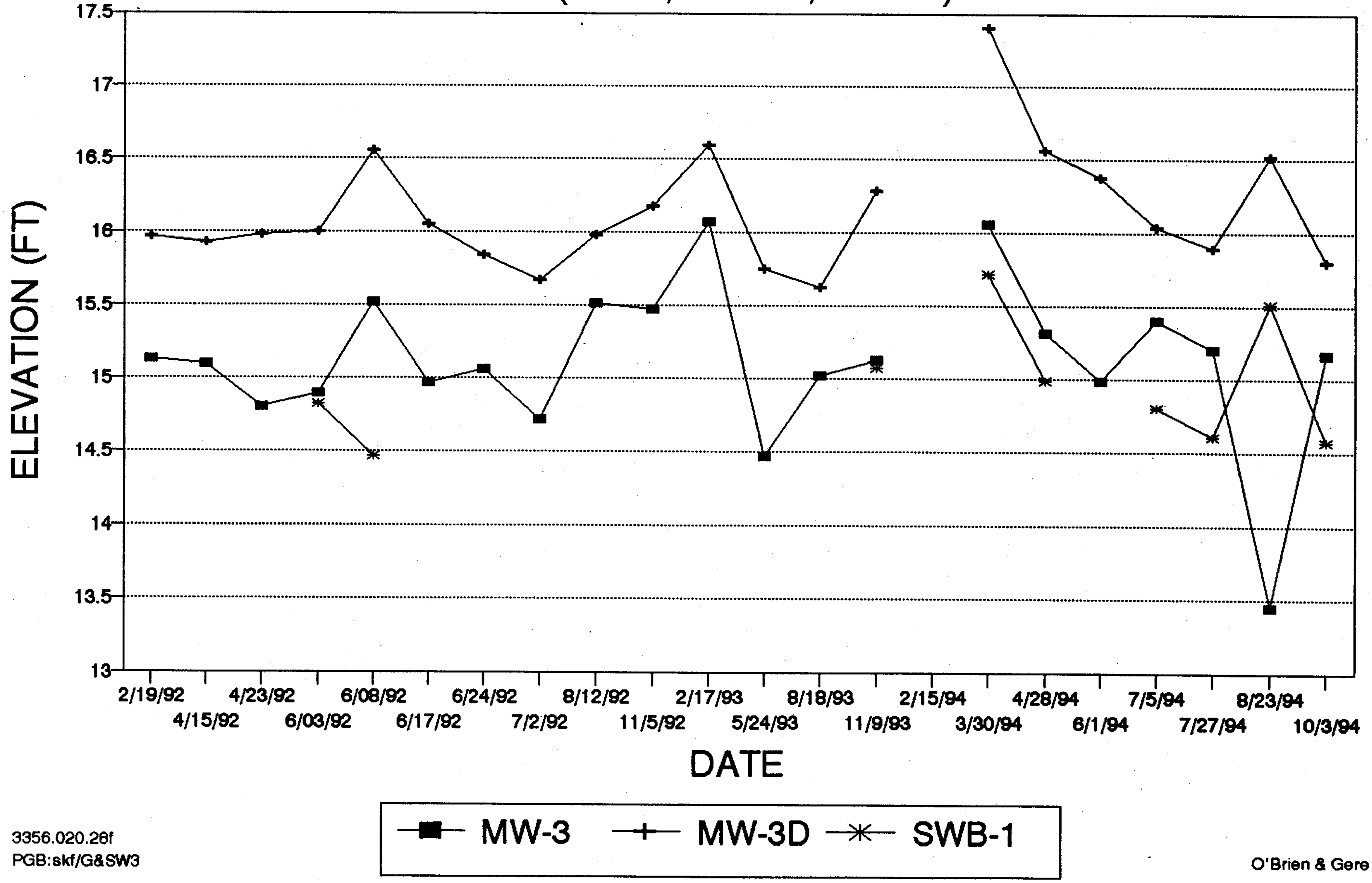
Figure 18
ITT SEALECTRO
MAMARONECK, NY
Ground Water/Surface Water Elevations
(MW-2, MW-2D, SWB-1)



3356.020.27F
PGB:skf/G&SW2

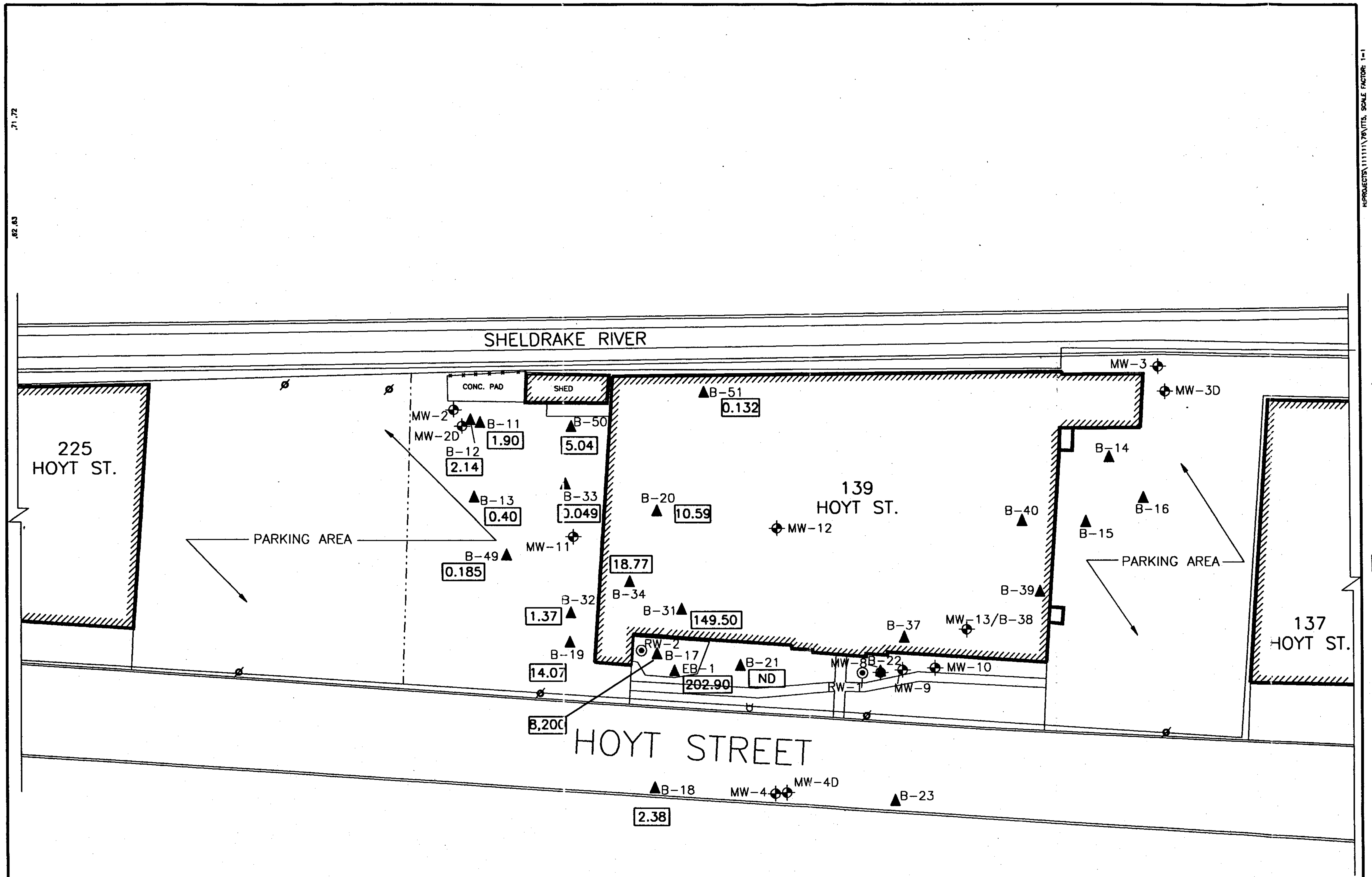
O'Brien & Gere Engineers, Inc.

Figure 19
ITT SEALECTRO
MAMARONECK, NY
Ground Water/Surface Water Elevations
(MW-3, MW-3D, SWB-1)



3356.020.26f
PGB:skf/G&SW3

O'Brien & Gere Engineers, Inc.



NOTES:

1). WHERE MORE THAN ONE SAMPLE WAS ANALYZED FROM A GIVEN BORING IN THE SHALLOW ZONE, THE HIGHEST CONCENTRATION DETECTED IS PRESENTED.

2). (ND)-NOT DETECTED.

3). DEPTH OF SHALLOW OVERBURDEN ZONE IS APPROXIMATELY 5 TO 20 FEET BLS.

DEC/15/94

FIGURE 20

ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND

PROPERTY LINE
MONITORING WELL LOCATION
RECOVERY WELL LOCATION
UTILITY POLE
SHALLOW SOIL BORING LOCATION
5.05 TOTAL VOC CONCENTRATION IN mg/kg

DISTRIBUTION OF VOCS IN SHALLOW OVERBURDEN ZONE

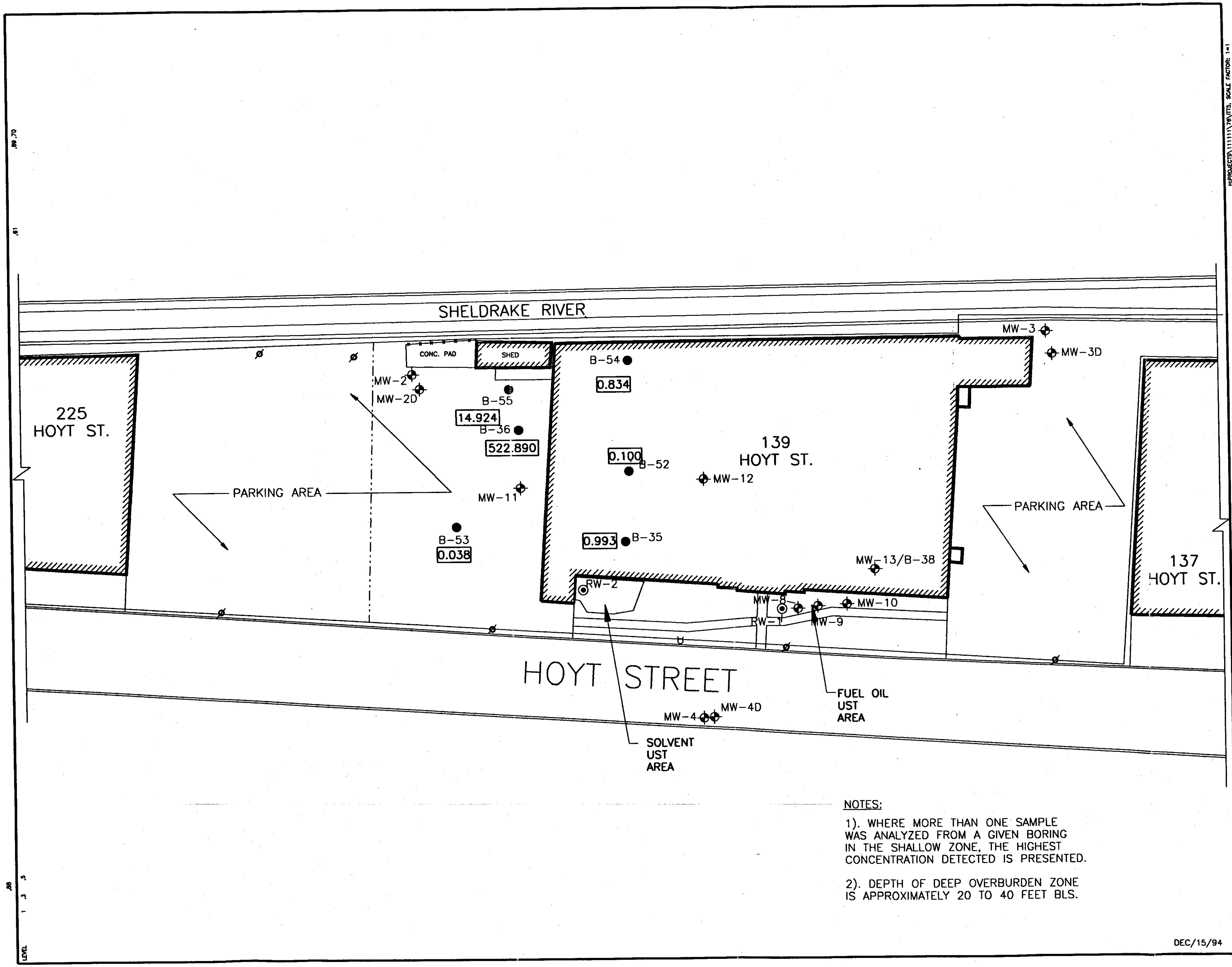
40 0 40
APPROX. SCALE IN FEET

3356.015-16F

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 21

ITT SEALECTRO
MAMARONECK, NEW YORK



LEGEND

- PROPERTY LINE
- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- UTILITY POLE
- DEEP SOIL BORING LOCATION
- 0.095 TOTAL VOC CONCENTRATION IN mg/kg

DISTRIBUTION OF VOCS IN DEEP OVERBURDEN ZONE

40 0 40
APPROX. SCALE IN FEET

3356.015-19F

O'BRIEN & GERE ENGINEERS, INC.

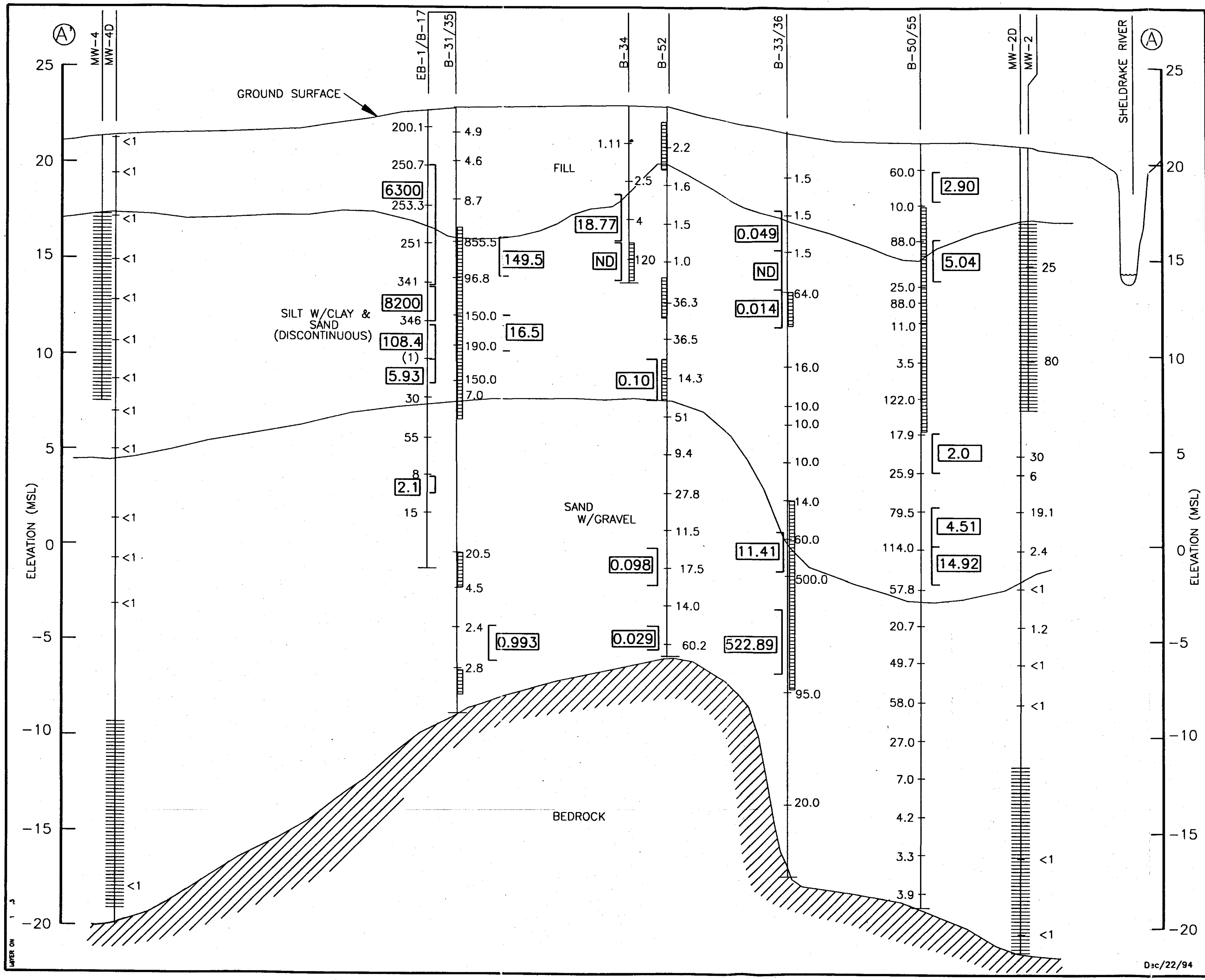
NOTES:

1). WHERE MORE THAN ONE SAMPLE WAS ANALYZED FROM A GIVEN BORING IN THE SHALLOW ZONE, THE HIGHEST CONCENTRATION DETECTED IS PRESENTED.

2). DEPTH OF DEEP OVERBURDEN ZONE IS APPROXIMATELY 20 TO 40 FEET BLS.

FIGURE 22

ITT SEALECTRO
MAMARONECK, NEW YORK



LEGEND

- MONITORING WELL SCREENED INTERVAL
- SOIL BORING LOCATION
- 36.5 — HNU HEADSPACE READING ppm
- 0.098 — TOTAL VOC CONCENTRATION IN mg/kg
- ULTRA VIOLET FLOURESENCE NOTED
- ND — VOC NOT DETECTED
- SAMPLE INTERVAL

NOTE:
VERTICAL EXAGGERATION IS 4X.

GENERALIZED HYDROGEOLOGIC CROSS SECTION AND VERTICAL DISTRIBUTION OF VOCs

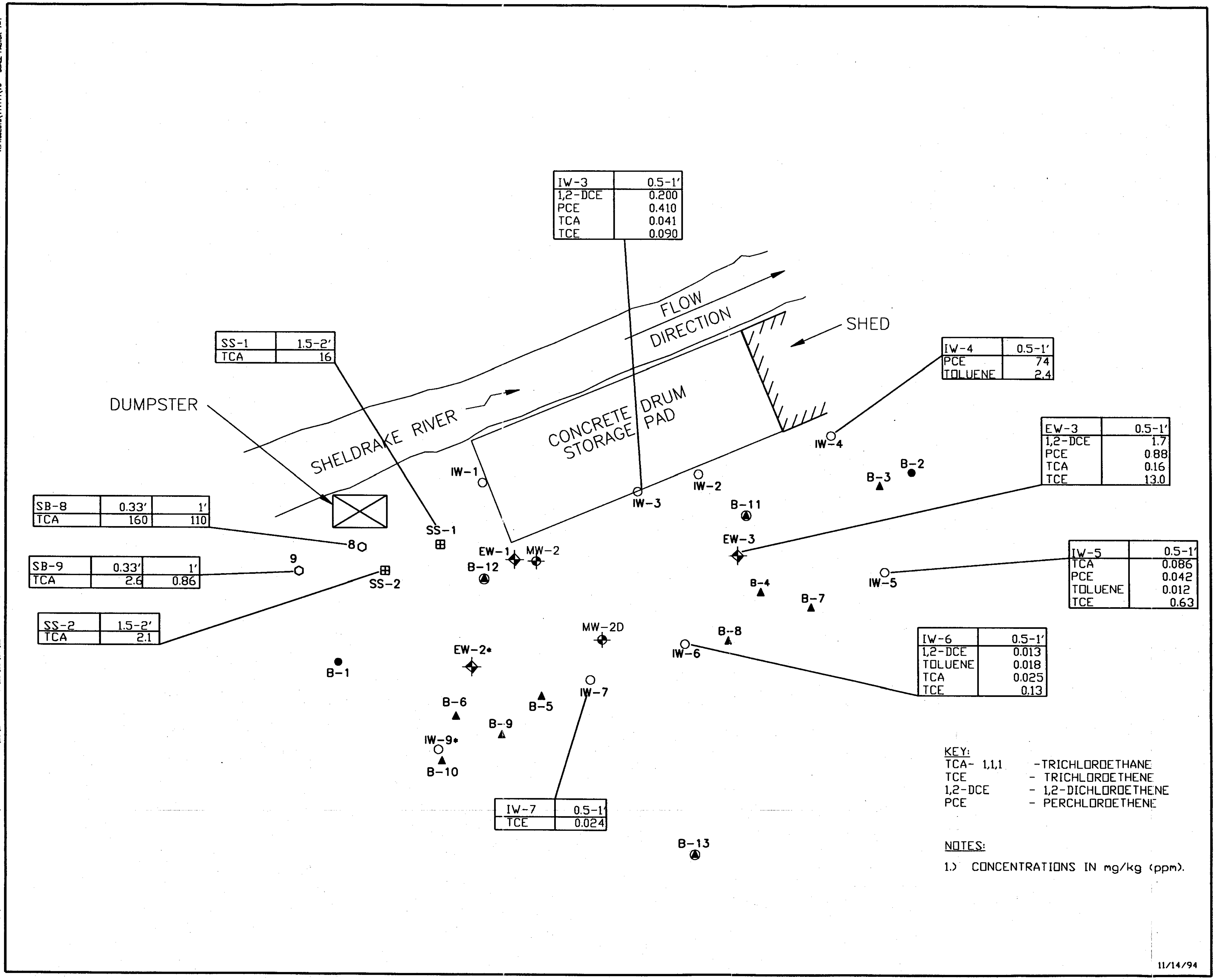
20 0 20
APPROX. HORIZ. SCALE IN FEET

3356.020-17F

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 23

ITT SEALECTRO
MAMARONECK, NEW YORK



LEGEND

- MONITORING WELL (6/88, TRC)
- SOIL BORING (6/88, TRC)
- SOIL BORING (8/89, OBG)
- SOIL BORING (1/92, OBG)
- SOIL SAMPLE (8/89, OBG)
- INLET WELL (10/91, OBG)
- EXTRACTION WELL (10/91, OBG)
- SURFACE SOIL SAMPLE (2/86, OBG)
- * INLET & EXTRACTION WELLS REMOVED

SURFACE SOILS ORGANIC DATA FORMER DRUM STORAGE PAD AREA

0 10 20
APPROX. SCALE IN FEET

3356.015.10F

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

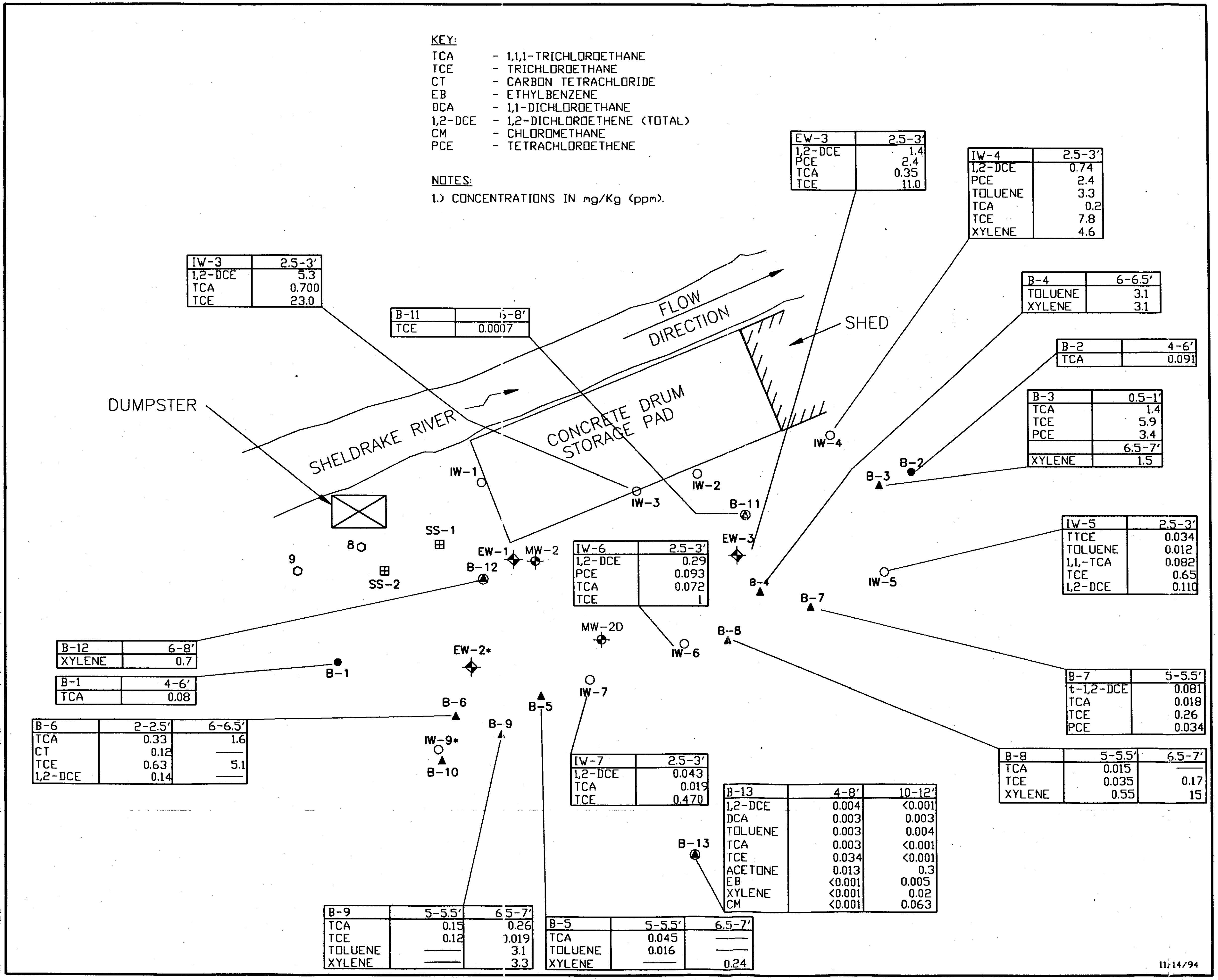


FIGURE 24

ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND

- MONITORING WELL (6/88, TRC)
- SOIL BORING (6/88, TRC)
- SOIL BORING (8/89, OBG)
- SOIL BORING (1/92, OBG)
- SOIL SAMPLE (8/89, OBG)
- INLET WELL (10/91, OBG)
- EXTRACTION WELL (10/91, OBG)
- SURFACE SOIL SAMPLE (2/86, OBG)
- * INLET & EXTRACTION WELLS REMOVED

SUBSURFACE SOILS
ORGANIC DATA
FORMER
DRUM STORAGE PAD AREA

0 10 20
APPROX. SCALE IN FEET

3356.015.09F

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

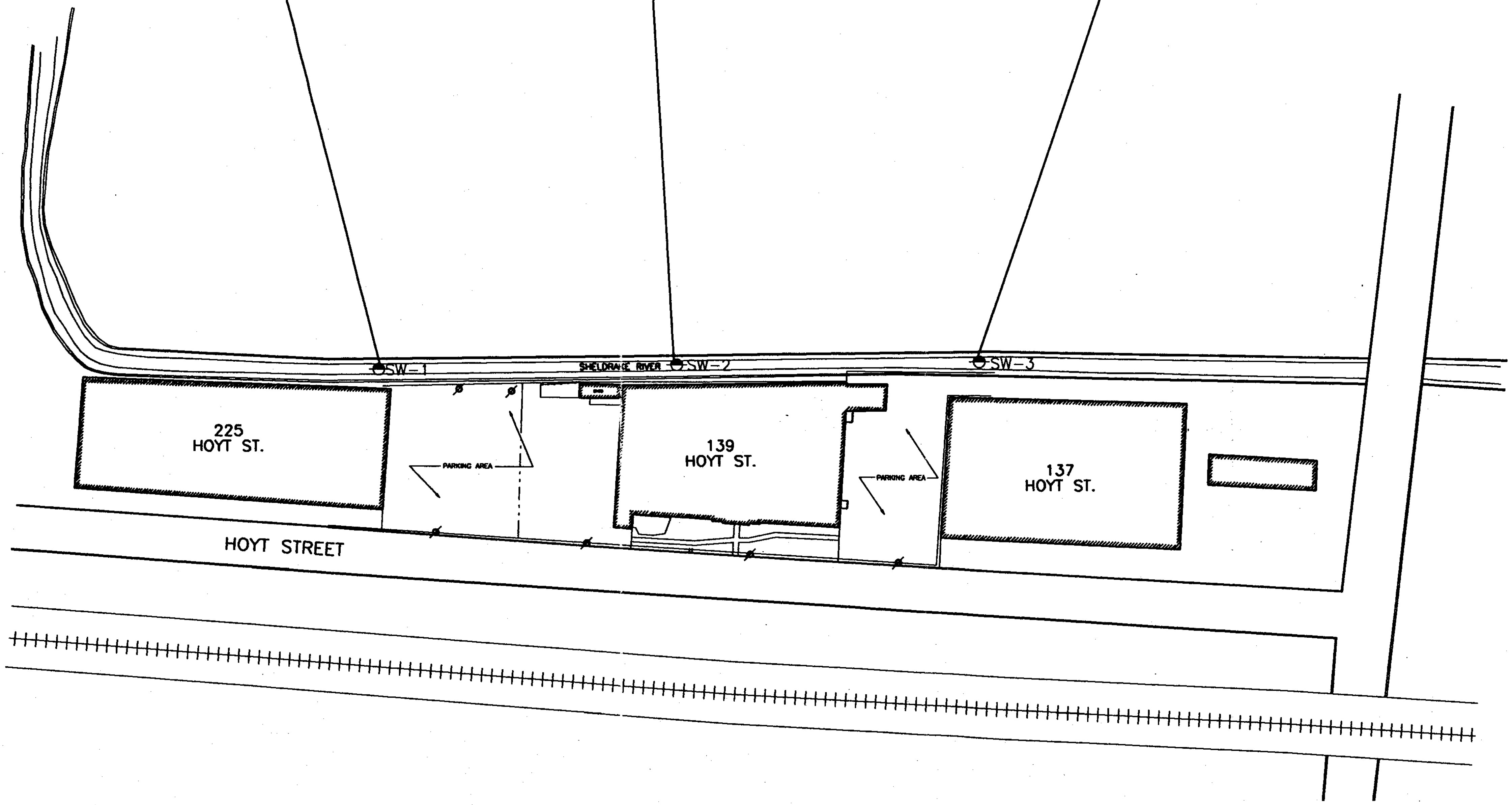
FIGURE 25

ITT SEALECTRO
MAMARONECK, NEW YORK

SW-1	2/21/92	4/16/92
1,2-DCE	2J	<1
TCA	6	24
TCE	2J	<1
TPH	11.3	<1

SW-2	2/21/92	4/16/92
1,2-DCE	2J	<1
TCA	7	24
TCE	2J	<1
TPH	10.9	<1

SW-3	2/21/92	4/16/92
TCA	<5	19
TPH	10.9	<1



KEY:
TCA – 1,1,1-TRICHLOROETHANE
1,2-DCE – 1,2-DICHLOROETHENE
TCE – TRICHLOROETHENE
TPH – TOTAL PETROLEUM HYDROCARBONS (PPM)
J INDICATES AN ESTIMATED VALUE

NOTES:
1.) SURFACE WATER CONCENTRATIONS IN UG/L (PPB)

DEC/15/94

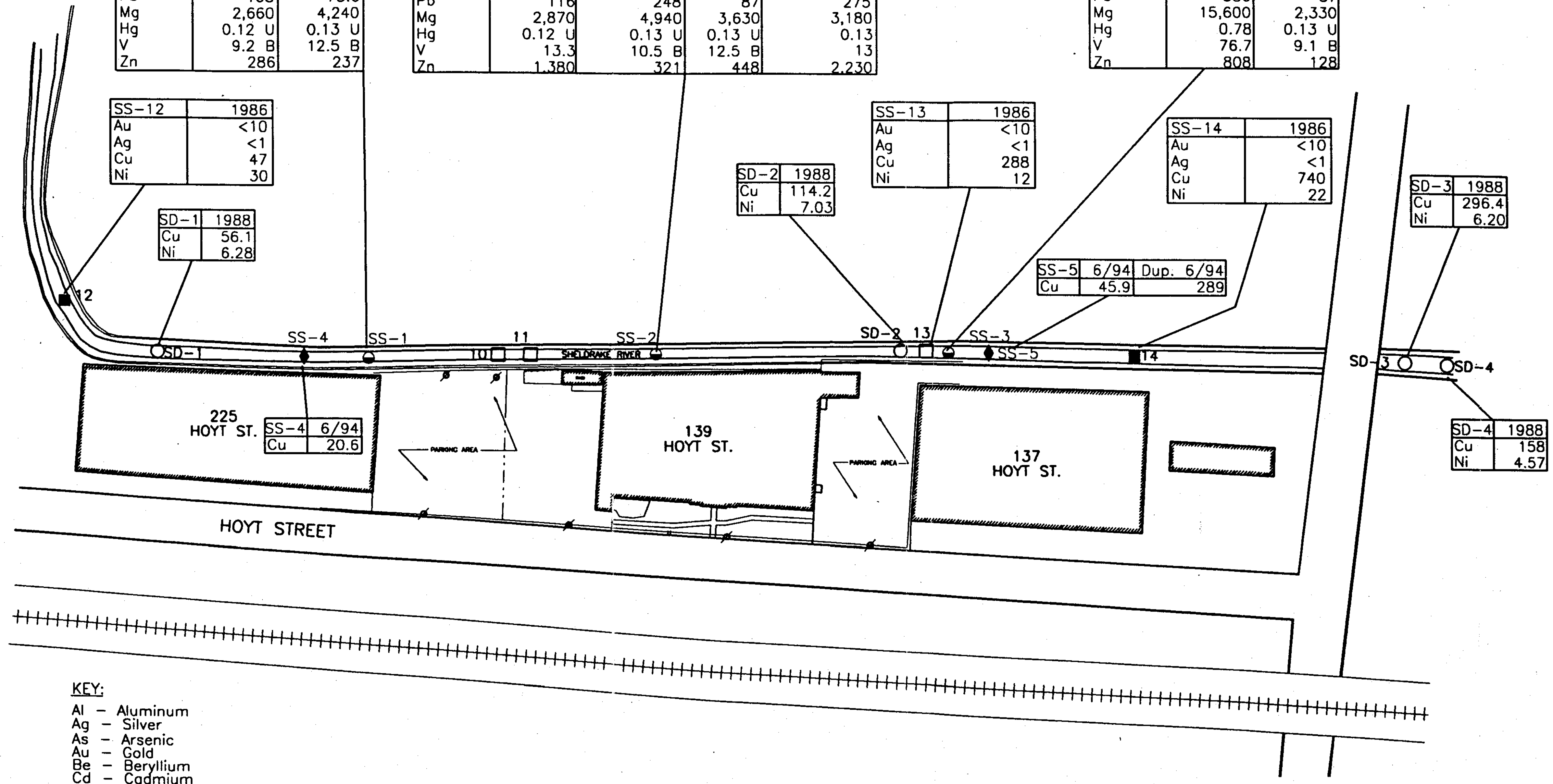
LEGEND
- PROPERTY LINE
- SURFACE WATER LOCATION
- UTILITY POLE

SHELDRAKE RIVER SURFACE WATER ORGANIC DATA

100 0 100
APPROX. SCALE IN FEET

3356.015.06F

O'BRIEN & GERE ENGINEERS, INC.



SS-1	2/21/92	4/16/92
Al	2,460	3730
As	3.2	3.6
Be	1 B	1.1 B
Cd	1.1 U	0.99 U
Cr	9.6	17.5
Cu	372	218
Fe	8,860	12,500
Pb	108	75.6
Mg	2,660	4,240
Hg	0.12 U	0.13 U
V	9.2 B	12.5 B
Zn	286	237

SS-2	2/21/92	DUP. 2/21/92	4/16/92	DUP. 4/16/92
Al	3,710	3,240	4,550	4,030
As	4.5	3.5	3.5	3.7
Be	9.3	34.5	1.5	2.5
Cd	1 U	1.1 U	0.98 U	1.3
Cr	16.5	37.4	16.5	10
Cu	2,790	2,400	318	4,710
Fe	13,200	12,200	17,700	13,300
Pb	116	248	87	275
Mg	2,870	4,940	3,630	3,180
Hg	0.12 U	0.13 U	0.13 U	0.13
V	13.3	10.5 B	12.5 B	13
Zn	1,380	321	448	2,230

SS-3	2/21/92	4/16/92
Al	28,700	2,500
As	36.4	2 B
Be	3.6 U	0.34 U
Cd	5.9 U	1 U
Cr	71	10.1
Cu	347	41
Fe	73,400	12,800
Pb	586	57
Mg	15,600	2,330
Hg	0.78	0.13 U
V	76.7	9.1 B
Zn	808	128

SS-12	1986
Au	<10
Ag	<1
Cu	47
Ni	30

SD-1	1988
Cu	56.1
Ni	6.28

SD-2	1988
Cu	114.2
Ni	7.03

SS-13	1986
Au	<10
Ag	<1
Cu	288
Ni	12

SS-14	1986
Au	<10
Ag	<1
Cu	740
Ni	22

SS-5	6/94	Dup. 6/94
Cu	45.9	289

SD-3	1988
Cu	296.4
Ni	6.20

SS-4	6/94
Cu	20.6

SD-4	1988
Cu	158
Ni	4.57

KEY:

Al – Aluminum
Ag – Silver
As – Arsenic
Au – Gold
Be – Beryllium
Cd – Cadmium
Cr – Chromium
Cu – Copper
Fe – Iron
Pb – Lead
Mg – Magnesium
Ni – Nickel
Hg – Mercury
V – Vanadium
Zn – Zinc

B – VALUE IS LESS THAN CONTRACT REQUIRED DETECTION LIMIT BUT GREATER THAN OR EQUAL TO THE INSTRUMENT DETECTION LIMIT

U – ANALYZED, BUT NOT DETECTED.

NOTES:

1.) CONCENTRATION IN mg/kg (ppm).

FIGURE 26

ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND

PROPERTY LINE
SEDIMENT SAMPLE (92, OBG)
SURFACE WATER SEDIMENT SAMPLE (2/86, OBG)
SEDIMENT SAMPLE (2/86, OBG)
SEDIMENT SAMPLE (6/88, TRC)
SEDIMENT SAMPLE (6/94, OBG)
UTILITY POLE

SHELDRAKE RIVER
SEDIMENT
INORGANIC DATA

100 0 100
APPROX. SCALE IN FEET

3356.015.20F

O'BRIEN & GERE ENGINEERS, INC.

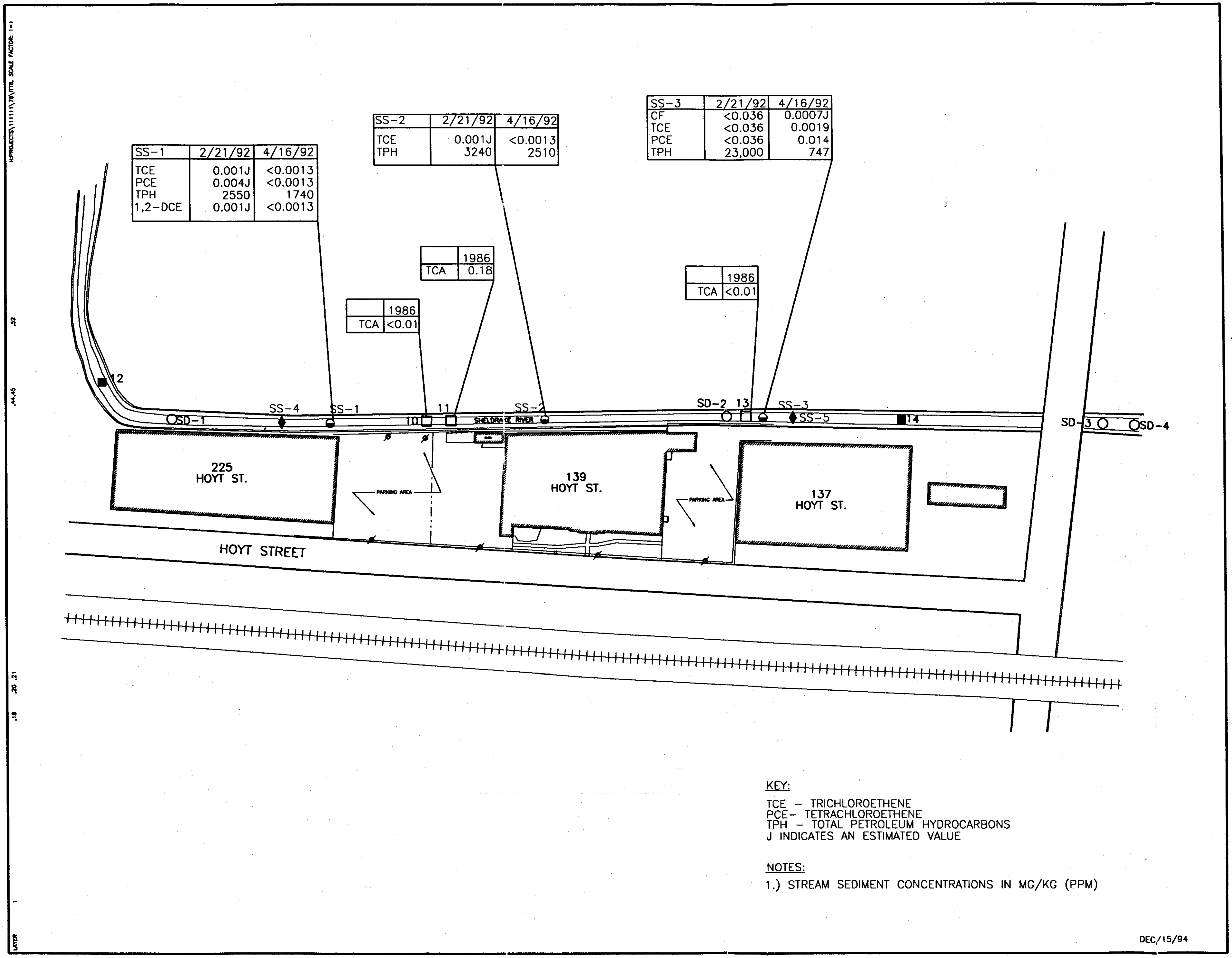


FIGURE 27

ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND

- PROPERTY LINE
- SEDIMENT SAMPLE (92, OBG)
- SURFACE WATER SEDIMENT SAMPLE (2/86, OBG)
- SEDIMENT SAMPLE (2/86, OBG)
- SEDIMENT SAMPLE (6/88, OBG)
- UTILITY POLE

SHELDRAKE RIVER SEDIMENT ORGANIC DATA

100 0 100
APPROX. SCALE IN FEET

3356.015.07F

O'BRIEN & GERE ENGINEERS, INC.

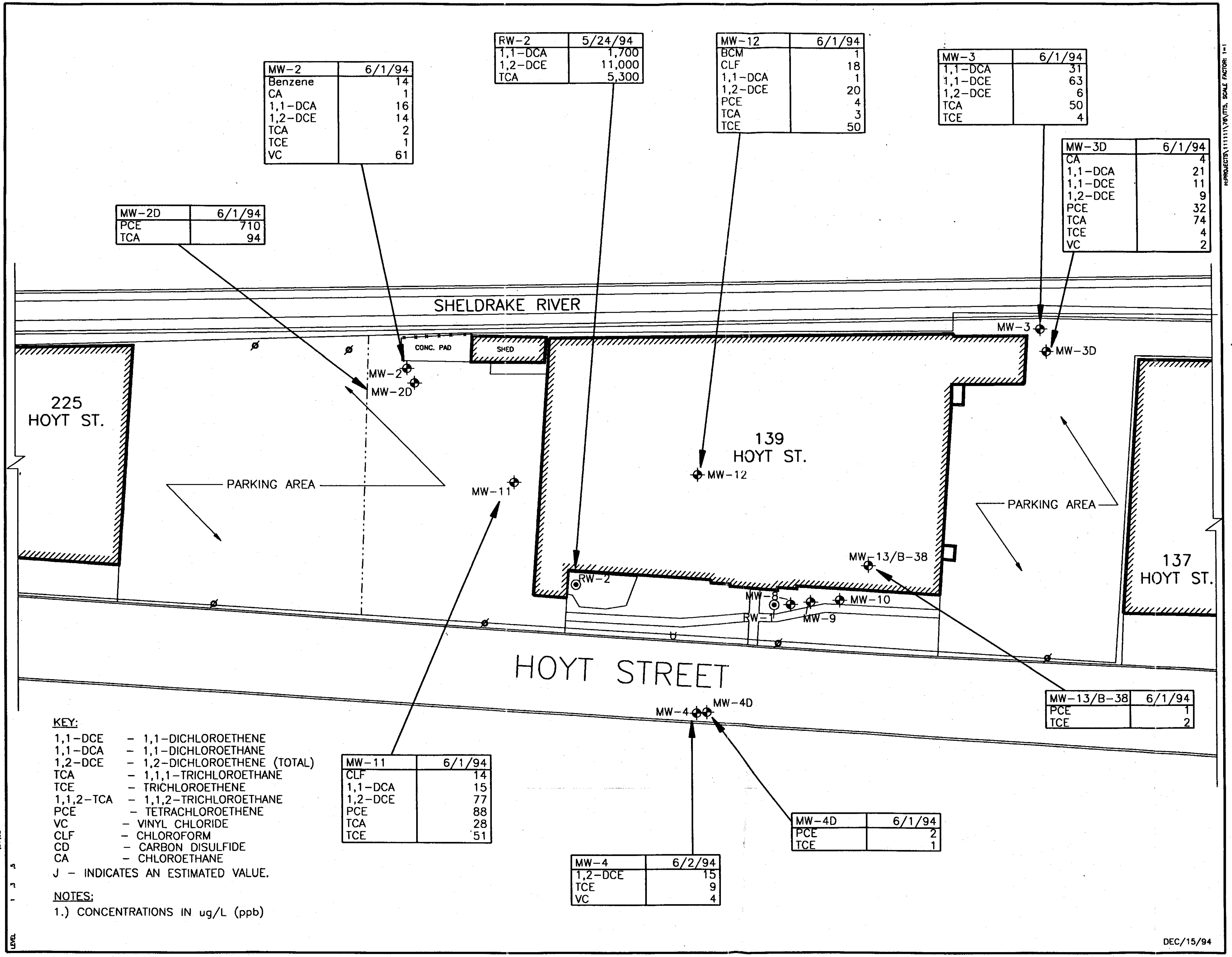


FIGURE 28

ITT SEALECTRO
MAMARONECK, NEW YORK

LEGEND

PROPERTY LINE

MONITORING WELL LOCATION

RECOVERY WELL LOCATION

UTILITY POLE

GROUND WATER
ORGANIC DATA
6/1-2/94

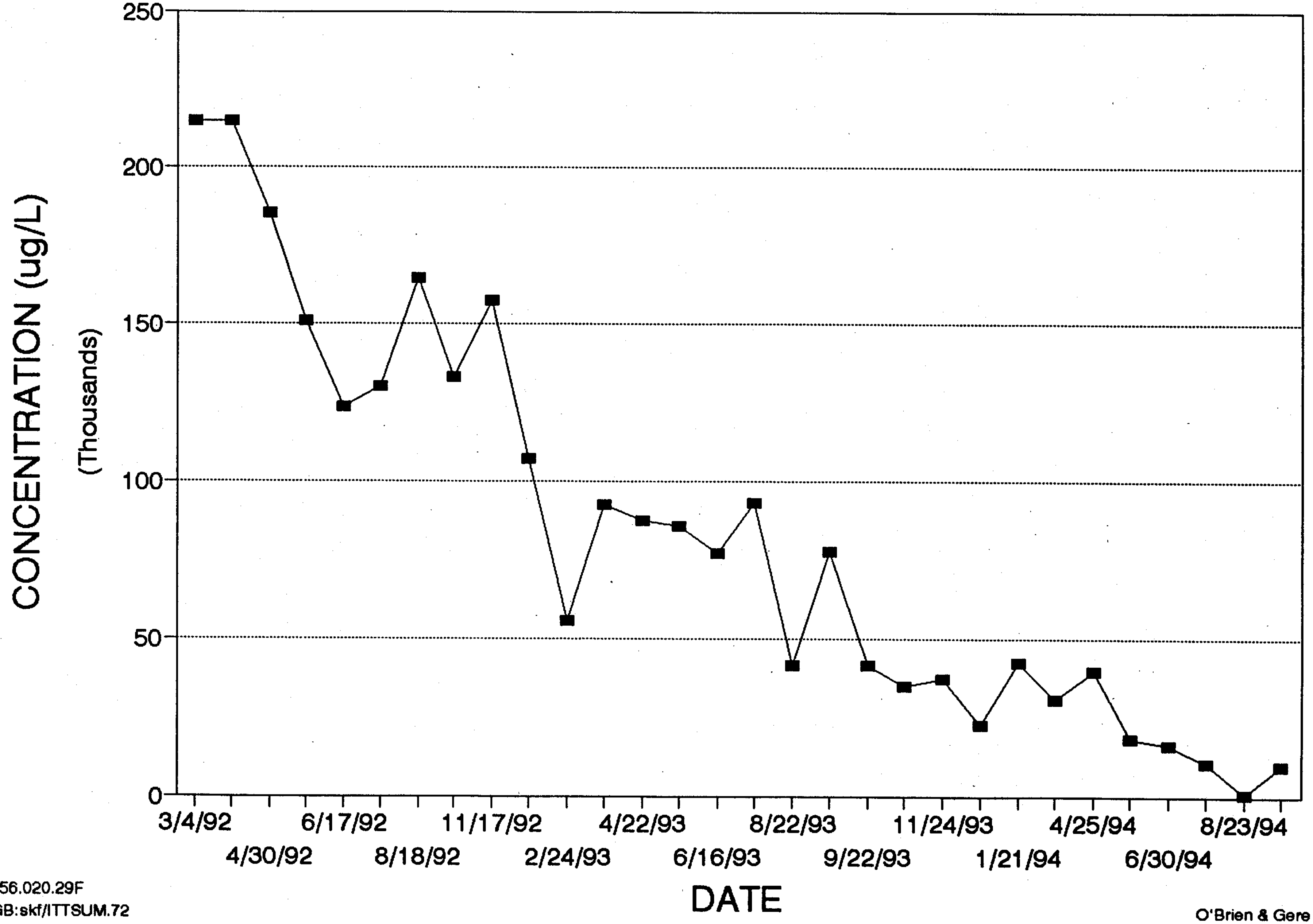
40 0 40

APPROX. SCALE IN FEET

3356.015-18F

O'BRIEN & GERE ENGINEERS, INC.

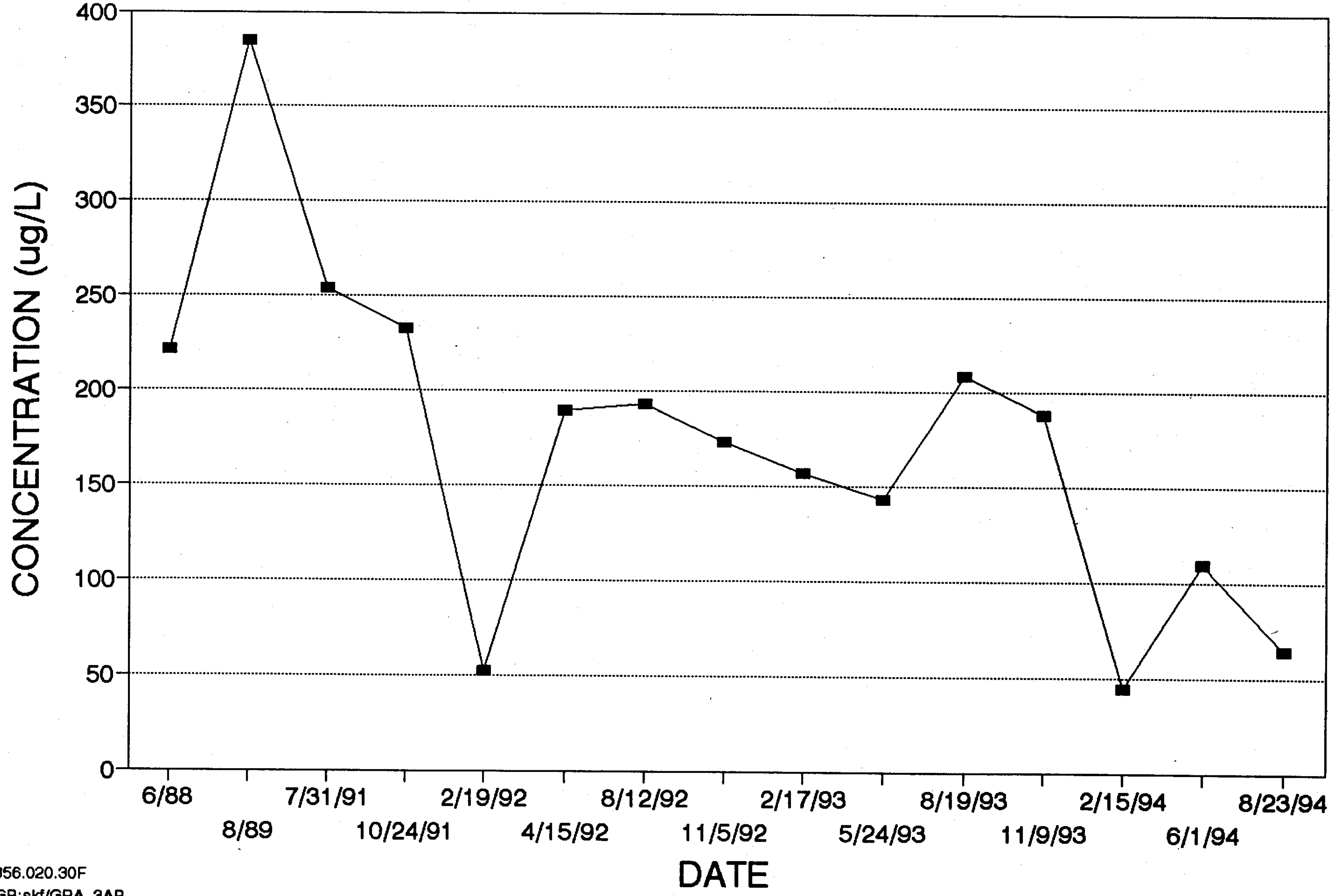
Figure 29
ITT SEALECTRO
MAMARONECK, NY
RW-2 TOTAL VOC CONCENTRATIONS



3356.020.29F
PGB:skf/ITTSUM.72

O'Brien & Gere Engineers, Inc.

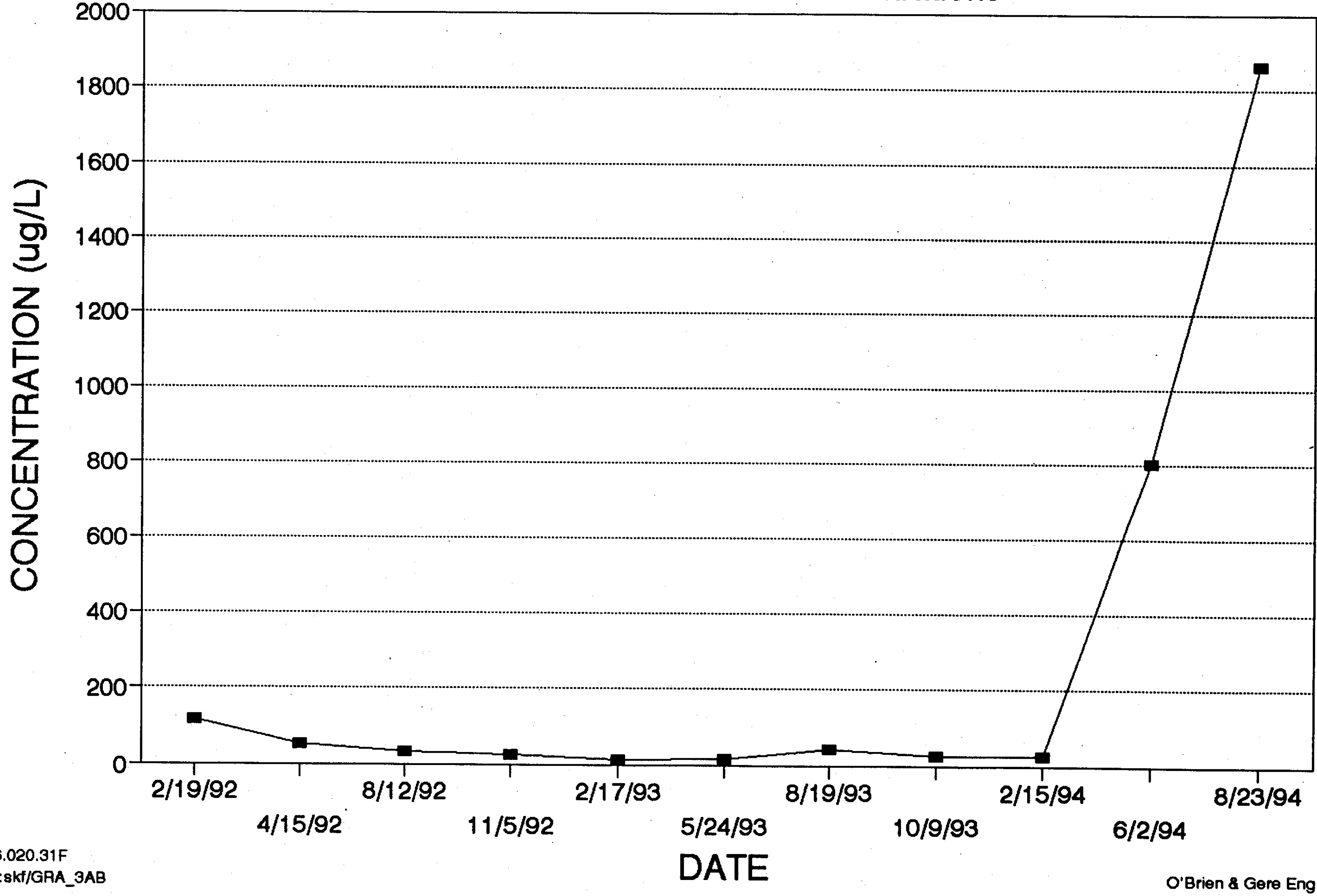
Figure 30
ITT SEALECTRO
MAMARONECK, NY
MW-2 Total VOC Concentrations



3356.020.30F
PGB:skf/GRA_3AB

O'Brien & Gere Engineers, Inc.

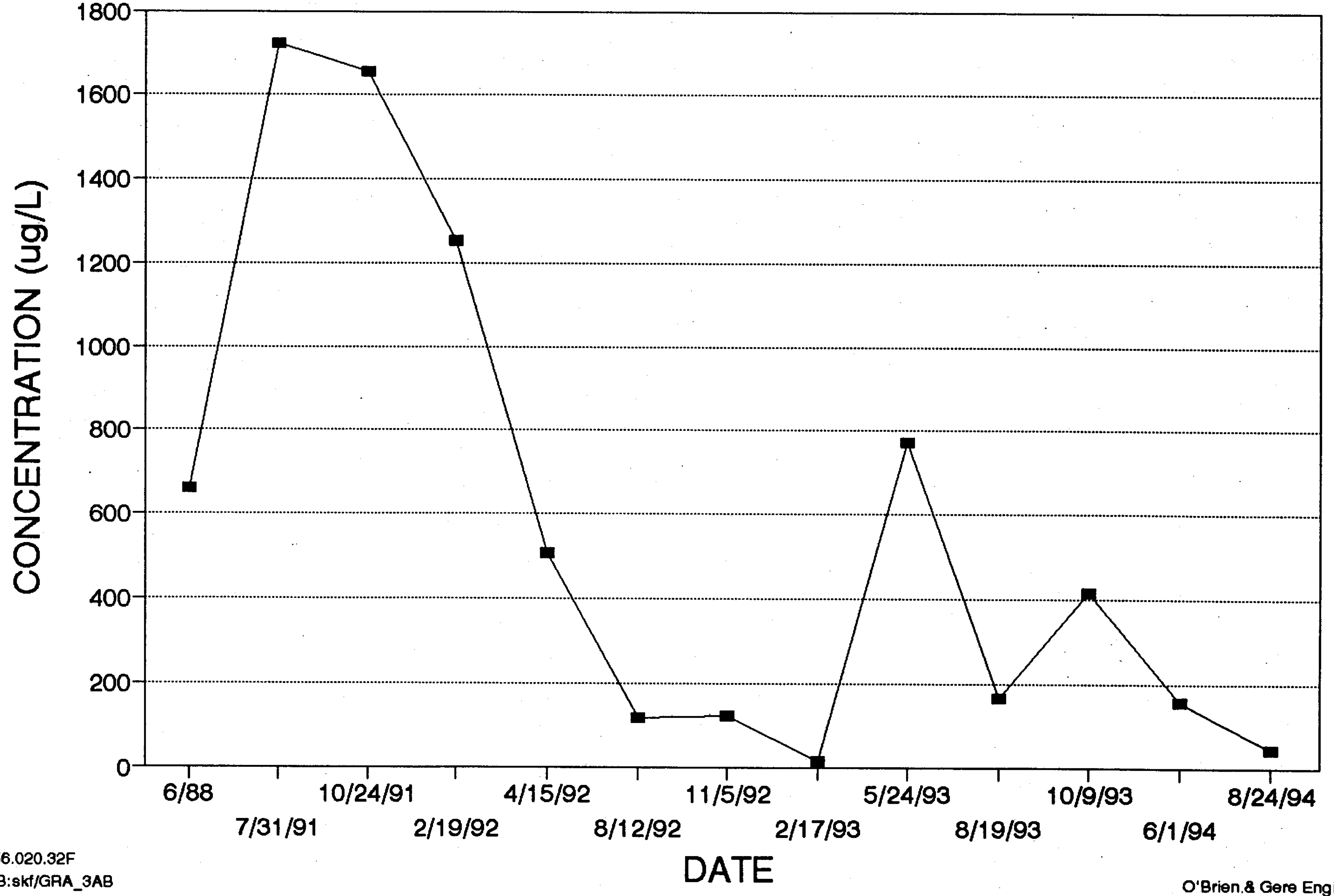
Figure 31
ITT SEALECTRO
MAMARONICK, NY
MW-2D Total VOC Concentrations



3356.020.31F
PGB:skf/GRA_3AB

O'Brien & Gere Engineers, Inc.

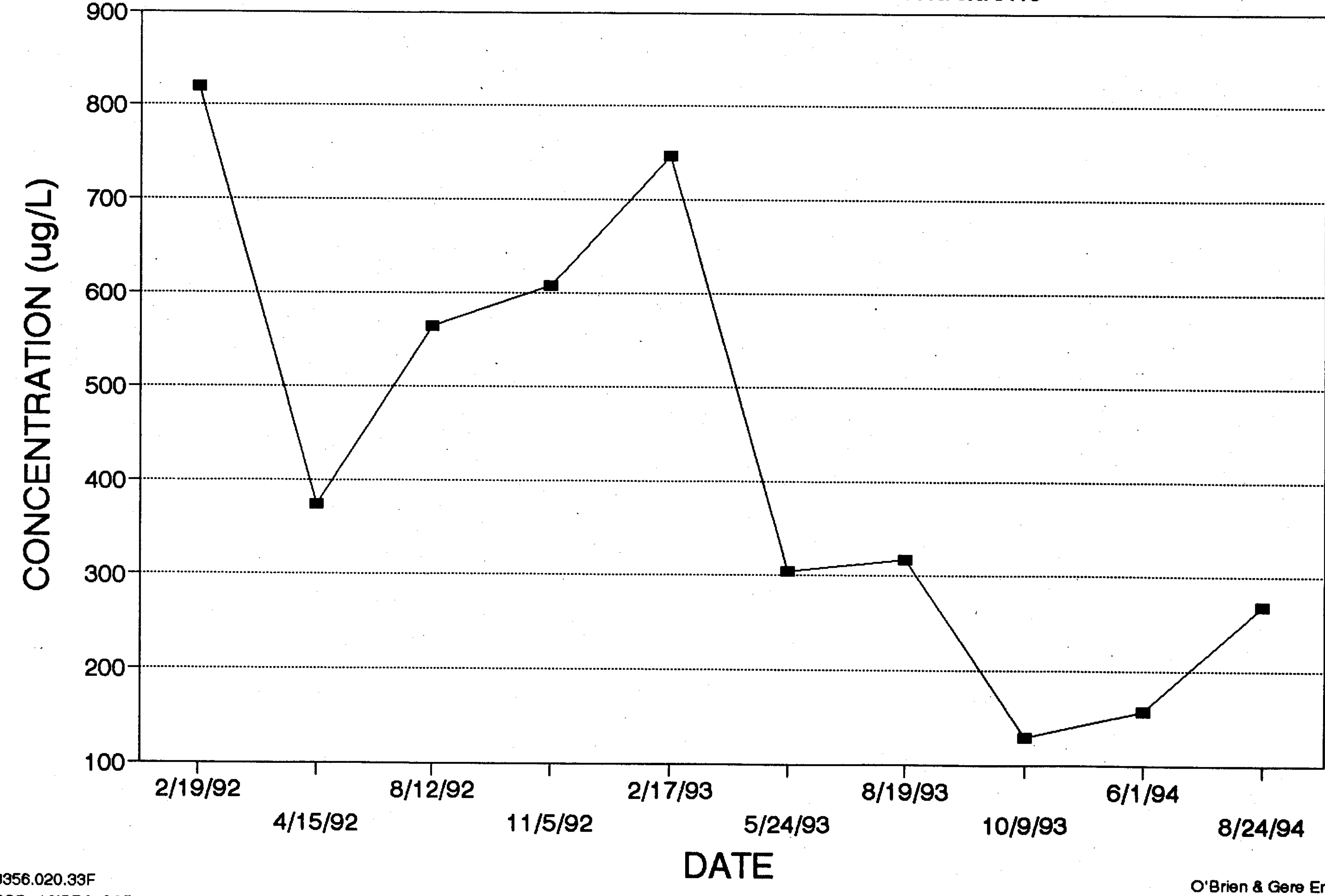
Figure 32
ITT SEALECTRO
MAMARONECK, NY
MW-3 Total VOC Concentration



3356.020.32F
PGB:skf/GRA_3AB

O'Brien & Gere Engineers, Inc.

Figure 33
ITT SEALECTRO
MAMARONECK, NY
MW-3D Total VOC Concentrations



3356.020.33F
PGB:skf/GRA 3AB

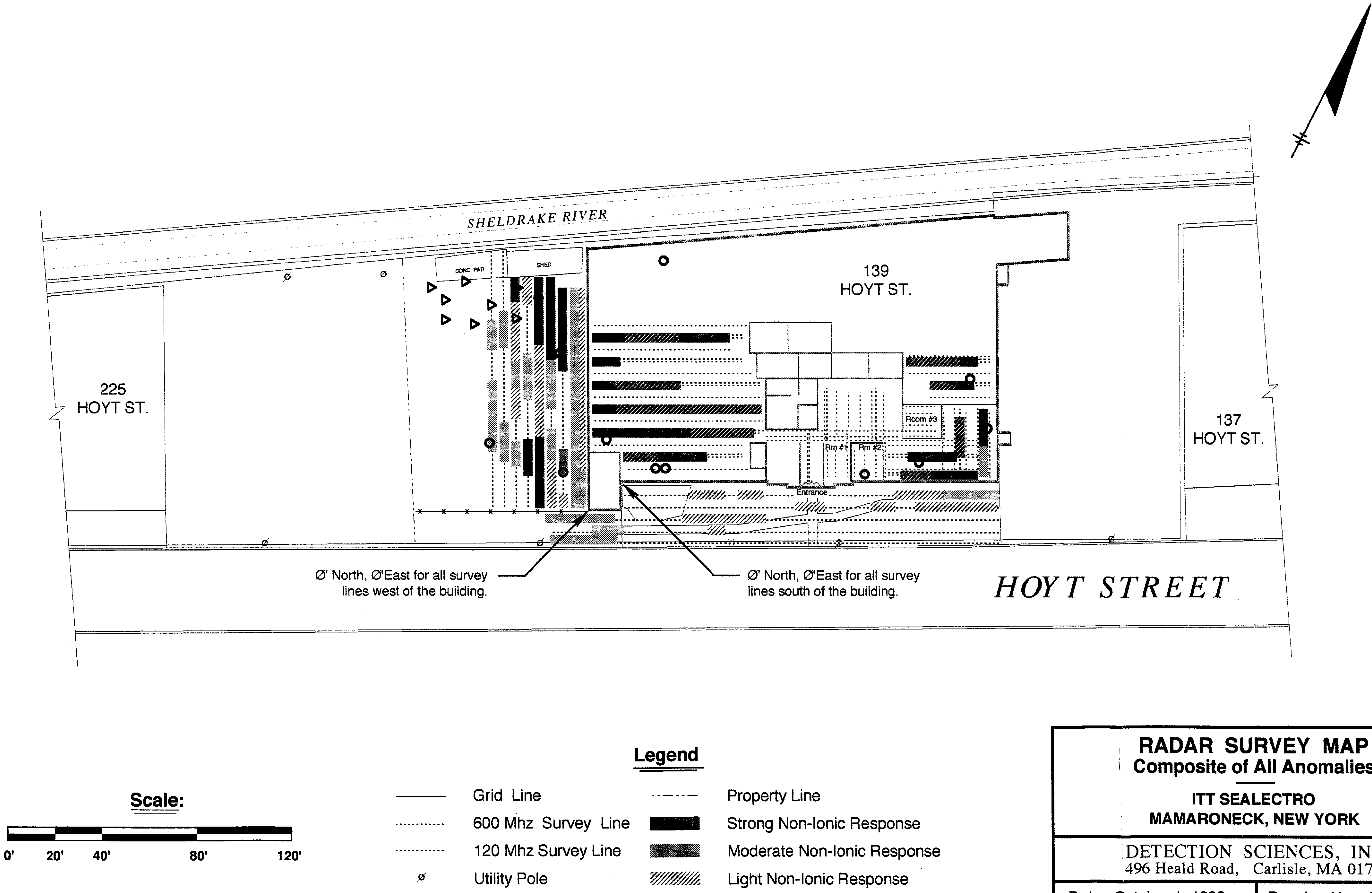
O'Brien & Gere Engineers, Inc.

Appendices

O'BRIEN & GERE
ENGINEERS, INC.

APPENDIX A

GPR FIGURES



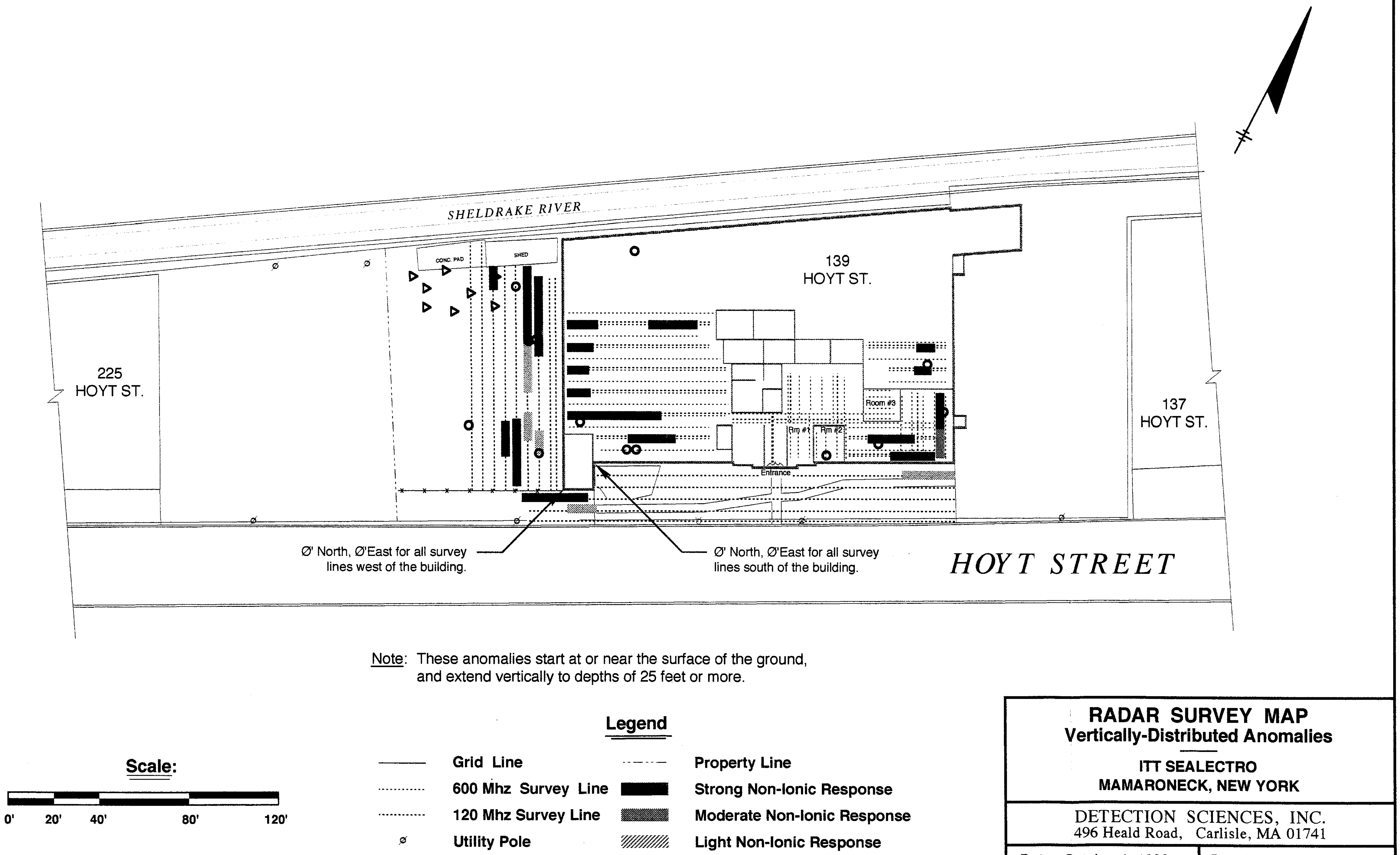
RADAR SURVEY MAP
Composite of All Anomalies

ITT SEALECTRO
MAMARONECK, NEW YORK

DETECTION SCIENCES, INC.
496 Heald Road, Carlisle, MA 01741

Date: October 1, 1993

Drawing No.: **340-93-01**
SHEET No. **1** OF **3**



Note: These anomalies start at or near the surface of the ground, and extend vertically to depths of 25 feet or more.

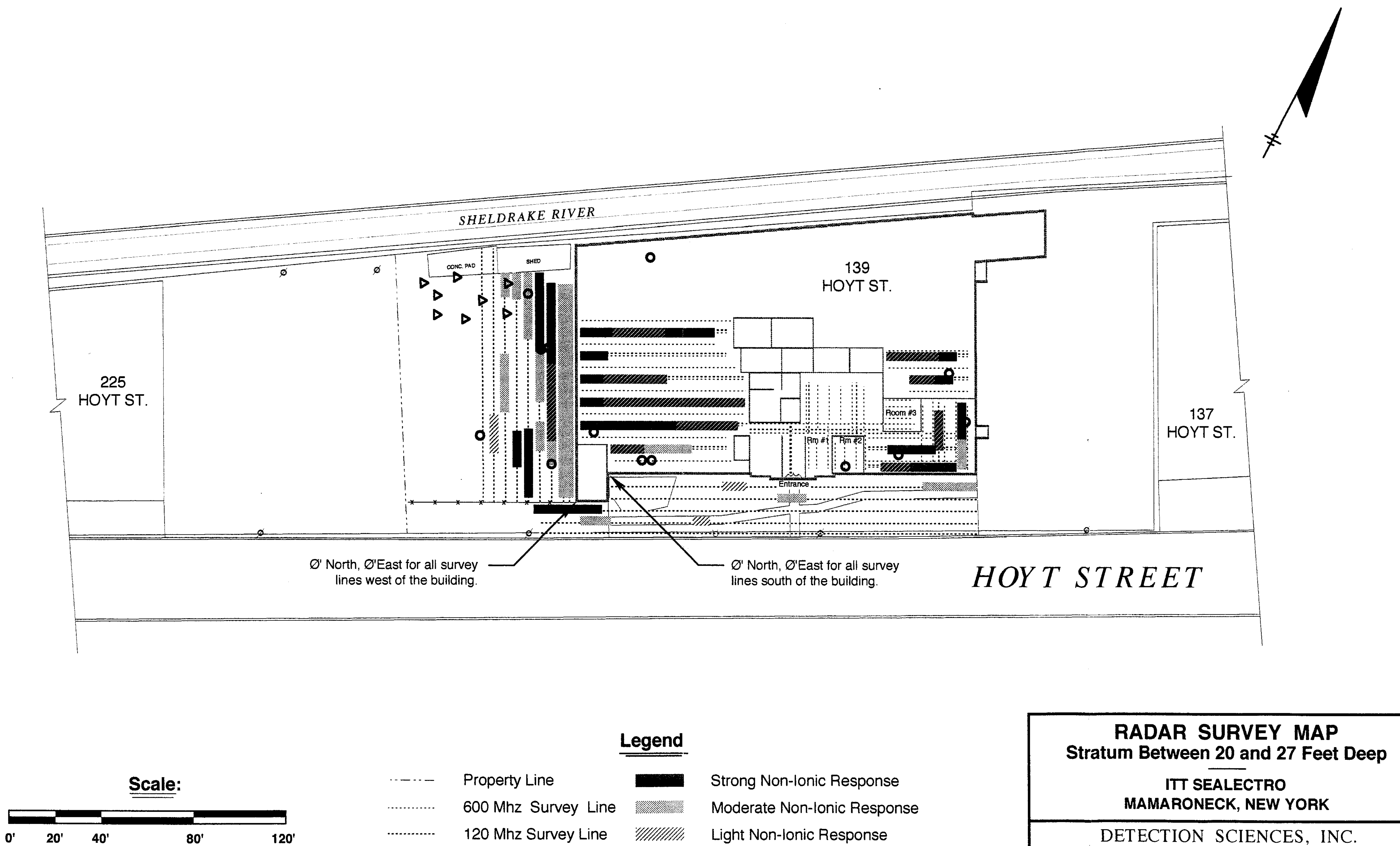
RADAR SURVEY MAP
Vertically-Distributed Anomalies

ITT SEALECTRO
MAMARONECK, NEW YORK

DETECTION SCIENCES, INC.
496 Heald Road, Carlisle, MA 01741

Date: October 1, 1993

Drawing No.: **340-93-01**
SHEET No. **2** OF **3**



Legend

-·-·-	Property Line	▬	Strong Non-Ionic Response
········	600 Mhz Survey Line	▒	Moderate Non-Ionic Response
········	120 Mhz Survey Line	▨	Light Non-Ionic Response
ø	Utility Pole	▩	Anomaly @ Depth ≥ 20'

RADAR SURVEY MAP
Stratum Between 20 and 27 Feet Deep

ITT SEALECTRO
MAMARONECK, NEW YORK

DETECTION SCIENCES, INC.
496 Heald Road, Carlisle, MA 01741

Date: October 1, 1993

Drawing No.: **340-93-01**
SHEET No. **3** OF **3**

APPENDIX B

SOIL BORING LOGS/MONITORING WELL COMPLETION DIAGRAMS

SOLVENT UST'S AREA – EB-1

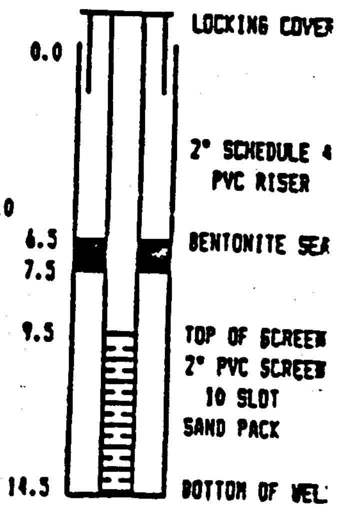
Depth	Analysis	Color/Lithology	Moisture	HNU Reading	Misc.
0-2		(Open Excavation to 2')			
2-4		dark yellow-brown fine sand	moist	(1)	Product Sheen Observed
4-6		dark yellow-brown fine sand	moist	(1)	Product Sheen Observed
6-8	*	dusky yellow-brown silty sand	saturated	50 ppm	
8-10	*	moderate dark-gray silt	saturated	50 ppm	
10-12	--	moderate dark-gray silt	dry	70 ppm	Product Sheen Observed
12-14	*	moderate dark-gray silt	saturated	(1)	
14-16		moderate red-brown silt	saturated	30 ppm	
16-18	--	moderate yellow-brown silty sand	moist/ saturated	55 ppm	
18-20	*	moderate yellow-brown fine-medium sand (running sands)	saturated	8 ppm	
20-22	--	moderate yellow-brown fine-medium sand	moist	15 ppm	
22-24	--	Unable to sample due to running sand			

(1) Visual and olfactory indicate significant contamination.
* Lab GC 8010/8020
-- Field GA VOA

WELL NO.:	MW-2	CONTRACTOR:	EAST COAST DRILLING	DATE STARTED:	6/21/88
PROJECT NO.:	5130-NSI-01	DRILLERS:	FREDERICKS/COOPER	DATE COMPLETED:	6/21/88
PROJECT:	SEALECTRO ASSESSMENT	TRC INSPECTOR:	JOHN HANKINS	DEPTH TO WATER (6/24/88)	
CLIENT:	ITT CORPORATION	DRILLING METHOD:	HOLLOW STEM AUGER	FROM CASING:	6.21 FT *
TOWN:	MAMARONECK, NY	CASING ELEVATION:	99.94 FT *	WATER ELEVATION:	93.73 FT *

DEPTH (FT)	BLOWS	OVA (PPM)	SOIL DESCRIPTION
0 - 2	4 9 4 6	--	FINE TO MEDIUM SAND AND GRAVEL INCLUDING BRICK FRAGMENTS, BROWN TO BLACK
5 - 7	4 2 2 3	25	SILT, SOME CLAY, BROWN, MOIST, 5.0-6.8; FINE TO MEDIUM SAND, BROWN, 6.8-7.0 SATURATED BELOW 6.5 FT
10 - 12	2 3 4 5	80	SILT, SOME FINE SAND, TRACE CLAY, GRAY, WET
15 - 17	3 4 6 6	30	SAME AS ABOVE

WELL CONSTRUCTION



* ELEVATION DATUM IS ARBITRARY 100.00 FEET ASSIGNED TO SOLVENT STORAGE PAD

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-2D
		PAGE 1 OF 3
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION:
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 1/21/92
		END DATE: 1/22/92
FILE NO.: 3356.011	FALL: 30"	
BORING COMPANY: Empire Soils		LEGEND: Grout, Sand Pack, Pellets, == Screen, Riser
FOREMAN: Jim Nowells		
OBG GEOLOGIST: D.E. Broach		

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0–2	7–5–4	18"/18"	12	ASPHALT				
						Wet, medium dense, moderate yellowish brown (10 YR 5/4), fine to coarse SAND, some fine to coarse gravel				<1
1										
2	2	2–4	2–3–3–4	24"/8"	6	Dry, loose, black CINDERS and SLAG	FILL			<1
3										
4	3	4–6	2–2–4–4	24"/6"	6	Wet, soft, moderate yellowish brown SILT and clay, some fine to medium sand, little fine to coarse gravel, micaceous				<1
5							SILT			
6	4	6–8	4–7–6–4	24"/24"	13	Moist, dusky yellowish brown (10 YR 2/2) SILT and fine sand, little clay grading downward to light olive gray (5 YR 6/1), medium SAND, wood chips at bottom of sand, micaceous				<1
7										
8	5	8–10	2–2–3–4	24"/16"	5	Moist, moderate yellowish brown, fine SAND and silt, trace clay grading to light olive gray, medium SAND, wood chips at bottom of sand, micaceous				<1
9							SAND			
10	6	10–12	4–7–8–10	24"/16"	15	Moist, medium dense, olive gray (5 Y 4/1) SILT, little clay and fine sand, low plasticity, high dilatency, micaceous				<1
11										
12	7	12–14	———	24"/0"	—	No recovery				<1
13										
14	8	14–16	3–5–6–7	24"/16"	11	Moist, medium dense, olive gray SILT, little fine sand as partings, micaceous	SILT			<1
15										
16	9	16–18	8–6–8–10	24"/18"	14	Moist, medium dense, olive gray SILT, little fine sand, trace grayish black (N2), fine to coarse gravel, micaceous				6
17										
18	10	18–20	4–4–6–11	24"/16"	10	Moist, medium dense, olive gray SILT, little fine to coarse sand as partings, trace fine to coarse grayish black, fine gravel, micaceous				19.1
19										

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-2D PAGE 2 OF 3
CLIENT: ITT Sealectro PROJECT LOCATION: Mamaroneck, NY FILE NO.: 3356.011	SAMPLER 3" Split Spoon HAMMER: 140 lbs. FALL: 30"	LOCATION: START DATE: 1/21/92 END DATE: 1/22/92
BORING COMPANY: Empire Soils FOREMAN: Jim Nowells OBG GEOLOGIST: D.E. Broach		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
20	11	20–22	4-6–	24"/12"	20	As above grading to moist, olive gray, fine				2.4
			14–18			to medium SAND, micaceous				
21										
22	12	22–24	3-4-4-7	24"/16"	8	Wet, loose, olive gray, medium to coarse				<1
						SAND, little fine sand, trace fine gravel,				
23						micaceous				
24	13	24–26	9-9–	24"/20"	21	Wet, medium dense, olive gray, medium to				1.2
			12–10			coarse SAND, little fine sand, trace fine to				
25						coarse gravel, micaceous				
							SAND			
26	14	26–28	20-16–	24"/20"	32	Wet, medium dense, olive gray, medium to				<1
			16–17			coarse SAND, little fine sand, trace fine to				
27						coarse gravel, micaceous				
28	15	28–30	18-19–	24"/14"	34	10" wet, medium dense, olive gray, medium to				<1*
			15–12			coarse SAND, little fine sand, trace fine to				
29						coarse gravel, micaceous, grading to coarse				
						SAND and fine gravel, micaceous				
30										
31										
32										
33										
34										
35	16	35–37	10-10–	24"/24"	19	Wet, medium dense, olive gray, fine to medium				<1
			9–11			SAND, micaceous				
36										
37										
38										
39										

* Running sand went to standard sampling.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-2D PAGE 3 OF 3
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION:
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 1/21/92 END DATE: 1/22/92
FILE NO.: 3356.011	FALL: 30"	
BORING COMPANY: Empire Soils FOREMAN: Jim Nowells OBG GEOLOGIST: D.E. Broach		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

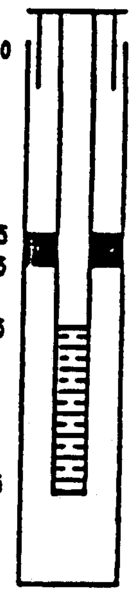
DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
40	17	40-42	5-3-3-5	24"/24"	6	Wet, medium dense, olive gray, fine to medium SAND, micaceous				<1
41							SAND			
42	18	42-42.5	100/0.1	24"/0"	—	BEDROCK				
						Bottom of boring 42.5'				
43										
44										
45										
46										
47										
48										
49										
50										

All colors from Munsell rock color chart.

WELL NO.:	MW-3	CONTRACTOR:	EAST COAST DRILLING	DATE STARTED:	6/21/88
PROJECT NO.:	5130-NS1-01	DRILLERS:	FREDERICKS/COOPER	DATE COMPLETED:	6/21/88
PROJECT:	SEALECTRO ASSESSMENT	TRC INSPECTOR:	JOHN HANKINS	DEPTH TO WATER (6/21/88)	
CLIENT:	ITT CORPORATION	DRILLING METHOD:	HOLLOW STEM AUGER	FROM CASING:	7.30 FT
TOWN:	MAMARONECK, NY	CASING ELEVATION:	100.69 FT *	WATER ELEVATION:	93.39 FT *

DEPTH (FT)	BLOWS	OVA (PPM)	SOIL DESCRIPTION
0 - 2	10 3 9 6	8	MEDIUM SAND, LITTLE GRAVEL, DARK BROWN, SLIGHTLY MOIST
5 - 7	3 6 4 4	0	MEDIUM TO COARSE SAND, LITTLE GRAVEL, DARK BROWN, WET BELOW 6.5 FT
10 - 12	4 5 3 3	25	VERY FINE SAND, SOME SILT, GRAY GRADING TO LIGHT BROWN, WET
15 - 17	2 2 3 3	6	VERY FINE SAND AND SILT, GRAY, WET

WELL CONSTRUCTION



* ELEVATION DATUM IS ARBITRARY 100.00 FEET ASSIGNED TO SOLVENT STORAGE PAD

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	REPORT OF BORING MW-3D
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	PAGE 1 OF 2
FILE NO.: 3356.011	FALL: 30"	LOCATION:
		START DATE: 1/23/92
		END DATE: 1/23/92

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

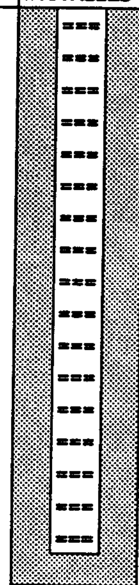
DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	4-4-5	18"/12"	8	Dry, loose, black, fine to coarse SAND, some silt, little fine to coarse gravel, micaceous	FILL			<1
1										
2	2	2-4	7-5-14-24	24"/14"	19	Dry, medium dense, dark yellowish brown (10 YR 4/2), fine to medium SAND, some silt, little clay and fine gravel, micaceous	SAND			<1
3										
4	3	4-6	4-9-25-24	24"/12"	34	Dry, dense, dark yellowish brown, fine to coarse SAND, some fine to coarse gravel, little silt, micaceous				<1
5										
6	4	6-8	10-15-15-15	24"/16"	30	Dry, dense, dark yellowish brown, fine to coarse SAND, some fine to coarse gravel, little silt, micaceous				<1
7										
8	5	8-10	6-5-3-4	24"/16"	8	Wet, loose, olive gray (5 Y 4/1) SILT, micaceous, low plasticity, low dilatency	SILT			<1
9										
10	6	10-12	5-2-4-3	24"/0"	6	No recovery				<1
11										
12	7	12-14	5-8-7-7	24"/14"	15	Wet, medium dense, olive gray SILT, some clay, fine to coarse sand lenses, micaceous				17.4
13										
14	8	14-16	WOH-1-4-4	24"/16"	5	Wet, loose, olive gray SILT grading to wet, loose, moderate yellowish brown, fine to coarse SAND, little fine to coarse gravel, micaceous				<1
15							SAND			
16	9	16-18	5-6-6-6	24"/18"	12	Wet, medium dense, olive gray, fine to coarse SAND, little fine to coarse gravel, micaceous				<1
17										
18	10	18-20	6-6-5-7	24"/18"	11	Wet, medium dense, olive gray, fine to coarse SAND, little fine to coarse gravel, micaceous				<1
19										

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-3D
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	PAGE 2 OF 2
		LOCATION:
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 1/23/92
		END DATE: 1/23/92
FILE NO.: 3356.011	FALL: 30"	

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout; Sand Pack; Pellets; == Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
20	11	20-22	17-27-	24"/18"	45	Wet, dense, olive gray, fine to coarse SAND,				<1
			18-19			little fine to coarse gravel, micaceous				
21										
22										
23							SAND			
24										
25	12	25-27	70-20-	24"/18"	48	Dry, dense, olive gray, fine to coarse SAND,				<1
			28-28			little fine to coarse gravel, micaceous				
26										
27										
28										
						BEDROCK				
29	13	29-29.1	100/0.1	24"/0"	—	No recovery				
						Bottom of boring 29.0'				
30										
31										
32										
33										
34										
35										



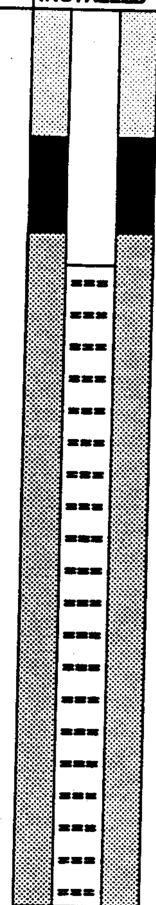
All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-4
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	PAGE 1 OF 1
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	LOCATION:
FILE NO.: 3356.011	FALL: 30"	START DATE: 2/12/92 END DATE: 2/12/92

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout, Sand Pack, Pellets, == Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0										
1										
2						For soil description see test boring log for MW-4D				
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14						Bottom of boring 14.0'				
15										
16										
17										
18										
19										
20										



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O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING MW-4D
PAGE 1 OF 2
LOCATION:

CLIENT: ITT Sealectro
PROJECT LOCATION: Mamaroneck, NY
FILE NO.: 3356.011

SAMPLER 3" Split Spoon
HAMMER: 140 lbs.
FALL: 30"

START DATE: 2/11/92
END DATE: 2/11/92

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	70-50-25	18"/18"	120	ASPHALT Dry, very dense, BLACK (NI), fine to coarse SAND and fine to coarse gravel (fill)	FILL			<1
1										
2	2	2-4	20-15-15-20	24"/18"	30	Dry, dense, dusky brown (5 YR 2/2), fine to coarse SAND and fine to coarse gravel (fill)				<1
3										
4	3	4-6	1-1-1-1	24"/10"	2	Moist, very loose, dusky brown SILT, some fine sand, plant matter, micaceous	SILT			<1
5										
6	4	6-8	3-6-9-9	24"/16"	15	6" as above; 10" moist, medium dense, olive gray (5 Y 4/1) SILT, some fine sand in laminations, micaceous				<1
7										
8	5	8-10	4-5-5-10	24"/18"	10	Moist, medium dense, olive gray SILT, some fine sand in laminations, micaceous				<1
9										
10	6	10-12	5-3-7-9	24"/18"	10	16" wet, loose, olive gray SILT, some fine sand in laminations; 2" wet, olive gray, fine to coarse SAND, some silt, micaceous				<1
11										
12	7	12-14	3-3-3-5	24"/12"	6	Wet, loose, olive gray, fine to coarse SAND, some silt, micaceous	SAND			<1
13										
14	8	14-16	12-7-5-5	24"/4"	12	Wet, medium dense, olive gray, fine to coarse SAND, some silt, micaceous				<1
15										
16	9	16-18	7-7-21-40	24"/24"	28	12" as above; 12" wet, medium dense, moderate yellowish brown (10 YR 5/4), fine to coarse SAND, little fine to coarse gravel, light brown (5 YR 5/6) staining, micaceous				<1
17										
18	10	18-20	——	——	—	No recovery, running sand				
19										
20	11	20-22	3-3-5-8	24"/24"	8	22" as above 2" wet, loose, moderate yellow brown, coarse SAND, some fine gravel, micaceous				<1
21										

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-4D
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	PAGE 2 OF 2
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	LOCATION:
FILE NO.: 3356.011	FALL: 30"	START DATE: 2/11/92 END DATE: 2/11/92

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout; Sand Pack; Pellets; == Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
22	12	22-24	2-3-4-5	24"/24"	7	Wet, loose, moderate yellow brown, fine to coarse SAND, some fine to coarse gravel in lenses, micaceous				<1
23										
24	13	24-39	——	——	—	No samples from 24-39' due to running sands				
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39	14	39-41	35-44-100/0	24"/16"	—	Wet, very dense, moderate yellow brown, medium to coarse SAND and fine sand, some fine to coarse gravel, angular rock fragments in gravel, micaceous				<1
40										
41						Bottom of boring 41.0'				
42										

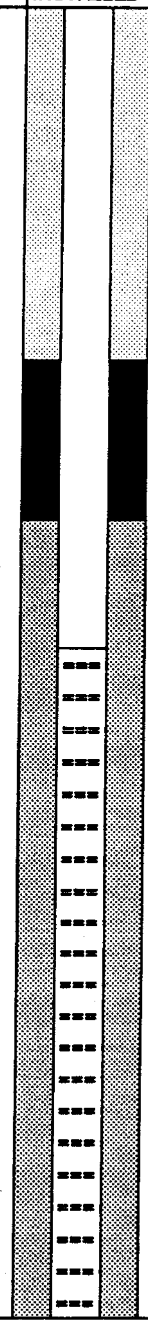
All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-5 PAGE 1 OF 1
CLIENT: ITT Sealectro PROJECT LOCATION: Mamaroneck, NY FILE NO.: 3356.011	SAMPLER 3" Split Spoon HAMMER: 140 lbs. FALL: 30"	LOCATION: START DATE: 1/28/92 END DATE: 1/28/92

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout, Sand Pack, Pellets, == Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0										
1						For soil description see test boring log for B-17 and B-19				
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										



Bottom of boring 20.0'

EB:cmb/ITT011.25

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-22/MW-8
		PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION:
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 2/4/92
		END DATE: 2/4/92
FILE NO.: 3356.011	FALL: 30"	
BORING COMPANY: Empire Soils		LEGEND: Grout; Sand Pack; Pellets; Screen; Riser
FOREMAN: Jim Nowells		
OBG GEOLOGIST: D.E. Broach		

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0–2	1-2-3-2	24"/16"	5	Dry, loose, moderate brown (5 YR 3/4), fine to medium SAND and silt, fine to coarse gravel (fill)	FILL			<1
1										
2	2	2–4	2-3-2-5	24"/16"	5	4" as above 8" moist, loose, moderate yellowish brown (10 YR 5/4), fine SAND and silt, some medium to coarse sand, micaceous	SAND			<1
3										
4	3	4–6	4-3-2-1	24"/12"	5	Moist, loose, dark yellowish brown (10 YR 4/2) SILT and fine sand, little fine to coarse gravel, black staining, heavy odor, micaceous				120.5*
5										
6	4	6–8	1-7-1-3	24"/16"	8	Wet, loose, dark gray (N3), fine to coarse SAND and silt, some fine to coarse gravel, slight odor, micaceous				73.5
7										
8	5	8–10	7-7-3-6	24"/14"	10	7" wet, loose, dark gray, fine to coarse SAND and silt, some fine to coarse gravel, heavy odor, black staining, micaceous; 7" moist, olive gray SILT, some fine sand				61.5
9							SILT			
10	6	10–12	2-3-5-6	24"/0"	8	No recovery, spoon coated with fuel oil				60.1
11										
12	7	12–14	7-6-5-2	24"/20"	11	Wet, loose, olive gray SILT and fine sand, micaceous				61.5*
13										
14	8	14–15	8-7	24"/6"	—	Wet, loose, olive gray SILT and fine sand, micaceous				
15						Bottom of boring 15.0'				
16										
17										
18										
19										
20										

* Samples submitted for laboratory analyses.
Free product in borehole. Boring converted to MW-8.
All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING RW-1
PAGE 1 OF 1
LOCATION:

CLIENT: ITT Sealectro
PROJECT LOCATION: Mamaroneck, NY
FILE NO.: 3356.011

SAMPLER 3" Split Spoon
HAMMER: 140 lbs.
FALL: 30"

START DATE: 2/10/92
END DATE: 2/10/92

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0–2	1-1-3-4	24"/0"	4	No recovery				
1										
2	2	2–4	1-1-1-2	24"/0"	2	No recovery				
3										
4	3	4–6	1-1-1-2	24"/12"	2	6" moist, very loose, dusky brown (5 YR 2/2), fine to coarse SAND and silt, some fine to coarse gravel, micaceous; 6" moist, dusky brown and medium gray (N5) SILT and fine to coarse sand, some fine to coarse gravel, black staining, heavy odor, micaceous				
5										
6	4	6–8	1-2-1-2	24"/18"	3	10" as above; 8" wet, dusky brown SILT and fine sand, plant matter, micaceous				
7										
8	5	8–10	1-1-1-2	24"/12"	2	4" as above; 8" wet, very loose, olive gray (5 Y 4/1), fine to coarse SAND, some silt, little fine to coarse gravel, micaceous, heavy odor, black staining				
9										
10	6	10–12	2-3-4-5	24"/16"	7	Wet, loose, olive gray, fine to coarse SAND, some silt, little fine to coarse gravel, heavy odor, black staining, micaceous				
11							SAND			
12	7	12–14	4-4-5-6	24"/18"	9	Wet, loose, olive gray, fine to coarse SAND, some silt, little fine to coarse gravel, heavy odor, black staining, micaceous				
13										
14						Bottom of boring 14.0'				
15										
16										
17										
18										
19										
20										

All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-11
PAGE 1 OF 1
LOCATION:

CLIENT: ITT Sealectro
PROJECT LOCATION: Mamaroneck, NY
FILE NO.: 3356.011

SAMPLER 3" Split Spoon
HAMMER: 140 lbs.
FALL: 30"

START DATE: 1/28/92
END DATE: 1/28/92

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	13-12-10	18"/18"	25	ASPHALT				
						Dry, moderate yellow brown (10 YR 5/4), fine to coarse SAND, some fine to coarse gravel				<1
1						6" dry, black (N1), fine to coarse gravel (fill)				
2	2	2-4	8-8-10-5	24"/6"	18	Dry, medium dense, black, fine to coarse SAND, some fine to coarse gravel (fill)	FILL			<1
3										
4	3	4-6	4-3-3-3	24"/12"	6	4" moist, loose, moderate yellow brown (10 YR 5/4), fine to coarse SAND, some fine to coarse gravel; 6" moist, black, fine to coarse SAND, some fine to coarse gravel, micaceous; 2" wet, olive gray SILT, micaceous				<1
5										
6	4	6-8	6-4-4-4	24"/12"	8	Wet, loose, olive gray (5 YR 4/1), fine to medium SAND, some coarse sand, little silt, trace gravel, strong odor, micaceous				19.5
7										
8	5	8-10	3-4-5-7	24"/16"	9	12" wet, loose, olive gray, fine to medium SAND, some coarse sand, micaceous; 4" moist, medium gray (105) SILT, little fine sand, micaceous				6.1
9										
10	6	10-12	3-4-7-9	24"/16"	11	Moist, medium gray SILT, little fine sand, micaceous				<1
11										
12						Bottom of boring 12.0'				
13										
14										
15										
16										
17										
18										
19										
20										

All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-12
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	PAGE 1 OF 1
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	LOCATION:
FILE NO.: 3356.011	FALL: 30"	START DATE: 1/27/92 END DATE: 1/27/92
BORING COMPANY: Empire Soils FOREMAN: Jim Nowells OBG GEOLOGIST: D.E. Broach		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	12-8-10	18"/6"	20	ASPHALT				
						Dry, black (N1), fine to coarse SAND, some fine to coarse gravel (fill)				1.3
1										
2	2	2-4	4-4-2-2		6	Dry, black, fine to coarse SAND, some fine to coarse gravel (fill)	FILL			<1
3										
4	3	4-6	2-2-2-4	24"/16"	4	Dry, olive gray (5 Y 4/1) SILT, some fine sand, micaceous				<1
5										
6	4	6-8	6-7-6-12	24"/16"	13	Moist, medium dense, olive gray SILT, some fine sand grading downward to wet, olive gray, coarse SAND, heavy odor, micaceous				54.5
7										
8	5	8-10	9-2-3-4	24"/16"	5	Moist, loose, olive gray, coarse SAND, heavy odor, micaceous				61.5
9										
10	6	10-12	2-3-4-5	24"/4"	7	Wet, loose, olive gray SILT, some fine to coarse sand, micaceous				9.5
11										
12	7	12-14	4-5-6-6	24"/16"	11	Wet, loose, olive gray SILT, some fine to coarse sand, micaceous				<1
13										
14						Bottom of boring 14.0'				
15										
16										
17										
18										
19										
20										

Samples S-2 (6-8') and S-4 (10-14') submitted for laboratory analyses.
All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-13
PAGE 1 OF 1
LOCATION:

CLIENT: ITT Sealectro
PROJECT LOCATION: Mamaroneck, NY
FILE NO.: 3356.011

SAMPLER 3" Split Spoon
HAMMER: 140 lbs.
FALL: 30"

START DATE: 1/28/92
END DATE: 1/28/92

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	——	——	——	ASPHALT				<1
						No recovery – coarse GRAVEL				
1										
2	2	2-4	4-3-3-6	24"/12"	6	Dry, loose, black (N1), fine to coarse SAND,	FILL			<1
						some fine to coarse gravel (fill)				
3										
4	3	4-6	4-2-3-6	24"/16"	5	Moist, medium gray (N5) SILT and fine sand,				<1
						some moderate yellow brown (10 YR 5/4) motti-	SILT			
5						ing in silt, micaceous, grading downward to				
						fine to coarse SAND, micaceous				
6	4	6-8	4-2-3-5	24"/16"	5	10" wet, loose, medium gray, fine to coarse	SAND			<1
						SAND; 6" wet, dusky brown (5 YR 2/2) SILT,				
7						some fine to coarse sand, micaceous				
8	5	8-10	4-2-3-3	24"/0"	5	No recovery				<1
							SILT			
9										
10	6	10-12	4-7-7-10	24"/18"	14	Moist, loose, olive gray (5 YR 4/1) SILT,				<1
						little fine sand, micaceous				
11										
12						Bottom of boring 12.0'				
13										
14										
15										
16										
17										
18										
19										
20										

All colors from Munsell color chart.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-14
PAGE 1 OF 1
LOCATION:

CLIENT: ITT Sealectro
PROJECT LOCATION: Mamaroneck, NY
FILE NO.: 3356.011

SAMPLER 3" Split Spoon
HAMMER: 140 lbs.
FALL: 30"

START DATE: 1/31/92
END DATE: 1/31/92

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout; Sand Pack; Pellets; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	5-6-3	18"/6"	11	ASPHALT				
						Dry, black (N1), medium dense, fine to coarse SAND and fine to coarse gravel, some silt (fill)	FILL			
1										
2	2	2-4	2-2-6-15	24"/20"	8	Moist, loose, moderate brown (5 YR 3/4), fine to medium SAND and silt, little fine to coarse gravel, micaceous				<1
3										
4	3	4-6	10-12-8-2	24"/16"	20	6" as above; 8" moist, medium dense, dark yellowish brown (10 YR 4/2), fine to coarse SAND, some silt, micaceous; 2" moist, medium dense, moderate red brown, fine SAND, little silt, micaceous				<1
5										
6	4	6-8	3-4-5-5	24"/20"	9	14" as above; 4" wet, loose, olive gray (5 YR 4/1), fine to coarse SAND, little silt; 2" moist, moderate red brown, fine SAND, little silt, micaceous				<1*
7										
8	5	8-10	2-2-2-2	24"/24"	4	6" wet, very loose, olive gray, fine to coarse SAND, some fine to coarse gravel, little silt; 8" moist, olive gray, fine SAND and silt, micaceous				<1
9										
10	6	10-12	1-1-5-3	24"/6"	6	Wet, loose, fine to coarse SAND and fine to coarse gravel, sheen on sample, micaceous				<1
11										
12	7	12-14	4-4-5-6	24"/24"	9	6" wet, loose, olive gray, fine to coarse SAND and fine to coarse gravel, micaceous; 18" moist, olive gray, fine SAND and silt, micaceous				NOTE
13										
14	8	14-16	WH-WH-WH-2	24"/18"	—	No recovery				<1
15										
16	9	16-18	2-5-8-12	24"/18"	13	6" moist, loose, olive gray, fine SAND and silt, micaceous; 12" moist, olive gray, fine to medium SAND, some silt, micaceous				<1*
17										
18						Bottom of boring 18.0'				
19										
20										

NOTE 13 ppm in gravel, 0.3 ppm in silty sand
* Samples submitted for laboratory analyses.
All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-15 PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION:
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 2/3/92 END DATE: 2/3/92
FILE NO.: 3356.011	FALL: 30"	
BORING COMPANY: Empire Soils FOREMAN: Jim Nowells OBG GEOLOGIST: D.E. Broach		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0.5–2	6-6-7	18"/12"	12	ASPHALT	0.5'			
						Dry, loose, dark yellow brown (10 YR 4/2) to				<1*
1						black (N1), fine to coarse SAND and silt, some				
						fine to coarse gravel (fill)				
2	2	2–4	6-12–	24"/5"	22	Dry, loose, dark yellow brown to black, fine	FILL			<1*
			10–7			to coarse SAND and silt, some fine to coarse				
3						gravel (fill)				
4	3	4–6	12-36–	24"/12"	46	6" as above				<1*
			10–12			6" rock fragments, micaceous				
5										
6	4	6–8	6-10–	24"/12"	19	Moist, medium dense, olive gray (5 Y 4/1)				<1
			9–11			SILT and fine sand, some medium to coarse sand,				
7						little fine to coarse gravel, iron staining,				
						micaceous	SILT			
8	5	8–10	3-6-6-3	24"/0"	12	No recovery				<1
9										
10	6	10–12	1-1-1-1	24"/0"	2	No recovery				<1
11										
12	7	12–14	3-4-4-5	24"/4"	8	Wet, loose, olive gray SILT and fine to coarse				<1
						sand, some fine to coarse gravel, micaceous				
13										
14						Bottom of boring 14.0'				
15										
16										
17										
18										
19										
20										

* Samples submitted for laboratory analyses (S-3 and S-5 field duplicate).

All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-16
PAGE 1 OF 1
LOCATION:

CLIENT: ITT Sealectro
PROJECT LOCATION: Mamaroneck, NY
FILE NO.: 3356.011

SAMPLER 3" Split Spoon
HAMMER: 140 lbs.
FALL: 30"

START DATE:
END DATE:

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout; Sand Pack; Pellets; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	10-10-12	18"/12"	20	ASPHALT				<1
						Dry, medium dense, black (N1), fine to coarse	FILL			
1						SAND, some fine to coarse gravel (fill)				
2	2	2-4	6-6-6-4	24"/18"	12	14" dry, loose, olive gray (5 Y 4/1) SILT,	SILT			<1*
						some fine sand, little medium to coarse sand,				
3						trace fine to coarse gravel, micaceous; 4" dry,				
						black and moderate yellow brown (10 YR 5/4)				
4	3	4-6	10-100/.5	24"/0"	—	SILT and fine sand, micaceous				—
						No recovery				
5										
6	4	6-8	1-4-3-5	24"/6"	7	Wet, loose, olive gray SILT, some fine sand,				<1
						micaceous				
7										
8	5	8-10	4-5-5-5	24"/0"	10	No recovery				—
9										
10	6	10-12	6-5-4-5	24"/8"	9	Wet, loose, olive gray SILT and fine sand,				<1
						micaceous				*
11										
12	7	12-14	4-5-6-10	24"/24"	11	Wet, loose, olive gray SILT and fine sand,				<1
						grading to wet, olive gray, fine to medium	SAND			
13						SAND, micaceous, iron staining				
14						Bottom of boring 14.0'				
15										
16										
17										
18										
19										
20										

* Samples submitted for laboratory analyses.
All colors from Munsell color chart.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-17
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	PAGE 1 OF 1
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	LOCATION:
FILE NO.: 3356.011	FALL: 30"	START DATE: 2/5/92 END DATE: 2/5/92

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	1-1-1-1	24"/6"	2	Wet, very loose, dark yellowish brown (10 YR 4/2), fine to coarse SAND and silt, little fine to coarse gravel, micaceous	SAND			200.1*
1										
2	2	2-4	1-1-1-1	24"/6"	2	Wet, very loose, dark yellowish brown, fine to coarse SAND and silt, little fine to coarse gravel, micaceous				250.7
3										
4	3	4-6	4-2-2-3	24"/12"	4	6" as above 6" moist, loose, dusky brown (5 YR 2/2) SILT and fine sand, little medium to coarse sand, plant matter, micaceous	SILT			253.3
5										
6	4	6-8	3-5-7-8	24"/24"	12	16" as above 8" wet, loose, olive gray (5 Y 4/1) SILT and fine sand, little medium to coarse sand, heavy odor, micaceous				251*
7										
8	5	8-10	3-5-8-10	24"/10"	13	Wet, loose, olive gray SILT and fine sand, little medium to coarse sand, heavy odor, micaceous				341*
9										
10	6	10-12	8-14-12-10	24"/12"	26	Wet, loose, olive gray SILT and fine sand, little medium to coarse sand, heavy odor, micaceous				346
11										
12						Bottom of boring 12.0'				
13										
14										
15										
16										
17										
18										
19										
20										

* Samples submitted for laboratory analyses.
Boring started 3' below grade due to excavation.
All colors from Munsell rock color chart.

EB:cmb/ITT011.15

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-18
PAGE 1 OF 1
LOCATION:

CLIENT: ITT Sealectro

PROJECT LOCATION: Mamaroneck, NY

FILE NO.: 3356.011

SAMPLER 3" Split Spoon

HAMMER: 140 lbs.

FALL: 30"

START DATE: 2/7/92
END DATE: 2/7/92

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	35-100/4	18"/4"	—	ASPHALT				<1
1						Dry, very dense, black (NI), fine to coarse SAND and fine to coarse gravel (fill)	FILL			
2	2	2-4	18-16-18-15	24"/10"	34	Dry, dense, dusky brown (5 YR 2/2), fine to coarse SAND and fine to coarse gravel, micaceous				<1
3										
4	3	4-6	2-3-3-3	24"/0"	6	No recovery				<1
5										
6	4	6-8	4-4-4-4	24"/24"	8	12" moist, loose, olive gray (5 Y 4/1) SILT and fine to medium sand; 12" moist, loose, dusky brown SILT and fine sand, peat laminations, micaceous				<1*
7										
8	5	8-10	3-15-9-6	24"/4"	24	Wet, medium dense, olive gray SILT and fine sand, some medium to coarse sand, micaceous				<1
9										
10	6	10-12	5-6-12-14	24"/20"	18	6" wet, medium dense, fine to coarse SAND and fine gravel, micaceous; 14" moist, olive gray SILT and fine sand, micaceous				<1
11										
12	7	12-14	15-18-18-20	24"/24"	36	Wet, dense, olive gray, fine to coarse SAND and fine gravel, micaceous				<1*
13										
14						Bottom of boring 14.0'				
15										
16										
17										
18										
19										
20										

* Samples submitted for laboratory analyses (6-S as field duplicate, S-2 and S-5).
All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-19
		PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION:
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 1/30/92 END DATE: 1/30/92
FILE NO.: 3356.011	FALL: 30"	

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout; Sand Pack; Pellets; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	11-17-15	18"/8"	28	6" ASPHALT				
						Dry, medium dense, grayish brown (5 YR 3/2),				<1
1						fine to coarse SAND, some fine to coarse gravel				
						(fill)				
2	2	2-4	12-5-6-6	24"/0"	11	No recovery	FILL			
3										
4	3	4-6	2-2-2-2	24"/6"	4	Moist, very loose, olive gray (5 Y 4/1) SILT,				125.4
						some fine sand, wood chips, micaceous				
5							SILT			
6	4	6-8	3-3-3-5	24"/16"	6	10" as above; 2" wet, loose, olive gray, fine				125.4
						to coarse SAND, some fine gravel; 4" moist,				7.5
7						dusky brown (5 YR 2/2) PEAT				
8	5	8-10	WOH-2-	24"/24"	5	6" as above; 12" moist, loose, olive gray,				147.5*
			3-4			fine to medium SAND, some silt, little coarse				
9						sand, wood chips, micaceous				
							SAND			
10	6	10-12	1-3-4-7	24"/6"	7	Moist, loose, olive gray, fine SAND, some				9.1
						silt, trace medium to coarse sand, peat lamin-				
11						ations, micaceous				
12	7	12-14	14-16-	24"/0"	38	No recovery (heavy odor)				
			22-26							
13										
14	8	14-16	7-6-	24"/24"	22	Moist, medium dense, olive gray, fine SAND,				14
			16-16			some silt, micaceous				
15										
16	9	16-18	4-7-	24"/16"	24	Moist to dry, olive gray SILT and fine sand,				16.9
			17-17			trace medium sand in laminatione, micaceous				
17										
18	10	18-20	6-7-9-11	24"/16"	16	Wet, medium dense, olive gray SILT and fine	SILT			10*
						sand, some medium sand, micaceous				
19										
20	11	20-22	6-6-6-7	24"/12"	12	Wet, medium dense, olive gray, fine to coarse				59.9
						SAND, some silt, little fine to coarse gravel,				
21						micaceous	SAND			
22						Bottom of boring 22.0'				

* Samples submitted for laboratory analyses. All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-20 PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION:
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 2/6/92 END DATE: 2/6/92
FILE NO.: 3356.011	FALL: 30"	

BORING COMPANY: Empire Soils
FOREMAN: Jim Nowells
OBG GEOLOGIST: D.E. Broach

LEGEND: Grout; Sand Pack; Pellets; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	3-4-4	18"/2"	7	Dry, loose, black (N1) CINDERS and SLAG (fill)	FILL			7.1*
1										
2	2	2-4	5-14-7-8	24"/8"	21	Dry, loose, black CINDERS and SLAG				7
3										
4	3	4-6	5-8-7-4	24"/2"	15	Moist, loose, olive gray (5 Y 4/1) SILT and fine sand, micaceous	SAND			<1
5										
6	4	6-8	5-4-4-7	24"/0"	8	No recovery, cinders/slag caved in borehole				
7										
8	5	8-9	4-4-7-9	24"/0"	11	No recovery, cinders/slag caved in borehole				
9	6	9-11	5-5-5-5	24"/6"	10	Wet, loose, olive gray, fine to medium SAND, micaceous				19.2
10										
11	7	11-13	5-9-11-13	24"/8"	20	2" wet, loose, olive gray, fine to coarse SAND, some fine to coarse gravel, micaceous				123.5
12						6" moist, olive gray SILT and fine sand, micaceous	SILT			
13						Bottom of boring 13.0'				
14										
15										
16										
17										
18										
19										
20										

* A composite of all of the samples was submitted for laboratory analyses due to the small amount of retrieved material.
All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-21 PAGE 1 OF 1 LOCATION:
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 2/4/92 END DATE: 2/4/92
FILE NO.: 3356.011	FALL: 30"	
BORING COMPANY: Empire Soils FOREMAN: Jim Nowells OBG GEOLOGIST: D.E. Broach		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	1-2-4-3	24"/20"	6	14" dry, loose, dusky brown (5 YR 2/2), fine to medium SAND and silt (top soil); 6" dry, loose, dark yellowish brown (10 YR 4/2), fine to medium SAND and silt, some coarse, little fine to coarse gravel	FILL			<1
1										
2	2	2-4	6-10-4-3	24"/16"	14	10" as above 6" dry, loose, black CINDERS and slag				<1
3										
4	3	4-6	1-1-3-3	24"/15"	4	6" moist, very loose, dark yellowish brown, fine SAND and silt, some medium to coarse sand, black staining, micaceous	SAND			<1
5										
6	4	6-8	2-2-3-3	24"/20"	5	8" as above 12" wet, loose, olive gray (5 Y 4/1), fine SAND and silt, trace medium to coarse sand, micaceous				51.5*
7										
8	5	8-10	1-2-4-6	24"/16"	6	Moist, loose, moderate brown (5 YR 4/4) SILT and fine sand, some clay, plant matter, micaceous	SILT			12.5
9										
10	6	10-12	4-4-6-9	24"/20"	10	Moist, loose, medium dark gray (N4), fine SAND and silt, laminations of medium sand, micaceous	SAND			<1*
11										
12	7	12-14	5-12-15-12	24"/16"	27	As above grading to wet, medium to coarse SAND, some fine sand, little silt, micaceous				11.1
13										
14						Bottom of boring 14.0'				
15										
16										
17										
18										
19										
20										

* Samples submitted for laboratory analyses.
All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-23 PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION:
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 2/7/92 END DATE: 2/7/92
FILE NO.: 3356.011	FALL: 30"	
BORING COMPANY: Empire Soils FOREMAN: Jim Nowells OBG GEOLOGIST: D.E. Broach		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	62-25-15	18"/16"	87	ASPHALT				<1
						6" dry, very dense, black (NI), fine to coarse				
1						SAND and fine to coarse gravel; 10" dry, dusky				
						brown (5 YR 2/2) SILT and fine sand, some med-				
2	2	2-4	25-24-	24"/16"	49	ium to coarse sand, little fine to coarse gravel				<1*
			25-50			Dry to moist, dense, moderate yellow brown				
3						(5 YR 3/4), fine to coarse SAND, some fine to				
						coarse gravel, micaceous				
4	3	4-6	4-5-5-8	24"/0"	10	No recovery				
5										
6	4	6-8	14-12-	24"/4"	24	Moist, medium dense, dusky brown, olive gray				<1*
			12-12			(5 Y 4/1) and moderate yellow brown SILT and				
7						fine sand, little medium to coarse sand,				
						trace fine to coarse gravel, micaceous				
8	5	8-10	2-8-9-9	24"/2"	17	Wet, medium dense, olive gray SILT and fine				<1
						sand, micaceous				
9										
10						Bottom of boring 10.0'				
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

* Samples submitted for laboratory analyses.
All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-24 PAGE 1 OF 1 LOCATION:
CLIENT: ITT Sealectro PROJECT LOCATION: Mamaroneck, NY FILE NO.: 3356.011	SAMPLER 3" Split Spoon HAMMER: 140 lbs. FALL: 30"	START DATE: 2/10/92 END DATE: 2/10/92
BORING COMPANY: Empire Soils FOREMAN: Jim Nowells OBG GEOLOGIST: D.E. Broach		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HNU
0	1	0-2	2-3-4-3	24"/6"	7	Dry, loose, dusky brown (5 YR 2/2) SILT and fine sand, some medium to coarse sand, little fine to coarse gravel, micaceous				40.5
1										
2	2	2-4	10-7-1-2	24"/6"	8	Moist, loose, moderate yellowish brown (10 YR 5/4) SILT and fine sand, some medium to coarse sand, little fine to coarse gravel, micaceous				46.5
3										
4	3	4-6	1-1-1-1	24"/6"	2	Moist, very loose, dusky brown SILT and fine sand, little medium to coarse sand, micaceous				55.1
5										
6	4	6-8	1-5-5-6	24"/24"	10	12" moist, loose, dusky brown SILT and fine sand, little medium to coarse sand, micaceous 12" moist, olive gray (5 Y 4/1) SILT and fine sand, micaceous				95
7										
8	5	8-10	3-4-4-4	24"/20"	8	Moist, loose, olive gray SILT and fine sand, micaceous, iron staining				<1
9										
10	6	10-12	2-2-3-3	24"/16"	5	Moist, loose, olive gray SILT and fine sand, micaceous				<1
11										
12	7	12-14	5-5-7-7	24"/24"	12	Wet, loose, olive gray SILT and fine sand, micaceous				<1
13										
14	8	14-16	1-2-3-3	24"/16"	5	Wet, loose, olive gray SILT and fine sand, micaceous				<1
15										
16	9	16-18	4-2-2-3	24"/24"	4	Wet, moderate yellow brown, medium SAND, some fine sand, micaceous				<1
17										
18						Bottom of boring 18.0'				
19										
20										

Monitoring well not installed due to encountering product. Not
All colors from Munsell rock color chart.

O'BRIEN & GERE ENGINEERS, INC.

B-25	Sheet 1 of 1	Date Completed: 12/02/9

Project Location: Mamaroneck, New York
ient: ITT Sealectro, Inc.

Boring Co.: Summit Drilling, Inc.
Foreman: Matt Rabb
OBG Geologist: Paul Rotondi/Damon Kozul

EQUIPMENT SPECIFICATIONS
Type: 2" I.D. split barrel sampler
Hammer: 140 lb. Fall: 30"

	Screen	Riser	Gravel Pack
Type	PVC	PVC	Morie #1
Length	n/a	n/a'	n/a

GROUND WATER ELEVATION DATA (MSL)
Ground Water Elevation: n/a Date:
Date:
Ground Surface Elevation: n/a
Top of Casing Elevation: n/a

Depth Below Grade	Sample No	Depth (EL.)	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Unified Soil Classif. System	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks
0-2'	1		1, 3	2'/1'	7	Loose, Moderate brown (5YR 3/4), dry, f-m SAND, trace f-gravel, well sorted, some fragments and black streaks present (poss. fill material)	SP				0	
			4, 3									
2-4'	2		3, 3	2'/1'	5	Loose, Dark yellowish brown (10YR 4/2) to moderate brown (5YR 3/4), dry, f-m SAND, trace-little medium gravel, some fragments and black streaks present.	SP				0	
			2, 2									
6'	3		3, 3	2'/1'	5	Loose, Dark yellowish brown (10YR 4/2) to moderate brown (5YR 3/4), dry, f-m SAND, trace-little medium gravel, grading into free product at 6' below grade. Water table at 6', strong petroleum odor present	SP				20	
			2, 1									
6-8'	4		1, 1	2'/1'	2	Very loose, same as above grading into a dusky yellowish brown (10YR 2/2) silty-CLAY to clayey SILT, trace f-m sand, saturated, strong organic odor present, sheen.	SP				30	
			1, 3									
8-10'	5		5, 7	2'/6"	16	Medium dense, same as above, saturated, light sheen present.	SP				40	
			9, 7									
12'	6		4, 6	2'/2'	12	Medium dense, grayish olive (10Y 4/2), dry -moist, SILT, trace clay, well sorted, med plasticity.	ML				0	
			6, 7									
12-14'	7		6, 5	2'/2'	11	Medium dense, grayish olive (10Y 4/2), saturated, SILT, trace fine sand, trace clay, high dilatancy.	ML				0	
			6, 9									
						TOTAL DEPTH - 14'						

O'BRIEN & GERE ENGINEERS, INC.

MW-09 / MW-26

Sheet 1 of 1 Date Completed: 12/02/92

Project Location: Mamaroneck, New York
Client: ITT Sealectro, Inc.

EQUIPMENT SPECIFICATIONS
Type: 2" I.D. split barrel sampler
Hammer: 140 lb. Fall: 30"

GROUND WATER ELEVATION DATA (MSL)
Ground Water Elevation: n/a Date:
Date:

…ring Co.: Summit Drilling, Inc.
Foreman: Matt Rabb
OBG Geologist: Paul Rotondi/Damon Kozul

	Screen	Riser	Gravel Pack
Type	PVC	PVC	Morie #1
Length	14'-4'	4'-0'	14'-2'

Ground Surface Elevation: n/a
Top of Casing Elevation: n/a

…pth …elow Grade	Sample No	Depth (EL.)	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Unified Soil Classif. System	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
…2'	1		2, 3	2'/6"	8	Loose, Dark yellowish brown (10YR 4/2), dry, f-m SAND, trace-little f-m gravel, veget. matter present.	SW				0	
			5, 4									
2-4'	2		3, 3	2'/1'	6	Same as above with minor glass fragments, vegetative matter - poorly sorted, well rounded.	SW				3	
			3, 3									
…6'	3		2, 1	2'/4"	2	Same as above grading into a dark greenish-gray (5GY 4/1) to olive gray (5Y 4/1) m-c SAND, trace-little f-sand, little f-m gravel. Water at 6' below grade.	SW				30	
			1, 2									
…8'	4		2, 3	2'/2'	6	Same as above, mottled, with black streaks present, STRONG PRODUCT ODOR with VISIBLE SHEEN, saturated.	SW				100	
			3, 3									
8-10'	5		4, 5	2'/2'	14	Medium dense, dark yellowish brown (10YR 4/2), saturated, f-m SAND grading into a dry-damp, olive green, clayey SILT of med. plasticity, trace f-sand, laminations.	SW ML				40	
			8, 9									
…12'	6		5, 7	2'/2'	17	Very stiff, moist-saturated, laminated, clayey-SILT of low plasticity, trace-fine sand, minor mica present. Water table at 11' below grade.	ML				0	
			10,10									
12-14'	7		6, 8	2'/1'	17	Same as above	ML				0	
			9, 8									

WELL CONSTRUCTION

14'-4': 2" 10 slot sch 40 PVC screen
4'-0': 2" 10 slot sch 40 PVC riser
14'-2': #1 Morie sand pack
2'-1': Bentonite pellets
1'-0': Grout to surface

8" Flush mount protective casing utilized with 2' square concrete pad.

O'BRIEN & GERE ENGINEERS, INC.

	B-27 YMW-28	Sheet 1 of 1 Date Completed: 12/02/92
Project Location: Mamaroneck, New York Client: ITT Sealectro, Inc.	EQUIPMENT SPECIFICATIONS Type: 2" I.D. split barrel sampler Hammer: 140 lb. Fall: 30"	GROUND WATER ELEVATION DATA (MSL) Ground Water Elevation: n/a Date: Date:
Boring Co.: Summit Drilling, Inc. Foreman: Matt Rabb Geologist: Paul Rotondi/Damon Kozul	Type: Screen PVC; Riser PVC; Gravel Pack Morie #1 Length: Screen n/a; Riser n/a; Gravel Pack n/a	Ground Surface Elevation: n/a Top of Casing Elevation: n/a

Depth Below Grade	Sample No	Depth (EL.)	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Unified Soil Classif. System	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0-2'	1		2, 2	2'/1'	5	Loose, dark yellowish brown (10YR 4/2), moist-damp, f-m sandy SILT, trace clay, trace f-gravel, concrete at 3' below grade	SM				0	
			3, 4									
2-4'	2		3, 2	2'/8"	2	Very loose, light brown (5YR 5/6), moist-damp, f-m SAND, trace c-sand, trace silt/clay, minor mica present, mottled. Auger to 4' through concrete.	SP				0	
			100/0"									
4-6'	3		4, 3	2'/1'	7	Same as above grading into a dark yellowish brown, dry-moist, f-m SAND, trace f-m gravel, poorly sorted. Water at 6'below grade.	SW				0	
			4, 3									
6-8'	4		3, 9	2'/1'	15	Stiff, dusky yellowish brown, saturated, clayey SILT of medium plasticity, trace f-m sand with strong odor grading into a grayish olive (10Y 4/2) to olive gray (5Y 3/2) f-sandy SILT, dry at bottom, PRODUCT ODOR, 1' of product in soil.	ML				70	
			6, 9									
8-10'	5		8, 8	2'/0'	17	No recovery in spoon.	n/a				--	
			9, 9									
10-12'	6		5, 6	2'/1'	16	Very stiff, grayish olive (10Y 4/2) to olive gray (5Y 3/2), saturated, clayey-SILT of medium plasticity, laminated, well sorted, no vegetative matter present.	ML				3	
			10,13									
12-14'	7		6, 6	2'/1'	16	Same as above, moderately laminated, no sheen.	ML				3	
			10,12									
						Total Depth - 14'						

O'BRIEN & GERE ENGINEERS, INC.

Project Location: Mamaroneck, New York
Client: ITT Sealectro, Inc.

MW-10/MW-28

Sheet 1 of 1 Date Completed: 12/02/9

EQUIPMENT SPECIFICATIONS
Type: 2" I.D. split barrel sampler
Hammer: 140 lb. Fall: 30"

GROUND WATER ELEVATION DATA (MSL)
Ground Water Elevation: n/a Date:
Date:

Boring Co.: Summit Drilling, Inc.
Foreman: Matt Rabb
OBG Geologist: Paul Rotondi/Damon Kozul

	Screen	Riser	Gravel Pack
Type	PVC	PVC	Morie #1
Length	14'-4'	4'-0'	14'-2'

Ground Surface Elevation: n/a
Top of Casing Elevation: n/a

Depth Below Grade	Sample No	Depth (EL.)	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Unified Soil Classif. System	Equipment Installed	pH	Sp Cond	HNU	Rmks
0-2'	1		1, 4 / 3, 3	2'/1'	7	Loose, dark yellowish orange (10YR 6/6) to moderate red-brown (10R 4/6), dry, f-silty SAND, trace c-gravel, black streaks, mica present.	SM				0	
2-4'	2		3, 3 / 3, 2	2'/1'	6	Same as above, slightly darker, moderate sorting.					10	
4-6'	3		4, 5 / 3, 4	2'/3"	8	Loose, dark yellowish orange (10YR 6/6) to moderate red-brown (10R 4/6), saturated, f-silty SAND, trace-little f-gravel, black streaks, ODOR PRESENT. Water table at 6' below grade.	SM				10	
6-8'	4		3, 2 / 2, 6	2'/1.5'	4	Soft, medium gray (N5), saturated, f-sandy SILT, micaceous, ODOR PRESENT, sheen, veg. matter evident in soil.	ML				100+	
8-10'	5		3, 2 / 7, 8	2'/1.5'	9	Loose, dark greenish gray (5G 6/1), saturated, f-m SAND, trace-little silt, trace f-gravel grading into a grayish olive green (5GY 3/2) to dusky yellowish green (10 GY 3/2) SILT, tr. f-sand/clay, mottled.	SP / ML				50	
10-12'	6		5, 6 / 8,11	2'/1'	14	Stiff, grayish olive, dry to moist, fine SAND, little-some silt, laminated, alt. wet and dry zones. Wet zones highly saturated, low plasticity.	SP/ML				10	
12-14'	7		6,11 / 9,12	2'/1'	20	Same as above, saturated, no laminations, high dilatancy.	SP/ML				5	

WELL CONSTRUCTION

14'-4': 2" 10 slot sch 40 PVC screen
4'-0': 2" 10 slot sch 40 PVC riser
14'-2': #1 Morie sand pack
2'-1': Bentonite pellets
1'-0': Grout to surface

8" Flush mount protective casing utilized with 2' square concrete pad.

O'BRIEN & GERE ENGINEERS, INC.

Project Location: Mamaroneck, New York Client: ITT Sealectro, Inc.	B-29	Sheet 1 of 1 Date Completed: 12/02/92

EQUIPMENT SPECIFICATIONS
Type: 2" I.D. split barrel sampler
Hammer: 140 lb. Fall: 30"

	Screen	Riser	Gravel Pack
Type	PVC	PVC	Morie #1
Length	n/a	n/a	n/a

Boring Co.: Summit Drilling, Inc.
Foreman: Matt Rabb
OBG Geologist: Paul Rotondi/Damon Kozul

GROUND WATER ELEVATION DATA (MSL)
Ground Water Elevation: n/a Date:
Date:
Ground Surface Elevation: n/a
Top of Casing Elevation: n/a

Depth Below Grade	Sample No	Depth (EL.)	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Unified Soil Classif. System	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0-2'	1		1, 3	2'/2'	5	Loose, dusky yellowish brown (10YR 4/2), dry f-m SAND, trace f-gravel, vegetative matter present.	SP				0	
			2, 2									
2-4'	2		7, 11	2'/4"	20	Same as above, saturated at 4' below grade.	SP				0	
			9, 4									
-6'	3		6, 4	2'/0'	9	No recovery from spoon	n/a				---	
			5, 5									
-8'	4		3, 3	2'/1'	7	Loose, dusky yellowish brown (10YR 4/2), saturated, f-m SAND, trace f-gravel, heavy sheen and STRONG ODOR present. Water table at 6' below grade.	SW/SP				10	
			4, 3									
8-10'	5		2, 6	2'/2'	13	Medium dense, dusky yellowish brown f-m SAND with strong odor and product sheen grading into an olive gray (5Y 3/2) saturated, micaceous f-sandy SILT at 9' grading into a grayish olive green (5GY 3/2) to gray, saturated-moist, SILT to f-sandy silt, tr-little clay, high dilatancy.	SW/SP SM ML/SM				10 0 0	
			7, 9									
10-12'	6		5, 9	2'/2'	20	Very stiff, grayish olive green, saturated-moist, SILT to f-sandy SILT, trace-little clay.	ML				5	
			11, 12									
12-14'	7		8, 11	2'/2'	25	Very stiff, grayish olive green, dry, SILT to f-sandy SILT, trace-little clay, micaceous.	ML				0	
			14, 12									
						TOTAL DEPTH - 14'						

O'BRIEN & GERE ENGINEERS, INC.

B-30	Sheet 1 of 1 Date Completed: 12/02/92

Project Location: Mamaroneck, New York
Client: ITT Sealectro, Inc.

EQUIPMENT SPECIFICATIONS
Type: 2" I.D. split barrel sampler
Hammer: 140 lb. Fall: 30"

GROUND WATER ELEVATION DATA (MSL)
Ground Water Elevation: n/a Date:
Date:

Boring Co.: Summit Drilling, Inc.
Foreman: Matt Rabb
OBG Geologist: Paul Rotondi/Damon Kozul

	Screen	Riser	Gravel Pack
Type	PVC	PVC	Morie #1
Length	n/a	n/a	n/a

Ground Surface Elevation: n/a
Top of Casing Elevation: n/a

Depth Below Grade	Sample No	Sample Depth (EL.)	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Unified Soil Classif. System	Equipment Installed	Field Testing pH	Field Testing Sp Cond	Field Testing HNU	Rmks
0-2'	1		1, 5	2'/6"	12	Medium dense, dusky yellowish brown (10YR 4/2), dry, f-m SAND, trace f-gravel, veget. matter present.	SP				0	
			7, 10									
2-4'	2		8, 7	2'/1'	17	Medium dense, olive green, dry, f-m SAND, well sorted, mostly fill material.	SP				0	
			10, 8									
4-6'	3		8, 10	2'/1'	19	Same as above (Fill Material)	SP				0	
			9, 7									
6-8'	4		7, 6	2'/1'	12	Medium dense, olive green to medium gray (N5), saturated, f-m SAND, trace-little f-gravel, black streaks, product odor at 8' accompanied by sheen, poorly sorted, mottled, Water at 7' below grade.	SW				60	
			6, 5									
8-10'	5		4, 5	2'/2'	13	Medium dense, grayish olive green (5GY 3/2) to olive gray, saturated, silty f-SAND, micaceous, well sorted, low plasticity	SM				2-3	
			8, 9									
10-12'	6		8, 11	2'/1'	21	Medium dense, grayish olive green to olive gray, saturated f-sandy SILT of low-medium plasticity, micaceous	SM				1-2	
			10, 10									
12-14	7		10, 11	2'/2'	22	Same as above, low-medium plasticity.	SM				0	
			11, 11									
						TOTAL DEPTH - 14'						

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-31
		PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Solvent UST Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DAT 12/16/93 END DATE: 12/16/93
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout; Sand Pack; Pellets; == Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	FIELD TESTING Head Space	FIELD TESTING HNU
0	0	0-.5	—	—	—	6 inch Concrete					
0.5	1	.5-2.5	10,13	2/1.4	23	Dry, dark brown and grey, medium dense,		B31-1	NO	4.9	0.6
			10,11			coarse SAND, little silt, some gravel and cinders					
						(fill material), dry					
2.5	2	2.5-4.5	16,35	2/1.3	107	Dry to damp, dark brown to light brown,		B31-2	NO	4.6	0.6
			72,40			very dense, medium to coarse SAND, some					
						chuncks of gneiss, trace silt, (with iron					
						oxide staining) (Fill material).					
4.5	3	4.5-6.5	43,75	2/1.4	110	Damp, dark brown to black, very dense,		B31-3	NO	8.7	0.8
			35,22			medium to coarse SAND, some fine to					
						medium grqvel and cinders (chunks of					
						feldic material) (Fill material)					
6.5	4	6.5-8.5	9,9	2/1.7	17	Damp to wet, dark grey, medium dense,		B31-4	High	85.5	100
			8,8			fine sandy SILT, micaceous plasticy trace					
						clay (odor).					
8.5	5	8.5-10.5	5,4	2/1.8	9	Damp to wet, dark brown to rusty, silty,	8.5-9	B31-5	Some	44.5	4
			5,7			loose, fine to medium SAND micaceous					
						Damp to wet, dark brown, meadow material,	9-10.5				
						(organic material).					
10.5	6	10.5-12.5	2,5	2/.7	12	Wet, dark brown to grey, medium dense,		B31-6	High	96.8	80
			7,19			medium to coarse SAND, some medium gravel,					
						little silt below meadow material stained (odor).					
12.5						Bottom of Boring 12.5 ft.					

Boring backfilled with cuttings and grout.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-32 & B-32A
PAGE 1 OF 1

CLIENT: ITT Sealectro
PROJECT LOCATION: Mamaroneck, NY
FILE NO.: 3356.020

SAMPLER 3" Split Spoon
HAMMER: 140 lbs.
FALL: 30"

LOCATION: Solvent UST Area
START DAT 12/16/93
END DATE: 12/16/93

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	Head Space	HNU
0						Pavement					
1	1	1-3	15,15	2/1.2	24	Damp, dark brown, medium dense, medium		B32-1	NO	3.4	0.6
			9,9			to coarse silty SAND, some medium gravel					
						and cinders (fill material).					
3	2	3-5	12,13	2/.8	25	Damp, brown to black, medium dense, medium		B32-2	Trace	2.1	0.6
			12,8			to coarse SAND, some medium gravel					
						and cinders (fill material).					
5	-	5-7	16,5	2/0	9	No recovery, loose.					
			4,4								
7	-	7-9	6,10	2/0	16	No recovery, medium dense,					
			6,11			(Moved adjacent to)					
						Bottom of Boring					
B-32A											
0						Pavement					
1	1	1-3	15,15	2/1.2	24	Damp, dark brown, medium dense, medium to		B32-1	NO	3.4	0.6
			9,9			coarse silty SAND, some medium gravel					
						and cinders, (fill material).					
3	2	3-5	12,13	2/.8	25	Damp, brown to black, medium dense, medium		B32-2	Trace	2.1	0.6
			12,8			to coarse SAND, some medium gravel and					
						cinders (fill material).					
5		5-7	5-4	2/0	8	No recovery, loose.					
			4,3								
7		7-9	5,6	2/1.5	11	Wet, grey, medium dense, sandy SILT.	7-7.5	B32-3	YES	42	10
			5,3								
						Grey silty medium SAND	7.5-8	B32-4			
						Wet, brown meadow material.	8-9				
9	5	9-11	9,7	2/1.6	28	Wet grey, medium dense, medium to coarse		B32-5	NO	4.4	0.6
			11,13			SAND well sorted micaceous.					
						Bottom of Boring					

Note: B-32A completed north of B-32.
Boring backfilled with cuttings and grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-33
		PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Solvent UST Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 12/16/94
		END DATE: 12/16/94
FILE NO.: 3356.020	FALL: 30"	
BORING COMPANY: Aquifer Drilling & Testing		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser
FOREMAN: Tony Pressimone		
OBG GEOLOGIST: John Knox		

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	Head Space	HNU
0	0	0-2				Pavement & Gravel					
2	1	2-4	10,12	2/.75	27	Dry, dark brown, medium, dense, medium		B33-1	NO	1.5	.5
			15,19			to coarse SAND, some medium gravel,					
						little silt (fill material).					
4	2	4-6	7,10	2/1.2	17	Damp, dark brown, medium dense, medium to		B33-2	NO	1.5	.5
			7,6			coarse SAND to light brown fine sandy					
						SILT, micaceous.					
6	3	6-8	6,13	2/2	46	Damp, light brown, dense, sandy SILT.	6-7	B33-3	NO	1	.5
			33,24			Brown sandy SILT, trace clay.	7-7.5				
						Grey brown coarse SAND, well sorted	7.5-8				
						some coarse GRAVEL.					
8	4	8-10	8,9	2/1.7	19	Gray, medium dense, sandy SILT.	8-8.5	B33-4	YES	64	8
			10,22			Medium to coarse SAND.	8.5-10				
						some fine gravel, saturated (odor).					
10						Bottom of Boring 10.0 ft.					

Boring backfilled with cuttings and grout.
Shelby Tube collected 5-7 ft.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-34
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	PAGE 1 OF 1
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	LOCATION:
FILE NO.: 3356.020	FALL: 30"	START DATE: 12/15/93 END DATE: 12/15/93

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout; Sand Pack; Pellets; == Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	Head Space	HNU
0	0	0-1				Concrete 8 inch and pea gravel 4 inch					
1	1	1-3	77,80 29.27	2/1.25	109	Dry, dark brown, very dense, medium to coarse SAND, some gravel (fill material)		B34-1	NO	1.1	0.5
3	2	3-5	80,32 40,26	2/1.2	72	Dry, light orange to brown (rusty), very dense medium to coarse SAND, some coarse gravel to dark brown coarse sand, (cinders, brick) (fill). (fill)		B34-2	NO	2.5	0.5
5	3	5-7	54,35 18,10	2/.75	53	Damp, light brown to dark brown, very dense, medium SAND, some gravel, trace of silt, (wet at tip of spoon).		B34-3	NO	4.0	0.8
7	4	7-9	5,4 3,3	2/1.8	7	Dark brown to some grey, loose, fine sandy SILT, trace plastic clay saturated at 7.5 ft (2 inch lenses of coarse sand (micaceous))		B34-4	YES Some	120	35
9						Bottom of Boring 9.0 ft.					

Boring backfilled with cuttings and grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-35 PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 2" Split Spoon	LOCATION: Solvent UST Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 12/23/93 END DATE: 1/6/94
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony
OBG GEOLOGIST: John Knox

LEGEND: Grout; Sand Pack; Pellets; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	Head Space	HNU
0		0-12				See Boring B-31.					
12	1	12-14	16,11	2/1.5	27	Wet, grey silty, medium dense, fine SAND,		B35-1	Little	190	45
			10,10			trace clay.					
14	2	14-16	25,35	2/1.0	52	Grey, very dense, silty fine SAND, trace clay		B35-2	YES	150	85
			17,17			gravel in tip of spoon					
						Set 6 inch casing from 0-15 ft.					
15	3	15-17	27,33	2/.9	61	Grey, very dense, medium to coarse SAND,		B35-3	NO	7	7
			28,45			some coarse GRAVEL, trace silt					
17	4	17-19	30,34	2/0	60	No recovery, very dense.					
			26,29								
19	5	19-21	6,6	2/0	12	Gravel lens at 20 ft., medium dense.					
			6,7			(No recovery)					
21	6	21-23		2/0		No recovery					
								B35-4	YES	20.5	1.4
23	7	23-25	11/14	2/.4	24	2nd spoon - grey brown, medium dense,					
						fine SAND, fine to medium GRAVEL,					
			10/10			(sheen on mud).					
25	8	25-27	13,13	2.0/0	33	No recovery - 1st spoon, medium dense.		B35-5	NO	1.5	0.6
			20,18								
			9,10		19	Grey brown, medium dense, fine SAND,					
			9,10			some silt (silty layer at bottom of spoon)					
27	9	27-29	20,23	2/1.0	55	Grey brown, very dense, silty SAND,		B35-6	NO	2.4	0.4
			32,32			some coarse GRAVEL					
29	10	29-31	90,140	1/.5	140+	Grey brown, very dense, fine silty SAND,		B35-7	Trace	2.8	0.7
						some coarse GRAVEL					
31.5						Bottom of Boring 31.5 ft.-Bedrock Encountered					

Boring backfilled with cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-36 PAGE 1 OF 2
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Solvent UST Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 1/11/94 END DATE: 1/11/94
FILE NO.: 3356.020	FALL: 30"	
BORING COMPANY: Aquifer Drilling & Testing FOREMAN: Carlos Puente OBG GEOLOGIST: John Knox		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING UV	Head Space	HNU
0		0-12				See B-33.					
						(Boring log for upper 12 ft. presented on B-33)					
12	1	12-14	16,12	2/1,2	26	Brown, medium dense, fine sandy SILT.	13-13.5	B36-1	NO	16	1
			14,18								
						Grey silty SAND, wet	13.5-14		NO		4
14	2	14-16	19,21	2/1.8	44	Brown, dense, fine sandy SILT	14-15	B36-2		10	4
			23,28								
						Grey silty SAND	15-16				4
						Set casing at 15 ft.					
								B36-3	NO	10	4
15	3	15-17	11,17	2/1.6	34	Wet, green grey, dense, fine silty SAND.					
			17,23								
17	4	17-19	18,20	2/1.5	42	Same as above.		B36-4	NO	10	—
			22,27								
19	5	19-21	28,31	2/1	49	Same as above, some odor.		B36-5	Trace	14	7
			18,27								
21	6	21-23	10,14	2/1.4	28	Grey, medium dense, fine SAND and trace SILT		B36-6	Trace	60	30
			14,19								
23	7	23-25	—	2/0		No recovery in spoon, hole open					
						taking next spoon from 25-28.5 ft.					
25	8	25-28.5	—	2/1.5		Grey fine SAND, trace silt, flourescent sheen		B36-7	YES	500	350
						multicolored			A lot		
							28.5-29				
29	9	29-31	36, 100/2	.7/.3		Grey, very dense, fine SAND.		B36-8	YES	95	70
31	10	31-33		2/0		Pulled spoon out, was empty.					
						Went back in hole, open to 33 ft.					
						Tried to spoon from 33-35 ft.					

Boring backfilled with cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-36 PAGE 2 OF 2
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Solvent UST Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 1/11/94 END DATE: 1/14/94
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Carlos Puente
OBG GEOLOGIST: John Knox

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	FIELD TESTING Head Space	FIELD TESTING HNU
33	11	33-35	—	2/0		No Recovery					
						Drilled to 35 ft.					
						Mud has sheen					
35	12	35-37	27,48	2/.5	98	Multicolored, very dense, fine to medium		B36-9	NO	20	
			50,50			GRAVEL, tip of spoon fine to medium SAND.					
37	13	37-39	100/0	0/0	100+	No recovery			—	—	—
						Bedrock encounted 39 ft.					

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-37 PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Fuel Oil UST Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 12/20/93 END DATE: 12/20/93
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout; Sand Pack; Pellets; == Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µN	Head Space	HNU
0	0	0-.5				6 inch Concrete					
.5	1	.5-2.5	9,8 8,8	2/1.1	16	Black, medium dense, medium to coarse SAND, some gravel and cinders, trace silt.		B37-1	NO	1.0	0.8
2.5	2	2.5-4.5	8,12 13,16	2/.8	25	Dry, tan-brown, medium dense, medium to coarse SAND, some decomposed gneiss, trace silt.		B37-2	NO	1.2	0.7
4.5	3	4.5-6.5	18,21 12,12	2/.8	33	Damp, tan brown, dense, medium to coarse SAND, trace silt.		B37-3	NO	.8	0.6
						Bottom of Boring 6.5 ft.					

Boring backfilled with cuttings and cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-38/MW-13 PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Fuel Oil UST Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DAT 12/17/93 END DATE: 12/17/93
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout, Sand Pack, Bentonite, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	Sample Number	FIELD TESTING µN	Head Space	HNU
0	0	0-.5				6 inch Concrete				
.5	1	.5-2.5	5,7 18,16	2/1.4	25	Dry black-brown, medium dense, coarse SAND, some medium to coarse GRAVEL and cinder trace silt (fill material).	B38-1	NO	1.3	0.6
2.5	2	2.5-4.5	18,18 14,18	2/1.2	32	Damp black to light brown, dense, coarse sand some medium to coarse gravel trace silt/brown medium to coarse sand some gneiss trace silt.	B38-2	NO	1.3	0.6
4.5	3	4.5-6.5	28,27 11,7	2/1.0	38	Same as above.	B38-3	NO	1.1	0.7
6.5	4	6.5-8.5	8,14 13,20	2/2.0	27	Wet brown to grey brown, medium dense, medium SAND. Grey fine to medium SAND some mica flakes trace silt, stained from 7-7.5 ft.	B38-4	YES	2.5	5.0
8.5	5	8.5-10.5	20,20 20,22	2/1.4	40	Wet, grey, dense, fine to medium SAND little silt	B38-5	NO	1.1	0.7
10.5	6	10.5-12.5	13,15 21,22	2/1.9	36	Wet, grey, dense, fine sandy SILT trace clay	B38-6	NO	1.0	0.9
12.5	7	12.5-14.5	13,15 16,18	2/2	31	Same as above	B38-7	NO	1.0	0.8
14.5						Bottom of Boring at 14.5 ft. MW-13 flush mount from 14.5 ft. below grade 2 inch 10 slot screen 10 ft.				

Monitoring Well Installed
14.5-4.5 0.010 Slot 2" PVC Well Screen
14.5- 2.0 ft. Washed Silica Sand, 2.0 - 1.5 ft. = bentonite, 1.5 - 0.0 ft. = grout

Locking flush mount installed.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-39
		PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Fuel Oil UST Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 12/17/93
		END DATE: 12/17/93
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout; Sand Pack; Pellets; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING μV	Head Space	HNU
0	0	0-.5				Concrete					
.5	1	.5-2.5	24,16	2/1.2	24	Dry, dark brown, medium dense, medium to coarse SAND, some cinders and gravel, trace silt, (fill material).		B39-1	NO	0.7	0.4
			8,11								
2.5	2	2.5-4.5	20,55	1/1.0		Damp, light brown to orange medium to coarse SAND, some gravel, trace silt.		B39-2	NO	0.7	0.4
4	3	4-6	58,75	2/1	107	Damp, light brown to orange, very dense, medium to coarse SAND, some fine to medium gravel, trace silt.		B39-3	NO	0.7	0.4
			32,25								
6	4	6-8	19,7	2/1.2	13	Wet, light brown-orange, medium dense, medium to coarse SAND, some fine to sandy silt, some organic material, (meadow material), in tip of spoon.		B39-4	NO	0.7	0.4
			6,6								
						Bottom of Boring 8.0 ft.					

Boring backfilled with cuttings and cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-40 PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Former Drum Storage Pad Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 12/21/93 END DATE: 12/21/93
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout; Sand Pack; Pellets; == Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µN	Head Space	HNU
0	0	0–.5				6 inch concrete					
.5	1	.5–2.5	44,35 92,75	2/.8	127	Damp, black to orange, very dense, medium to coarse SAND, some medium to coarse gravel, trace silt.		B40–1	NO	0.6	1.0
2.5	2	2.5–4.5	30,63 44,42	2/1.1	107	Dry, tan, to orange brown, very dense, medium to coarse SAND, some medium gravel, little silt (gneiss).		B40–2	Trace	0.6	1.0
4.5	3	4.5–6.5	53,17 11,12	2/1.5	28	Brown, medium dense, medium to coarse SAND some fine to medium gravel little silt, wet at 6 ft.		B40–3	NO	0.7	1.1
6.5	4	6.5–8.5	8,8 6,4	2/.8	14	Wet, grey, medium dense, sandy SILT.		B40–4	NO	0.7	1.0
8.5						Bottom of Boring 8.5 ft.					

Boring backfilled with cuttings and cement bentonite grout.
3 Shelby Tubes attempted starting at 8.5 ft. – none successful.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-41 PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Former Drum Storage Pad Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 12/22/93 END DATE: 12/22/93
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout; Sand Pack; Pellets; == Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	FIELD TESTING Head Space	FIELD TESTING HNU
0	0	0-1				1 ft GRAVEL and ASPHALT					
1	1	1-3	19,12	2/.5	22	Dry, tan brown, medium dense, medium		B41-1	NO	2.1	0.4
			10,8			to coarse SAND, some fine to medium					
						gravel, little silt.					
3	2	3-5	8,10	2/.75	13	Damp, tan brown, medium dense, medium		B41-2	NO	1.8	0.4
			13,22			to coarse SAND, some fine to medium gravel,					
						cinders and little silt.					
						Bottom of Boring 5.0 ft.					

Boring backfilled with cuttings and cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-42 PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Former Drum Storage Pad Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 12/22/93 END DATE: 12/22/93
FILE NO.: 3356.020	FALL: 30"	

		LEGEND:
BORING COMPANY:	Aquifer Drilling & Testing	Grout / Screen
FOREMAN:	Tony Pressimone	Sand Pack / Riser
OBG GEOLOGIST:	John Knox	Pellets

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	Head Space	HNU
0	0	0-1				1 ft GRAVEL and ASPHALT					
1	1	1-3	24,14	2/1.7	23	Dry to damp, brown to black, medium dense,		B42-1	—	3.2	.4
			9,8			medium to coarse SAND, some medium to coarse					
						gravel, cinders, trace silt.					
3	2	3-5	7,11	2/1.4	19	Same as above	3.5-4.5	B42-2	—	2.1	.4
			8,9								
						Damp, brown, fine sandy SILT,	4.5-5				
						wet at 5 ft.					
5						Bottom of Boring 5.0 ft.					

Boring backfilled with cuttings and cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-43
PAGE 1 OF 1

CLIENT: ITT Sealectro
PROJECT LOCATION: Mamaroneck, NY
FILE NO.: 3356.020

SAMPLER 3" Split Spoon
HAMMER: 140 lbs.
FALL: 30"

LOCATION: Former Drum Storage Pad Area
START DATE: 12/22/93
END DATE: 12/22/93

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	FIELD TESTING Head Space	FIELD TESTING HNU
0	0	0-1				1 ft GRAVEL and ASPHALT					
1	1	1-3	24,13	2/1.6	21	Dry, black, medium dense, medium to coarse SAND, some fine to medium gravel, cinders, trace silt.		B43-1	—	0.4	0.4
			9,8								
3	2	3-5	8,9	2/1.3	13	Black to brown, medium dense, medium to coarse SAND some gravel and cinders, grading to brown fine to medium sandy SILT (wet at tip).		B43-2	—	1.2	0.4
			4,4								
5						Bottom of Boring 5.0 ft.					

Boring backfilled with cuttings and cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-44 PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Former Drum STorage Pad Are
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 12/22/93 END DATE: 12/22/93
FILE NO.: 3356.020	FALL: 30"	
BORING COMPANY: Aquifer Drilling & Testing FOREMAN: OBG GEOLOGIST: John Knox		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	FIELD TESTING Head Space	FIELD TESTING HNU
0	0	0-1				1 ft GRAVEL and ASPHALT					
1	1	1-3	12,12	2/1.4	22	Dry, brown to black, medium dense, medium		B44-1	—	1.6	0.4
			10,9			to coarse SAND, some fine to medium gravel,					
						cinders, trace silt.					
3	2	3-5	6,6	2/1.5	11	Black to tan, medium desne, medium to		B44-2	—	1.6	0.5
			5,8			coarse SAND, some gravel and cinders to					
						coarse sandy silt, wet at tip.					
5						Bottom of Boring 5.0 ft.					

Boring backfilled with cuttings and cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-45
PAGE 1 OF 1

CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Former Drum Storage Pad Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 12/22/93
FILE NO.: 3356.020	FALL: 30"	END DATE: 12/22/93

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout; Sand Pack; Pellets; == Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING μv	Head Space	HNU
0	0	0-1				1 ft GRAVEL and ASPHALT					
1	1	1-3	20,22	2/1.4	39	Dry, black, dense, medium to coarse		B45-1	NO	1.7	0.5
			17,15			SAND, some gravel, cinders brick, trace silt.					
3	2	3-5	6,6	2/2	15	Brown grey, medium dense, sandy SILT		B45-2	NO	1.1	0.5
			9,9			some coarse sand,					
						wet at tip.					
5						Bottom of Boring 5.0 ft					

Boring backfilled with cuttings and cement/bentonits grout.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-46
PAGE 1 OF 1

CLIENT: ITT Sealectro

PROJECT LOCATION: Mamaroneck, NY

FILE NO.: 3356.020

SAMPLER 3" Split Spoon

HAMMER: 140 lbs.

FALL: 30"

LOCATION: Former Drum Storage Pad Area

START DATE: 12/22/93
END DATE: 12/22/93

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	Head Space	HNU
0	0	0-1				1 ft GRAVEL and ASPHALT					
1	1	1-3	20,17	2/	34	Dry, black, dense, medium to coarse SAND,		B46-1	NO	1.8	0.4
			17,17			some fine to medium gravel, cinders,					
						trace silt.					
3	2	3-5	10,9	2/2	20	Damp, grey, medium dense, fine silty SAND,		B46-2	YES	97.8	80
			11,15			trace clay.					
						wet at tip of spoon					
5						Bottom of Boring 5.0 ft.					

Boring backfilled with cuttings and cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-47
		PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Former Drum Storage Pad Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 12/22/93
		END DATE: 12/22/93
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µ/V	Head Space	HNU
0	0	0-.5				6 inch Pavement					
.5	1	.5-2.5	23,11	2/.5	21	Dry, tan yellow, medium dense, medium to		B47-1	NO	1.6	0.4
			10,11			coarse SAND, trace silt, little gravel.					
2.5	2	2.5-4.5	9,12	2/.5	19	Damp, brown to black, medium dense, medium		B47-2	NO	3.3	0.4
			7,6			to coarse SAND, some fine to medium gravel,					
						cinders, slag, trace silt.					
4.5	3	4.5-6.5	2,5	2/	12	Damp, brown to black, medium dense, medium		B-47-3	NO	1.5	.4
			7,13			to coarse SAND, some fine to medium gravel					
						to 5 ft.					
						Wet, brown medium to coarse silty SAND,	5-5.5		NO	1.0	1.0
						some orange-mottling.					
						Wet, grey medium to coarse SAND, little silt.	5.5-6.5		YES	--	5.0
6.5						Bottom of Boring 6.5 ft.					

Boring backfilled with cuttings and cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING B-48
		PAGE 1 OF 1
CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	LOCATION: Former Drum Storage Pad Area
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	START DATE: 12/22/93
		END DATE: 12/22/93
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	FIELD TESTING Head Space	FIELD TESTING HNU
0	0	0-1				1 ft. GRAVEL and ASPHALT					
1	1	1-3	11,17	2/1	32	Dry, black-orange (rust), dense,		B48-1	NO	1.1	0.4
			15,11			medium to coarse SAND, some fine to medium					
						GRAVEL, cinders, trace silt.					
3	2	3-5	4,5	2/1.8	12	Brown to grey, medium dense, fine sandy SILT		B48-2	NO	1.1	0.4
			7,12			at the tip grey coarse silty SAND,					
						Wet at tip of spoon.					
5						Bottom of Boring 5.0 ft.					

Boring backfilled with cuttings and cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-49
PAGE 1 OF 1

CLIENT: ITT Sealectro
SAMPLER 2" Split Spoon
LOCATION: Solvent UST Area

PROJECT LOCATION: Mamaroneck, NY
HAMMER: 140 lbs.
START DATE: 1/11/94
END DATE: 1/11/94

FILE NO.: 3356.020
FALL: 30"

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µ/V	Head Space	HNU
0	0	0-1				Asphalt					
1	1	1-3	45,100	1.5/.7	200						
			100			Dry, orange brown, very dense, medium to coarse SAND, some fine to medium gravel, trace silt.		B49-1	Trace	2	0
3	2	3-5	8,8	2/.5	13	Damp, brown black, medium dense, silty medium SAND, some large gravel.		B49-2	NO	3	1
			5,4								
5	3	5-7	9,9	2/1.2	19	Wet, grey, medium dense, silty fine SAND micaceous, rust stains.		B49-3	NO	1	1
			10,12								
7	4	7-9	4,4	2/1.2	10	Grey, medium dense, medium to coarse SAND to brown sandy silt in bottom		B49-4	NO	2	1
			6,9								
9	5	9-11	12,12	2/1.8	26	Brown, medium dense, sandy SILT (meadow material).	9-9.5'	B49-5	NO	1	2
			14,16								
						Grey medium to coarse SAND, trace silt.	9.9-10.5'				
						Gray silty fine SAND, micaceous.	10.5-11'				
11						Bottom of Boring 11.0 ft.					

Boring backfilled with full cuttings and bentonite cement grout.
Shelby Tube collected 4 to 6 ft.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-50
PAGE 1 OF 1

CLIENT: ITT Sealectro
PROJECT LOCATION: Mamaroneck, NY
FILE NO.: 3356.020

SAMPLER 2" Split Spoon
HAMMER: 140 lbs.
FALL: 30"

LOCATION: Solvent UST Area
START DATE: 1/11/94
END DATE: 1/11/94

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	Head Sampl	HNU
0	0	0-1				1 ft Asphalt & Gravel					
1	1	1-3	40,26	2/2	52	Dark brown, very dense, fine sandy SILT (solvent odor).	1-1.5	B50-1	YES	60	40
			26,22			Tan medium to coarse SAND and some coarse gravel and construction material, trace silt	1.5-2.5				1
						Dark brown medium to coarse SAND and some fine to medium gravel, cinders, slag	2.5-3				1
3	2	3-5	12,13	2/.5	25	Damp, dark brown, medium dense, medium to coarse SAND, some fine to medium gravel, cinders, slag.		B50-2	YES Glows	10	4
			12,10								
5	3	5-7				No recovery					
7	4	7-9	6,6	2/1.8	15	Wet, dark grey brown, medium dense, medium to coarse silty SAND, grading to coarse sand and gravel.		B50-3	Yes A lot	60	40
			9,11					B50-4			
9	5	9-11	26,24	2/2	41	Dark grey, dense, fine sandy SILT at tip medium to coarse SAND some medium gravel in top of spoon 10-10.5 ft. meadow material.		B50-5	Same	24	5
			17,7								
11	6	11-13	10,10	1/.8	19	Grey, medium dense, medium to coarse SAND, some silt at tip brown fine sandy SILT		B50-6	Little		5
			9,8								
13						Bottom of Boring 13.0 ft.					

Boring backfilled with cuttings and bentonite/cement grout.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING B-51
PAGE 1 OF 1

CLIENT: ITT Sealectro
PROJECT LOCATION: Mamaroneck, NY
FILE NO.: 3356.020

SAMPLER 3" Split Spoon
HAMMER: 140 lbs.
FALL: 30"

LOCATION: Solvent UST Area
START DATE: 12/29/93
END DATE: 12/29/93

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	Head Space	HNU
0	0	0-.5				6 inch - concrete					
.5	1	.5-2.5	23,47	2/1.2	102	Dry, brown, very dense, medium to coarse		B51-1	YES	1.5	.5
			55,40			SAND, some medium to coarse gravel,					
						cinders, brick material trace silt.					
2.5	2	2.5-45	20,48	2/1.5	98	Dry, brown, very dense, medium to coarse		B51-2	YES	0.9	.5
			50,19			SAND, some medium to coarse gravel,					
						chuncks of gneiss, trace silt, unknown					
						white material looks like gypsum.					
4.5	3	4.5-6.5	18-14	2/1.0	24	Black, medium dense, medium to coarse SAND,		B51-4	NO	1.0	0.5
			10-9			some fine to medium gravel, cinders					
						slag trace silt. Wet at tip of spoon.					
6.5	4	6.5-8.5	5,10	2/1.6	20	Brown, medium dense, silty fine SAND,		B51-4	YES	0.7	0.8
			10,10			little organic material					
						in tip of spoon was a grey fine to medium					
						SAND showing fluoresence, wet					
8.5	5	8.5-10.5	25,14	2/1.3	30	Grey, medium dense, medium to coarse SAND		B51-5	NO	1.2	0.8
			16,20			some fine gravel, trace silt					
						well sorted wet					
10.5	6	10.5-12.5	24,22	2/1.4	48	Wet, grey, dense, coarse SAND and fine		B51-6	YES	19.1	12
			26-29			gravel, grading to a grey fine to medium sand					
12.5						Bottom of Boring 12.5 ft.					

Boring backfilled with cuttings and bentonite/cement grout.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING: B-52

CLIENT:	ITT - Sealectro	SAMPLER:	2" Split Spoon	LOCATION:	
PROJ. LOCATION:	Mamaroneck, NY	HAMMER:	140 lbs	START DATE:	4/27/94
FILE NO.:	3356.020	FALL:	30"	END DATE:	4/27/94

BORING COMPANY: ADT - MA
FOREMAN: Tom Brown
O'BRIEN & GERE: John Knox

LEGEND: \ Grout; Sand Pack; Bentonite; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	SAMPLE NUMBER	FIELD TESTING UV	Head	HnU
0		0-1				Concrete & Gravel					
1	1	1-3	4,8	2/1	18	Dry, black, medium dense, coarse SAND,		B52-1	Yes	2.2	1.5
		10,12				some fine to medium gravel, cinders,					
2						slag medium.					
3	2	3-5	15,30	2/.7	63	Dry, brown and black micaceous, very		B52-2	No	1.6	1.0
			33,17			dense, medium to coarse SAND, some					
4						large gravel.					
5	3	5-7	3,2	2/1.3	4	Wet, Brown to grey, loose, silty fine SAND,		B52-3	No	1.5	1.0
			2,2			trace clay, (organic layer).					
6											
7	4	7-9	4,3	2/1.5	5	Grey, medium stiff, silty CLAY, trace		B52-4	No	1.0	1.0
			2,3			fine sand, tip of spoon had coarse sand.					
8											
9	5	9-11	4,6	2/1.5	14	Wet, grey, medium dense, medium to		B52-5	Yes	36.3	13.0
			8,7			coarse SAND, some fine gravel, little					
10						silt, odor.					
11	6	11-12	4,3	2/2	9	Brown, loose, fine sandy SILT.		B52-6	No	35.5	15.5
			6,9								
12		12-13				Grey clay.					
13	7	13-15	4,4	2/1.2	10	Grey to green, medium dense, silty fine		B52-7	Yes	14.3	10.0
			6,5			SAND, trace clay, odor.					
14											
15	8	15-17	15,10	2/.8	16	Grey, black, medium dense, medium to		B52-8	No	51.0	25.0
			6,7			coarse SAND, some fine to medium					
16						gravel, trace silt.					
17	9	17-19	6,9	2/1.0	15	Black, medium dense, medium to coarse		B52-9	No	9.4	12.0
			6,8			SAND, some fine to medium gravel,					
18						trace silt.					
19	10	19-21	7,9	2/1.2	19	Brown black, medium dense, medium to		B52-10	No	27.8	22.0
			10,13			coarse SAND, some fine to coarse					
20						gravel, trace silt.					
21	11	21-23	16,24	2/.6	43	Brown, dense, fine to medium SAND,		B52-11	No	11.5	6.0
			19,20			some medium to coarse gravel, little silt.					
22											

Boring backfilled with drill cuttings and cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING: B-52
PAGE 2 OF 2

CLIENT: ITT - Sealectro	SAMPLER 2" Split Spoon	LOCATION:
PROJECT LOCATIO Mamaroneck, NY	HAMMER: 140 lbs	START DATE: 4/27/94
FILE NO.: 3356.020	FALL: 30"	END DATE: 4/27/94

BORING COMPANY: ADT - MA
FOREMAN: Tom Brown
O'BRIEN & GERE: John Knox

LEGEND: \ Grout; Sand Pack; Bentonite; Screen =; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	SAMPLE NUMBER	FIELD TESTING UV	Head	HnU
23	12	23-25	14,9	2/1	17	Brown, medium dense, fine to medium		B52-12	No	17.5	7.4
			8,9			SAND, trace silt.					
24											
25	13	25-27	9,13	2/0.5	26	Brown, medium dense, grey fine to medium		B52-13	No	14.0	4.4
			13,9			SAND, trace silt.					
26											
27	14	27-29	13,25	1.2/1.0	75	Grey brown, very dense, to coarse SAND,		B52-14	No	60.2	6.0
			50/2			some medium to coarse angular gravel,					
28						trace silt.					
						Bedrock encountered at 28 ft.					
29											
30											
31											
32											
33											
34											
35											
36											
37											
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45											

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING: B-53
		PAGE 1 OF 2
CLIENT: ITT - Sealectro	SAMPLER: 2" Split Spoon	LOCATION:
PROJ. LOCATION: Mamaroneck, NY	HAMMER: 140 lbs	START DATE: 4/25/94
		END DATE: 4/26/94
FILE NO.: 3356.020	FALL: 30"	
BORING COMPANY: ADT - MA		LEGEND: \ Grout; Sand Pack; Bentonite; Screen; Riser
FOREMAN: Tom Brown		
O'BRIEN & GERE: John Knox		

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	SAMPLE NUMBER	FIELD TESTING UV	Head	HnU
0	1	0-2	55,58	2/2	98	Asphalt and gravel.			Yes	2.4	0.8
			40,35								
1	·					Dry, very dense, orange medium to coarse					
						SAND, some fine to medium gravel, trace silt.					
2	2	2-4	9,7	2/1.0	13	Damp, brown black, medium dense, medium			No	2.8	1.0
			6,3			SAND, some coarse gravel.					
3											
4	3	4-6	9,9	2/1.5	20	Wet, grey, medium dense, silty fine SAND,			No	1.0	1.0
			11,13			orange mottling.					
5											
6	4	6-8	5,5	2/1.5	12	Grey, medium dense, medium to coarse			No	1.5	1.0
			7,8			SAND, to brown sandy silt.					
7											
8	5	8-10	12,13	2/2	25	Grey, medium dense, medium to coarse			No	1.0	2.0
			15,15			SAND, trace silt.					
9											
10	6	10-12	11,7	2/0.5	21				Yes	2.0	1.3
			14,15			Grey, medium dense, fine sandy SILT.					
11											
12	7	12-14	12,19	2/1.0	40				Yes	2.5	1.8
			21,29			Same as above, except dense.					
13											
14	8	14-16	20,19	2/2	36				Yes	2.0	1.5
			17,21			Same as above, except dense.					
15											
16	9	16-18	4,6	2/1.0	15	Same as above.		B53-1	No	2.0	1.0
			9,11								
17											
18	10	18-20	3,5	2/1.75	11	Same as above, trace clay.		B53-2	No	4,1	3.0
			6,7								
19											
20	11	20-22	3,4	2/1.7	7	Grey, loose, fine sandy SILT, trace clay.		B53-3	No	1.8	1.3
			3,3								
21											
22	12	22-24	5,5	2/0	11	No recovery (gravel blocking spoon),		B53-4			
			6,7			medium dense.					

Boring backfilled with drill cuttings and cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING: B-53
		PAGE 2 OF 2
CLIENT: ITT - Sealectro	SAMPLER 2" Split Spoon	LOCATION:
PROJECT LOCATIO Mamaroneck, NY	HAMMER: 140 lbs	START DATE: 4/25/94
		END DATE: 4/26/94
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: ADT - MA
FOREMAN: Tom Brown
O'BRIEN & GERE: John Knox

LEGEND: \ Grout; Sand Pack; Bentonite; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	SAMPLE NUMBER	FIELD TESTING UV	Head	HnU
23											
24	13	24-26	6,6	2/1.0	15	Grey, medium dense, medium to coarse SAND, some fine to medium gravel, trace silt.		B53-5	Yes	1.0	2.5
			9,9								
25											
26	14	26-28	3,4	2/1.5	13	Brown, medium dense, medium to coarse SAND, trace silt.		B53-6	No	1.5	6.5
			9,13								
27											
28	15	28-32		4/0		No recovery, hole open, spooned from 30-32 ft.					
29											
30	16	30-32	NA	2/0	NA	No recovery, big piece of gravel blocking spoon.					
31											
32	17	32-24	11,13	2/1.2	26	Brown, medium dense, medium to coarse SAND, little silt, trace clay.		B53-7	No	0.8	0.7
			13,15								
33											
34	18	34-36	9,9	2/1.5	20	Brown, medium dense, medium to coarse SAND, trace silt.		B53-8	No	0.9	0.7
			11,14								
35											
36	19	36-38	6,7	2/1.0	18	Brown orange, medium dense, medium to coarse SAND, trace silt.		B53-9	No	1.7	0.8
			11,13								
37											
38	20	38-40	4,4	2/1.3	9	Grey green, loose, fine SAND, trace silt.		B53-10	No	1.7	1.0
			5,28								
39											
40						Bedrock encountered at 40 ft.					
41											
42											
43											
44											
45											

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING: B-54

CLIENT:	ITT - Sealectro	SAMPLER:	2" Split Spoon	LOCATION:	
PROJ. LOCATION:	Mamaroneck, NY	HAMMER:	140 lbs	START DATE:	4/26/94
				END DATE:	4/27/94
FILE NO.:	3356.020	FALL:	30"		

BORING COMPANY: ADT - MA
FOREMAN: Tom Brown
O'BRIEN & GERE: John Knox

LEGEND: \ Grout; Sand Pack; Bentonite; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	SAMPLE NUMBER	FIELD TESTING UV	Head	HnU
0		0-1				Concrete and gravel.					
1	1	1-3	19,14	2/1.2	26	Dry, tan brown, medium denst, silty medium to co		B54-1	No	-0.3	0.7
			12,10			to coarse SAND, little fine to coarse gravel.					
2											
3	2	3-5	1,2	2/0	16	No recovery, tip of spoon had chunk of					
			14,7			gravel, medium dense.					
4											
5	3	5-7	3,2	2/1.0	4	Damp, brown, loose, silty medium to coarse		B54-3	No	0.0	0.7
			2,3			SAND, little fine to coarse gravel and slag.					
6											
7	4	7-9	5,4	2/-	7	Wet, medium stiff, brown silty CLAY, trace		B54-4	No	-1.7	0.7
			3,5			sand and organic matter, wet.					
8											
9	5	9-11	8,7	2/1.3	10	Wet, grey, medium dense, fine to medium		B54-5	No	-1.6	0.7
			3,5			SAND, some coarse sand and fine gravel,					
10						trace silt.					
11	6	11-13	2,3	2/2	8	Brown, loose, sandy SILT.		B54-6	No	2.0	0.7
			5,3								
12						Grey fine SAND (odor).					
						4" steel set at 12 ft.					
13											
14											
15	7	15-17	9,9	2/1	21	Wet, grey green, medium dense, silty fine		B54-8	No	2.6	1.5
			12,9			SAND,					
16											
17	8	17-19	15,17	2/2	35	Grey green, dense, silty fine SAND.		B54-9	No	7.0	1.5
			18,21								
18											
19	9	19-21	9,15	2/1.8	30	Same as above.		B54-10	No	15.0	4.1
			15,9								
20											
21	10	21-23	9,9	2/-	20	Grey green, medium dense, fine SAND, some silt,		B54-11	No	19.4	8.1
			11,15			trace clay.					
22											

Boring backfilled with cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING: B-54
		PAGE 2 OF 2
CLIENT: ITT - Sealectro	SAMPLER 2" Split Spoon	LOCATION:
PROJ. LOCATION: Mamaroneck, NY	HAMMER: 140 lbs	START DATE: 4/26/94
		END DATE: 4/27/94
FILE NO.: 3356.020	FALL: 30"	

BORING COMPANY: ADT - MA
FOREMAN: Tom Brown
O'BRIEN & GERE: John Knox

LEGEND: Grout, Sand Pack, Bentonite, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVER	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	SAMPLE NUMBER	FIELD TESTING UV	Head	HnU
23	11	23-25	8,11	2/1.0	22	Grey green, medium dense, fine SAND,		B54-12	No	51	5
			11,19			some silt, trace clay.					
24											
25	12	25-27	15,19	2/1.2	39	Grey medium, dense, to coarse SAND,		B54-13	No	37.0	9.2
			20,20			little fine to medium gravel, trace silt.		B54-131			
26											
27	13	27-29	7,9	2/1.8	20	Grey brown, medium dense, medium to coarse		B54-14	No	27.0	10.0
			11.7			SAND, some medium to coarse gravel,					
28						trace silt.					
29	14	29-31	21,15	2/1.0	30	Grey brown, dense, medium to coarse SAND,		B54-15	No	13.0	5.0
			15,13			some medium to coarse gravel, trace silt.					
30											
31	15	31-33	7,12	2/1.2	27	Grey green, medium dense, medium SAND,		B54-16	No	30.0	10.0
			15,50/4			some lenses of coarse sand, trace silt.					
32											
33						Bedrock at 33 ft., bottom of boring.					
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING: B-55

CLIENT: ITT - Sealectro
PROJ. LOCATION: Mamaroneck, NY
FILE NO.: 3356.020

SAMPLER: 2" Split Spoon
HAMMER: 140 lbs
FALL: 30"

LOCATION:
START DATE: 5/3/94
END DATE: 5/3/94

BORING COMPANY: ADT - MA
FOREMAN: Tom Brown
O'BRIEN & GERE: John Knox

LEGEND: Grout, Sand Pack, Bentonite, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVER	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	SAMPLE NUMBER	FIELD TESTING UV	Head	HnU
0		0-1				Concrete and gravel.					
1	1	1-3	7,9 9,6	2/1.5	18	Dry, brown grey, medium dense, medium to coarse SAND, some medium to coarse gravel, bricks, trace silt.		B55-1	NO	1.2	0.7
2											
3	2	3-5	3,1 1,1	2/.5	2	Damp, black, very loose,medium to coarse SAND, slag and gravel, trace silt.		B55-2	Yes	3.9	1.5
4											
5	3	5-7	2,3 3,2	2/.5	6	Damp, brown, loose, silty fine SAND, little fine gravel, trace clay.		B55-3	Yes	8.8	2.5
6											
7	4	7-9	5,4 8,10	2/2	12	Wet, brown grey silty clay.		B55-4	Yes	25.0	10.0
8						Grey black medium to coarse SAND, some medium to coarse gravel, trace silt.			Yes	88.0	79.0
9	5	9-11	6,5 5,3	2/2	10	Grey, medium dense, medium to coarse SAND, trace silt, (ranbow sheen).		B55-5	Yes	11.0	20.0
10											
11	6	11-13	5,6 9,6	2/2	15	Same as above.		B55-6	Yes	3.5	5.6
12											
13	7	13-15	2,4 5,12	2/1.8	9	Brown, loose, silty fine SAND		B55-7	Yes	22.0	22.0
14						Grey silty fine sand, little clay.					
15	8	15-17	7,10 9,13	2/1.2	19	Grey brown, medium dense, silty fine SAND, trace clay.		B55-8	No	17.9	6.0
16											
17	9	17-19	9,10 12,11	2/1.0	22	Grey brown, medium dense, silty fine SAND (runny).		B55-9	No	25.9	3.0
18											
19	10	19-21	8,13 14,17	2/1.5	27	Grey green, medium dense, silty fine SAND (odor).		B55-10	No	79.5	40.0
20											
21	11	21-23	7,9 12,16	2/1.0	21	Grey green, medium dense, silty fine SAND, flourencent sheen, (odor).		B55-11	No	114.0	41.0
22											

Boring backfilled with cement/bentonite grout.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING: B-55

CLIENT:	ITT - Sealectro	SAMPLER	2" Split Spoon	LOCATION:	
PROJECT LOCATIO	Mamaroneck, NY	HAMMER:	140 lbs	START DATE:	5/3/94
FILE NO.:	3356.020	FALL:	30"	END DATE:	5/3/94

BORING COMPANY: ADT - MA
FOREMAN: Tom Brown
O'BRIEN & GERE: John Knox

LEGEND: \ Grout; Sand Pack; Bentonite; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	SAMPLE NUMBER	FIELD TESTING UV	Head	HnU
23	12	23-25	7,13	2/1.2	27	Grey green, medium dense, silty fine SAND,		B55-12	No	57.8	2
			14,17			trace gravel, odor.					
24											
25	13	25-27	9,12	2/1.0	21	Grey, medium dense, fine to medium SAND,		B55-12	No	20.7	8.6
			9,12			trace fine gravel, odor.					
26											
27	14	27-29	8,13	2/1.0	25	Grey brown, medium dense, medium to		B55-14	No	49.5	10.5
			12,15			coarse SAND, some, fine to medium gravel,					
28						trace silt, odor.					
29	15	29-31	8,14	2/1.0	28	Grey brown, medium dense, medium to		B55-15	No	58.0	8.5
			14,14			coarse SAND, some fine to medium gravel,					
30						trace silt, odor.					
31	16	31-33	22,23	2/1.5	44	Grey green, dense, fine to medium SAND,		B55-16	No	27.0	14.5
			21,29			trace silt.					
32											
33	17	33-35	23,25	2/1.5	54	Grey brown, very dense, fine to medium		B55-17	No	7.0	2.0
			29,33			SAND, trace silt.					
34											
35	18	35-37	22,21	2/1.25	49	Tan brown, dense, medium SAND, trace silt.		B55-18	No	4.2	1.4
			28,33								
36											
37	19	37-39	56,22	2/1.5	43	Brown, dense, fine to medium SAND,		B55-19	No	3.3	1.0
			21,28			trace silt.					
38											
39	20	39-41	30,70	1.4/1.4		Brown, very dense, medium to coarse SAND,		B55-20	No	3.9	1.0
			100/4			trace silt, (in the tip of spoon - fine sand,					
40						trace silt).					
41						Bottom of boring at 41.0 ft., hit bedrock.					
42											
43											
44											
45											

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-11
CLIENT: ITT Sealectro	SAMPLER 2" Split Spoon	PAGE 1 OF 1
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	LOCATION: Solvent UST Area
FILE NO.: 3356.020	FALL: 30"	START DATE: 12/22/93 END DATE: 12/22/93

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout; Sand Pack; Pellets; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	Sample Number	FIELD TESTING µV	Head Space	HNU
1	1	1-3	34,25		72	Dry, black grey, very dense, medium to		MW11-1	YES	36	1.1
			47,36			coarse SAND, some fine to medium GRAVEL,					
						cinders, trace silt.					
3	2	3-5	5,7	2/.4	13	Same as above, except damp, medium dense.		MW11-2	NO	1.5	0.6
			6,5								
5	3	5-7	2,2	2/1.4	4	Grey brown, loose, silty fine SAND	V-5 ft.	NW11-3	NO	1.4	0.8
			2,2			to medium to coarse silty SAND.					
7	4	7-9	2,2	2/1.6	5	Wet grey to brown,loose, fine sandy SILT		MW11-4	NO	2.3	0.8
			3,9			with mica flecks					
9	5	9-11	6,9	2/.9	16	Grey, medium dense, fine to medium SAND		MW11-5	YES	6.0	0.9
			7,7			some coarse sand and fine gravel					
						trace silt.					
11	6	11-13	16,16	2/1.2	28	Grey, medium dense, fine sandy SILT		MW11-6	NO	10.6	0.9
			12,17			trace clay.					
13	7	13-15	5,11	2/1.3	28	Grey, medium dense, silty fine SAND		MW11-7	NO	11.0	0.8
			17,21			well sorted.					
15						Bottom of Boring 15.0 ft					

14-4 0.010 inch 2" PVC Well Screen.
14-3 Washed Silica Sand.
3-1.5 Bentonite Pellets.
1.5-0 Grout.
Locking flush mount installed.

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

CLIENT: ITT Sealectro	SAMPLER 3" Split Spoon	REPORT OF BORING MW-12
		PAGE 1 OF 1
PROJECT LOCATION: Mamaroneck, NY	HAMMER: 140 lbs.	LOCATION: Solvent UST Area
FILE NO.: 3356.020	FALL: 30"	START DAT 12/21/93 END DATE: 12/21/93

BORING COMPANY: Aquifer Drilling & Testing
FOREMAN: Tony Pressimone
OBG GEOLOGIST: John Knox

LEGEND: Grout, Sand Pack, Pellets, == Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	Sample Number	FIELD TESTING: µV	Head Space	HNU
0	0	0-.5				6 inch Concrete				
.5	1	.5-2.5	10,17	2/1.1	41	Dry, black, dense, medium to coarse SAND,	MW12-1	NO	1.2	0.9
			24,10			some medium to coarse gravels and cinders				
						trace silt.				
2.5	2	2.5-4.5	12,10	2/.4	18	Dry, black and tan, medium dense, medium to	MW12-2	YES Trace	1.5	0.6
			8,8			coarse SAND, some fractured gneiss pieces.				
4.5	3	4.5-6.5	32,29	2/1.1	45	Damp, tan brown, toblack, dense, medium coar	MW12-3	NO	2.3	0.6
			16,8			SAND, some gravel and gneiss chuncks and				
						cinders trace little silt.				
6.5	4	6.5-8.5	5,6	2/.7	13	Wet, dense, fine sandy SILT,	MW12-4	NO	2.0	0.5
			7,8			little to trace clay.				
8.5	5	8.5-10.5	34,19	2/0	41	No recovery				
			22,22							
10.5	6	10.5-12.5	10,19	2/1.9	44	Wet, grey, dense, silty fine SAND.	MW12-5	NO	3.0	0.5
			25,29							
12.5	7	12.5-14.5	16,18	2/	42	Olive to grey, dense, silty fine SAND,	MW12-6	NO	9.5	4.0
			24,29			lenes of coarse sand at 14 ft.				
14.5						Bottom of boring at 14.5 ft.				

Monitoring Well installed: Locking flush mount installed
14.5 – 4.5 ft. = 0.010 slot 2" PVC screen
14.5 – 3.0 ft. = # Movie, 3.0 – 1.5 ft. = bentonite, 1.5 – 0.0 ft. = grout.

APPENDIX C

GEOTECHNICAL TESTING DATA

SOIL MECHANICS DRILLING CORP.
3770 MERRICK ROAD - SEAFORD, L.I., NEW YORK 11783 - (516) 221-2333

Job No. 93-891

Date 1/3/94

RE: ITT Selectro

AQUIFER DRILLING & TESTING
51-41 59th Place
Woodside, NY 11377

PERMEABILITY TEST RESULTS

Test type: Falling head permeability

Material: Shelby Tube Sample 5-7' depth B-33

Soil type: Sandy silt - brown (grain size included #1P)

Unit Dry Weight (lbs/ft^3) 81.0 PCF

Water Content, Initial (%) 26.0

Water Content, Final (%) 35.6

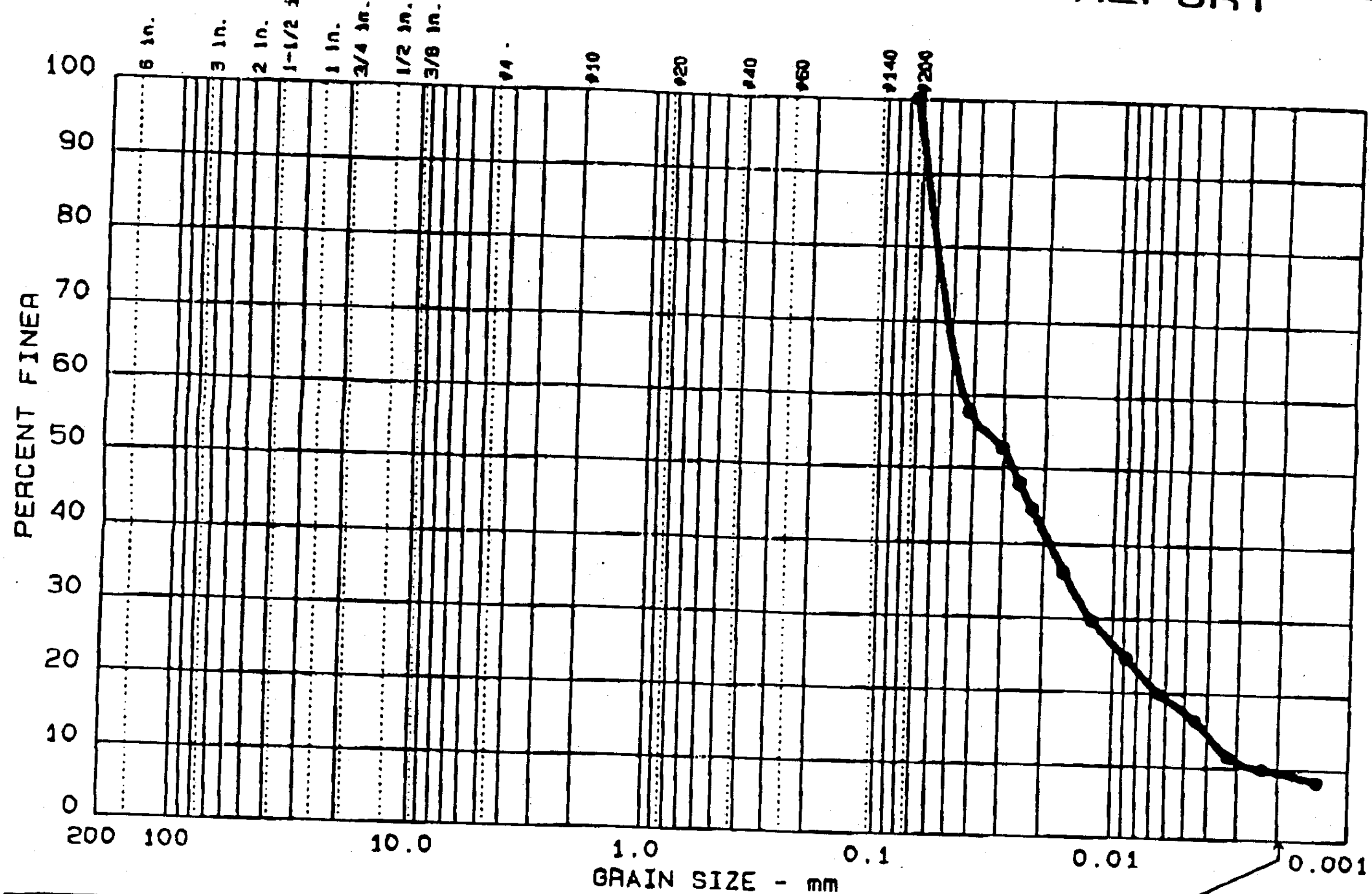
Calculated Permeability:

3.5×10^{-5} cm/sec
7.0×10^{-5} ft/min

low permeability

(516) 221-2333

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	11	0.0	0.0	0.0	90.5	9.5

SIEVE SIZES

	#200									
●	100.0									

SPECIFICATIONS

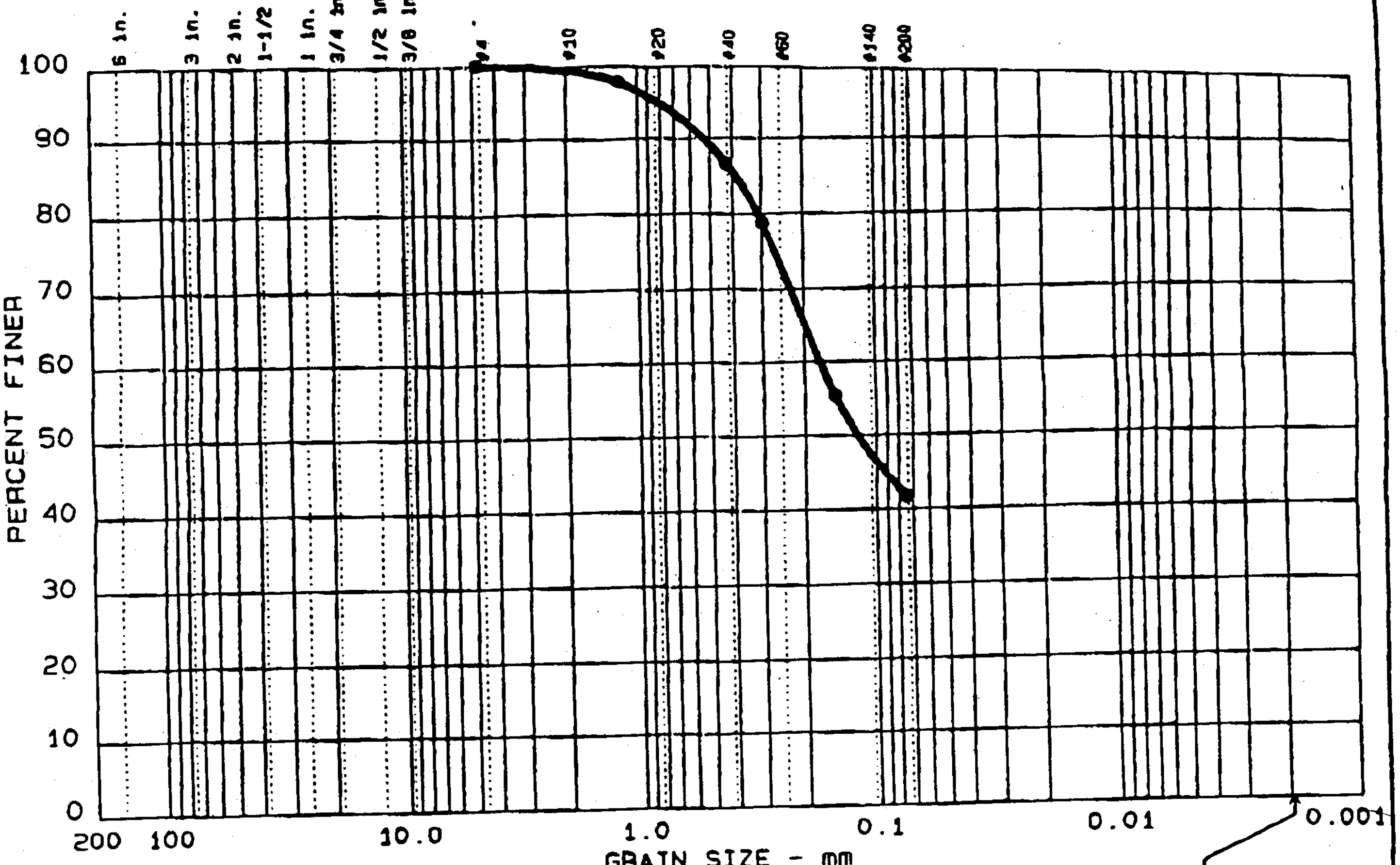
●										

Project No.: 93-891 Date: 12-30-93
Project: ITT Selectro
● Location: Mamaroneck, NY
Material: Silt, trace clay-brown

Remarks: Jar sample
B33-3
Depth 6 - 8'

Figure No.1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	1	0.0	0.0	58.5	41.5	

SIEVE SIZES

	#4	#16	#40	#50	#100	#200
●	100.0	97.9	86.6	78.8	55.4	41.5

SPECIFICATIONS

Project No.: 93-891 Date: 12-30-93
Project: ITT Selectro
● Location: Mamaroneck, NY
Material: Sandy silt-brown

Remarks:
Depth 5 - 7' (tube sample)

Permeability
Figure No. 1P

SUBSOIL INVESTIGATIONS
SOIL MECHANICS DRILLING CORP.
3770 MERRICK ROAD • SEAFORD, L.I., NEW YORK 11783 • (516) 221-2333

Job No. 93-891

Date 1/25/94

AQUIFER DRILLING & TESTING
51-41 59th Place
Woodside, NY 11377

RE: ITT Selectro
Mamaroneck, NY

PERMEABILITY TEST RESULTS

Test type: Falling head permeability

Material: Shelby Tube Sample B-49 (4 to 6 ft)

Soil type: Silt, trace sand and clay (grain size included #2P)

Unit Dry Weight (lbs/ft^3) 81.9 PCF

Water Content, Initial (%) 34.7

Water Content, Final (%) 43.7

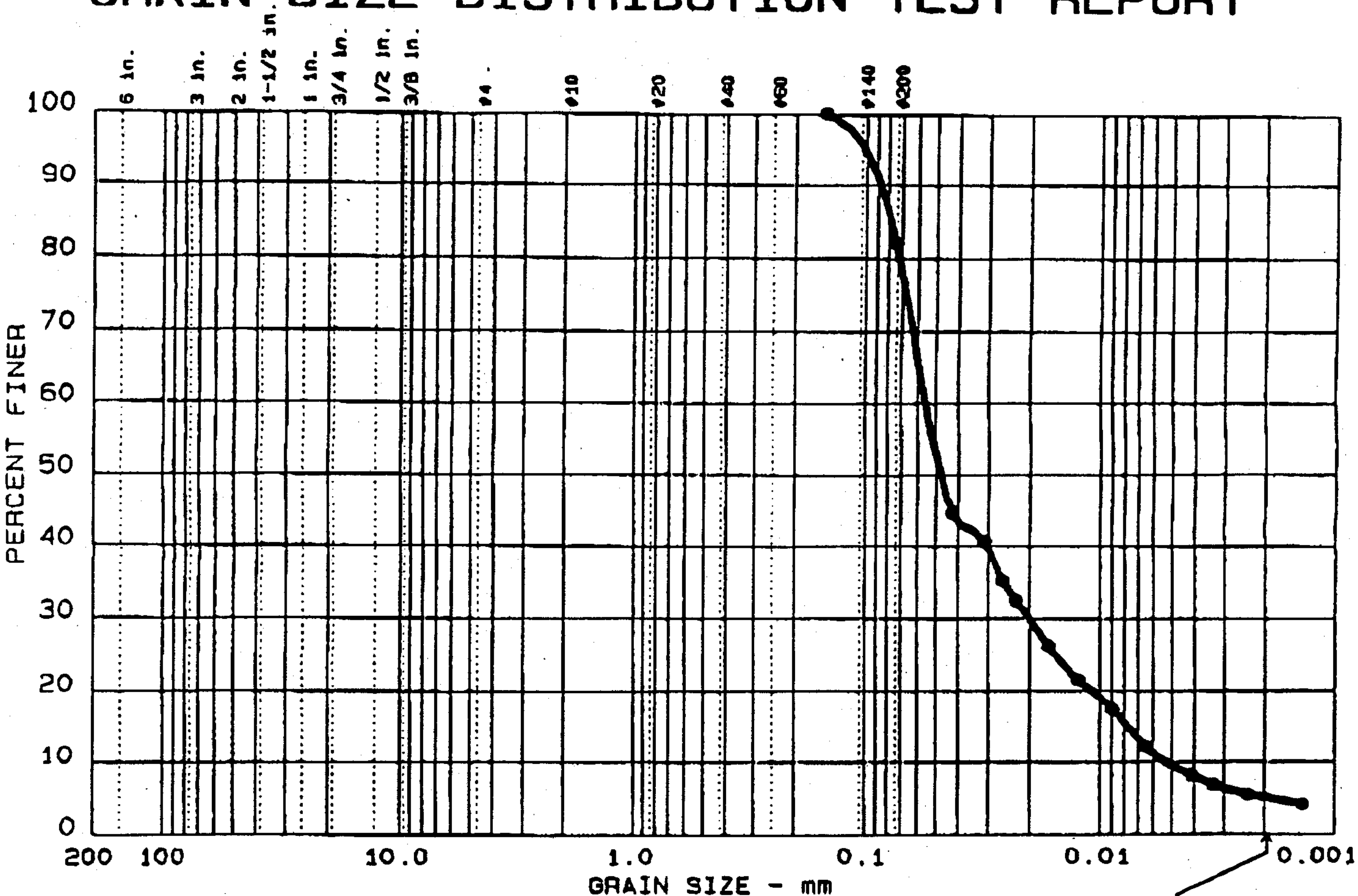
Calculated Permeability:

1.4×10^{-6} cm/sec
2.8×10^{-6} ft/min

very low permeability

SOIL MECHANICS DRILLING CORP.
3770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783
(516) 221 2333 • FAX (516) 221 0254

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	13	0.0	0.0	18.0	77.1	4.9

SIEVE SIZES

	#100	#200								
●	100.0	82.0								

SPECIFICATIONS

●										

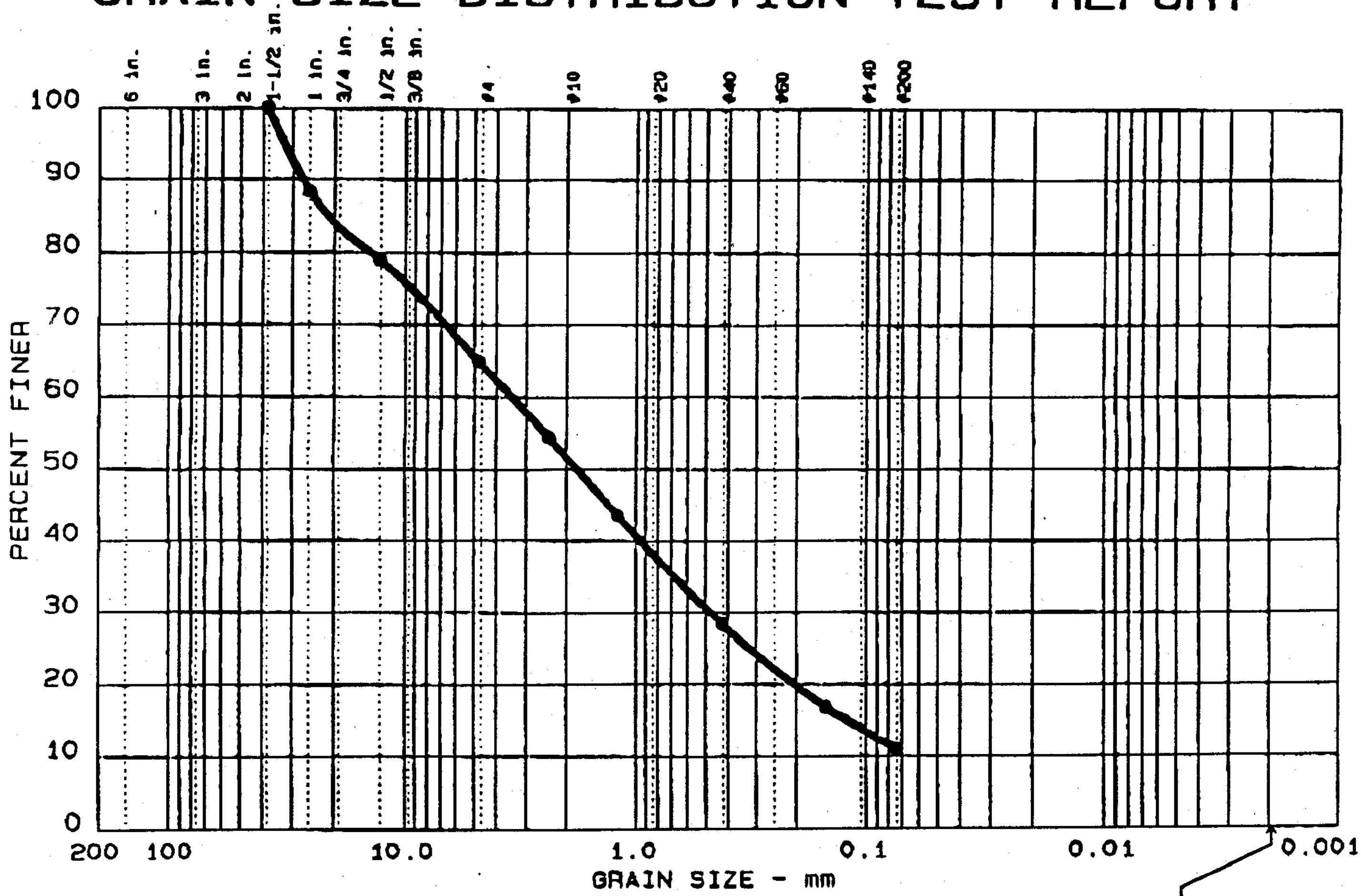
Project No.: 93-891 Date: 1-24-94
Project: ITT Selectro
● Location: Mamaroneck, NY
Material: Silt, trace sand & clay-brown

Remarks:
B-49 4-6' (?)

Figure No.2P

SOIL MECHANICS DRILLING CORP.
3770 MERRICK ROAD • SEAFORD, L.I. NEW YORK 11783
(516) 221-2333 • FAX (516) 221-0254

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	14	0.0	35.2	53.9	10.9	

SIEVE SIZES

	1.5"	1"	0.5"	#4	#8	#16	#40	#100	#200	
●	100.0	88.3	78.9	64.8	54.3	43.3	28.4	16.7	10.9	

SPECIFICATIONS

●										

Project No.: 93-891 Date: 1-24-94
Project: ITT Selectro
● Location: Mamaroneck, NY
Material: Blast furnace slag w/ cinders-black

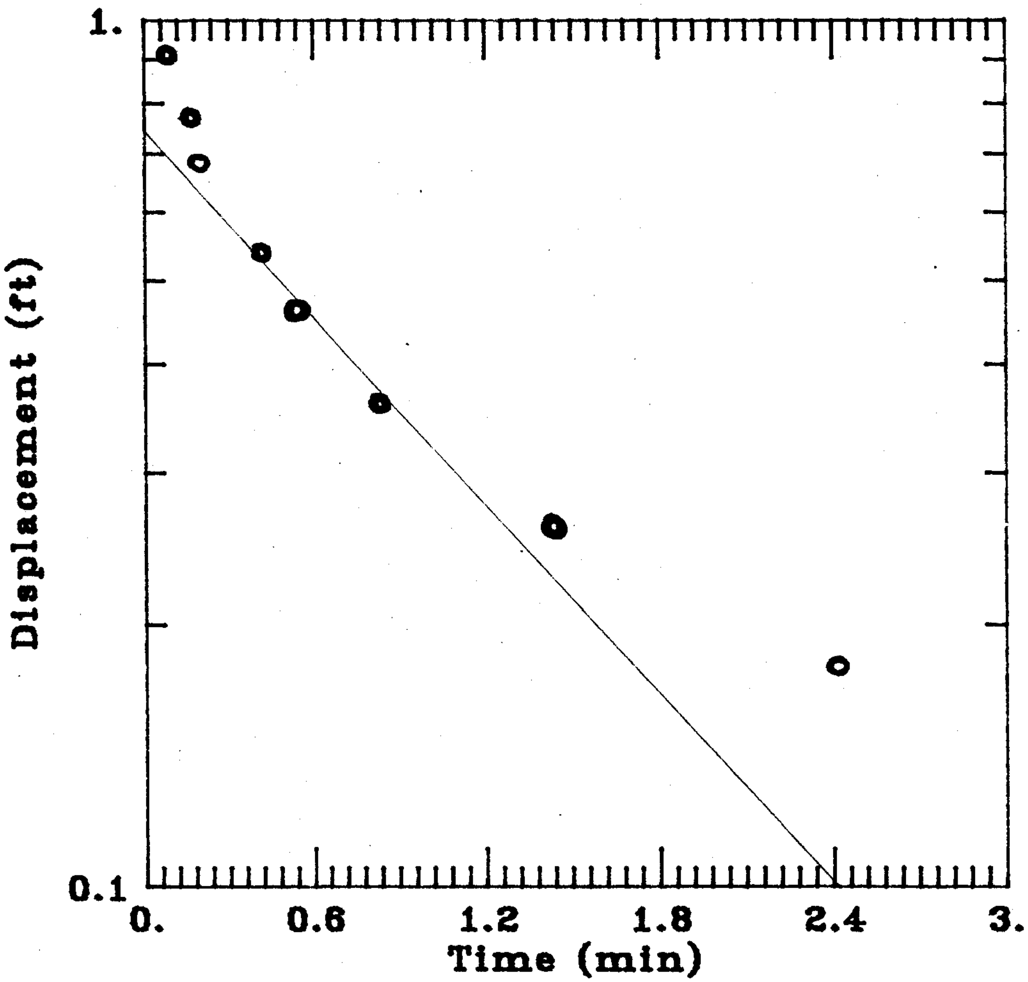
Remarks:
Top 6" of tube sample

Figure No.2 Top

APPENDIX D

IN SITU HYDRAULIC CONDUCTIVITY TESTING DATA

ITT SEALECTRO MW-2



DATA SET:
a: ittmw-2so
05/07/92

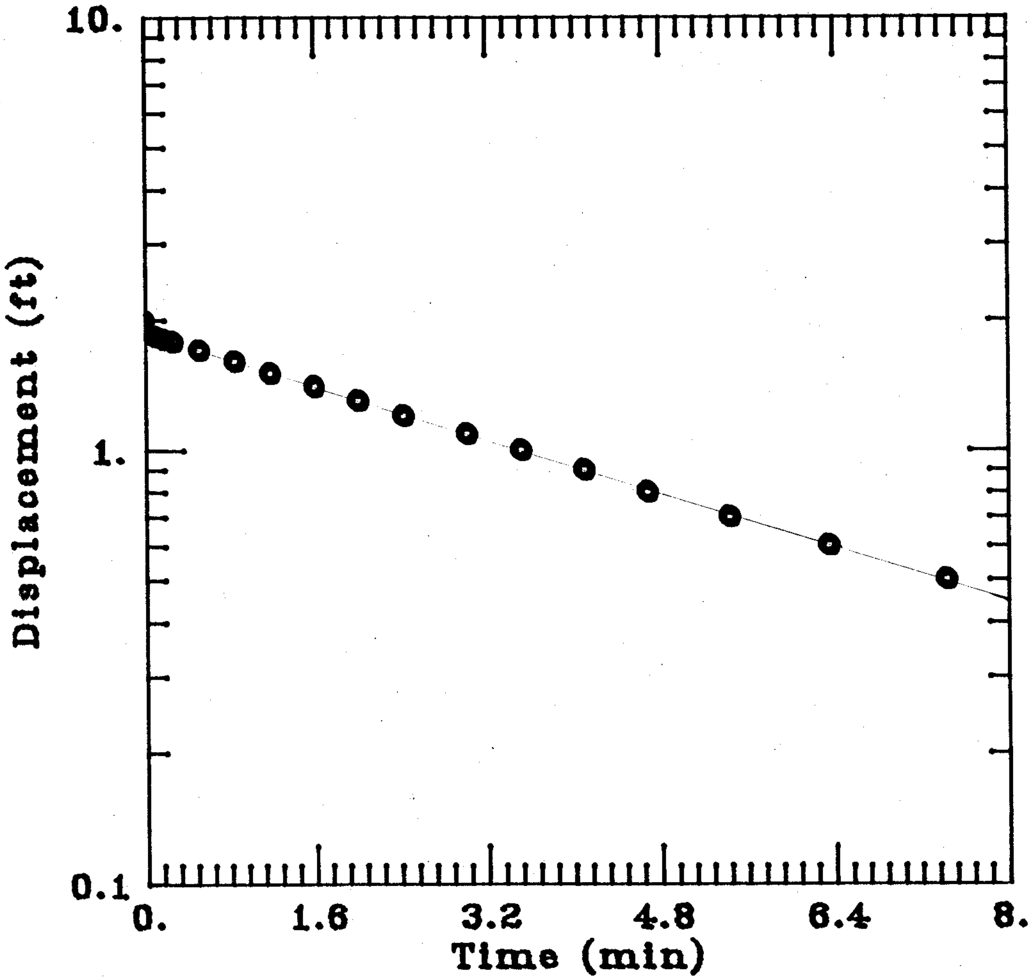
AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

ESTIMATED PARAMETERS:
K = 0.0007014 ft/min
y0 = 0.7471 ft

TEST DATA:
H0 = 1.157 ft
rc = 0.083 ft
rw = 0.3542 ft
L = 7.74 ft
b = 36. ft
H = 7.74 ft

ITT-SEALECTRO MW-2D



DATA SET:
B: IITMW2D
01/04/80

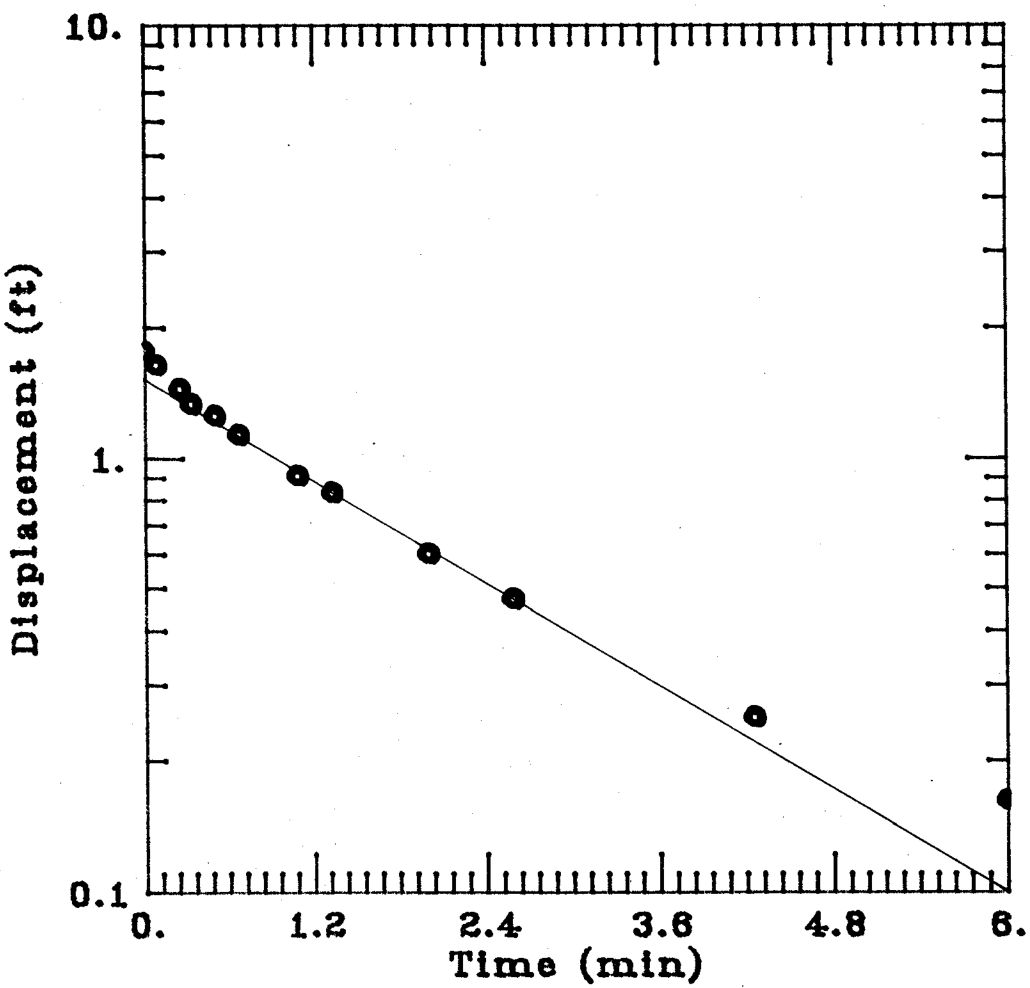
AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

ESTIMATED PARAMETERS:
K = 0.0002037 ft/min
y0 = 1.855 ft

TEST DATA:
H0 = 2. ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 35. ft
H = 35. ft

ITT-SEALECTRO MW-3



DATA SET:
a: ittmw-3s.dat
06/03/92

AQUIFER TYPE:
Unconfined

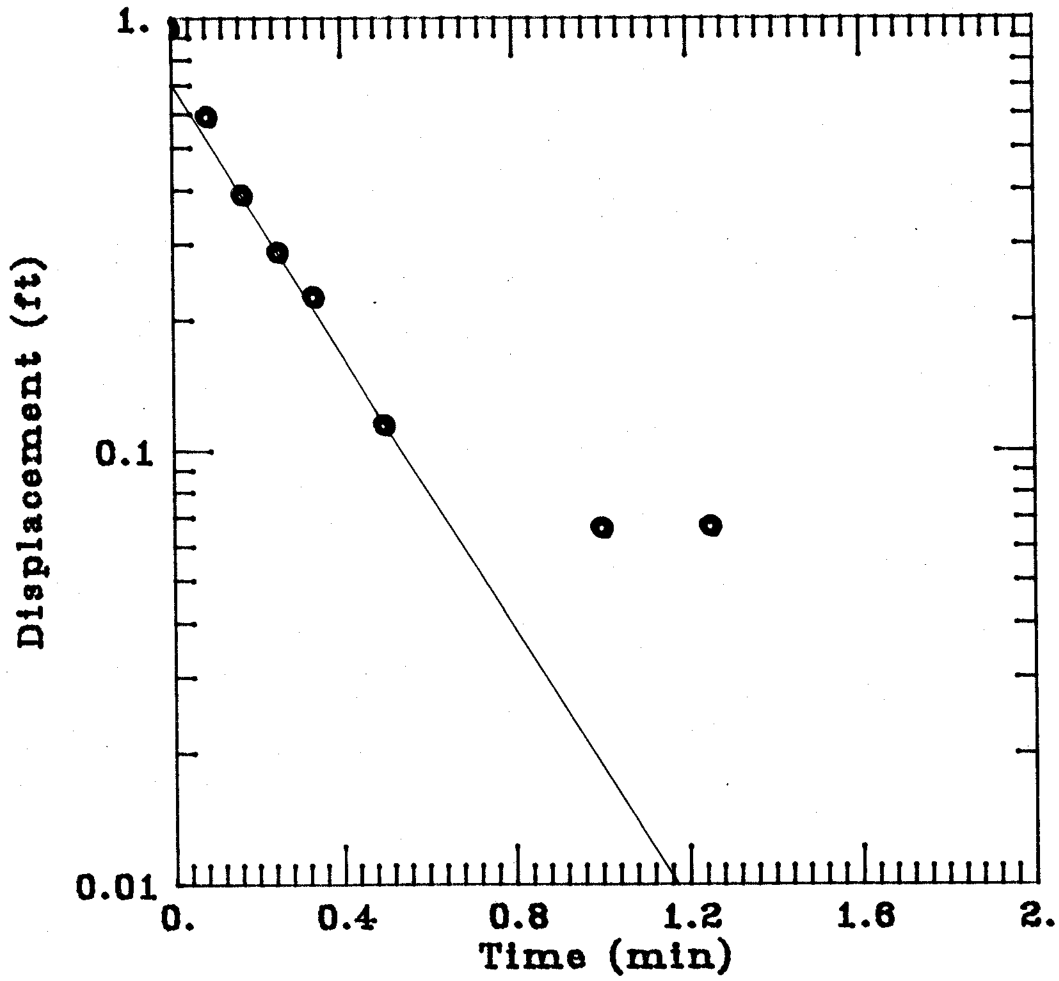
SOLUTION METHOD:
Bouwer-Rice

OBS. WELL:
MW-3S

ESTIMATED PARAMETERS:
K = 0.001244 ft/min
y0 = 1.522 ft

TEST DATA:
H0 = 1.78 ft
rc = 0.1667 ft
rw = 0.3542 ft
L = 10. ft
b = 10. ft
H = 6. ft

ITT-SEALECTRO MW-3D



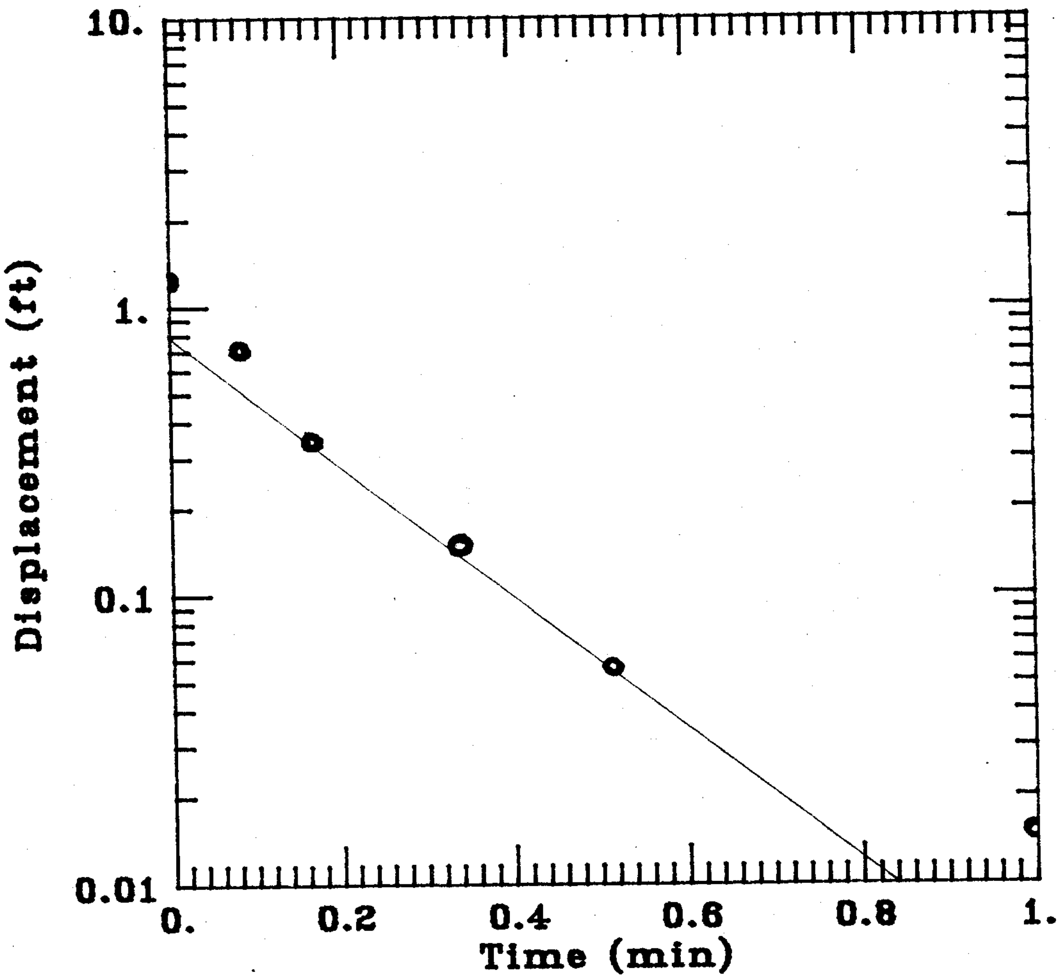
DATA SET:
A: ITTMW-3D.DAT
06/03/92

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

ESTIMATED PARAMETERS:
K = 0.003342 ft/min
y0 = 0.7021 ft

TEST DATA:
H0 = 0.95 ft
rc = 0.083 ft
rw = 0.3542 ft
L = 10. ft
b = 22. ft
H = 20.58 ft

ITT SEALECTRO MW-4



DATA SET:
a: ittmw-4do
05/07/92

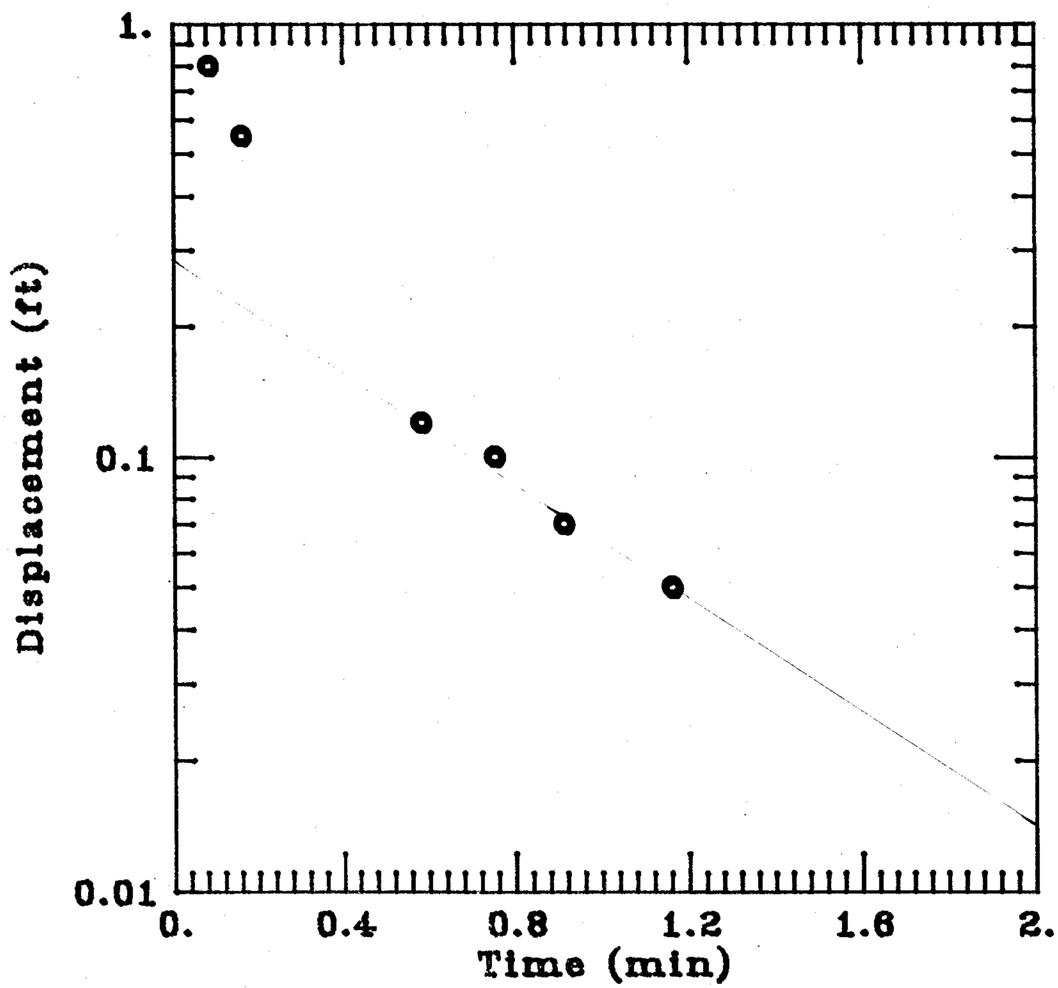
AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

ESTIMATED PARAMETERS:
K = 0.004137 ft/min
y0 = 0.7966 ft

TEST DATA:
H0 = 1.25 ft
rc = 0.083 ft
rw = 0.3542 ft
L = 8.6 ft
b = 37. ft
H = 8.6 ft

ITT-SEALECTRO MW4D

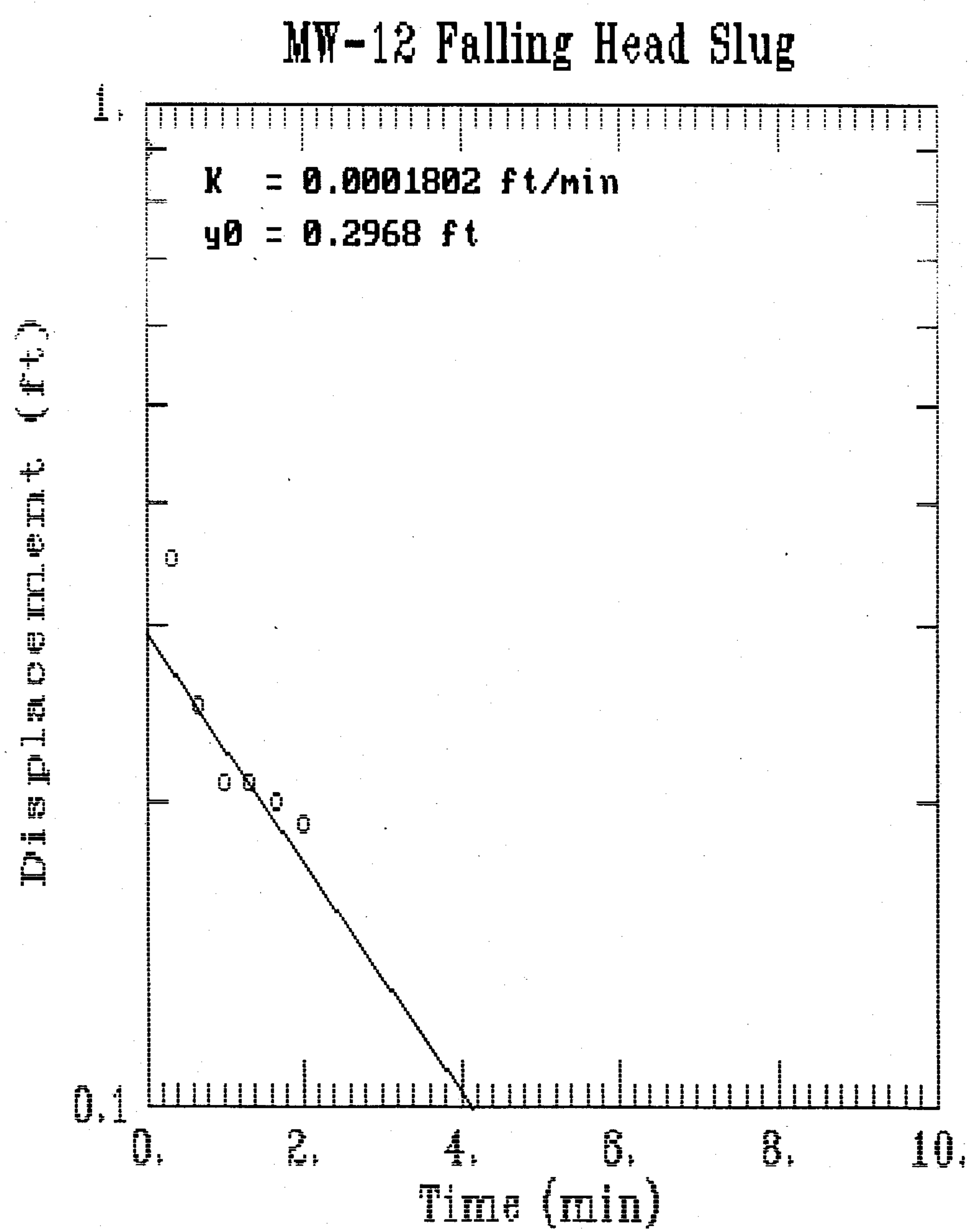


DATA SET:
ITTMW4D
01/04/80

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

ESTIMATED PARAMETERS:
K = 0.001718 ft/min
y0 = 0.2855 ft

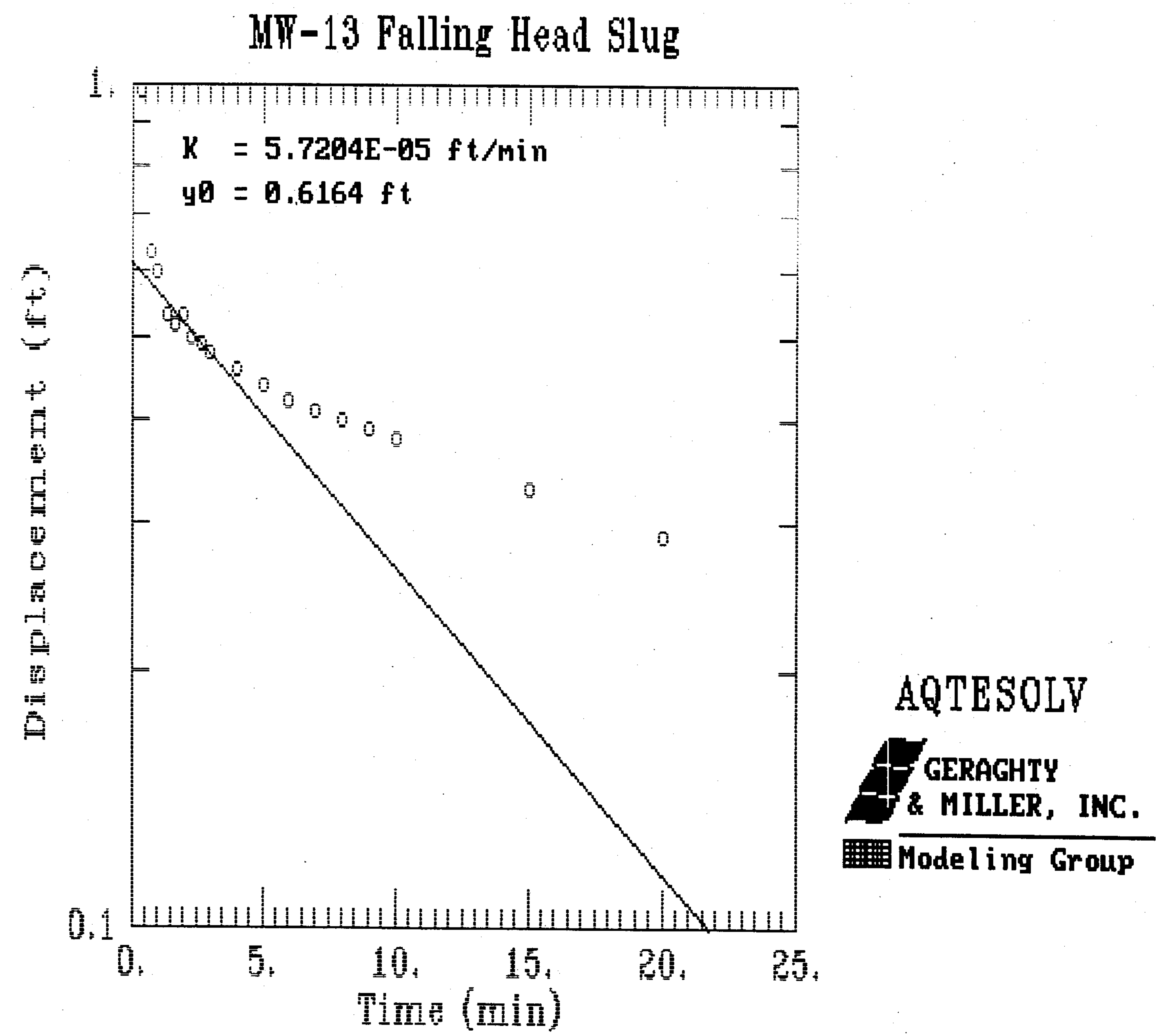
TEST DATA:
H0 = 1.3 ft
rc = 0.083 ft
rw = 0.33 ft
L = 10. ft
b = 35. ft
H = 35. ft



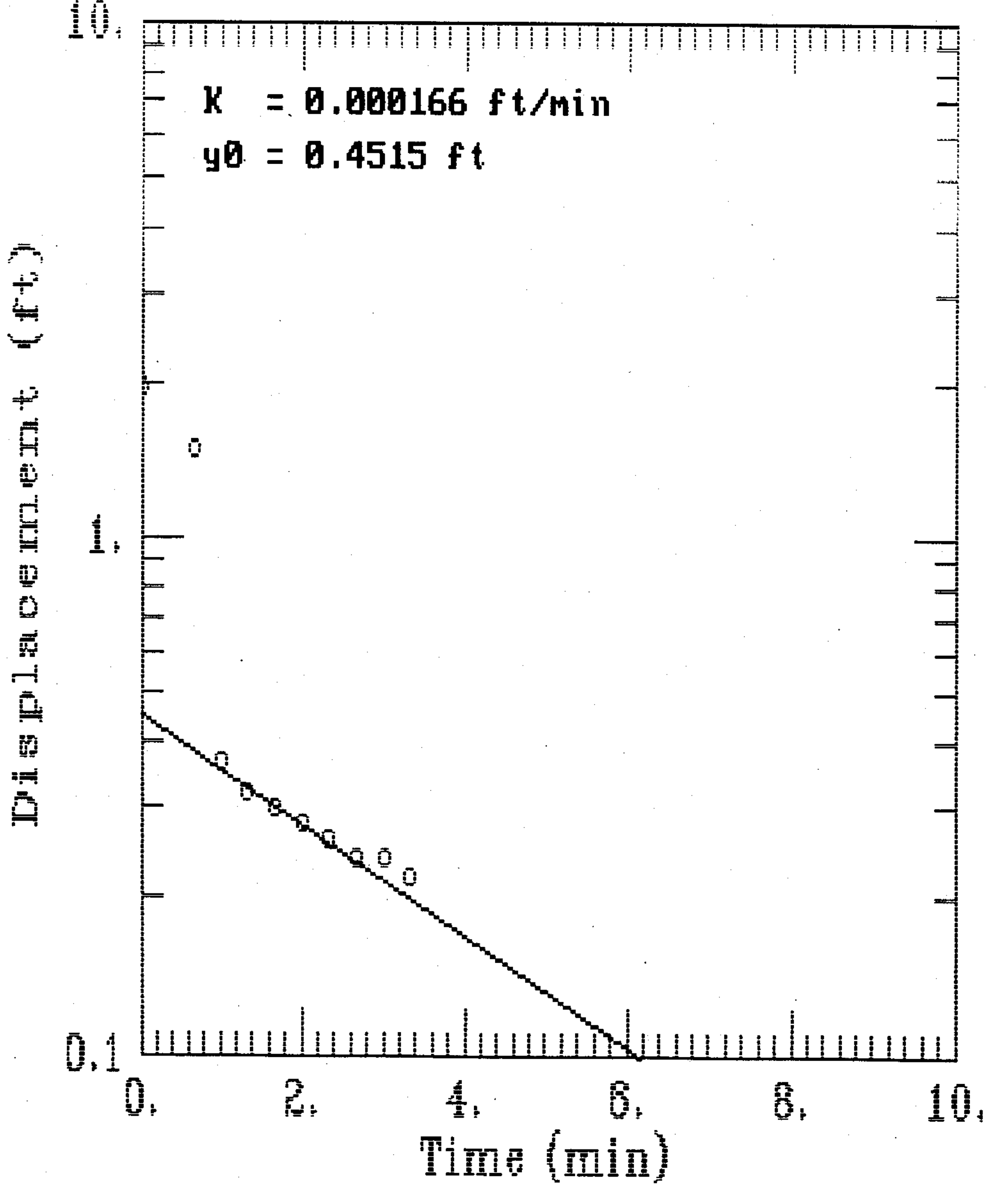
AQTESOLV

GERAGHTY & MILLER, INC.

Modeling Group


MW-13 Falling Head Slug
K = 5.7204E-05 ft/min
y0 = 0.6164 ft
Displacement (ft)
1.
0.1
0.
5.
10.
15.
20.
25.
Time (min)
AQTESOLV
GERAGHTY & MILLER, INC.
Modeling Group

MW-11 Falling Head Slug



AQTESOLV
GERAGHTY & MILLER, INC.
Modeling Group

APPENDIX E

GROUND WATER SAMPLING LOGS

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT - Sealectro Well No. MW-2
Sampled By JRK, KJE, KCB Date 2/15/94 Time --------
Weather Sunny 35°F Sampled with Bailer YES Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 13.75 ft.

Well elevation
(Rel. Mean Sea Level): ________ ft.

Depth to water table:
(below top of casing) 6.10 ft.

Water table elevation
(Rel. Mean Sea Level): ________ ft.

Length of water column (LWC) 7.65 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.25 gallons
4" diameter wells = 0.653 x (LWC) = ________ gallons

Depth to water after purging: 5.64 ft. (below top of casing)
Depth to water before sampling: 5.64 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color Light Brown Odor None Turbidity 65 NTU
Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 4 gallons.
Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Brown Odor None Turbidity >200 NTU
Was an oil film or layer apparent? No

		pre-purge	1st-purge	2nd-purge	post-purge
E.	CONDUCTIVITY (uS)	965	985	1010	990
F.	pH	7.5	7.7	6.9	7.1
G.	TEMPERATURE (Fahrenheit)	52	50.5	49.9	51.5
H.	Turbidity (NTU)	65	< Off Scale>		

I. WELL SAMPLING NOTES:

Bailing: BEGIN @ 10:50 thru 11:20 4 gallons removed

Sample Time @ 11:30

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT - Sealectro Well No. MW-2D
Sampled By JRK, KJE, KCB Date 2/15/94 Time --------
Weather Sunny 35°F Sampled with Bailer YES Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 40.76 ft.

Well elevation
(Rel. Mean Sea Level): ________ ft.

Depth to water table:
(below top of casing) 5.41 ft.

Water table elevation
(Rel. Mean Sea Level): ________ ft.

Length of water column (LWC) 35.35 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 5.76 gallons
4" diameter wells = 0.653 x (LWC) = ________ gallons

Depth to water after purging: 19.60 ft. (below top of casing)
Depth to water before sampling: 19.60 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color Clear Odor None Turbidity 4.6 NTU
Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 17.5 gallons.
Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Tan Brown Odor None Turbidity >200 NTU
Was an oil film or layer apparent? No

		pre-purge	1st-purge	2nd-purge	post-purge
E.	CONDUCTIVITY (uS)	1050	1110	1110	1080
F.	pH	7.4	8.0	8.0	7.6
G.	TEMPERATURE (Fahrenheit)	50.1	50.7	50.7	50.5
H.	Turbidity (NTU)	4.6	44	130	<off-scale>

I. WELL SAMPLING NOTES:

Bailing: BEGIN @ 10:50 thru 11:40 17.5 gallons removed

Sample Time @ 11:45

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT - Sealectro Well No. MW-4
Sampled By JRK, KJE, KCB Date 2/15/94 Time --------
Weather Sunny 35°F Sampled with Bailer YES Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 13.96 ft.

Well elevation
(Rel. Mean Sea Level): ________ ft.

Depth to water table:
(below top of casing) 5.02 ft.

Water table elevation
(Rel. Mean Sea Level): ________ ft.

Length of water column (LWC) 8.94 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.46 gallons
4" diameter wells = 0.653 x (LWC) = ________ gallons

Depth to water after purging: 7.65 ft. (below top of casing)
Depth to water before sampling: 6.55 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color Grey Odor None Turbidity 55 NTU
Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 4.4 gallons.
Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Grey Odor Petroleum Turbidity >200 NTU
Was an oil film or layer apparent? No

		pre-purge	1st-purge	2nd-purge	post-purge
E.	CONDUCTIVITY (uS)	3260	3800	4350	4790
F.	pH	6.65	6.7	6.75	6.8
G.	TEMPERATURE (Fahrenheit)	47.6	47.0	47.8	47.6
H.	Turbidity (NTU)	4.6	<off-scale>		

I. WELL SAMPLING NOTES:

Bailing: BEGIN @ 3:30 thru 3:50 4.4 gallons removed

Sample Time @ 4:00

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT - Sealectro Well No. MW-4D
Sampled By JRK, KJE, KCB Date 2/15/94 Time --------
Weather Sunny 35°F Sampled with Bailer YES Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 39.65 ft.

Well elevation
(Rel. Mean Sea Level): ____ ft.

Depth to water table:
(below top of casing) 5.17 ft.

Water table elevation
(Rel. Mean Sea Level): ____ ft.

Length of water column (LWC) 34.48 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 5.62 gallons
4" diameter wells = 0.653 x (LWC) = ____ gallons

Depth to water after purging: 6.5 ft. (below top of casing)
Depth to water before sampling: 5.45 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color Clear Odor None Turbidity 40 NTU
Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 17.0 gallons.
Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Dark Brown Odor None Turbidity >200 NTU
Was an oil film or layer apparent? No

		pre-purge	1st-purge	2nd-purge	post-purge
E.	CONDUCTIVITY (uS)	1708	1800	1950	2040
F.	pH	7.4	7.45	7.3	7.2
G.	TEMPERATURE (Fahrenheit)	46.1	46.8	47.6	48.4
H.	Turbidity (NTU)	40	<off-scale>		

I. WELL SAMPLING NOTES:

Bailing: BEGIN @ 3:30 thru 4:15 17 gallons removed

Sample Time @ 4:30

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT - Sealectro Well No. MW-11
Sampled By JRK, KJE, KCB Date 2/15/94 Time --------
Weather Sunny 35°F Sampled with Bailer YES Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 14.24 ft.

Well elevation
(Rel. Mean Sea Level): ________ ft.

Depth to water table:
(below top of casing) 5.91 ft.

Water table elevation
(Rel. Mean Sea Level): ________ ft.

Length of water column (LWC) 8.33 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.36 gallons
4" diameter wells = 0.653 x (LWC) = ________ gallons

Depth to water after purging: 6.8 ft. (below top of casing)
Depth to water before sampling: 5.89 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color Light Brown Odor None Turbidity 150 NTU
Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 4.0 gallons.
Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Dark Brown Odor None Turbidity >200 NTU
Was an oil film or layer apparent? No

		pre-purge	1st-purge	2nd-purge	post-purge
E.	CONDUCTIVITY (uS)	710	720	730	760
F.	pH	7.1	7.5	7.2	7.4
G.	TEMPERATURE (Fahrenheit)	46	46	48.2	49.4
H.	Turbidity (NTU)	150	<off-scale>		

I. WELL SAMPLING NOTES:

Bailing: BEGIN @ 11:50 thru 12:30 4 gallons removed

Sample Time @ 1:45

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT - Sealectro Well No. MW-12
Sampled By JRK, KJE, KCB Date 2/15/94 Time --------
Weather Sunny 35°F Sampled with Bailer YES Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 14.23 ft.
Well elevation (Rel. Mean Sea Level): ____ ft.

Depth to water table: (below top of casing) 6.21 ft.
Water table elevation (Rel. Mean Sea Level): ____ ft.

Length of water column (LWC) 8.02 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.31 gallons
4" diameter wells = 0.653 x (LWC) = ____ gallons

Depth to water after purging: 9.24 ft. (below top of casing)
Depth to water before sampling: 7.45 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color Tan Odor None Turbidity 43 NTU
Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 4.0 gallons.
Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Tan Brown Odor None Turbidity >200 NTU
Was an oil film or layer apparent? No

		pre-purge	1st-purge	2nd-purge	post-purge
E.	CONDUCTIVITY (uS)	325	300	280	255
F.	pH	8.0	7.95	7.8	7.6
G.	TEMPERATURE (Fahrenheit)	54.0	54.5	54.5	55.5
H.	Turbidity (NTU)	43	<off-scale>		

I. WELL SAMPLING NOTES:

Bailing: BEGIN @ 3:10 thru 3:20 4 gallons removed

Sample Time @ 3:25

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT - Sealectro Well No. MW-13
Sampled By JRK, KJE, KCB Date 2/15/94 Time --------
Weather Sunny 35°F Sampled with Bailer YES Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 14.44 ft. Well elevation (Rel. Mean Sea Level): ______ ft.

Depth to water table: (below top of casing) 6.21 ft. Water table elevation (Rel. Mean Sea Level): ______ ft.

Length of water column (LWC) 8.23 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.34 gallons
4" diameter wells = 0.653 x (LWC) = ______ gallons

Depth to water after purging: 12.97 ft. (below top of casing)
Depth to water before sampling: 8.98 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color Tan Odor None Turbidity 43 NTU
Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 4.0 gallons.
Did well go dry? Yes

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Tan Odor None Turbidity >200 NTU
Was an oil film or layer apparent? No

		pre-purge	1st-purge	2nd-purge	post-purge
E.	CONDUCTIVITY (uS)	1610	1600	1630	1620
F.	pH	7.1	7.0	7.2	7.2
G.	TEMPERATURE (Fahrenheit)	54.0	54	55.1	55
H.	Turbidity (NTU)	43	<off-scale>		

I. WELL SAMPLING NOTES:

Bailing: BEGIN @ 12:20 thru 12:40 4 gallons removed

Sample Time @ 2:15

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT SEALECTRO Well No. MW-2S
Sampled By JRK/AP Date 06/01/94 Time --------
Weather SUNNY 80°F Sampled with Bailer YES Pump ___

A. WATER TABLE:

Well depth:
(below top of casing) 13.50 ft.

Well elevation
(Rel. Mean Sea Level): 196.68 ft.

Depth to water table:
(below top of casing) 5.36 ft.

Water table elevation
(Rel. Mean Sea Level): 191.32 ft.

Length of water column (LWC) 8.14 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.33 gallons

Depth to water after purging: 7.93 ft. (below top of casing)
Depth to water before sampling: 7.62 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color GREY Odor NONE
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 9.0 gallons.
Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color CLEAR Odor NONE
Was an oil film or layer apparent? NO

	INITIAL	FIRST	SECOND	THIRD	FOURTH	FIFTH
CONDUCTIVITY (uS)	0.39	0.62	0.65	0.62	0.60	0.60
pH	7.1	7.2	6.7	6.6	6.6	6.3
TEMPERATURE (°C)	21.0	21.0	16.0	16.0	16.0	17.0
TURBIDITY (NTU)	990	990	990	990	990	210
DISSOLVED OXYGEN (mg/l)	9.2	9.7	10.8	10.8	10.8	1.9

E. WELL SAMPLING NOTES:

PUMPING: BEGIN @ 1046 thru 1054 9 gallons removed
SAMPLING: @ 1121 hrs

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT SEALECTRO Well No. MW-2D
Sampled By JRK/AP Date 06/01/94 Time --------
Weather SUNNY 80°F Sampled with Bailer YES Pump ___

A. WATER TABLE:

Well depth:
(below top of casing) 42.50 ft.

Well elevation
(Rel. Mean Sea Level): 199.40 ft.

Depth to water table:
(below top of casing) 4.79 ft.

Water table elevation
(Rel. Mean Sea Level): 194.61 ft.

Length of water column (LWC) 37.71 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 6.15 gallons

Depth to water after purging: 26.42 ft. (below top of casing)
Depth to water before sampling: 4.8 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color GREY Odor NONE
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 20.0 gallons.
Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color CLEAR Odor NONE
Was an oil film or layer apparent? NO

	INITIAL	FIRST	SECOND	THIRD	FOURTH	FIFTH
CONDUCTIVITY (uS)	0.43	0.70	0.69	0.90	1.0	0.90
pH	7.2	7.6	7.8	7.6	7.6	7.3
TEMPERATURE (°C)	22.0	17.0	19.0	18.0	20.0	17.0
TURBIDITY (NTU)	130	990	990	370	750	90
DISSOLVED OXYGEN (mg/l)	5.9	7.8	9.0	9.6	9.4	4.1

E. WELL SAMPLING NOTES:

PUMPING: BEGIN @ 0957 thru 1025 20 gallons removed
SAMPLING: @ 1129 hrs

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT SEALECTRO Well No. MW-3S
Sampled By JRK/AP Date 06/01/94 Time --------
Weather SUNNY 80°F Sampled with Bailer YES Pump ___

A. WATER TABLE:

Well depth:
(below top of casing) 14.0 ft.

Well elevation
(Rel. Mean Sea Level): 197.45 ft.

Depth to water table:
(below top of casing) 6.88 ft.

Water table elevation
(Rel. Mean Sea Level): 190.57 ft.

Length of water column (LWC) 7.12 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.20 gallons

Depth to water after purging: 12.52 ft. (below top of casing)
Depth to water before sampling: 7.02 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color BROWN Odor NONE
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 5.0 gallons.
Did well go dry? YES

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color CLEAR Odor NONE
Was an oil film or layer apparent? NO

	INITIAL	FIRST	SECOND	THIRD	FOURTH	FIFTH
CONDUCTIVITY (uS)	0.71	0.78	0.60	0.63	0.44	----
pH	7.2	7.2	7.0	7.2	6.4	----
TEMPERATURE (°C)	21.0	20.0	17.0	19.0	17.0	----
TURBIDITY (NTU)	990	990	990	990	50	----
DISSOLVED OXYGEN (mg/l)	11.0	12.8	14.5	13.6	5.6	----

E. WELL SAMPLING NOTES:

PUMPING: BEGIN @ 1336 thru 1344 5 gallons removed
SAMPLING: @ 1420 hrs

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT SEALECTRO Well No. MW-3D
Sampled By JRK/AP Date 06/01/94 Time --------
Weather SUNNY 80°F Sampled with Bailer YES Pump ___

A. WATER TABLE:

Well depth:
(below top of casing) 29.0 ft.

Well elevation
(Rel. Mean Sea Level): 199.95 ft.

Depth to water table:
(below top of casing) 5.84 ft.

Water table elevation
(Rel. Mean Sea Level): 194.11 ft.

Length of water column (LWC) 23.16 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 3.80 gallons

Depth to water after purging: 7.95 ft. (below top of casing)
Depth to water before sampling: 8.92 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color BROWN Odor NONE
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 20.0 gallons.
Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color CLEAR Odor NONE
Was an oil film or layer apparent? NO

	INITIAL	FIRST	SECOND	THIRD	FOURTH	FIFTH
CONDUCTIVITY (uS)	0.65	0.63	0.63	0.63	0.63	0.63
pH	7.0	6.7	6.7	6.8	6.7	6.7
TEMPERATURE (°C)	24.0	18.0	17.0	17.0	17.0	17.0
TURBIDITY (NTU)	990	990	990	990	990	990
DISSOLVED OXYGEN (mg/l)	10.4	13.1	12.3	13.1	13.2	12.7

E. WELL SAMPLING NOTES:

PUMPING: BEGIN @ 1319 thru 1329 20 gallons removed
SAMPLING: @ 1410 hrs

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT SEALECTRO Well No. MW-4S
Sampled By JRK/AP Date 06/02/94 Time --------
Weather SUNNY 75°F Sampled with Bailer YES Pump ___

A. WATER TABLE:

Well depth:
(below top of casing) 14.0 ft.

Well elevation
(Rel. Mean Sea Level): 196.86 ft.

Depth to water table:
(below top of casing) 4.56 ft.

Water table elevation
(Rel. Mean Sea Level): 192.30 ft.

Length of water column (LWC) 9.44 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.50 gallons

Depth to water after purging: 4.95 ft. (below top of casing)
Depth to water before sampling: 4.59 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color BLACK Odor NONE
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 10.0 gallons.
Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color BROWN Odor NONE
Was an oil film or layer apparent? NO

	INITIAL	FIRST	SECOND	THIRD	FOURTH	FIFTH
CONDUCTIVITY (uS)	3.4	3.4	3.2	3.1	3.0	2.9
pH	6.6	6.6	6.5	6.7	6.5	6.5
TEMPERATURE (°C)	16.0	15.0	14.0	14.0	13.0	13.0
TURBIDITY (NTU)	990	990	990	640	990	990
DISSOLVED OXYGEN (mg/l)	7.5	10.9	12.5	11.8	11.2	10.9

E. WELL SAMPLING NOTES:

PUMPING: BEGIN @ 0919 thru 0927 10 gallons removed
SAMPLING: @ 1000 hrs

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT SEALECTRO Well No. MW-4D
Sampled By JRK/AP Date 06/02/94 Time --------
Weather SUNNY 75°F Sampled with Bailer YES Pump ___

A. WATER TABLE:

Well depth:
(below top of casing) 41.0 ft.

Well elevation
(Rel. Mean Sea Level): 196.95 ft.

Depth to water table:
(below top of casing) 4.70 ft.

Water table elevation
(Rel. Mean Sea Level): 192.25 ft.

Length of water column (LWC) 36.3 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 5.90 gallons

Depth to water after purging: 10.2 ft. (below top of casing)
Depth to water before sampling: 4.72 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color BLACK Odor NONE
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 30.0 gallons.
Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color BROWN Odor NONE
Was an oil film or layer apparent? NO

	INITIAL	FIRST	SECOND	THIRD	FOURTH	FIFTH
CONDUCTIVITY (uS)	1.2	0.64	0.63	0.63	0.63	0.63
pH	6.9	7.0	7.0	7.2	7.3	6.9
TEMPERATURE (°C)	14.0	14.0	14.0	15.0	14.0	14.0
TURBIDITY (NTU)	310	990	840	870	530	310
DISSOLVED OXYGEN (mg/l)	10.7	11.5	11.0	13.1	12.0	12.4

E. WELL SAMPLING NOTES:

PUMPING: BEGIN @ 0932 thru 0948 30 gallons removed
SAMPLING: @ 1010 hrs

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT SEALECTRO Well No. MW-11
Sampled By JRK/AP Date 06/01/94 Time --------
Weather SUNNY 80°F Sampled with Bailer YES Pump ___

A. WATER TABLE:

Well depth:
(below top of casing) 14.24 ft.

Well elevation
(Rel. Mean Sea Level): ______ ft.

Depth to water table:
(below top of casing) 4.25 ft.

Water table elevation
(Rel. Mean Sea Level): ______ ft.

Length of water column (LWC) 9.99 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.63 gallons

Depth to water after purging: 7.90 ft. (below top of casing)
Depth to water before sampling: 4.23 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color GREY Odor NONE
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 10.0 gallons.
Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color CLEAR Odor NONE
Was an oil film or layer apparent? NO

	INITIAL	FIRST	SECOND	THIRD	FOURTH	FIFTH
CONDUCTIVITY (uS)	0.57	0.17	0.15	0.14	0.15	0.14
pH	6.9	6.4	6.3	6.4	6.3	6.5
TEMPERATURE (°C)	21.0	19.0	18.0	19.0	18.0	18.0
TURBIDITY (NTU)	990	760	140	310	490	10
DISSOLVED OXYGEN (mg/l)	7.1	9.7	9.9	9.4	9.4	6.7

E. WELL SAMPLING NOTES:

PUMPING: BEGIN @ 1046 thru 1054 9 gallons removed
SAMPLING: @ 1121 hrs

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT SEALECTRO Well No. MW-12
Sampled By JRK/AP Date 06/01/94 Time --------
Weather SUNNY 80°F Sampled with Bailer YES Pump ___

A. WATER TABLE:

Well depth:
(below top of casing) 14.23 ft.

Well elevation
(Rel. Mean Sea Level): ___ ft.

Depth to water table:
(below top of casing) 5.40 ft.

Water table elevation
(Rel. Mean Sea Level): ___ ft.

Length of water column (LWC) 8.83 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.40 gallons

Depth to water after purging: 9.96 ft. (below top of casing)
Depth to water before sampling: 5.42 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color BROWN Odor NONE
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 10.0 gallons.
Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color CLEAR Odor NONE
Was an oil film or layer apparent? NO

	INITIAL	FIRST	SECOND	THIRD	FOURTH	FIFTH
CONDUCTIVITY (uS)	0.22	0.10	0.10	0.10	0.10	0.10
pH	7.3	7.2	7.1	7.1	7.0	7.0
TEMPERATURE (°C)	22.0	16.0	16.0	15.0	15.0	14.0
TURBIDITY (NTU)	990	990	990	---	---	---
DISSOLVED OXYGEN (mg/l)	12.2	16.0	15.5	17.0	16.4	16.2

E. WELL SAMPLING NOTES:

PUMPING: BEGIN @ 1450 thru 1500 10 gallons removed
SAMPLING: @ 1555 hrs

GROUND WATER SAMPLING FIELD LOG

Sample Location ITT SEALECTRO Well No. MW-13
Sampled By JRK/AP Date 06/01/94 Time --------
Weather SUNNY 80°F Sampled with Bailer YES Pump ___

A. WATER TABLE:

Well depth:
(below top of casing) 14.44 ft.

Well elevation
(Rel. Mean Sea Level): ________ ft.

Depth to water table:
(below top of casing) 3.98 ft.

Water table elevation
(Rel. Mean Sea Level): ________ ft.

Length of water column (LWC) 10.46 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.70 gallons

Depth to water after purging: 12.48 ft. (below top of casing)
Depth to water before sampling: 7.25 ft. (below top of casing)

B. PHYSICAL APPEARANCE AT START:

Color BROWN Odor NONE
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 9.0 gallons.
Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color CLEAR/BROWN Odor NONE
Was an oil film or layer apparent? NO

	INITIAL	FIRST	SECOND	THIRD	FOURTH	FIFTH
CONDUCTIVITY (uS)	0.12	0.14	0.13	0.14	0.14	0.14
pH	7.5	7.4	7.5	7.5	7.5	7.8
TEMPERATURE (°C)	18.0	16.0	16.0	17.0	18.0	15.0
TURBIDITY (NTU)	990	990	910	990	990	200
DISSOLVED OXYGEN (mg/l)	12.9	14.1	13.5	13.6	15.8	13.7

E. WELL SAMPLING NOTES:

PUMPING: BEGIN @ 1515 thru 1523 9 gallons removed
SAMPLING: @ 1600 hrs

GROUND WATER SAMPLING FIELD LOG

SAMPLE LOCATION: ITT Sealectro **WELL NUMBER:** MW-2S

Sampled By: SAM/AP Date: 8/23/94 Weather: Sunny 75-80

Sample Equipment: Stainless Steel Bailer Evacuation Equipment: Centrifugal Pump

A. WATER TABLE

Well Depth:
(below top of inner casing) 13.20 ft.

Depth to water table:
(below top of inner casing) 4.42 ft.

Length of water column(LWC) 8.78 ft.

Well Elevation:
(Rel. Mean Sea Level) 196.68 ft.

Water table elevation
(Rel. Mean Sea Level) 192.26 ft.

2" diameter wells = 0.163 x (LWC) = 1.43 gallons
4" diameter wells = 0.653 x (LWC) = ______ gallons
6" diameter wells = 1.469 x (LWC) = ______ gallons

B. WELL EVACUATION DATA

		Well Volumes					
	Initial	1	2	3	4	5	6
Start Time		0947	0948	0949	0950	0954	
End Time		0948	0949	0950	0951	0955	
Gallons Purged		1.50	1.50	1.50	1.50	1.50	
Spec. Conduc. (ms/cm	0.631	0.56	0.44	0.402	0.39	0.394	
pH	6.64	6.64	6.55	6.43	6.34	6.32	
Temp (C)	19.70	19.30	20.40	20.00	19.90	20.80	
Turbidity (NTU)	999.00	999.00	999.00	999.00	999.00	999.00	
Dissolved Oxygen	7.30	4.00	4.28	4.09	4.26	4.28	
Salinity (%)	0.02	0.02	0.01	0.01	0.01	0.01	

Appearance at start: Silty Dark Grey (odor unknown)

Appearance at end: Silty Dark Grey (odor unknown)

Other Observations: ______

Depth to water after purging: 9.54 ft. (below top of inner casing)

Amount of water removed: 7.50 gallons

Depth to water before sampling: 4.54 ft. (below top of inner casing)

Parameters Sampled For:	Sampling Time:
VOA (8010/8020)	1140
TPH (418.1)	

NOTES: Field Blank was taken at 1135

GROUND WATER SAMPLING FIELD LOG

SAMPLE LOCATION: ITT Sealectro **WELL NUMBER:** MW-2D

Sampled By: SAM/AP Date: 8/23/94 Weather: Sunny 75-80

Sample Equipment: Stainless Steel Bailer Evacuation Equipment: Centrifugal Pump

A. WATER TABLE

Well Depth:
(below top of inner casing) 42.50 ft.

Depth to water table:
(below top of inner casing) 4.52 ft.

Length of water column(LWC) 37.98 ft.

Well Elevation:
(Rel. Mean Sea Level) 199.40 ft.

Water table elevation
(Rel. Mean Sea Level) 194.88 ft.

2" diameter wells = 0.163 x (LWC) = 6.20 gallons
4" diameter wells = 0.653 x (LWC) = ______ gallons
6" diameter wells = 1.469 x (LWC) = ______ gallons

B. WELL EVACUATION DATA

		Well Volumes					
	Initial	1	2	3	4	5	6
Start Time		1010	1012	1014	1019	1026	
End Time		1012	1014	1019	1025	1030	
Gallons Purged		6.00	6.00	7.00	7.00	5.00	
Spec. Conduc. (ms/cm	0.79	0.888	0.926	0.918	0.92	0.921	
pH	6.95	7.16	7.22	7.31	7.34	7.32	
Temp (C)	20.40	18.00	19.10	17.40	18.20	19.30	
Turbidity (NTU)	597.00	999.00	587.00	426.00	398.00	399.00	
Dissolved Oxygen	5.43	4.77	4.59	3.65	3.70	4.02	
Salinity (%)	0.02	0.03	0.04	0.04	0.04	0.04	

Appearance at start: Silty Dark Grey (odor-none)

Appearance at end: Silty Tan (odor-none)

Other Observations:

Depth to water after purging: 41.30 ft. (below top of inner casing)

Amount of water removed: 31.00 gallons

Depth to water before sampling: 4.48 ft. (below top of inner casing)

Parameters Sampled For: Sampling Time:

VOA (8010/8020) 1145

NOTES:

GROUND WATER SAMPLING FIELD LOG

SAMPLE LOCATION: ITT Sealectro **WELL NUMBER:** MW-3S

Sampled By: SAM/AP Date: 8/24/94 Weather: Sunny 75-80

Sample Equipment: Stainless Steel Bailer Evacuation Equipment: Centrifugal Pump

A. WATER TABLE

Well Depth:
(below top of inner casing) 14.00 ft.

Depth to water table:
(below top of inner casing) 8.43 ft.

Length of water column(LWC) 5.57 ft.

Well Elevation:
(Rel. Mean Sea Level) 197.45 ft.

Water table elevation
(Rel. Mean Sea Level) 189.02 ft.

2" diameter wells = 0.163 x (LWC) = 0.91 gallons
4" diameter wells = 0.653 x (LWC) = ______ gallons
6" diameter wells = 1.469 x (LWC) = ______ gallons

B. WELL EVACUATION DATA

		Well Volumes					
	Initial	1	2	3	4	5	6
Start Time		0922	0924	0925	0926	0927	
End Time		0924	0925	0926	0927	0928	
Gallons Purged		1.00	1.00	1.00	1.00	1.00	
Spec. Conduc. (ms/cm	0.682	0.787	0.464	0.431	0.407	0.609	
pH	7.65	7.61	7.14	6.9	6.84	7.03	
Temp (C)	20.40	20.20	22.90	25.00	25.10	23.40	
Turbidity (NTU)	999.00	220.00	999.00	999.00	999.00	999.00	
Dissolved Oxygen	6.72	5.50	5.49	5.38	5.23	5.78	
Salinity (%)	0.01	0.03	0.01	0.01	0.01	0.02	

Appearance at start: Dark Grey (no odor)

Appearance at end: Light Grey (no odor)

Other Observations: Silty

Depth to water after purging: 11.50 ft. (below top of inner casing)
Amount of water removed: 5.00 gallons
Depth to water before sampling: 8.39 ft. (below top of inner casing)

Parameters Sampled For:
VOA (8010/8020)
TPH (418.1)

Sampling Time:
0955

NOTES:

GROUND WATER SAMPLING FIELD LOG

SAMPLE LOCATION: ITT Sealectro WELL NUMBER: MW-3D

Sampled By: SAM/AP Date: 8/24/94 Weather: Sunny 75-80

Sample Equipment: Stainless Steel Bailer Evacuation Equipment: Centrifugal Pump

A. WATER TABLE

Well Depth:
(below top of inner casing) 29.00 ft.

Depth to water table:
(below top of inner casing) 5.70 ft.

Length of water column(LWC) 23.30 ft.

Well Elevation:
(Rel. Mean Sea Level) 199.95 ft.

Water table elevation
(Rel. Mean Sea Level) 194.25 ft.

2" diameter wells = 0.163 x (LWC) = 3.80 gallons
4" diameter wells = 0.653 x (LWC) = ______ gallons
6" diameter wells = 1.469 x (LWC) = ______ gallons

B. WELL EVACUATION DATA

		Well Volumes					
	Initial	1	2	3	4	5	6
Start Time		0935	0937	0939	0942	0944	
End Time		0937	0939	0941	0944	0947	
Gallons Purged		3.80	3.80	3.80	3.80	3.80	
Spec. Conduc. (ms/cm	0.515	0.532	0.536	0.551	0.548	0.548	
pH	6.99	6.93	6.86	7.06	7.07	6.99	
Temp (C)	22.20	20.60	20.00	17.80	17.90	17.50	
Turbidity (NTU)	999.00	999.00	319.00	85.00	28.00	34.00	
Dissolved Oxygen	6.37	7.30	7.12	6.82	7.17	5.27	
Salinity (%)	0.02	0.02	0.02	0.02	0.02	0.02	

Appearance at start: Dark Grey (no odor)

Appearance at end: Light Tan (no odor)

Other Observations: Silty @ start

Depth to water after purging: 7.95 ft. (below top of inner casing)

Amount of water removed: 19.00 gallons

Depth to water before sampling: 5.37 ft. (below top of inner casing)

Parameters Sampled For: Sampling Time:

VOA (8010/8020) 1000

NOTES:

GROUND WATER SAMPLING FIELD LOG

SAMPLE LOCATION: ITT Sealectro **WELL NUMBER:** MW-4S

Sampled By: SAM/AP Date: 8/23/94 Weather: Sunny 75-80

Sample Equipment: Stainless Steel Bailer Evacuation Equipment: Centrifugal Pump

A. WATER TABLE

Well Depth:
(below top of inner casing) 14.00 ft.

Depth to water table:
(below top of inner casing) 4.25 ft.

Length of water column(LWC) 9.75 ft.

Well Elevation:
(Rel. Mean Sea Level) 196.86 ft.

Water table elevation
(Rel. Mean Sea Level) 192.61 ft.

2" diameter wells = 0.163 x (LWC) = 1.60 gallons
4" diameter wells = 0.653 x (LWC) = ______ gallons
6" diameter wells = 1.469 x (LWC) = ______ gallons

B. WELL EVACUATION DATA

		Well Volumes					
	Initial	1	2	3	4	5	6
Start Time		1254	1300	1303	1308	1310	
End Time		1259	1303	1307	1310	1312	
Gallons Purged		1.60	1.60	1.60	1.60	1.60	
Spec. Conduc. (ms/cm	1.98	2.69	2.6	2.41	2.27	2.25	
pH	7.16	6.92	6.92	6.91	6.83	6.91	
Temp (C)	22.00	20.60	20.20	20.10	19.50	18.00	
Turbidity (NTU)	724.00	999.00	321.00	119.00	44.00	84.00	
Dissolved Oxygen	5.21	6.42	6.23	6.57	5.67	5.86	
Salinity (%)	0.08	0.13	0.12	0.11	0.11	0.10	

Appearance at start: Black (septic odor)

Appearance at end: Light Tan; trace of silt (septic odor)

Other Observations: ______

Depth to water after purging: 12.12 ft. (below top of inner casing)
Amount of water removed: 8.00 gallons
Depth to water before sampling: 4.20 ft. (below top of inner casing)

Parameters Sampled For:	Sampling Time:
VOA (8010/8020)	1355
TPH (418.1)	

NOTES: ______

GROUND WATER SAMPLING FIELD LOG

SAMPLE LOCATION: ITT Sealectro **WELL NUMBER:** MW-4D

Sampled By: SAM/AP Date: 8/23/94 Weather: Sunny 75-80

Sample Equipment: Stainless Steel Bailer Evacuation Equipment: Centrifugal Pump

A. WATER TABLE

Well Depth:
(below top of inner casing) 41.00 ft.

Depth to water table:
(below top of inner casing) 4.34 ft.

Length of water column(LWC) 36.66 ft.

Well Elevation:
(Rel. Mean Sea Level) 196.95 ft.

Water table elevation
(Rel. Mean Sea Level) 192.61 ft.

2" diameter wells = 0.163 x (LWC) = 6.00 gallons
4" diameter wells = 0.653 x (LWC) = ______ gallons
6" diameter wells = 1.469 x (LWC) = ______ gallons

B. WELL EVACUATION DATA

		Well Volumes					
	Initial	1	2	3	4	5	6
Start Time		1330	1335	1340	1342	1347	
End Time		1335	1340	1342	1347	1350	
Gallons Purged		6.00	6.00	6.00	6.00	6.00	
Spec. Conduc. (ms/cm	0.93	0.671	0.677	0.684	0.689	0.683	
pH	7.16	7.19	7.28	7.01	7.04	6.94	
Temp (C)	17.20	18.50	16.80	15.50	15.30	15.50	
Turbidity (NTU)	84.00	215.00	34.00	8.00	14.00	9.00	
Dissolved Oxygen	6.62	5.86	6.15	3.49	4.59	2.91	
Salinity (%)	0.04	0.03	0.02	0.02	0.02	0.02	

Appearance at start: Dark Grey (no odor)

Appearance at end: Clear (no odor)

Other Observations: ______

Depth to water after purging: 8.89 ft. (below top of inner casing)

Amount of water removed: 30.00 gallons

Depth to water before sampling: 4.29 ft. (below top of inner casing)

Parameters Sampled For: VOA (8010/8020)

Sampling Time: 1400

NOTES: ______

GROUND WATER SAMPLING FIELD LOG

SAMPLE LOCATION: ITT Sealectro **WELL NUMBER:** MW-11

Sampled By: SAM/AP Date: 8/24/94 Weather: Sunny 75-80

Sample Equipment: Stainless Steel Bailer Evacuation Equipment: Centrifugal Pump

A. WATER TABLE

Well Depth:
(below top of inner casing) 14.24 ft.

Depth to water table:
(below top of inner casing) 3.95 ft.

Length of water column(LWC) 10.29 ft.

Well Elevation:
(Rel. Mean Sea Level) ______ ft.

Water table elevation
(Rel. Mean Sea Level) ______ ft.

2" diameter wells = 0.163 x (LWC) = 1.70 gallons
4" diameter wells = 0.653 x (LWC) = ______ gallons
6" diameter wells = 1.469 x (LWC) = ______ gallons

B. WELL EVACUATION DATA

		Well Volumes					
	Initial	1	2	3	4	5	6
Start Time		1044	1045	1047	1048	1050	
End Time		1045	1047	1048	1050	1052	
Gallons Purged		1.70	1.70	1.70	1.70	1.70	
Spec. Conduc. (ms/cm	0.158	0.138	0.141	0.125	0.138	0.133	
pH	7.12	7.1	7.15	7.29	7.13	7.29	
Temp (C)	22.00	22.90	23.70	22.50	21.40	21.40	
Turbidity (NTU)	999.00	978.00	374.00	96.00	267.00	166.00	
Dissolved Oxygen	7.26	6.11	6.07	6.66	6.23	6.59	
Salinity (%)	0.00	0.00	0.00	0.00	0.00	0.00	

Appearance at start: Dark Grey (no odor)

Appearance at end: Light Tan (no odor)

Other Observations: ______

Depth to water after purging: 4.45 ft. (below top of inner casing)

Amount of water removed: 8.50 gallons

Depth to water before sampling: 3.97 ft. (below top of inner casing)

Parameters Sampled For:	Sampling Time:
VOA (8010/8020)	1100

NOTES: ______

GROUND WATER SAMPLING FIELD LOG

SAMPLE LOCATION: ITT Sealectro **WELL NUMBER:** MW-12

Sampled By:	SAM/AP	Date:	8/24/94	Weather:	Sunny 75-80
Sample Equipment:	Stainless Steel Bailer			Evacuation Equipment:	Centrifugal Pump

A. WATER TABLE

Well Depth:
(below top of inner casing) 14.23 ft.

Depth to water table:
(below top of inner casing) 5.05 ft.

Length of water column(LWC) 9.18 ft.

Well Elevation:
(Rel. Mean Sea Level) ______ ft.

Water table elevation
(Rel. Mean Sea Level) ______ ft.

2" diameter wells = 0.163 x (LWC) = 1.50 gallons
4" diameter wells = 0.653 x (LWC) = ______ gallons
6" diameter wells = 1.469 x (LWC) = ______ gallons

B. WELL EVACUATION DATA

		Well Volumes					
	Initial	1	2	3	4	5	6
Start Time		1157	1158	1159	1200	1202	
End Time		1158	1159	1200	1202	1204	
Gallons Purged		1.50	1.50	1.50	1.50	1.50	
Spec. Conduc. (ms/cm	0.113	0.102	0.099	0.101	0.103	0.106	
pH	7.25	7.08	7	7.01	7.06	7	
Temp (C)	24.00	22.40	20.90	20.30	20.70	22.80	
Turbidity (NTU)	999.00	682.00	999.00	999.00	999.00	372.00	
Dissolved Oxygen	6.33	6.21	6.76	7.07	7.36	7.08	
Salinity (%)	0.00	0.00	0.00	0.00	0.00	0.00	

Appearance at start: Dark Grey (no odor)
Appearance at end: Light Tan (no odor)

Other Observations: ______

Depth to water after purging: 6.21 ft. (below top of inner casing)
Amount of water removed: 7.50 gallons
Depth to water before sampling: 6.31 ft. (below top of inner casing)

Parameters Sampled For: **Sampling Time:**

VOA (8010/8020) 1240

NOTES: ______

GROUND WATER SAMPLING FIELD LOG

SAMPLE LOCATION: ITT Sealectro **WELL NUMBER:** MW-13

Sampled By: SAM/AP Date: 8/24/94 Weather: Sunny 75-80

Sample Equipment: Stainless Steel Bailer Evacuation Equipment: Centrifugal Pump

A. WATER TABLE

Well Depth:
(below top of inner casing) 14.44 ft.

Depth to water table:
(below top of inner casing) 3.61 ft.

Length of water column(LWC) 10.83 ft.

Well Elevation:
(Rel. Mean Sea Level) ____ ft.

Water table elevation
(Rel. Mean Sea Level) ____ ft.

2" diameter wells = 0.163 x (LWC) = 1.80 gallons
4" diameter wells = 0.653 x (LWC) = ____ gallons
6" diameter wells = 1.469 x (LWC) = ____ gallons

B. WELL EVACUATION DATA

		Well Volumes					
	Initial	1	2	3	4	5	6
Start Time		1211	1213	1214	1216	1219	
End Time		1213	1214	1215	1219	1221	
Gallons Purged		2.00	2.00	2.00	2.00	2.00	
Spec. Conduc. (ms/cm	0.142	0.187	0.212	0.195	0.209	0.208	
pH	7.1	7.12	7.17	7.33	7.31	7.32	
Temp (C)	23.40	21.20	20.00	19.90	20.40	20.60	
Turbidity (NTU)	731.00	924.00	424.00	728.00	307.00	965.00	
Dissolved Oxygen	5.86	6.23	6.04	6.83	6.38	6.05	
Salinity (%)	0.00	0.00	0.00	0.00	0.00	0.00	

Appearance at start: Dark Grey (no odor)
Appearance at end: Light Tan (no odor)

Other Observations: ____

Depth to water after purging: 13.78 ft. (below top of inner casing)
Amount of water removed: 10.00 gallons
Depth to water before sampling: 4.91 ft. (below top of inner casing)

Parameters Sampled For:	Sampling Time:
VOA (8010/8020)	1255
TPH (418.1)	

NOTES: ____

APPENDIX F

DISPOSAL MANIFESTS

DIVISION OF HAZARDOUS SUBSTANCES REGULATION

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

Please print or type. Do not Staple.

Form Approved, OMB No. 2050-0039, Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. [redacted] Manifest Document No. [redacted]

2. Page 1 of 1

Information in the shaded areas is not required by Federal Law.

A. State Manifest Document No. NY B [redacted]

3. Generator's Name and Mailing Address
[redacted]

4. Generator's Phone [redacted]

B. Generator's ID

5. Transporter 1 (Company Name) [redacted]

6. US EPA ID Number [redacted]

C. State Transporter's ID [redacted]

D. Transporter's Phone [redacted]

7. Transporter 2 (Company Name)

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
[redacted]

10. US EPA ID Number [redacted]

G. State Facility's ID

H. Facility's Phone [redacted]

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. [redacted]	[illegible]	[illegible]	[illegible]	[illegible]	EPA [redacted] STATE
b.					EPA STATE
c.					EPA STATE
d.					EPA STATE

J. Additional Descriptions for Materials Listed Above

a. [redacted]

b.

c.

d.

K. Handling Codes for Wastes Listed Above

a. b. c. d.

15. Special Handling Instructions and Additional Information

[redacted]

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name [illegible] Signature [illegible] Mo. Day Year [illegible]

17. Transporter 1 (Acknowledgement of Receipt of Materials)

Printed/Typed Name [illegible] Signature [illegible] Mo. Day Year 09 15 94

18. Transporter 2 (Acknowledgement of Receipt of Materials)

Printed/Typed Name Signature Mo. Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name Signature Mo. Day Year

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

APPENDIX G

HUMAN TOXICOLOGICAL EFFECTS PROFILES

Appendix G. Toxicity Profiles

Brief synopses of the human toxicological effects of chemicals of potential concern at the site, including RfDs and cancer slope factors published by USEPA, are presented below. These synopses were compiled from the USEPA IRIS database, which contains toxicologic reference data, standards and health advisories for specific chemicals.

G.1. 1,1-Dichloroethylene (1,1-DCE)

According to USEPA, liver toxicity is considered to be the principal toxicologic effect of 1,1-DCE in experimental animals, and rats are considered to be the most sensitive species. USEPA has published a reference dose (RfD) for oral ingestion of 1,1-DCE of 0.009 mg/kg/day. Based on suggestive evidence of carcinogenicity in animal studies, USEPA has classified 1,1-DCE as a group C carcinogen (possible human carcinogen), and published a oral slope factor for carcinogenic effects of 0.6 $(mg/kg/day)^{-1}$.

G.2. 1,1-Dichloroethane (1,1-DCA)

There is limited data regarding the chronic non-carcinogenic effects of 1,1-DCA on laboratory species. USEPA has published a chronic oral RfD for 1,1-DCA of 0.1 mg/kg/day. The USEPA has classified 1,1-DCA as a group C agent (possible human carcinogen). However, the slope factor and inhalation unit risk for 1,1-DCA are currently under review at USEPA.

G.3. Acetone

Acetone, is classified as a Class D human carcinogen due to insufficient evidence of carcinogenicity. Limited human studies have shown that workers exposed to acetone vapors (600 to 2150 ppm) experienced transient eye and nose irritation. Depending on exposure concentration and frequency of duration, chronic non-carcinogenic effects of acetone in animals may include decreased body weight, liver effects, kidney effects and red blood cell effects. These affects appear to be dose related. The USEPA has published an RfD for acetone of 1 mg/kg/day.

G.4. Benzene

Benzene is a recognized human carcinogen. Several epidemiologic studies have provided sufficient evidence of a causal relationship between benzene exposure and leukemia in humans. Benzene is also a known inducer of aplastic anemia in humans, with a latent period of up to ten years. It also produces leukopenia and thrombocytopenia, which may progress to pancytopenia. In both humans and animals, benzene exposure is associated with chromosomal damage, although it is not mutagenic in microorganisms.

The USEPA has classified benzene as a class A carcinogen (known human carcinogen), and has published a cancer potency factor of 2.9E-02 (mg/kg/day) for the quantitative estimation of the cancer risk from low level oral and inhalation exposure to benzene.

G.5. Polycyclic Aromatic Hydrocarbons (PAH)

PAHs have been reported to cause hematopoietic effects at moderate doses to laboratory animals. Laboratory studies have shown that chronic low dose exposure of PAHs may cause renal and hepatic effects. There is limited human studies on direct non-carcinogenic effects. Chronic RfDs have been published by the USEPA for acenaphthene (0.06 mg/kg-day), anthracene (0.3 mg/kg-day), fluoranthene (0.04 mg/kg-day), fluorene (0.04 mg/kg-day), and pyrene (0.03 mg/kg-day).

PAH carcinogenicity data, especially for benzo(a)pyrene (BaP), is sufficient to show BaP and other PAHs as probable human carcinogens (B2). Animal studies show positive genotoxicity and induction of lung tissue neoplasticity. Tumors have also been induced in laboratory animals exposed to PAH residues. An oral slope factor for benzo(a)pyrene of 7.3 $(mg/kg\text{-}day)^{-1}$ has been published by the USEPA. No other slope factors are available for the other on-Site PAHs.

The toxicity values for BaP were used to represent all PAHs in the study. Relative potency factors were used in the exposure assessment and risk characterization, as shown below, for other PAHs, as demonstrated in the USEPA document, Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons (PAH) (USEPA, 1993). The total PAH (BaP equivalent) chronic cancer daily intakes (CDIs) were then compared to the equivalent BaP slope factor.

Summary of Relative Potency Factors (BaP equivalents)

PAH Compound	Relative Potency Factor
Benzo(a)pyrene	1.0
Benzo(a)anthracene	0.1
Benzo(b)fluoranthrene	0.1
Benzo(k)fluoranthrene	0.01
Dibenz(a,h)anthracene	1.0
Chrysene	0.001
Indeno(1,2,3-cd)pyrene	0.1

G.6. Bis(2)ethylhexylphthalate (BEHP)

Non-cancer effects in animals known to be caused by BEHP include increased liver and kidney weights, and retarded growth. These adverse effects were reported in studies where rats were fed 19-64 mg/kg-day in diets for 1-2 years. Based on animal studies, the USEPA has published an oral RfD of 0.02 mg/kg-day for BEHP.

There is inadequate human carcinogenicity data for BEHP. Results from animal studies indicate that exposure to 6000 ppm BEHP in the diet may cause significant increases in the incidence of hepatocellular carcinomas. Based on animal studies, the USEPA has classified BEHP as a B2 (probable human carcinogen) cancer agent and has published a slope factor of 0.014 $(mg/kg\text{-}day)^{-1}$.

G.7. Bromodichloromethane

No information is available regarding human exposures to bromodichloromethane (ATSDR 1989). Animal data are limited to oral exposure studies of various durations that primarily indicate a potential for severe hepatic and renal effects, although data are also suggestive of adverse hematological, immunological and developmental effects in animals.

Bromodichloromethane was carcinogenic in rats and mice after intermediate and chronic oral exposure (ATSDR 1989); epidemiological data for humans is unavailable. The carcinogenic potential of bromodichloromethane following inhalation and dermal exposure is unknown.

The USEPA has established a chronic oral RfD of 0.02 mg/kg/day, and has categorized bromodichloromethane as a class B2 carcinogen (IRIS 1993). The established oral slope factor and drinking water unit risk are 6.2 $(mg/kg\text{-}day)^{-1}$ and $1.8E^{-6}$ $(ug/L)^{-1}$, respectively (IRIS 1993).

G.8. Carbon Disulfide

The toxic effects of carbon disulfide are manifested primarily as cardiovascular, hepatic and neurological effects. Several studies have documented an increase incidence of elevated blood pressure. Carbon disulfide appears to reduce the liver's ability to detoxify other chemicals by suppressing the microsomal hepatic enzyme system. The nervous system is the primary target organ for carbon disulfide and appears to have effect on both the axons and myelin sheaths. The USEPA has published an RfD for carbon disulfide of 1E-01 mg/kg/day. Carbon disulfide is classified as Class D due to insufficient evidence for human carcinogenicity.

G.9. Chloroethane

There is little information available on the oral toxicity of chloroethane. Inhalation of chloroethane is known to produce various CNS effects including dizziness, incoordination and unconsciousness. Inhalation of chloroethane is also known to cause nausea in humans.

G.10. Chloroform

Humans exposed to chloroform by inhalation for various durations, either occupationally and under anesthesia during surgery, have shown various adverse CNS, hepatic, gastrointestinal, and cardiovascular effects (ATSDR 1991). Animal inhalation studies generally support these observations, and have also indicated renal and developmental toxicity. Oral exposure data in humans is limited to acute, very high dose accidently ingestion that results in severe cardiovascular and hepatic effects. Short- and long-term oral studies in animals indicate that the liver is the primary target organ, although other body systems may be affected to varying degrees. Limited information regarding dermal exposure indicates that skin irritation is possible. Chloroform is a hepatocarcinogen in animals after chronic oral exposure, and is implicated as a human carcinogen in among consumers of chlorinated drinking water (ATSDR 1991). The USEPA reported a chronic oral RfD for chloroform of 0.01 mg/kg-day; the inhalation RfC is currently under review by the USEPA (IRIS 1993). Chloroform has been classified a B2 carcinogen by the USEPA (IRIS 1993); the slope factor for risk of cancer after oral exposure is reported to be 0.0061 $(mg/kg\text{-}day)^{-1}$, and the drinking water unit risk is reported as $1.7E^{-7}$ $(ug/L)^{-1}$.

G.11. Copper
There is a published RfD regarding the chronic non-carcinogenic effects of copper of 0.037 mg/kg-day. The ATSDR has reported that long-term oral exposure to high levels of copper can cause dizziness, diarrhea, and renal damage. Young children are especially sensitive to the hepatic effects of copper exposure. Copper is classified as a level D agent (insufficient evidence for carcinogenicity) by the USEPA with respect to potential carcinogenic effects.

G.12. Ethylbenzene
Animal and human studies indicate that ethylbenzene can be rapidly and efficiently absorbed via inhalation, oral ingestion, and dermal uptake. Following absorption, ethylbenzene is rapidly and extensively metabolized in the liver and adrenal cortex, and eliminated from the body, primarily in the urine. Generally, ethylbenzene metabolites are considered to be only slightly toxic.

According to ATSDR (ATSDR 1989), there are no reports on the hematological, hepatotoxic, developmental, or reproductive effects of ethylbenzene in humans. Animal studies suggest that dose dependant systemic toxicity, fetotoxicity, and adverse reproductive effects may be induced by ethylbenzene, though the relevance of these studies to public health remains inconclusive. In addition, it appears that ethylbenzene or ethylbenzene metabolites are not mutagenic in bacteria or yeast. However, based on LOAEL studies, the USEPA has published an oral RfD of 0.1 mg/kg-day for ethylbenzene.

No association between increased cancer incidence in humans and exposure to ethylbenzene was located in the literature by ATSDR. The only animal data indicating a significant increase in tumors in rats orally exposed to ethylbenzene was regarded by ATSDR to be inconclusive due to methodological deficiencies in the study design. Therefore, the relevance of ethylbenzene induced carcinogenicity to public health cannot be determined. USEPA has classified ethylbenzene as a group D agent, which means that there is inadequate evidence of carcinogenicity of ethylbenzene in animals. No potency factor or other quantitative estimate of carcinogenicity has been developed by the USEPA for ethylbenzene.

G.13. Methylene Chloride
In humans, methylene chloride is known to affect the central nervous system. Acute exposure is also known to cause liver and kidney effects. The USEPA has published a RfD for oral ingestion of Methylene Chloride of 0.06 mg/kg/day. Based on suggestive evidence of carcinogenicity in animal studies, USEPA has classified 1,1-DCE as a group B2 carcinogen (probable human carcinogen) and published an oral slope factor for carcinogenic effects of 0.0075 $(mg/kg/day)^{-1}$.

G.14. Nickel
Studies show that chronic exposure to nickel causes low body weights in laboratory rats. Human health studies demonstrate that low dose nickel exposure may cause ataxia and lethargy. The USEPA has published a chronic oral RfD of 0.02 mg/kg-day for nickel, based on animal studies. The USEPA has not published information regarding nickel carcinogenicity.

G.15. Tetrachloroethene (PCE)
Tetrachloroethylene induces dose dependant toxic effects in the liver which is considered to be the primary target organ for PCE toxicity. Based on animal dose response data, the USEPA has published a chronic oral Rfd for PCE of 0.01 mg/kg/day. The potential carcinogenic classification for PCE is currently classified by the U.S.EP ECAO as C-B2, and there is an interim oral slope factor available of 0.052 $(mg/kg\text{-}day)^{-1}$, and a interim inhalation slope factor available of 0.002 $(mg/kg\text{-}day)^{-1}$.

G.16. 1,2-Dichloroethene (1,2-DCE)
1,2-Dichloroethene has been shown to induce dose dependant liver toxicity and immunologic effects in rats. The USEPA has published a chronic oral RfD for 1,2-DCE of 0.02 mg/kg/day based on the induction of liver toxicity. There is no data currently published by USEPA regarding the potential carcinogenic effects.

G.17. Trichloroethene (TCE)
Trichloroethylene has been classified as a B2 carcinogenic agent by USEPA based on sufficient evidence for carcinogenicity in experimental animals. Based on quantitative dose response information, USEPA has published a cancer potency factor of 0.07 $(mg/kg/day)^{-1}$.

G.18. Toluene

Information concerning non-cancer effects in humans after inhalation exposure to toluene indicates that the primary target organ is the central nervous system (ATSDR, 1988). CNS effects appear dose-related and range from slight CNS depression to coma after acute exposure among occupationally exposed persons. Permanent severe CNS effects have been observed in substance abusers after chronic exposure to high concentrations. Inhalation exposure of various durations is also associated with adverse respiratory, hematological, hepatic, renal, reproductive, and developmental effects in humans. Although interpretation of toluene-induced health effects in humans is confounded by concurrent exposure to various other volatile substances, animal studies on the health effects of toluene inhalation generally support the epidemiologic and case data for humans. Little information is available concerning exposure to toluene via the oral and dermal routes. Limited animal data indicate that there is some potential for neurological effects after oral exposure, and that dermal and ocular irritation is possible. An oral RfD of 0.2 mg/kg-day and an inhalation RfC of 0.4 mg/m^3 are established by the USEPA (IRIS 1993). Data appear inadequate to evaluate the carcinogenic potential of toluene (ATSDR 1988); the USEPA has classified toluene as a class D agent with respect to human carcinogenicity.

G.19. Vinyl Chloride

Vinyl chloride is a known human carcinogen (class A agent) that can cause angiosarcomas of the liver and tumors of the brain, lung, and hemolymphopoietic system. According to the USEPA and ATSDR, there is evidence from human and animal studies that vinyl chloride can also cause adverse teratogenic and reproductive effects in humans and animals. The USEPA has published an oral slope factor of 1.9 $(mg/kg\text{-}day)^{-1}$ for vinyl chloride, based on sufficient evidence of cancer effects in humans and animals. For inhalation exposures, the USEPA has published an inhalation slope factor of 0.3 $(mg/kg\text{-}day)^{-1}$.

Chronic inhalation exposures of humans to vinyl chloride have been associated with systemic toxicity such as sclerotic syndrome, acro-osteolysis, and liver tissue damage, and have caused lesions of the liver, lungs, and kidneys in experimental animals. Acute exposures to vinyl chloride can cause narcosis and bronchitis in humans. There are no RfDs available for vinyl chloride.

G.20. Xylenes

High level acute and chronic xylene exposures in humans may be associated with respiratory effects following inhalation, and neurological effects including impaired reaction times, impaired short term memory, and alterations in equilibrium and body balance. Acute and/or chronic xylene exposures in animals have been related to cardiovascular, hepatic, renal, neurological, and developmental effects. USEPA has published a reference dose (RfD) for oral ingestion of xylene of 2 mg/kg/day. USEPA has classified xylene as a group D agent with respect to potential carcinogenicity. No cancer potency factors or other quantitative estimates of potential xylene carcinogenicity have been published.

G.21. 1,1,1-Trichloroethane (1,1,1-TCA)

Animal studies suggest that dose dependant liver toxicity, CNS effects, and slight growth retardation effects may be induced by 1,1,1-TCA. In addition, it appears that ethylbenzene or ethylbenzene metabolites are not mutagenic in bacteria or yeast. According to USEPA, there is currently insufficient evidence to indicate that 1,1,1-TCA may be carcinogenic in animal or human populations (group D carcinogenicity classification).

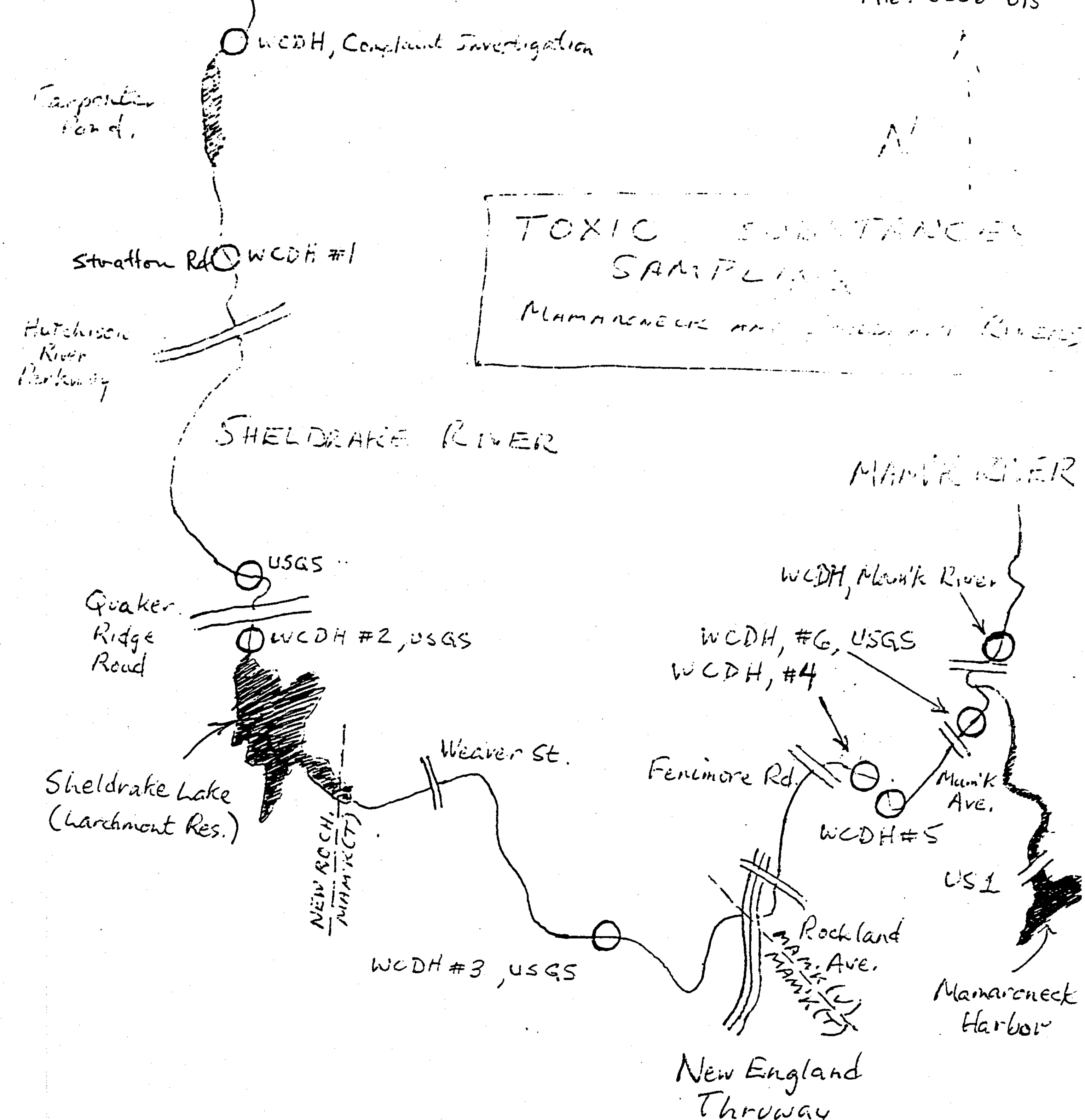
Exhibits

O'BRIEN & GERE
ENGINEERS, INC.

EXHIBIT A

BACKGROUND RIVER DATA

File: 3356 015



WCDH Sheldrake R, 1980	USGS Sheldrake R, 1976	WCDH Mamaroneck R, 198
1- Stratton Rd.	Quaker Ridge Rd.	Jefferson Ave.
2- Reservoir Inlet	Reservoir Inlet	
3- Fernwood Ave	Fernwood Ave.	
4- Fayette Ave.	Mamaroneck Ave	
5- Waverly Ave		
6- Mamaroneck Ave		
Add.- Carpenter Pond, 1981		

West. Co. Dept. of Health 1982

TOXIC SUBSTANCES SAMPLING PROGRAM

SHELDRAKE RIVER- Water, sediment, elutriate and fish samples.
All results reported in parts per billion

Lab #	Location	Cu	Zn	As	Pb	PCB	Dieldrin	Chlordane	DDT	DDD	DDE
WATER - September 30, 1980											
C-1623,382	#1 STRATTON RD.	<20	<50	<20	<10	<1	<.1	.1	<.5	<.5	<.5
C-1624,383	#2 RESERVOIR INLET	<20	<50	<20	10	<1	<.1	<.1	<.5	<.5	<.5
C-1622,384	#5 WAVERLY STREET	<20	<50	<20	20	<1	<.1	<.1	<.5	<.5	<.5
C-1621,385	#6 MAMARONECK AVE.	20	<50	<20	30	<1	<.1	<.1	<.5	<.5	<.5
High Flow - March 17, 1982											
801	#2 RESERVOIR INLET	<20	<50	<20	<10	<1	<.1	<.1	<.5	<.5	<.5
802	#1 STRATTON RD.	<20	<50	<20	<10	<1	<.1	<.1	<.5	<.5	<.5
803	#5 WAVERLY STREET	<20	<50	<20	20	<1	<.1	<.1	<.5	<.5	<.5
804	#6 MAMARONECK AVE.	120	60	<20	30	<1	<.1	<.1	<.5	<.5	<.5
SEDIMENT - September 30, 1980											
C-1627,376	#1 STRATTON RD.	8200	25000	1400	63000	<1	9.3	46	3.3	2.6	2
C-1625,377	#2 RESERVOIR INLET	7100	24000	2000	38000	<1	2.3	75	21	14	7
C-1629,378	#3 FERNWOOD	14000	53000	1900	66000	<1	6.5	68	14	7	7
C-1630,379	#4 FAYETTE AVE.	9700	34000	1100	28000	<1	.4	96	7	10	6
C-1626,380	#5 WAVERLY STREET	17000	90000	1800	110000	310	<.1	360	15	81	27
C-1628,381	#6 MAMARONECK AVE.	110000	77000	<400	78000	<1	<.1	150	13	16	14
ELUTRIATE - September 30, 1980											
C-1635,370	#1 STRATTON RD.	40	210	<20	400	<1	<.1	1.3	<.5	<.5	<.5
C-1631,371	#2 RESERVOIR INLET	20	130	<20	180	<1	<.1	.5	<.5	<.5	<.5
C-1633,374	#3 FERNWOOD	40	310	<20	350	<1	<.1	1.6	<.5	<.5	<.5
C-1632,373	#4 FAYETTE AVE.	60	260	<20	350	<1	<.1	1.5	<.5	<.5	<.5
C-1636,372	#5 WAVERLY STREET	30	250	<20	280	<1	<.1	.9	<.5	<.5	<.5
C-1634,375	#6 MAMARONECK AVE.	400	260	<20	220	<1	<.1	.8	<.5	<.5	<.5
WHOLE FISH - 4 black carp and 1 catfish - July 31, 1981											
C-1474,593	20 yds S,STRATTON	1500	30000	<200	330		Contamination	of	[illegible]		[illegible]
FILET FISH - 5 black carp - July 31, 1981											
C-1475,594	20 yds S,STRATTON	1900	30000		<100		"	"	"		

NOTE - HEPTACHLOREPOXIDE = <.1 in water, sediment and elutriate.
/po

mamaroneck, NY 3356, ...

INDUSTRIAL REACHES OF THE SHELDRAKE RIVER

SUMMER 1986

By

Robert P. Hohberg, B.S., M.A., P.D.

914-698-4448

INTRODUCTION

This project was proposed to provide base data on the Industrial Reaches of the Sheldrake River which flows into the Mamaroneck River and affects the waters of Harbor Island Beach. Nineteen (19) sampling stations were to be established. Twenty (20) sampling stations have been established in this project. This report includes analyses for turbidity, salinity, emulsified oil, pH, coliforms count and fecal count. Both a first and second run of samplings have been executed in order to locate point pollution. It should be noted that Joe Fraioli, Village Manager of Mamaroneck, afforded the author official credentials to carry out this work.

In addition to the work included in this report, the author: 1) reported to John D'Aquino and Richard Doran of the Westchester County Department of Health, 2) reviewed the pertinent sewer lines with Joe Paterno of the Town of Mamaroneck Highway Department, 3) reported to Tom Leddy, Conservation Officer of the Town of Mamaroneck, 4) contacted Dominick Esposito, chief engineer of Amerchol, 628 Waverly Avenue, Mamaroneck, NY 10543, concerning a suspicious discharge into the Concord Avenue drain. In addition, my field notes, graphs and tables have been keyed with the Westchester County Department of Health Map, the appropriate section of which is included in this report.

A total of one hundred and twenty (120) chemical tests and sixty (60) bacterial procedures were performed. Independent laboratory analysis for this project would have cost $12,322.67 plus travel expenses. My consultant's fee for this work was $3,500.00.

Introduction (continued)

I would like to express my thanks to Tom Leddy, Joe Paterno, Ed Reilly and the men of the Highway Department of the Town of Mamaroneck for their assistance and encouragement. Cliff Emanuelson and Claudia Ng were of great help in preparing the map and formal report.

Station: S1a

Date: 7/14/86

Depth: Subsurface

Time: 6:32 a.m.

Conditions: overcast; muggy; oil slicks on water; shopping cart, oil drums, and debris; very slow flow; some slight rain the day before; gas bubbles

Water Temperature: 10.5°C

Air Temperature: 18°C

Tests:

Turbidity: 11.0 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.5 p.p.m.

pH: 6.2

Station: S1

Date: 7/15/86

Depth: Subsurface

Time: 7:45 a.m.

Conditions: sunny; good flow; clear water; bottom visible; bank is littered + poison ivy; debris; gas bubbles

Water Temperature: 18°C

Air Temperature: 19°C

Tests:

Turbidity: 6.4 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.2 p.p.m.

pH: 6.2

Station: S2G

Date: 7/16/86

Depth: Subsurface

Time: 7:02 a.m.

Conditions: partly cloudy; sludge opposite pipe; debris and hypodermic syringe in water; little to slow flow; Elodea and Spyrogyra; murky at pipe outlet; oil streaks

Water Temperature: 18°C

Air Temperature: 22°C

Tests:

Turbidity: 5.2 N.T.U.

Salinity: 0.1 o/oo

Emulsified Oil: 0.5 p.p.m.

pH: 6.2

Station: S2a

Date: 7/17/86

Depth: Subsurface

Time: 7:00 a.m.

Conditions: sunny; murky; spyrogyra; gas bubbles; good flow then pooling and slow; steel grating and cans in water; oil flecks visible

Water Temperature: 20°C

Air Temperature: 20°C

Tests:

Turbidity: 5.2 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.0 p.p.m.

pH: 6.2

Station: S2

Depth: Subsurface

Conditions: overcast; Spyrogyra and Elodea; debris; small to medium drain pipes; slow steady flow; pidgeon rookery

Date: 7/18/86

Time: 6:54 a.m.

Water Temperature: 21°C

Air Temperature: 22°C

Tests:

Turbidity: 5.6 N.T.U.

Salinity: 0.1 o/oo

Emulsified Oil: 0.0 p.p.m.

pH: 6.1

Station: S3

Depth: Subsurface

Conditions: cloudy; scum (brown) on surface of water; slow flow; shopping cart and debris; oil slicks

Date: 7/22/86

Time: 7:00 a.m.

Water Temperature: 30°C

Air Temperature: 22°C

Tests:

Turbidity: 4.3 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.0 p.p.m.

pH: 6.1

Station: S4a

Date: 7/23/86

Depth: Subsurface

Time: 6:48 a.m.

Conditions: constant running drain on left bank facing upstream; shopping cart and debris; pooling water; upstream another running drain

Water Temperature: 19°C

Air Temperature: 21°C

Tests:

Turbidity: 3.5 N.T.U.

Salinity: 1.0 o/oo

Emulsified Oil: 0.0 p.p.m.

pH: 6.0

Station: S4

Date: 7/24/86

Depth: Subsurface

Time: 6:30 a.m.

Conditions: sunny; Elodea and Spyrogyra; debris (shopping carts, bottles, cans, etc.); duck and duckling; slow flow

Water Temperature: 20°C

Air Temperature: 21°C

Tests:

Turbidity: 6.5 N.T.U.

Salinity: 0.1 o/oo

Emulsified Oil: 0.2 p.p.m.

pH: 6.1

Station: S5

Depth: Subsurface

Conditions: sunny; large oil slick; scum on water; shopping cart; slow flow; sand bags in water

Date: 7/25/86

Time: 6:30 a.m.

Water Temperature: 21°C

Air Temperature: 23°C

Tests:

Turbidity: 13.0 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 1.2 p.p.m.

pH: 6.1

Station: S6

Depth: Subsurface

Conditions: overcast; suds at drain; murky water; shopping cart; drain (active) on left bank as you face upstream; much siltation

Date: 7/26/86

Time: 6:23 a.m.

Water Temperature: 23°C

Air Temperature: 25°C

Tests:

Turbidity: 49.0 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 4.0 p.p.m.

pH: 6.1

Station: S7

Date: 7/28/86

Depth: Subsurface

Time: 6:50 a.m.

Conditions: overcast and foggy; shopping cart; good flow over small fall; Elodea; slight foam; cinder block and other debris

Water Temperature: 23°C

Air Temperature: 23°C

Tests:

Turbidity: 3.7 N.T.U.

Salinity: 0.5 o/oo

Emulsified Oil: 0.8 p.p.m.

pH: 6.3

Station: S8

Date: 7/29/86

Depth: Subsurface

Time: 6:35 a.m.

Conditions: overcast; slow flow; showers previous day; Elodea; clear to bottom; debris and mechanical refuse; muggy

Water Temperature: 24°C

Air Temperature: 22°C

Tests:

Turbidity: 3.2 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.0 p.p.m.

pH: 6.2

Station: S9

Date: 8/5/86

Depth: Subsurface

Time: 6:55 a.m.

Conditions: sunny; 72 hours after rain; fast and muddy flow; debris (tires, shopping cart, boxes); rat; grass cuttings and garden debris

Water Temperature: 21°C

Air Temperature: 18°C

Tests:

Turbidity: 17.0 N.T.U.

Salinity: 0.5 o/oo

Emulsified Oil: 0.5 p.p.m.

pH: 6.2

Station: S10

Date: 8/6/86

Depth: Subsurface

Time: 6:30 a.m.

Conditions: sunny; fast flow; murky

Water Temperature: 23°C

Air Temperature: 21°C

Tests:

Turbidity: 12.0 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.5 p.p.m.

pH: 6.3

Station: S10a

Depth: Subsurface

Conditions: overcast; rain (heavy at times) day before, cancelled sampling; green murky; slow flow; debris (mechanical and plastic); gas bubbles

Date: 8/8/86

Time: 6:40 a.m.

Water Temperature: 23°C

Air Temperature: 21°C

Tests:

Turbidity: 21.0 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 2.0 p.p.m.

pH: 6.6

Station: S11

Depth: Subsurface

Conditions: sunny; debris (building bricks, old sign, etc.); clear look to water; slow flow

Date: 8/9/86

Time: 9:15 a.m.

Water Temperature: 21°C

Air Temperature: 23°C

Tests:

Turbidity: 8.1 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 1.0 p.p.m.

pH: 6.4

Station: S12

Depth: Subsurface

Conditions: sunny; fast spill over dam; greenish tint; bottom is visible; sand bags on dam wall

Date: 8/10/86

Time: 7:35 a.m.

Water Temperature: 20°C

Air Temperature: 20°C

Tests:

Turbidity: 8.5 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.8 p.p.m.

pH: 6.0

Station: S13

Depth: Subsurface

Conditions: overcast; ducks, geese, heron; much silt; a mound of excavated silt; gas bubbles; no fish visible; murky water; copious amounts of bird feces

Date: 8/12/86

Time: 6:45 a.m.

Water Temperature: 19°C

Air Temperature: 18°C

Tests:

Turbidity: 13.0 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.5 p.p.m.

pH: 6.3

Station: S14

Date: 8/13/86

Depth: Subsurface

Time: 6:40 a.m.

Conditions: sunny; slight green tint to clear water; very little debris; some bubbles at falls; swift flow; new wall construction

Water Temperature: 17°C

Air Temperature: 10°C

Tests:

Turbidity: 5.6 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.1 p.p.m.

pH: 6.5

Station: Sla

Date: 8/14/86

Depth: Subsurface

Time: 6:25 a.m.

Conditions: sunny; green and murky; slow flow; oil drums and debris; silt island in center; gas bubbles and oil slick

Water Temperature: 18°C

Air Temperature: 11°C

Tests:

Turbidity: 8.8 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.5 p.p.m.

pH: 6.3

Station: S2G

Date: 8/15/86

Depth: Subsurface

Time: 6:30 a.m.

Conditions: cloudy; smell of H_2S; murky; brown sediment at bottom of drain pipe (feces?); Spirogyra and Elodea; debris; brown scum on water; good flow

Water Temperature: 17.5°C

Air Temperature: 12°C

Tests:

Turbidity: 2.5 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.5 p.p.m.

pH: 6.5

Station: S2a

Date: 8/20/86

Depth: Subsurface

Time: 12:04 p.m.

Conditions: 12+ hours after rain of previous day; sunny; rapid flow; debris tire, and various flotsom and jetsom

Water Temperature: 21°C

Air Temperature: 23°C

Tests:

Turbidity: 3.5 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.0 p.p.m.

pH: 6.3

Station: S2

Date: 8/21/86

Depth: Subsurface

Time: 6:10 a.m.

Conditions: cloudy; fast flow; Elodea; debris; drain pipes; mechanical debris; bubbles on water

Water Temperature: 21°C

Air Temperature: 20°C

Tests:

Turbidity: 2.7 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.2 p.p.m.

pH: 6.5

Station: S3a

Date: 8/23/86

Depth: Subsurface

Time: 8:45 a.m.

Conditions: cloudy; slow flow; murky green bottom visible; oil slicks; shopping cart and mechanical debris; many drain pipes along bank

Water Temperature: 19°C

Air Temperature: 18°C

Tests:

Turbidity: 4.6 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.0 p.p.m.

pH: 6.4

Station: S6

Date: 8/26/86

Depth: Subsurface

Time: 7:35 a.m.

Conditions: cloudy; fast flow; village yard wash down enters street drain; shopping cart and building debris; Suburban Carting Company seems to be walling off access to river bank

Water Temperature: 21°C

Air Temperature: 13°C

Tests:

Turbidity: 70.0 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 3.0 p.p.m.

pH: 6.5

Station: S7

Date: 8/27/86

Depth: Subsurface

Time: 7:00 a.m.

Conditions: overcast; extremely rapid flow; suspicious spill on road; shopping cart and debris

Water Temperature: 20°C

Air Temperature: 21°C

Tests:

Turbidity: 13.0 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.3 p.p.m.

pH: 6.2

Station: S10a

Date: 8/28/86

Depth: Subsurface

Time: 8:15 a.m.

Conditions: overcast; very slow flow; bottom visible; mechanical and other debris; just before rain; blockage under port side of bridge looking upstream

Water Temperature: 19°C

Air Temperature: 18°C

Tests:

Turbidity: 5.5 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 1.0 p.p.m.

pH: 6.3

Station: S11

Date: 8/11/86

Depth: Subsurface

Time: 1:05 p.m.

Conditions: sunny; gray brown cast to the water; bottom visible; old sign holder and building debris; slow flow; gardening debris on banks

Water Temperature: 17°C

Air Temperature: 17°C

Tests:

Turbidity: 8.3 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.0 p.p.m.

pH: 6.2

Station: S13

Date: 8/30/86

Depth: Subsurface

Time: 9:05 a.m.

Conditions: sunny; large amounts of sediment; aves feces; gas bubbles; surface (eutrophic) algae; Elodea; geese, ducks, egret, gull, snail; slow flow

Water Temperature: 15°C

Air Temperature: 14°C

Tests:

Turbidity: 6.5 N.T.U.

Salinity: 0.0 o/oo

Emulsified Oil: 0.2 p.p.m.

pH: 6.4

Station: S1a

Depth: Subsurface

Conditions: Two hours and 16 minutes after high tide

Date: 7/14/86

Time: 6:32 a.m.

Water Temperature: 10.5°C

Air Temperature: 18°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
	1		+		0	0		0	0	
	2		0	+	0	+		0	+	
A	3	1,000	+		0	+	3	0	0	2
	4		+		0	0		+		
	5		+		+			0	0	
	1		+		0	0		0	0	
	2		0	0	0	0		0	0	
B	3	10,000	+		0	+	1	0	+	1
	4		+		0	0		0	0	
	5		+		0	0		0	0	
	1		0	0	0			0	0	
	2		0	0	0			0	0	
C	3	100,000	0	+	0	0	0	0	0	0
	4		0	0	0			0	0	
	5		0	+	0	0		0	0	

Confirm Code: 3,1,0

MPN Index: 11

Coliform Count: 11,000/100 ml

Fecal Count: 7,000/100 ml

Station: S1

Depth: Subsurface

Conditions: Two hours and 5 minutes after high tide

Date: 7/15/86

Time: 7:45 a.m.

Water Temperature: 18°C

Air Temperature: 19°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	0	+	0	+	2	0	+	2
	2		0	0						
	3		0	0						
	4		+		0	+		+		
	5		0	0						
B	1	10,000	0	+	0	0	1	0	0	1
	2		0	+	0	0		0	0	
	3		0	0						
	4		0	0						
	5		+		+			+		
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 2,1,0

Coliform Count: 7,000/100 ml

Fecal Count: 7,000/100 ml

MPN Index: 7

Station: S2G

Depth: Subsurface

Conditions: 22 minutes after high tide

Date: 7/16/86

Time: 7:02 a.m.

Water Temperature: 18°C

Air Temperature: 22°C

Row	Tube Number	Dilution Factor	Presumptive		Confirm		Positive Tubes Number Code	Fecal		Positive Tubes Number Code
			24 hr	48 hr	24 hr	48 hr		24 hr	48 hr	
A	1	1,000	0	0			4			4
	2		+		+			+		
	3		+		+			+		
	4		+		0	+		+		
	5		+		0	+		+		
B	1	10,000	0	+	0	0	0	0		0
	2		0	0						
	3		0	0						
	4		+		0			0		
	5		0	+	0			0		
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 4,0,0

MPN Index: 13

Coliform Count: 13,000/100 ml

Fecal Count: 13,000/100 ml

Station: S2a

Depth: Subsurface

Conditions: 46 minutes before high tide

Date: 7/17/86

Time: 7:00 a.m.

Water Temperature: 20°C

Air Temperature: 20°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		0	0	4	0		4
	2		+		+			+		
	3		+		0	+		+		
	4		+		+			+		
	5		+		+			+		
B	1	10,000	+		0	0	1	0	0	1
	2		+		0	0		0	0	
	3		0	0					0	
	4		+		+	0		+		
	5		+		0			0		
C	1	100,000	+		0	0	0	0	0	0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 4,1,0

MPN Index: 17

Coliform Count: 17,000/100 ml

Fecal Count: 17,000/100 ml

Station: S2

Depth: Subsurface

Conditions: one hour and 58 minutes before high tide

Date: 7/18/86

Time: 6:54 a.m.

Water Temperature: 21°C

Air Temperature: 22°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
	1		0	+	0	0		0	0	
	2		+		+			+		
A	3	1,000	+		+		4	0	0	3
	4		+		0	+		+		
	5		+		+			+		
	1		+		+			+		
	2		0	0						
B	3	10,000	0	0			1			1
	4		0	0						
	5		0	0						
	1		0	0						
	2		0	0						
C	3	100,000	0	0			0			0
	4		0	0						
	5		0	0						

Confirm Code: 4,1,0

MPN Index: 17

Coliform Count: 17,000/100 ml

Fecal Count: 11,000/100 ml

Station: S3a

Depth: Subsurface

Conditions: three hours and 29 minutes before high tide

Date: 7/21/86

Time: 8:18 a.m.

Water Temperature: 21°C

Air Temperature: 24°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		+		3	+		1
	2		0	+	0	+		0	0	
	3		0	+	0	+		0	0	
	4		0	+	0	0		0	0	
	5		0	+	0	0		0	0	
B	1	10,000	0	+	0	0	1	0	0	0
	2		0	+	0	+		0	0	
	3		0	0						
	4		0	+	0	0		0	0	
	5		0	0						
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 3,1,0

MPN Index: 11

Coliform Count: 11,000/100 ml

Fecal Count: 2,000/100 ml

Station: S3

Depth: Subsurface

Conditions: five hours and 4 minutes before high tide

Date: 7/22/86

Time: 7:00 a.m.

Water Temperature: 30°C

Air Temperature: 22°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		0	0	1	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		+		0	0		0	0	
	5		+		0	+		0	0	
B	1	10,000	+		0	0	0	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		0	0						
	5		+		0	0		0	0	
C	1	100,000	+		0	0	0	0	0	0
	2		+		0	0		0	0	
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 1,0,0

MPN Index: 2

Coliform Count: 2,000/100 ml

Fecal Count: 0/100 ml

Station: S4a

Depth: Subsurface

Conditions: at low tide

Date: 7/23/86

Time: 6:48 a.m.

Water Temperature: 19°C

Air Temperature: 21°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		+		3	0	0	1
	2		0	+	0	0		0	0	
	3		0	+	0	+		0	0	
	4		+		0	0		0	0	
	5		+		+			+		
B	1	10,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 3,0,0

MPN Index: 8

Coliform Count: 8,000/100 ml

Fecal Count: 2,000/100 ml

Station: S4

Depth: Subsurface

Conditions: half hour after low tide

Date: 7/24/86

Time: 6:30 a.m.

Water Temperature: 20°C

Air Temperature: 21°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		0	0	1	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		+		0	0		0	0	
	5		+		0	+		0	0	
B	1	10,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		+		0	0		0	0	
	5		0	+	0	0		0	0	
C	1	100,000	0	+	0	0	0	0	0	0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	+	0	0		0	0	

Confirm Code: 1,0,0

MPN Index: 2

Coliform Count: 2,000/100 ml

Fecal Count: 0/100 ml

Station: S5

Depth: Subsurface

Conditions: three hours and 50 minutes after high tide

Date: 7/25/86

Time: 6:30 a.m.

Water Temperature: 21°C

Air Temperature: 23°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		0	0	3	0	0	0
	2		+		+			0	0	
	3		+		0	0		0	0	
	4		+		0			0	0	
	5		+		+	+		0	0	
B	1	10,000	0	+	0	0	0	0	0	0
	2		0	+	0	0		0	0	
	3		0	0						
	4		0	+	0	0		0	0	
	5		0	+	0	0		0	0	
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	+	0	0		0	0	
	5		0	0						

Confirm Code: 3,0,0

MPN Index: 11

Coliform Count: 11,000/100 ml

Fecal Count: 0/100 ml

Station: S6

Depth: Subsurface

Conditions: three hours and 28 minutes after high tide

Date: 7/26/86

Time: 6:32 a.m.

Water Temperature: 23°C

Air Temperature: 25°C

Row	Tube Number	Dilution Factor	Presumptive		Confirm		Positive Tubes Number Code	Fecal		Positive Tubes Number Code
			24 hr	48 hr	24 hr	48 hr		24 hr	48 hr	
A	1	1,000	+		+		5	+		4
	2		+		+			+		
	3		+		+			0	0	
	4		+		+			+		
	5		+		+			+		
B	1	10,000	+		0	0	3	0	0	0
	2		0	+	0	+		0	0	
	3		0	0						
	4		0	+	0	+		0	0	
	5		0	+	0	+		0	0	
C	1	100,000	0	0			0			0
	2		0	+	0	0		0	0	
	3		0	+	0	0		0	0	
	4		0	0						
	5		0	+	0	0		0	0	

Confirm Code: 5,3,0

MPN Index: 79

Coliform Count: 79,000/100 ml

Fecal Count: 13,000/100 ml

Station: S7

Depth: Subsurface

Conditions: One hour and 29 minutes after high tide

Date: 7/28/86

Time: 6:50 a.m.

Water Temperature: 23°C

Air Temperature: 23°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		+		5	+		3
	2		+		+			+		
	3		+		+			+		
	4		+		+			0	0	
	5		+		+			0	0	
B	1	10,000	0	0	0		2			1
	2		0	0	0					
	3		+		+			+		
	4		0	0	0					
	5		+		+			0	0	
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		+		0	0		0	0	
	5		0	0	0					

Confirm Code: 5,2,0

MPN Index: 49

Coliform Count: 49,000/100 ml

Fecal Count: 11,000/100 ml

Station: S8

Depth: Subsurface

Conditions: 19 minutes after high tide

Date: 7/29/86

Time: 6:35 a.m.

Water Temperature: 24°C

Air Temperature: 22°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
	1		+		+			0	0	
	2		+		0	0		0	0	
A	3	1,000	+		+		3	+		2
	4		+		0	0		0	0	
	5		+		+			+		
	1		+		0	0		0	0	
	2		+		0	0		0	0	
B	3	10,000	0	+	0	0	0	0	0	0
	4		0	0						
	5		0	0						
	1		+		+			+		
	2		0	0						
C	3	100,000	0	0			1			1
	4		0	+	0	0		0	0	
	5		0	0						

Confirm Code: 3,0,1

MPN Index: 11

Coliform Count: 11,000/100 ml

Fecal Count: 7,000/100 ml

Station: S9

Depth: Subsurface

Conditions: 54 minutes before low tide

Date: 8/5/86

Time: 6:55 a.m.

Water Temperature: 21°C

Air Temperature: 18°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	0	+	0	+	3	0	0	0
	2		+		0	+		0	0	
	3		0	+	0	0		0	0	
	4		+	0	0	+		0	0	
	5		0	0						
B	1	10,000	+		+		1	+		1
	2		0	+	0	0		0		
	3		0	0						
	4		0	+	0	0		0		
	5		0	0						
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 3,1,0

MPN Index: 11

Coliform Count: 11,000/100 ml

Fecal Count: 2,000/ 100 ml

Station: S10

Depth: Subsurface

Conditions: 3 minutes after low tide

Date: 8/6/86

Time: 6:30 a.m.

Water Temperature: 23°C

Air Temperature: 21°C

Row	Tube Number	Dilution Factor	Presumptive		Confirm		Positive Tubes Number Code	Fecal		Positive Tubes Number Code
			24 hr	48 hr	24 hr	48 hr		24 hr	48 hr	
A	1	1,000	+		0	0	1	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		+		0	0		0	0	
	5		+		0	+		0	0	
B	1	10,000	0	0	0	0	0	0	0	0
	2		0	0						
	3		0	+						
	4		0	0						
	5		0	0						
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 1,0,0

Coliform Count: 2,000/100 ml

Fecal Count: 0/100 ml

MPN Index: 2

Station: S10a

Depth: Subsurface

Conditions: 23 minutes after low tide

Date: 8/8/86

Time: 6:40 a.m.

Water Temperature: 23°C

Air Temperature: 21°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		+		4	+		3
	2		+		+			0	0	
	3		+		+			+		
	4		+		+			+		
	5		+		0	0		0	0	
B	1	10,000	0	+	0	0	0	0	0	0
	2		0	+	0	0		0	0	
	3		0	+	0	0		0	0	
	4		0	+	0	0		0	0	
	5		0	+	0	0		0	0	
C	1	100,000	0	0			0			0
	2		0	0						
	3		+		0	0		0	0	
	4		0	0						
	5		0	+	0	0		0	0	

Confirm Code: 4,0,0

MPN Index: 13

Coliform Count: 13,000/100 ml

Fecal Count: 8,000/100 ml

Station: S11

Depth: Subsurface

Conditions: One hour and 18 minutes after low tide

Date: 8/9/86

Time: 9:15 a.m.

Water Temperature: 21°C

Air Temperature: 23°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		+		4	+		2
	2		+		0	+		0	0	
	3		0	+	0	0		0	0	
	4		+		+			+		
	5		+		+			0	0	
B	1	10,000	0	+	0	0	1	0	0	0
	2		0	0						
	3		0	0						
	4		0	+	0	+		0	0	
	5		0	0						
C	1	100,000	0	+	+		1	0	0	0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 4,1,1

MPN Index: 21

Coliform Count: 21,000/100 ml

Fecal Count: 5,000/100 ml

Station: S12

Depth: Subsurface

Conditions: four hours and 5 minutes after high tide

Date: 8/10/86

Time: 7:35 a.m.

Water Temperature: 20°C

Air Temperature: 20°C

Row	Tube Number	Dilution Factor	Presumptive		Confirm		Positive Tubes Number Code	Fecal		Positive Tubes Number Code
			24 hr	48 hr	24 hr	48 hr		24 hr	48 hr	
A	1	1,000	+		+		2	0	0	0
	2		0	0						
	3		0	0						
	4		+		+			0	0	
	5		0	0						
B	1	10,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 2,0,0

MPN Index: 5

Coliform Count: 5,000/100 ml

Fecal Count: 0/100 ml

Station: S13

Depth: Subsurface

Conditions: two hours and 15 minutes after high tide

Date: 8/12/86

Time: 6:45 a.m.

Water Temperature: 19°C

Air Temperature: 18°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	0	+	0	0	4	0	0	2
	2		0	+	+			+		
	3		0	+	0	+		0	0	
	4		0	+	0	+		0	0	
	5		+		+			+		
B	1	10,000	+		0	0	0	0	0	0
	2		0	0						
	3		0	+	0	0		0	0	
	4		0	+	0	0		0	0	
	5		0	0						
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 4,0,0

MPN Index: 13

Coliform Count: 13,000/100 ml

Fecal Count: 5,000/100 ml

Station: S14

Depth: Subsurface

Conditions: one hour and 22 minutes after high tide

Date: 8/13/86

Time: 6:40 a.m.

Water Temperature: 17°C

Air Temperature: 10°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		+		3	+		2
	2		+		0	0		0	0	
	3		+		+			+		
	4		+		0	+		0	0	
	5		+		0	0		0	0	
B	1	10,000	0	0			2			1
	2		+		+			+		
	3		0	0	0					
	4		0	0						
	5		0	+	0	+		0	0	
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	+	0	0		0	0	
	5		0	0						

Confirm Code: 3,2,0

Coliform Count: 14,000/100 ml

Fecal Count: 7,000/100 ml

MPN Index: 14

Station: S1a

Depth: Subsurface

Conditions: at high tide

Date: 8/14/86

Time: 6:25 a.m.

Water Temperature: 18°C

Air Temperature: 11°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		0	0	2	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		+		+			0	0	
	5		+		+			0	0	
B	1	10,000	+		0	0	0	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		+		0	0		0	0	
	5		+		0	0		0	0	
C	1	100,000	+		0	0	0	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		+		0	0		0	0	
	5		+		0	0		0	0	

Confirm Code: 2,0,0

MPN Index: 5

Coliform Count: 5,000/100 ml

Fecal Count: 0/100 ml

Station: S2G

Depth: Subsurface

Conditions: one hour before high tide

Date: 8/15/86

Time: 6:30 a.m.

Water Temperature: 17.5°C

Air Temperature: 12°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000		+	0	+	4	+		4
	2			+	0	0		0	0	
	3			+	+			+		
	4			+	+			+		
	5			+	+			+		
B	1	10,000	+		+		2	0	0	1
	2		+		0	0		+		
	3		0	0	0					
	4		+		+			0	0	
	5		+		0	0		0	0	
C	1	100,000	+		0	0	1	0	0	0
	2		+		0	0		0	0	
	3		0	0	0					
	4		0	+	+					
	5		0	0	0	0				

Confirm Code: 4,2,1

MPN Index: 26

Coliform Count: 26,000/100 ml

Fecal Count: 17,000/100 ml

Station: S2a

Depth: Subsurface

Conditions: 17 minutes before high tide

Date: 8/20/86

Time: 12:04 p.m.

Water Temperature: 21°C

Air Temperature: 23°C

Row	Tube Number	Dilution Factor	Presumptive		Confirm		Positive Tubes Number Code	Fecal		Positive Tubes Number Code
			24 hr	48 hr	24 hr	48 hr		24 hr	48 hr	
A	1	1,000	+		0	0	4	0	0	1
	2		+		0	+		0	0	
	3		+		+			0	0	
	4		+		+			+		
	5		+		+			0	0	
B	1	10,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 4,0,0

MPN Index: 13

Coliform Count: 13,000/100 ml

Fecal Count: 2,000/100 ml

Station: S2

Depth: Subsurface

Conditions: 9 minutes after low tide

Date: 8/21/86

Time: 6:10 a.m.

Water Temperature: 21°C

Air Temperature: 20°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		0	0	1	+		2
	2		+		0	0		0	0	
	3		+		+			+		
	4		+		0	0		0	0	
	5		+		0	0		0	0	
B	1	10,000	+		0	0	0	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		+		0	0		0	0	
	5		+		0	0		0	0	
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 1,0,0

MPN Index: 2

Coliform Count: 2,000/100 ml

Fecal Count: 5,000/100 ml

Station: S3a

Depth: Subsurface

Conditions: 30 minutes after low tide

Date: 8/23/86

Time: 8:45 a.m.

Water Temperature: 19°C

Air Temperature: 18°C

Row	Tube Number	Dilution Factor	Presumptive		Confirm		Positive Tubes Number Code	Fecal		Positive Tubes Number Code
			24 hr	48 hr	24 hr	48 hr		24 hr	48 hr	
	1		+		+			+		
	2		+		+			+		
A	3	1,000	+		0	0	3	0	0	3
	4		+		+			+		
	5		+		0	0		0	0	
	1		0	0						
	2		0	0						
B	3	10,000	0	0			1			1
	4		0	+	0	0		0	0	
	5		+		+			+		
	1		0	0						
	2		0	0						
C	3	100,000	0	0			0			0
	4		0	+	0	0		0	0	
	5		0	0						

Confirm Code: 3,1,0

MPN Index: 14

Coliform Count: 14,000/100 ml

Fecal Count: 14,000/100 ml

Station: S6

Depth: Subsurface

Conditions: three hours after high tide

Date: 8/26/86

Time: 7:35 a.m.

Water Temperature: 21°C

Air Temperature: 13°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		+		4	0	0	1
	2		+		0	0		0	0	
	3		+		0	+		+		
	4		+		+			0	0	
	5		+		+			0	0	
B	1	10,000	+		0	0	0	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		0	0						
	5		0	0						
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 4,0,0

MPN Index: 13

Coliform Count: 13,000/100 ml

Fecal Count: 2,000/100 ml

Station: S7

Depth: Subsurface

Conditions: one hour and 31 minutes after high tide

Date: 8/27/86

Time: 7:00 a.m.

Water Temperature: 20°C

Air Temperature: 21°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		0	0	1	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		+		0	0		0	0	
	5		0	+	0	+		0	0	
B	1	10,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		+		0	0		0	0	
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 1,0,0

Coliform Count: 2,000/100 ml

Fecal Count: 0/100 ml

MPN Index: 2

Station: S10a

Depth: Subsurface

Conditions: one hour and 46 minutes after high tide

Date: 8/28/86

Time: 8:15 a.m.

Water Temperature: 19°C

Air Temperature: 18°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		0	0	1	0	0	1
	2		+		0	0		0	0	
	3		+		+			+		
	4		0	0						
	5		0	0						
B	1	10,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 1,0,0

MPN Index: 2

Coliform Count: 2,000/100 ml

Fecal Count: 2,000/100 ml

Station: S11

Depth: Subsurface

Conditions: one hour and 22 minutes before low tide

Date: 8/29/86

Time: 1:05 p.m.

Water Temperature: 17°C

Air Temperature: 17°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		0	0	1	0	0	1
	2		+		+			+		
	3		+		0	0		0	0	
	4		+		0	0		0	0	
	5		+		0	0		0	0	
B	1	10,000	+		0	0	0	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		0	0						
	5		0	0						
C	1	100,000	0	0			0			0
	2		0	0						
	3		0	0						
	4		0	0						
	5		0	0						

Confirm Code: 1,0,0

MPN Index: 2

Coliform Count: 2,000/100 ml

Fecal Count: 2,000/100 ml

Station: S13

Depth: Subsurface

Conditions: 43 minutes after high tide

Date: 8/30/86

Time: 9:05 a.m.

Water Temperature: 15°C

Air Temperature: 14°C

Row	Tube Number	Dilution Factor	Presumptive 24 hr	Presumptive 48 hr	Confirm 24 hr	Confirm 48 hr	Positive Tubes Number Code	Fecal 24 hr	Fecal 48 hr	Positive Tubes Number Code
A	1	1,000	+		0	+	1	0	0	0
	2		+		0	0		0	0	
	3		+		0	0		0	0	
	4		+		0	0		0	0	
	5		+		0	0		0	0	
B	1	10,000	0	+	0	0	0	0	0	0
	2		0	0						
	3		0	+	0	0		0	0	
	4		0	+	0	0		0	0	
	5		0	+	0	0		0	0	
C	1	100,000	0	0			0			0
	2		0	+	0	0		0	0	
	3		0	+	0	0		0	0	
	4		0	+	0	0		0	0	
	5		0	+	0	0		0	0	

Confirm Code: 1,0,0

MPN Index: 2

Coliform Count: 2,000/100 ml

Fecal Count: 0/100 ml

Turbidity Table

Station	Date	Turbidity/N.T.U.
S6	8/26/86	70.0
S6	7/26/86	49.0
S10a	8/08/86	21.0
S9	8/05/86	17.0
S7	8/27/86	13.0
S13	8/12/86	13.0
S5	7/25/86	13.0
S10	8/06/86	12.0
S1a	7/14/86	11.0
S1a	8/14/86	8.8
S12	8/10/86	8.5
S11	8/29/86	8.3
S11	8/09/86	8.1
S13	8/30/86	6.5
S4	7/24/86	6.5
S1	7/15/86	6.4
S14	8/13/86	5.6
S2	7/18/86	5.6
S10a	8/28/86	5.5
S3a	7/21/86	5.2
S2a	7/17/86	5.2
S2G	7/16/86	5.2
S3a	8/23/86	4.6
S3	7/22/86	4.3
S7	7/28/86	3.7
S2a	8/20/86	3.5
S4a	7/23/86	3.5
S8	7/29/86	3.2
S2	8/21/86	2.7
S2G	8/15/86	2.5

Range: 67.5 (70.0-2.5)

Mean: 10.65

Median: 6.45

Mode: bimodal
13.0 and 5.2

Salinity Table

Station	Date	Salinity o/oo
S4a	7/23/86	1.0
S7	7/28/86	0.5
S9	8/05/86	0.5
S2G	7/16/86	0.1
S3a	7/21/86	0.1
S2	7/18/86	0.1
S4	7/24/86	0.1
S2G	8/15/86	0.0
S2	8/21/86	0.0
S8	7/29/86	0.0
S2a	8/20/86	0.0
S3	7/22/86	0.0
S3a	8/23/86	0.0
S2a	7/17/86	0.0
S10a	8/28/86	0.0
S14	8/13/86	0.0
S1	7/15/86	0.0
S13	8/30/86	0.0
S11	8/09/86	0.0
S11	8/29/86	0.0
S12	8/10/86	0.0
S1a	8/14/86	0.0
S1a	7/14/86	0.0
S10	8/06/86	0.0
S5	7/25/86	0.0
S13	8/12/86	0.0
S7	8/27/86	0.0
S10a	8/08/86	0.0
S6	7/26/86	0.0
S6	8/26/86	0.0

Range: 1.0 (1.0-0.0)   Mean: 0.08

Median: 0.0   Mode: 0.1

Emulsified Oil

Station	Date	Emulsified Oil/p.p.m.
S6	7/26/86	4.0
S6	8/26/86	3.0
S10a	8/08/86	2.0
S5	7/25/86	1.2
S11	8/09/86	1.0
S10a	8/28/86	1.0
S7	7/28/86	0.8
S12	8/10/86	0.8
S1a	7/14/86	0.5
S2G	7/16/86	0.5
S9	8/05/86	0.5
S10	8/06/86	0.5
S13	8/12/86	0.5
S1a	8/14/86	0.5
S2G	8/15/86	0.5
S7	8/27/86	0.3
S1	7/15/86	0.2
S4	7/24/86	0.2
S2	8/21/86	0.2
S13	8/30/86	0.2
S14	8/13/86	0.1
S2a	7/17/86	0.0
S2	7/18/86	0.0
S3a	7/21/86	0.0
S3	7/22/86	0.0
S4a	7/23/86	0.0
S8	7/29/86	0.0
S2a	8/20/86	0.0
S3a	8/23/86	0.0
S11	8/29/86	0.0

Range: 4.0 (4.0-0.0) Mean: 0.62

Median: 0.4 Mode: 0.0

pH Table

Station	Date	pH
S10a	8/08/86	6.6
S6	8/26/86	6.5
S2	8/21/86	6.5
S2G	8/15/86	6.5
S14	8/13/86	6.5
S13	8/30/86	6.4
S11	8/29/86	6.4
S3a	8/23/86	6.4
S11	8/09/86	6.4
S2a	8/20/86	6.3
S7	7/28/86	6.3
S10a	8/28/86	6.3
S13	8/12/86	6.3
S1a	8/14/86	6.3
S10	8/06/86	6.3
S1	7/15/86	6.2
S7	8/27/86	6.2
S1a	7/14/86	6.2
S2a	7/17/86	6.2
S8	7/29/86	6.2
S2G	7/16/86	6.2
S9	8/05/86	6.2
S6	7/26/86	6.1
S5	7/25/86	6.1
S4	7/24/86	6.1
S3	7/22/86	6.1
S3a	7/21/86	6.1
S2	7/18/86	6.1
S4a	7/23/86	6.0
S12	8/10/86	6.0

Range: 0.6 (6.6-6.0)

Mean: 6.26

Median: 6.25

Mode: 6.2

Coliform Count Table

Station	Date	Coliforms Count/100 ml
S6	7/26/86	79,000
S7	7/28/86	49,000
S2G	8/15/86	26,000
S11	8/09/86	21,000
S2	7/18/86	17,000
S2a	7/17/86	17,000
S14	8/13/86	14,000
S3a	8/23/86	14,000
S2G	7/16/86	13,000
S10a	8/08/86	13,000
S13	8/12/86	13,000
S2a	8/20/86	13,000
S6	8/26/86	13,000
S1a	7/14/86	11,000
S3a	7/21/86	11,000
S5	7/25/86	11,000
S8	7/29/86	11,000
S9	8/05/86	11,000
S4a	7/23/86	8,000
S1	7/15/86	7,000
S12	8/10/86	5,000
S1a	8/14/86	5,000
S3	7/22/86	2,000
S4	7/24/86	2,000
S10	8/06/86	2,000
S2	8/21/86	2,000
S7	8/27/86	2,000
S10a	8/28/86	2,000
S11	8/29/86	2,000
S13	8/30/86	2,000

Range: 77,000 (79,000-2,000)   Mean: 13,266.6

Median: 11,000   Mode: 2,000

Fecal Count Table

Station	Date	Fecal Count/100 ml
S2a	7/17/86	17,000
S2G	8/15/86	17,000
S3a	8/23/86	14,000
S2G	7/16/86	13,000
S6	7/26/86	13,000
S2	7/18/86	11,000
S7	7/28/86	11,000
S10a	8/08/86	8,000
S1a	7/14/86	7,000
S1	7/15/86	7,000
S8	7/29/86	7,000
S14	8/13/86	7,000
S13	8/12/86	5,000
S11	8/09/86	5,000
S2	8/21/86	5,000
S9	8/05/86	2,000
S6	8/26/86	2,000
S3a	7/21/86	2,000
S10a	8/28/86	2,000
S4a	7/23/86	2,000
S11	8/29/86	2,000
S2a	8/20/86	2,000
S4	7/24/86	0.0
S7	8/27/86	0.0
S10	8/06/86	0.0
S1a	8/14/86	0.0
S12	8/10/86	0.0
S13	8/30/86	0.0
S5	7/25/86	0.0
S3	7/22/86	0.0

Range: 17,000 (17,000-0.0)

Mean: 5,366

Median:

Mode: bimodal
2,000 and 0.0

SUMMARY AND CONCLUSIONS

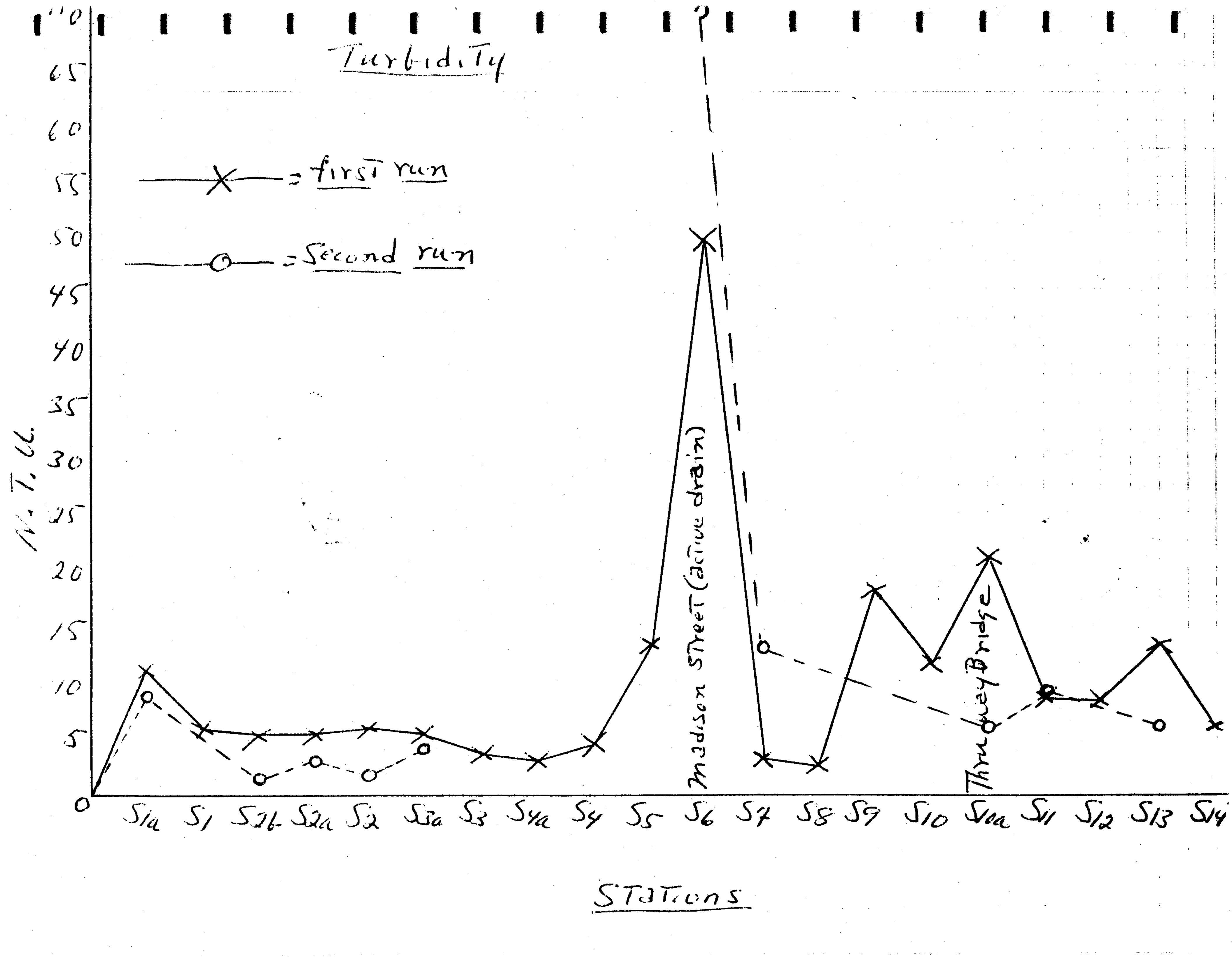
The range of pH readings (0.6) indicates a consistantly slightly acid (mean 6.3) river which does not emulsify oil spills and contributes to keeping pollutant oil floating on the water's surface. Therefore, when interpreting the graph on emulsified oil, the peaks may indicate current (such as the Madison Street active drain) or remnant points of oil pollution.

Turbidity analysis indicates that the active drain at Madison Street Station S6 is carrying the largest amounts of particles. The second most abundant source of particle carrying water occurs at S10a Thruway Bridge.

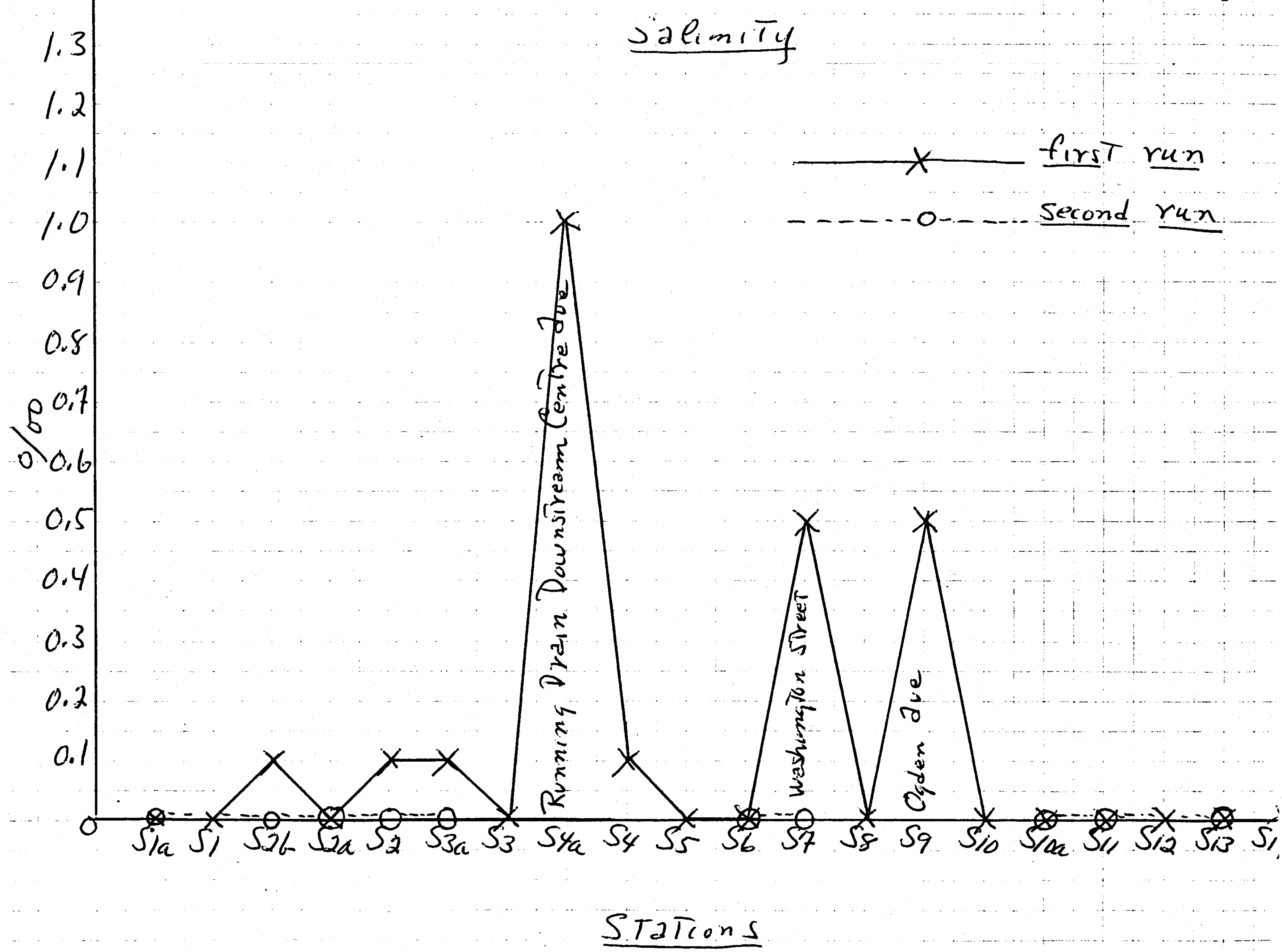
Salinity readings may indicate a need to investigate the running drain downstream of Centre Avenue and its possible connection to the Saxon Ice Company. Washington Street and Ogden Avenue readings may indicate road run off salt.

Coliforms Count and Fecal Count clearly incriminate both the Large Drain Pipe Columbus Park Station S2G and Madison Street Active Drain Station S6 as points of bacterial pollution.

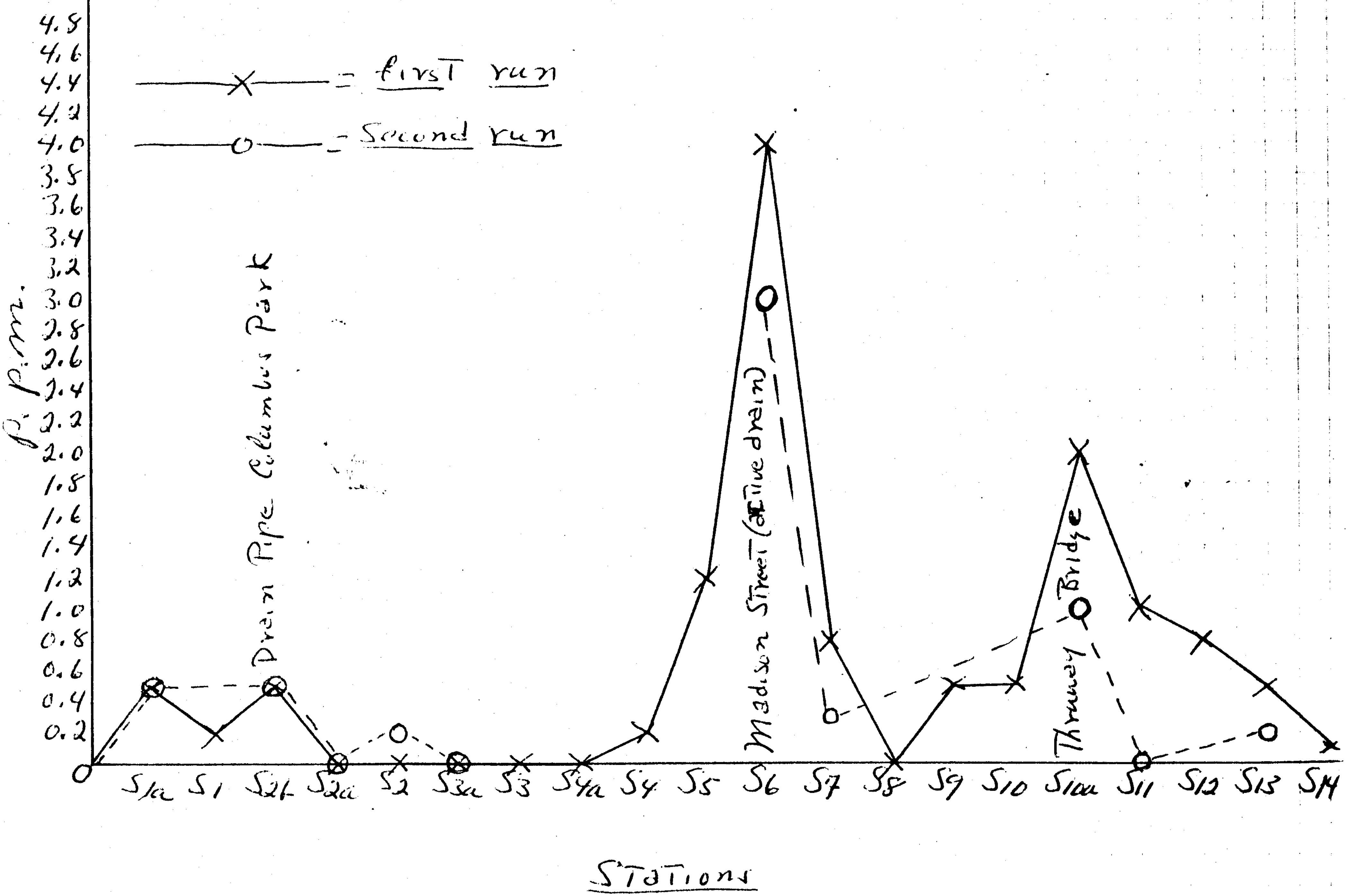
In conclusion, I strongly recommend that all suspicious points of pollution be thoroughly investigated for possible sewage contamination. In addition, I suggest that the large sewage line which crosses the Sheldrake River upstream of station S10 be cited as an immediate threat to point pollution of the Sheldrake River. Engineering steps must be taken to correct this situation.

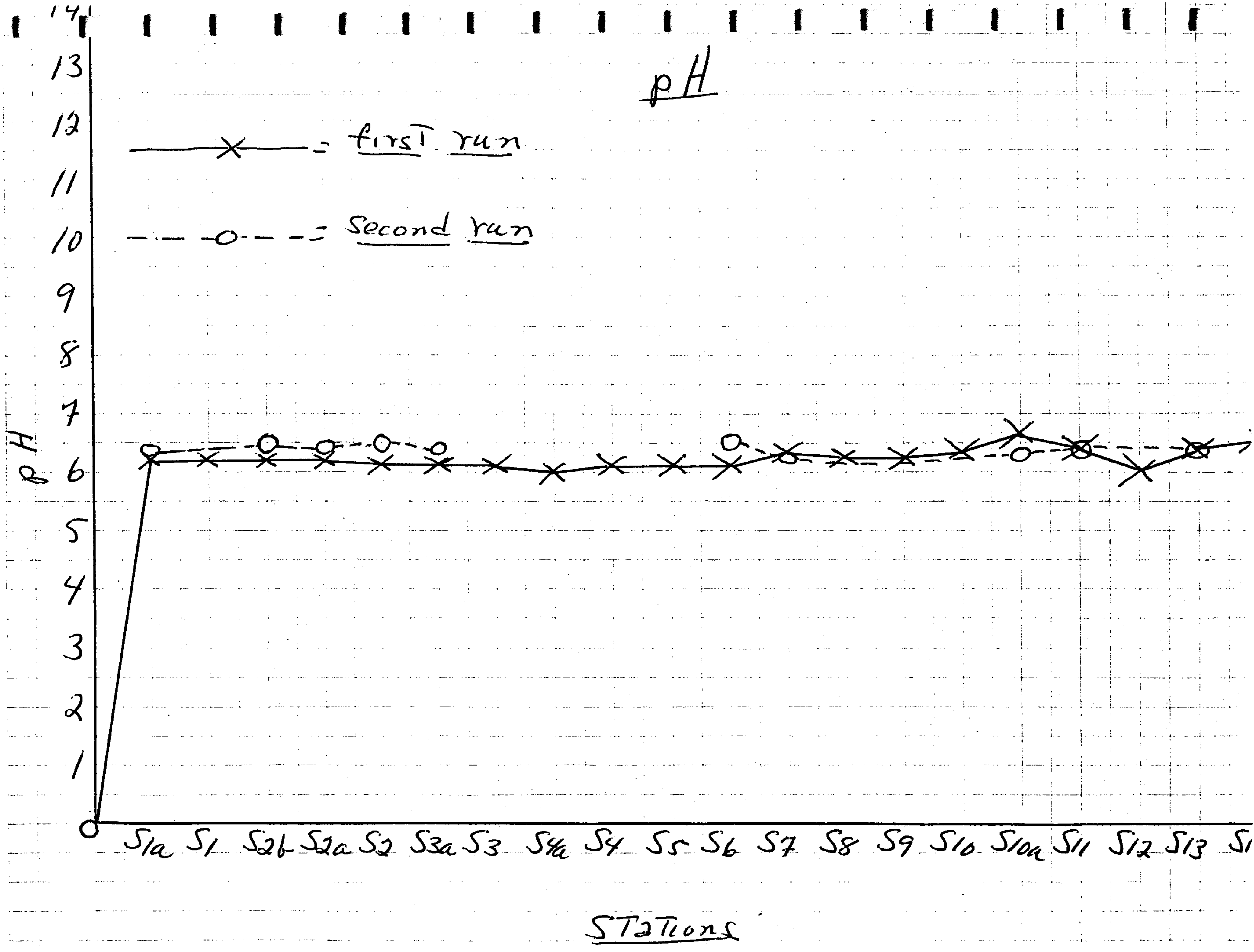


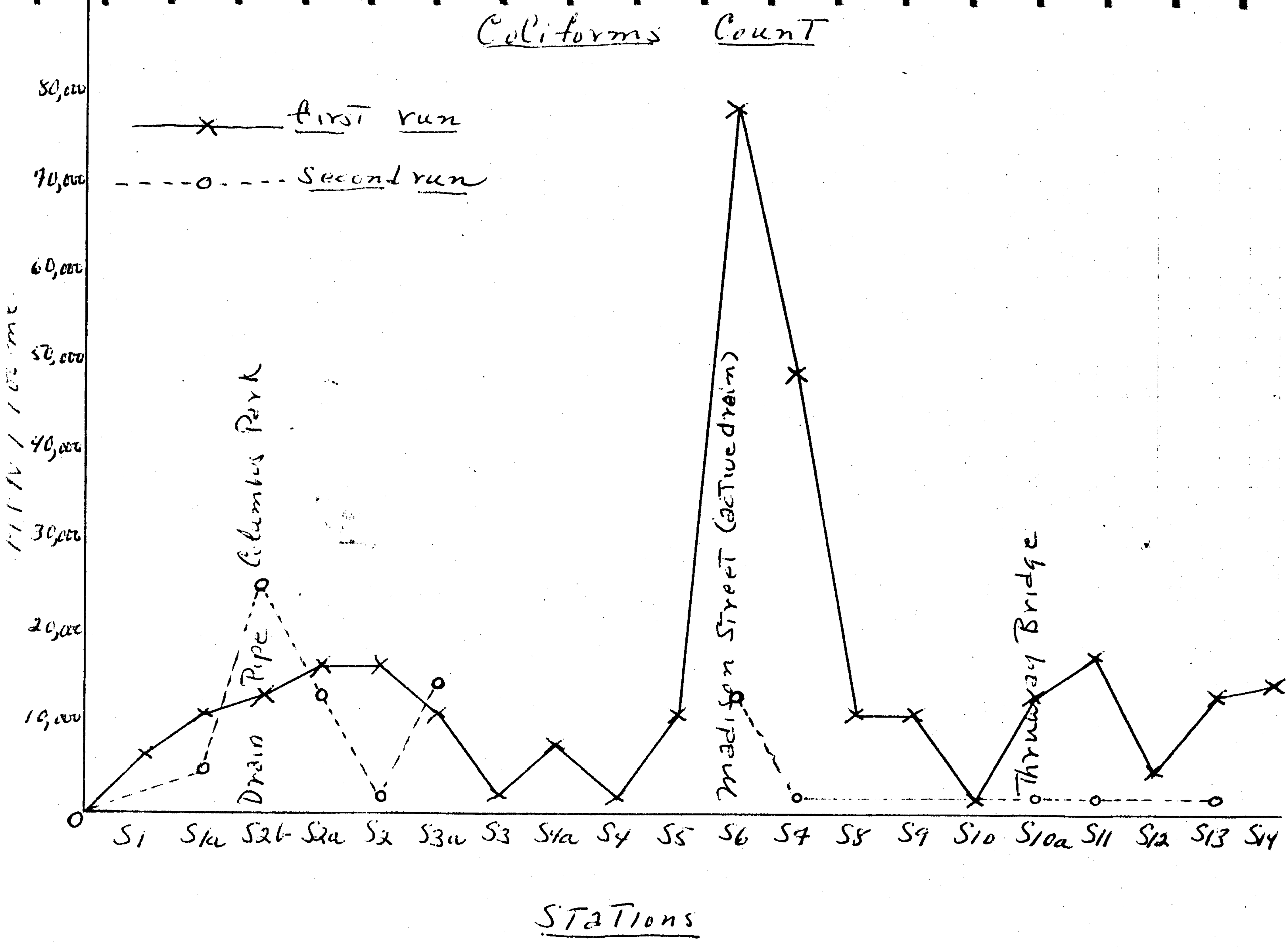
Turbidity
= first run
= Second run
N.T.U.
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
?
Madison Street (active drain)
Thruway Bridge
S1a
S1
S2b
S2a
S2
S3a
S3
S4a
S4
S5
S6
S7
S8
S9
S10
S10a
S11
S12
S13
S14
STations

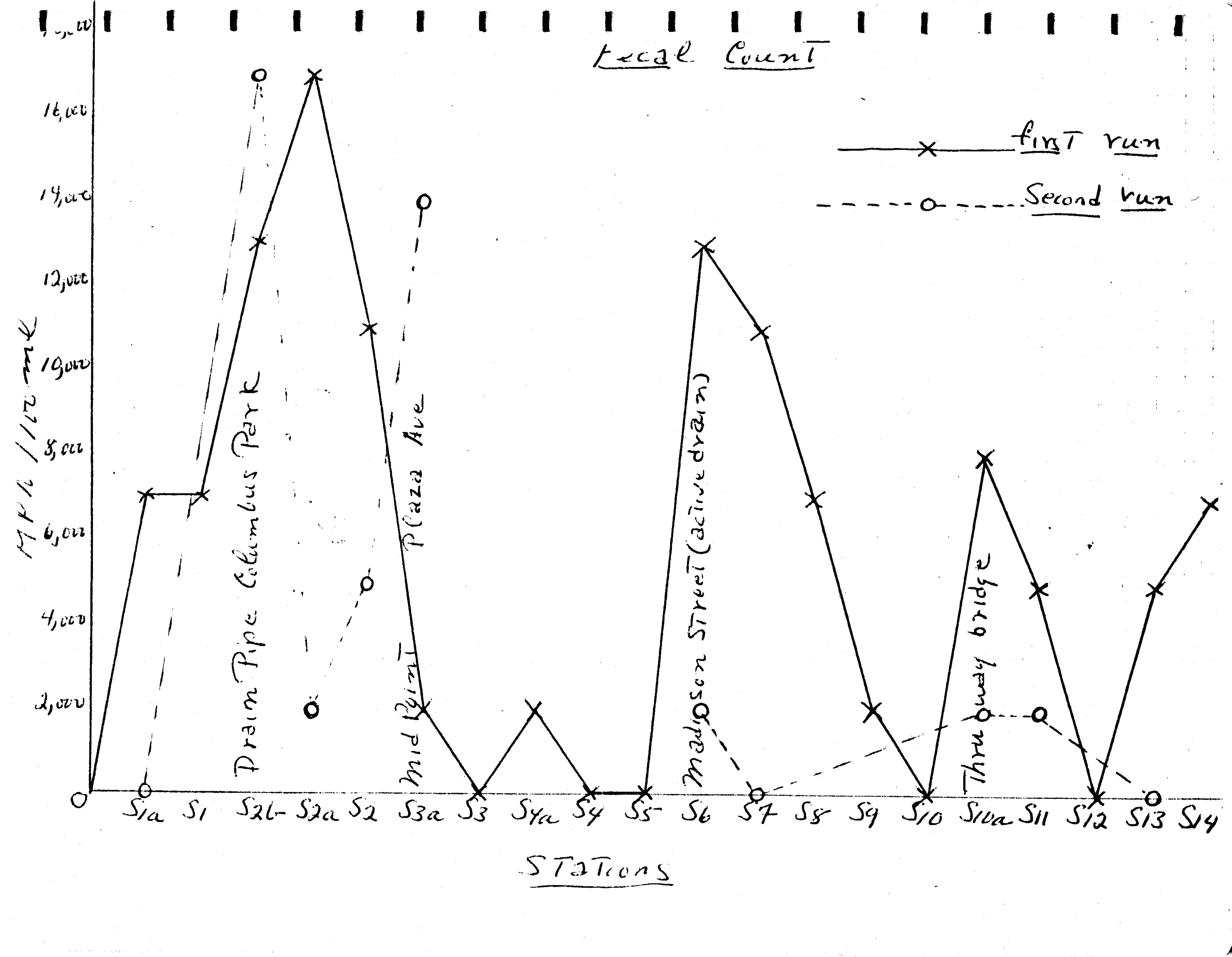

Salinity
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
o/oo
first run
second run
Running Drain Downstream Centre Ave
Washington Street
Ogden Ave
S1a S1 S2b S2a S2 S3a S3 S4a S4 S5 S6 S7 S8 S9 S10 S10a S11 S12 S13 S1
Stations

Emulsified Oil




pH
first run
Second run
pH
14
13
12
11
10
9
8
7
6
5
4
3
2
1
S1a S1 S2b S2a S2 S3a S3 S4a S4 S5 S6 S7 S8 S9 S10 S10a S11 S12 S13
STations


Coliforms Count
first run
Second run
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Drain Pipe
Columbus Park
Madison Street (active drain)
Thruway Bridge
S1
S1a
S2b
S2a
S2
S3a
S3
S4a
S4
S5
S6
S7
S8
S9
S10
S10a
S11
S12
S13
S14
STATIONS


Fecal Count
first run
Second run
MPN/100 ml
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
16,000
Drain Pipe Columbus Park
Plaza Ave
Mid Point
Madison Street (active drain)
Thruway bridge
S1a
S1
S2b
S2a
S2
S3a
S3
S4a
S4
S5
S6
S7
S8
S9
S10
S10a
S11
S12
S13
S14
STATIONS

STATION LOCATIONS

S1a - Columbus Park, junction of Sheldrake and Mamaroneck Rivers

S1 - Columbus Park

S2G - Columbus Park, 42m from S1, at large drain pipe

S2a - Columbus Park, 30m upstream from S2G, below small terrace falls

S2 - Columbus Park, at Mamaroneck Avenue

S3a - midpoint of E. Plaza Ave. (Sheldrake Dr.), downstream from Blood Bros.

S3 - at Waverly Avenue

S4a - at a running drain, downstream from Centre Avenue

S4 - Centre Avenue, upstream of another running drain

S5 - Madison Street, downstream from bridge

S6 - Madison Street, at active drain

S7 - Washington Street

S8 - Fenimore Road

S9 - Ogden Avenue, at drain

S10 - Concord Avenue

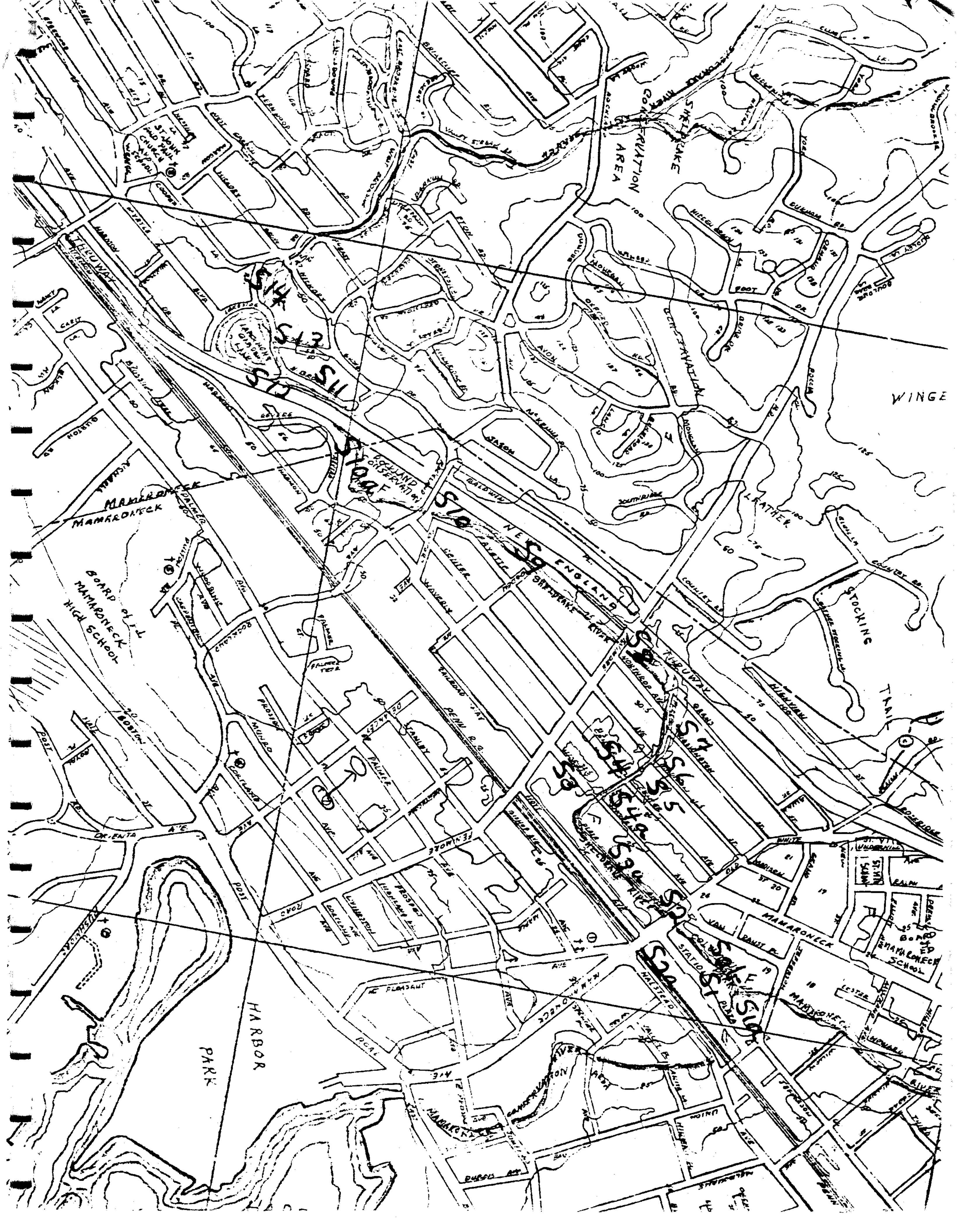
S10a - at Thruway

S11 - N. Brook Drive

S12 - N. Brook Drive, at falls

S13 - mid Garden Lake

S14 - entrance to Garden Lake, below falls



CONSERVATION AREA
SHELDRAKE
CONSERVATION
WINGE
STOCKING
LEATHER
THRUWAY
NEW ENGLAND
ROCKLAND CONSERVATION
SHELDRAKE RIVER
MAMARONECK
MAMARONECK
BOARD OF ED MAMARONECK HIGH SCHOOL
BOARD ED MAMARONECK SCHOOL
HARBOR
PARK
CONSERVATION AREA
MAMARONECK AVE
PENN R.R.
RAILROAD WAY
ORIENTA AVE
BOSTON
POST
PROSPECT
MUNRO
PALMER
STANLEY
HALSTEAD
COLUMBUS PARK
STATION PLAZA
VAN RANST PL
S14
S13
S11
S12
S10
S9
S8
S7
S6
S5
S4
S4a
S3
S3a
S2
S2a
S1
S1a