Phase II Work Plan
Engineering Investigations and Evaluations of
Inactive Hazardous Waste Disposal Sites

Watch Hill Sand & Gravel, ID No.: 152084

Islip, Suffolk County

November 1991

Prepared For:

New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York

Prepared by:

Division of Hazardous Waste Remediation
Bureau of Hazardous Site Control
Eastern Investigation Section

GENERAL

All work will be conducted in conformance with the New York State Department of Environmental Conservation (NYSDEC) Phase II Generic Workplan and Guidelines presented in Schedule 4 of the Contract and this document.

Based on this workplan a costing sheet is to be developed and attached by the consultant. This workplan and associated costs will be made part of the cost plus fixed fee contract with a limiting upset figure. This workplan has been assembled based on the information available. It may be necessary to alter the scope of the field work based on data collected during the Phase II investigation.

A copy of this workplan and Exhibits 1 and 3 of the contract must be taken to the field by the consultant during the Phase II field activities. Through his actions, the field representative will display familiarity with the provisions of the work plan and exhibits. Failure to provide any of the above documents at the New York State Department of Environmental Conservation (NYSDEC) representative's request, or for the consultant to show inadequate comprehension of their contents are sufficient grounds for NYSDEC to halt Phase II field work.

INTRODUCTION

This is a 45 acre site which after operating as a mining operation accepted construction and demolition (C&D)materials as fill. There are allegations that not all the material that was accepted as fill could be labelled as C&D material.

A passive methane ventilation system was installed onsite due to the methane concentrations of 4682 ppm detected in the methane monitoring well.

Hydrogeology

This site is located near the groundwater divide. The soils are generally expected to be sands and gravels. One of the property owners has had three wells installed. The well depths range from 66 feet to 67.5 feet; each well was installed with a ten foot screen.

NYSDEC Site Visit

A site visit was conducted on by NYSDEC personnel. From the site visit, the proposed locations of monitoring wells and sampling points were determined (see Figure 3). The exact locations of the monitoring wells will be determined in the field by Department personnel and the consultants representative.

OBJECTIVES

The objective of this Phase II investigation is to collect the

information required to classify the site for further action. This includes collecting the field data necessary to identify the occurrence and characteristics of contamination and if a release of contaminants from the site has occurred. This information will be used to determine if any imminent and/or significant environmental or health hazard exists.

Specifically, these objectives will be accomplished through the drilling of test borings, installation of groundwater monitoring wells, and sampling and analysis of groundwater, surface water, soil, wastes, and sediments (where any or all of these media are applicable).

The project has been subdivided into specific tasks. Table 1 briefly summarizes each task. The following is a more detailed description of activities required to complete this investigation.

SITE RECONNAISSANCE

Record Search/Data Compilation

For the purposes of report preparation, the consultant is to compile all data available from but not limited to the USEPA, the USGS, the NYSDEC, the New York State Health Department, Suffolk County Department of Health Services as well as information from pertinent reports and or plans. The consultant must compile and review the historical aerial photos for this site to aid in determining the limits and type of fill.

A site visit will be conducted prior to the commencement of any drilling or sampling activities. At this time, markers designating the tentative locations for test borings, monitoring wells, and surface sampling locations will be emplaced. During the visit, specific information determined by NYSDEC personnel will be corroborated. As an example, access problems related to drilling, geophysical survey, sampling, or an onsite water source must be confirmed by the consultant. Air monitoring, consisting of a perimeter survey with a photoionization detection (PID) instrument, eg an HNu model P1-101, and a flame ionization detection (FID) instrument, eg an OVA, shall be done upon arrival at the site. A survey within the boundary shall follow the perimeter survey. This air monitoring is separate from monitoring that is part of the health and safety plan.

The exact location of all buried power lines, underground gas lines, water mains, sewage pipes, and storm water pipes, or other utilities must be obtained by the consultant from the appropriate utility and/or municipal department prior to the arrival of the drill rig and commencement of drilling. All due caution must be exercised by the driller with respect to overhead power lines, telephone lines and or cables.

FIELD INVESTIGATION

Geophysical Survey

The consultant will conduct an electromagnetic geophysical survey at this site to assess the limits of the fill and the potential for buried metal objects.

All geophysical data must be reduced by the consultant, analyzed and made available to the Bureau for review prior to the installation of monitoring wells. The findings of the geophysical survey must be used to determine the best location of test pits and monitoring wells, and to select other environmental sampling locations.

Soil Gas Survey

No soil gas survey work is planned for this site.

Test Borings and Well Installation

Three additional monitoring wells are proposed to be installed to provide data pertinent to both water chemistry and characterization of the stratigraphy and groundwater regime at the site. Finalized well locations will depend on; 1) the utility search in order to avoid underground obstacles, 2) accessibility, 3) and the geophysical test results. The decision for final monitoring well locations will be made jointly by the Consultant and the Department. The approximate locations of the proposed wells for this site are shown on Figure 3.

It is expected that these wells will be installed in overburden. All monitoring wells will be constructed as specified in Figure 1 of Exhibit 3 of the Contract. Ten (10) foot PVC well screens should be utilized.

Test borings will be advanced with hollow stem augers, a minimum I.D. of 6 1/4 inches, through overburden, and NX sized diamond core barrels in competent rock, driven by truck, track, or trailer mounted drilling equipment. Alternative methods of drilling or equipment may be allowed or requested for site specific criteria, but must be approved by NYSDEC. Sampling will be conducted at 5 foot intervals or change in soil strata down to the saturated zone unless otherwise specified by the DEC representative. The saturated soil zone will be sampled continuously. Soil samples will be classified in the field by a geologist, or a soils engineer. A grain size analysis for non-cohesive soils or Atterberg limits test for cohesive soils will be performed at every significant change in subsurface lithology, as well as one such analysis in the screened interval. For costing purposes, it will be assumed that a total of three grain size analyses and three Atterberg limits tests will be performed. All work will be done in accordance with the Generic Workplan, Exhibit 1, the Guidelines for Exploratory Boring, and Exhibit 3 of this Contract (Schedule 4).

Installation of the bentonite seal above the groundwater table during monitoring well construction shall be done in accordance with

the following. After installation of the filter pack, a slurry of bentonite powder and water mixed to the consistency of pudding shall be pumped into the working space of the well with a side discharge tremie pipe. The working space of the well is defined as the space between the outside diameter of the riser pipe and the inside diameter of the casing or augers. A quantity of slurry sufficient to fill the annular space of the boring to one foot above the filter pack is needed. Bentonite pellets should then be added to complete the seal to two feet above the filter pack, continuous measurements of the surface of the bentonite pellets should be made when adding them. The bentonite pellets must be hydrated before adding grout. The amount of water added to hydrate the pellets and time allowed for hydration shall be determined from the manufacturers recommendations. If the recommendations are not available, then a steady stream of water must be applied to the bentonite pellets for at least one (1) hour. When the pellets have been given sufficient time to hydrate then the grout may be pumped into the working space of the well using a side discharge tremie pipe.

Well development will begin a minimum of 24 hours after placement of the grout, to allow the grout to completely set. For costing purposes assume maximum four hours of development for each well. Groundwater elevation readings will be taken in each well before and immediately after development. Each well will be developed to the point that the turbidity of the recovered water is 50 Nephelometric Turbidity units (NTu) or less. A nephelometer will be brought to the field for the purpose of making this measurement. A signed statement will be provided to the Department that the turbidity was less than 50 NTu for each well immediately after development if a Department representative is not present when the measurements are taken.

Permeability testing, a slug test, of each well will be done following sampling. The results of the permeability tests will be correlated with the screen size, grain size of the filter pack, and the results of the gradation tests conducted on the insitu soils in the screened interval. A conclusion should be drawn as to the effect of the filter pack and screen size on the permeability tests.

A temporary staff gauge or other surface water elevation measuring device will be established on any nearby surface water body, which may significantly influence groundwater movement. The surface elevation of these water bodies will be checked whenever groundwater elevations are measured.

Test Pits

The consultant shall provide a contingent cost for two test pits to examine any anomalies identified in the geophysical survey. Each test pit will be estimated to be a total of twelve (12) feet in depth.

Surveying and Mapping

A map will be prepared showing the location and appropriate elevations (ground surface, top of monitor well casing) for each

boring, monitoring well, sampling location, and other key contour points as determined by the consultant (a draft copy of the map will be made available to NYSDEC prior to its finalization and incorporation into reports). A licensed land surveyor will be used to establish the locations and elevations of each above mentioned point.

To allow for accurate water level measurements, each of the well elevations will be determined relative to a USGS datum. If a USGS datum is not available within 200 feet of the site, the elevation measurements will be made relative to a site specific datum. Elevation measurements made to the top of casing will be to the nearest 0.01 foot and made to the ground surface will be to the nearest 0.1 foot. Survey work will be done in accordance with Section C.10 of Exhibit 3.

In addition, all sampling points will be surveyed to determine relative location.

SAMPLING AND ANALYSIS

Sampling and chemical analysis will be performed by the consultant in accordance with the 1989 Analytical Services Protocol.

Where dilution of any Phase II sample is to be done by the chemical analytical laboratory, prior to analysis, the NYSDEC is to be advised immediately. The concern is that a component of low concentration, but of significant environmental impact, could become so diluted that its presence in the final extract will not be detected.

During this contract, the NYSDEC chemist will discuss alternatives with the laboratory's chemist on how best to conduct the analysis. The NYSDEC's chemist is Mr. John Rankin, his telephone number is (518) 457-3252.

Although a method or extra work may be agreed upon by both chemists, clearance for any extra cost must be obtained by the consultant from the NYSDEC contract manager. Such cost will be paid from the contingency amount in the contract, and clearance must be confirmed by the NYSDEC in writing.

All samples taken for chemical analysis shall be delivered to the laboratory within 24 hours of their collection. Express courier service shall be used to transport the samples, unless the laboratory is close enough to the site for the consultant to make direct delivery.

Air

Air monitoring, consisting of a perimeter survey with a photoionization detection (PID) instrument, eg an HNu model P1-101, and a flame ionization detection (FID) instrument, eg an OVA, shall be done upon arrival at the site. A survey within the boundary shall follow the perimeter survey. This air monitoring is separate from monitoring that is part of the health and safety plan. If a source of air contamination is identified, the air will be sampled using appropriate equipment to determine the nature and concentration of the

contaminant. Upwind air samples will also be analyzed at the same time. Wind directions must be continuously monitored and documented during any sampling and analysis of air samples. The intent of the air sampling is to determine whether or not there is an air release from the site and not to do a health assessment.

Groundwater

Groundwater from the three additional monitoring wells and the three existing monitoring wells should be sampled.

Surface Water and Sediment

No surface water sediment samples are planned.

Soil

No surface soil samples are planned.

Where determined by NYSDEC or the consultant's field representative that chemical analyses are required for soil samples from well drilling activities, the consultant must be prepared to obtain such samples for shipment to laboratory. Pricing for this activity must be included. For costing purposes, assume one analysis per boring.

Wastes

Provide a contingent cost to obtain and analyze a total of six waste samples from the two test pits.

Laboratory Analyses QA/QC

All samples will be placed in precleaned bottles supplied from the laboratory. Samples will immediately be placed in coolers, with ice, upon collection. The laboratory will conduct all analyses in accordance with the 1989 Analytical Services Protocols (ASP) and attach one copy of the QA/QC data to the final report.

Table 3 summarizes the analyses to be performed at the site. Type of sample, number of samples, and analytical methods are included.

The consultant shall provide an estimate of the cost for sub-contracting the task of reviewing the CLP QA/QC documents by an independent data validator not involved with the analytical laboratories under this contract.

HEALTH AND SAFETY PLAN

A Health and Safety Plan will be submitted as a separate document. The Department shall review this plan only to provide assurance for the health and safety of State Personnel. All other personnel and equipment associated with the project are the responsibility of the consultant.

REPORT PREPARATION

Report preparation will involve analysis of the data, as well as preparation of the text. Included in this task are the compilation and organization of the data, editing of boring logs, reduction of

hydrologic data, preparation of graphical representations analysis, and calculations, and updating the HRS score for the site. The report shall follow the format detailed in the Generic Phase II Workplan. Five (5) copies of the draft report shall be submitted. After review by NYSDEC, any corrections are to be made by the consultant and fifteen (15) copies of the final report are to be submitted. Each copy of the final report will be signed and stamped by a Professional Engineer licensed to practice in the State of New York.

QUALITY ASSURANCE PLAN

The consultant shall develop a QA/QC document which as a minimum shall address the conditions listed below.

Analytical cleanups are mandatory when matrix interferences are involved.

The consultant must address the presentation of the reporting and deliverables package. The QA requirements for the Phase II investigation must be addressed. Sample control forms attached to the amendment (of the contract) as Exhibit 1 must be supplied to the analytical laboratory for completion and inclusion with the data package.

The Quality Assurance Plan will be submitted as a separate document.

Table 1
Phase II Task Description
Watch Hill Sand & Gravel, 152084

TASK		DESCRIPTION
3.1	Conduct Records	Review all necessary file and report information and supplement as necessary
3.2	Site Reconnaissance	Corroborate NYSDEC information regarding the locations of the proposed monitoring wells, and access for drilling rigs. Locate drill water supply and evaluate geophysical needs of the site. Conduct utility clearance.
3.3	Geophysical Survey	The geophysical method for this site will be electromagnetic.
3.4	Soil Gas Survey	None.
3.5	Conduct Borings Install Monitoring Wells	Complete 3 borings and 3 monitoring wells. The zone to be screened will be chosen based on the logs.
	Soil samples from borings	Sample at 5 foot intervals and at changes in subsurface lithology to the saturated zone, and continuously in the saturated zone. Perform grain size analyses and atterberg limits tests as specified in the text.
	In-situ permeability tests	Following well sampling, falling head permeability tests (slug test) will be performed on each monitoring well.
3.6	Test Pits	Contingent cost for two 12 foot deep test pits.
3.7	Survey	By licensed surveyor in accordance with Section C.10 of Exhibit 3, Schedule 4 of the contract.
4.0	Sampling and Analysis	In accordance with the 1989 ASP.
	CLP QA/QC Documents	To be reviewed by a data validator not involved with the laboratories on this contract.
4.1	Air sampling	None anticipated

Table 1 Continued

	TASK	DESCRIPTION
4.2	Groundwater	Collect seven groundwater samples utilizing dedicated clean PVC, teflon, or stainless steel bailers. Samples to be analyzed as shown in Table 3.
4.3	Surface Water Sediment	None
4.4	Soil Samples	None.
5.0	Report Preparation	Prepare final report containing pertinent previous report information and data, additional field data, and site assessments with recommendations for any future action at the site, and in accordance with Article 49.
	Project Management	Project coordination, administration and reporting.

Table 2

Phase II Work Plan - Sampling Summary

Watch Hill Sand & Gravel, 152084

Designation ft.	Location	Aquifer Screened	Approx. Boring Depth (ft)	Length of Screen
Groundwater				
GW-1	Upgradient	overburden	75	10
GW-2	Downgradient	overburden	75	10
GW-3	Downgradient	overburden	75	10
Surface Water				
None				
Sediment	(at surface water locations)			
None				
Soil				
None				
Leachate				
None				
Waste				
Provide a contingent cost for six waste samples. (from the test pits)				

Note: Locations, aquifer screened, approximate boring depth, and length of screen are based on existing data and are the basis of the cost estimate. These criteria may change based on the results of the geophysical surveys and/or field conditions.

Table 3

Recommended Chemical Analyses - Watch Hill Sand & Gravel
NYSDEC ID No.: 152084

Type of Sample	Type of Analysis[1] TCL[2] Metals	TCL[3] Volatiles	TCL[4] Semi-Volatiles	TCL[5] Pesticides/ PCBs	Spike/ Duplicate[6]
Groundwater[7]	7	7	7	7	1/1
Surface Water	---	---	---	---	---
Sediment	---	---	---	---	---
Soil	---	---	---	---	---
Leachate	---	---	---	---	---
Drums	---	---	---	---	---
Waste	6	6	6	6	1/1
Field Blank	1	1	1	1	---
Trip Blank	---	1	---	---	---

(1) Complete identification per NYSDEC Generic Work Plan, Section 3(b)(ii)(B). Field pH, conductivity, and temperature measurements will be conducted on all water samples. Chemical Oxygen Demand (COD), Total Dissolved Solids (TDS), Total Suspended Solids (TSS), pH, and specific conductance will be determined for all water samples by the laboratory.

(2) TCL Metals - Preparation and analysis of the 15 Task 1, and 9 Task 2 inorganic compounds using the specified ASP methods.

(3) TCL Volatiles - Preparation and analysis using the ASP specified GC/MS method for TCL purgeable organics plus a library search and quantification of any non-TCL compounds. The ASP requires the library search only for the 10 non-TCL compounds of largest apparent concentration.

(4) TCL Semi-Volatiles - Preparation and analysis using the ASP specified GC/MS method for TCL extractable base/neutral and acid organic compounds plus a library search and quantification of any non-TCL compounds. The ASP requires the library search only for the 20 non-TCL compounds of largest apparent concentration.

(5) TCL Pesticides/PCBs - Preparation and pre-extraction of the TCL organochloride pesticides and polychlorinated biphenyls using the ASP specified GC-ECD method.

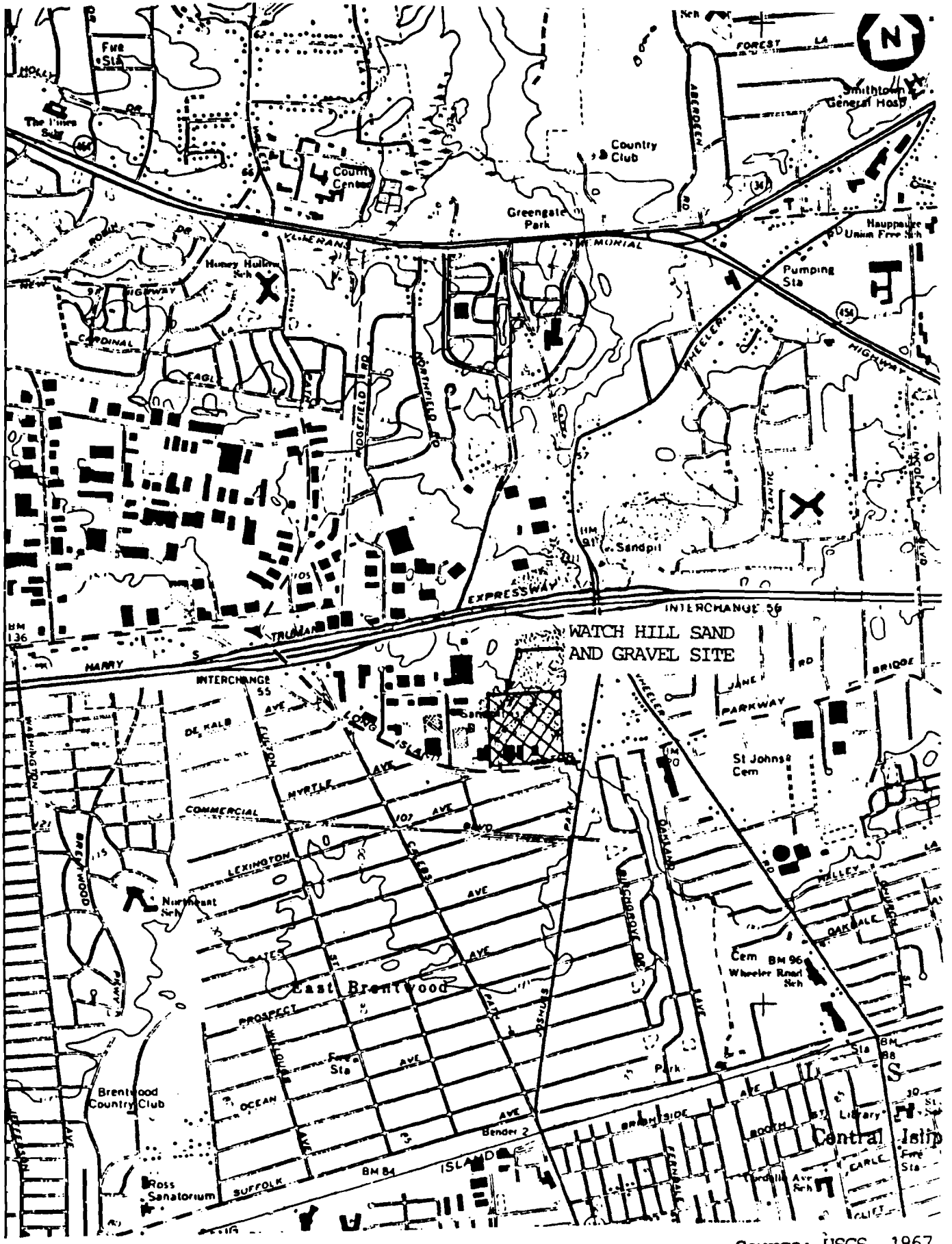
(6) Superfund and Analytical Services Protocol, September 1989, require at least one spiked sample analysis and one duplicate sample analysis from each group of samples of a similar matrix type for each case of samples or for each 20 samples received, whichever is more frequent.

(7) A duplicate sample must be obtained from a monitoring well chosen at random (or some other medium if wells are not available). That duplicate sample must not be identified as a duplicate to the laboratory, but must be assigned an identifier similar to other groundwater samples.

The Bureau requires the blind analysis of a duplicate sample for each site by the laboratory to confirm the integrity of all sampling and analytical activities.

(8) Where applicable, samples will also be analyzed for EP (Toxicity), corrosivity (pH), ignitability, and reactivity to determine whether they are characteristic hazardous waste. For EP Tox analysis: if the total metals or pesticide concentration in the onsite soil samples are higher than twenty times the maximum concentration for the characteristic of EP Toxicity, then it may be necessary to conduct an EP Tox test for that sample. Soil samples should be preserved for future EP Tox analysis once the total metals results are known.

--- Designates that no samples are to be analyzed.



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

FIGURE 1-1 WATCH HILL SAND & GRAVEL

SITE LOCATION MAP

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

CENTRAL ISLIP QUADRANGLE

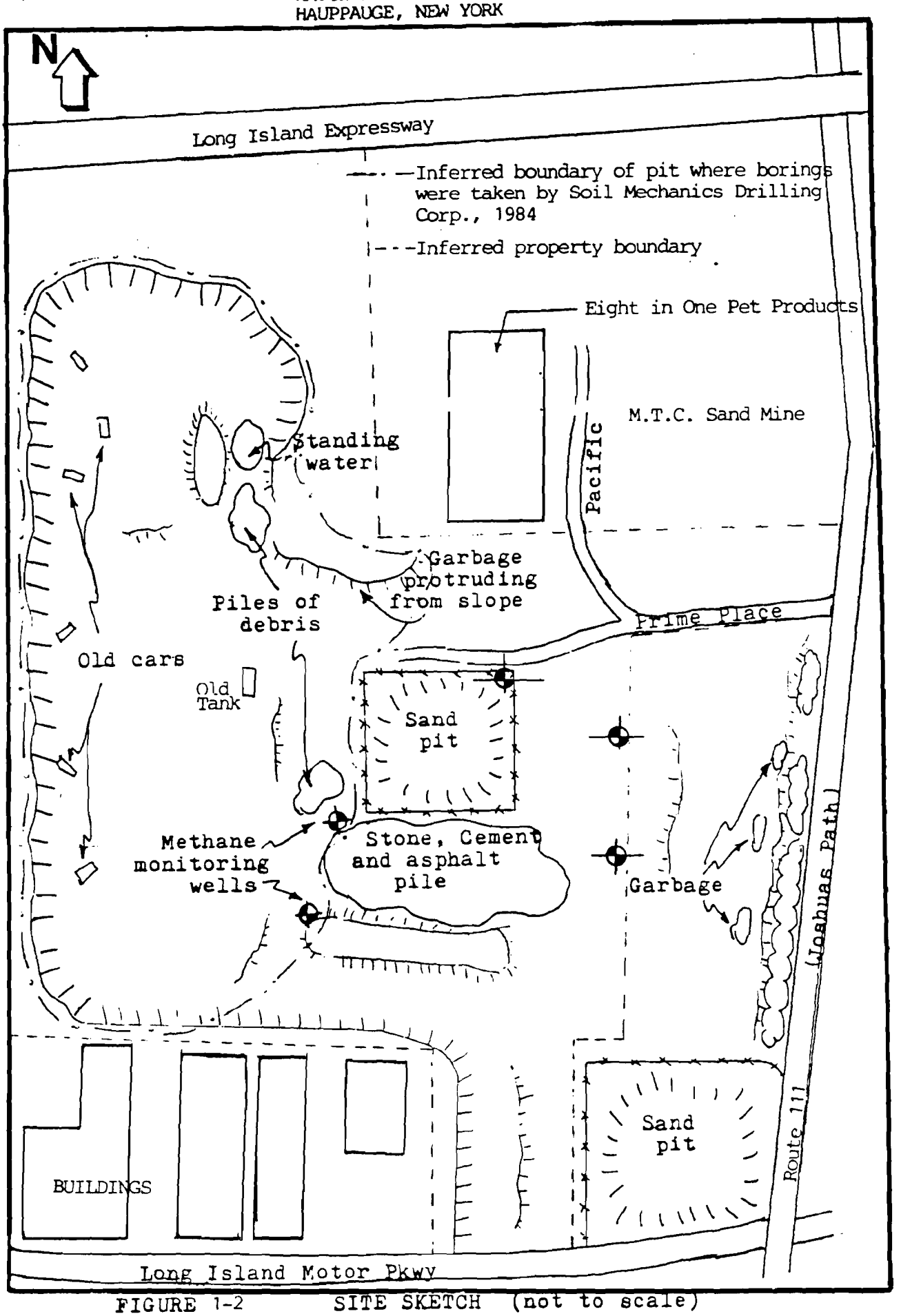


FIGURE 1-2 SITE SKETCH (not to scale)