

# ENGINEERING INVESTGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE I INVESTIGATION  
Watch Hill Sand & Gravel  
Site No. 152084

Islip, Suffolk County

SEPTEMBER, 1989



New York State Department of  
Environmental Conservation  
50 WOLF ROAD, ALBANY, NEW YORK 12233

Thomas C. Jorling, Commissioner

Division of Hazardous Waste Remediation  
Michael J. O'Toole, Jr., P.E., Director

Prepared by:

YEC, INC.

UNDER CONTRACT TO

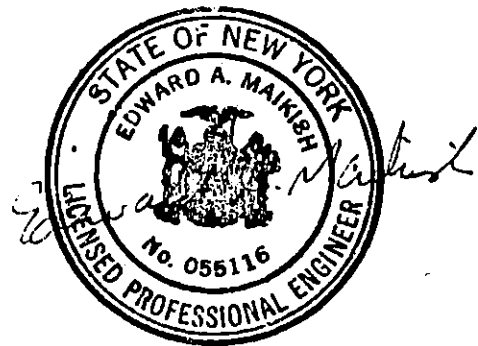
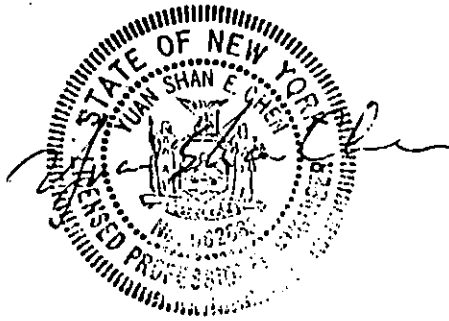
LAWLER, MATUSKY & SKELLY ENGINEERS

ENGINEERING INVESTIGATIONS AT  
INACTIVE HAZARDOUS WASTE SITES  
IN THE STATE OF NEW YORK  
PHASE I INVESTIGATIONS

Watch Hill Sand and Gravel  
Islip, Suffolk County  
NYSDEC I.D. No. 152084

Prepared for

DIVISION OF HAZARDOUS WASTE REMEDIATION  
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
50 Wolf Road  
Albany, New York 12233-0001



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September 1989

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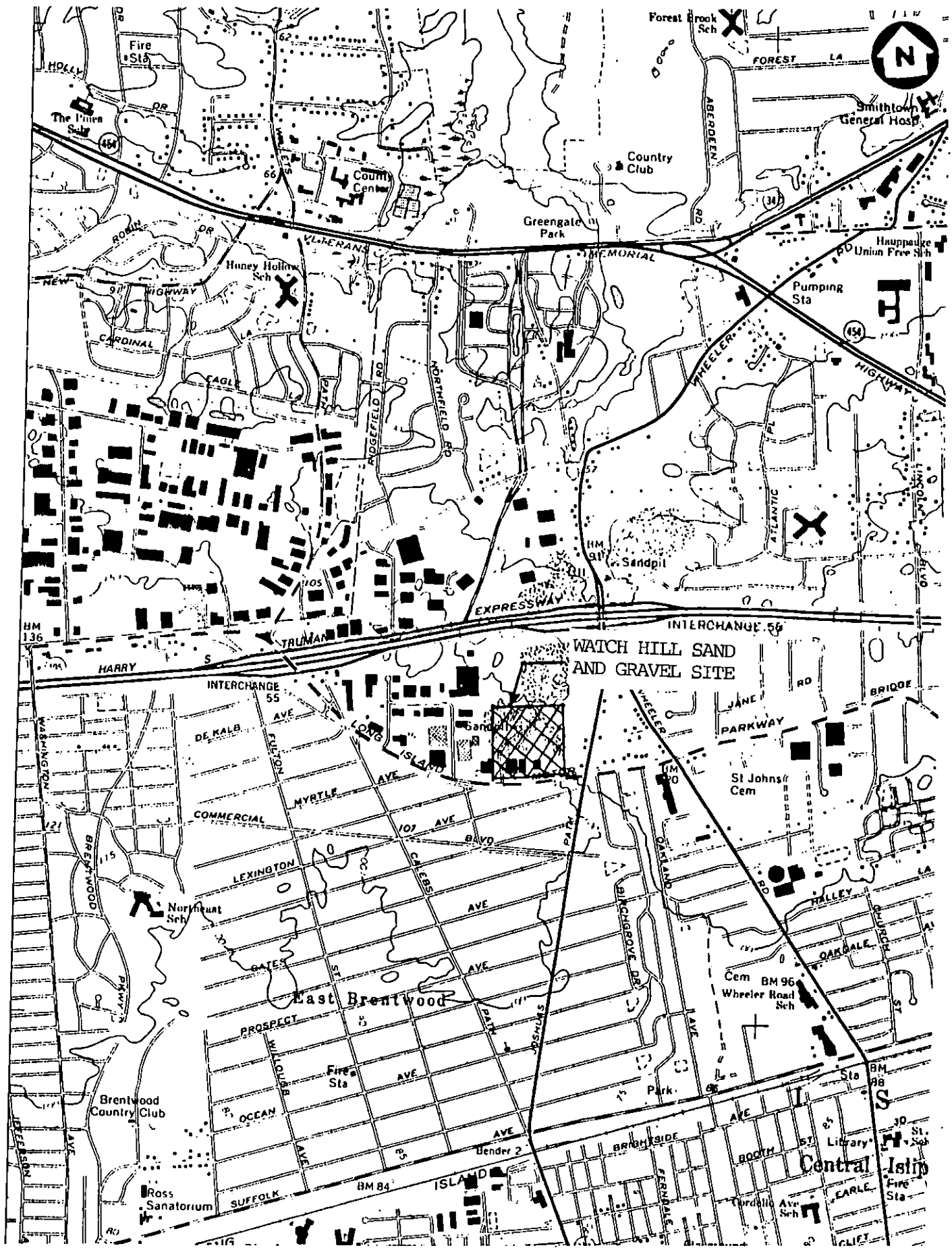
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## 1. EXECUTIVE SUMMARY

Watch Hill Sand and Gravel (NYSDEC I.D. # 152084) is an approximately 45-acre site located at the intersection of Route 111 and Long Island Motor Parkway in Islip, New York (Figures 1-1 and 1-2). The site is bound on the west by Cardinal Industrial Park, and on the north by M.T.C. (another sand mining area). The site was an old landfill operated by the Town of Islip for depositing household garbage and construction and demolition debris, and the period of landfilling is unknown. Mining in this area has occurred since the late 1960's. A one-year construction and demolition debris landfill permit was issued in December, 1978 by New York State Department of Environmental Conservation to dispose sand, cement, concrete, asphalt, iron, brick, road construction debris and demolition debris (Appendix C, Ref.3). According to Mr. Gerald J. Philbin, operator of Watch Hill Sand and Gravel, he conducted a sand and gravel operation at the site for less than one year in 1979 or 1980 and paid the royalties to the owner, Mr. Franklin Frank of Expressway Aggregates (Appendix C, Ref.2).

The site neither has a fence nor a gate at the entrance. No leachate or suspicious hazardous waste disposal areas were observed during the site inspection performed by YEC, Inc. on February 3, 1989. However, it appeared that extensive filling had taken place in the past. Two methane monitoring wells were installed in the buried landfill. There was no response by an HNu



SITE COORDINATES:  
 Longitude: 73 13' 00"  
 Latitude : 40 48' 00"

FIGURE 1-1 WATCH HILL SAND & GRAVEL

Source: USGS, 1967  
 Scale: 1 inch = 2000 f

SITE LOCATION MAP

CENTRAL ISLIP QUADRANGLE

WATCH HILL SAND & GRAVEL  
HAUPPAUGE, NEW YORK

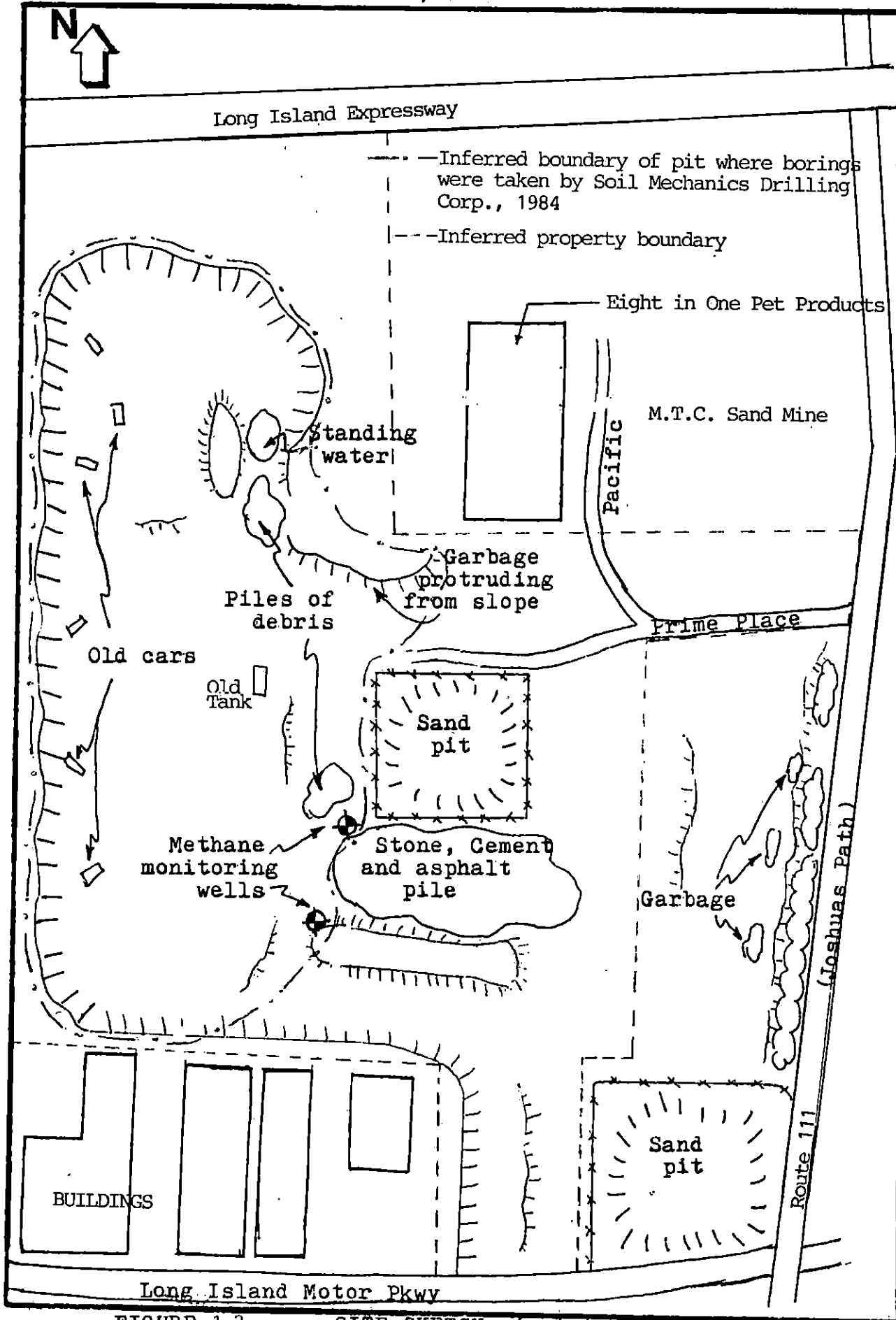


FIGURE 1-2 SITE SKETCH (not to scale)

meter in or around the wells. Near the center of the site and north of the methane monitoring wells, there is a slope with domestic garbage protruding from it. There is a junk pile near the center of the property, where a medium sized tank, which was empty and partly rusted, was found. A reading of 15 ppm with the HNu meter at the opening of the tank was observed.

A preliminary application of the Hazard Ranking System (HRS) was completed to quantify risks associated with the site. A detailed environmental site assessment to fully evaluate the site was not conducted. A preliminary HRS score was completed on the basis of the available data. It should be noted that without a full environmental assessment, an unrealistically low HRS score may result.

Under the HRS, three numerical scores are computed to express the site's relative risk or damage to the population and the environment. The three scores are described below:

- $S_M$  reflects the potential for harm to humans or the environment from migration of a hazardous substance away from the facility via groundwater, surface water, or air. It is a composite of separate scores for each of the three routes ( $S_{gw}$  = groundwater route score,  $S_{sw}$  = surface water route score, and  $S_a$  = air route score).
- $S_{FE}$  reflects the potential for harm from substances that can explode or cause fires.

- $S_{DC}$  reflects the potential for harm from direct contact with hazardous substances at the facility (i.e., no migration need be involved).

The preliminary HRS score was:

$S_M$  = Not Scored ( $S_{gw}$  = Not Scored;  $S_{sw}$  = 0;  $S_a$  = 0)

$S_{FE}$  = Not Scored

$S_{DC}$  = Not Scored

Due to the lack of on-site groundwater analytical data, HRS Scoring was not conducted for groundwater. Fire and explosion was not completed because the Fire Marshal did not observe any overt and/or obvious hazards.

## 2. PURPOSE

Under contract to Lawler, Matusky and Skelly Engineers, which is in turn under contract to the New York State Department of Environmental Conservation (NYSDEC) Superfund Program, YEC, Inc. conducted this Phase I Investigation at the Watch Hill Sand and Gravel Corp. The purpose of this investigation was to provide a preliminary evaluation of the potential hazardous waste present at the site, to estimate the potential pollutant migration pathways leading off site, and to determine natural resources or extent of the human population that might be affected by the pollutants. The evaluation includes preparation of a narrative site description, initial characterization of the hazardous substances on site, and calculation of a preliminary HRS score. This assessment will be used to determine what additional actions, if any, should be conducted at this site.

### 3. SCOPE OF WORK

The Phase I effort involved the following tasks:

- A review of available information from state, county, municipal, and federal files;
- Interviews with individuals knowledgeable about the site; and
- Physical inspection of the site that included review of USGS 7.5-minute topographic maps. No samples were collected, although real time air monitoring was performed during the site inspection using an HNu photoionization organic vapor detector.

Photographs were taken during the site inspection on February 3, 1989 and are included in Appendix A. All observations were recorded in a field log book and are reported in the United States Environmental Protection Agency (USEPA) Site Inspection Report Form 2070-13 as presented in Section 5-5 of this report.

Table 3-1 lists the information sources contacted for the Phase I investigation.

Table 3-1

SOURCES CONTACTED FOR THE NYSDEC PHASE I  
INVESTIGATION AT WATCH HILL SAND AND GRAVEL

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AGENCIES CONTACTED

U.S. Environmental Protection Agency, Region II  
26 Federal Plaza, Room 900  
New York, New York 10278  
(212) 264 6696  
Contact: Ben Conetta  
Date: 9/6/88  
Information Gathered: No Files/Information.

New York State Department of Environmental Conservation  
Division of Hazardous Waste Remediation  
50 Wolf Road  
Albany, New York 12233-0001  
(518) 457 0639  
Contact: Mike Komoroske  
Date: 8/8/88  
Information Gathered: No Files/Information.

New York State Department of Environmental Conservation  
Region 1  
Division of Solid Waste  
SUNY Campus - Building 40  
Stony Brook, New York 11794  
(516) 751 7900  
Contact: Robert Galli  
Date: 1/5/89  
Information Gathered: File Search for the Site.

Suffolk County Soil & Water Conservation District  
164 Old Country Road  
Peconic Plaza  
Riverhead, New York 11901  
(516) 727 2315  
Contact: Stanley Pauzer  
Date: 8/1/88  
Information Gathered: Soil Survey of Suffolk County,  
New York.

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Table 3-1 (Cont.)

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Suffolk County Department of Health Services  
Bureau of Drinking Water  
225 Rabro Drive East  
Hauppauge, NY 11788  
(516) 348 2895  
Contact: Steve Cary  
Date: 11/29/88  
Information Gathered: No Information.

Suffolk County Department of Health Services  
Hazardous Materials Management  
15 Horseblock Place  
Farmingville, NY 11738  
(516) 451 4647  
Contact: Otto Reneberg  
Date: 11/28/88  
Information Gathered: File Search for the Site.

Long Island Regional Planning Board  
H.Lee Dennison Office Building  
Veterans Memorial Highway  
Hauppauge, New York 11787  
(516) 360 5191  
Contact: Roy Fedelem  
Date: 12/22/88  
Information Gathered: Census Tract Map and Population.

Suffolk County Water Authority  
Oakdale  
Long Island, NY 11769  
(516) 589 5200  
Contact: E.J. Rosavitch, P.E.  
Date: 12/21/88 and 8/1/89  
Information Gathered: No Information.

Chief Fire Marshal  
1 Manitton Court  
Islip, NY 11751  
(516) 724 5477  
Contact: Mr. Thomas Greene  
Date: 3/10/89  
Information Gathered: The Fire Marshal did not identify any  
overt and/or obvious fire hazards.

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Table 3-1 (Cont.)

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New York State Department of Environmental Conservation  
Region 1  
SUNY Campus - Building 40  
Stony Brook, New York 11794  
(516) 751 7900  
Contact: Michael Scheibel  
Date: 12/21/88  
Information Gathered: Critical Habitat of Endangered  
Species and Plant Species.

Cornell Cooperative Extension - Suffolk County  
246 Griffing Avenue  
Riverhead, NY 11901  
(516) 727 7850  
Contact: William J. Sanok  
Date: 12/21/88  
Information Gathered: Farmland/Agriculture Land and Surface  
Water Bodies Information.

New York State Department of Environmental Conservation  
Region 1  
SUNY Campus - Building 40  
Stony Brook, New York 11794  
(516) 751 7900  
Contact: Martin E. Shea  
Date: 12/22/88  
Information Gathered: Fresh Water Wetlands within a 1-mile  
radius of the site.

New York State Department of Health  
Nelson A. Rockefeller Empire State Plaza  
Corning Tower Building  
Albany, NY 12237  
(518) 473 6731  
Contact: James Covey, P.E.  
Date: 9/15/88  
Information Gathered: Community Water Supply Atlas.

New York State Department of Health  
Room # 205, 2 University Place  
Albany, NY 12203  
(518) 458 6310  
Contact: Rick Teurs  
Date: 2/1/89  
Information Gathered: No Files/Information.

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Table 3-1 (Cont.)

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National Demolition Corporation  
Old Northport Road  
Kings Park, NY 11754  
(516) 269 5959  
Contact: Mr. Gerald J. Philbin, Site Operator  
Date: 12/28/88  
Information Gathered: Site History.

United States Department of the Interior  
Fish and Wildlife Service  
700 Rockaway Turnpike  
Lawrence, NY 11714  
(718) 917 1767  
Contact: Inspector Santora  
Date: 8/15/89  
Information Gathered: List of Federally Endangered Species;

United States Department of the Interior  
Fish and Wildlife Service  
100 Grange Place, Room 202  
Cortland, NY 13045  
Contact: Leonard P. Corin, Field Supervisor  
Date: 8/14/89  
Information Gathered: List of Federally Endangered Species  
in the vicinity of the site.

INTERVIEWS

Contact: Tom Marquardt  
Address: Principal Planner  
Town of Islip  
655 Main Street  
Islip, NY 11751  
(516) 224 5691  
Date: 2/3/89  
Information Gathered: Site History and Site Operations.

Contact: Betty Gallagher  
Address: Town of Islip  
Department of Environmental Control  
401 Main Street  
Islip, NY 11751  
(516) 224 5640  
Date: 8/14/89  
Information Gathered: No Information.

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Table 3-1 (Cont.)

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Contact: Franklin Frank

Address: Expressway Aggregates

525B Mid Island plaza

Hicksville, NY 11801

(516) 935 8200

Date: 8/30/89

Information Gathered: Refused to give information.

#### 4. SITE ASSESSMENT

##### 4.1 SITE HISTORY

Watch Hill Sand and Gravel (NYSDEC I.D. # 152084) is an approximately 45-acre site located at the intersection of Route 111 and Long Island Motor Parkway in Islip, New York. The site is bound on the west by Cardinal Industrial Park, and on the north by M.T.C. (another sand mining area). The site was an old landfill operated by the Town of Islip for depositing household garbage and construction and demolition debris, and the period of landfilling is unknown (Appendix C, Ref.3). A one-year construction and demolition debris landfill permit was issued in December, 1978 by New York State Department of Environmental Conservation to dispose sand, cement, concrete, asphalt, iron, brick, road construction debris and demolition debris (Appendix C, Ref.3). Mining in this area has occurred since the late 1960's. According to Mr. Gerald J. Philbin, Watch Hill Sand and Gravel conducted a sand and gravel operation at the site for less than one year in 1979 or 1980, paid the royalties to the owner, Mr. Franklin Frank of Expressway Aggregates, and ceased all the operations in 1981 (Appendix C, Ref.2).

##### 4.2 SITE TOPOGRAPHY

Watch Hill Sand and Gravel lies approximately 1.6 miles south of New Mill Pond, which is part of the Nissequogue River System. Site elevation is about 100 feet above mean sea level (MSL) as

shown on USGS 7.5-minute Quadrangle (Ref.9). The site is located 1.1 mile north of Long Island Railroad. Drainage across the study area is generally toward the northern direction and ultimately to Nissequogue River. The lot apparently is a shallow, flat bottomed sand mine, whose acreage is suitable for development in the future. The site appeared that extensive filling had taken place in the past. Toward the front, the site is covered with outwashed sand.

#### 4.2.1 Soils

The soil type at Watch Hill Sand and Gravel site is classified as Gravel Pits (Gp), Riverhead Sandy loam, 3 to 8 percent slopes (RdB) and Haven loam, 0 to 2 percent slopes (HaA) (Ref.5). The Riverhead series consists of deep, well drained, moderately coarse textured soils that formed in a mantle and sandy loam or fine sandy loam over thick layers of coarse sand and gravel. The Haven series consists of deep, well drained, medium textured soils that formed in a loamy or silty mantle over stratified coarse sand and gravel. Gravel Pits are open excavations that have been made for the purpose of mining sand and gravel.

#### 4.2.2 Land Use

The site is within a mixed residential, commercial and industrial district. The total population within a 3-mile radius of the site is approximately 67,200 persons (Ref.12). There are

no active agricultural sites within three miles of this particular site (Ref.8).

#### 4.2.3 Critical and Sensitive Habitats

There are no critical habitats or plant species of concern within a 1-mile radius of the site (Ref.11 and Ref.14).

#### 4.3 REGIONAL GEOLOGY

Geologically, Long Island is made up of layers of unconsolidated material underlain by bedrock. Figure 4-1 shows a representative geologic cross section on a north/south transect of the Island. The bedrock slopes gently from northwest to southeast and the unconsolidated material varies in thickness from zero in the northwest to a maximum thickness of over 2000 feet in the south-central part of the Island.

Above the bedrock is the Raritan Formation of Cretaceous age. This formation has two members. The lower, called the Lloyd Sand Member, is composed of coarse-grained sand, gravel, and some clay. The Lloyd Sand is one of the most important aquifers on Long Island largely because it yields adequate supplies of good quality water in areas, generally beneath the margins of Long Island, where supplies from overlying formations are inadequate or are contaminated. The upper member is mostly clay and is called the Clay Member of the Raritan Formation.

Overlying the Raritan Formation is the Magothy Formation,

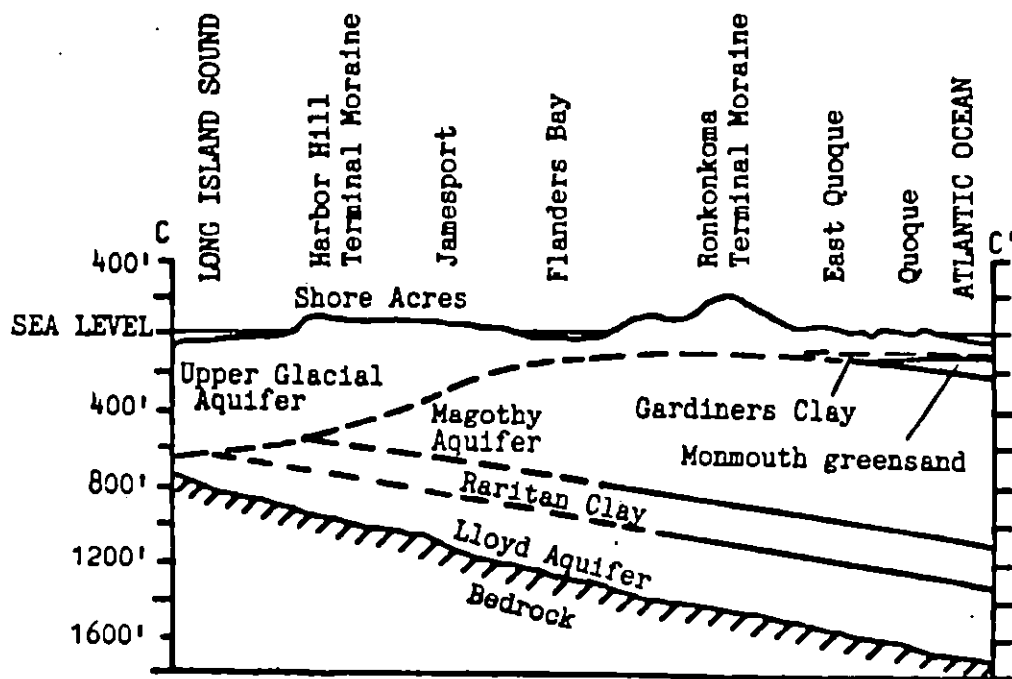
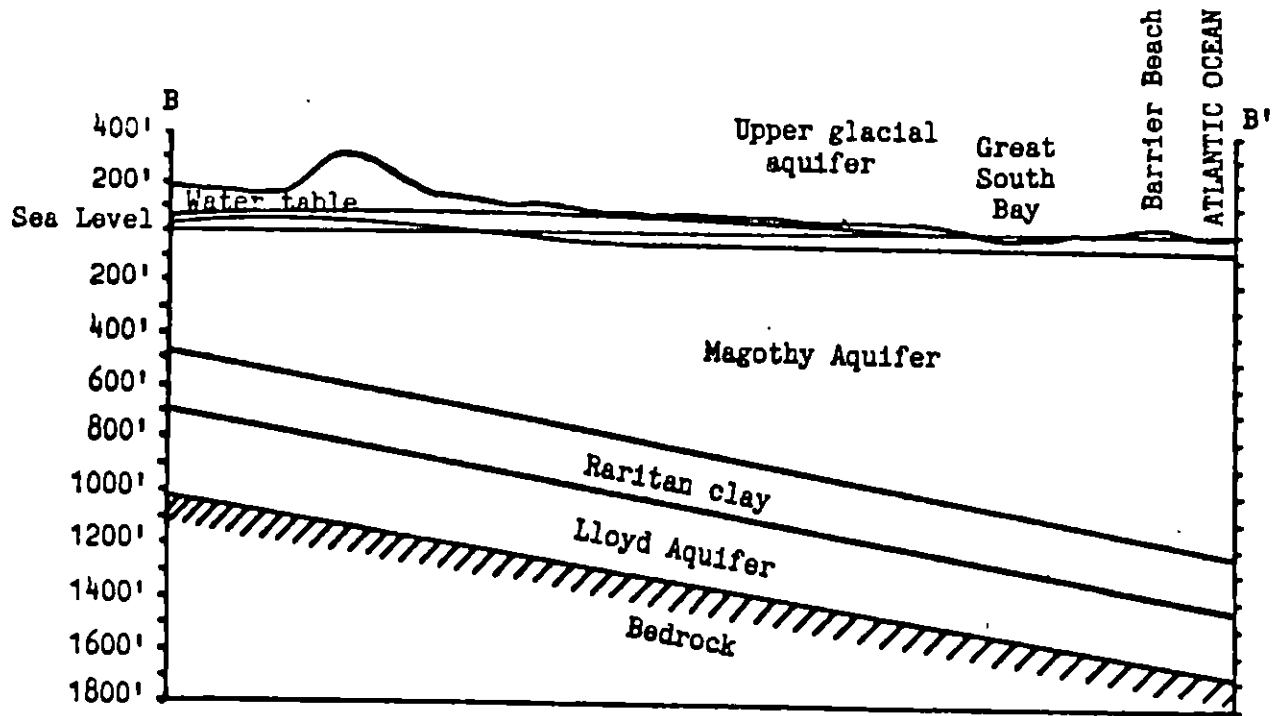


FIGURE 4-1

Representative Geologic Cross-Sections, Long Island, NY

(Ref: Final Long Island Groundwater Management Program, New York State Department of Environmental Conservation, 1986)

also of Cretaceous age. The Magothy Formation in central Suffolk County is a thick body of continental deposits composed of lenses of sand, sandy clay, clay, and some gravel. It rests on the Raritan Formation and is in turn unconformably overlain by Upper Glacial Deposits. The Magothy is important as an alternate aquifer in the event that the water in the overlying Upper Glacial Deposits becomes contaminated. The Glacial Deposits in the area consist primarily of glacial outwash, lacustrine and marine deposits (Appendix C, Ref.5).

#### 4.4 SITE CONTAMINATION

No sampling programs have been previously conducted at this site, with the exception of soil samples collected from soil borings in the pit to locate the approximate location and depths of the garbage in 1984 by Soil Mechanics Drilling Corp. for Town of Islip. Samples were analyzed for EP Toxicity parameters by New York Testing Laboratories, Inc. All six soil samples collected were found to be non-toxic (Ref.3). Methane samples were collected in December, 1984 at eight monitoring wells on Eight-in-One Pet Products, Inc., which is located on the north of the site in the M.T.C. Property and only one showed a significant reading of 4,682 ppm (Ref.3).

An air quality survey was conducted by YEC, Inc. using an HNu Photoionizer during YEC's site inspection on February 3, 1989. No readings above background were noted except for the tank found near the center of the property showed a reading of 15 ppm at the

openings. Currently, no analytical data are available for on-site groundwater and local surface waters.

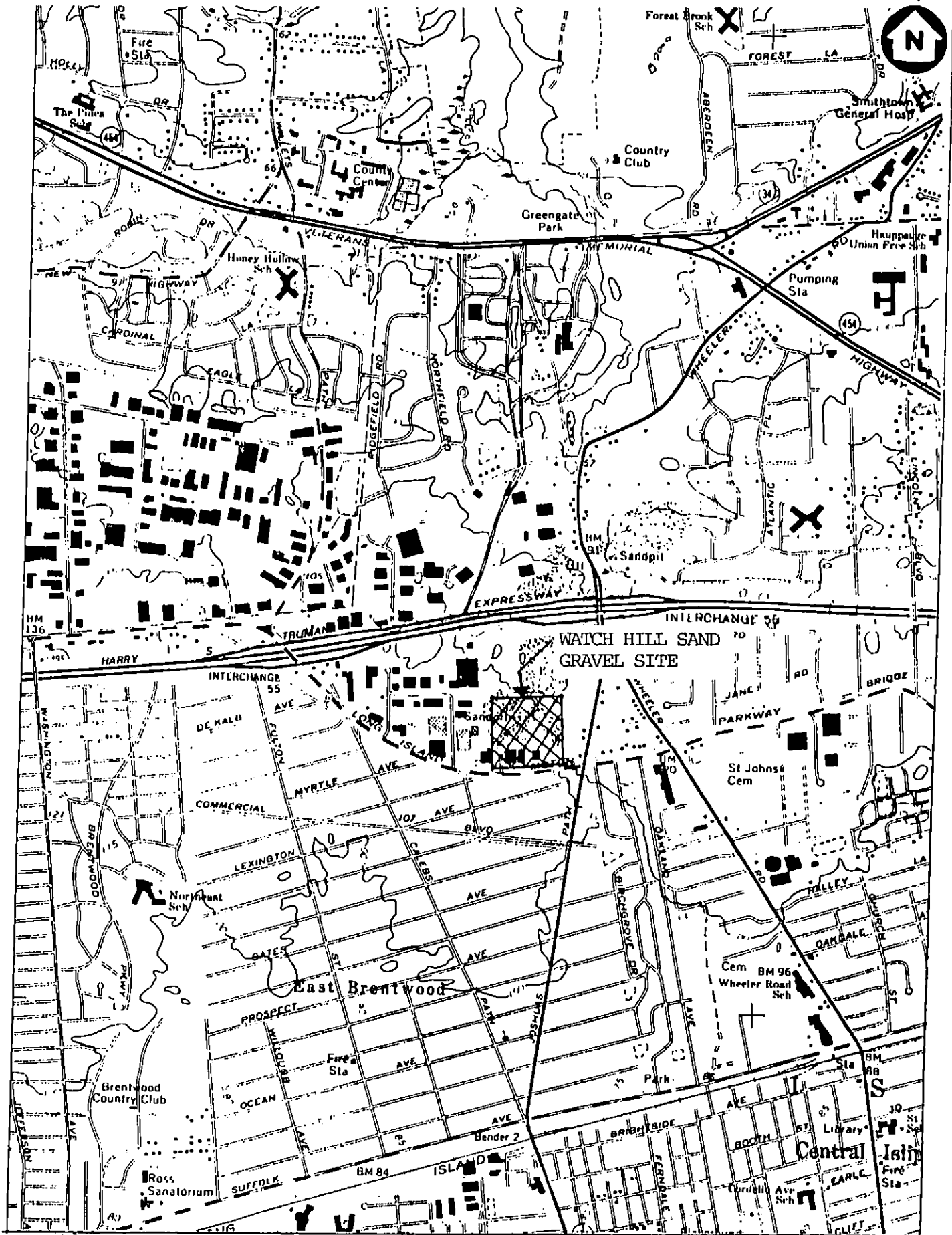
## 5. APPLICATION OF HAZARD RANKING SCORE

### 5.1 NARRATIVE SUMMARY

Watch Hill Sand and Gravel (NYSDEC I.D. # 152084) is an approximately 45-acre site located at the intersection of Route 111 and Long Island Motor Parkway in Hauppauge, New York (Figure 5-1). The site is bound on the west by Cardinal Industrial Park, and on the north by M.T.C. (another sand mining area). The site was an old landfill operated by the Town of Islip for depositing household garbage, and construction and demolition debris and the period of landfilling is unknown. Mining in this area has occurred since late 1960's. Watch Hill Sand and Gravel conducted a sand and gravel operation at the site for less than one year in 1979 or 1980 and paid the royalties to the owner, Mr. Franklin Frank of Expressway Aggregates, and ceased all the operations in 1981.

Soil samples collected in 1984 by Soil Mechanics Drilling Corp. from the soil borings in the pit to locate the approximate location and depths of the garbage were found to be non-toxic. There is no analytical data available for on-site groundwater.

There is no fence surrounding the property, and no gate at the entrance. During the site inspection, no suspicious hazardous waste disposal areas were detected.



SITE COORDINATES:  
 Longitude: 73 13' 00"  
 Latitude : 40 48' 00"

FIGURE 5-1 WATCH HILL SAND & GRAVEL  
 HAUPPAUGE, NEW YORK

SOURCE: USGS, 1967  
 SCALE: 1" = 2000 Ft.  
 CENTRAL ISLIP QUADRANGLE

SITE LOCATION MAP

**FIGURE 1**  
**MRS COVER SHEET**

**Facility Name:** Watch Hill Sand and Gravel

**Location:** Route 111 and Long Island Motor Parkway

**EPA Region:** II

**Person(s) in Charge of Facility:** Franklin Frank

William Plander

**Name of Reviewer:** Ari Selvakumar

**Date:** 2/9/89

**General Description of the Facility:**

*(for example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action; etc.)*

Watch Hill Sand and Gravel is an approximately 45-acre site located at the intersection of Route 111 and Long Island Motor Parkway in Islip, New York. The site was an old landfill operated by the Town of Islip for depositing household garbage and construction and demolition debris and the period of landfilling is unknown. The site was used for sand and gravel operation since the late 1960's. Watch Hill Sand and Gravel conducted a sand and gravel operation for less than one year in 1979 or 1980. There is no sign of any mining operation now.

The site is not fenced and has no gate.

During the site inspection, no suspicious hazardous waste disposal areas were detected.

**Scores:**  $S_M = NS$  ( $S_{PM} = NS$   $S_{SM} = 0$   $S_B = 0$  )

$S_{FE} = NS$

$S_{DC} = NS$

NS = Not Scored

**Ground Water Route Work Sheet**

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Re (Sect)
---------------	--------------------------------	-------------	-------	------------	-----------

<b>1</b> Observed Release	<b>0</b> 45	1	0	45	3.
---------------------------	-------------	---	---	----	----

If observed release is given a score of 45, proceed to line **4**.  
 If observed release is given a score of 0, proceed to line **2**.

<b>2</b> Route Characteristics					<b>3.2</b>
Depth to Aquifer of Concern	0 1 <b>2</b> 3	2	4	8	
Net Precipitation	0 1 <b>2</b> 3	1	2	3	
Permeability of the Unsaturated Zone	0 1 2 <b>3</b>	1	3	3	
Physical State	0 <b>1</b> 2 3	1	1	3	
<b>Total Route Characteristics Score</b>			10	15	

<b>3</b> Containment	0 1 2 <b>3</b>	1	3	3	<b>3.3</b>
----------------------	----------------	---	---	---	------------

<b>4</b> Waste Characteristics					<b>3.4</b>
Toxicity/Persistence	0 3 6 9 12 15 18	1	-	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	-	8	
<b>Total Waste Characteristics Score</b>			-	26	

<b>5</b> Targets					<b>3.5</b>
Ground Water Use	0 1 2 <b>3</b>	3	9	9	
Distance to Nearest Well/Population Served	0 4 8 8 10	1	35	40	
	12 16 18 20				
	24 30 32 <b>35</b> 40				
<b>Total Targets Score</b>			44	49	

<b>6</b> If line <b>1</b> is 45, multiply <b>1</b> x <b>4</b> x <b>5</b> If line <b>1</b> is 0, multiply <b>2</b> x <b>3</b> x <b>4</b> x <b>5</b>	-	57.330
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**7**. Divide line **6** by 57.330 and multiply by 100 S<sub>gw</sub> = Not Scored

### Surface Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
<b>1</b> Observed Release	① 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line <b>4</b> If observed release is given a value of 0, proceed to line <b>2</b>					
<b>2</b> Route Characteristics					4.2
Facility Slope and Intervening Terrain	① 1 2 3	1	0	3	
1-yr. 24-hr. Rainfall	0 1 ② 3	1	2	3	
Distance to Nearest Surface Water	0 ① 2 3	2	2	6	
Physical State	0 ① 2 3	1	1	3	
<b>Total Route Characteristics Score</b>			5	15	
<b>3</b> Containment	① 1 2 3	1	0	3	4.3
<b>4</b> Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 18	1	-	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	-	8	
<b>Total Waste Characteristics Score</b>			-	26	
<b>5</b> Targets					4.5
Surface Water Use	0 1 ② 3	3	6	9	
Distance to a Sensitive Environment	0 ① 2 3	2	2	6	
Population Served/Distance to Water Intake Downstream	① 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
<b>Total Targets Score</b>			8	55	
<b>6</b> If line <b>1</b> is 45, multiply <b>1</b> x <b>4</b> x <b>5</b> If line <b>1</b> is 0, multiply <b>2</b> x <b>3</b> x <b>4</b> x <b>5</b>			0	64.350	
<b>7</b> Divide line <b>6</b> by 64.350 and multiply by 100			0	0	$S_{sw} =$

## SURFACE WATER ROUTE WORK SHEET

**Air Route Work Sheet**

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max Score	Ref Section
<b>1</b> Observed Release	<b>0</b> 45	1	0	45	5.1

Date and Location:

Sampling Protocol:

If line **1** is 0, the  $S_a = 0$ . Enter on line **5**.  
 If line **1** is 45, then proceed to line **2**.

<b>2</b> Waste Characteristics														
Reactivity and Incompatibility	0	1	2	3		1	-		3					
Toxicity	0	1	2	3		3	-		9					
Hazardous Waste Quantity	0	1	2	3	4	5	6	7	8		1	-		8
<b>Total Waste Characteristics Score</b>											-	20		

<b>3</b> Targets													
Population Within 4-Mile Radius	0	9	12	15	18		1	21	30				
Distance to Sensitive Environment	0	1	2	3		2	2	6					
Land Use	0	1	2	3		1	3	3					
<b>Total Targets Score</b>											26	39	

<b>4</b> Multiply <b>1</b> x <b>2</b> x <b>3</b>	0	35.100	
--	---	--------	--

**5** Divide line **4** by 35.100 and multiply by 100  $S_a = 0$

**AIR ROUTE WORK SHEET**

	S	S <sup>2</sup>
Groundwater Route Score (S <sub>gw</sub> )	Not scored	-
Surface Water Route Score (S <sub>sw</sub> )	0	0
Air Route Score (S <sub>a</sub> )	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		Not scored
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		Not scored
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		Not scored

**WORKSHEET FOR COMPUTING S<sub>M</sub>**

## Fire and Explosion Work Sheet

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
<b>1</b> Containment	1                      3	1		3	7.1
<b>2</b> Waste Characteristics					7.2
Direct Evidence	0                      3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
<b>Total Waste Characteristics Score</b>				20	
<b>3</b> Targets					7.3
Distance to Nearest Population	0 1 2 3 <b>4</b> 5	1	4	5	
Distance to Nearest Building	0 1 2 <b>3</b>	1	3	3	
Distance to Sensitive Environment	<b>0</b> 1 2 3	1	0	3	
Land Use	0 1 2 <b>3</b>	1	3	3	
Population Within 2-Mile Radius	0 1 2 3 4 <b>5</b>	1	5	5	
Buildings Within 2-Mile Radius	0 1 2 3 <b>4</b> 5	1	4	5	
<b>Total Targets Score</b>				19	24
<b>4</b> Multiply <b>1</b> x <b>2</b> x <b>3</b>				1,440	
<b>5</b> Divide line <b>4</b> by 1,440 and multiply by 100				SFE =	Not scored

## FIRE AND EXPLOSION WORK SHEET

Rating Factor	Assigned value (Circle One)	multiplier	Score	Score	(Section)
1 Observed Incident	0 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 3	1	3	3	8.2
3 Containment	0 15	1	15	15	8.3
4 Waste Characteristics Toxicity	0 1 2 3	5	-	15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 1 2 3 4 5	4	16	20	
Distance to a Critical Habitat	0 1 2 3	4	0	12	
<b>Total Targets Score</b>			16	32	
If line 1 is 45, multiply 1 x 4 x 5					
If line 1 is 0, multiply 2 x 3 x 4 x 5			-	21,600	
Divide line 6 by 21,600 and multiply by 100			SDG = Not scored		

## DIRECT CONTACT WORK SHEET

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---

**DOCUMENTATION RECORDS  
FOR  
HAZARD RANKING SYSTEM**

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**Instructions:** As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 80 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference. Include the location of the document.

**Facility Name:** Watch Hill Sand and Gravel

**Location:** Route 111 and Long Island Motor Parkway

**Date Scored:** 2/9/1989

**Person Scoring:** Ari Selvakumar

**Primary Source(s) of Information (e.g., EPA region, state, FIT, etc.):**

NYSDEC Region I Files  
Town of Islip Files  
Site Inspection  
USGS Quadrangle Map  
Soil Survey of Suffolk County

**Factors Not Scored Due to Insufficient Information:**

The Fire Marshal did not observe any overt and/or obvious fire hazards.  
Ref. 13

**Comments or Qualifications:**

HRS Scoring for groundwater was not computed because of lack of on-site groundwater analytical data.

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**GROUNDWATER ROUTE**

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**1. OBSERVED RELEASE**

**Contaminants detected (3 maximum):**

No data available.

**Rationale for attributing the contaminants to the facility:**

Assigned value = 0

\* \* \*

**2. ROUTE CHARACTERISTICS**

**Depth to Aquifer of Concern**

**Name/description of aquifer(s) of concern:**

Upper Glacial Deposit underlain by the Magothy Formation.  
Ref.1, P.#2

**Depth(s) from the ground surface to the highest seasonal level of the saturated zone (water table(s)) of the aquifer of concern:**

55 feet.  
Ref.2, P.#2

**Depth from the ground surface to the lowest point of waste disposal/storage:**

Approximately 25 feet.  
Ref.3, P.#17  
Assigned value = 2

**Net Precipitation**

**Mean annual or seasonal precipitation (list months for seasonal):**

44 inches.  
Ref.4, P.#2

**Mean annual lake or seasonal evaporation (list months for seasonal):**

30 inches..  
Ref.4, P.#3

**Net precipitation (subtract the above figures):**

14 inches.  
Assigned value = 2



**3. TARGETS**

**Groundwater Use**

**Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:**

Drinking.

Ref.7

Assigned value = 3

**Distance to Nearest Well**

**Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:**

Suffolk County Water Authority well field is approximately 0.4 miles away from the site.

Ref.7, P.#3

**Distance to above well or building:**

0.4 miles.

Ref.7, P.#3

Assigned value = 3

**Population Served by Groundwater Wells Within a 3-Mile Radius**

**Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:**

Suffolk County Water Authority, Brentwood Water District, Central Islip Psychiatric Center and St. Joseph Convent - Long Island University well fields are within 3-mile radius of the site.

Ref.7, P.#4

**Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):**

None.

Ref.8, P.#2

**Total population served by groundwater within a 3-mile radius:**

Suffolk County Water Authority		
Brentwood Water District	25,812	Ref.7, P.#4
Central Islip Psychiatric Center	4,525	Ref.7, P.#4
St. Joseph Convent-Long Island University	1,177	Ref.7, P.#4

Total population is greater than 10,000

Assigned value = 5

Matrix value = 35

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**S U R F A C E   W A T E R   R O U T E**

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**1. OBSERVED RELEASE**

**Contaminants detected in surface water at the facility or downhill from it (5 maximum):**

No data available.

**Rationale for attributing the contaminants to the facility:**

N/A.

Assigned value = 0

\* \* \*

**2. ROUTE CHARACTERISTICS**

**Facility Slope and Intervening Terrain**

**Average slope of facility in percent:**

Approximately 1 percent.

Ref.6

**Name/description of nearest downslope surface water:**

New Mill Pond.

Ref.9, P.#1

**Average slope of terrain between facility and above-cited surface water body in percent:**

Approximately 1 percent.      Ref.9, P.#1

Assigned value = 0

**Is the facility located either totally or partially in surface water?**

No.

Ref.6

**Is the facility completely surrounded by areas of higher elevation?**

No.

Ref.6

**1-Year 24-Hour Rainfall in Inches**

2.8 inches.      Ref.4, P.#4

Assigned value = 2

**Distance to Nearest Downslope Surface Water**

1.6 miles.      Ref.9, P.#1

Assigned value = 1

---

Physical State of Waste

Solid.

Ref.6

Assigned value = 1

• • •

**3. CONTAINMENT**

Containment

Method(s) of waste or leachate containment evaluated:

Landfill is covered.

Ref.6

Method with highest score:

Landfill slope precludes runoff.

Ref.6 Assigned value = 0

**4. WASTE CHARACTERISTICS**

Toxicity and Persistence

Compound(s) evaluated:

Unknown.

Compound with highest score:

N/A.

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0. (Give a reasonable estimate even if quantity is above maximum.):

Unknown.

Basis of estimating and/or computing waste quantity:

N/A.

• • •

**5. TARGETS**

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Recreation; It is part of Greengate Park.

Ref.8, P.#2

Assigned value = 2

**Is there tidal influence?**

No.  
Ref.9, P.#1

**Distance to a Sensitive Environment**

**Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:**

No.  
Ref.9, P.#1      Assigned value = 0

**Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:**

0.75 miles.  
Ref.10, P.#2      Assigned value = 1

**Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:**

None.      Ref.11, P.#2 and Ref.14, P.#1  
Assigned value = 0

**Population Served by Surface Water**

**Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:**

None.  
Ref.8, P.#2

**Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):**

N/A.

**Total population served:**

N/A.

**Name/description of nearest of above water bodies:**

N/A.

**Distance to above-cited intakes, measured in stream miles:**

N/A.

Assigned value = 0

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**A I R   R O U T E**

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**1. OBSERVED RELEASE**

**Contaminants detected:**

No contaminants detected.  
Ref.6

**Date and location of detection of contaminants:**

N/A.

**Methods used to detect the contaminants:**

HNu Photoionizer.  
Ref.6

**Rationale for attributing the contaminants to the site:**

Assigned value = 0

\* \* \*

**2. WASTE CHARACTERISTICS**

**Reactivity and Incompatibility**

**Most reactive compounds:**

N/A.

**Most incompatible pair of compounds:**

N/A.

**Toxicity**

**Most toxic compound:**

N/A.

**Hazardous Waste Quantity**

**Total quantity of hazardous waste:**

N/A.

**Basis of estimating and/or computing waste quantity:**

N/A.

\* \* \*

### 3. TARGETS

#### Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi      **0 to 1 mi**      0 to 1/2 mi      0 to 1/4 mi

7,336.      Ref.12, P.#9

Assigned value = 21

#### Distance to a Sensitive Environment

**Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:**

None.

Ref.9, P.#1      Assigned value = 0

**Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:**

0.75 miles.      Ref.10, P.#2

Assigned value = 1

**Distance to critical habitat of an endangered species, if 1 mile or less:**

None.      Ref.11, P.#2 and Ref.14, P.#1

Assigned value = 0

#### Land Use

**Distance to commercial/industrial area, if 1 mile or less:**

Adjacent.

Ref.9, P.#1      Assigned value = 3

**Distance to national or state park, forest, wildlife reserve, if 2 miles or less:**

Greengate Park is about 1.5 miles of the site. It is a county park.

Ref.9, P.#1      Assigned value = 0

**Distance to residential area, if 2 miles or less:**

100 feet.      Ref.9, P.#1

Assigned value = 3

**Distance to agricultural land in production within past 5 years, if 1 mile or less:**

None.      Ref.8, P.#2

Assigned value = 0

**Distance to prime agricultural land in production within past 5 years, if 2 miles or less:**

None.      Ref.8, P.#2

Assigned value = 0

**Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within the view of the site?**

None.

Ref.6      Assigned value = 0

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**F I R E   A N D   E X P L O S I O N**

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**1. CONTAINMENT**

NOT SCORED. Ref. 13

**Hazardous substances present:**

**Type of containment, if applicable**

. . .

**2. WASTE CHARACTERISTICS**

**Direct Evidence**

**Type of instrument and measurements:**

**Ignitability**

**Compound used:**

**Reactivity**

**Most reactive compounds:**

**Incompatibility**

**Most incompatible pair of compounds:**

**Hazardous Waste Quantity**

**Total quantity of hazardous substances at the facility:**

**Basis of estimating and/or computing waste quantity:**

. . .

---

### 3. TARGETS

#### Distance to Nearest Population

100 feet. Ref.9, P.#1  
Assigned value = 4

#### Distance to Nearest Building

Adjacent. Ref.9, P.#1  
Assigned value = 3

#### Distance to a Sensitive Environment

##### **Distance to wetlands:**

0.75 miles. Ref.10, P.#2  
Assigned value = 0

##### **Distance to critical habitat:**

None. Ref.11, P.#2 and Ref.14, P.#1  
Assigned value = 0

#### Land Use

##### **Distance to commercial/industrial area, if 1 mile or less:**

Adjacent. Ref.9, P.#1  
Assigned value = 3

##### **Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:**

Greengate Park is located 1.5 miles of the site. Ref.9, P.#1  
Assigned value = 0 as it is a county park.

##### **Distance to residential area, if 2 miles or less:**

100 feet. Ref.9, P.#1  
Assigned value = 3

##### **Distance to agricultural land in production within past 5 years, if 1 mile or less:**

None.  
Ref.8, P.#2 Assigned value = 0

##### **Distance to prime agricultural land in production within past 5 years, if 2 miles or less:**

None. Ref.8, P.#2  
Assigned value = 0

##### **Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within the view of the site?**

No. Ref.6  
Assigned value = 0

#### Population Within 2-Mile Radius

29,028. Ref.12, P.#9  
Assigned value = 5

#### Buildings Within 2-Mile Radius

Approximately 1000. Ref.6  
Assigned value = 4

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**D I R E C T   C O N T A C T**

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**1. OBSERVED INCIDENT**

**Date, location, and pertinent details of incident:**

No observed incident.

Ref.6

Assigned value = 0

• • •

**2. ACCESSIBILITY**

**Describe type of barrier(s):**

The site is not fenced and there is no gate at the entrance.

Ref.6

Assigned value = 3

• • •

**3. CONTAINMENT**

**Type of containment, if applicable:**

Near the center of the site, there is a slope with domestic garbage protruding.

Ref. 6

Assigned value = 15

• • •

**4. WASTE CHARACTERISTICS**

Toxicity

**Compounds evaluated:**

Unknown.

**Compound with highest score:**

N/A.

• • •

**5. TARGETS**

Population Within One-mile Radius

7,336. Ref.12, P.#9

Assigned value = 4

Distance to Critical Habitat (of endangered species)

None. Ref.11, P.#2 and Ref.14, P.#1

Assigned value = 0

---

REFERENCES

---

If the entire reference is not available for public review in the EPA regional files on this site, indicate where the reference may be found:

---

Reference Number	Description of the References
1	Jensen, H.M. and Julian Soren, 1971, Hydrogeologic data from selected wells and test holes in Suffolk County, Long Island, New York. Document Location: USGS, Albany, New York.
2	Thomas P. Doriski, 1987, Potentiometric surface of the Water table, Magothy and Lloyd aquifers on Long Island, New York in 1984. Document Location: USGS, Albany, New York.
3	Town of Islip, Files. Document Location: Town of Islip, Islip, New York.
4	Uncontrolled Hazardous Waste Site Ranking System: A Users Manual, 1984. Document Location: YEC, Inc., Valley Cottage, New York.
5	US Department of Agriculture Soil Conservation Service, Soil Survey of Suffolk County, New York, 1975. Document Location: Suffolk County Soil and Water Conservation District, Riverhead, New York.
6	Site Inspection by YEC, Inc., 1989. Document Location: YEC, Inc., Valley Cottage, New York.
7	New York State Department of Health, 1982, New York State Atlas of Community Water Systems Source. Document Location: New York State Department of Health, Albany, New York.
8	Sanok, J. William, 1989, Cooperative Extension Agent, Cornell Cooperative Extension, Riverhead, New York, Communication regarding farmland, agriculture land and surface water bodies. Document Location: YEC, Inc., Valley Cottage, New York.

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REFERENCES

---

Reference Number	Description of the References
9	USGS 7.5- Minute Series (Topographic) Quadrangle, Central Islip, New York, 1967. Document Location: YEC, Inc., Valley Cottage, New York.
10	Shea, E. Martin, 1989, New York State Department of Environmental Conservation, Region 1, New York, Communication regarding NYSDEC regulated freshwater wetlands within a 1-mile radius of the Watch Hill Sand & Gravel Site. Document Location: YEC, Inc., Valley Cottage, New York.
11	Scheibel, S. Michael, 1989, New York State Department of Environmental Conservation, Region 1, New York, Communication regarding critical habitat of endangered species or plant species of concern in the vicinity of Watch Hill Sand & Gravel Site. Document Location: YEC, Inc., Valley Cottage, New York.
12	Long Island Regional Planning Board, 1982, Population - 1988. Document Location: Long Island Regional Planning Board, Hauppauge, New York.
13	Greene, Thomas, 1989, Chief Fire Marshal, Town of Islip, New York, Communication regarding whether the site is declared as a threat of fire and/or explosion. Document Location: YEC, Inc., Valley Cottage, New York.
14	Leonard, P. Corin, 1989, Field Supervisor, United States Department of the Interior, Fish and Wildlife Service, Communication regarding federally listed endangered species in the vicinity of the site. Document Location: YEC, Inc., Valley Cottage, New York.

---

REFERENCE NO. 1

LOAN COPY

**HYDROGEOLOGIC DATA  
FROM SELECTED WELLS AND TEST HOLES IN  
SUFFOLK COUNTY, LONG ISLAND, NEW YORK**

By

H. M. Jensen and Julian Soren



**LONG ISLAND WATER RESOURCES  
BULLETIN NUMBER 3**

Prepared by the U. S. Department of Interior, Geological Survey, in cooperation with the New York State Department of Environmental Conservation, the Nassau County Department of Public Works, the Suffolk County Department of Environmental Control, and the Suffolk County Water Authority.

Published by

**SUFFOLK COUNTY DEPARTMENT OF ENVIRONMENTAL CONTROL**

1971

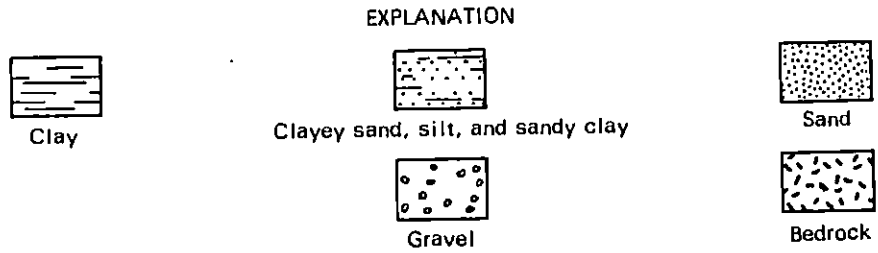
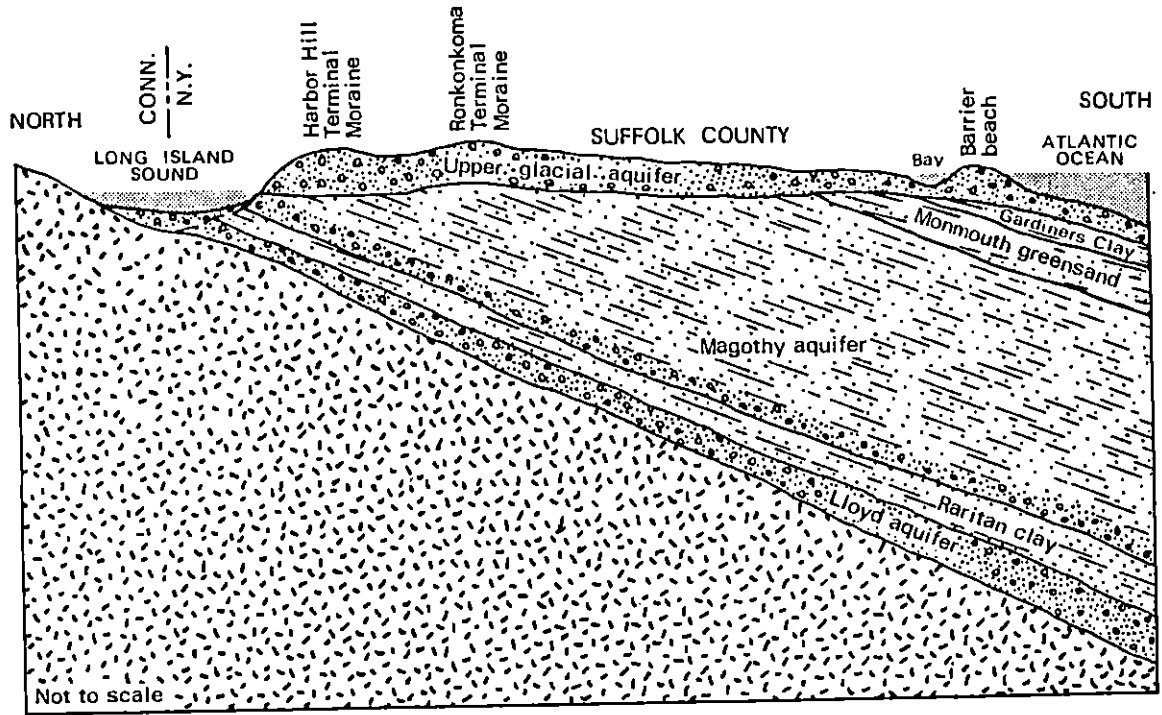


Figure 2.--Generalized section showing major hydrogeologic units in Suffolk County, N.Y.

Table 1.--Major hydrogeologic units in Suffolk County, N. Y.

Hydrogeologic unit <u>1/</u>	Geologic name	Approximate thickness (feet)	Description and water-bearing character
Upper glacial aquifer	Holocene and upper Pleistocene deposits, and Mannelto Gravel	0-750	Mainly brown and gray sand and gravel of moderate to high hydraulic conductivity; also includes deposits of clayey glacial till and lacustrine clay of low hydraulic conductivity. A major aquifer.
Gardiners Clay	Gardiners Clay	0-75	Green and gray clay, silt, clayey and silty sand, and some interbedded clayey and silty gravel; of low hydraulic conductivity. Unit tends to confine water in underlying aquifer.
Jameco aquifer	Jameco Gravel	Not known	Not identified in Suffolk County.
Monmouth greensand <u>2/</u>	Monmouth Group	0-200	Interbedded marine deposits of dark-gray, olive-green, dark-greenish-gray, and greenish-black glauconitic and lignitic clay, silt, and clayey and silty sand. Unit has low hydraulic conductivity and tends to confine water in underlying aquifer.
Magothy aquifer	Matawan Group- Magothy Formation, undifferentiated	0-1,100	Gray and white fine to coarse sand of moderate hydraulic conductivity. Generally contains sand and gravel beds of low to high hydraulic conductivity in basal 100 to 200 feet. Contains much interstitial clay and silt, and beds and lenses of clay, of low hydraulic conductivity. A major aquifer.
Raritan clay	Clay member of the Raritan Formation	0-200	Gray, black, and multicolored clay and some silt and fine sand. Unit has low hydraulic conductivity and tends to confine water in underlying aquifer.
Lloyd aquifer	Lloyd Sand Member of the Raritan Formation	0-500	White and gray fine-to-coarse sand and gravel of moderate hydraulic conductivity and some clayey beds of low hydraulic conductivity. Not highly developed as an aquifer.
Bedrock	Undifferentiated crystalline rocks	Not known	Mainly metamorphic rocks of low hydraulic conductivity; surface generally weathered; considered to be the bottom of the groundwater reservoir. Not a source of water in Suffolk County.

1/ Adapted largely from Cohen and other (1968, p. 18).

2/ Name adopted in this report.

REFERENCE NO. 2

UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

**POTENTIOMETRIC-SURFACE OF THE  
WATER-TABLE, MAGOTHY, AND LLOYD AQUIFERS  
ON LONG ISLAND, NEW YORK, IN 1984**

By  
**Thomas P. Doriski**



WATER-RESOURCES INVESTIGATIONS REPORT 86-4189

Plate 1. Water-table altitude

Plate 3. Potentiometric surface of Magothy aquifer

Plate 2. Water-table well numbers

Plate 4. Potentiometric surface of Lloyd aquifer

Prepared in cooperation with the

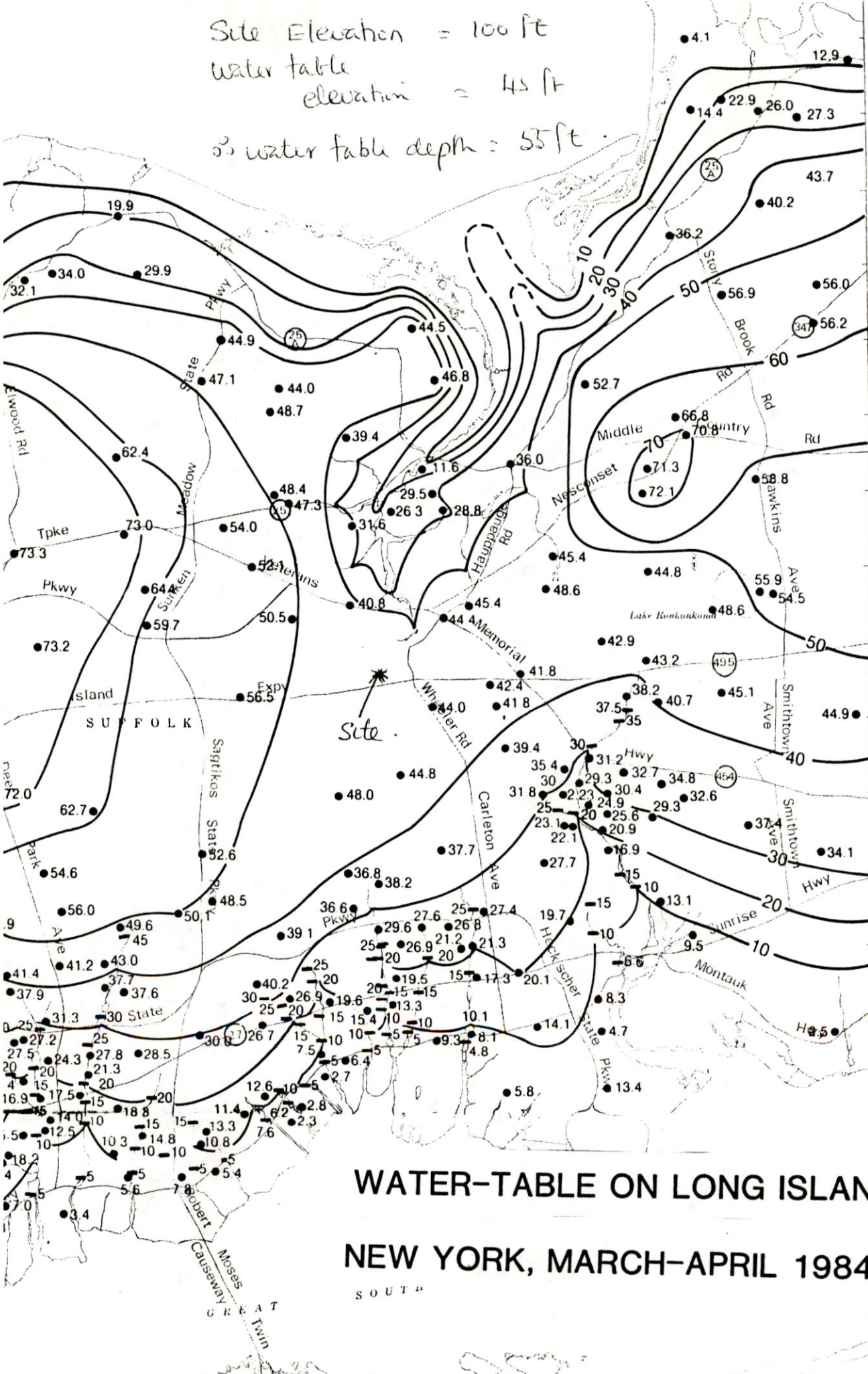
NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS  
SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES  
SUFFOLK COUNTY WATER AUTHORITY

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Syosset, New York

1987

Site Elevation = 100 ft  
water table elevation = 45 ft  
∴ water table depth = 55 ft



**WATER-TABLE ON LONG ISLAND  
NEW YORK, MARCH-APRIL 1984**

SOUTH

REFERENCE NO. 3

SOIL  
IONS



**SOIL MECHANICS DRILLING CORP.**  
3770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783  
(516) 221-2333

LETTER OF TRANSMITTAL

DATE: July 7, 1986  
JOB NO.: 84-196  
RE: Edison Drive  
Hauppauge, NY

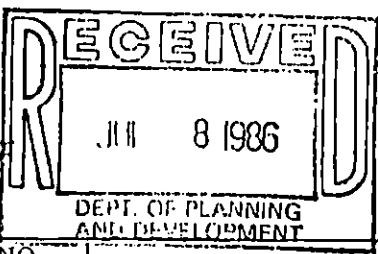
TOWN OF ISLIP  
DEPT. OF PLANNING & DEVELOPMENT

655 MAIN STREET  
ISLIP, NY 11751

ATTN: Mr. Tom Marquardt

WE ARE SENDING YOU THE FOLLOWING ITEMS:  Attached  Under Separate Cover  
via \_\_\_\_\_

- Prints
- Change Order
- Shop Drawings
- Copy of Letter



- Plans
- Samples
- Specifications

QTY	DATE	NO.	DESCRIPTION
	5/2-5/4/84		Boring Log
	5/31/84		Laboratory Analysis of samples recovered from above referenced site.

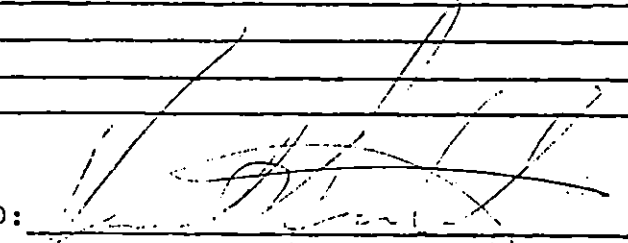
THE FOLLOWING ARE TRANSMITTED AS CHECKED BELOW:

- For approval
- For your use
- As requested
- For review and comment
- Approved as submitted
- Approved as noted
- Returned for corrections
- Resubmit \_\_\_\_\_ copies for approval
- Submit \_\_\_\_\_ copies for distribution
- Return \_\_\_\_\_ corrected prints

Other: \_\_\_\_\_  
FOR BIDS DUE \_\_\_\_\_ 19\_\_\_\_  
PRINTS RETURNED AFTER LOAN TO US

REMARKS: PLEASE NOTE CONCLUSIONS ON PAGE 8 OF LABORATORY RESULTS,  
MATERIAL NOT CONSIDERED TOXIC.

TO: \_\_\_\_\_  
\_\_\_\_\_

SIGNED:   
Vincent Nantista, Vice Pres.

**N**  
**NEW YORK TESTING LABORATORIES, INC.**  
**T**

CALL BOX 1021, 75 URDAN AVENUE, WESTBURY, N.Y. 11590 • (516) 334-7770 • (212) 297-1449 TWX 510-222-0283

Lab. No. 84-72648

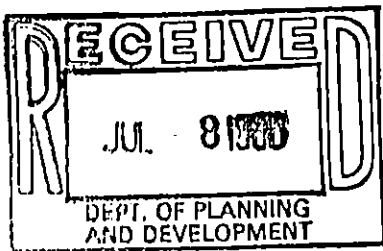
P.O. No. 3262

Cover Page

REPORT OF ANALYSIS

FOR

SOIL MECHANICS DRILLING CORP.  
3770 MERRICK ROAD  
SEAFORD, N.Y. 11783



31 MAY 1984

# NEW YORK TESTING LABORATORIES, INC.

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Lab No. 84-72648

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4.0 SAMPLE IDENTIFICATION	1
5.0 SAMPLE IDENTIFICATION AND RESULTS	2-7
6.0 CONCLUSION	8
7.0 CERTIFICATION AND SIGNATURE	8

\*\*\*\*\*

## NEW YORK TESTING LABORATORIES, INC.

Page 1.

Lab No. 84-72648

1.0 REFERENCES

- 1.1 Client purchase order number: 3262
- 1.2 Lab. No. 84-72648
- 1.3 Identification and listing of Hazardous Waste.  
Federal Register, Vol. 45 No. 98, May 19, 1980.
- 1.4 Handbook for analytical Quality Control in Water-  
Wastewater Laboratories - EPA-600/4-79-019, March  
1979.

2.0 DESCRIPTION OF TESTS

- 2.1 E P Toxicity: Ref. 1.3 para. 261.24

Identifies materials whose constituents may have a tendency to leach or migrate when disposed of improperly. The liquid phase of a sample is separated. The solid phase is extracted at pH 5 with aqueous acetic acid for 24 hours. The extract is combined with the liquid phase and analyzed.

3.0 TEST REQUIREMENTS

- 3.1 E P Toxicity - Table 1

4.0 SAMPLE IDENTIFICATION

3662 (1 through 6)

## NEW YORK TESTING LABORATORIES, INC.

Page 2.

Lab No. 84-72648

5.0 SAMPLE IDENTIFICATION AND RESULTS5.1 Sample Marked

3262- 1

Date Sampled: Not Available  
 Collected by: Soil Mechanics Drilling Corp.  
 Date received by NYTL: 5/10/84

5.1.1 RESULTS

<u>E P Toxicity (PPM)</u>	<u>Max. Allowable Levels</u>	<u>Found</u>
Arsenic	5.0	< 0.05
Barium	100.0	< 1.0
Cadmium	1.0	< 0.01
Chromium	5.0	< 0.05
Lead	5.0	< 0.05
Mercury	0.2	< 0.02
Selenium	1.0	< 0.01
Silver	5.0	< 0.05
Endrin	0.02	< 0.01
Lindane	0.4	< 0.01
Methoxychlor	10.0	< 0.01
Toxaphene	0.5	< 0.01
2,4-D	10.0	< 0.01
2,4,5-TP (Silvex)	1.0	< 0.01

&lt; = Less than

## NEW YORK TESTING LABORATORIES, INC.

Page 3.

Lab No. 84-72648

5.0 SAMPLE IDENTIFICATION AND RESULTS5.2 Sample Marked

3262- 2

Date Sampled: Not Available  
 Collected by: Soil Mechanics Drilling Corp.  
 Date received by NYTL: 5/10/84

5.2.1 RESULTS

<u>E P Toxicity (PPM)</u>	<u>Max. Allowable Levels</u>	<u>Found</u>
Arsenic	5.0	< 0.05
Barium	100.0	< 1.0
Cadmium	1.0	< 0.01
Chromium	5.0	< 0.05
Lead	5.0	< 0.05
Mercury	0.2	< 0.02
Selenium	1.0	< 0.01
Silver	5.0	< 0.05
Endrin	0.02	< 0.01
Lindane	0.4	< 0.01
Methoxychlor	10.0	< 0.01
Toxaphene	0.5	< 0.01
2,4-D	10.0	< 0.01
2,4,5-TP (Silvex)	1.0	< 0.01

&lt; = Less than

## NEW YORK TESTING LABORATORIES, INC.

Page 4.

Lab No. 84-72648

5.0 SAMPLE IDENTIFICATION AND RESULTS5.3 Sample Marked

3262-3

Date Sampled: Not Available  
 Collected by: Soil Mechanics Drilling Corp.  
 Date received by NYTL: 5/10/84

5.3.1 RESULTS

<u>E P Toxicity (PPM)</u>	<u>Max. Allowable Levels</u>	<u>Found</u>
Arsenic	5.0	< 0.05
Barium	100.0	< 1.0
Cadmium	1.0	< 0.01
Chromium	5.0	< 0.05
Lead	5.0	< 0.05
Mercury	0.2	< 0.02
Selenium	1.0	< 0.01
Silver	5.0	< 0.05
Endrin	0.02	< 0.01
Lindane	0.4	< 0.01
Methoxychlor	10.0	< 0.01
Toxaphene	0.5	< 0.01
2,4-D	10.0	< 0.01
2,4,5-TP (Silvex)	1.0	< 0.01

&lt; = Less than

## NEW YORK TESTING LABORATORIES, INC.

Page 5.

Lab No. 84-72648

5.0 SAMPLE IDENTIFICATION AND RESULTS5.4 Sample Marked

3262-4

Date Sampled: Not Available  
 Collected by: Soil Mechanics Drilling Corp.  
 Date received by NYTL: 5/10/84

5.4.1 RESULTS

<u>E P Toxicity (PPM)</u>	<u>Max. Allowable Levels</u>	<u>Found</u>
Arsenic	5.0	< 0.05
Barium	100.0	< 1.0
Cadmium	1.0	< 0.01
Chromium	5.0	< 0.05
Lead	5.0	< 0.05
Mercury	0.2	< 0.02
Selenium	1.0	< 0.01
Silver	5.0	< 0.05
Endrin	0.02	< 0.01
Lindane	0.4	< 0.01
Methoxychlor	10.0	< 0.01
Toxaphene	0.5	< 0.01
2,4-D	10.0	< 0.01
2,4,5-TP (Silvex)	1.0	< 0.01

&lt; = Less than

## NEW YORK TESTING LABORATORIES, INC.

Page 6.

Lab No. 84-72648

5.0 SAMPLE IDENTIFICATION AND RESULTS5.5 Sample Marked

3262-5

Date Sampled: Not Available  
 Collected by: Soil Mechanics Drilling Corp.  
 Date received by NYTL: 5/10/84

5.5.1 RESULTS

<u>E P Toxicity (PPM)</u>	<u>Max. Allowable Levels</u>	<u>Found</u>
Arsenic	5.0	< 0.05
Barium	100.0	< 1.0
Cadmium	1.0	< 0.01
Chromium	5.0	< 0.05
Lead	5.0	< 0.05
Mercury	0.2	< 0.02
Selenium	1.0	< 0.01
Silver	5.0	< 0.05
Endrin	0.02	< 0.01
Lindane	0.4	< 0.01
Methoxychlor	10.0	< 0.01
Toxaphene	0.5	< 0.01
2,4-D	10.0	< 0.01
2,4,5-TP (Silvex)	1.0	< 0.01

&lt; = Less than

## NEW YORK TESTING LABORATORIES, INC.

Page 7.

Lab No. 84-72648

5.0 SAMPLE IDENTIFICATION AND RESULTS5.6 Sample Marked

3262-6

Date Sampled: Not Available  
 Collected by: Soil Mechanics Drilling Corp.  
 Date received by NYTL: 5/10/84

5.6.1 RESULTS

<u>E P Toxicity (PPM)</u>	<u>Max. Allowable Levels</u>	<u>Found</u>
Arsenic	5.0	< 0.05
Barium	100.0	< 1.0
Cadmium	1.0	< 0.01
Chromium	5.0	< 0.05
Lead	5.0	< 0.05
Mercury	0.2	< 0.02
Selenium	1.0	< 0.01
Silver	5.0	< 0.05
Endrin	0.02	< 0.01
Lindane	0.4	< 0.01
Methoxychlor	10.0	< 0.01
Toxaphene	0.5	< 0.01
2,4-D	10.0	< 0.01
2,4,5-TP (Silvex)	1.0	< 0.01

&lt; = Less than

# NEW YORK TESTING LABORATORIES, INC.

Page 8.

Lab No. 84-72648

## 6.0 CONCLUSION

The six (6) submitted samples are not considered toxic.

## 7.0 CERTIFICATION AND SIGNATURE

We certify that this report is a true report of results obtained from our tests of this material.

Respectfully submitted,

NEW YORK TESTING LABORATORIES, INC.

  
G. J. Horvitz  
Chief Officer

Att: Mr. Carl Vernick

gd

SUBSOIL  
VESTIGATIONS



**SOIL MECHANICS DRILLING CORP.**

3770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783 • (516) 221-2333

December 31, 1985

WEBER AND GROSS  
534 Broad Hollow Road  
Melville, N.Y. 11747

Re: Eight-in-One Pet Products Inc.  
Hauppauge, N.Y.

Att: Ms. Jeanne-Marie Christensen

*Tom M*

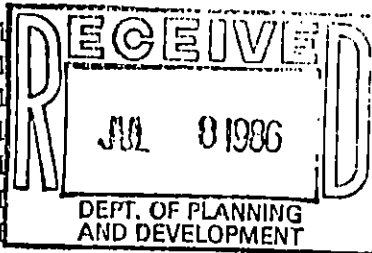
Gentlemen:

Forwarded herewith are three (3) copies of the Monitoring Well Location Plan for the Methane Wells recently installed at the above referenced site.

Samples were drawn from the test wells as the end of the hose was lowered at a constant rate to the total depth of the well. Samples were collected in gas bags and then analyzed at the Lab by Gas Chromatography. The results are as follows:

Location

MW-A	10 PPM
MW-B	32 PPM
MW-C	10 PPM
MW-D	4682 PPM
MW-E	7 PPM
MW-F	17 PPM
MW-G	10 PPM
MW-H	16 PPM



\* PPM = Parts Per Million.

The only significant reading was MW-D which, in its present form, does not constitute a danger. It appears that with the levels found, some simple form of trenching and ventilation system can be installed. Levels encountered pose no problem to going forward with construction.

Our recommendations for the venting system will follow shortly, along with our bill.

If you have any questions regarding the enclosed, please feel free to call and discuss them with us.

Very truly yours,

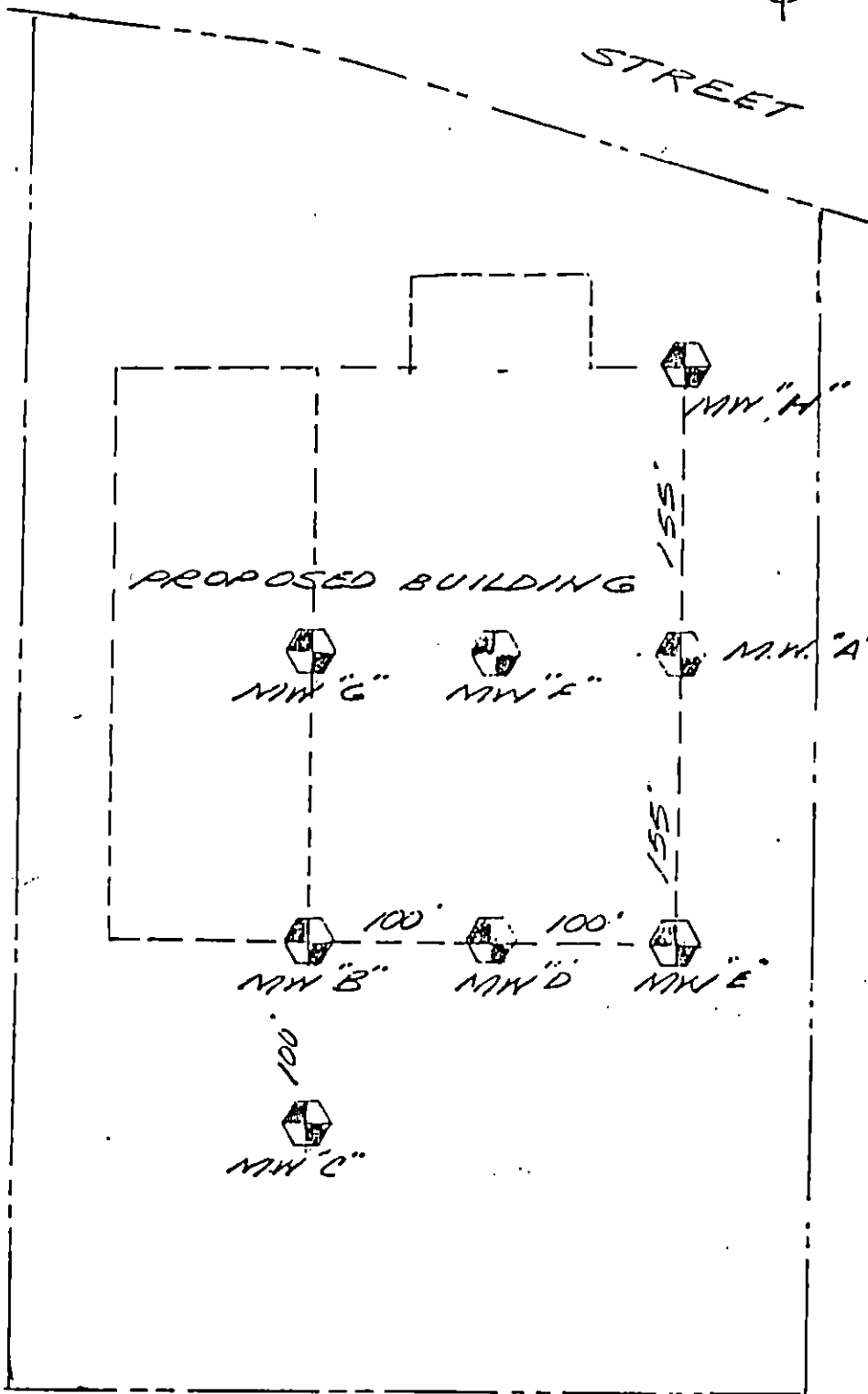
SOIL MECHANICS DRILLING CORP.

Carl Vernick  
President

CV/mfw  
encl.

TEST BORINGS • GROUND WATER DETERMINATIONS • FOUNDATION RECOMMENDATIONS • HOLLOW STEM AUGER BORINGS  
LABORATORY ANALYSES • CONTROLLED LANDFILL • DIAMOND CORE DRILLING • SAND & GRAVEL PROSPECTING  
BEARING VALUES • WELL POINT INSTALLATIONS • ENGINEERING SUPERVISION • PERCOLATION TESTS  
SANITARY INVESTIGATIONS • UNDISTURBED SAMPLING • TEST PITS • TOP SOIL ANALYSES

STREET



**SOIL MECHANICS DRILLING CORP.**  
 subsoil investigations

3770 MERRICK ROAD • SEAFORD, NEW YORK 11783 • 816 231-2333

METHANE WELL LOCATION PLAN

3M1 PET PRODUCTS INC.

HAUPPDRUGE NY.

VERTICAL BORING SCALE

DRAWING DATE

DRAWING NUMBER

DATES OF BORINGS

12/7-13/9 9.35

REVISED

85-637A

SHEET OF

*Peter J. Van Weele & Co.*

*Successors to Eugene A. Smith, Inc.*

LAND SURVEYORS — CONSULTING ENGINEERS

THREE LAZARE LANE, P. O. BOX 174, ISLIP, N. Y. 11751

(516) 581-0450

June 26, 1986

Mr. Thomas Marquardt  
Town of Islip  
Planning Department  
Main Street  
Islip, New York 11751

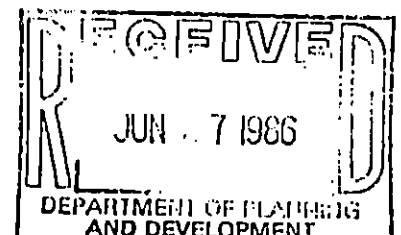
RE: Road Opening, Prime Place & Pacific Street

Dear Tom:

Enclosed please find a copy of the report prepared for determination of the limits of the buried garbage located upon this site.

This report shows the approximate location of garbage and the approximate depths of the garbage. Test borings were made in a grid across the the area until no garbage was encountered. The thickness of each layer of material was recorded. This report includes a log for each of the sixteen borings taken. I am working on obtaining a copy of the logs for the methane test wells showing the location and the quantity of gas encountered. As soon as I have the information in my hands I will forward a copy to you.

In response to your letter requesting the completion of Part Three of the Long Form Environmental Assessment, I have the following comments.



PRIME PLACE &amp; PACIFIC STREET

JUNE 26, 1986

The location of the garbage and the thickness of the low bearing capacity layers will effect the location of any contemplated structures. If a building were to be built upon the area where garbage is present, the structure would be constructed upon structural piles designed for the anticipated loads. If there were a high enough concentration of methane gas, a collection and disposal system would be designed to eliminate any hazard. The design would have to be approved by the Suffolk County Health Department and by the Town. A second mitigating measure would be to locate any buildings outside the area where garbage and methane exist.

If you have any further questions, please feel free to call upon me.

Very truly yours

PETER J. VAN WEELE & CO.

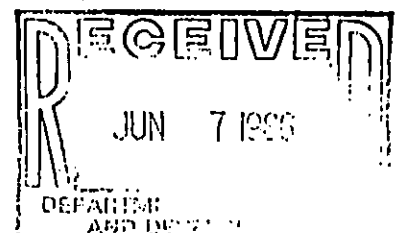


David P. Van Weele

DPVW/cjo

encl.

cc: Joseph Fernandez



RECEIVED  
JUN 18 1984  
DEPT. OF PLANNING  
AND DEVELOPMENT

OFFICE OF THE UNDERSIGNED  
401 Broad Hollow Road  
Melville, New York 11747

June 15, 1984

Mr. Wm. Rutowski  
Town of Islip  
Department of Planning, Housing & Development  
655 Main Street  
Islip, New York 11751

Dear Bill:

As per your request enclosed please find borings which we had done in Plander's Pit. I am also enclosing the "work logs" for a number of the borings.

Sincerely,

*Martin Eglow*  
Martin Eglow

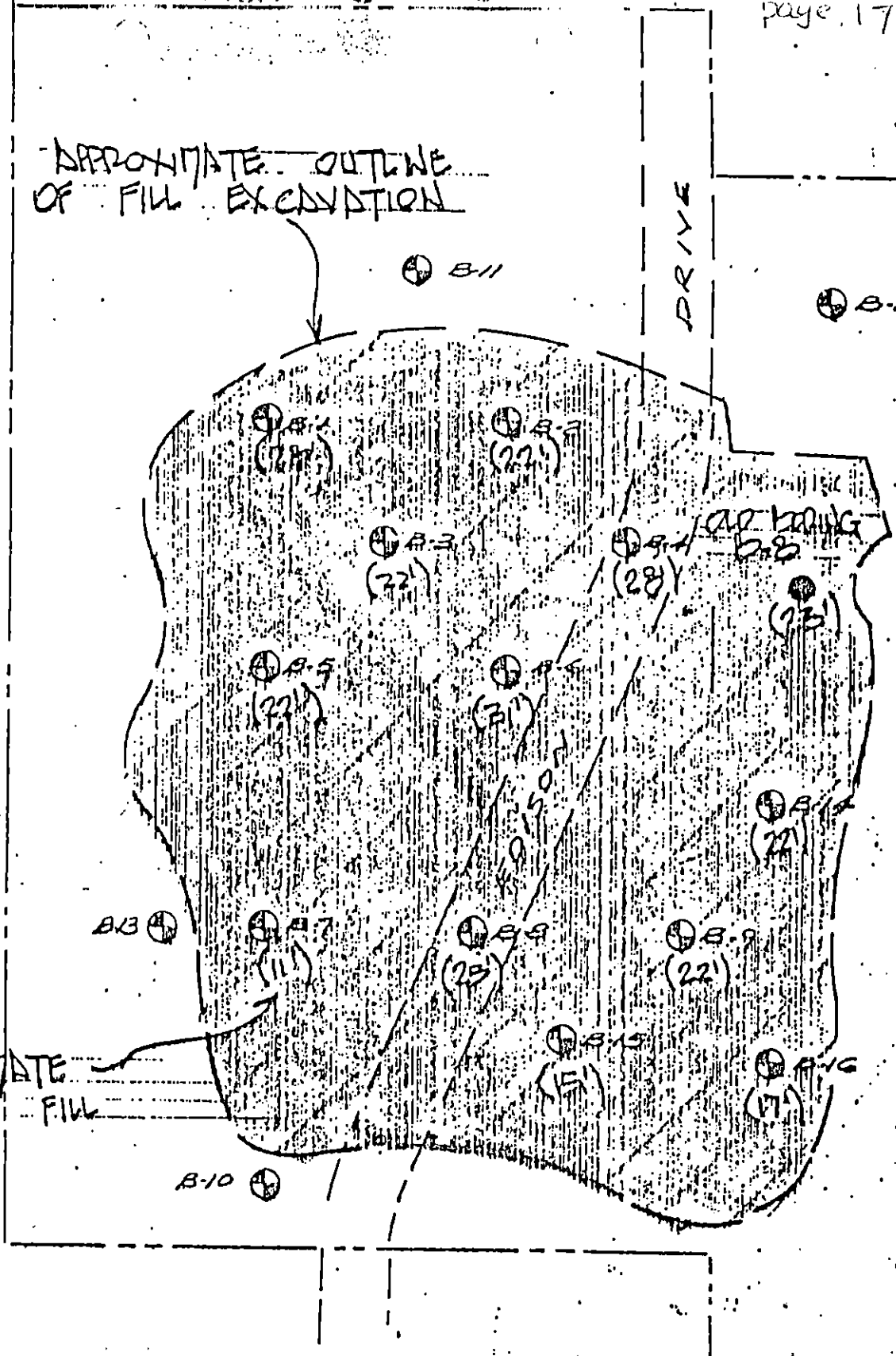
ME/fj  
enc.

*ALBERT ...*

RECEIVED  
JUN 7 1986  
DEPARTMENT  
AND DEVELOPMENT

APPROXIMATE OUTLINE  
OF FILL EXCAVATION

DRIVE



APPROXIMATE  
DEPTH OF FILL

BORING LOCATION PLAN

HAUPPAUGE, N.Y.

MAY 2-4, 1984

JOB NPB4-196

DRAWING NO 2

SUBSOIL INVESTIGATIONS

221-9333

3770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783

JOB LOCATION: Hauppauge		BORING #	1	GROUND WATER OBSERVATION			
DATE:				DATE	TIME	DEPTH	
DRILLER:							
INSPECTOR:							
ENGINEER:		SURFACE ELEVATION: 104.45					
TYPE RIG:							

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0		6	11				
	1	9	7				
	2	6	115				
		12	6				
	3	4	4				
5		3	5				
10							
	4	9	6		Sand, Silt, Gravel Misc, Wood (Fill) (11-65)		
		6					
15							
	5	2	1				
		3					
20							
	6	10	6				
		5					
25							
	7	5	6		Tan Sand Trace Gravel (Fill?) (SP)		
		6					
30							
	8	25	39		Tan Gravelly Sand (SP) (6-65)		
		47					
35							
	9	22	32				
		37	49				
40					END 37'		

BUBBOIL INVESTIGATIONS

3770 MERRICK ROAD • SEAFORD, L.I., NEW YORK 11783

JOB LOCATION: Hauppauge		<b>BORING # 2</b>	GROUND WATER OBSERVATION				
DATE: _____			DATE	TIME	DEPTH		
DRILLER: _____			Perched 17'				
INSPECTOR: _____			_____	_____	_____		
ENGINEER: _____		SURFACE ELEVATION: 107.34					
TYPE RIG: _____							
DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				

0							
	1	3	10		Sand, Silt, Gravel (Fill) (11-65)		
		17	20				
		18	17				
	2	12	10				
		9	7				
5	3	6	4				
10	4	3	4		Brick, Wood, Paper, Misc. Garbarage (Fill) (11-65)		
		5					
15	5	8	9				
		7					
20	6	8	10				
		15					
25	7	6	16		Brown Sand Trace Gravel (SP) (7-65)		#7 Slight Odor.
		22					
30	8	22	36		Tan Gravelly Sand (SP) (6-65)		
		27					
35	9	14	15		Tan Sand Trace Gravel (SP) (7-65)		
		16					
40	10	36	30		Tan Gravelly Sand (SP) (6-65)		
		34	33				
					END 42'		



**SUBSOIL INVESTIGATIONS**  
3770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783

JOB LOCATION: <b>Hauppauge</b>			<b>BORING # 4</b>	GROUND WATER OBSERVATION
DATE: _____				DATE      TIME      DEPTH
DRILLER: _____				_____
INSPECTOR: _____				_____
ENGINEER: _____				_____
TYPE RIG: _____			SURFACE ELEVATION: <b>106.70</b>	_____

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0		1	2				
1	1	16	36				
2	2	13	15				
3	3	16	17				
4	4	10	6				
5	5	7	5		Sand, Silt, Gravel Wood, Metal Chains (Fill) (11-65)		Samples #4, 5 Contaminated
6	6	5	6				
7	7	10					
8	8	4	4		Tan Sand Trace Gravel (Fill?) (SP)		
9	9	3					
10	10						
11	11						
12	12						
13	13						
14	14						
15	15						
16	16						
17	17						
18	18						
19	19						
20	20	19	22				
21	21	17					
22	22						
23	23						
24	24						
25	25	6	8		Tan Gravelly Sand (SP) (7-65)		
26	26	5					
27	27						
28	28						
29	29						
30	30						
31	31						
32	32						
33	33						
34	34						
35	35	27	55		Tan Gravelly Sand (SP) (6-65)		
36	36	50					
37	37						
38	38						
39	39						
40	40	29	47				
41	41	48	56				
42	42				END 42'		

SUBSOIL INVESTIGATIONS

3770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783

JOB LOCATION: Hauppauge	<b>BORING #</b>	5	GROUND WATER OBSERVATION	
DATE: _____			DATE	TIME
DRILLER: _____			_____	_____
INSPECTOR: _____			_____	_____
ENGINEER: _____	SURFACE ELEVATION: 104.60		_____	_____
TYPE RIG: _____			_____	_____

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0							
	1	4	6		Brown Sand Trace Silt Trace Gravel (Fill) (11-65)		
		12	21				
		24	22				
	2	11	15				
		10	7				
5	3	5	10				
					Sand, Silt, Gravel Wood, Misc. (Fill) (11-65)		
	4	4	3				
		4	7				
15	5	11	12				
		16	13				
					Brown Gravelly Sand Trace Silt (SP) (6-65)		
	7	16	22				
		24	21				
30	8	30	32		Tan Gravelly Sand (SP) (6-65)		
		42	38				
35	9	30	42				
		51	40				
					END 37'		
40							

JOB LOCATION: Hauppauge  
 DATE: \_\_\_\_\_  
 DRILLER: \_\_\_\_\_  
 INSPECTOR: \_\_\_\_\_  
 ENGINEER: \_\_\_\_\_  
 TYPE RIG: \_\_\_\_\_

BORING # 6

GROUND WATER OBSERVATION		
DATE	TIME	DEPTH
_____	_____	_____
_____	_____	_____
_____	_____	_____

SURFACE ELEVATION: 106.05

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6 ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0		2	3		Sand, Silt, Gravel (Fill) (11-65)		#4 EP Tox
1		6	6				
2		8	7				
		5	5				
5		5	5				
		15	20				
10		3	4		Sand, Silt, Wood Plastic, Glass, Paper Misc. (Fill) (11-65)		
		4					
15		2	12				
		6					
20		5	6				
		17					
25		16	57		Tan Gravelly Sand (SP) (6-65)		
		100	3"				
30		10	18				
		30					
35		21	26				
		33					
40		16	27				
		37	43				
					END 42'		

JOB LOCATION: Hauppauge

DATE: \_\_\_\_\_

DRILLER: \_\_\_\_\_

INSPECTOR: \_\_\_\_\_

ENGINEER: \_\_\_\_\_

TYPE RIG: \_\_\_\_\_

BORING # 7

GROUND DATE	WATER TIME	OBSERVATION DEPTH

SURFACE ELEVATION: 106.55

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0							
	1	6	15		Brown Silty Sand Trace Gravel (Fill) (11-65)		
		20	23				
		16	10				
	2	9	8				
5	3	5	3				
		3	4				
10	4	3	5				
		10					
					Tan Gravelly Sand (SP) (7-65)		
15	5	12	14				
		20					
20	6	10	15				
		21					
25	7	15	22				
		25	28				
					END 27'		
30							
35							
40							

SUBSOIL INVESTIGATIONS

3770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783

JOB LOCATION: Hauppauge		<b>BORING #</b>  8	GROUND WATER OBSERVATION		
DATE: _____			DATE	TIME	DEPTH
DRILLER: _____			_____	_____	-
INSPECTOR: _____			_____	_____	_____
ENGINEER: _____		SURFACE ELEVATION: 112.77			
TYPE RIG: _____		_____			

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0							
	1	2	3		Sand, Silt, Gravel (Fill) (11-65)		
		6	6				
	2	6	5				
		3	2				
5	3	1	1		Wood, Sand, Silt Misc. (Fill) (11-65)		
		2	7				
10	4	31	26				
		12	3				
15	5	9	5				
		8	13				
20	6	1	2				
		3	4				
25	7	8	13		Tan Sand Trace Gravel (SP) (8-65)		
		14	14				
					Tan Gravelly Sand (SP) (6-65)		
30	8	18	32				
		41	43				
35	9	28	45		END 37'		
		47	51				
40							

JOB LOCATION: Hauppauge		BORING # 9	GROUND WATER OBSERVATION		
DATE: _____			DATE	TIME	DEPTH
DRILLER: _____			_____	_____	_____
INSPECTOR: _____			_____	_____	_____
ENGINEER: _____		SURFACE ELEVATION: 113.05			_____
TYPE RIG: _____		_____			_____

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0	1	2	5		Sand, Silt, Gravel (Fill) (11-65)		
		11	15				
	2	18	13				
		10	11				
5	3	7	4				#5 EP Tox
		5	12				
					Sand, Silt, Gravel Wood, Metal, Rags Plastic Misc. (Fill) (11-65)		
10	4	3	3				
		2					
15	5	3	5				
		3					
20	6	9	10				
		9					
					Tan Sand Trace Gravel (SP) (7-65)		
25	7	16	33				
		43					
30	8	14	24				
		23					
					Tan Gravelly Sand (SP) (6-65)		
35	9	82	75				
		36					
40	10	27	52				
		38	48				
					END 42'		

SOIL INVESTIGATIONS  
 3770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783

JOB LOCATION: <b>Hauppauge</b>  DATE: _____ DRILLER: _____ INSPECTOR: _____ ENGINEER: _____ TYPE RIG: _____	<b>BORING #</b> 10	<b>GROUND WATER OBSERVATION</b> DATE      TIME      DEPTH _____ _____ _____
SURFACE ELEVATION:      124.05		

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0							
	1	1	2		Tan Sand Trace Gravel (SP) (8-65)		
		6	11				
	2	16	17				
		19	20				
		19	20				
5	3	16	17				
10	4	14	16		Tan Sand Trace Gravel (SP) (7-65)		
		19					
15	5	12	16				
		18					
20	6	10	17				
		21					
25	7	11	19				
		23	19				
30					END 27'		
35							
40							

**SUBSOIL INVESTIGATIONS**  
 3770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783

<b>JOB LOCATION:</b> Hauppauge	<b>BORING #</b> 11	<b>GROUND WATER OBSERVATION</b> DATE _____ TIME _____ DEPTH _____
<b>DATE:</b> _____		_____
<b>DRILLER:</b> _____		_____
<b>INSPECTOR:</b> _____		_____
<b>ENGINEER:</b> _____		_____
<b>TYPE RIG:</b> _____	<b>SURFACE ELEVATION:</b> 103.11	_____

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0							
	1	1	1		Brown Silty Sand Trace Gravel (Fill) (11-65)		
		1	2				
	2	2	2		Tan Gravelly Sand (SP) (7-65)		
		7	5				
5	3	12	16				
		22	28				
					Tan Gravelly Sand (SP) (6-65)		
10	4	26	75				
		28					
					END 22'		
15	5	13	17				
		19					
					Tan Gravelly Sand (SP) (6-65)		
20	6	23	28				
		27	29				
					END 22'		
25							
					END 22'		
30							
					END 22'		
35							
					END 22'		
40							

BUBBOIL INVESTIGATIONS

5 J MERRICK ROAD SEAFORD, L. I., NEW YORK 11783

JOB LOCATION: <b>Hauppauge</b>		<b>BORING #</b>  12	GROUND WATER OBSERVATION		
DATE:	DRILLER:		INSPECTOR:	ENGINEER:	TYPE RIG:
SURFACE ELEVATION: 113.41					

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0	1	4	13		Brown Silty Sand Trace Gravel (Fill)		
		15	18				
	2	18	11		Tan Gravelly Sand (SP) (8-65)		
		8	8				
5	3	8	8		Tan Gravelly Sand (SP) (7-65)		
		9	12				
					Tan Gravelly Sand (SP) (6-65)		
10	4	8	15				
		21	27		Tan Gravelly Sand (SP) (6-65)		
15	5	10	14		END 22'		
		21	29				
					END 22'		
20	6	14	19				
		27	32		END 22'		
25					END 22'		
30					END 22'		
35					END 22'		
40					END 22'		

SUBSOIL INVESTIGATIONS

3770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783

JOB LOCATION:		BORING #	13	GROUND WATER OBSERVATION		
Hauppauge				DATE	TIME	DEPTH
DATE:				_____	_____	---
DRILLER:				_____	_____	_____
INSPECTOR:				_____	_____	_____
ENGINEER:		SURFACE ELEVATION: 106.50				
TYPE RIG:						

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0							
	1	1	2		Tan Sand Trace Gravel Trace Silt (Fill) (11-65)		
		3	5				
	2	4	5		Tan Gravelly Sand (SP) (7-65)		
		5	4				
5	3	5	14		Tan Gravelly Sand (SP) (6-65)		
		16	27				
					Tan Gravelly Sand (SP) (6-65)		
	4	18	28				
					Tan Gravelly Sand (SP) (6-65)		
		25	27				
15	5	13	28		END 22'		
		26	28				
20	6	20	29		END 22'		
		26	28				
25					END 22'		
30					END 22'		
35					END 22'		
40					END 22'		

SUBSOIL INVESTIGATIONS  
 5770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783

<b>JOB LOCATION:</b> Hauppauge	<b>BORING #</b> 14	<b>GROUND WATER OBSERVATION</b> DATE _____ TIME _____ DEPTH _____
<b>DATE:</b> _____	<b>SURFACE ELEVATION:</b> 115.23	_____
<b>DRILLER:</b> _____		_____
<b>INSPECTOR:</b> _____		_____
<b>ENGINEER:</b> _____		_____
<b>TYPE RIG:</b> _____		_____

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0							
	1	5	13		Sand, Silt, Gravel, Wood, Paper, Miscellaneous (Fill) (11-65)		#5 EP TOX
		11	10				
	2	7	5				
		6	5				
5	3	9	14				
		16	15				
10	4	7	4				
		9	6				
15	5	8	9		Tan Gravelly Sand (SP) (6-65)		
		10	8				
20	6	36	34				
		29	38				
25	7	17	25				
		28	32				
30	8	18	29		END 37'		
		30	32				
35	9	16	29				
		34	37				
40							

BUDBOIL INVESTIGATIONS

3770 MERRICK ROAD • SEAFORD, L. I., NEW YORK 11783

OB LOCATION: Hauppauge	BORING # 15	GROUND WATER OBSERVATION DATE                  TIME                  DEPTH _____                  _____                  -- _____                  _____                  _____ _____                  _____                  _____
DATE: DRILLER: INSPECTOR: ENGINEER: TYPE RIG:	SURFACE ELEVATION: 111.57	

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				

0		2	13		Brown Silty Sand Trace Gravel (Fill) (11-65)		#3 EP TOX	
	1	10	6					
		5	6		Sand, Silt, Paper, Miscellaneous (Fill) (11-65)			
	2	5	4					
- 5		9	2		Sand, Silt, Paper, Miscellaneous (Fill) (11-65)			
	3	4	1					
		8	6		Tan Gravelly Sand (SP) (6-65)			
	4	4	8					
		12	19			Tan Gravelly Sand (SP) (6-65)		
	5	27	26					
		15	36			Tan Gravelly Sand (SP) (6-65)		
	6	28	29					
		15	48			Tan Gravelly Sand (SP) (6-65)		
	7	37	45					
						END 27'		
- 30								
- 35								
- 40								

JOB LOCATION: Hauppauge		BORING # 16	GROUND WATER OBSERVATION	
DATE:	DRILLER:		DATE	TIME
INSPECTOR:	ENGINEER:	SURFACE ELEVATION: 112.90	Perched 8'-4"	
TYPE RIG:				

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER		CASING BLOWS PER FT.	DESCRIPTION	SYMBOL	REMARKS
		0-6	6-12				
0							
	1	3	9		Sand, Gravel (Fill) (11-65)		#5 EP TOX
		14	16				
	2	10	12		Sand, Silt, Gravel, Wood, Metal, Miscellaneous (Fill) (11-65)		
		9	8				
5	3	6	3		Sand, Silt, Gravel, Wood, Metal, Miscellaneous (Fill) (11-65)		
		3	4				
					Sand, Silt, Gravel, Wood, Metal, Miscellaneous (Fill) (11-65)		
	4	8	4				
		9	6		Sand, Silt, Gravel, Wood, Metal, Miscellaneous (Fill) (11-65)		
15	5	9	7		Sand, Silt, Gravel, Wood, Metal, Miscellaneous (Fill) (11-65)		
		16	10				
					Sand, Silt, Gravel, Wood, Metal, Miscellaneous (Fill) (11-65)		
	6	20	29				
		32	27		Sand, Silt, Gravel, Wood, Metal, Miscellaneous (Fill) (11-65)		
25	7	17	32		Tan Gravelly Sand (SP) (6-65)		
		34	30				
					Tan Gravelly Sand (SP) (6-65)		
	8	18	32				
		29	30		Tan Gravelly Sand (SP) (6-65)		
35	9	17	27		Tan Gravelly Sand (SP) (6-65)		
		38	31				
					Tan Gravelly Sand (SP) (6-65)		
40					END 37'		

REFERENCE NO. 4

1

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# **Uncontrolled Hazardous Waste Site Ranking System**

Page 1

## **A Users Manual (HW-10)**

**Originally Published in  
the July 16, 1982, *Federal Register***

**United States  
Environmental Protection  
Agency**

**1984**



Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Asheville, N.C., 1979.

**FIGURE 5**  
**NORMAL ANNUAL TOTAL PRECIPITATION**  
**(INCHES)**

793

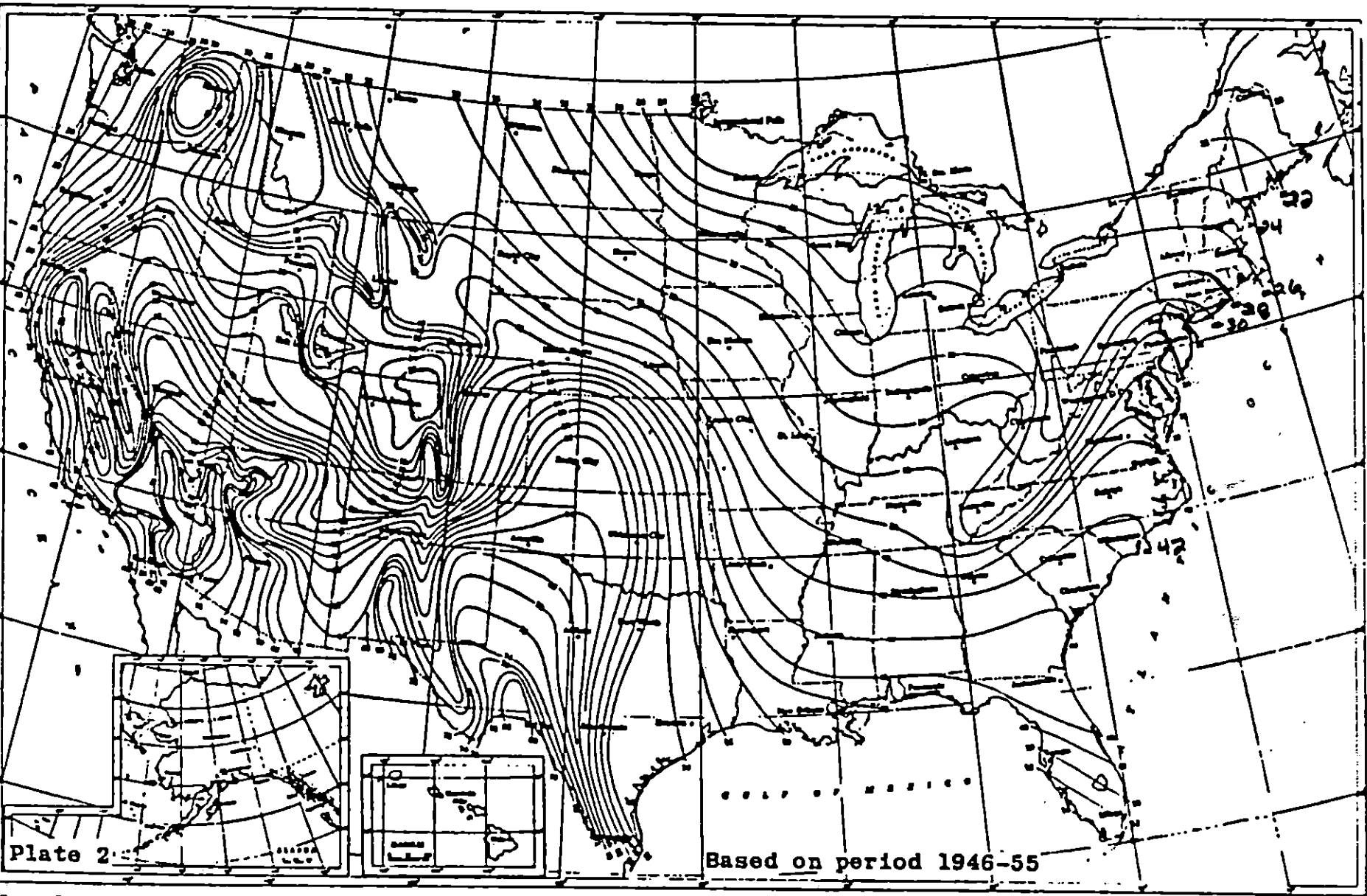


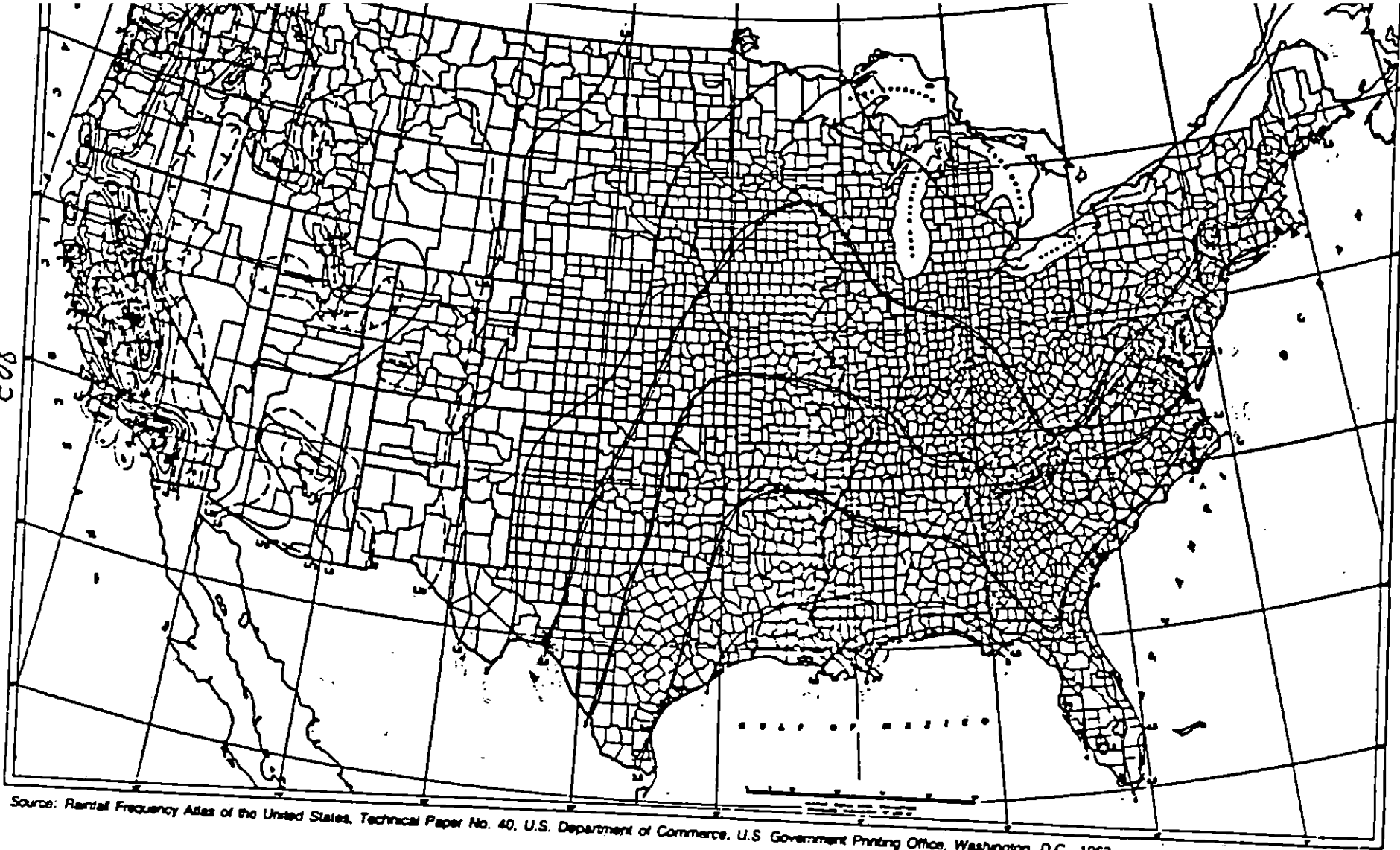
Plate 2

Based on period 1946-55

Source: Climatic Atlas of the United States. U.S. Department of Commerce, National Climatic Center, Asheville, N.C., 1979.

**FIGURE 4**  
**MEAN ANNUAL LAKE EVAPORATION**  
**(IN INCHES)**

792



802

Source: Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1963.

**FIGURE 8  
1-YEAR 24-HOUR RAINFALL  
(INCHES)**

Com  
Sou  
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Sou  
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Diki

As  
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TABLE 2  
PERMEABILITY OF GEOLOGIC MATERIALS\*

Type of Material	Approximate Range of Hydraulic Conductivity	Assigned Value
Clay, compact till, shale; unfractured metamorphic and igneous rocks	$<10^{-7}$ cm/sec	0
Silt, loess, silty clays, silty loams, clay loams; less permeable limestone, dolomites, and sandstone; moderately permeable till	$10^{-5} - 10^{-7}$ cm/sec	1
Fine sand and silty sand; sandy loams; loamy sands; moderately permeable limestone, dolomites, and sandstone (no karst); moderately fractured igneous and metamorphic rocks, some coarse till	$10^{-3} - 10^{-5}$ cm/sec	2
Gravel, sand; highly fractured igneous and metamorphic rocks; permeable basalt and lavas; karst limestone and dolomite	$>10^{-3}$ cm/sec	3

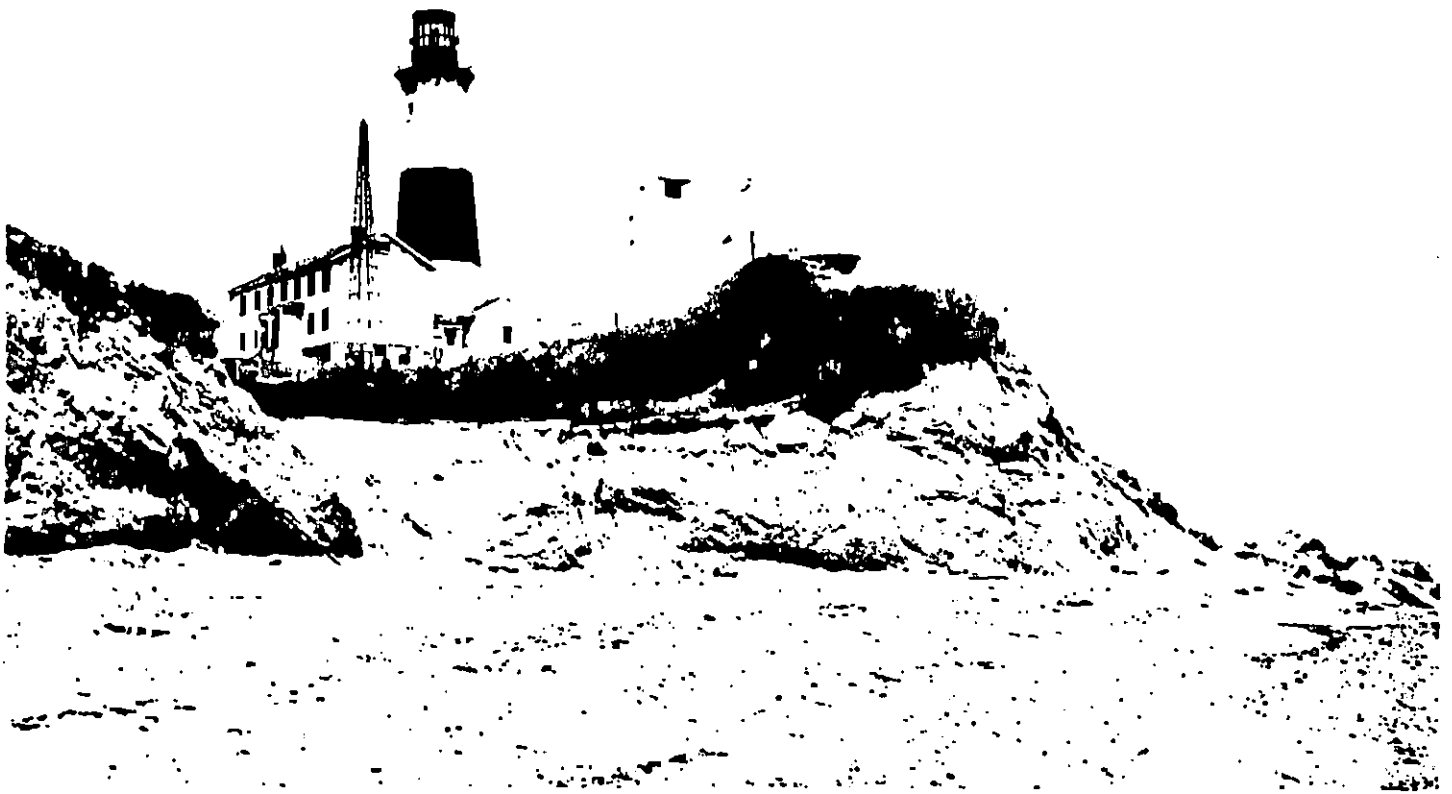
\*Derived from:

Davis, S. N., Porosity and Permeability of Natural Materials in Flow-Through Porous Media, R.J.M. DeWitt ed., Academic Press, New York, 1969

Freeze, R.A. and J.A. Cherry, Groundwater, Prentice-Hall, Inc., New York, 1979

REFERENCE NO. 5

SOIL SURVEY OF  
**Suffolk County, New York**



**SUFFOLK COUNTY SOIL & WATER  
CONSERVATION DISTRICT**

Person's Plaza  
134 Old Country Road, Route 58  
Riverhead, N.Y. 11901  
Phone: 516-727-2315



**United States Department of Agriculture  
Soil Conservation Service**  
in cooperation with  
**Cornell Agricultural Experiment Station**



SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, or E, shows the slope. Most symbols without a slope letter are those of nearly level soils but some are for land types that have a considerable range of slope. A final number, 3, in the symbol shows that the soil is eroded.

SYMBOL	NAME
At	Atsion sand
Bc	Beaches
Bd	Berryland mucky sand
BgA	Bridgehampton silt loam, 0 to 2 percent slopes
BgB	Bridgehampton silt loam, 2 to 6 percent slopes
BhB	Bridgehampton silt loam, till substratum, 2 to 6 percent slopes
BhC	Bridgehampton silt loam, till substratum, 6 to 12 percent slopes
Bm	Bridgehampton silt loam, graded
Ca	Canadice silt loam
CpA	Carver and Plymouth sands, 0 to 3 percent slopes
CpC	Carver and Plymouth sands, 3 to 15 percent slopes
CpE	Carver and Plymouth sands, 15 to 35 percent slopes
CuB	Cut and fill land, gently sloping
CuC	Cut and fill land, sloping
CuE	Cut and fill land, steep
De	Deerfield sand
Du	Dune land
Es	Escarpments
Fd	Fill land, dredged material
Fs	Fill land, sandy
Gp	Gravel pits
HaA	Haven loam, 0 to 2 percent slopes
HaB	Haven loam, 2 to 6 percent slopes
HaC	Haven loam, 6 to 12 percent slopes
He	Haven loam, thick surface layer
Ma	Made land
MfA	Montauk fine sandy loam, 0 to 3 percent slopes
MfB	Montauk fine sandy loam, 3 to 8 percent slopes
MfC	Montauk fine sandy loam, 8 to 15 percent slopes
MkA	Montauk silt loam, 0 to 3 percent slopes
MkB	Montauk silt loam, 3 to 8 percent slopes
MkC	Montauk silt loam, 8 to 15 percent slopes
MiB	Montauk soils, graded, 0 to 8 percent slopes
MiC	Montauk soils, graded, 8 to 15 percent slopes
MnA	Montauk loamy sand, sandy variant, 0 to 3 percent slopes
MnB	Montauk loamy sand, sandy variant, 3 to 8 percent slopes
MnC	Montauk loamy sand, sandy variant, 8 to 15 percent slopes
MnE	Montauk loamy sand, sandy variant, 15 to 35 percent slopes
Mu	Muck
PIA	Plymouth loamy sand, 0 to 3 percent slopes
PIB	Plymouth loamy sand, 3 to 8 percent slopes
PIC	Plymouth loamy sand, 8 to 15 percent slopes
PmB3	Plymouth gravelly loamy sand, 3 to 8 percent slopes, eroded
PmC3	Plymouth gravelly loamy sand, 8 to 15 percent slopes, eroded
PsA	Plymouth loamy sand, silty substratum, 0 to 3 percent slopes
PsB	Plymouth loamy sand, silty substratum, 3 to 8 percent slopes
Ra	Raynham loam
Rc	Recharge basin
RdA	Riverhead sandy loam, 0 to 3 percent slopes
RdB	Riverhead sandy loam, 3 to 8 percent slopes
RdC	Riverhead sandy loam, 8 to 15 percent slopes
ReB	Riverhead very stony sandy loam, 3 to 8 percent slopes
ReC	Riverhead very stony sandy loam, 8 to 15 percent slopes
RhB	Riverhead and Haven soils, graded, 0 to 8 percent slopes
RhC	Riverhead and Haven soils, graded, 8 to 15 percent slopes
RpE	Riverhead and Plymouth very bouldery soils, 15 to 35 percent slopes
ScB	Scio silt loam, till substratum, 2 to 6 percent slopes
SdA	Scio silt loam, sandy substratum, 0 to 2 percent slopes
SdB	Scio silt loam, sandy substratum, 2 to 6 percent slopes
Su	Sudbury sandy loam
Tm	Tidal marsh
Ur	Urban land
Wa	Wallington silt loam, till substratum
Wd	Walpole sandy loam
We	Wareham loamy sand
Wh	Whitman sandy loam

WORKS

Highways and roads
Divided .....
Good motor .....
Poor motor .....
Trail .....
Highway markers
National Interstate
U. S. ....
State or county ..
Railroads
Single track .....
Multiple track ....
Abandoned .....
Bridges and crossings
Road .....
Trail .....
Railroad .....
Ferry .....
Ford .....
Grade .....
R. R. over .....
R. R. under .....
Buildings .....
School .....
Church .....
Mine and quarry ....
Gravel pit .....
Power line .....
Pipeline .....
Cemetery .....
Dams .....
Levee .....
Recharge basin .....
Well, oil or gas .....
Forest fire or lookout
Windmill .....
Located object .....

ayers in such areas are thicker than those in the profile described.

Fill land, sandy is mostly along the waterfront and is used as building sites. It is not suited to most other uses. On-site investigation is needed to determine the suitability of individual areas for building sites. Because of thoughtlessness on thicker fills and low fertility of most fill material, limitations are severe on this land type for establishing and maintaining lawns and landscaping. Ground water pollution is a hazard where thinner fills provide little or no filter material between the bottoms of cesspools and the water table. Capability unit not assigned; woodland suitability group not assigned.

### Gravel Pits

Gravel pits (Gp) are open excavations that have been made for the purpose of mining sand and gravel. These pits range in depth from 8 or 10 feet to more than 100 feet. The sides of the pits generally are left nearly vertical, and the bottoms are level.

Abandoned pits are not suited to farming. Most of these areas are in a cover of native vegetation. Houses have been built in some of the larger pits. Capability unit not assigned; woodland suitability group not assigned.

### Haven Series

The Haven series consists of deep, well-drained, medium-textured soils that formed in a loamy or silty mantle over stratified coarse sand and gravel. These soils are present throughout the county, but most areas are on outwash plains between the two terminal moraines. Slopes range from 0 to 12 percent, but they generally are 1 to 6 percent. Native vegetation consists of black oak, white oak, red oak, scrub oaks, and pitch pine.

In a representative profile a thin layer of leaf litter and decomposed organic matter is on the surface in wooded areas. Below this is the surface layer of dark grayish-brown loam about 3 inches thick. In cultivated areas the surface layer is mixed with the material formerly in the upper part of the subsoil, and a plow layer of brown or dark-brown loam, about 10 inches thick, is present. The subsoil is dark-brown to strong-brown, friable loam to a depth of about 19 inches. The lower part, to a depth of 28 inches, is yellowish-brown, friable gravelly loam. The substratum, to a depth of 55 inches, is yellowish-brown to brownish-yellow loose sand and gravel.

Haven soils have high to moderate available moisture capacity. Reaction is strongly acid to very strongly acid throughout. Natural fertility is low. The response of crops to lime and fertilizer is good. Internal drainage is good. Permeability is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. The A zone is 25 to 35 inches thick.

Representative profile of Haven loam, 0 to 2 percent slopes, in a wooded area, on Gerrard Road, 1½ miles north of Sunrise Highway in Brookhaven:

- O1—3½ to 1½ inches, loose pine needles, leaves, and twigs.
- O2—1½ inches to 0, black (5YR 2/1) humified organic material.

- A1—0 to 3 inches, dark grayish-brown (10YR 4/2) loam; weak, fine and medium, granular structure; friable; many fine and coarse roots; many pores; very strongly acid; abrupt, smooth boundary.
- B21—3 to 10 inches, brown to dark-brown (7.5YR 4/4) loam; weak, fine and medium, subangular blocky structure; friable; common roots; many pores; a few root channels filled with dark grayish-brown loam; very strongly acid; clear, wavy boundary.
- B22—10 to 19 inches, strong-brown (7.5YR 5/6) loam; weak, fine and medium, subangular blocky structure; friable; common roots; many pores; 5 percent gravel ¼ to ½ inch in diameter; very strongly acid; gradual, wavy boundary.
- B23—19 to 28 inches, yellowish-brown (10YR 5/6) gravelly loam; weak, medium and fine, subangular blocky structure; friable; a few fine roots; 20 percent fine gravel; very strongly acid; abrupt, wavy boundary.
- IIC—28 to 55 inches, yellowish-brown (10YR 5/4) to brownish-yellow (10YR 6/6) gravelly sand; single grain; loose; 30 percent gravel ¼ to 1 inch diameter; very strongly acid.

Depth to strongly contrasting sand and gravel ranges from 18 to 36 inches, depending on the thickness of the solum. The content of gravel ranges from 2 to 15 percent in all horizons above any B23 or IIB3 horizons that are present. Reaction is strongly acid or very strongly acid throughout.

In the Ap horizon color ranges from very dark grayish brown (10YR 3/2) to brown or dark brown (10YR 4/3). In the A1 horizon color ranges from dark grayish brown (10YR 4/2) to black (10YR 2/1). The Ap horizon has weak or moderate granular structure. It commonly has a firm, platy plowpan in the lower part. If a plowpan is present in the Ap horizon, the material above the plowpan is friable or very friable. The Ap horizon is 8 to 12 inches thick. In places accumulated A horizons range from 12 to 30 inches in thickness.

In the B21 and B22 horizons color ranges from brown or dark brown (7.5YR 4/4) to light olive brown (2.5Y 5/6). The texture of these horizons ranges from very fine sandy loam to silt loam. It is massive or structure is weak, subangular blocky. Consistence is very friable or friable. Where a B23 horizon is present, it has the same range of characteristics as the B21 and B22 horizons, except that the content of gravel ranges from 15 to 35 percent.

In the strongly contrasting IIC horizon, color ranges from yellowish brown (10YR 5/4) to olive yellow (2.5Y 6/6). This horizon is coarse or medium sand, and typically is stratified. The content of gravel is 10 to 50 percent.

In places is a transitional B3 or IIB3 horizon that ranges from sandy loam to gravelly sand in texture. It is 2 to 5 inches thick. The content of coarse fragments in this horizon ranges from 1 to 20 percent.

Haven soils are near Riverhead, Scio, Bridgehampton, and Montauk soils. Haven soils are similar to Riverhead soils, but they have less sand in the B2 horizon. They are similar to Scio soils, but lack the colors that indicate wetness in those soils. They are similar to Bridgehampton soils, but have a thinner solum, are less silty, and lack the bisqueum color profile of the Bridgehampton soils. They are similar to Montauk soils, but lack the fragipan and the till substratum typical of those soils.

**Haven loam, 0 to 2 percent slopes (HoA).**—This soil has the profile described as representative of the series. It is mostly nearly level and generally is on outwash plains. Some areas of this soil are on moraines and generally are on the top of low-lying hills. Some of these areas are slightly undulating. Most areas of this soil are large, but on moraines the areas are smaller and are irregular in shape.

Included with this soil in mapping are small areas of Scio soils and some crescent-shaped, gravelly areas. Also included are soils that have a moderately coarse textured surface layer and a medium-textured subsoil. In many areas of this soil that are mapped in association with

## SOIL SURVEY

Bridgehampton soils, the soil is deeper and siltier than that described as representative of the series. Bridgehampton soils generally are included in mapping in these areas. Also included, on moraines, are areas of Montauk soils that have a very weak fragipan. Montauk soils formed in loose, sandy till.

The hazard of erosion is slight on this Haven soil. Primary management concerns are keeping the soil from crusting after rain, maintaining tilth, and reducing the plowpan.

This soil is used extensively for crops, and it is well suited to all crops commonly grown in the county. Potatoes are the main crop, but cauliflower, cabbage, corn, onion, and sod crops are also grown. Because of the nearly level slope and ease of excavation, most areas of this soil in the western part of the county are being used for housing developments and industrial parks. Capability unit I-1; woodland suitability group 3o1.

**Haven loam, 2 to 6 percent slopes (HoB).**—This soil is on outwash plains and moraines, commonly along shallow, intermittent drainage channels. Slopes are short. In larger areas this soil is mostly undulating. Most areas of this soil are smaller than the areas of Haven loam, 0 to 2 percent slopes.

In cultivated areas this soil is 2 or 3 inches shallower than the soil described as representative of the series, and it contains a larger amount of gravel. Otherwise the two profiles are similar.

Included with this soil in mapping are small areas of overhead and Bridgehampton soils, some of which are a complex pattern with the dominant Haven soil. These included soils generally are in the larger areas of this soil. Also included are Montauk silt loams that have a very weak fragipan. In places areas of this soil that are mapped near Montauk soils have layers of till deep in the substratum. Also included are areas along the bottom of narrow drainage channels that have a silty surface layer that is thicker than that in the profile described.

The hazard of erosion is moderate to slight on this Haven soil. Management concerns are controlling runoff from erosion and keeping the surface loose and free from crusting.

This soil is well suited to all crops commonly grown in the county. It generally is farmed the same as adjoining areas of nearly level soils. Crops commonly grown are potatoes, cauliflower, cabbage, and corn. Most areas in the western part of the county are used for housing developments. Capability unit IIe-1; woodland suitability group 3o1.

**Haven loam, 6 to 12 percent slopes (HaC).**—This soil is on moraines where slopes generally are complex or on short side slopes along drainage channels. Areas on moraines are large and are irregular in shape. Areas on alluvial plains are long and narrow and follow drainage channels that cut into the plains.

The profile of this soil is similar to that of the soil described as representative of the series, except that in cultivated areas this soil is 5 or 6 inches shallower than the soil described as representative of the series, and it contains a larger amount of sand and gravel and contains

these areas are north of Scuttlehole Road and Millstone Road in Southhampton. Also included are narrow areas of Haven soils that have a thick surface layer. These areas are along the bottom of intermittent drainage channels. Included on moraines are small areas of Riverhead soils that are in a complex with the dominant Haven soils or have textures that are transitional. Montauk silt loams that have a very weakly expressed fragipan are also included. In places, in areas that are mapped adjacent to Montauk soils, this Haven soil has layers of till deep in the substratum.

The hazard of erosion is moderate to severe on this Haven soil. In places small gravelly areas limit the growing and harvesting of some truck crops.

This soil is suited to potatoes and to most crops commonly grown in the county, but only a small acreage is in potatoes. This soil is better suited to hand-harvested crops or to crops that can be planted and harvested by small machines. Some areas are used for crops, but most areas that were formerly cultivated have now reverted to grass or brush. In the western part of the county, most areas adjoining large residential areas of less sloping soils are being used as homesites. Capability unit IIIe-2; woodland suitability group 3o1.

**Haven loam, thick surface layer (Ho).**—This soil is mainly on outwash plains throughout the county. It occupies the bottom of the larger drainage channels or closed depressions where silty material has accumulated from surrounding areas. Slope is less than 3 percent. Areas of this soil generally are quite small. They are mostly long and narrow, but in closed depressions the areas are nearly round.

This soil has the profile described as representative of the series, except that the content of organic matter in the surface layer increases with depth, and the surface layer ranges from about 12 to 30 inches in thickness. Also, in most places the surface layer contains more silt than the soil described as representative of the series, and in some places the subsoil is loam or silt loam.

Included with this soil in mapping are small areas of soils that have a surface layer less than 1 foot thick or more than 2½ feet thick. These included soils are on the same landform and in close association with this soil. Also included are small areas of Scio soils, on the wetter sites, and areas of coarser textured soils that have thick accumulations on the surface. Areas of somewhat poorly drained or wetter soils are shown on the map by the conventional symbol for wet spots.

The hazard of erosion is slight on this Haven soil, except where the soil receives large amounts of water from adjoining sloping soils. Summer crops in closed depressions are damaged if heavy rain falls during the growing season.

Most areas of this soil are well adapted to most crops commonly grown in the county. In closed depressions, however, wheat and rye are frequently damaged by ponding. Areas of this soil generally are used along with adjoining areas of

These differences do not seriously alter their usefulness and behavior.

Raynham soils are associated with Scio and Walpole soils. They are similar to Scio soils in texture, but they have a higher seasonal water table and are more poorly drained, as indicated by the grayer color in the solum. Also, Raynham soils lack the till substratum of some of the Scio soils, and they are thicker over sand and gravel than the sandy substratum phase of Scio soils. The B horizon of Raynham soils contains more silt and very fine sand than that of Walpole soils. Although Raynham soils are not associated with Wallington soils, the two are similar, but Raynham soils lack the ragipan and the compact till substratum of Wallington soils.

**Raynham loam (Ro).**—This is the only Raynham soil mapped in the county. This nearly level soil is in low-lying areas beside marshes and creeks. In many places it is a transition between poorly drained areas and well drained areas on uplands. It is on outwash plains and moraines. Areas generally are small and irregular.

Included with this soil in mapping are wet spots of silt loam soils and a very poorly drained silt loam soil. Included are soils that have a water table at a similar depth as Raynham soils, but they lack the gray color of Raynham soils, have a slightly coarser subsoil, and sand and gravel below a depth of 30 inches.

The hazard of erosion is slight on this Raynham soil. This soil is used for farming, artificial drainage is needed.

This soil is not well suited to crops commonly grown in the county unless it is artificially drained. Because of its position on the landscape, it is difficult to locate adequate drainage outlets. Near Southhampton, small areas of this soil were formerly cleared and used for crops, but most of these areas are idle and are in brush. Most of the other areas of this soil are wooded. This soil is better suited to woodland and to recreational areas than to other uses. In places, areas of this soil have been filled and used as homesites. As demand for building lots increases, more areas will be filled for use as building lots. Capability unit IIIw-1; woodland suitability p 4w1.

### Recharge Basin

A recharge basin (Rc) is made up of basins that vary in size or of dugouts that have been dug into a porous sand and gravel substratum. These basins provide for the disposal of surface water by acting as catchments and by allowing the water to infiltrate the sand and gravel and to recharge the ground water supply. Recharge basins are used to catch runoff from areas such as highways (fig. 13), parking developments, or parking lots.

Small basins less than 2 acres in size are indicated on the detailed map by a spot symbol, and basins larger than 2 acres are delineated and identified by the symbol for a recharge basin. Capability unit not assigned; woodland suitability p not assigned.

### Riverhead Series

The Riverhead series consists of deep, well-drained, moderately coarse textured soils that formed in a mantle of sandy loam or fine sandy loam over thick layers of sand and gravel. These soils occur throughout the county in rolling to steep areas on moraines and in level to gently sloping areas on outwash plains. These soils

range from nearly level to steep; however, they generally are nearly level to gently sloping. Native vegetation consists of black oak, white oak, red oak, and scrub oak.

In a representative profile the surface layer is brown to dark brown sandy loam about 12 inches thick. The upper part of the subsoil, to a depth of about 27 inches, is strong-brown, friable sandy loam. The lower part of the subsoil is yellowish-brown, very friable loamy sand to a depth of about 32 inches. Below is yellowish-brown, friable gravelly loamy sand to a depth of about 35 inches. The substratum is very pale brown and brown loose sand and gravel or sand to a depth of 65 inches.

Riverhead soils have moderate to high available moisture capacity. Internal drainage is good. Permeability is moderately rapid in the surface layer and in the subsoil and very rapid in the substratum. Natural fertility is low. Reaction is strongly acid to very strongly acid throughout. The response of crops to lime and fertilizer is good. The root zone is mainly in the upper 25 to 35 inches. In many places where these soils have been farmed, a plowpan is in the lower part of the surface layer and in the upper part of the subsoil.

Representative profile of Riverhead sandy loam, 0 to 3 percent slopes, 0.9 mile south of State Route 25, 0.3 mile north of junction of County Road 21 and Longwood Road in Brookhaven, "Camp Wilderness, Boy Scouts of America":

- Ap—0 to 12 inches, brown to dark-brown (10YR 4/3) sandy loam; weak, fine, granular structure; friable; many fine roots in upper part; moderate to strong, platy, firm plowpan in lower 4 inches; strongly acid; abrupt, smooth boundary.
- B2—12 to 27 inches, strong-brown (7.5YR 5/6) sandy loam; very weak, medium, subangular blocky structure that parts to weak, fine granular; friable; a few fine roots; many fine pores; less than 5 percent gravel; strongly acid; clear, wavy boundary.
- B31—27 to 32 inches, yellowish-brown (10YR 5/4) loamy sand; very weak, fine, granular structure; very friable; a few fine roots; 10 percent gravel; strongly acid; abrupt, smooth boundary.
- IIB32—32 to 35 inches, yellowish-brown (10YR 5/4) gravelly loamy sand; massive; friable; a few fine roots; 30 percent gravel; strongly acid; abrupt, smooth boundary.
- IIIC1—35 to 40 inches, brown to dark-brown (7.5YR 4/4) sand; single grain; loose; 10 percent fine gravel; strongly acid; abrupt, smooth boundary.
- IIIC2—40 to 65 inches, very pale brown (10YR 7/4) coarse and medium sand that contains 2-inch layers of gravel, 8 to 24 inches apart; single grain; loose; strongly acid.

The solum ranges from 22 to 36 inches in thickness. It corresponds in depth to the upper boundary of the underlying coarse sand and gravel. The content of gravel or stones ranges from 2 to 15 percent, by volume, in the upper part of the solum and from 5 to 35 percent in the substratum. The content of gravel in the solum is higher in soils that have a thin solum. In places the solum is more than 30 inches thick, and streaks and pockets of olive-gray colors are present immediately above the sand or sand and gravel substratum. Reaction ranges from strongly acid to very strongly acid throughout.

In places these soils have an Ap horizon that ranges from very dark grayish brown (10YR 3/2) to brown or dark brown (10YR 4/3). The A1 horizon ranges from black (10YR 2/1) to dark grayish brown (10YR 4/2).

The B horizon ranges from brown or dark brown (7.5YR 4/4) to light olive brown (2.5Y 5/6). Texture is dominantly sandy loam, but it ranges to fine sandy loam. Structure is massive, or very weak subangular blocky. Consistence ranges from friable to very friable.

used for housing developments and industrial parks. Ability unit II-1; woodland suitability group 3o1. **Riverhead sandy loam, 3 to 8 percent slopes (RdB).**—This soil is on moraines and outwash plains. It generally occurs in areas along shallow, intermittent drainageways. Slopes generally are moderately short, but large areas on moraines are undulating.

The profile of this soil is similar to the one described as representative of the series, though in cultivated areas this soil is likely to be 2 to 3 inches shallower to receive sand and gravel, and the surface layer is likely to contain a slightly larger amount of gravel.

Included with this soil in mapping are small areas of Bridgehampton, Haven, and Plymouth soils in a complex pattern. The texture of these soils is marginal to heavy sandy loam. These included soils generally are on large areas. Near Bridgehampton are included areas of Riverhead soils that have gray and strong-brown silt layers at a depth of 26 to 30 inches. Also included are narrow strips of Haven loam, thick surface layer, frequent intermittent drainageways, and soils that have a surface layer of loam or fine sandy loam and a subsoil of heavy loam. Included with this soil on moraines are Montauk soils that have a very weak fragipan that is buried in loose, sandy till.

The hazard of erosion is moderate to slight on this Riverhead soil. The main concerns of management are controlling runoff and erosion and providing adequate drainage.

This soil is well suited to all crops commonly grown in the county, and it is used mainly for this purpose. Most areas in the western part of the county, however, are reserved for housing developments and as industrial sites. **Ability unit II-2; woodland suitability group 3o1. Riverhead sandy loam, 8 to 15 percent slopes (RdC).**—This soil is in narrow bands on outwash plains along the slopes of deep, intermittent drainageways. Slopes are steep. On the Harbor Hill moraine and on the Ronkonkoma moraine east of the Shinnecock Canal, the areas of this soil are larger than in other places in the county and they generally are rolling.

The profile of this soil is similar to the one described as representative of the Riverhead series, but in cultivated areas this soil generally is 3 to 4 inches shallower to receive coarse sand and gravel, and it is as much as 15 percent gravel, by volume.

Included with this soil in mapping are eroded and colluvial areas too small to map separately. Also included are complex patterns with this Riverhead soil are Haven and Plymouth soils that have a texture marginal to heavy sandy loam. These soils generally are in large separate areas on moraines. Along the bottom of intermittent drainageways, strips of Haven loam, thick surface layer, and areas too narrow to map separately are also included. Other inclusions are Montauk soils that have a very weak fragipan that formed in loose sandy till and some areas that have a sand and gravel substratum, 1 to 2 feet thick, overlain by till at a depth of more than 42 inches.

The hazard of erosion is moderately severe on this Riverhead soil. Controlling erosion is the main concern of management. This soil is limited by droughtiness and the difficulty of applying irrigation water. The selection of crops to applications of lime and fertilizer is limited. Slope limits the use of large farm machines.

This soil is suited to crops commonly grown in the county; however, the hazard of erosion reduces its usefulness for farming. Most areas of this soil are in trees or brush. A few small tracts were formerly cleared and farmed along with adjoining less sloping soils, but many of these areas are now in grass or brush because the use of heavy farm equipment on these areas is impracticable. Many of the larger areas of this soil are used for housing developments where large lots are needed. These rolling areas are in the western part of the county. **Capability unit IIIe-1; woodland suitability group 3o1.**

**Riverhead very stony sandy loam, 3 to 8 percent slopes (ReB).**—This gently sloping Riverhead soil is on Fishers Island. It is on morainic deposits, and the areas are complex and undulating, characteristic of moraines. Areas of this soil are small, and they make up a very small part of the total acreage of the county.

The profile of this soil is similar to the one described as representative of the series, except that it has many stones larger than 10 inches in diameter scattered over the surface. In addition, this soil contains more fine sand than the soil described as representative of the series.

Included with this soil in mapping are small areas that have no stones or that have too few stones to be classified stony. A very small acreage of Plymouth soils that are very stony are included.

The hazard of erosion is moderate to slight on this Riverhead soil. The stones on the surface of this soil limit its use to woodland or pasture.

This soil is poorly suited to farming. Some areas are cleared, but they are not farmed. These areas have been left idle, and most of them are reverting to woodland. Areas on Fishers Island are mainly used as sites for large estates. This soil has little value for uses other than woodland or hunting areas. **Capability unit VI-1; woodland suitability group 3o1.**

**Riverhead very stony sandy loam, 8 to 15 percent slopes (ReC).**—This soil is on Fishers Island. It is on morainic deposits. Many closed depressions or kettle holes are on the surface. The areas of this soil are small to medium.

The profile of this soil is similar to the one described as representative of the series, except that many stones larger than 10 inches in diameter are scattered over the surface or are imbedded in the soil. Also, this soil contains more fine sand than the soil described as representative of the series.

Included with this soil in mapping are small areas that have no stones or that have too few stones to be classified stony. In addition, areas of Plymouth soils, 8 to 15 percent slopes, that are very stony make up about 10 percent of this unit.

The hazard of erosion is moderate on this Riverhead soil. The stones on the surface of this soil limit its use to woodland or to pasture.

This soil is poorly suited to crops. Some areas are cleared, but most areas have been allowed to revert to brush or trees. This soil has little value for uses other than woodland and hunting areas. **Capability unit VI-1; woodland suitability group 3o1.**

**Riverhead and Haven soils, graded, 0 to 8 percent slopes (RhB).**—This mapping unit consists of areas of Riverhead sandy loam, of Haven loam, or of both. The

REFERENCE NO. 6

## SITE INSPECTION REPORT

NYSDEC SITE NO. : 152084

SITE NAME: Watch Hill Sand and Gravel

SITE LOCATION: Route 111 and Motor Parkway  
Islip, Long Island, New York

DATE OF INSPECTION: Friday, February 3, 1989

WEATHER: 33<sup>o</sup>F degrees and light rain

SITE STATUS: Vacant sand lot

YEARS OF OPERATION: Unknown

AGENCY PERFORMING  
INSPECTION: YEC, Inc., NYSDEC's subcontractor

INSPECTED BY: Marie McDonnell, Staff Geologist  
Gregory Fabijanic, Staff Engineer

SITE REPRESENTATIVE  
INTERVIEWED: Tom Marquardt  
Principal Planner, Town of Islip

The site inspection at the site of Watch Hill Sand and Gravel included the following:

- (1) An interview with a representative from the Town of Islip;
- (2) Ambient air monitoring onsite using an HNu photoionization detector;
- (3) A visual inspection of the site to determine locations of structures, equipment, fences, and to search for suspicious drums, tanks or similar signs of hazardous waste released to the environment; and
- (4) Photodocumentation of the site.

At 1:30 pm Marie McDonnell and Gregory Fabijanic met with Tom Marquardt, Principal Planner for the Town of Islip, to gather background information on the Watch Hill Sand and Gravel site, and to conduct a file search. He was interviewed for information on past site activities, past and current owners, and landfilling activities on the site.

Mr. Marquardt provided us with some background on the landfilling activities which occurred on the site in the past. The landfill probably received construction and demolition debris, and household garbage for a short period of time. Soil borings were recently done on the site by Soil Mechanics Co., although we were not permitted to take detailed copies of these reports either, at this time.

The site is on the order of 50 acres and is adjacent to a number of commercial properties and three highways. It has no fences or gates. The lot apparently is a shallow, flat bottomed sand mine, whose acreage is suitable for development in the future.

At some time in the past, an area of the property was used as a landfill. Near the center of the site, north of the methane monitoring wells, is a slope with domestic garbage protruding from it. Mr. Marquardt informed us that methane monitoring wells were installed into the buried landfill so that methane monitoring could be done as a precautionary measure, since there

are buildings within 100 yards of that location.

The monitoring wells were two inch PVC standpipe, with screw on caps. One well's cap was removed to check for a reading with the HNu meter. The second well seemed to be set in the ground very loosely, as if it did not go very deep into the ground. Its cap could not be removed. There was no response with HNu in or around the wells.

There is a junk pile near the center of the property. Here we found a medium sized tank which was empty, and partly rusted (see picture #6, Appendix A). We observed a reading of 15 ppm with HNu at the openings to this tank.

Near the monitoring wells; there is an area fenced in with chain link fencing. The area is about 50 feet by 100 feet and its purpose is unknown. There were many off-road vehicle tracks inside this area.

During the site inspection, no suspicious hazardous waste disposal sites were observed. Photodocumentation of the site inspection is presented in Appendix A. Air monitoring was conducted throughout the site, upwind and downwind of the areas of concern, using a HNu photoionization detector. No readings above background were noted during the site visit, except for the tank noted in this report.

REFERENCE NO. 7



STATE OF NEW YORK  
DEPARTMENT OF HEALTH

Corning Tower The Governor Nelson A. Rockefeller Empire State Plaza Albany, New York 12237

vid Axelrod, M.D.  
ommissioner

**OFFICE OF PUBLIC HEALTH**

da A. Randolph, M.D., M.P.H.  
irector

iam F. Leavy  
ecutive Deputy Director

September 15, 1988

Ms. Ari Selvakumar  
Staff Engineer  
YEC, Inc.  
Forest View Professional Building  
10 Pine Crest Road  
Valley Cottage, NY 10989

Dear Ms. Selvakumar:

As we discussed on September 15, 1988, we no longer have copies of the "Atlas". However, I am enclosing a copy of the Suffolk County portion of the Atlas.

If you have any questions, give me a call at (518) 458-6731.

Sincerely,

A handwritten signature in cursive script that reads 'James R. Covey'. The signature is written in black ink and is positioned above the typed name and title.

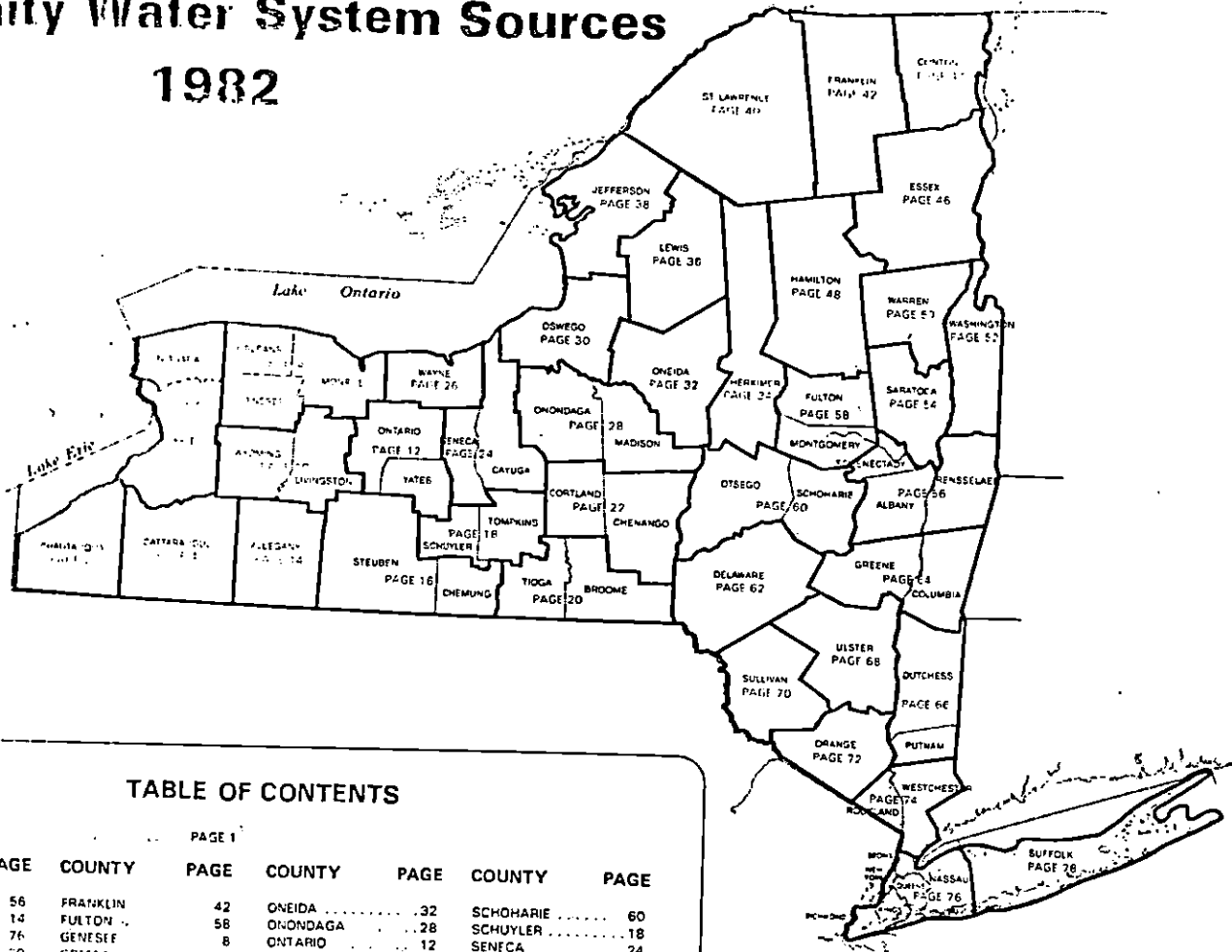
James R. Covey, P.E.  
Associate Sanitary Engineer  
Bureau of Public Water Supply Protection

Enclosure

cc: Mr. Burke

# New York State Atlas of Community Water System Sources 1982

FAST  
TO HEALTH



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## LEGEND

- BOUNDARIES AND PLACES**
- International
  - State
  - County
  - Town
  - Indian Reservation
  - City
  - Unincorporated Place
  - Built-up Area (Over 25,000 population including any contiguous city or village)
  - Village
  - Federal Reservation

- CLASSIFICATION OF POPULATED PLACES**
- 100,000 or more
  - 50,000 to 100,000
  - 12,500 to 50,000
  - 2,500 to 12,500
  - 250 to 2,500
  - 250 or less
- YONKERS**  
Levittown  
Poughkeepsie  
Hampton Falls  
Burlington

- TRANSPORTATION**
- Highways**
- Divided Highways
    - Full Control of Access
    - Partial or No Control of Access
  - Undivided Highway
  - Interchange
  - Touring Route (State, U.S., Interstate) or State Parkway
  - Touring Route Markers
    - State
    - U.S.
    - Interstate

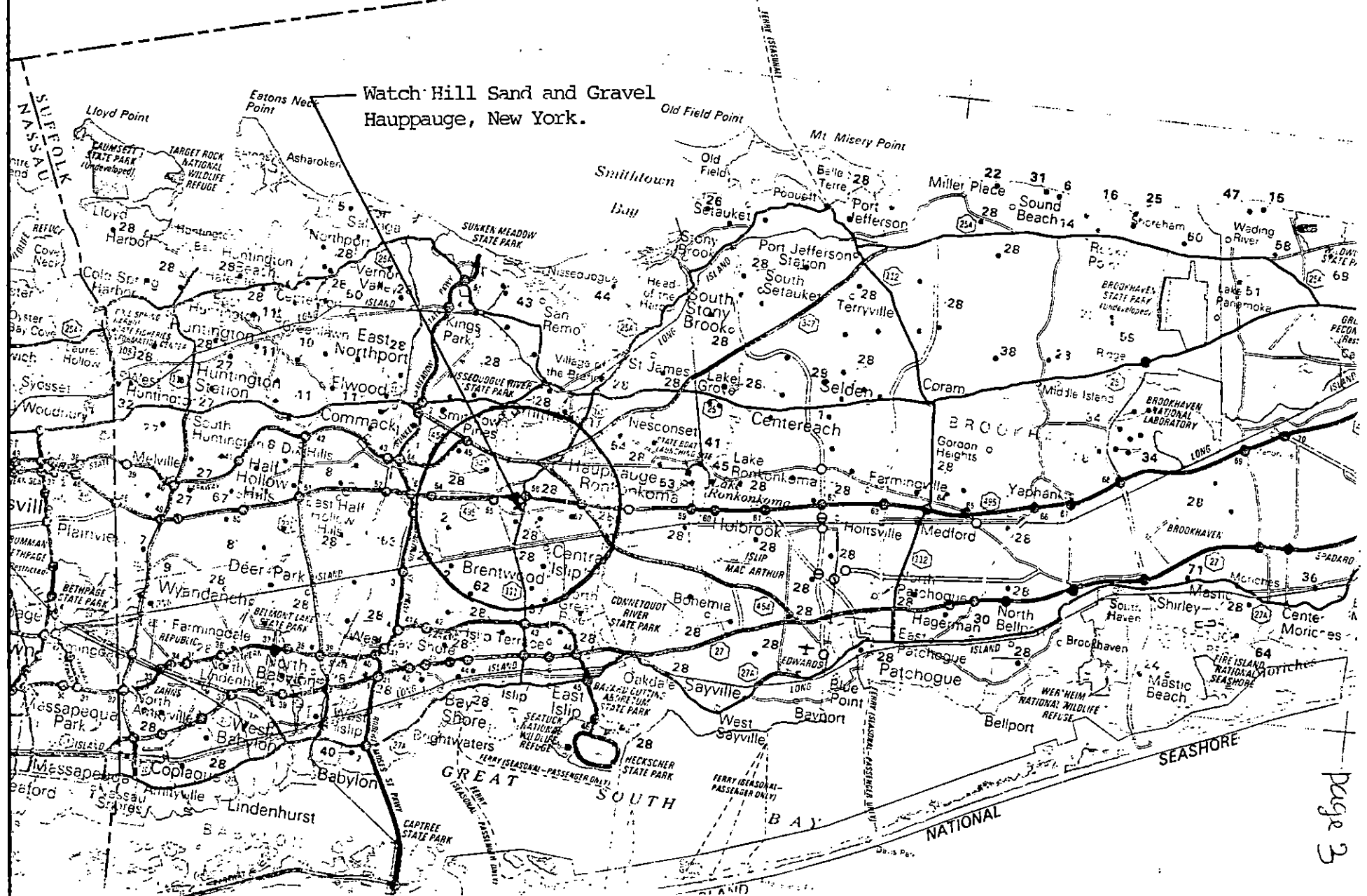
- Railroads**
- Operating Line
  - Operator
  - Owner (If Other than Operator)
  - Company Having Trackage Rights
  - Service/Discontinued
- Airports (Open to the Public, Military)**
- Runway under 4000'
  - Runway over 4000'
- Rest Areas**
- Food, Gas, Rest Rooms
  - Gas, Rest Rooms
  - Rest Rooms
  - Parking Only

- RECREATION FACILITIES**
- State or National Recreation Area
  - State Campground
  - State Boat Launching Site
  - State Canal Park
  - State Fish Hatchery
  - Other State Recreation Site

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LONG

Watch Hill Sand and Gravel  
Hauppauge, New York.



# SUFFOLK COUNTY

D NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
<b>Municipal Community</b>			
1	Bevon Water Corporation.	1150	Wells
2	Brentwood Water District.	25812	Wells
3	Bridgehampton Water Company.	1916	Wells
4	Captain Kidd Water Company.	580	Wells
5	Crab Meadow Beach.	50	Wells
6	Culross Corporation (Culross Beach).	104	Wells
7	Dering Harbor Village.	130	Wells
8	Dix Hills Water District.	30000	Wells
9	East Farmingdale Water District.	7850	Wells
10	Fishers Island Water Works Corporation.	250	Barlow, Middle Farms and Treasure Ponds, Wells
11	Greenlawn Water District.	40000	Wells
12	Greenport Village.	6851	Wells
13	Hampton Bays Water District.	9500	Wells
14	Hawthorne - Maple Civic Association.	50	Wells
15	Herod Point Association.	80	Wells
16	North Shores Water Company.	5000	Wells
17	Ocean Beach Village.	155	Wells
18	Reeves Beach Water Company.	650	Wells
19	Riverhead Water District.	9300	Wells
20	Roanoke Water Corporation.	201	Wells
21	Saltire Village.	35	Wells
22	Scott's Beach Water Company.	342	Wells
23	Shelter Island Heights Association.	498	Wells
24	Shirley Water Works.	3400	Wells
25	Shorewood Water Corporation.	10000	Wells
26	Soundview Association.	236	Wells
27	South Huntington Water District.	51260	Wells
28	Suffolk County Water Authority.	900000	Wells
29	Sunhill Water Corporation.	3959	Wells
30	Swan Lake Water Corporation.	1485	Wells
31	Terrace-on-the-Sound.	400	Wells
32	Woodbury Triangle Corporation.	800	Wells
<b>Non-Municipal Community</b>			
33	Aquebogue Mobile Home Court.	120	Wells
34	Brookhaven National Labs.	3373	Wells
35	Calverton Hills Owners Association.	897	Wells
36	Cedar Lodge Nursing Home.	100	Wells
37	Central Islip Psychiatric Center.	4525	Wells
38	Crest Hall Health Related Facility.	120	Wells
39	East Quogue Mobile Estates.	160	Wells
40	Good Samaritan Hospital.	NA	Wells
41	Greis Mobile Park.	70	Wells
42	Hampton Gateway Apartments.	304	Wells
43	Kings Park Psychiatric Center.	3100	Wells
44	Knox School.	NA	Wells
45	Lake Hurst Lodge Adult Home.	57	Wells
46	Leier's Mobile Park.	350	Wells
47	Little Flower Children's Services.	150	Wells
48	Montauk Air Force Station.	10	Wells
49	Napeague Trailer Park.	78	Wells
50	Northport VA Hospital.	3000	Wells
51	Oak Park Trailer Park.	50	Wells
52	Oakland Ridge Mobile Park.	74	Wells
53	Park Lake Rest Home.	46	Wells
54	Peacock Alley.	35	Wells
55	Peconic River Trailer Park.	90	Wells
56	Peconic View Adult Mobile Home Park.	70	Wells
57	Pinecrest Garden Apartments.	392	Wells
58	Ramblewood Mobile Homes.	210	Wells
59	Ridge Rest Home.	58	Wells
60	Rocky Point Family Housing.	55	Wells
61	Rollin Mobile Homes.	220	Wells
62	St Joseph Convent - Long Island University.	1177	Wells
63	Sam A Lewison Start Center.	40	Wells
64	South Bay Adult Home.	40	Wells
65	Southampton College.	1000	Wells
66	Speonk Mobile Home Park.	50	Wells
67	Suffolk Developmental Center.	3500	Wells
68	Three Mile Harbor Trailer Park.	40	Wells
69	Thurm's Mobile Estates.	450	Wells
70	USCG Station - Moriches.	23	Wells
71	Wes Dubicki Apartments.	NA	Wells

REFERENCE NO. 8

YEC, INC.  
Forest View Professional Building  
10 Pine Crest Road  
Valley Cottage, NY 10989  
(914) 268-3203

December 21, 1988

Mr. William J. Sanok  
Cooperative Extension Agent  
Agricultural Program Leader  
Cornell Cooperative Extension  
246 Griffing Avenue  
Riverhead, NY 11901

Dear Mr. Sanok:

I am in receipt of your letter dated Nov. 21, 1988 and thanks for the information on New York Pyrotechnics Products Company and Sag Harbor Landfill site. I need the same information for the following two sites (see attached site location maps):

1. Watch Hill Sand and Gravel located at the intersection of RT 111 and Motor Parkway, Hauppauge, New York.
2. Bridgehampton Materials located east of Mill Stone Road and north of Middleline Highway, Southampton, New York.

I would very much appreciate, if you could send the above information at your earliest convenience.

Thanking you.

Sincerely yours

*A. Selvakumar*

Mrs. Ari Selvakumar  
Staff Engineer, YEC, Inc.



January 20, 1989

Mrs. Ari Selvakumar  
YEC, Inc.  
Forest View Professional Building  
10 Pine Crest Road  
Valley Cottage, NY 10989

Dear Mrs. Selvakumar:

The following information is in response to your requests of December 21 and January 7.

A. Watch Hill Sand & Gravel, Route 111 and Motor Parkway, Hauppauge, New York.

1. There are no active agricultural sites within three miles of this particular operation. There was a farm to the northeast, just about three miles away, but that area was developed.

2. There is surface water directly north of this site known as New Mill Pond which is part of Green Gate Park.

3. I do not know where the public wells are but I know this whole area is supplied by the Suffolk County Water Authority.

B. Bridgehampton Materials, Southampton, New York.

1. There is quite extensive agriculture just to the south of this site. The closest land for agriculture is within half to three-quarters of a mile of the site in question.

2. The major crops produced in this area are potatoes, corn, wheat, and rye.

3. There is a fair amount of irrigation on the northern part of this area because of the relatively sandy soil. The irrigation is from groundwater wells.

4. The surface water area includes a number of ponds directly east of the site which include Little Pond, Long Pond, Little Long Pond, Crooked Pond, etc. These areas are about two and one-half miles from the site.

5. All of the drinking water for residents in this area comes from groundwater, not surface water.

-more-

*Helping You Put Knowledge to Work*

Mrs. Ari Selvakumar

Page 2

C. Joseph Menafra Property, South Country Road, Westhampton.

1. There are two farmland areas within three miles of this site. The first one is located to the northeast about two and a half miles away. The second one is located directly to the west, between two and three miles.

2. The crops grown in these areas include nurseries directly west of the site. The major crops here are trees and shrubs. On the farmland to the northeast in the Oakville area the major crops are potatoes, mixed vegetables, including Chinese vegetables, cabbage, cauliflower, and small grain (wheat and rye).

3. The source of irrigation for these areas is all from groundwater. Irrigation is used on all of these areas because of the very sandy soil.

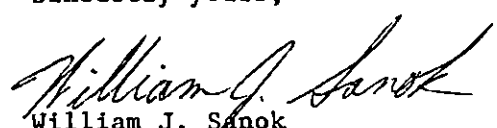
4. There are surface bodies of water directly to the east and in small areas to the west of the site. The area to the east is the Old Ice Pond and the North Pond next to the Westhampton Airport. To the southeast and southwest there are saltwater creeks and bays.

5. None of these surface waters are used for drinking.

6. The drinking water for all of the housing developments throughout this area comes from groundwater wells.

I hope that this is the information that you need for your survey.

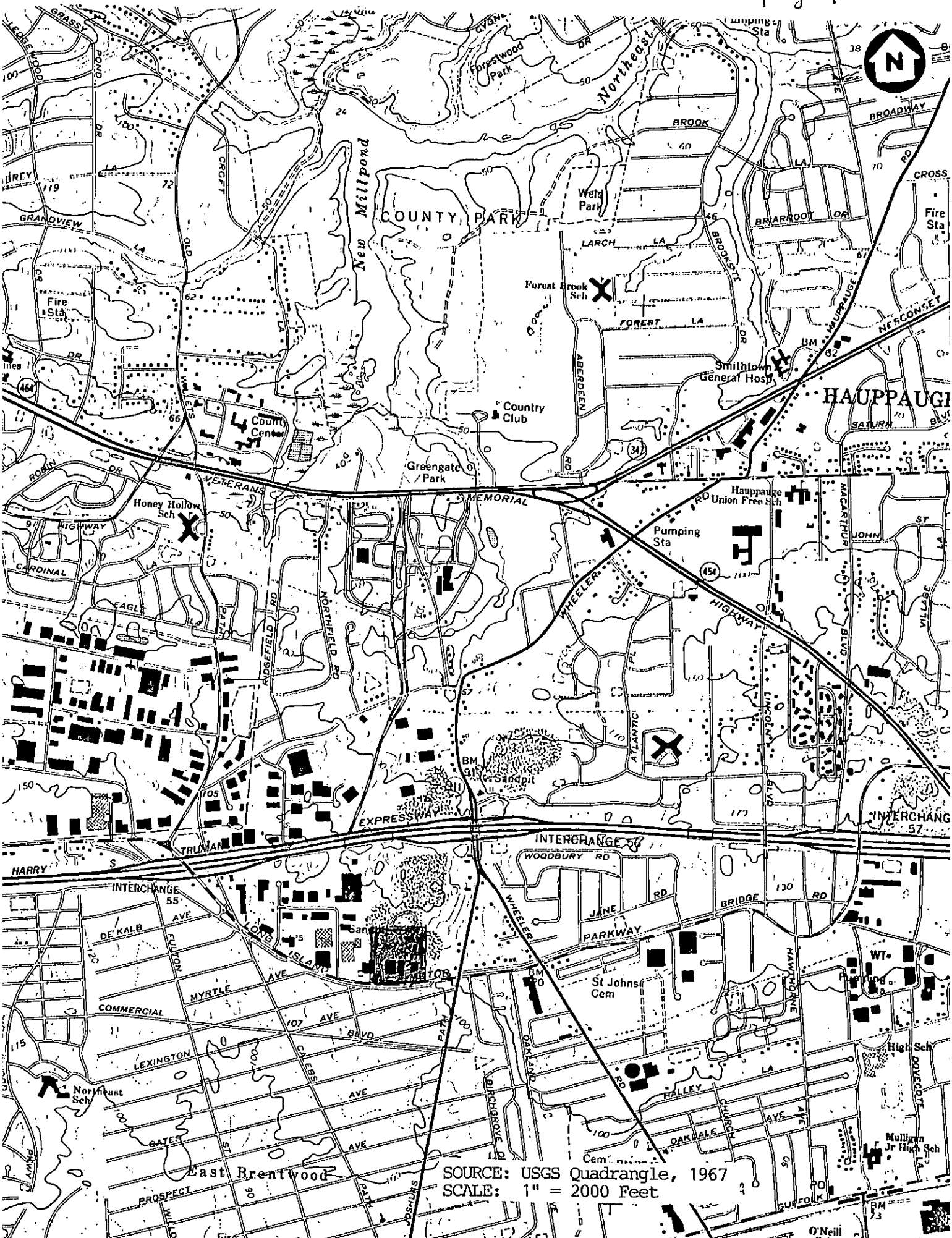
Sincerely yours,



William J. Sanok  
COOPERATIVE EXTENSION AGENT  
Agricultural Program Leader

WJS:kr

REFERENCE NO. 9



SOURCE: USGS Quadrangle, 1967  
SCALE: 1" = 2000 Feet

O'Neill

REFERENCE NO. 10

YEC, INC.  
Forest View Professional Building  
10 Pine Crest Road  
Valley Cottage, NY 10989  
(914) 268-3203

February 13, 1989.

Mr. Martin E. Shea  
Fish and Wildlife Technician  
New York State Department of Environmental  
Conservation - Region I  
Building 40 - SUNY Campus  
Stony Brook, NY 11794

Dear Mr. Shea:

I requested your assistance in providing the information on freshwater wetlands within 1-mile radius of the following sites in December, 1988.

1. Watch Hill Sand and Gravel located at the intersection of RT 111 and Motor Parkway, Hauppauge, New York.
2. Bridgehampton Materials located east of Millstone Road and north of Middle Line Highway, Southampton, New York.
3. S.P. Materials located at 170 Town Line Road, Kings Park, New York.
4. Joseph Menafra located at South Country Road, Westhampton Beach, New York.

I would appreciate, if you could send the above information at your earliest convenience as the Phase I reports are due on the 15th of March, 1989.

I am sorry to trouble you so much.

Thanking you.

Sincerely yours

*Ari Selvakumar*

Ari Selvakumar, Ph.D.  
Staff Engineer



Source: Mr. Martin E. Shea  
Fish and Wildlife Technician  
NYSDEC - Region 1

SCALE: 1" = 2000 Ft.

REFERENCE NO. 11

YEC, INC.  
Forest View Professional Building  
10 Pine Crest Road  
Valley Cottage, NY 10989  
(914) 268-3203

December 21, 1988

Mr. Michael S. Scheibel  
Senior Wildlife Biologist  
New York State Department of Environmental  
Conservation - Region 1  
Building 40 - SUNY Campus  
Stony Brook, NY 11794

Dear Mr. Scheibel:

Thank you very much for the information on endangered or threatened species of concern for Grucci site. I would very much appreciate if you could send the same information on the following two sites (see attached site location maps):

1. Watch Hill Sand & Gravel located at the intersection of RT 111 and Motor Parkway, Hauppauge, New York.
2. Bridgehampton Materials located east of Mill Stone Road and north of Middle line Highway, Southampton, New York.

I would appreciate, if you could send the above information at your earliest convenience.

Thanking you.

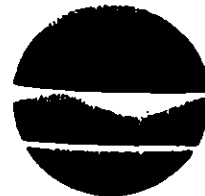
Sincerely yours

*A Selvakumar*  
Mrs. Ari Selvakumar  
Staff Engineer, YEC, Inc.

New York State Department of Environmental Conservation  
Building 40—SUNY, Stony Brook, New York 11794

(516) 751-7900

page 2



Thomas C. Jorling  
Commissioner

March 24, 1989

Mrs. Ari Selvakumar  
YEC, Inc.  
10 Pine Crest Road  
Valley Cottage, NY 10989

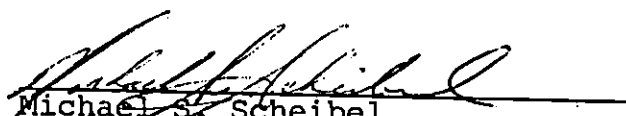
Dear Mrs. Selvakumar:

I have reviewed your request of December 21, 1988, regarding the following projects:

1. Watch Hill Sand & Gravel, Hauppauge. I have consulted the Natural Heritage Program maps, and find no known occurrence for any state-listed endangered/threatened species of flora or fauna.
2. Bridgehampton Materials, Southampton. A breeding site for the New York State endangered tiger salamander (Ambystoma tigrinum) has been identified south of this location. If there are any wetlands on-site, a qualified field biologist should investigate for the presence of this species.

If I can be of further assistance, please do not hesitate to contact me at (516) 751-7900, ext. 248.

Sincerely,

  
Michael S. Scheibel  
Senior Wildlife Biologist

MSS/sjmr

REFERENCE NO. 12



# Long Island Regional Planning Board

Page 1



Edward Cook  
Chairman  
John J. Hart  
Vice Chairman  
Patrick F. Caputo  
Paul J. Fitzpatrick  
John Wickham  
John W. Wydler  
Lee E. Koppelman  
Executive Director

H. Lee Dennison Executive Office Building  
Veterans Memorial Highway, Hauppauge, L.I., N.Y. 11788  
Area Code (516) 360-5189

December 22, 1988

Mrs. Ari Selvakumar  
Staff Engineer  
YEC, Inc.  
10 Pine Crest Road  
Valley Cottage, N. Y. 10989

RE: Request for Population Estimates Near Four Superfund Sites  
Dear Mrs. Selvakumar:

Population estimates of this kind require very detailed work and many hours of research. Because of the amount of time required to do this accurately and the fact that you are getting paid to do this research, we will not be able to prepare these estimates.

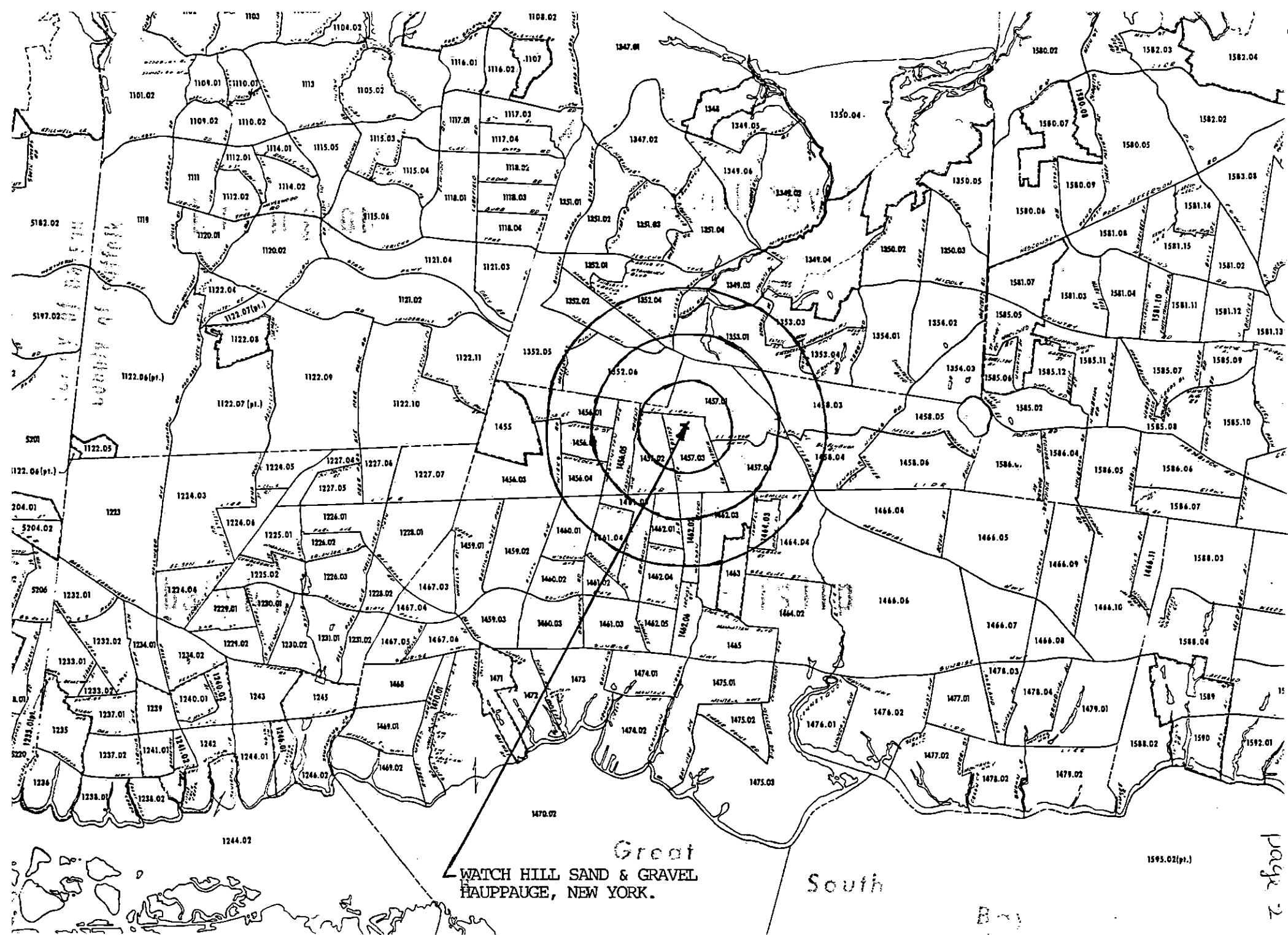
Please find enclosed a census tract map, 1980 census tract population figures and the 1988 Population Survey. Using these sources, you can prepare rough population estimates. To do more accurate estimates would require days of work in our office using many large scale maps and using microfiche to look up the population figures for small areas.

Sincerely,

*Roy Fedelem*

Roy Fedelem  
Research Analyst

RF:pd  
Enc.



Great  
WATCH HILL SAND & GRAVEL  
HAUPPAUGE, NEW YORK.

South

1593.02(pt.)

# SUFFOLK COUNTY

SELECTED CHARACTERISTICS OF CENSUS TRACTS IN NEW YORK  
 PREPARED BY THE NEW YORK STATE DATA CENTER FROM THE  
 1980 CENSUS OF POPULATION SPECIAL TRACT FILE

PAGE 111  
 DATE 10/05/81

COUNTY	TRACT	TOTAL POPUL	POPUL IN HOUSEHOLDS	GROUP QUARTERS	OCCUPIED UNITS	AVERAGE HH SIZE	TOTAL UNITS
103	110101	3405	3261	144	968	3.4	1037
103	110102	5336	5326	10	1708	3.1	1744
103	1102	5500	5489	11	2052	2.7	2108
103	1103	5726	5660	66	1898	3.0	1949
103	110401	3117	3117		924	3.4	960
103	110402	3326	3298	28	1160	2.8	1221
103	110501	3250	3209	41	1039	3.1	1067
103	110502	2752	2752		944	2.9	958
103	1106	7651	7601	50	2698	2.8	2770
103	1107	650	25	625	10	2.5	13
103	110801	2267	2244	23	688	3.3	801
103	110802	5760	5760		1742	3.3	1838
103	110901	2875	2840	35	1169	2.4	1202
103	110902	3937	3906	31	1294	3.0	1336
103	111001	1900	1818	82	664	2.7	690
103	111002	3518	3517	1	1234	2.9	1282
103	1111	6468	6463	5	2162	3.0	2244
103	111201	3089	3075	14	1081	2.8	1106
103	111202	4683	4675	8	1531	3.1	1564
103	1113	4392	4322	70	1356	3.2	1379
103	111401	1565	1565		460	3.4	472
103	111402	5509	5481	28	1641	3.3	1659
103	111503	4700	4700		1443	3.3	1468
103	111504	1505	1505		427	3.5	436
103	111505	6417	6115	302	1709	3.6	1755
103	111506	2800	2729	71	805	3.4	820
103	111601	4381	4381		1358	3.2	1386
103	111602	3392	3392		1062	3.2	1092
103	111701	5385	5361	24	1671	3.2	1702
103	111703	3354	3342	12	920	3.6	931
103	111704	3675	3611	64	1029	3.5	1042
103	111801	6136	6136		1638	3.7	1656
103	111802	3556	3543	13	915	3.9	924
103	111803	3192	3192		834	3.8	839
103	111804	2505	2505		683	3.7	691
103	1119	6071	6071		1872	3.2	1901
103	112001	4937	4937		1611	3.1	1650
103	112002	5309	5147	162	1598	3.2	1622
103	112102	4300	4300		1156	3.7	1160
103	112103	4434	4434		1179	3.8	1195
103	112104	3194	3188	6	909	3.5	918
103	112204	4608	4608		1326	3.5	1335
103	112205					.0	
103	112206	3346	3304	42	1003	3.3	1015
103	112207	4793	4764	29	1261	3.8	1280
103	112208	2241	39	2202	12	3.3	20
103	112209	8671	8498	173	2242	3.8	2270
103	112210	7010	6971	39	1773	3.9	1783
103	112211	4924	4924		1283	3.8	1294
103	1223	4380	3291	1089	1083	3.0	1105
103	122403	2408	2408		666	3.6	697
103	122404	3610	3610		1027	3.5	1055

SELECTED CHARACTERISTICS OF CENSUS TRACTS IN NEW YORK  
 PREPARED BY THE NEW YORK STATE DATA CENTER FROM THE  
 1980 CENSUS OF POPULATION SPECIAL TRACT FILE

PAGE 112  
 DATE 10/05/81

COUNTY	TRACT	TOTAL POPUL	POPUL IN HOUSEHOLDS	GROUP QUARTERS	OCCUPIED UNITS	AVERAGE HH SIZE	TOTAL UNITS
103	122405	3369	3363		6		859
103	122406	3706	3695		11	3.9	889
103	122501	3269	3265		4	4.1	1005
103	122502	4380	4380			3.9	954
103	122601	6547	6528		19	4.0	1137
103	122602	5511	5511			3.5	1915
103	122603	6320	6320			3.8	1454
103	122704	2248	2248			3.3	1914
103	122705	3502	3502			3.9	592
103	122706	4604	4604			3.5	1011
103	122707	3327	3327			3.1	1516
103	122801	5118	5117		1	3.6	939
103	122802	4264	4264			3.5	1517
103	122901	5799	5799			3.4	1255
103	122902	4099	4091		8	3.3	1801
103	123001	6081	6081			3.1	1347
103	123002	4892	4892			3.6	1742
103	123101	3823	3823			3.6	1385
103	123102	4612	4612			3.4	1129
103	123201	1142	1142			3.2	1469
103	123202	5586	5330		256	3.3	355
103	123301	6043	5987		56	4.0	1396
103	123302	1554	1554			2.9	2090
103	123401	3875	3875			3.5	470
103	123402	7636	7636			3.4	1155
103	1235	5092	4373		719	3.3	2339
103	1236	3984	3984			2.7	1707
103	123701	4617	4617			2.7	1538
103	123702	7277	7266		11	3.4	1416
103	123801	4214	4214			3.3	2251
103	123802	4024	4024			2.8	1571
103	1239	5151	5151			3.2	1280
103	124001	4802	4802			3.3	1600
103	124002	3519	3519			3.3	1465
103	124101	4331	4250		81	3.4	1053
103	124102	3316	3316			3.2	1356
103	1242	5800	5785		15	2.8	1259
103	1243	6273	6061		212	3.1	1932
103	124401	3285	3285			3.1	2007
103	124402	3705	3705			2.7	1269
103	1245	4965	4911		54	3.3	1424
103	124601	3030	3030			2.9	1755
103	124602	4393	4223		170	3.1	995
103	134701	6701	6448		253	2.7	1637
103	134702	5232	5232			3.4	1996
103	1348	2681	138		2543	3.3	1633
103	134902	4718	4377		341	3.1	62
103	134903	1455	1455			3.6	1229
103	134904	6064	6042		22	3.8	393
103	134905	4198	4198			3.3	1901
103	134906	5999	5970		29	3.8	1159
103	135002	5591	5591			3.4	1774
						3.5	1617

SELECTED CHARACTERISTICS OF CENSUS TRACTS IN NEW YORK  
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PAGE 113  
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COUNTY	TRACT	TOTAL POPUL	POPUL IN HOUSEHOLDS	GROUP QUARTERS	OCCUPIED UNITS	AVERAGE HH SIZE	TOTAL UNITS
103	135003	3794	3794		1199	3.2	1236
103	135004	2485	2472		737	3.4	784
103	135005	2737	2262	13	853	2.7	973
103	135101	4628	4628	475	1224	3.8	1229
103	135102	4534	4522		1244	3.6	1250
103	135103	4510	4510	12	1120	4.0	1128
103	135104	4504	4504		1202	3.7	1219
103	135201	2480	2480		694	3.6	697
103	135202	4831	4831		1233	3.9	1241
103	135204	4748	4748		1249	3.8	1263
103	135205	6251	6251		1739	3.6	1748
103	135206	2046	2046		616	3.3	625
103	135301	3792	3753	39	1048	3.6	1068
103	135303	4405	4387	18	1307	3.4	1328
103	135304	3234	3234		819	3.9	828
103	135401	4721	4721		1338	3.5	1385
103	135402	5985	5985		1639	3.7	1695
103	135403	4339	4289	50	1254	3.4	1320
103	1455	1455	118	3747	41	2.9	44
103	145601	4913	4913		1239	4.0	1255
103	145602	5048	5048		1254	4.0	1279
103	145603	4473	4473		1065	4.2	1129
103	145604	3116	3111	5	844	3.7	899
103	145605	2673	2539	134	693	3.7	706
103	145701	5539	5535	4	1654	3.3	1722
103	145702	4276	4276		1158	3.7	1217
103	145703	4273	4273		1275	3.4	1314
103	145704	6050	6050		1982	3.1	2100
103	145803	4657	4632	25	1335	3.5	1353
103	145804	2362	2362		718	3.3	748
103	145805	5480	5423	57	1827	3.0	1932
103	145806	8173	8173		2234	3.7	2292
103	145901	3037	3037		814	3.7	862
103	145902	5857	5844	13	1568	3.7	1618
103	145903	5507	5507		1619	3.4	1649
103	146001	3030	3020	10	805	3.8	842
103	146002	4142	4138	4	1047	4.0	1085
103	146003	4719	4718	1	1507	3.1	1582
103	146102	2145	2145		539	4.0	547
103	146103	5410	5326	84	1364	3.9	1390
103	146104	3243	2941	302	724	4.1	739
103	146105	4922	4869	53	1340	3.6	1370
103	146201	3876	3876		924	4.2	951
103	146202	3192	3192		782	4.1	860
103	146203	3857	3827	30	1053	3.6	1164
103	146204	4751	4751		1144	4.2	1180
103	146205	2340	2340		622	3.8	642
103	146206	2088	2088		588	3.6	611
103	1463	2194	45	2149	15	3.0	19
103	146401	3395	3394	1	886	3.8	937
103	146402	3952	3952		1054	3.7	1071
103	146403	4069	4069		1005	4.0	1119

SELECTED CHARACTERISTICS OF CENSUS TRACTS IN NEW YORK  
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COUNTY	TRACT	TOTAL POPUL	POPUL IN HOUSEHOLDS	GROUP QUARTERS	OCCUPIED UNITS	AVERAGE HH SIZE	TOTAL UNITS
103	1465	5588	5588				
103	146604	4820	4820		1573	3.6	1632
103	146605	1219	1209		1488	3.2	1518
103	146606	7687	7525	10	370	3.3	390
103	146607	1621	1612	162	2109	3.6	2154
103	146608	1996	1996	9	785	2.1	802
103	146609	8686	8646		528	3.8	539
103	146610	8801	8801	40	2248	3.8	2313
103	146611	2442	2442		2713	3.2	2764
103	146703	4203	4197		671	3.6	706
103	146704	2222	2222	6	1135	3.7	1166
103	146705	4164	4154		619	3.6	629
103	146706	2864	2864	10	1086	3.8	1106
103	1468	6022	6022		833	3.4	850
103	146901	5865	5865		1688	3.6	1720
103	146902	4488	4164		1735	3.4	1760
103	147001	3908	3908	324	1234	3.4	1281
103	147002	5544	5519		1104	3.5	1131
103	1471	3286	3279	25	1726	3.2	3846
103	1472	5192	4987	7	1114	2.9	1138
103	1473	5585	5403	205	1962	2.5	2062
103	147399	7	7	182	2175	2.5	2306
103	147401	5293	5276			.0	
103	147402	3717	3706	17	1942	2.7	1982
103	147501	6809	6783	11	1253	3.0	1299
103	147502	4626	4468	26	2118	3.2	2204
103	147503	4048	4048	158	1255	3.6	1272
103	147601	2814	2754		1155	3.5	1191
103	147602	5276	5276	60	861	3.2	897
103	147701	3376	3376		1623	3.3	1676
103	147702	4809	4690		1112	3.0	1132
103	147802	4460	4249	119	1431	3.3	1464
103	147803	2030	2007	211	1472	2.9	1524
103	147804	5523	5523	23	653	3.1	672
103	147901	4840	4813		1529	3.6	1555
103	147902	4442	4414	27	1519	3.2	1553
103	158001	3939	3939	28	1343	3.3	1370
103	158002	6102	6098		1267	3.1	1368
103	158005	5993	5993	4	2062	3.0	2251
103	158006	6682	6682		1683	3.6	1732
103	158007	6238	143		1952	3.4	1999
103	158008	774	774	6095	46	3.1	71
103	158009	2597	2597		207	3.7	210
103	158102	3577	3577		734	3.5	744
103	158103	3306	3306		1069	3.3	1122
103	158104	5952	5952		999	3.3	1041
103	158107	2972	2972		1557	3.8	1590
103	158108	2232	2232		912	3.3	937
103	158110	2091	2091		589	3.8	604
103	158111	5402	5402		527	4.0	545
103	158112	4019	4019		1356	4.0	1387
03	158113	1356	1356		1049	3.8	1091
					499	2.7	531

SELECTED CHARACTERISTICS OF CENSUS TRACTS IN NEW YORK  
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 1980 CENSUS OF POPULATION SPECIAL TRACT FILE

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COUNTY	TRACT	TOTAL POPUL	POPUL IN HOUSEHOLDS	GROUP QUARTERS	OCCUPIED UNITS	AVERAGE HH SIZE	TOTAL UNITS
103	158114	3224	3224		801	4.0	810
103	158115	7558	7479				
103	158202	7378	7327	79	1801	4.2	1831
103	158203	1661	1661	51	2201	3.3	2260
103	158204	7557	7092	465	504	3.3	517
103	158205	1277	1259	18	2477	2.9	2617
103	158299				345	3.6	384
103	158304	5534	5498			.0	
103	158305	8071	8053	36	1659	3.3	1812
103	158306	4107	4095	18	2648	3.0	3315
103	158308	6407	6407	12	1160	3.5	1229
103	158309	3154	3154		1660	3.9	1730
103	158310	2208	1932		1019	3.1	1085
103	158311	3550	3536	276	633	3.1	675
103	158312	346	346	14	1055	3.4	1099
103	158313	7121	6821		101	3.4	109
103	158314	8378	8378	300	2173	3.1	2308
103	158401	6666	6666		2464	3.4	2636
103	158402	4372	4372		2528	2.6	3617
103	158403	1597	1597		1199	3.6	1250
103	158404	6639	6583	56	553	2.9	618
103	158502	2978	2932	46	2842	2.3	3187
103	158505	4424	4421	3	1111	2.6	1169
103	158506	2296	2296		1315	3.4	1351
103	158507	3418	3418		735	3.1	804
103	158508	5649	5649		907	3.8	952
103	158509	4261	4261		1413	4.0	1447
103	158510	5020	5020		1354	3.1	1508
103	158511	5579	5579		1507	3.3	1688
103	158512	3205	3205		1539	3.6	1609
103	158601	8122	7850		855	3.7	887
103	158604	4899	4899	272	2348	3.3	2443
103	158605	4695	4695		1285	3.8	1325
103	158606	4429	4429		1186	4.0	1214
103	158607	2554	2554		1316	3.4	1388
103	158704	4743	4743		830	3.1	891
103	158705	1590	1585		1716	2.8	1855
103	158707	1315	1130	5	455	3.5	567
103	158708	1898	1898	185	400	2.8	455
103	158709	1048	1048		691	2.7	782
103	158710	2543	2522		350	3.0	452
103	158711	3827	3827	21	858	2.9	968
103	158712	6729	6722		1287	3.0	1433
103	158802	4096	4048	48	1740	3.9	1827
103	158803	2124	2124		1345	3.0	1409
103	158804	7126	7079		574	3.7	588
103	1589	6577	6524	47	2309	3.1	2475
103	1590	4714	4584	53	2596	2.5	2738
103	159102	5548	5223	130	1833	2.5	1992
103	159103	5003	5003	325	2032	2.6	2154
103	159104	9862	9858		1233	4.1	1395
103	159105	5448	5448	4	2579	3.8	2657
					1772	3.1	1824

SELECTED CHARACTERISTICS OF CENSUS TRACTS IN NEW YORK  
 PREPARED BY THE NEW YORK STATE DATA CENTER FROM THE  
 1980 CENSUS OF POPULATION SPECIAL TRACT FILE

PAGE 116  
 DATE 10/05/81

COUNTY	TRACT	TOTAL POPUL	POPUL IN HOUSEHOLDS	GROUP QUARTERS	OCCUPIED UNITS	AVERAGE HH SIZE	TOTAL UNITS
103	159106	2259	2184	75	621	3.5	675
103	159201	2475	2449	26	848	2.9	893
103	159203	4668	4668		1584	2.9	1717
103	159204	3669	3512	157	1091	3.2	1164
103	1593	2809	2809		1009	2.8	1081
103	159403	7895	7895		2158	3.7	2370
103	159404	4260	4226	34	1214	3.5	1344
103	159405	6548	6526	22	2282	2.9	2488
103	159406	2146	2035	111	630	3.2	674
103	159502	8401	8401		2781	3.0	5750
103	159504	6356	6356		1799	3.5	2071
103	159505	5246	5246		1549	3.4	1774
103	159506	4931	4931		1337	3.7	1488
103	159601	4472	4419	53	1543	2.9	1692
103	159602	3123	3115	8	1018	3.1	1093
103	169701	4405	4306	99	1480	2.9	2081
103	169702	4952	4711	241	2063	2.3	2368
103	1698	4841	4689	152	1814	2.6	1988
103	1699	6045	5935	110	2135	2.8	2721
103	170001	4885	4885		1780	2.7	2485
103	170002	3844	3844		1487	2.6	2165
103	1701	2273	2099	174	812	2.6	937
103	170201	4770	4755	15	1957	2.4	2871
103	170202	3400	3370	30	1425	2.4	2672
103	1803	2071	2053	18	887	2.3	1818
103	190401	5400	5051	349	1890	2.7	2443
103	190402	1467	1448	19	489	3.0	616
103	190403	1660	1660		686	2.4	1044
103	190501	4066	4062	4	1595	2.5	2761
103	190502	2238	2238		929	2.4	2421
103	190601	4634	4634		1911	2.4	3246
103	190602	5596	5576	20	2134	2.6	3588
103	190701	6096	5516	580	2180	2.5	4253
103	190703	5081	5081		2157	2.4	3672
103	190704	2908	2855	53	1158	2.5	1880
103	1908	4000	3903	97	1618	2.4	2542
103	2009	5661	5628	33	2386	2.4	4529
103	201001	3201	3201		1266	2.5	2529
103	201002	5158	5041	117	2108	2.4	5913
103	201099	9	9		.0		
103	9901	1284231	1253867	30364	85719	91.3	31722

POPULATION ESTIMATES  
FOR  
WATCH HILL SAND AND GRAVEL

1. Within 1-mile radius

Census Tract	Population	% Covered	Population
1457.02	4276	45	1924
1457.03	4273	70	2991
1457.01	5539	40	2216
1352.06	2046	10	205

TOTAL POPULATION = 7,336

2. Within 2-mile radius

Census Tract	Population	% Covered	Population
1457.01	5539	95	5262
1457.02	4276	100	4276
1457.03	4273	100	4273
1457.04	6050	55	3328
1462.01	3876	45	1744
1462.02	3192	35	1117
1462.03	3857	15	579
1461.05	4922	10	492
1456.01	4913	15	737
1456.02	5048	40	2019
1456.04	3116	5	156
1456.05	2673	90	2406
1352.06	2046	55	1125
1352.02	4831	5	242
1352.04	4748	5	237
1353.01	3792	15	569
1458.03	4657	10	466

TOTAL POPULATION = 29,028

3. Within 3-mile radius

Census Tract	Population	% Covered	Population
1457.01	5539	100	5539
1457.02	4276	100	4276
1457.03	4273	100	4273
1457.04	6050	100	6050
1458.03	4657	50	2328
1458.04	2362	35	827
1353.01	3792	100	3792
1353.03	4405	25	1101
1353.04	3234	5	162
1349.03	1455	10	145
1352.02	4831	50	2416
1352.04	4748	45	2137
1352.05	6251	10	625
1352.06	2046	100	2046
1456.01	4913	65	3193
1456.02	5048	100	5048
1456.03	4473	10	447
1456.04	3116	100	3116
1456.05	2673	60	1604
1460.01	3030	30	909
1461.04	3243	70	2270
1461.05	4922	60	2953
1462.01	3876	35	1357
1462.04	4751	25	1188
1462.02	3192	85	2713
1462.03	3857	75	2893
1463	2194	15	329
1464.03	4069	85	3459

TOTAL POPULATION = 67,196

REFERENCE NO. 13

YEC, INC.  
Forest View Professional Building  
10 Pine Crest Road  
Valley Cottage, NY 10989  
(914) 268-3203

March 10, 1989

Mr. Tom Greene  
Fire marshal  
1 Manitton Court  
Islip, NY 11751

Dear Mr. Greene:

YEC, Inc. is under contract to New York State Department of Environmental Conservation to conduct Phase I Investigation on Watch Hill Sand and Gravel located at the intersection of RT 111 and Long Island Motor Parkway in Hauppauge (see attached site location map), New York. I would like to know whether this site is declared as threat of fire and/or explosion by you.

I would very much appreciate, if you could send the above information at your earliest convenience.

Thanking you.

Sincerely yours

*A Selvakumar*

Ari Selvakumar, Ph.D.  
Staff Engineer, YEC, Inc.

# TOWN OF ISLIP



OFFICE OF THE TOWN ATTORNEY  
TOWN HALL  
ISLIP, N.Y. 11751

(516) 224-5550  
Fax (516) 581-8424

ROBERT J. CIMINO  
TOWN ATTORNEY

LAWRENCE DONOHUE  
DEPUTY TOWN ATTORNEY

March 21, 1989

Mr. Edward Chen  
YEC, Inc.  
10 Pine Crest Road  
Valley Cottage, New York 10989

Re: Watch Hill Sand and Gravel

Dear Mr. Chen:

We refer to your letter to the Town Fire Marshal, dated March 10, 1989.

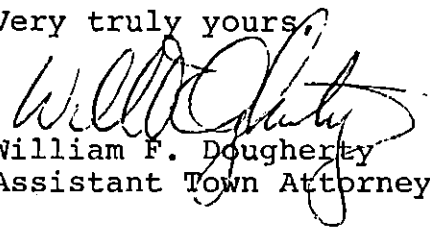
On March 17, 1989, a Town fire marshal visited the property in question. During a visual inspection of the premises, he was unable to observe any overt and/or obvious fire hazards.

After reviewing the records maintained by his office; the Fire Marshal was unable to locate any reports or complaints pertaining to this property.

The Fire Marshal does not have the capability to identify latent threats of fire and/or explosion. Consequently, it cannot make any representations regarding the existence of such risks or threats on the premises in question.

It is my understanding that you possess a copy of a Town Planning Division soil mechanics study dated May 13, 1984. The contents of this report, of course, speaks for itself.

Very truly yours,

  
William F. Dougherty  
Assistant Town Attorney

WFD:cv

REFERENCE NO. 14



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

100 Grange Place  
Room 202  
Cortland, New York 13045

October 3, 1989

Dr. Ari Selvakumar  
YEC, Inc.  
Forest View Professional Building  
10 Pine Crest Road  
Valley Cottage, NY 10989

Dear Dr. Selvakumar:

This responds to your August 14, 1989 request for information on the presence of Federally listed endangered or threatened species in the vicinity of the following sites:


1. Watch Hill Sand and Gravel, Central Islip, New York and
2. Bridgehampton Materials and Heavy Equipment Corporation, Southampton, New York.

Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) is required with the Fish and Wildlife Service. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered. A compilation of Federally listed and proposed endangered and threatened species in New York is enclosed for your information.

This response relates only to endangered species under our jurisdiction. It does not address other Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other legislation.

Please contact us if we can be of further assistance.

Sincerely,

  
Leonard P. Corin  
Field Supervisor

Enclosure

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES  
IN NEW YORK

Common Name	Scientific Name	Status	Distribution
<u>FISHES</u>			
Sturgeon, shortnose*	<u>Acipenser brevirostrum</u>	E	Hudson River & other Atlantic coastal rivers
<u>REPTILES</u>			
Turtle, green*	<u>Chelonia mydas</u>	T	Oceanic summer visitor coastal waters
Turtle, hawksbill*	<u>Eretmochelys imbricata</u>	E	Oceanic summer visitor coastal waters
Turtle, leatherback*	<u>Dermochelys coriacea</u>	E	Oceanic summer resident coastal waters
Turtle, loggerhead*	<u>Caretta caretta</u>	T	Oceanic summer resident coastal waters
Turtle, Atlantic ridley*	<u>Lepidochelys kempii</u>	E	Oceanic summer resident coastal waters
<u>BIRDS</u>			
Eagle, bald	<u>Haliaeetus leucocephalus</u>	E	Entire state
Falcon, peregrine	<u>Falco peregrinus</u>	E	Entire state - re- establishment to former breeding range in progress
Plover, piping	<u>Charadrius melodus</u>	E T	Great Lakes Watershed Remainder of coastal New York
Tern, roseate	<u>Sterna dougallii dougallii</u>	E	Southeastern coastal portions of state
<u>MAMMALS</u>			
Bat, Indiana	<u>Myotis sodalis</u>	E	Entire state
Cougar, eastern	<u>Felis concolor cougar</u>	E	Entire state - probably extinct
Whale, blue*	<u>Balaenoptera musculus</u>	E	Oceanic
Whale, finback*	<u>Balaenoptera physalus</u>	E	Oceanic
Whale, humpback*	<u>Megaptera novaeangliae</u>	E	Oceanic
Whale, right*	<u>Eubalaena glacialis</u>	E	Oceanic
Whale, sei*	<u>Balaenoptera borealis</u>	E	Oceanic
Whale, sperm*	<u>Physeter catodon</u>	E	Oceanic

\* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service.

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES  
IN NEW YORK (Cont'd)

Common Name	Scientific Name	Status	Distribution
<u>MOLLUSKS</u>			
Snail, Chittenango ovate amber	<u>Succinea</u> <u>chittenangoensis</u>	T	Madison County
<u>PLANTS</u>			
Monkshood, northern wild	<u>Aconitum noveboracense</u>	T	Ulster County
Pogonia, small whorled	<u>Isotria medeoloides</u>	E	Entire state
Swamp pink	<u>Helonias bullata</u>	T	Staten Island - presumed extirpated
Gerardia, sandplain	<u>Agalinis acuta</u>	E	Nassau and Suffolk Counties
Fern, American hart's-tongue	<u>Phyllitis scolopendrium</u> var. <u>americana</u>	T	Onondaga and Madison Counties
Orchid, eastern prairie fringed	<u>Platanthera leucophea</u>	Proposed T	Not relocated in New York



**POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 1 - SITE LOCATION AND INSPECTION INFORMATION**

I. IDENTIFICATION	
01 STATE NY	02 SITE NUMBER New

**II. SITE NAME AND LOCATION**

01 SITE NAME (Legal, common, or descriptive name of site) Watch Hill sand and Gravel		02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER Route 111 and Long Island Motor Parkway			
03 CITY Hauppauge		04 STATE NY	05 ZIP CODE 11787	06 COUNTY Suffolk	07 COUNTY CODE 103
09 COORDINATES LATITUDE: 40 48 00.0 LONGITUDE: 73 13 00.0		10 TYPE OF OWNERSHIP (Check one) <input checked="" type="checkbox"/> A. PRIVATE <input type="checkbox"/> B. FEDERAL <input type="checkbox"/> C. STATE <input type="checkbox"/> D. COUNTY <input type="checkbox"/> E. MUNICIPAL <input type="checkbox"/> F. OTHER			

**III. INSPECTION INFORMATION**

01 DATE OF INSPECTION 2, 3, 89 <small>MONTH DAY YEAR</small>	02 SITE STATUS <input checked="" type="checkbox"/> ACTIVE <input type="checkbox"/> INACTIVE	03 YEARS OF OPERATION 1960 present <small>BEGINNING YEAR ENDING YEAR</small>	
04 AGENCY PERFORMING INSPECTION (Check all that apply) <input type="checkbox"/> A. EPA <input type="checkbox"/> B. EPA CONTRACTOR <input type="checkbox"/> C. MUNICIPAL <input type="checkbox"/> D. MUNICIPAL CONTRACTOR <input type="checkbox"/> E. STATE <input type="checkbox"/> F. STATE CONTRACTOR <u>YEC, Inc.</u> <input type="checkbox"/> G. OTHER			

05 CHIEF INSPECTOR Marie McDonnell	06 TITLE Staff Geologist	07 ORGANIZATION YEC, Inc.	08 TELEPHONE NO. (914) 268 3203
09 OTHER INSPECTORS Gregory Fabijanic	10 TITLE Staff Engineer	11 ORGANIZATION YEC, Inc.	12 TELEPHONE NO. (914) 268 3203
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO.
Tom Marquardt	Planner	Town of Islip, 655 Main St. Islip, NY 11751	(516) 224 5691
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one) <input checked="" type="checkbox"/> PERMISSION <input type="checkbox"/> WARRANT	18 TIME OF INSPECTION 1.30 PM	19 WEATHER CONDITIONS 33 degree F and light rain
---	----------------------------------	---

**IV. INFORMATION AVAILABLE FROM**

01 CONTACT Ari Selvakumar	02 OF (Agency/Organization) YEC, Inc.	03 TELEPHONE NO. 914 268 3203
04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM Ari Selvakumar	05 AGENCY YEC, Inc.	06 ORGANIZATION
	07 TELEPHONE NO. (914) 268 3203	08 DATE 2, 8, 89 <small>MONTH DAY YEAR</small>

EPA FORM 2070-13 (7-81)





POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

L IDENTIFICATION

01 STATE NY 02 SITE NUMBER New

II. HAZARDOUS CONDITIONS AND INCIDENTS

01  A. GROUNDWATER CONTAMINATION 02  OBSERVED (DATE: \_\_\_\_\_)  POTENTIAL  ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

No data available.

01  B. SURFACE WATER CONTAMINATION 02  OBSERVED (DATE: \_\_\_\_\_)  POTENTIAL  ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

None reported.

01  C. CONTAMINATION OF AIR 02  OBSERVED (DATE: \_\_\_\_\_)  POTENTIAL  ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

None reported.

01  D. FIRE/EXPLOSIVE CONDITIONS 02  OBSERVED (DATE: \_\_\_\_\_)  POTENTIAL  ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

Fire Marshal was unable to observe any overt and/or obvious fire hazards.

01  E. DIRECT CONTACT 02  OBSERVED (DATE: \_\_\_\_\_)  POTENTIAL  ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

None reported.

01  F. CONTAMINATION OF SOIL 02  OBSERVED (DATE: \_\_\_\_\_)  POTENTIAL  ALLEGED  
03 AREA POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

Soil samples collected in 1984 on Eight-in-One Pet Products, inc., which is located north of the site were found to be non-toxic.

01  G. DRINKING WATER CONTAMINATION 02  OBSERVED (DATE: \_\_\_\_\_)  POTENTIAL  ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

No data available.

01  H. WORKER EXPOSURE/INJURY 02  OBSERVED (DATE: \_\_\_\_\_)  POTENTIAL  ALLEGED  
03 WORKERS POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

None reported.

01  I. POPULATION EXPOSURE/INJURY 02  OBSERVED (DATE: \_\_\_\_\_)  POTENTIAL  ALLEGED  
03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_ 04 NARRATIVE DESCRIPTION

None reported.





**POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION  
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION**

**I. IDENTIFICATION**

01 STATE NY	02 SITE NUMBER New
----------------	-----------------------

**II. PERMIT INFORMATION**

01 TYPE OF PERMIT ISSUED <i>(Check all that apply)</i>	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
<input type="checkbox"/> A. NPDES				
<input type="checkbox"/> B. UIC				
<input type="checkbox"/> C. AIR				
<input type="checkbox"/> D. RCRA				
<input type="checkbox"/> E. RCRA INTERIM STATUS				
<input type="checkbox"/> F. SPCC PLAN				
<input type="checkbox"/> G. STATE <i>(Specify)</i>				
<input type="checkbox"/> H. LOCAL <i>(Specify)</i>				
<input type="checkbox"/> I. OTHER <i>(Specify)</i>				
<input type="checkbox"/> J. NONE				

**III. SITE DESCRIPTION**

01 STORAGE/ DISPOSAL <i>(Check all that apply)</i>	02 AMOUNT	03 UNIT OF MEASURE	04 TREATMENT <i>(Check all that apply)</i>	05 OTHER
<input type="checkbox"/> A. SURFACE IMPOUNDMENT <input type="checkbox"/> B. PILES <input type="checkbox"/> C. DRUMS, ABOVE GROUND <input type="checkbox"/> D. TANK, ABOVE GROUND <input type="checkbox"/> E. TANK, BELOW GROUND <input type="checkbox"/> F. LANDFILL <input type="checkbox"/> G. LANDFARM <input type="checkbox"/> H. OPEN DUMP <input type="checkbox"/> I. OTHER <i>(Specify)</i>			<input type="checkbox"/> A. INCINERATION <input type="checkbox"/> B. UNDERGROUND INJECTION <input type="checkbox"/> C. CHEMICAL/PHYSICAL <input type="checkbox"/> D. BIOLOGICAL <input type="checkbox"/> E. WASTE OIL PROCESSING <input type="checkbox"/> F. SOLVENT RECOVERY <input type="checkbox"/> G. OTHER RECYCLING/RECOVERY <input checked="" type="checkbox"/> H. OTHER <u>Landfill and Sand Mine</u> <i>(Specify)</i>	<input type="checkbox"/> A. BUILDINGS ON SITE None <hr/> 06 AREA OF SITE <u>45</u> <i>(Acres)</i>

**07 COMMENTS**

Town of Islip operated a portion of the site as a landfill and disposed household garbage, and construction and demolition debris.

**IV. CONTAINMENT**

01 CONTAINMENT OF WASTES *(Check one)*

A. ADEQUATE, SECURE     
  B. MODERATE     
  C. INADEQUATE, POOR     
  D. INSECURE, UNSOUND, DANGEROUS

**02 DESCRIPTION OF DRUMS, DIKING, LINEAR, BARRIERS, ETC.**

There is no liner in the bottom of the landfill.

**V. ACCESSIBILITY**

01 WASTE EASILY ACCESSIBLE:  YES  NO

02 COMMENTS  
The site is not fenced and there is no gate.

**VI. SOURCES OF INFORMATION *(Cite specific references, e.g. state files, sample analysis, reports)***

Site Inspection.



**POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA**

**I. IDENTIFICATION**  
01 STATE NY 02 SITE NUMBER

**II. DRINKING WATER SUPPLY**

01 TYPE OF DRINKING SUPPLY <i>(Check as appropriate)</i>		02 STATUS			03 DISTANCE TO SITE
COMMUNITY	<input type="checkbox"/> SURFACE A. <input type="checkbox"/>	<input checked="" type="checkbox"/> WELL B. <input checked="" type="checkbox"/>	ENDANGERED A. <input type="checkbox"/>	AFFECTED B. <input type="checkbox"/>	MONITORED C. <input type="checkbox"/>
NON-COMMUNITY	<input type="checkbox"/> SURFACE C. <input type="checkbox"/>	<input type="checkbox"/> WELL D. <input type="checkbox"/>	D. <input type="checkbox"/>	E. <input type="checkbox"/>	F. <input type="checkbox"/>
					A. <u>0.4</u> (mi) B. _____ (mi)

**III. GROUNDWATER**

01 GROUNDWATER USE IN VICINITY *(Check one)*

A. ONLY SOURCE FOR DRINKING     B. DRINKING *(Other sources available)*  
COMMERCIAL, INDUSTRIAL, IRRIGATION *(No other water sources available)*

C. COMMERCIAL, INDUSTRIAL, IRRIGATION *(Limited other sources available)*     D. NOT USED, UNUSABLE

02 POPULATION SERVED BY GROUND WATER Greater than 10,000    03 DISTANCE TO NEAREST DRINKING WATER WELL 0.4 (mi)

04 DEPTH TO GROUNDWATER <u>55</u> (ft)	05 DIRECTION OF GROUNDWATER FLOW <u>North</u>	06 DEPTH TO AQUIFER OF CONCERN <u>Unknown</u> (ft)	07 POTENTIAL YIELD OF AQUIFER <u>Unknown</u> (gpd)	08 SOLE SOURCE AQUIFER <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
---	--	---	---	---

09 DESCRIPTION OF WELLS *(including depth, depth, and location relative to population and buildings)*

Suffolk County Water Authority, Brentwood Water District, Central Islip Psychiatric Center and St. Joseph Convent-Long Island University wells are within 3-mile radius of the site.

10 RECHARGE AREA <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO    COMMENTS	11 DISCHARGE AREA <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO    COMMENTS
---	--

**IV. SURFACE WATER**

01 SURFACE WATER USE *(Check one)*

A. RESERVOIR, RECREATION DRINKING WATER SOURCE     B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES     C. COMMERCIAL, INDUSTRIAL     D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME: <u>None</u>	AFFECTED	DISTANCE TO SITE
_____	<input type="checkbox"/>	_____ (mi)
_____	<input type="checkbox"/>	_____ (mi)
_____	<input type="checkbox"/>	_____ (mi)

**V. DEMOGRAPHIC AND PROPERTY INFORMATION**

01 TOTAL POPULATION WITHIN	02 DISTANCE TO NEAREST POPULATION
ONE (1) MILE OF SITE A. <u>7,331</u> NO OF PERSONS	<u>Adjacent</u> (mi)
TWO (2) MILES OF SITE B. <u>29,028</u> NO OF PERSONS	
THREE (3) MILES OF SITE C. <u>67,196</u> NO OF PERSONS	

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE <u>Approximately 1,000</u>	04 DISTANCE TO NEAREST OFF-SITE BUILDING <u>Adjacent</u> (mi)
---	--

05 POPULATION WITHIN VICINITY OF SITE *(Provide approximate description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)*

The site is within a mixed residential, commercial and industrial district. Total population within a 3-mile radius of the site is approximately 67,196 persons.



**POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA**

**I. IDENTIFICATION**

01 STATE 02 SITE NUMBER  
NY -

**VI. ENVIRONMENTAL INFORMATION**

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

A.  $10^{-6} - 10^{-8}$  cm/sec     B.  $10^{-4} - 10^{-6}$  cm/sec     C.  $10^{-2} - 10^{-3}$  cm/sec     D. GREATER THAN  $10^{-2}$  cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

A. IMPERMEABLE (Less than  $10^{-8}$  cm/sec)     B. RELATIVELY IMPERMEABLE ( $10^{-4} - 10^{-6}$  cm/sec)     C. RELATIVELY PERMEABLE ( $10^{-2} - 10^{-4}$  cm/sec)     D. VERY PERMEABLE (Greater than  $10^{-2}$  cm/sec)

03 DEPTH TO BEDROCK

Unknown (ft)

04 DEPTH OF CONTAMINATED SOIL ZONE

Unknown (ft)

05 SOIL pH

Unknown

06 NET PRECIPITATION

14 (in)

07 ONE YEAR 24 HOUR RAINFALL

2.8 (in)

08 SLOPE  
SITE SLOPE

1 %

DIRECTION OF SITE SLOPE

Variable

TERRAIN AVERAGE SLOPE

1 %

09 FLOOD POTENTIAL

SITE IS IN \_\_\_\_\_ YEAR FLOODPLAIN

10

SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (if any remaining)

ESTUARINE

A. None (mi)

OTHER

B. None (mi)

12 DISTANCE TO CRITICAL HABITAT (if endangered species)

\_\_\_\_\_ (mi)

ENDANGERED SPECIES: None

13 LAND USE IN VICINITY

DISTANCE TO

COMMERCIAL/INDUSTRIAL

A. Adjacent (mi)

RESIDENTIAL AREAS; NATIONAL/STATE PARKS,  
FORESTS, OR WILDLIFE RESERVES

B. Adjacent (mi)

AGRICULTURAL LANDS  
PRIME AG LAND      AG LAND

C. \_\_\_\_\_ (mi)      D. \_\_\_\_\_ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site is located approximately 1.1 mile north of Long Island Railroad. Site elevation is about 100 feet above mean sea level (MSL). Soil type in this region is suitable for the purpose of mining sand and gravel. Drainage across the study area is generally toward the northern direction and ultimately to Nissequogue river.

**VII. SOURCES OF INFORMATION** (See specific references, e.g., state files, sample analysis reports)

Site Inspection, USGS 7.5-Minute Topographic Map, Soil Survey of Suffolk County, etc.



**POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 8 - SAMPLE AND FIELD INFORMATION**

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	

**II. SAMPLES TAKEN**

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

**III. FIELD MEASUREMENTS TAKEN**

01 TYPE	02 COMMENTS
Air Quality	Air Monitoring was conducted during site inspection by use of an HNu Photoionizer Unit around the perimeter of the site.
	No readings above background were noted. However, readings may have been adversely impacted by the weather conditions.

**IV. PHOTOGRAPHS AND MAPS**

01 TYPE <input checked="" type="checkbox"/> GROUND <input type="checkbox"/> AERIAL	02 IN CUSTODY OF <u>YEC, Inc</u> <small>(Name of organization or individual)</small>
03 MAPS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	04 LOCATION OF MAPS <u>YEC, Inc. (USGS 7.5-minute Quadrangle Map, Site Plan)</u>

**V. OTHER FIELD DATA COLLECTED** (Provide narrative description)

YEC, Inc. field notes and photographs.

**VI. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

Site Inspection by YEC, Inc.



**POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 7 - OWNER INFORMATION**

**L IDENTIFICATION**

<b>01 STATE</b> NY	<b>02 SITE NUMBER</b> 
-----------------------	---------------------------

<b>II. CURRENT OWNER(S)</b>					<b>PARENT COMPANY (if applicable)</b>				
<b>01 NAME</b> Franklin Frank			<b>02 D+B NUMBER</b>		<b>08 NAME</b>			<b>09 D+B NUMBER</b>	
<b>03 STREET ADDRESS (P.O. Box, RFD #, etc.)</b> 525B Mid-Island Plaza			<b>04 SIC CODE</b>		<b>10 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>11 SIC CODE</b>	
<b>06 CITY</b> Hicksville		<b>06 STATE</b> NY	<b>07 ZIP CODE</b> 11801		<b>12 CITY</b>		<b>13 STATE</b>	<b>14 ZIP CODE</b>	
<b>01 NAME</b> William Plander			<b>02 D+B NUMBER</b>		<b>08 NAME</b>			<b>09 D+B NUMBER</b>	
<b>03 STREET ADDRESS (P.O. Box, RFD #, etc.)</b> 525B Mid-Island Plaza			<b>04 SIC CODE</b>		<b>10 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>11 SIC CODE</b>	
<b>06 CITY</b> Hicksville		<b>06 STATE</b> NY	<b>07 ZIP CODE</b> 11801		<b>12 CITY</b>		<b>13 STATE</b>	<b>14 ZIP CODE</b>	
<b>01 NAME</b>			<b>02 D+B NUMBER</b>		<b>08 NAME</b>			<b>09 D+B NUMBER</b>	
<b>03 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>04 SIC CODE</b>		<b>10 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>11 SIC CODE</b>	
<b>06 CITY</b>		<b>06 STATE</b>	<b>07 ZIP CODE</b>		<b>12 CITY</b>		<b>13 STATE</b>	<b>14 ZIP CODE</b>	
<b>01 NAME</b>			<b>02 D+B NUMBER</b>		<b>08 NAME</b>			<b>09 D+B NUMBER</b>	
<b>03 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>04 SIC CODE</b>		<b>10 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>11 SIC CODE</b>	
<b>06 CITY</b>		<b>06 STATE</b>	<b>07 ZIP CODE</b>		<b>12 CITY</b>		<b>13 STATE</b>	<b>14 ZIP CODE</b>	
<b>III. PREVIOUS OWNER(S) (List must read and first)</b>					<b>IV. REALTY OWNER(S) (if applicable; list must read and first)</b>				
<b>01 NAME</b>			<b>02 D+B NUMBER</b>		<b>01 NAME</b>			<b>02 D+B NUMBER</b>	
<b>03 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>04 SIC CODE</b>		<b>03 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>04 SIC CODE</b>	
<b>06 CITY</b>		<b>06 STATE</b>	<b>07 ZIP CODE</b>		<b>06 CITY</b>		<b>06 STATE</b>	<b>07 ZIP CODE</b>	
<b>01 NAME</b>			<b>02 D+B NUMBER</b>		<b>01 NAME</b>			<b>02 D+B NUMBER</b>	
<b>03 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>04 SIC CODE</b>		<b>03 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>04 SIC CODE</b>	
<b>06 CITY</b>		<b>06 STATE</b>	<b>07 ZIP CODE</b>		<b>06 CITY</b>		<b>06 STATE</b>	<b>07 ZIP CODE</b>	
<b>01 NAME</b>			<b>02 D+B NUMBER</b>		<b>01 NAME</b>			<b>02 D+B NUMBER</b>	
<b>03 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>04 SIC CODE</b>		<b>03 STREET ADDRESS (P.O. Box, RFD #, etc.)</b>			<b>04 SIC CODE</b>	
<b>06 CITY</b>		<b>06 STATE</b>	<b>07 ZIP CODE</b>		<b>06 CITY</b>		<b>06 STATE</b>	<b>07 ZIP CODE</b>	
<b>V. SOURCES OF INFORMATION (Cite specific references, e.g., maps, files, sample analysis, reports)</b>									
Town of Islip Files.									



**POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART B - OPERATOR INFORMATION**

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	

II. CURRENT OPERATOR (Provide if different from owner)				OPERATOR'S PARENT COMPANY (if applicable)			
01 NAME		02 D+B NUMBER		10 NAME		11 D+B NUMBER	
None							
03 STREET ADDRESS (P.O. Box, AFD #, etc.)			04 SIC CODE	12 STREET ADDRESS (P.O. Box, AFD #, etc.)			13 SIC CODE
06 CITY		08 STATE	07 ZIP CODE	14 CITY		15 STATE	16 ZIP CODE
08 YEARS OF OPERATION		09 NAME OF OWNER					

III. PREVIOUS OPERATOR(S) (If 2 or more use one first; provide only if different from owner)				PREVIOUS OPERATORS' PARENT COMPANIES (if applicable)			
01 NAME		02 D+B NUMBER		10 NAME		11 D+B NUMBER	
Gerald Philbin							
03 STREET ADDRESS (P.O. Box, AFD #, etc.)			04 SIC CODE	12 STREET ADDRESS (P.O. Box, AFD #, etc.)			13 SIC CODE
Old Northport Road							
06 CITY		08 STATE	07 ZIP CODE	14 CITY		15 STATE	16 ZIP CODE
Kings Park		NY	11754				
08 YEARS OF OPERATION		09 NAME OF OWNER DURING THIS PERIOD					
less than a year		Franklin Frank William Plander					

01 NAME		02 D+B NUMBER		10 NAME		11 D+B NUMBER	
William Plander							
03 STREET ADDRESS (P.O. Box, AFD #, etc.)			04 SIC CODE	12 STREET ADDRESS (P.O. Box, AFD #, etc.)			13 SIC CODE
525B Mid-Island Plaza							
06 CITY		08 STATE	07 ZIP CODE	14 CITY		15 STATE	16 ZIP CODE
Hicksville		NY	11801				
08 YEARS OF OPERATION		09 NAME OF OWNER DURING THIS PERIOD					
20 years		Franklin Frank William Plander					

01 NAME		02 D+B NUMBER		10 NAME		11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, AFD #, etc.)			04 SIC CODE	12 STREET ADDRESS (P.O. Box, AFD #, etc.)			13 SIC CODE
06 CITY		08 STATE	07 ZIP CODE	14 CITY		15 STATE	16 ZIP CODE
08 YEARS OF OPERATION		09 NAME OF OWNER DURING THIS PERIOD					

IV. SOURCES OF INFORMATION (Can specify references, e.g., Maps, files, sample analysis, reports)							
Town of Islip Files.							



**POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART B - GENERATOR/TRANSPORTER INFORMATION**

**I. IDENTIFICATION**

01 STATE NY	02 SITE NUMBER
----------------	----------------

**II. ON-SITE GENERATOR** None

01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE

**III. OFF-SITE GENERATOR(S)**

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY
06 STATE	07 ZIP CODE	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY
06 STATE	07 ZIP CODE	06 STATE	07 ZIP CODE

**IV. TRANSPORTER(S)**

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY
06 STATE	07 ZIP CODE	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY
06 STATE	07 ZIP CODE	06 STATE	07 ZIP CODE

**V. SOURCES OF INFORMATION** (Can specify references, e.g., phone files, sample analysis, reports)

--



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 10 - PAST RESPONSE ACTIVITIES

L IDENTIFICATION  
01 STATE 02 SITE NUMBER  
Nv

II. PAST RESPONSE ACTIVITIES None

01 <input type="checkbox"/> A. WATER SUPPLY CLOSED 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> B. TEMPORARY WATER SUPPLY PROVIDED 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> C. PERMANENT WATER SUPPLY PROVIDED 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> D. SPILLED MATERIAL REMOVED 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> E. CONTAMINATED SOIL REMOVED 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> F. WASTE REPACKAGED 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> H. ON SITE BURIAL 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> I. IN SITU CHEMICAL TREATMENT 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> J. IN SITU BIOLOGICAL TREATMENT 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> K. IN SITU PHYSICAL TREATMENT 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> L. ENCAPSULATION 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> M. EMERGENCY WASTE TREATMENT 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> N. CUTOFF WALLS 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> O. EMERGENCY DIXING/SURFACE WATER DIVERSION 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> P. CUTOFF TRENCHES/SUMP 04 DESCRIPTION	02 DATE _____	03 AGENCY _____
01 <input type="checkbox"/> Q. SUBSURFACE CUTOFF WALL 04 DESCRIPTION	02 DATE _____	03 AGENCY _____



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 10 - PAST RESPONSE ACTIVITIES

L IDENTIFICATION  
01 STATE 02 SITE NUMBER

II PAST RESPONSE ACTIVITIES (Continued)

01  R. BARRIER WALLS CONSTRUCTED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

01  S. CAPPING/COVERING  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

01  T. BULK TANKAGE REPAIRED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

01  U. GROUT CURTAIN CONSTRUCTED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

01  V. BOTTOM SEALED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

01  W. GAS CONTROL  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

01  X. FIRE CONTROL  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

01  Y. LEACHATE TREATMENT  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

01  Z. AREA EVACUATED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

01  1. ACCESS TO SITE RESTRICTED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

01  2. POPULATION RELOCATED  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

01  3. OTHER REMEDIAL ACTIVITIES  
04 DESCRIPTION

02 DATE \_\_\_\_\_

03 AGENCY \_\_\_\_\_

III. SOURCES OF INFORMATION (Cite specific references e.g., state files, sample analysis reports)



POTENTIAL HAZARDOUS WASTE SITE  
SITE INSPECTION REPORT  
PART 11 - ENFORCEMENT INFORMATION

L. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	152084

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION  YES  NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

None.

III. SOURCES OF INFORMATION (Cite specific references, e.g., State log, sample analyses, reports)

## 6. ASSESSMENT OF DATA ADEQUACY AND RECOMMENDATIONS

The available data are considered insufficient to prepare a final HRS Score for the Watch Hill Sand and Gravel site. Soil samples collected in 1984 from the soil borings in the pit to locate the approximate location and depths of garbage disposal were found to be non-toxic. No surface waters are located near the site; the closest is approximately 1.6 miles downslope. In order to prepare a final HRS score for this site, analytical data for groundwater and on-site soils will be necessary. It is recommended, as part of a Phase II Investigation, to install groundwater wells, collect and analyze groundwater samples, and collect and analyze on-site soil samples.

APPENDIX A PHOTOGRAPHIC RECORD

WATCH HILL SAND & GRAVEL  
HAUPPAUGE, NEW YORK

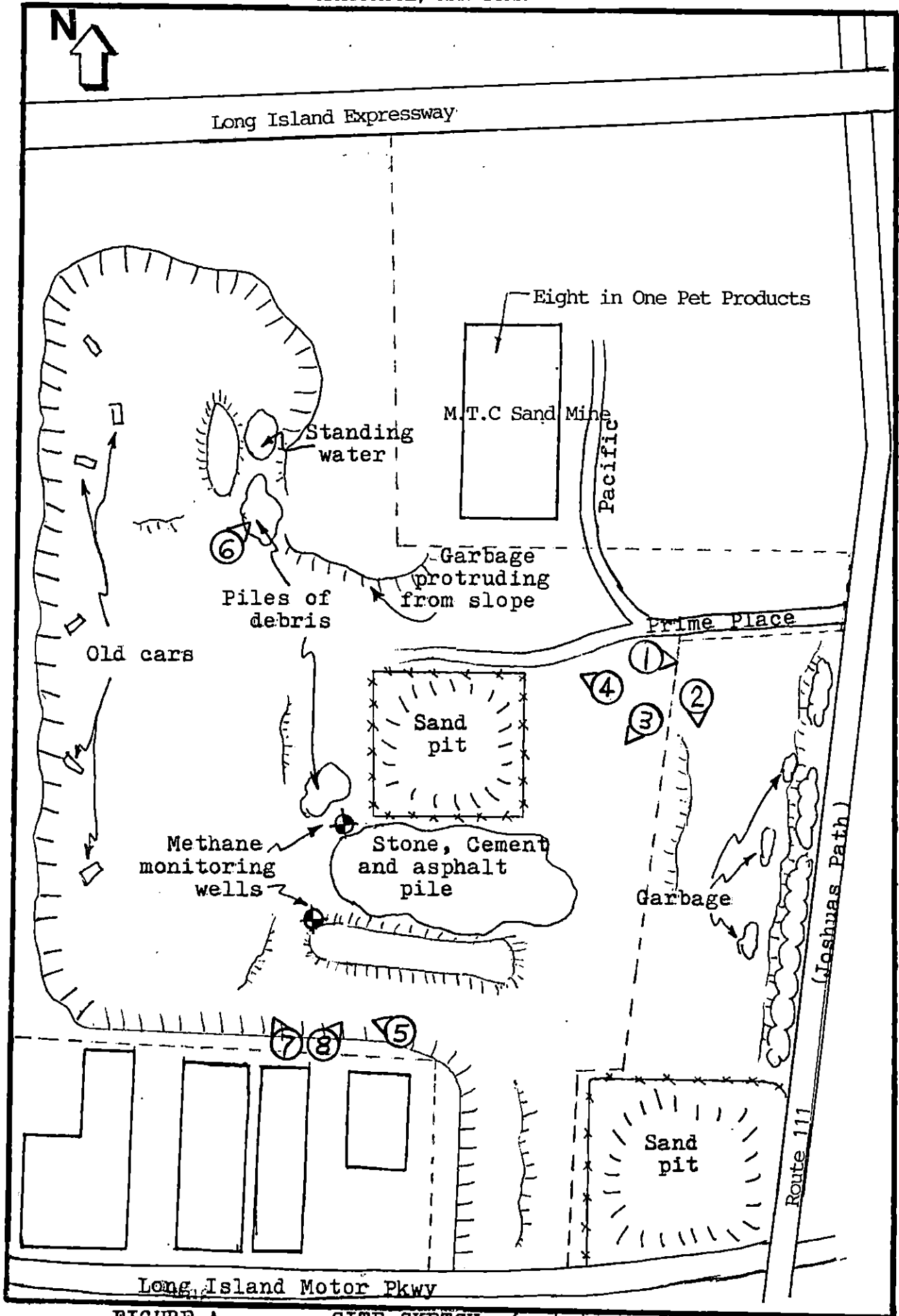
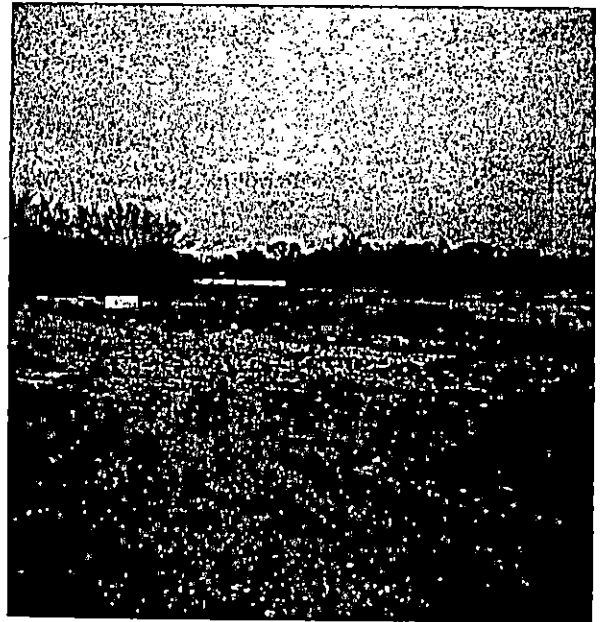


FIGURE A SITE SKETCH (not to scale)



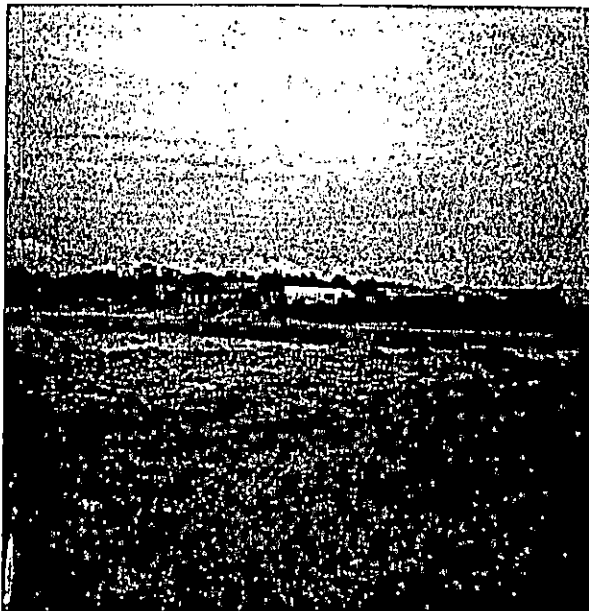
1. February 3, 1989

View east out entrance road.



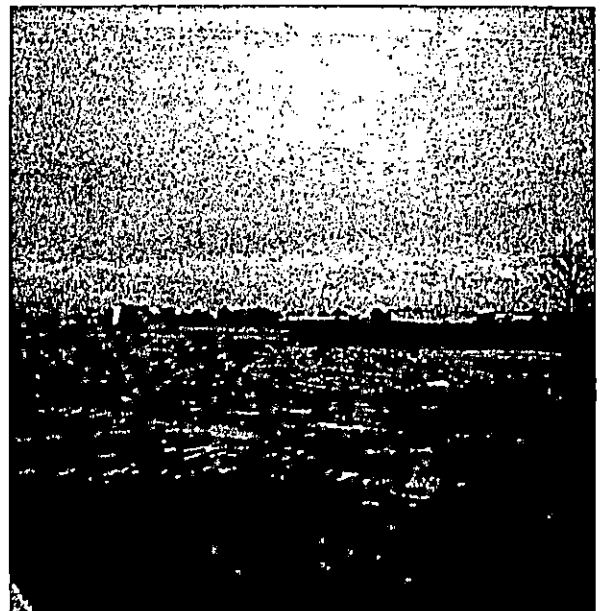
2. February 3, 1989

View south of open field.



3. February 3, 1989

View South-west across open field.



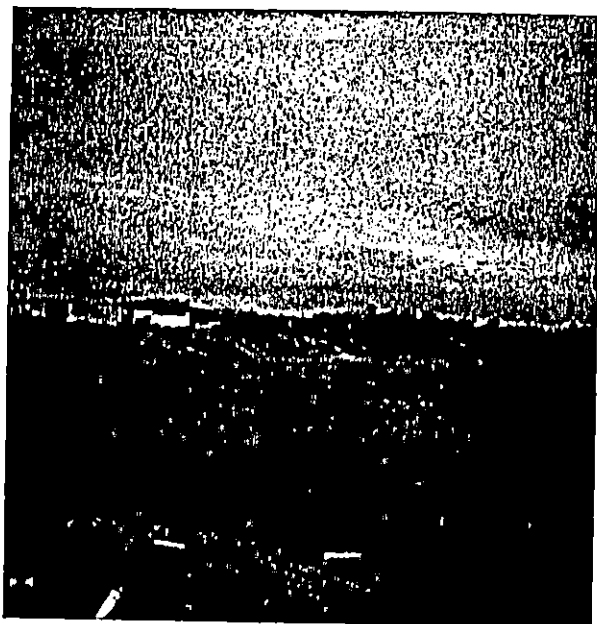
4. February 3, 1989

View west towards excavated area.



5. February 3, 1989

View west of garbage at the south boundary.



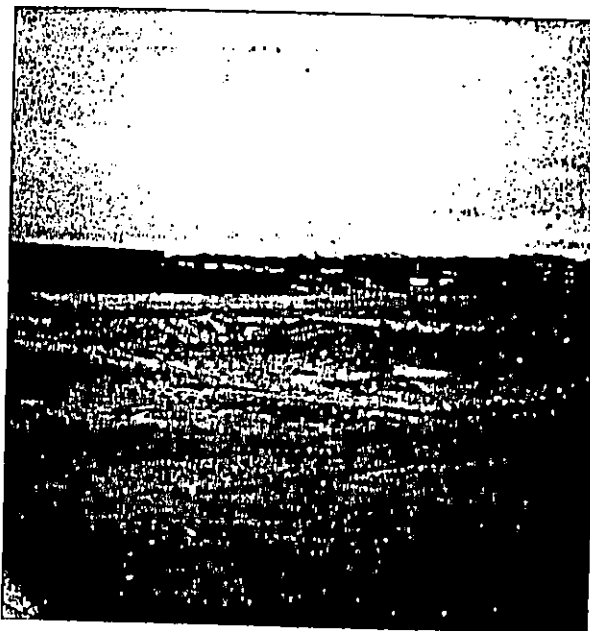
7. February 3, 1989

View north-west of excavated area.



6. February 3, 1989

Empty, rusted tank near middle of property.



8. February 3, 1989

View north-east of area around monitoring wells.

APPENDIX B UPDATED NYSDEC INACTIVE HAZARDOUS WASTE  
DISPOSAL SITE REGISTRY FORM

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
 DIVISION OF SOLID AND HAZARDOUS WASTE  
 INACTIVE HAZARDOUS WASTE  
 DISPOSAL SITE REPORT

Priority Codes: \_\_\_\_\_ Site Codes: 152084

Name of Site: Watch Hill Sand and Gravel Region: 1

Street Address: Route 111 and Long Island Motor Parkway

Town/City: Hauppauge, New York 11787 County: Suffolk

Name of Current Owner of Site: Franklin Frank and William Plander

Address of Current Owner of Site: 525B Mid-Island plaza, Hicksville, NY 11801

Type of Sites:     Open Dump     Structure     Lagoon  
                    Landfill         Treatment Pond and Sand Mine

Estimated Size: 45 acre(s)

**Site Description:**

Watch Hill Sand and Gravel is approximately a 45-acre site located at the intersection of RT 111 and Long Island Motor Parkway in Hauppauge, New York. The site was an old landfill operated by the Town of Islip which received household garbage and construction and demolition debris. The site was used for sand and mine operation since 1960.

The site is not fenced and has no gate. During the site inspection, no suspicious hazardous waste disposal areas were detected.  
 Hazardous Waste Disposed:     Confirmed         Suspected

**Type and Quantity of Hazardous Wastes Disposed:**

<u>Type</u>	<u>Quantity</u> (Pounds, Drums, Tons, Gallons)
None	
_____	_____
_____	_____
_____	_____
_____	_____

Time Period Site was Used for Hazardous Waste Disposal:

\_\_\_\_\_, 19\_\_ To \_\_\_\_\_, 19\_\_

Owner(s) During Period of Use: Franklin Frank and William Plander

Site Operator During Period of Use: Franklin Frank and William Plander

Address of Site Operator: 525B Mid-Island Plaza, Hicksville, NY 11801

Analytical Data Available:  Air  Surface Water  Groundwater  
 Soil  Sediment  None

Contravention of Standards:  Groundwater  Drinking Water  
 Surface Water  Air

Soil Types: Sand and Gravel

Depth to Groundwater Tables: 55 feet

Legal Actions: Type: \_\_\_\_\_  State  Federal

Status:  In Progress  Completed

Remedial Actions:  Proposed  Under Design  
 In Progress  Completed

Nature of Action: \_\_\_\_\_  
\_\_\_\_\_

Assessment of Environmental Problems:  
Unknown.

Assessment of Health Problems:  
Unknown.

Person(s) Completing This Form:

For NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Name: Ari Selvakumar  
Title: Staff Engineer, YEC, Inc.  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

NEW YORK STATE DEPARTMENT OF HEALTH

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

APPENDIX C PHOTOCOPIED REFERENCES

#### APPENDIX C REFERENCES

1. Correspondence between William C. Roberts and Mr. Martin Eglow, June 1964.
2. Correspondence between YEC, Inc. and Gerald J. Philbin, June 1989.
3. Town of Islip Files.
4. Correspondence between YEC, Inc. and Betty Gallagher of Islip Town Hall, August 1989.
5. Wallace D. Laguna, Geology of Brookhaven National Laboratory and Vicinity, Suffolk County, New York, Geological Survey Bulletin 1156-A, 1963.

RECEIVED  
JUN 7 1984  
DEPT. OF PLANNING  
AND DEVELOPMENT

COUNTY OF SUFFOLK



PETER F. COHALAN  
SUFFOLK COUNTY EXECUTIVE

XC to Guy  
Riv  
[Handwritten initials]

DEPARTMENT OF HEALTH SERVICES

DAVID HARRIS, M.D., M.P.H.  
Commissioner

June 4, 1984

Martin Eglow  
Broad Hollow Road  
Islip, NY 11746

Plander's Pit Property, Located W/O Rte. 111 & N/O Motor Pkwy.,  
Hauppauge, New York

Mr. Eglow:

This letter confirms the discussion held in our offices on May 31, 1984  
as you met with Mr. Robert Villa, P.E., Chief Engineer of the Division  
of Environmental Health, and myself concerning future construction on the  
above referenced property.

At that meeting it was indicated that we had significant concerns regard-  
ing the danger of building on property that had been used for landfilling  
purposes. Recently on Long Island, two explosions occurred; one causing  
several deaths and the other causing serious injuries because of methane  
production.

Based on the department's recollection of this site during the period  
that it had been used by the Town of Islip for fill purposes, large amounts  
of combustible material, including household garbage and other materials,  
deposited at the site. In our estimation, this would require  
significant investigation to determine the potential for methane production.

In copy of this letter we are indicating our concerns to the Town of Islip  
and also informing you that there is a further problem of sanitary waste  
leakage throughout the filled-in area.

Therefore, in light of actions by the EPA and state in the past regarding  
groundwater pollution, there may be a question as to who can be ultimately  
responsible for preventing leachate at the site from entering into our  
groundwaters. Cappings, ventings and other steps may become necessary  
to alleviate future pollution from this site.

If there are any questions, please do not hesitate to contact me.

Sincerely,  
truly yours,

William C. Roberts, P.E., Chief  
of Environmental Engineering & Pollution Control.

WCR  
William Rutkoski, Commissioner, Tn. of Islip Plan. & Devel. Dept.

YEC, INC.  
Forest View Professional Building  
10 Pine Crest Road  
Valley Cottage, NY 10989  
(914) 268-3203

December 28, 1988

Watch Hill Sand and Gravel  
Old Northport Road  
Kings Park, NY 11754

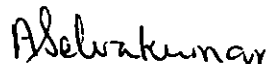
Dear Sir/Madam:

YEC, Inc. is under contract to New York State Department of Environmental Conservation (NYSDEC) Hazardous Waste Remediation Division to conduct Phase I Investigation on Watch Hill Sand and Gravel located at the intersection of RT 111 and Long Island Motor Parkway in Hauppauge, New York. I need your assistance in providing the site history, years of operation, past and present owners name and address, and any other information you have on this site.

I would appreciate if you could send the above information at your earliest convenience.

Thanking you.

Sincerely yours



Ari Selvakumar  
Staff Engineer

# NATIONAL DEMOLITION CORP.

N.Y. SPECS. SAND & GRAVEL

OLD NORTHPORT ROAD • KINGS PARK, NEW YORK 11754  
(516) 269-5959

January 6th, 1989

Mr. Ari Selvakumar  
Staff Engineer  
YEC, INC.  
10 Pinecrest Road  
Valley Cottage, New York 10989

Dear Mr. Selvakumar:

In regards to your letter dated 12/28/88 about the Watch Hill Sand & Gravel operation located at the intersection of RT 111 and Long Island Motor Parkway in Hauppauge. Watch Hill Sand & Gravel conducted a sand and gravel operation at the site. We were only there for a short time less than one year and were paying royalties for materials taken from the property. The royalties were paid to Mr. Franklin Frank or his company Expressway Aggregates. The site was an old landfill operated by the Town of Islip and they were depositing raw garbage on the property years prior to our arrival. Watch Hill Sand & Gravel was operating on that site in 1979 or 1980. Watch Hill Sand & Gravel ceased all operations in 1981 and the corporation was dissolved soon thereafter.

The above information is all that I can relate as far as Watch Hill Sand & Gravel is concerned.

Sincerely,



GERALD J. PHILBIN

GJP:km

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF SOLID AND HAZARDOUS WASTE  
INACTIVE HAZARDOUS WASTE DISPOSAL SITE REPORT

PRIORITY CODE: 2a SITE CODE: 152084

NAME OF SITE: Watch Hill Sand and Gravel REGION: one

STREET ADDRESS: RT 111 & Motor Hwy.

TOWN/CITY: Hempstead NY COUNTY: Suffolk

NAME OF CURRENT OWNER OF SITE: Expressway Research Dev Co.

ADDRESS OF CURRENT OWNER OF SITE: 350 Mid Island Plaza Hicksville

TYPE OF SITE: OPEN DUMP  STRUCTURE  LAGOON   
LANDFILL  TREATMENT POND

ESTIMATED SIZE: \_\_\_\_\_ ACRES

SITE DESCRIPTION:  
Site used as a C&D Landfill

HAZARDOUS WASTE DISPOSED: CONFIRMED  SUSPECTED

TYPE AND QUANTITY OF HAZARDOUS WASTES DISPOSED:  
TYPE QUANTITY (POUNDS, DRUMS, TONS, GALLONS)

TYPE	QUANTITY (POUNDS, DRUMS, TONS, GALLONS)

SITE OPERATOR DURING P /IOD OF USE: W. L. Hill 12000 & Co.

ADDRESS OF SITE OPERATOR: old Northport Rd. Kings Park N.Y.

ANALYTICAL DATA AVAILABLE: AIR  SURFACE WATER  GROUNDWATER   
SOIL  SEDIMENT  NONE

CONTRAVENTION OF STANDARDS: GROUNDWATER  DRINKING WATER   
SURFACE WATER  AIR

SOIL TYPE: Sandy Gravel

DEPTH TO GROUNDWATER TABLE: \_\_\_\_\_

LEGAL ACTION: TYPE: \_\_\_\_\_ STATE  FEDERAL

STATUS: IN PROGRESS  COMPLETED   
REMEDIAL ACTION: PROPOSED  UNDER DESIGN   
IN PROGRESS  COMPLETED

NATURE OF ACTION: \_\_\_\_\_

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

ASSESSMENT OF HEALTH PROBLEMS:

PERSON(S) COMPLETING THIS FORM:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NEW YORK STATE DEPARTMENT OF HEALTH

NAME Robert Frey

NAME \_\_\_\_\_

TITLE Prin. Engin. Tech.

TITLE \_\_\_\_\_

NAME \_\_\_\_\_

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

TITLE \_\_\_\_\_

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_



53 SUFFOLK COUNTY COMMUNITY COLLEGE (WESTERN CAMPUS)

11788

CENTRAL ISLIP

BRENTWOOD

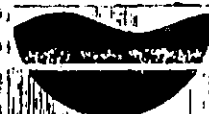
ST JOSEPH'S ACADEMY AND CONVENT

CENTRAL ISLIP HOSPITAL

11706

11722

New York State Department of Environmental Conservation  
Division of Solid/Hazardous Waste  
Building 40, SUNY  
Stony Brook, New York 11794  
(516) 751-2617



Henry G. Williams  
Commissioner

November 27, 1987

Watch Hill Sand and Gravel  
Old Northport Road  
Kings Park, New York 11754

Dear Sir:

The New York State Department of Environmental Conservation (NYSDEC), as required by Chapter 857 of the Laws of 1982 (commonly known as the "New York State Superfund Law") has undertaken a program to conduct preliminary evaluations of suspected inactive hazardous waste disposal sites throughout the State.

Our present records indicate that you are the owner and/or operator of the following site:

Watch Hill Sand and Gravel  
  
Route 111 and Motor Parkway  
Hauppauge, New York 11787

In accordance with the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA"), 42 U.S.C. Section 9601 et seq., the Department of Environmental Conservation has determined that you may be liable for the present and future costs of response, removal and remediation and for damages to the natural resources of the State of New York at and around the referenced site.

In view of the foregoing, this letter constitutes a claim by the State of New York pursuant to 42 U.S.C. Section 9612(a) for all costs, damages and claims recoverable now and in the future under federal and state law, including CERCLA. Unless, in a timely fashion, all investigative, removal and remedial work necessary at the site and its environs is performed and unless the State is reimbursed for all damages to its natural resources and for all past, present and future response, removal and remediation costs, this claim will not have been satisfied. In such event, the State of New York may hold you liable subject to New York's claims under federal and state law through legal action.

At this time, we request that you compile and submit, in accordance with the Environmental Conservation Law (ECL), Section 27-1307, the following information regarding the site. This information will be utilized in conducting a preliminary evaluation of the hazard associated with the site. This information shall include the following:

- a. all generators of wastes deposited at the site;
- b. types and quantities of such wastes;
- c. period of time site was operated;
- d. description of site operational practices;
- e. description of testing, monitoring or remedial action undertaken or planned;
- f. description of any known health or environmental problems at the site;
- g. any other information which may assist the NYSDEC in evaluating the public health or environmental significance of the site.

Also, please be advised that, pursuant to Section 27-1317 of the ECL, the manner in which the above referenced site is used may not be substantially changed without notifying this Department, in writing, at least sixty (60) days prior to the proposed change. A substantial change of use includes, but is not limited to, the erection of a building or other structure on the site, the paving of the site for use as a roadway or parking lot, and the creation of a park or other public private recreational facility on the site.

If you have any questions in connection with this matter, please contact this office at (516) 751-2617.

Sincerely,

*Philip Barbato*  
 Philip Barbato, P.E.  
 Regional Solid Waste Engineer

PB:dm  
 cc: C. Goddard

APPLICATION FOR USE OF A CONSTRUCTION AND DEMOLITION DEBRIS DISPOSAL SITE

FOR STATE USE ONLY

PROJECT NO. <b>52-0-02</b>	DATE RECEIVED <b>12/11/78</b>
DEPARTMENT ACTION <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved	DATE <b>12/11/78</b>

CAUTION INSTRUCTIONS ON REVERSE SIDE

PROJECT NAME <b>Expressway</b>	2. ADDRESS (Street, City, State, Zip Code) <b>Development Co. 3508 Mid-Island Plaza-Hicksville, N.Y.</b>	3. Telephone No. <b>935-8200</b>
OWNER'S NAME <b>Rich Hill Sand &amp; Gravel</b>	5. ADDRESS (Street, City, State, Zip Code) <b>Old Northport Rd. Kings Park, N.Y.</b>	6. Telephone No. <b>269-6700</b>
SITE SUPERVISOR <b>Leo Comelio</b>	8. ADDRESS (Street, City, State, Zip Code) <b>16 Whitewood Court - Huntington, N.Y.</b>	9. Telephone No. <b>265-5126</b>
PROJECT/FACILITY NAME <b>Rich Hill Sand &amp; Gravel</b>		13. ENVIRONMENTAL CONSERVATION REGION
PROJECT STATUS <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Proposed <input type="checkbox"/> Existing	12. COUNTY IN WHICH FACILITY IS LOCATED <b>Suffolk</b>	16. ESTIMATED DAILY VOLUME <b>500 Cubic Yards</b>
RATING HOURS/DAY <b>Days 4:30 to 7:00</b>	15. ESTIMATED SITE LIFE <b>12 Months</b>	

CRIBE SPECIFIC LOCATION OF SITE  
**Route 111 & Motor Parkway - Hauppauge**

LIST EACH WASTE COMPONENT TO BE DISPOSED  
**Sand - Cement - Concrete - Asphalt - Iron - brick. Road construction debris.**

**Demo debris only accepted.**  
**Access to site controlled by cable and locked.**  
BRIEFLY DESCRIBE PROPOSED COMPACTION, COVER, SEEDING AND FINAL CLOSURE OF SITE

**Cover - Clean Fill**  
**Seeding - Grass**  
**Proposed Industrial Site**  
**Equipment used 966 Cat and D6 Dozer - 100 Hough**  
**Final cover will be one foot.**

CERTIFICATION:  
I hereby affirm under penalty of perjury that information provided on this form and attached statements and exhibits is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.  
**12/14/78** \_\_\_\_\_  
Date Signature and Title

FOR ITEMS SUBMITTED FOR PLACEMENT ON TOWN BOARD AGENDA  
(NO ITEM WILL BE PLACED ON AGENDA WITHOUT COMPLETED FORM A)

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INSTRUCTIONS

All items shall be reported to the Deputy Supervisor no later than 12 days prior to meeting. This memorandum, when completed, shall be the covering document for all Town Board Agenda submissions.

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descriptions of Essence of Resolution, including specific location, applicable, by address and name of hamlet.

Renewal of Permit to mine sand and gravel at a 45 acre site (10 acres affected) in Central Islip bound on the west by Cardinal Industrial Park, the north by M.T.C. (another sand mining area), the east by Islip Avenue, and on the south by Motor Parkway.

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Use. Give brief background. If item has previously been before the Board, explain. Explain if similar resolutions have been passed or denied by the Board and the policy implications, if any.

Mining in this area has occurred since the late 1960's to present. This site is the larger of two such mining operations in Islip Town, both of which are located in this area. As this site is isolated from adjacent industrial areas, few complaints have been received on the operation. Applicant last received a permit 11/80. Applicant has removed a dilapidated structure and graded slopes to 1 on 3.

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Financial Impact. Describe Funding and Amount. Refer to item in budget, or total budget item.

Permit fee \$200

Sand 541.43

741.43 dated 12/24/81

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Signature of Commissioner/Dept. Head

Date

4/6/82

RUNNING THENCE along said land South  $3^{\circ} 48' 00''$  East 253.30 feet to land of County of Suffolk;

RUNNING THENCE along said land the following three courses and distances:

- 1) South  $85^{\circ} 8' 00''$  West 32.61 feet;
- 2) South  $89^{\circ} 44' 00''$  West 246 feet;
- 3) South  $73^{\circ} 13' 00''$  West 125.06 feet to land now or formerly of Meadow Farm Homes, Ltd.;

RUNNING THENCE along said land North  $3^{\circ} 48' 00''$  West 266.85 feet;

RUNNING THENCE along said land and along land now or formerly of Charles J. Robinson South  $86^{\circ} 12' 00''$  West 400 feet;

RUNNING THENCE along the land presently of Doro Operating Corp. North  $3^{\circ} 48' 00''$  West 83.33 feet;

RUNNING THENCE along said land and along lands now or formerly of L. Mayer, Ralph and Peter Piffath, Cardinal Industrial Park and Newton Associates North  $3^{\circ} 32' 00''$  West 1,713.71 feet to the southerly side of South Service Road of Long Island Expressway;

RUNNING THENCE easterly along the southerly side of said South Service Road of Long Island Expressway along an arc of a curve bearing to the right having a radius of 22,718.32 feet the chord of which bears North  $80^{\circ} 22' 39.5''$  East 585.02 feet a distance along said arc of 585.04 feet to land shown on said Map of Central Islip Farms No. 42;

RUNNING THENCE along said land the following two courses and distances:

- 1) South  $3^{\circ} 33' 40''$  East 916.97 feet;
- 2) North  $86^{\circ} 15' 20''$  East 1,268.41 feet the westerly side of Joshua's Path, Suffolk Station Road, at the point or place of BEGINNING.

FOR a period of one year pursuant to Chapter 15 of the Town Code of the Town of Islip and on the following conditions:

- 1) All existing slopes bordering property owned by others shall have the slope angle maintained at 1 on 3 and the planting maintained in a manner which will prevent erosion.

RESOLUTION

On a motion of Councilman \_\_\_\_\_, seconded by  
Councilman \_\_\_\_\_, be it

RESOLVED, that the application of F & F Structures being comprised of the following individuals: William Jerome Plander, Harley M. Plander, Leonard Frank and Franklin Frank, with corporate headquarters at 525-B Mid Island Plaza, Hicksville, New York, 11802, for removal of sand, gravel, clay, topsoil, bank run, or other substances pursuant to Chapter 15 of the Town Code of the Town of Islip be renewed on the following parcel:

Being described as Suffolk County Tax Map numbers District 0500, Section 038, Block 02, lot 020; District 0500, Section 039, Block 02, lot 029; District 0500, Section 054, Block 01, lots 072 and 073, being further described as all that certain plot, piece or parcel of land, situate, lying and being at Hauppauge, Town of Islip, County of Suffolk and State of New York, bounded and described as follows:

BEGINNING at a point on the westerly side of Joshua's Path, Suffolk Station Road, where the same is intersected by the southerly side of land shown on Map of Central Islip Farms, filed in the Suffolk County Clerk's Office on February 28, 1928 as Map No. 42;

RUNNING THENCE along the westerly side of Joshua's Path, Suffolk Station Road, South  $8^{\circ} 25' 30''$  West 500.33 feet to land now or formerly of Joseph and James Andreassi et-al;

RUNNING THENCE along said land North  $81^{\circ} 34' 00''$  West 212.72 feet;

RUNNING THENCE along said land and along lands now or formerly of Angelo and Mary Palidino, Big Chief Fence and Building Supplies, Inc. and Petroleum Facilities, Inc. South  $8^{\circ} 26' 00''$  West 508.57 feet;

RUNNING THENCE along said land of Petroleum Facilities, Inc. South  $86^{\circ} 12' 00''$  West 46.42 feet;

- 2) Access in and out of the property will be confined to one entrance/exit onto Islip Avenue (SR 100) or Motor Parkway (one road opening on Motor Parkway has been granted), and only after receiving permission for said curb cut from the appropriate jurisdiction. Applicant is to take precautions to prevent accumulated sand and mud on the truck tires from entering the public right-of-way. If material from the mining operation enters onto a public right-of-way, it shall be removed immediately and returned to the site being mined.
- 3) Trucks removing sand and other materials from the premises are to utilize a tarp covering after loading and prior to exiting from the property.
- 4) No organic matter of any type shall be stored or found on site during the course of this permit. Under no circumstances shall organic matter or demolition material in any form be used for fill or buried on site.
- 5) The depth of the mining operation shall be limited to a depth of one hundred and fifteen feet (115') above sea level and/or in accordance with Teas and Barrett 3/26/80, Proposed Plan of Regrading.

If mining occurs below this depth, applicant agrees to notify the Town of Islip Division of Engineering, in writing, within ten (10) days and follow methods specified by the Division of Engineering pursuant to type and method of fill. If notified by registered mail by the Town of Islip Division of Engineering that the mining operation has gone below the depth indicated, the applicant shall follow methods specified by the Division of Engineering pursuant to type and method of fill.

- 6) Applicant agrees to supply all information and fees required pursuant to Chapter 15 of the Town Code of the Town of Islip for renewal of permit eleven (11) months after passage of this application to the Department of Planning and Development.
- 7) Applicant agrees to maintain wooded areas on Islip Avenue and Motor Parkway to prevent blowing sand and dust onto these roadways until such time as building permits are issued for these areas. The condition of these wooded areas as of March 1982 is acceptable. In addition, if sand and dust become a problem to the areas to the south and west, steps must be taken to prevent material from blowing off your site.

- 8) Sand and soil deposits on the northeast side of the property, adjoining the M.T.C. site, shall remain on site for the purpose of grading until such time as site development proposal is accepted and building permits issued.
- 9) Nothing contained herein shall be construed to overrule any previous requirements established by the Town Board on this parcel and in case of conflict, the requirements contained herein shall take precedence.
- 10) The list of conditions herein shall be signed and notarized by all the owners or by a vote of the corporation before this permit shall take effect.

FOR a period of one (1) year;

UPON a vote being taken, the result was:



YEC, INC.  
Forest View Professional Building  
10 Pine Crest Road  
Valley Cottage, NY 10989  
(914) 268-3203

August 14, 1989  
Betty Gallagher  
Islip Town Hall  
401 Main Street, Islip NY 11751

Dear Betty:

In keeping with New York State regulations concerning Phase I work, I am required to have you review and sign an interview acknowledgement form for our records. I'd like you to make any revisions or corrections to the summary of our phone conversation that are necessary and return the form to our office at the address below:

YEC, Inc.  
10 Pine Crest Road  
Valley Cottage, NY 10989

I'd like to thank you for your time and assistance.

Sincerely Yours,

*Mark J. Mecca*

Mark J. Mecca  
Staff Geologist, YEC Inc.

MJM:mjm

RECEIVED  
D.E.C.  
TOWN OF ISLIP  
AUG 18 10 41 AM '89

# Geology of Brookhaven National Laboratory and Vicinity, Suffolk County New York

By WALLACE DE LAGUNA

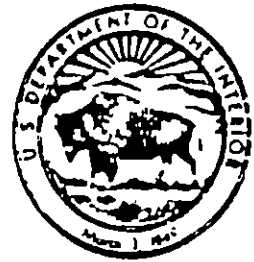
STUDIES OF SITES FOR NUCLEAR ENERGY FACILITIES—  
BROOKHAVEN NATIONAL LABORATORY

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GEOLOGICAL SURVEY BULLETIN 1156-A

*This report concerns work done on behalf  
of the U.S. Atomic Energy Commission*

*This series of reports provides a basis for  
evaluating results of a possible nuclear  
incident upon the hydrologic environment*



STUDIES OF SITES FOR NUCLEAR ENERGY FACILITIES—BROOKHAVEN  
NATIONAL LABORATORY

GEOLOGY OF BROOKHAVEN NATIONAL LABORATORY  
AND VICINITY, SUFFOLK COUNTY, NEW YORK

By WALLACE DE LAGUNA

ABSTRACT

In connection with the construction and operation of atomic research facilities at the Brookhaven National Laboratory, the U.S. Geological Survey made a study of the geologic and ground-water conditions at and near the Laboratory. The area is in central Suffolk County, about 60 miles east of New York City, and extends in a 20-mile-wide strip across the island from Long Island Sound on the north to the Atlantic Ocean on the south. The geologic fieldwork consisted of examination of surface outcrops and the supervision of the drilling of and examination of samples from shallow test wells 100 to 200 feet deep and two deep test wells about 1,000 feet deep.

The gently rolling land surface at the Laboratory is bordered by two lines of hills; the Harbor Hill moraine on the north, and the Ronkonkoma moraine on the south. A broad flat, relatively featureless outwash plain extends south from the Ronkonkoma moraine to the tidal swamps, bays, and barrier beaches, which form the southern boundary of the area. The Carmans, Forge, and Peconic Rivers, and their tributaries, carry most of the surface water.

Six principal stratigraphic units, some containing subdivisions of local importance, were recognized in the test holes and surface exposures. At the bottom is the southeasterly sloping bedrock of Precambrian age, which is at a depth of about 1,500 feet beneath the Laboratory. Above the bedrock is the Raritan formation of Cretaceous age about 500 feet thick, which is divided into the lower hard sand member and an upper clay member. Resting on the clay member of the Raritan formation is about 800 feet of sand, sandy clay, and some gravelly beds, which have been tentatively assigned to the Magothy (?) formation. The Gardiners clay, an interglacial deposit of Pleistocene age, overlies the Magothy (?) formation in much of the area. The Gardiners is 10 to 20 feet thick at Brookhaven National Laboratory, but it thickens appreciably to the south. Above the Gardiners clay are upper Pleistocene deposits, which have a maximum thickness of about 200 feet. Locally these deposits are divided into an unidentified unit of sand and gravel characterized by a greenish color, a unit of silt and clay recognized near Manorville, and the Harbor Hill and Ronkonkoma moraine deposits and associated outwash deposits. Recent deposits of gravel, sand, silt, and clay are restricted to stream channels, bays, and beaches, and are generally less than 40 feet thick.

fresh water under artesian pressure occurs in several permeable zones in the Baritan and Magothy (?) formations. Most of the water in the upper Pleistocene deposits is unconfined and fresh and it is the principal source of supply. Recent deposits are not a source of water except for small supplies at scattered localities on the barrier beaches.

## INTRODUCTION

### PURPOSE AND SCOPE OF INVESTIGATION

In the fall of 1946, the War Department, then in charge of the atomic energy program, requested the U.S. Geological Survey to prepare a preliminary report on the possible water supply problems of the proposed nuclear research laboratory at Camp Upton. In the fall of 1947, the Geological Survey began a detailed investigation of the ground-water conditions in the vicinity of the Laboratory with particular reference to the effect of a hypothetical accidental release to the environment of radioactive wastes. The routine operation of Brookhaven National Laboratory does not constitute a hazard because of the very stringent precautions that the Laboratory exercise in handling and disposing of radioactive materials. The work on which the present report is based began in March 1948. During the first 2 years, 2 deep test wells and about 12 shallow observation wells were drilled. As a guide to the installation of test wells, an attempt was made to obtain information on the subsurface geology by earth resistivity observations, but the method was found to be poorly adapted to the conditions in the area.

During this same period, 95 samples of surface and ground waters were collected and shipped to Washington for analysis. On the basis of the data provided by this work, a second water-sampling program was set up in November 1950 to monitor the surface water and ground-water supplies of the area, but this sampling was stopped in the summer of 1953 because the program was felt to be unsound.

Some instrumental leveling was done in the first year or two, and in 1949 the Topographic Division of the Geological Survey established a network of bench marks covering the area of immediate interest. This made it possible to convert water level measurements to a sea level datum so that accurate water table contour maps could be drawn.

A more detailed study of the hydrology began in 1950; a detailed pumping test was run at the end of that year. In 1951 the observation-well net was expanded, and in 1952 a study was made of the hydrology of the Carmans River. At the same time, an attempt was made to estimate the amount of water lost annually by evaporation and by transpiration so that an estimate could be made of the recharge to the ground-water reservoir.

Attempts were made during the first year to measure the rate of movement of the ground water directly by tracers. The work provided answers which seemed to be valid, but it was dropped because of the complexity of the theoretical and practical problems involved. Some laboratory work with dye solutions was attempted later to illustrate the pattern of movement of contaminated liquids, but again problems involved in faithfully representing natural conditions were not satisfactorily solved.

The investigation was made under the immediate supervision of M. L. Brashears, Jr., and J. E. Upson, former district geologists. The organization and preparation of the report were coordinated by C. V. Thiers and J. E. Upson.

### PREVIOUS INVESTIGATIONS

Previous work on the hydrology and geology of Long Island has dealt either with Long Island as a whole or with the western part. In 1903 the water supply problems of Greater New York were studied in detail by the Commission on Additional Water Supplies and described in a report by Burr, Hering, and Freeman (1904). This report related primarily to the occurrence and availability of ground water in Nassau County and western Suffolk County. In 1906, this study was enlarged to investigate the possibility of developing 250 mgd. (million gallons per day) of water from Suffolk County by extending the Brooklyn aqueduct eastward along the south shore through Patchogue, Moriches, and Quogue. Branches and collecting works were to tap, among other sources, the Carmans River and the lower Peconic. A report on this study was made by Spears (1908). Because of the general interest in the problem of water supply at this time, and as the result of a cooperative agreement with the Commission on Additional Water Supply, the U.S. Geological Survey made a study of both the geology and the hydrology of all Long Island in the years 1902-05. The results of this investigation were published under the authorship of Veatch and others (1906). Later, geologic investigations were made by Fuller (1914).

In 1932, the U.S. Geological Survey returned to the study of Long Island under cooperative agreements with the New York State Water Resources Commission (formerly Water Power and Control Commission) and with Nassau County. Later, these agreements were extended to include Suffolk County.

The principal publications dealing with central Suffolk County that have resulted from these cooperative investigations are listed under "References cited." These reports are concerned mainly with the problem areas of western Long Island, and little has been published

the water table by Luczynski and Johnson (1952). Among the independent workers who have contributed to the glacial geology of Long Island are MacClintock and Richards (1936) and Fleming (1935).

#### LOCATION OF AREA

Brookhaven National Laboratory is on the site of Camp Upton, formerly an Army post during World Wars I and II. It is nearly in the geographical center of Long Island, about 60 miles east of New York City. (See fig. 1) The Laboratory tract is an irregular polygon that is roughly rectangular and about 2.5 miles on a side.

Brookhaven National Laboratory lies in a strip across the island about 13 miles wide extending approximately north-south between long  $72^{\circ}45'$  and  $73^{\circ}$  W. This area (fig. 1) is referred to in this report as the Upton area from the post office address of the Laboratory, and it is the area of principal concern in the hydrologic part of this report.

The geologic studies cover a somewhat wider area (fig. 1), as it was felt desirable to include some information from adjoining areas where wells had been drilled deep enough to reach beds of Cretaceous age. This larger area, extending from about long  $73^{\circ}07'30''$  W. on the west to long  $72^{\circ}37'30''$  W. on the east, a distance of about 26 miles, is here called central Suffolk County.

#### WELL-NUMBERING SYSTEM

Numbers of wells mentioned in the text and shown on illustrations of this report are those assigned by the New York State Water Resources Commission. Wells are numbered serially and are designated by letter prefix according to the county in which they are: S for Suffolk County and N for Nassau County. Records and logs of wells referred to in this report are either published in Bulletins GW 4, 9, and 31 of the New York Water Resources Commission or may be examined at the Geological Survey office at 1505 Kellum Place, Mineola, N.Y. The location of wells referred to in this report are shown on plate 1.

#### TOPOGRAPHY

Brookhaven National Laboratory is on gently rolling ground in the upper part of the Peconic River valley, which is bordered by two lines of low hills. These extend beyond the limits of the valley east and west nearly the full length of Long Island and form its most prominent topographic features. The northern line of hills, known as the Harbor Hill moraine, lies along the north shore of Long Island; the

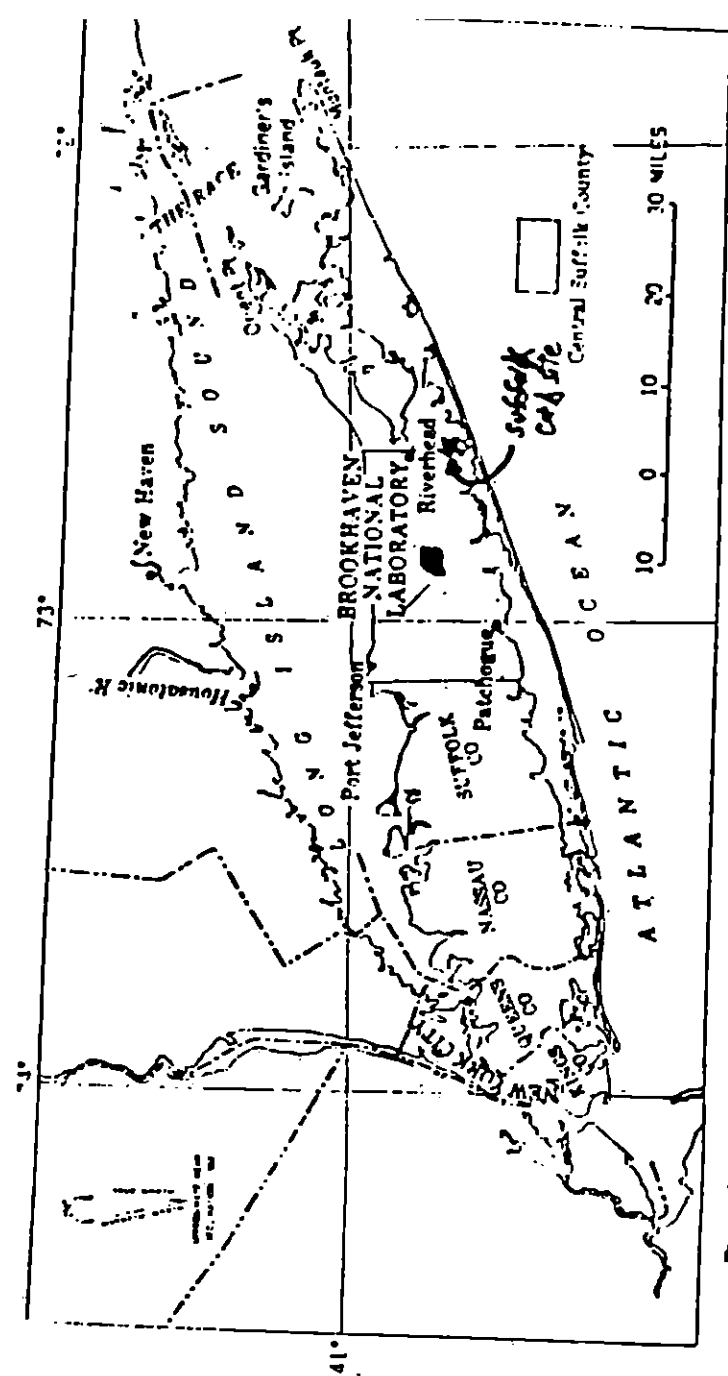


FIGURE 1.—Outline of map of Long Island, showing location of Brookhaven National Laboratory and adjoining areas.

center of Long Island and passes just south of Brookhaven National Laboratory. (See pl. 1.)

Just west of Brookhaven National Laboratory, the two moraines are connected by a narrow north-south ridge, which gives the neighboring hamlet of Ridge its name. East of this ridge, and enclosed by it and two moraines, is the Manorville basin (pl. 1), on the relatively high west margin of which are the main Laboratory grounds. The basin forms the upper drainage area of the Peconic River. It is partly enclosed on the east-south of Calverton by Bald Hill, a salient of the Ronkonkoma moraine, so that the surface drainage of the Manorville basin is poor, and much of the land near the river is swampy. East of Calverton, the valley widens and forms the Riverhead basin (pl. 1).

West of the north-south ridge is the narrow, straight valley of the Carmans River, branches of which formerly drained Artist Lake and a pond at Middle Island. To the east, along the south margin of the Harbor Hill moraine are two large kettle holes, Long Pond and Deep Pond.

Just west of the Carmans River, another ridge extends north from Coram Hill and nearly joins one of the wide low spurs extending south from the Harbor Hill moraine. West of this ridge, between the two moraines, is the Selden basin (pl. 1), a wide shallow basin that has no surface-drainage outlet.

South of the Ronkonkoma moraine is a comparatively flat featureless plain of irregular width. This surface slopes gently to the south, where it merges into a swamp and then passes under Great South Bay and Moriches Bay. The shoreline is indented by many small estuaries that are the drowned mouths of the small streams that drain the plain. The principal irregularities of the plain south of Brookhaven National Laboratory are the valleys of the Carmans River, which head north of the moraine, and the much shorter Forge River which heads in the Ronkonkoma moraine just south and southeast of the Laboratory.

Between the mouths of the Carmans and the Forge Rivers, the south shore bays are divided by a wide tongue of land which extends nearly across to Fire Island Beach. This tongue is occupied by the summer community of Martie and by the southern part of another community called Mastie Beach. To the east is Moriches Bay; to the west is Great South Bay. The bays are bordered on the south by a long narrow line of barrier beaches.

The north shore of central Suffolk County is bordered by a long line of steep bluffs overlooking Long Island Sound. These bluffs form a series of shallow arcs, concave northward, each of which is 8 to

10 miles long. The line of bluffs is broken by several small embayments such as at Mount Sinai Harbor and Wading River. These embayments have flat swampy bottoms and are bordered on the south by an abrupt line of hills. West of Port Jefferson the shoreline is much less regular, because it comprises a succession of bays and necks.

#### SUMMARY OF STRATIGRAPHY

Six principal stratigraphic units, some of which include subdivisions of minor importance, were recognized in the test drilling at Brookhaven National Laboratory and have been identified in well logs and at exposures in central Suffolk County (table 1). Their general relationships are indicated diagrammatically in figure 2, and their lithology, as determined in the two deep test wells at Brookhaven National Laboratory, is indicated in figure 3. Plate 2 shows the lithologic characteristics of the uppermost units, particularly those of Pleistocene age. Plate 1 shows the location of wells used in preparing the report; the cross sections are shown in plate 2.

At the base is the oldest of the stratigraphic units, the bedrock of pre-Cretaceous age, to which no formational name has been attached. Above the bedrock is the Raritan formation of Cretaceous age, which is as much as 500 feet thick. This formation has two members. The lower, as much as 300 feet thick, called the Lloyd sand member, is composed of coarse grained sand, gravel, and some clay. The upper member, as much as 200 feet thick, is mostly clay and is called the clay member of the Raritan formation. Overlaying the Raritan formation is the Magothy (1) formation, also of Cretaceous age. Beneath Brookhaven National Laboratory this formation consists of about 900 feet of mostly clayey sand, and it includes beds of clay and of sand and gravel.

Beneath most of the laboratory tract, and in general beneath the southern half of central Suffolk County, the Magothy (1) formation is overlain unconformably by the Gardiners clay of Pleistocene age. Within Brookhaven National Laboratory and for a few miles to the south, test wells showed the Gardiners clay to be 10 to 20 feet thick and to be composed of clay containing sand and gravel. Still farther south, along the ocean shore, the Magothy (1) formation is overlain by 150 feet or more of clay, silt, and clayey sand, which in texture, color, and composition is somewhat like the Gardiners clay, but which resembles neither the Magothy (1) below nor the upper Pleistocene deposits above. This material is tentatively referred to as the Gardiners clay, although it is possible that detailed paleontologic studies may show that other units are present in some places (Perlmutter and Candeell, 1959).

TABLE 1.—Physical character and water-bearing properties of the geologic units underlying central Suffolk County

System	Series	Geologic unit	Approximate thickness (feet)	Physical character of deposits	Water-bearing properties	
Quaternary	Recent	Recent deposits	0-40	Gravel, sand, silt, some clay, organic matter, and shell fragments.	Permeable beds contain fresh and salt water near shoreline. Clay and silt are local confining units.	
	Pleistocene	Upper Pleistocene deposits	Moraine deposits and outwash	0-150	Moraine deposits composed of unsorted boulders, gravel silt and clay; compact in places. Outwash composed chiefly of gravel and sand. Locally, thin localite deposits of silt and clay at and near surface.	Moraine deposits generally of low permeability but permeable sandy zones are common. Outwash generally highly permeable and productive. Water-table conditions prevail almost everywhere.
			Clay at Manorville	0-60	Silt and clay, laminated, gray and brown.	Relatively impermeable local confining unit.
		Unidentified unit	0-50	Fine to coarse sand, greenish, some silt and clay.	Contains water under water-table conditions. Tapped by few wells.	
		Unconformity? Gardiners clay	0-150	Clay and silt, grayish-green, some lenses of sand and gravel.	Relatively impermeable. Confining unit in southern part of area.	
		Unconformity				

Cretaceous	Upper Cretaceous	Magdaly(?) formation	0-1 000	Sand fine to coarse, clayey, lenses of clay, coarse basal zone containing gravel. Lignite is abundant. Light and dark gray are predominant colors.	Low to high permeability. Tapped by few wells but has several productive zones. Water is under artesian pressure.
		Unconformity			
		Clay member	150-200	Clay and silt, dark and light gray; some red and white; some lenses of sand.	Relatively impermeable extensive confining unit.
		Lloyd sand member	130-300	Sand and gravel, gray, some beds of sandy clay and clay and silt.	Permeable zones are potential sources of water. Not tapped by pumping wells at present. Water is under artesian pressure.
		Unconformity			
		Bedrock		Granitic-gneiss, upper 30-50 feet moderately to highly weathered.	Relatively impermeable. Not an aquifer.

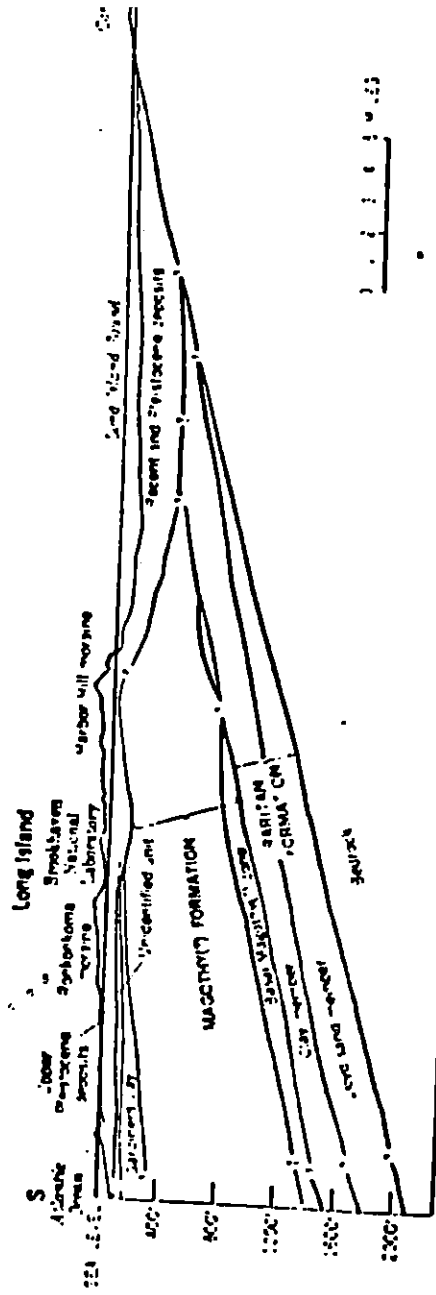


FIGURE 2.—Generalized cross section along long 72°52'30" W. in central Suffolk County.

... term used to describe the glacial deposits which, in nearly all Long Island, overlie the Gardiners clay or the Magdoyen(?) formation. Most of these deposits consist of sand and gravel which, with local silt and clay, form the stratified outwash and morainal deposits of presumed Wisconsin age. Their maximum known thickness is about 200 feet. The formational units into which Fuller (1914, p. 80-170) divided these deposits have not been recognized within the area of this report. However, some distinctive subdivisions were recognized. For example, overlying the Gardiners clay in the southern half of the report area is a greenish sand 25- to 50-foot thick of uncertain origin, but apparently the oldest outwash material in this area. It has not been named and, therefore, is called here the unidentified unit. At Manorville, and probably beneath a surrounding area of several square miles, there is a varved clay in the middle of the upper Pleistocene deposits. In the lower part of the Peconic River valley, beneath the south-shore beaches and in a buried valley south of Mount Sinai Harbor, the upper Pleistocene deposits include a complex series of alternating layers of sand, silt, and clay, some fossiliferous, which may in part represent the Gardiners clay. Despite these variations, however, most of the upper Pleistocene deposits form a comparatively uniform blanket of sand and gravel. The current differentiation of stratigraphic units on Long Island is the result of gradual refinement of knowledge based largely on data from wells. Substantial contributions were made by Thompson, Wells, and Blank (1937), and more recently by Suter, de Laguna, and Perlmutter (1949). Most of the formations recognized here occur nearly everywhere beneath Long Island.

**BEDROCK**

The bedrock which underlies the unconsolidated deposits is known principally from well records. It includes hard, dense schist, gneiss, and granite similar in character to that which underlies much of the mainland in nearby parts of New York and Connecticut. These rocks were previously thought to be of Precambrian age, but now many geologists believe that some of them are metamorphosed early Paleozoic age sediments. Data from well records and samples on Long Island do not warrant any identification except of rock type. Two deep test wells (S6409 and S6434, pl. 1) penetrated bedrock at a depth of nearly 1,600 feet beneath Brookhaven National Laboratory. The bedrock was found to be a hard, banded, granitic gneiss. Microscopic examination showed it to be composed of about 60 percent plagioclase (oligoclase and andesine) feldspar, about 50 percent

... otherwise, the two samples were identical.

This bedrock contains no openings capable of holding or transmitting appreciable quantities of water, thus it forms the base of the water-bearing material beneath Brookhaven National Laboratory.

In Connecticut, the bedrock includes, in addition to the gneiss and schist, a body of sandstone, shale, and diabase of Triassic age which could conceivably extend south from New Haven as far as Long Island. Seismic studies (Oliver and Drake, 1951, p. 1295) suggest that it does not. No rocks of Triassic age have been found in any wells drilled on Long Island.

#### CONFIGURATION OF THE BEDROCK SURFACE

The shape of the upper surface of the bedrock of Long Island is best known beneath the west end of the island (de Laguna and Brashears, 1948). Here the bedrock surface, as indicated by well records, has a maximum relief of about 100 feet, except where it is near the surface and may have been modified by erosion in Pleistocene or Recent time. The apparent low relief and local deep weathering of the bedrock in western Long Island as shown by well logs (de Laguna and Brashears, 1948, p. 8) suggest that the surface had reached an advanced stage of peneplanation. Indeed, the surface is considered to be part of the Fall Zone peneplain (Von Engel, 1942, p. 353). The most recent map of the bedrock surface underlying Long Island (Suler, and others, 1949, pls. 8, 9, and 10) shows that this surface slopes southeast about 80 feet per mile beneath most of Long Island. It seems to slope more southerly at the east end of Long Island. If the surface represents a peneplain, the relief on the bedrock surface in the Brookhaven area is not likely to be greater than 50 to 100 feet.

#### FORMATIONS OF LATE CRETACEOUS AGE

##### RARITAN FORMATION

The Raritan formation rests directly on highly to slightly weathered bedrock. The formation is probably entirely continental and was laid down as a coastal-plain deposit by streams flowing off the uplifted Fall Zone peneplain. The name Raritan was applied to the Long Island deposits by Veatch and others (1900, p. 23) who correlated the formation with deposits of the same name in New Jersey. On Long Island the formation has two fairly distinct members: the Lloyd sand member below, and a clay member above.

Northward the Lloyd sand thins and probably pinches out beneath Long Island Sound, and the clay member may do likewise. Southward the formation extends a considerable distance offshore, possibly as far as the continental shelf (about 100 miles), where the beds probably have lithologic characteristics different from those beneath Long Island.

At many wells the position of the contact with overlying deposits, and in fact between the members themselves, cannot be defined precisely. Nevertheless, the units are distinctive in their general characteristics.

##### LLOYD SAND MEMBER OF THE RARITAN FORMATION

The Lloyd sand member is a fairly uniform and extensive unit consisting predominantly of sand and gravel with some clay. It is known only from well logs. At the two deep test wells (S6409 and S6434) at Brookhaven National Laboratory, it is separated from the hard crystalline bedrock by 15 to 30 feet of tough, white, structureless clay containing scattered angular grains of quartz, which is considered to be weathered bedrock. At the same wells, the upper contact of the Lloyd sand member with the overlying clay member is fairly definitely marked by a change in the lithology of the sediments.

As shown by the columnar section (fig. 3) of well S6409, the Lloyd sand member is about 300 feet thick. It is largely composed of fine to coarse sand containing silt and clay in the interstices. It also includes beds of clay or sandy clay and coarser textured beds that contain gravel. Near the middle, the unit consists chiefly of sand and coarse gravel, which contains some pebbles at least 2 inches in diameter. The voids between the pebbles are for the most part filled with sand and some clay. The porosity of the unit is, therefore, appreciably less than that of a well-sorted sand or gravel. A somewhat similar sequence of material was found at well S6434. The dominantly sandy material which makes up the bulk of the unit here rests directly on highly weathered bedrock.

The pebbles and the sand found in the Lloyd member at Brookhaven National Laboratory and elsewhere on Long Island are composed almost entirely of quartz. This composition suggests that the material was derived from a region in which the climate was warm and the rate of erosion slow, so that all but the most resistant material was entirely decomposed. The clay is entirely or dominantly kaolinite, a mineral indicative of complete weathering.

is in many respects similar to that found in western Suffolk, Nassau, Queens, and Kings Counties where more than a hundred wells have been drilled into it. In both the Laboratory wells and in a well drilled at Port Jefferson, however, the interstitial clay seems to be tougher and more tightly packed than it is farther west.

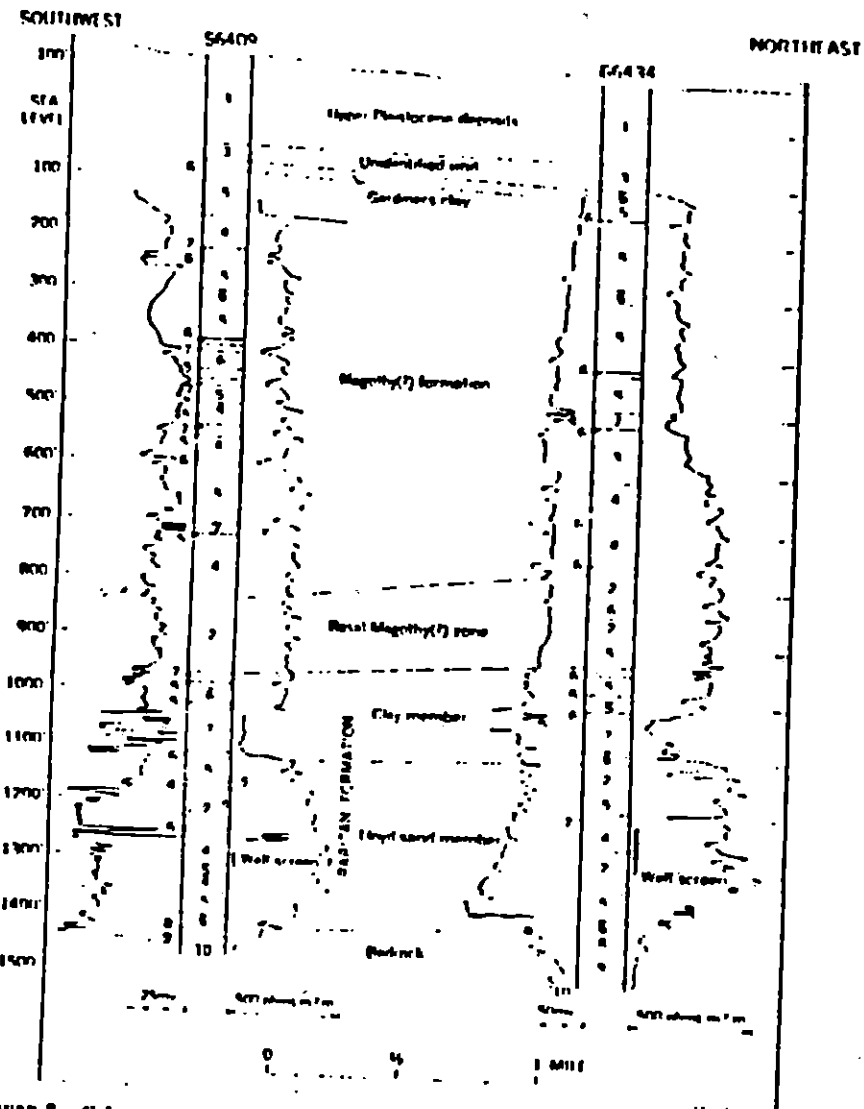


FIGURE 2. Columnar sections and electric log of deep test wells at Brookhaven National Laboratory.

Numbers arranged in order of estimated decreasing permeability.

Well No.	Description of well	Well No.	Description of well
1	Sand, or sand and gravel, clean; little or no silt or clay	6	Clay, mixed with some sand, and containing beds of clayey sand.
2	Sand, coarse, or sand and gravel; includes some clay	7	Clay, tough; containing little sand.
3	Sand, fine or medium; includes some clay	8	Bedrock weathered. Original rock texture no longer visible, but material has not been transported or sorted by water.
4	Sand, coarse, or sand and gravel; mixed with considerable clay and containing beds of clay.	9	Bedrock, weathered. Original igneous texture visible, but most minerals except quartz much altered chemically.
5	Sand, fine to medium; mixed with considerable clay and containing beds of clay.	10	Bedrock, fresh. May show some staining or discoloration.

In the western part of Long Island, the Lloyd ranges in thickness from about 350 feet on the south shore to a few tens of feet along the north shore, where in a few places it is absent. These variations in thickness apparently represent the form in which the Lloyd was originally deposited. At Port Jefferson the Lloyd has a thickness of 135 feet, which shows that it thins to the north in central Suffolk County also. Indeed, it is possible that beneath Long Island Sound, the Lloyd sand pinches out and that the overlying clay member of the Raritan overlaps it and extends beyond it. (See fig. 2.) Thus, although penetrated by only a few wells in the report area, the Lloyd probably is a continuous unit of substantial thickness.

#### CLAY MEMBER OF THE RARITAN FORMATION

The clay member, which overlies the Lloyd sand, makes up the balance of the Raritan formation. At Brookhaven National Laboratory, the top of the clay member is 875 feet below sea level at well S6409 and 940 feet below at S6434. In both wells, its thickness was less than 900 feet. It is largely composed of tough dark-gray or black lignitic clay and some red and white clay and includes some sandy layers and thin lenses of gravel. It also contains some light-gray silty and sandy clay. It is not clearly bedded, as the textures and colors grade into one another. Zones which contain well marked, narrow bands of light silty clay alternate with darker clay which may represent annual variations in rate of deposition, as between a rainy and dry season.

The clay member shows little if any systematic variation in thickness on Long Island. In most of the carefully logged wells that penetrate it, the clay is about 900 feet thick, and at least some of the

...near the top of the clay member is at or near sea level, the member is much less than 200 feet thick and in places it may be absent. This is probably due to local erosion, most of which probably took place in late Tertiary or Pleistocene time. Where the clay member is found at greater depths, as in central Suffolk County, there is no evidence of erosion, but the data are scanty. Thompson, Wells, and Blank (1937, p. 453) suggest that in Kings and Queens Counties, channels were cut into the clay member at the close of Raritan time and then filled with sand or other permeable material at the beginning of Magothy(?) deposition. There is no evidence that such deep erosion and deposition took place within the area investigated; the Lloyd member in central Suffolk County is everywhere covered by the clay member.

Like the Lloyd member below and the Magothy(?) formation above, the clay member has not yielded any fossils except plant remains and is probably nonmarine. The scattered pieces and grains of lignite, the widely distributed spores and pollen, the casts of twigs and leaves, and the possible varving suggest deposition on a coastal plain by generally sluggish but sometimes flooded rivers, that drained a deeply weathered area of moderate relief. It is possible, but unlikely, that some of the rivers crossing this plain maintained their channels in the same place over long periods of time, because aggrading streams commonly build up both their banks and their beds and then shift some distance laterally to lower ground. Accordingly, the coarser grained materials found locally probably are lenses of limited extent both horizontally and vertically. However, at places these may act as relatively permeable but devious paths for the movement of water.

#### WATER-BEARING PROPERTIES

The Lloyd sand is one of the most important aquifers on Long Island largely because it yields adequate supplies of good quality water in areas, generally beneath the margins of Long Island, where supplies from overlying formations are inadequate or are contaminated by or readily subject to contamination by sea water. The Lloyd can supply water under these circumstances because it is overlain by the relatively impermeable and virtually continuous blanket of the clay member.

The problem of how fresh water moves into and out of the Lloyd has been considered by many investigators. Such movement may occur by means of valleys cut through the clay member or by slow

...and others, 1940, p. 1  
As there is little evidence of deep buried valleys in the clay member in central Suffolk County, it is likely that most of the movement of water into and out of the Lloyd is by means of slow seepage through the overlying clay. Luszczynski (oral communication) speculates that if the clay member has an average permeability of 0.2 to 0.3 gpd per square ft, then quite possibly all the water in the Lloyd reaches the surface by percolation through the clay member. Wenzel (1942, p. 13) gives the permeability of a clay (sample No. 2278) that is similar to the clay member of the Raritan as 0.2 gpd per ft, which suggests that there is no compelling need to assume permeable channelways. In any event, movement of water through the clay member of the Raritan either up or down doubtless is very slow in most places.

Although the water from the Lloyd is relatively high in iron content, the usefulness of the aquifer in central Suffolk County is not seriously compromised by the probability of poor yield, as exemplified by the two Brookhaven National Laboratory wells. In the western part of the island, many wells tapping the Lloyd sand member have specific capacity between 10 and 20, which means that they yield 10 to 20 gpm per ft of drawdown. Test well S6409 at Brookhaven National Laboratory was finished with 25 feet of screen and had a specific capacity of about 2. The other deep test well, S6434, was underreamed and gravel-packed and finished with 80 feet of screen, but it had a specific capacity of only 2.5. The principal reason for these low yields seems to be the toughness of the interstitial clay in the deposits, which made it difficult to wash the clay out thoroughly during the development. Much of the same type of tough interstitial clay was found in the cores from test well S5901 at Port Jefferson.

#### MAGOTHY(?) FORMATION

The Magothy(?) formation in central Suffolk County is a thick body of continental deposits composed of lenses of sand, sandy clay, clay, and some gravel. It rests on the Raritan formation and is in turn unconformably overlain by upper Pleistocene deposits. The greatest thickness, revealed by drilling, is about 1,000 feet. The present upper surface of the Magothy(?) on Long Island is an erosional surface, and the original total thickness is not known.

The type area of the Magothy formation is in Maryland along the Magothy River, where it was first described by Darton (1893, p. 407-419). W. O. Crosby (1910) and later Horace R. Blank (written communication, 1935) suggested that the Cretaceous deposits overlying the Raritan formation on Long Island were a greatly thickened extension of the Magothy formation of New Jersey. Later work (Parl-

part of the Magothy (?) formation beneath the south shore of Suffolk County includes marine beds possibly equivalent in age to the Monmouth group of New Jersey. In this report, as in recent publications by Survey authors, the name Magothy when applied to the upper part of the Long Island Cretaceous, is followed by a question mark to indicate the doubt. Examination of pollen and spores may lead to both a reliable correlation of the Cretaceous deposits on Long Island with those of New Jersey and to the establishment of a useful type sequence for Long Island itself.

The Magothy (?) formation underlies most of Long Island except for parts of Kings and Queens Counties and northwestern Nassau County where it was removed by erosion. It may extend beneath Long Island Sound, but is probably truncated by erosion and overlain by Pleistocene deposits. (See fig. 2.) To the south, the Magothy (?) formation, like the Raritan, extends out under the sea, where it also probably changes from a terrestrial to a marine deposit.

The formation crops out at only a few places on Long Island, most of them in northern Nassau County, so that the formation is known chiefly from well records. At test wells S6409 and S6434, the Magothy (?) is about 885 and 819 feet thick, respectively. (See fig. 3.) Well S5901 at Port Jefferson, 12 miles northwest of Brookhaven National Laboratory, passed through nearly 500 feet of the Magothy (?) formation, and well S128 about 5 miles southwest of the Laboratory penetrated about 760 feet of the Magothy (?) and did not reach the bottom of the formation.

The Magothy (?) at Brookhaven National Laboratory has about the same characteristics as elsewhere on Long Island. It is composed of beds of poorly sorted quartzose sand mixed with and interbedded with silt and clay, and locally it contains pebbles or small lenses of gravel. Sandy clay and clayey sand make up most of the fine beds, but there are also several thick beds of clay. In both of the deep test wells (S6409 and S6434), the basal 100-150 feet of the Magothy (?) contains a greater proportion of coarse grained material. This consists partly of coarse sand and gravel that contains pebbles as much as 2 or 3 inches in diameter. The voids are largely filled with silt and soft clay, however, and the coarse grained beds are separated by beds of sandy clay. A similar coarse grained zone can be distinguished in most reliable well logs in other parts of Long Island (J. J. Geraghty, written communication, 1953). It is best described as a zone, immediately overlying the clay member of the Raritan, in which relatively coarse-grained permeable material is commonly found.

The Magothy (?) formation typically contains several clay layers,

and the aggregate thickness of the clay beds is nearly as great as that of the clay member of the Raritan. Even in the western part of the Island, where wells are close together, it is difficult or impossible to trace any of these clay beds from one well to the next; hence, they are probably lenticular and individually of small extent. Thus, they probably do not constitute an effective barrier to the movement of ground water in the clay member of the Raritan formation.

#### WATER-BEARING PROPERTIES

Although it consists in part of beds of dense clay and layers of coarse sand and gravel, by far the greater part of the Magothy (?) formation is made up of sandy clay and clayey sand. Thus, although the formation as a whole is probably less permeable than the Lloyd because of its thickness it can transmit and store large amounts of ground water. Also, there are no effective barriers to the movement of water through the formation except locally. Wells that are constructed and developed carefully generally yield large quantities of water from all but the most clayey parts of the formation. In other parts of Long Island, the beds of gravel at the base of the Magothy (?) and the lenses of sand and gravel of smaller extent that occur at various zones within the formation also yield substantial quantities of water. The Magothy (?) is important as an alternate aquifer in the event that the water in the overlying upper Pleistocene deposits becomes contaminated.

A well near Brookhaven National Laboratory that produces water from the Magothy (?) is S5902 at Port Jefferson. The aquifer tapped by this well is apparently not the basal Magothy, but a coarse-grained zone 100 feet higher. Well S5901, only 0.2 mile from S5902, did not penetrate productive water-bearing material in the Magothy (?) and was abandoned. This is one of a very few places in central Suffolk County where difficulty has been encountered in obtaining water. At most other places, where adequate supplies of water are not available from the upper Pleistocene, ample supplies have been developed from the Magothy (?) formation.

The highly productive beds of the Magothy (?) are by no means confined to the basal zone, but there is no other zone in which a reliable supply can be predicted. Rather it is a case of drilling carefully until material of appropriate grain size and permeability is found. Both of the deep wells at Brookhaven National Laboratory penetrated considerable material in the Magothy (?) from which water might be obtained. Well S6434 was screened temporarily between 656 and 676 feet and tested by pumping. Even with only 20 feet of screen, no gravel pack, and little development the zone yielded water at a specific

Between the Late Cretaceous and the end of Tertiary time, the Raritan and Magothy (?) formations were tilted gently to the south and considerably dissected by streams. The shape of the land surface thus formed is important for it is related to the thickness and distribution of the younger deposits resting on it. As these younger deposits have somewhat different hydrologic properties than the Cretaceous beds, their thickness is a matter of considerable importance to this report. In particular, extensive valleys now filled with permeable deposits occur in the western part of Long Island. If similar valleys are present in central Suffolk County, they might provide buried channels for the movement of ground water. Although few wells penetrate to the Cretaceous in central Suffolk County, the general shape of the surface may be inferred from its configuration in the western part of the Island, where more data are available, and by inference from the general geology.

When the coastal plain formed on the Magothy (?) deposits began to be eroded, the lower reaches of the ancestral Housatonic and Connecticut Rivers probably were the first main streams flowing south or southeast across the area which subsequently became Long Island. As these streams trenched themselves, tributaries called subsequent streams developed along the outcrops of the less resistant beds and in particular along the contact of the Cretaceous deposits and the crystalline bedrock. As the main streams cut deeper, the tributaries which followed this contact migrated southward down the slope of the surface of the more resistant bedrock and removed in the process a wider and wider strip of the Cretaceous cover. The inner lowland so formed is the site of Long Island Sound, and the cuesta ridge to the south of it forms the core of Long Island. Thus, in general, the surface of the Cretaceous deposits of Long Island in pre-Pleistocene time probably consisted of gently south dipping slopes (diplopes), steep north facing slopes (scarp slopes) scoured by short steep valleys, and a few main stream valleys, the original consequent streams, which traversed across or detoured around the cuesta ridges.

Whether or not such a major stream valley crossed central Suffolk County is not known. Veatch and others (1906, pl. 6A) suggest that the ancestral Housatonic River at first crossed the area not far west of the present site of Brookhaven National Laboratory. Well records suggest that there is a buried valley extending at least a few miles south of Mount Sinai Harbor, but there is no evidence to show that this valley extends across the island. Even if the Housatonic River crossed the island, such a remnant of its valley might well be a short segment only across the higher part of the postulated cuesta ridge.

Veatch (1906, pls. 6B and 6C) believed that the ancient Housatonic and Connecticut Rivers were eventually deflected westward where they entered the inner lowland, as the result of steam piracy, and flowed across the west end of Long Island as the ancient Sound River. Veatch thought that this river flowed to the west rather than to the east, partly because the Delaware, Susquehanna, and Potomac Rivers turn west where they cross the basal Cretaceous beds, and partly because well records revealed segments of buried valleys in southern Queens County and in south-central Kings County. Veatch (1906, pl. 6D) suggested also that the ancestral Housatonic and Connecticut Rivers were deflected east around the end of Long Island during the late Pleistocene time.

Many of the well records in central Suffolk County are generalized, and the correlations are somewhat questionable. However, within and a short distance south of the Laboratory area, several test wells were cored and the samples carefully studied. Interpretations as to the position of the Cretaceous surface at these wells are considered to be reasonably accurate. Data were particularly sought in the area south and southeast of Brookhaven National Laboratory, for this is the general direction of movement of the ground water from the Laboratory. These core identifications show that the Cretaceous surface is 82 feet below sea level at the southwest corner of the laboratory tract (well S6409, pl. 2). From here the surface slopes down gently to the south and southeast to 149 feet below sea level at well S6457 near Route 27, and it slopes down to about 140 feet below sea level at well S6460 (pl. 2). Still farther south, the position of the upper surface of the Cretaceous beds is uncertain, but it may be as much as 250 to 300 feet below sea level to the south according to interpretation of drillers' logs. Conceivably some of the clay correlated as Gardiners may be part of the Magothy (?) formation.

Beneath Brookhaven National Laboratory north of well S6409, the Cretaceous surface slopes to the north and is 161 feet below sea level at the northeast corner of Brookhaven National Laboratory (well S6458, pl. 2). Still farther north, few reliable well records are available, but the surface probably rises along the north shore in the vicinity of Shoreham, perhaps even to altitudes above sea level. West along the north shore, near Mount Sinai Harbor, is the valley already referred to, and still farther west, in Port Jefferson, well records and one exposure show clearly that the Cretaceous surface is 50 feet or more above sea level. A small buried ridge which appears to trend east-west beneath the southern boundary of Brookhaven National Laboratory may be part of a minor cuesta.

East of Brookhaven National Laboratory, beneath the valley of the

valley. Wells in Ashover Hill and Riverhead reached the Magothy (?) at considerable depths below sea level.

The total relief on the surface of the Cretaceous deposits in central Suffolk County is about 400 feet. Except for parts of the north shore, which are outside of the area of immediate interest to Brookhaven National Laboratory, the Cretaceous surface is very gently sloping, and the valleys and ridges referred to are but very minor undulations on a generally flat and nearly level surface.

#### DEPOSITS OF PLEISTOCENE AGE

During the Pleistocene epoch there were four major glacial stages. These were separated by three relatively warm interglacial stages. Long Island is about at the southern limit of the last major advance of the ice, the Wisconsin stage, and perhaps near the limit of the ice front of the earlier glacial stages.

In central Suffolk County, the deposits of Pleistocene age comprise: the Gardiners clay, believed to be a shallow marine deposit of the last major interglacial stage; and a complex sequence of glacial and nonglacial deposits, probably all of Wisconsin age, grouped under the name upper Pleistocene deposits. (See pl. 2.) The Jamaica gravel found in western Long Island and the Mammotto gravel identified near the Nassau-Suffolk County boundary have not been recognized in central Suffolk County.

#### GARDINERS CLAY

In about the southern half of central Suffolk County, the Magothy (?) formation is overlain unconformably by a fossiliferous marine clay that probably is the equivalent of the Gardiners clay as defined and described by Fuller (1914, p. 92). The type locality of this formation is on Gardiners Island at the east of Peconic Bay. It is not possible to trace the deposits from the type locality to Long Island proper; therefore, the name Gardiners clay in this report is restricted to the fossiliferous clay beneath much of the southern part of the area that is between the upper Pleistocene deposits above and the Magothy (?) formation below.

In most of Long Island, except where it has locally been deformed by ice shove, the top of the Gardiners clay is about 50 feet or more below present sea level. In central Suffolk County, it is everywhere about 100 feet below sea level or deeper. The nonmarine clays exposed at or about sea level along the north shore of Long Island, described by Fuller as Gardiners clay, are no longer believed to be part of that formation (Weiss, 1954, p. 148).

As used in this report, the Gardiners clay comprises three somewhat

that may or may not be contiguous with one another. These bodies are somewhat different lithologically and thus have somewhat different effects on the movement of ground water.

One of these is a thin body of clay or clay and sand that extends, in the area where it is best known, from about the northern border of Brookhaven National Laboratory as far south as Route 27 at well S6457 (pls. 1, 2). Similar deposits were penetrated by wells S128 and 595 to the west. Most wells in the area do not penetrate the Cretaceous beds, so the extent and continuity of the Gardiners is not known. However, it appears to underlie a belt around 6 miles wide north and south, roughly north of Route 27, and extending east and west across central Suffolk County. In this belt, the Gardiners clay is about 10 feet thick. The altitude of its upper surface is 101 feet below sea level at S6456 (pl. 2), 91 feet below at S 6459 (pl. 2), and 130 feet below at S 6457 (pl. 1). Where penetrated by these wells, the formation is composed of tough dark-gray to green sandy clay that contains a few pebbles. The green color is in part due to a small amount of glauconite and a small amount of green clay minerals.

A few pelecypod and gastropod shells were found in the Gardiners clay at several of the wells in this area. At well S6409, a thin layer of dark brown peat underlies the clay. None of this material was particularly diagnostic; the peat being described by E. S. Barghoorn (Harvard Univ., written communication, 1952) as yielding only conifer pollen grains, Lycopodium spores, and other evidence of arboreal flora, which suggests a climate similar to, or more probably, slightly colder than the present.

Microfossils in the Gardiners were somewhat more indicative. Lawrence Weiss, formerly of the Geological Survey, prepared a report (1954) of the foraminifera obtained from cores and other samples. The foraminifera, and to a lesser degree the diatoms (K. E. Lohman, written communication, 1950), suggest strongly that the thin northern part of the formation in the vicinity of the laboratory was deposited in a shallow body of brackish water, not unlike the bays that fringe the southern shore of Long Island today. The fossil forms are largely identical with those living in the present bays. They do not resemble the forms living in the less well protected and more saline water of Long Island Sound. Similar forms are also found in protected waters to the north along the New England coast, which suggests that the Gardiners clay was formed during an interglacial period when the climate was similar to or perhaps a little colder than now. This conclusion agrees with the less conclusive evidence furnished by the peat. Also indicative of a somewhat colder climate is the altitude

run if the glaciers and polar icecaps of the time were more extensive than those of today. MacClintock and Richards (1936, p. 330-331) suggest that the Gardiners clay is the equivalent of the Cape May formation of New Jersey, and they indicated on a map the probable position of the shoreline in New Jersey, New York, and Connecticut when the Cape May formation and the Gardiners clay were deposited. In this map, the sea level is shown as higher than at present in New Jersey, but lower than at present in Long Island and Connecticut. This would suggest that the land had been subsequently tilted, or that the two formations are not actually contemporaneous.

The second body of the Gardiners clay, as here considered, comprises the thick clay penetrated by wells S5591, S8549, and others (pl. 2), south of Route 27. The upper surface of this clay is at about 130 feet below sea level, but the lower contact slopes seaward so that the unit attains its greatest apparent thickness at well S8549 (pl. 2), where it consists of a nearly continuous body of tough generally green clay. A similar sequence, not quite so thick, was penetrated in well S5591 (pl. 2). Predominantly clay beds, as much as 80 feet thick, occur at depths of 130 feet below sea level at other southerly wells such as S6187 and S152. Thus, these thick clays may extend along the entire shore from Blue Point to Westhampton Beach and possibly beyond.

Clays of such thickness seem to be inconsistent with the apparent mode of deposition of the thin clay to the north. Also, the basis for an age determination is not firm. Hence, the thick clay may not be entirely of Gardiners age and may include beds of the Magothy (I) formation. Similar thick clays have been found farther west beneath Fire Island Beach, and Cretaceous foraminifera have been found in some of them (Perlmutter and Crandell, 1959, p. 1066-1067). However, the writer feels that lithologically the clay here discussed is not typical of the Magothy (I), and believes that if it is not Gardiners it must wholly or partly belong to some intervening formation hitherto unidentified.

A third body of deposits tentatively correlated with the Gardiners clay comprises certain fossiliferous sands and clays found in wells in the Riverhead area and south of Mount Sinai Harbor. As explained in the foregoing paragraphs, it is likely that valleys were cut into the surface of the Magothy (I) formation at both of these places during the Tertiary. These valleys may have been invaded by the sea during deposition of the Gardiners clay. At well S5140 in Riverhead, Weiss (1954) found microfossils similar to those present in the Gardiners clay beneath Brookhaven National Laboratory and considered that the beds represent a shore facies of the Gardiners clay. These fossils

were present in two sand layers and in an intervening clay pebbled between depths of 70 and 101 feet below sea level. Shells also were reported in fine sand at 33 feet below sea level at about 1.5 miles east-northeast, but no samples were available for study. The fossiliferous sand 33 feet below sea level is presumably pre-Wisconsin if it is overlain by glacial outwash. However, at this comparatively shallow depth, the overlying material may be of Recent age.

In the Mount Sinai Harbor area, clay or sand and clay containing shells have been found in several wells at depths below sea level as follows: S43, -60 to -200 feet; S2650, -10 feet; S9087, -60 to -70 feet; and S108 at about -100 feet. These are approximate figures, and as the area was overridden by later ice sheets, the clay may have been deformed by ice shove. The foraminifera from well S2650 were briefly examined by N. M. Perlmutter who found them similar to those described by Weiss from the Gardiners clay. The material is therefore, like the sand at Riverhead, probably interglacial, and possibly contemporaneous with the Gardiners clay.

#### WATER-BEARING PROPERTIES

With respect to water-bearing properties, the chief concern is with the predominantly clayey parts of the Gardiners that lie beneath and south of Brookhaven National Laboratory. Beneath the laboratory and roughly north of Route 27, the thin supposedly lagoonal portion of the Gardiners, as here distinguished, lies between the highly permeable upper Pleistocene deposits above and the moderately permeable Cretaceous formations below. The effectiveness of this part of the Gardiners clay as a barrier to ground-water movement is an important factor in determining whether contamination reaching the ground water in the glacial sands would be carried down to the lower aquifers. The beds of tough clay are probably relatively impermeable, but they do not appear to occur in sufficiently thick and continuous strata to form a fully effective barrier to ground-water movement. If the Gardiners clay was indeed formed in a bay such as those which now fringe the south shore of the Island, and if the sea level rose from -140 feet to -90 feet during deposition, the formation would then probably consist of overlapping lenses of clay with zones of coarser grained silt and sand around the margins and local silty or sandy zones throughout. Indeed, the logs of wells S0457 and S0459 indicate that such sandy zones exist. Accordingly, this part of the Gardiners clay is apparently not a continuous and complete barrier to ground-water movement over the whole area, although the tough clay zones probably are effective barriers locally.

communication, 1962) bear out this conclusion. The hydraulic head differential across the clay in the area south of the Laboratory, as measured at wells S6456, S6459, and S6460 is on the order of half a foot. The clay therefore must be sufficiently impermeable to restrict somewhat the movement of water, which here is from upper to lower strata. However, the sandy zones in the clay, which as far as is known may occur anywhere, would offer relatively little restriction to the movement of water, which could then pass downward wherever the hydraulic gradient is favorable. Thus, taking the unit as a whole, water can pass through the Gardiners clay, although at a slow rate, in small amounts and probably at most places only by circuitous routes.

The thicker beds of clay and sand and clay beneath the south shore of the island, which were referred to the Gardiners clay, are doubtless appreciably more effective as a barrier to the movement of ground water than the thin beds of clay farther north. This is due not only to their greater thickness but also to the infernal greater continuity of the clays, although the log of well S1592 (pl. 2) suggests that there are sandy zones even in this material. However, the significance of these characteristics is less than in the clay to the north, because the southern clay beds lie within the area where ground water is moving upward rather than downward. The thick clay in the vicinity of well S5591 and southward greatly retards the actual movement of water from the deeper formations. In fact, it may force relatively large amounts of water to discharge upward in more northern areas, perhaps through more permeable deposits such as those penetrated by well S1592.

The scattered fossiliferous sands and clays in the Riverhead and Mount Sinai Harbor areas are impossible to evaluate hydrologically as their structure and distribution are not known. It would appear, however, that they are but a part of a geologically complex filling of the buried valleys in these areas, and that the details of the hydrology of these areas is likely to be similarly complex. These areas are remote from the Laboratory and their hydrology is of correspondingly small importance to the basic problems of this report.

#### UPPER PLEISTOCENE DEPOSITS

The term upper Pleistocene deposits was used by the writer in 1948 (de Laguna, 1948, p. 16) to include all the Pleistocene deposits on Long Island above the Gardiners clay. Fuller (1914, p. 106-176) divides this material into three formations: the Jacob sand, thought to grade downward into the Gardiners clay; the Manhasset formation, thick glacial deposits presumably of Illinoian age; and a thin, surficial veneer considered to be Wisconsin drift. Subsequent work

suggests that the Jacob sand is not a separate formation, and that the Manhasset formation is actually largely, if not entirely, of Wisconsin age.

The Jacob sand, as described by Fuller (1914, p. 106), consists of very fine sand, silt, and rock flour, which are plastic when wet, but which contain little true clay. The color is very light gray, or yellow or buff. Fuller gives no thickness for the unit. According to Fuller, the Jacob sand is exposed at several places in wave-cut bluffs at or near sea level along the north shore of Long Island and at the type area at Jacobs Point, 15 miles northeast of Brookhaven National Laboratory. At places, the Jacob sand grades downward into a brown silty clay which Fuller believed to be the Gardiners clay, but this clay contains no fossils and is no longer believed to be Gardiners. Also, Fuller's suggestion (1914, p. 106-106 and fig. 77) that the non-fossiliferous Jacob sand at the type locality and elsewhere along the north shore is equivalent to fine-grained fossiliferous sand which overlies the Gardiners clay on Gardiners Island probably is incorrect. This fossiliferous sand probably should be considered part of the Gardiners clay (MacGinitie and Richards, 1936). In its type area the Jacob sand does not appear to be a true stratigraphic unit, but rather to comprise beds and lenses, each of rather limited extent, of fine sand silt, and rock flour probably deposited in quiet water ponded along the ice front. Deposits comparable to the Jacob sand are not recognized in well logs beneath the central or southern part of Long Island.

The type locality of the Manhasset formation of Fuller is in Manhasset in northern Nassau County, where thick deposits of glacial sand and gravel contain a thin intercalated bed of clayey till. The lower gravel Fuller called the Hempstead gravel member, the till was called the Montauk till member (after the type locality at Montauk Point), and the gravel above the till was called the Herod gravel member, although the correlation of this particular gravel with the sand and gravel at Herod Point in central Suffolk County is also uncertain. Fuller believed that only the top few feet of till which overlies the Manhasset formation at the type locality was deposited by the Wisconsin ice sheet. This belief was based on an interpretation of the physiography with which subsequent workers have not been in agreement. Wells (1935, p. 121-122) and Fleming (1935, p. 222) state that they could find no evidence of weathering or erosion to indicate that there was an interglacial period at any time subsequent to the deposition of the Gardiners clay. The writer agrees with this opinion.

Fleming (1935, p. 216-238) proposes a three-fold subdivision of the post-Gardiners glacial material into Herod, Montauk, and Latest, a

however, of three ice sheets. The glacial deposits observed in the Brookhaven National Laboratory area appear to be the product of two ice advances similar in character and probably both of Wisconsin age.

The Ronkonkoma and Harbor Hill moraines as mapped by Fuller (1914, pl. 1) are accepted with slight modification; and the bulk of the upper Pleistocene deposits are considered to be outwash from the same glaciers that formed the moraines. The chief points of disagreement with Fuller are: (1) the Manhasset formation, as defined by Fuller, is not considered to occur within the area and does not underlie the two outwash deposits at shallow depth as he believed; (2) the outwash is believed to be substantially thicker than Fuller thought; and (3) the thin till (supposedly ground moraine of the Ronkonkoma advance), which Fuller maps as underlying central Suffolk County and considerable territory to the north and west, is not believed to be present. This last unit is here replaced by Ronkonkoma and Harbor Hill outwash as discussed in the following paragraphs.

On the other hand, some units are here recognized in the upper Pleistocene that Fuller had little or no chance of observing. The first of these, called the unidentified unit (Weiss, 1954, p. 148), occurs at the base of the upper Pleistocene deposits. The second unit is clay, some of it varved, which is best known from cores from a test well at Manorville. Lastly are some thin surficial fine-grained deposits, not typical outwash, that occur in the upper part of the Harbor Hill outwash in the headwaters of the Peconic River in or near the eastern part of Brookhaven National Laboratory.

Thus in summary, the upper Pleistocene deposits in the vicinity of Brookhaven National Laboratory comprise the Harbor Hill and Ronkonkoma moraine deposits and outwash, which are indistinguishable on the basis of texture and composition alone, but which occupy somewhat different physiographic positions; and three minor units, differentiated on the basis of their composition: the unidentified unit, the clay at Manorville, and fine-grained surficial deposits of limited but uncertain extent.

#### UNIDENTIFIED UNIT

South of Brookhaven National Laboratory, and for an unknown distance east and west, the Gardiners clay is overlain by 25 to 50 feet of sand or clay and sand characterized by a greenish color which is referred to as the unidentified unit. Beneath the southern half of the laboratory tract, and south to Route 27, this material forms the basal part of the upper Pleistocene deposits. Its relation to the other units

is shown in wells as far west as Patchogue (well S7519) and as far east as West Hampton Beach (wells S9973 and S152). It probably extends beyond these areas. The northern limit of the unit has been located only at Brookhaven National Laboratory where test drilling indicates that this unit extends north of well S6459 (pl. 2). To the south, the unit can be traced nearly as far as well S1592 (pl. 2), but beyond this point the greenish deposits cannot be distinguished in well logs from similar material that may be part of the Gardiners clay or older deposits. The data from other wells along the south shore of the Island are not adequate to define the unit.

The unidentified unit, in the vicinity of Brookhaven National Laboratory, where it is most clearly defined, is composed of fine- to medium grained white and gray sand, and 5 to 10 percent of interstitial green clay. The sand grains consist mostly of quartz, but some other minerals also are present, principally feldspar, amphibole, and garnet. The green clay was identified by Clarence Ross (written communication, 1949) as nontronite, but probably there are other clay minerals present. Some broken grains of reworked glauconite are also present; and the nontronite may well have been formed by the weathering of glauconite. Elsewhere, the unit apparently contains considerable clay or sandy clay.

Samples of sand were collected for mechanical analysis from well S6459. The texture of the sample of greenish sand is not distinctive. The amounts and proportions of fine and medium sand are similar to those in some of the upper Pleistocene outwash; the content of coarse and very coarse material is small. Mineralogically the greenish sand differs from the overlying outwash mainly in the apparent absence of biotite and the presence of glauconite. It appears to have a more varied mineral content than the Gardiners clay.

The origin of the unit is uncertain, but it is here considered to be part of the upper Pleistocene deposits because of its general mineralogic and lithologic similarity to the sands of those deposits. The glauconite may well have been derived from the shallow marine deposits in Long Island Sound, then dry, by the first advance of the ice across this area, and it need not have come from the area of the Atlantic Ocean to the south.

#### WATER-BEARING PROPERTIES

The unidentified unit, although very similar in texture to much of the outwash, contains less coarse sand, and probably on the average a little more clay. The difference is difficult to estimate quantitatively.

material. Even a small difference may be of some importance. As shown in a later section, a body of contaminated liquid of even slightly greater density than the normal ground water will tend to sink to the bottom of the aquifer. Also, the adsorptive and ion-exchange capacity of the nontronite and glauconite in the unit is appreciably higher than that of the overlying outwash. It is concluded, therefore, that following a spill or leak, any contaminated water which sinks into the unidentified unit at the bottom of the upper Pleistocene, will move less rapidly and be subject to more adsorption than it would be in the overlying material.

#### MORAINIC DEPOSITS AND OUTWASH

The moraine deposits and outwash comprise four separate units: the Ronkonkoma moraine, outwash and other meltwater deposits from the Ronkonkoma ice, the Harbor Hill moraine, and outwash from the Harbor Hill ice. These units are distinguishable topographically, but not lithologically with present information.

The Ronkonkoma moraine is a line of irregular hills that lies immediately south of Brookhaven National Laboratory (pl. 1). It extends eastward past South Manor, where it forms the south side of the Manorville Basin, and still farther east through Bald Hill. It also extends westward, paralleling the Carmans River valley at Yaphank, and then crosses that valley and includes Coram Hill and others to the west.

The Ronkonkoma outwash underlies and forms the sloping but fairly smooth terrain south of Brookhaven National Laboratory, and also the irregular hills on and among which the main Laboratory tract is situated. These hills are considered to be kames formed during the late stages of melting of the Ronkonkoma glacier.

The Harbor Hill moraine (pl. 1) lies along the north shore of Long Island and is of little direct concern in connection with the ground-water problems of the Laboratory. Outwash from the Harbor Hill ice, however, extends southward to within about  $1\frac{1}{2}$  miles of the north boundary of Brookhaven National Laboratory, and to the east it extends south of the Peconic River and underlies most of the Manorville Basin. It is believed that meltwater from the Harbor Hill ice flowed down the site of the Carmans River, through the gap in the Ronkonkoma moraine, and into the narrow tongue that broadened at the south to form a fanlike feature; the broad, flat area where the communities of Mastic and Mastic Beach are now located (pl. 1).

Within the Laboratory tract, except for the thin, surficial clay and

lithologically inseparable and form virtually a single water-bearing unit. As a unit, these deposits rest upon the unidentified unit and, where that unit is missing or unrecognizable, upon the Gardiners clay. At places, where the Gardiners is missing, it rests on the Magothy (1) formation. In the laboratory area, it is from 100 to more than 200 feet thick. Its thickness, altitude, relationships to underlying formations, and general lithologic characteristics are shown by the cross sections in plate 2.

The moraine and outwash deposits are a crudely stratified body of clean sand and gravel which contains very little clay or silt, and only locally a few boulders. The sand grains are mostly quartz with small amounts of alkali feldspar, mica, amphibole, and other minerals. As indicated by a few exposures, the sand is well but coarsely bedded. Individual beds are difficult to define, as variations in texture are gradational.

Cores from some of the test holes reveal thin layers of silt or clay, which at most are 1 to 2 inches thick. Thicker lenses of clay are absent in the immediate vicinity of the Laboratory, but they are exposed locally along the north shore, especially at Wildwood State Park and Rocky Point (pl. 1). These lenses of silt and clay were probably deposited in small lakes formed between the retreating face of the Harbor Hill ice sheet and the Harbor Hill moraine. They are not more than 20 to 30 feet thick, and the majority are less than 10 feet thick. They appear to be at most a few hundred yards long. All these beds of silt and clay are near sea level, and they are evidently the material identified as the Jacob sand and the Gardiners clay by Fuller (1914).

No systematic variations in texture were actually observed in the glacial outwash or moraine deposits, and indeed to detect any would probably require a statistical study of a considerable number of large samples. The data available, however, suggest that the Ronkonkoma outwash becomes finer grained south of the Ronkonkoma moraine, and that the lower part of the outwash is somewhat finer than the upper part. No such generalization appears to hold for the material north of the Ronkonkoma moraine.

#### WATER-BEARING PROPERTIES

Because of their similarity in structure and texture, the moraine and outwash deposits are considered a hydrologic unit. In the Laboratory area, the water table lies within what is probably the Ronkonkoma outwash, so that this deposit is of primary concern. The clean, coarse sand and gravel is very porous and highly permeable. It makes a

osity, the deposits store large quantities of water. Because of their high permeability, the deposits yield large quantities of water to wells and are the source of nearly all the ground water pumped in central Suffolk County.

So far as is known there are no effective barriers to the movement of water anywhere in the unit. However, because the deposits are particular, there may be substantial variation in permeability over short distances. The permeability of the deposits south of the Ronkonkoma moraine may decrease slightly with depth and with distance to the south.

Some of these minor variations in water-bearing characteristics might become significant in connection with possible movement of a contaminant. As the moraine deposits and outwash were deposited by water flowing in general from north to south, it is reasonable to suppose that individual lenses of sand and gravel are themselves elongated in this direction. Thus, there may be threads of relatively permeable material along which water might move a little more rapidly under proper hydraulic conditions. Also, there may be either fine- or coarse-grained deposits localized beneath and along the valleys of the principal streams, such as the Carmans or Forge Rivers.

Finally, as discussed by de Laguna (written communication, 1962) there is apparently a substantial difference between permeabilities in horizontal and vertical directions.

#### CLAY AT MANORVILLE

A test well (S10,384) drilled by a private contractor near Manorville (pl. 1) penetrated a bed of tough clay which was underlain and overlain by outwash sand and gravel, between 2 and 33 feet below sea level. The lower part of this clay has typical glacial varving, which indicates that it was deposited in a lake left in the Manorville basin during the ice retreat. Similar clay was found in well S6422 from 4 to 62 feet below sea level. East, in the Riverhead basin, several wells penetrated what are probably equivalent beds of clay 15 to 30 feet above sea level. Three of these reached the bottom of the clay at 74, 1, and 130 feet below sea level. It is tentatively suggested that the red clay at well S10,384 is possible interglacial, at least intersubglacial, and may separate Ronkonkoma from Harbor Hill outwash. Whether the clays penetrated by the other wells to the east and to the west are of the same unit is not known. There are, however, clay and silt of Gardiners age at about these depths in the eastern part of the Riverhead basin, and in well logs it would be impossible to distinguish

continuity and extent of this clay. However, if the clay is post-Ronkonkoma, the temporary lake in which it formed presumably would have been limited to the north of the Ronkonkoma moraine, and the clay itself should occur correspondingly. It was not found in the Laboratory area, nor to the south of Brookhaven National Laboratory. West of the Laboratory, in the upper valley of the Carmans River, there are few data, and none to indicate the presence of a comparable clay.

The clay at Manorville, if laterally extensive, probably exerts a considerable influence on the movement of the ground water in the upper Pleistocene deposits in the area where it occurs. The water table is some 35 feet above sea level at Manorville, so that there is about 35 feet of saturated sand and gravel above the clay. The clay at well S10,384 is about 31 feet thick, and it is underlain by about 42 feet of sand and gravel. Movement of water between the upper and lower strata is certainly considerably impeded by the clay, and presumably artesian conditions prevail in the lower strata, although water-level measurements are not available to indicate the head difference. It is also possible that in some parts of the Manorville basin the water in the deposits beneath the clay flows southeastward toward and eventually to the south shore, whereas the water in the deposits above the clay discharges into the Peconic River. The clay appears to terminate, however, well to the east of the Laboratory, so that it does not influence directly the movement of ground water in the areas of potential contamination, but it may well be an important factor in the hydrology of the central and lower Peconic River valley.

#### SURFICIAL SILT AND CLAY

In the east third of the Laboratory area, test drilling and shallow excavations have revealed in places thin deposits of silt and clay. The material is discontinuous and unevenly distributed. It is at most 5 or 10 feet thick, and is generally found at or very near the surface; and not deeper than 20 to 30 feet. It appears to be more widespread in the slightly lower land along the Peconic River and minor headwater tributaries than in higher ground. It may have been first deposited by the wind as loess, shortly after the retreat of the ice sheets and before a vegetative cover had developed; and subsequently moved by running water and redeposited on lower land. Some of it may have originated as waterlain material, and some may be unworked loess. The extent of the deposits is determined in part by hydrologic data.

These deposits are sufficiently fine grained so that they appreciably impede the movement of shallow ground water. They hold water at or near the land surface, and thus locally form swampy areas or ponds.

times when the level in the main underlying water body declines, they support perched or semiperched water bodies. Similarly, when the level in the main underlying water body rises, these fine-grained deposits confine the water under slight artesian pressure. These relationships are a really complex because the deposits are discontinuous and occur close to the water table. The deposits affect the movement of shallow water into and out of the Peconic River and associated ponds, swamps, and drainage ditches in a rather complex way, and thus they have a bearing on the possible movement of contaminated waters in and outside the eastern part of the Laboratory area.

#### DEPOSITS OF RECENT AGE

Deposits of Recent age comprise gravel and sand on beaches, organic matter, silt and clay in tidal swamps, gravel, and sand and silt in stream channels. These deposits are thin and discontinuous, and they occur chiefly along the shores of the present Long Island Sound, the open ocean, bays behind barrier beach and various bars, and along the channels of the few larger streams. They are not sufficiently extensive to make it important to differentiate them from underlying deposits (almost everywhere the upper Pleistocene deposits) upon which they rest unconformably.

They are generally neither thick enough nor extensive enough to comprise any appreciable ground-water reservoirs. Nearly all these deposits are remote from the Laboratory and there is no immediate problem in regard to their possible contamination.

#### REFERENCES CITED

- Hurr, W. H., Herling, Rudolph, and Freeman, J. R., 1901, Report of the commission on additional water supply for the City of New York: New York, Martin R. Brown Co., 980 p.
- Crosby, W. O., 1910, Report of the geological relations of the ground water of Long Island: New York City Board of Water Supply, open file report, 64 p.
- Barton, N. H., 1893, The Magoths formation of northeastern Maryland: *Am. Jour. Sci.*, 3d ser., v. 45, p. 407-419.
- de Laguna, W., and Brashers, M. L., Jr., 1948, The configuration of the rock floor in western Long Island: *New York Water Power and Control Comm. Bull.* GW-13, 86 p.
- Fleming, W. L. S., 1935, Glacial geology of central Long Island: *Am. Jour. Sci.*, 5th ser., v. 30, p. 216-238.
- Fuller, M. L., 1914, The geology of Long Island, N.Y.: U.S. Geol. Survey Prof. Paper 82, 231 p.
- Johnson, A. H., and others, 1952, Record of wells in Suffolk County, N.Y.: *New York Water Power and Control Comm. Bull.* GW 31, 137 p.
- Leggett, R. M., and others, 1939, Record of wells in Suffolk County, N.Y.: *New York Water Power and Control Comm. Bull.* GW 4, 19 p.

- Lawryman, N. J., and Johnson, A. H., 1951, The water table in Long Island, New York, in January 1951: *New York Water Power and Control Comm. Bull.* GW-27, 28 p.
- MacClintock, Paul, and Richards, H. G., 1938, Correlation of late Pleistocene marine and glacial deposits of New Jersey and New York: *Geol. Soc. America Bull.*, v. 47, no. 3, p. 270-328.
- Oliver, J. E., and Drake, C. J., 1951, Geophysical investigations in the emerged and submerged Atlantic Coastal Plain: *Geol. Soc. America Bull.*, v. 62, p. 1287-1290.
- Perlmutter, N. M., and Crandell, H. C., 1959, Geology and ground-water supplies of the south-shore beaches of Long Island, N.Y.: *New York Acad. Sci. Annals*, v. 20, art. 4, p. 1060-1078.
- Roberts, C. M. and Brashers, M. L., Jr., 1945, Record of wells in Suffolk County, N.Y., supplement 1: *New York Water Power and Control Comm. Bull.* GW-9, 165 p.
- Spear, W. N., 1908, Long Island sources, an additional supply of water for the City of New York: *New York City Board of Water Supply*, v. 1, p. 85-102.
- Stuler, Russell, de Laguna, Wallace, and Perlmutter, N. M., 1949, Mapping of geologic formations and aquifers of Long Island, N.Y.: *New York State Water Power and Control Comm. Bull.* GW-18, 178 p.
- Thompson, D. G., Wells, F. G., and Blank, H. R., 1937, Recent geologic studies on Long Island with respect to ground-water supplies: *Econ. Geology*, v. 32, no. 4, p. 451-470.
- Veitch, A. C., and others, 1906, Underground water resources of Long Island, N.Y.: U.S. Geol. Survey Prof. Paper 44, 394 p.
- Von Engel, O. D., 1942, Geomorphology, systematic and regional: New York, The MacMillan Co., 655 p.
- Wells, Lawrence, 1954, Foraminifera and origin of the Gardiners clay (Pleistocene), eastern Long Island, N.Y.: U.S. Geol. Survey Prof. Paper 254-G, p. 145-162.
- Wells, F. G., 1935, Reconsideration of the Pleistocene geology of Long Island [Isla.]: *Geol. Soc. America Proc.*, 1934, p. 121-122.
- Wenzel, L. K., 1942, Methods for determining permeability of water-bearing materials: U.S. Geol. Survey Water-Supply Paper 887, 192 p.