R-49-8-91-13

FINAL

REMEDIAL INVESTIGATION

WORK PLAN

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY
(CLEAN)**

**NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK**

NORTHERN AND CHESAPEAKE DIVISIONS

CONTRACT N62472-90-D-1298, CTO 0003

AUGUST 1991

HALLIBURTON NUS
Environmental Corporation

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NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK

NORTHERN AND CHESAPEAKE DIVISIONS

Submitted to:
Northern Division
Environmental Branch, Code 1421/PW
Naval Facilities Engineering Command
Building 77-L, U.S. Naval Base
Philadelphia, PA 19112-5094

Submitted By:
HALLIBURTON NUS Environmental Corporation
Park West Two - 2100 Cliff Mine Road
Pittsburgh, PA 15275-1071

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Submitted By:

David D. Brayack

David D. Brayack, P.E.
Project Manager

Approved for Submittal By:

for Debra M. Wolbrecke

Arthur K. Bomberger, P.E.
Program Manager

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EXECUTIVE SUMMARY

The work to be performed under Contract N62472-90-D-1298, Contract Task Order (CTO) 003, is to conduct a Remedial Investigation (RI) at the Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, New York.

The overall objective of the RI will be to characterize the nature and extent of potential environmental contamination and associated risks to human health and the environment at the NWIRP. The data collected will also be used to evaluate potential remedial options. The specific objectives of the RI for the Bethpage plant are to identify the location and concentration of potential soil and groundwater contamination by solvents and metals at three sites identified in the Initial Assessment Study (RGH 1986) and to determine whether these sites are the source of a trichloroethene (TCE) contaminated groundwater plume in the Bethpage area. The NWIRP, the Grumman Aerospace Corporation (Grumman), and the RUCO Polymer Corporation (RUCO) are potential sources of this contamination. The findings and results of the NWIRP and Grumman activities are expected to supplement each other.

An Initial Assessment Study of NWIRP Bethpage, New York and NWIRP Calverton, New York conducted in 1986 (RGH 1986) indicated that three areas at the Bethpage Plant may pose a threat to human health or the environment. These three sites are Site 1 - Former Drum Marshaling Area (identified as Site 7 in the Initial Assessment Study), Site 2 - Recharge Basin Area (identified as Site 8 in the Initial Assessment Study), and Site 3 - Salvage Storage Area (identified as Site 9 in the Initial Assessment Study). Each of these sites may contain soils and groundwater contaminated with volatile organics, semivolatile organics, and metals.

Currently, there are limited data available on contaminated groundwater at the NWIRP and no data available on soil contamination. Additional data are required to identify the nature and extent of soil and groundwater contamination on the Navy's property and to assess risks to human health and the environment.

A concurrent, three-phase field investigation is planned at this facility to address these data needs. The first phase will include soil-gas measurements throughout the sites to help define the location of soil and groundwater contamination. Soil-gas measurements will be obtained at two depths in the vadose zone soils. The second phase is dependent on the results of the first phase and will include the installation of temporary groundwater well points and quick turn-around analysis of the groundwater. During the installation of the well points, subsurface soil samples will be collected for offsite analytical testing. The third phase

will consist of the installation of permanent monitoring wells and the sampling and chemical analysis of surface soils, groundwater, sediment, surface water, and wastes, (if encountered). All samples will be analyzed for TCL volatile organics. The shallow soils (surface and up to 5 feet deep), groundwater (except the temporary monitoring well groundwater samples), sediment, surface water, and wastes will also be analyzed for semivolatile organics, TAL metals, and cyanide. Hexavalent chromium analysis will be performed on the surface water, waste, and groundwater samples. The soils which are visually identified as being stained, will analyzed for PCBs and pesticides. In addition, select soil and groundwater samples will be analyzed for engineering parameters.

The proposed field activities and sampling are summarized in Table ES-1. For Sites 1, 2, and 3, there will be a total of 78 soil-gas locations installed each with 2 soil-gas measurements; 29 temporary wells installed and 29 temporary groundwater samples collected; 29 soil borings installed and an estimated 44 subsurface soil samples collected; 29 surface soils collected, 17 permanent monitoring wells installed (with the potential for two additional upgradient wells installed) and 22 (24) groundwater samples collected; 2 surface water samples collected; 6 sediment samples collected; and 1 waste sample collected (if encountered). Each of these samples will be analyzed. The soil-gas samples will be analyzed in the field using a gas chromatograph (GC); the temporary monitoring well groundwater samples will be analyzed by a local laboratory using a GC: and the balance of the samples would be analyzed at a fixed-base laboratory using Contract Laboratory Program (CLP) protocol.

The results of the field activities will be presented in a Remedial Investigation report.

Table ES-1
Analytical Testing Summary[1]
Bethpage, New York

Parameter	Soil Gas	TMW - GW	Soil	Ground-water	Sediment	Surface Water	Sludge
Total Samples	156	29	75	24	6	2	1
Volatile Organics (Field GC)	156	29	0	0	0	0	0
TCL Volatile Organics	0	0	75	24	6	2	1
TCL Semivolatile Organics	0	0	53	24	6	2	1
TAL Metals - Total	0	0	53	24	6	2	1
TAL Metals - Filtered	0	0	0	24	0	0	0
Cyanide	0	0	53	24	0	2	1
PCBs/Pesticides	0	0	10	0	0	0	1
Hexavalent Chromium	0	0	0	24	0	2	0
pH, TOC, Grain Size, Moisture Content, Bulk Density	0	0	6	0	1	0	1
pH, TOC, COD, TDS, BOD, Alkalinity, Hardness, TSS	0	0	0	3	0	0	0

1 - Number of samples is exclusive of QA/QC requirements.
TMW - GW: Temporary Monitoring Well - Groundwater Samples

1.0 INTRODUCTION

1.1 Purpose

The work to be performed under Contract N62472-90-D-1298, Contract Task Order (CTO) 003, is to conduct a Remedial Investigation (RI) at the Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, New York, (see Figure 1-1). This work is part of the Navy's Installation Restoration Program, which is designed to identify contamination of Navy and Marine Corps lands/facilities resulting from past operations and to institute corrective measures, as needed. There are typically four distinct phases. Phase 1 is the Preliminary Assessment (formerly known as the Initial Assessment Study). Phase 2 is a Site Investigation, which augments the information collected in the Preliminary Assessment. Phase 3 is the Remedial Investigation/Feasibility Study, which characterizes the contamination at a facility and develops options for remediating the site. Phase 4 is the Remedial Action, which results in the control or cleanup of contamination at sites.

The overall objective of the RI will be to characterize the nature and extent of potential environmental contamination and associated risks to human health and the environment at the NWIRP. The data collected will also be used to evaluate potential remedial options. The specific objectives for the Bethpage plant are to identify the location and concentration of potential soil and groundwater contamination by solvents and metals at three sites identified in the Initial Assessment Study (IAS) (RGH 1986) and to determine whether these sites are the source of a trichloroethene (TCE) contaminated groundwater plume in the Bethpage area. The NWIRP, the Grumman Aerospace Corporation (Grumman), and the RUCO Polymer Corporation (RUCO) are potential sources of this contamination (see Figure 1-2).

The NWIRP is conducting this Remedial Investigation to address potential sources of groundwater contamination at the NWIRP. The NWIRP is bordered on the north, south, and west by Grumman Aerospace Corporation, and on the east by a residential area, (see Figure 1-2). Grumman is currently conducting a Remedial Investigation of its property. The scope of activities is similar to the Navy's scope and includes a soil-gas survey, soil sampling, and groundwater sampling. The Grumman work is being conducted under the direction of the State of New York. Some of the data obtained from the Grumman work can be used to supplement this Remedial Investigation. RUCO (Hooker Chemical/RUCO Polymer) is on the National Priorities List (NPL) and is also currently under investigation.

An Initial Assessment Study of NWIRP Bethpage, New York and NWIRP Calverton, New York conducted in 1986 (RGH 1986) indicated that three areas at the Bethpage Plant may pose a threat to human health or the environment. These three sites are Site 1 - Former Drum Marshaling Area (identified as Site 7 in the Initial Assessment Study, or IAS), Site 2 - Recharge Basin Area (identified as Site 8 in the IAS), and Site 3 -Salvage Storage Area (identified as Site 9 in the IAS). (These sites were renumbered to avoid confusion with the Site designations at the Calverton Plant.) Figure 1-3 presents the location of the three sites at Bethpage. Figures 1-4, 1-5, and 1-6 present the general layout of Sites 1, 2, and 3, respectively.

Based on the historic data presented in the Initial Assessment Study, there is the potential for volatile organic, semivolatile organic, and inorganic contamination at each of the three sites. The activities to be conducted under the RI will consist of project plans, sample collection, sample analysis, preparation of a RI report, and presentation of the results.

This RI Work Plan will provide the details of the specific tasks to be performed for the RI. Additional information on the specific activities will be provided in the Quality Assurance/Quality Control (QA/QC) and Sampling Plan, Data Management Plan, and Health and Safety Plan. These other plans are being prepared concurrently.

1.2 Organization

This report consists of five sections. Section 1.0 is this introduction. Section 2.0 presents the site background information. Section 3.0 provides the scoping of the remedial investigation. Section 4.0 describes the specific tasks to be conducted under this CTO. Section 5.0 provides the management structure and preliminary schedule of activities. Costing information was provided in the proposal dated June 17, 1991, and as amended by the negotiations between the Navy and HALLIBURTON NUS on June 25, 1991.

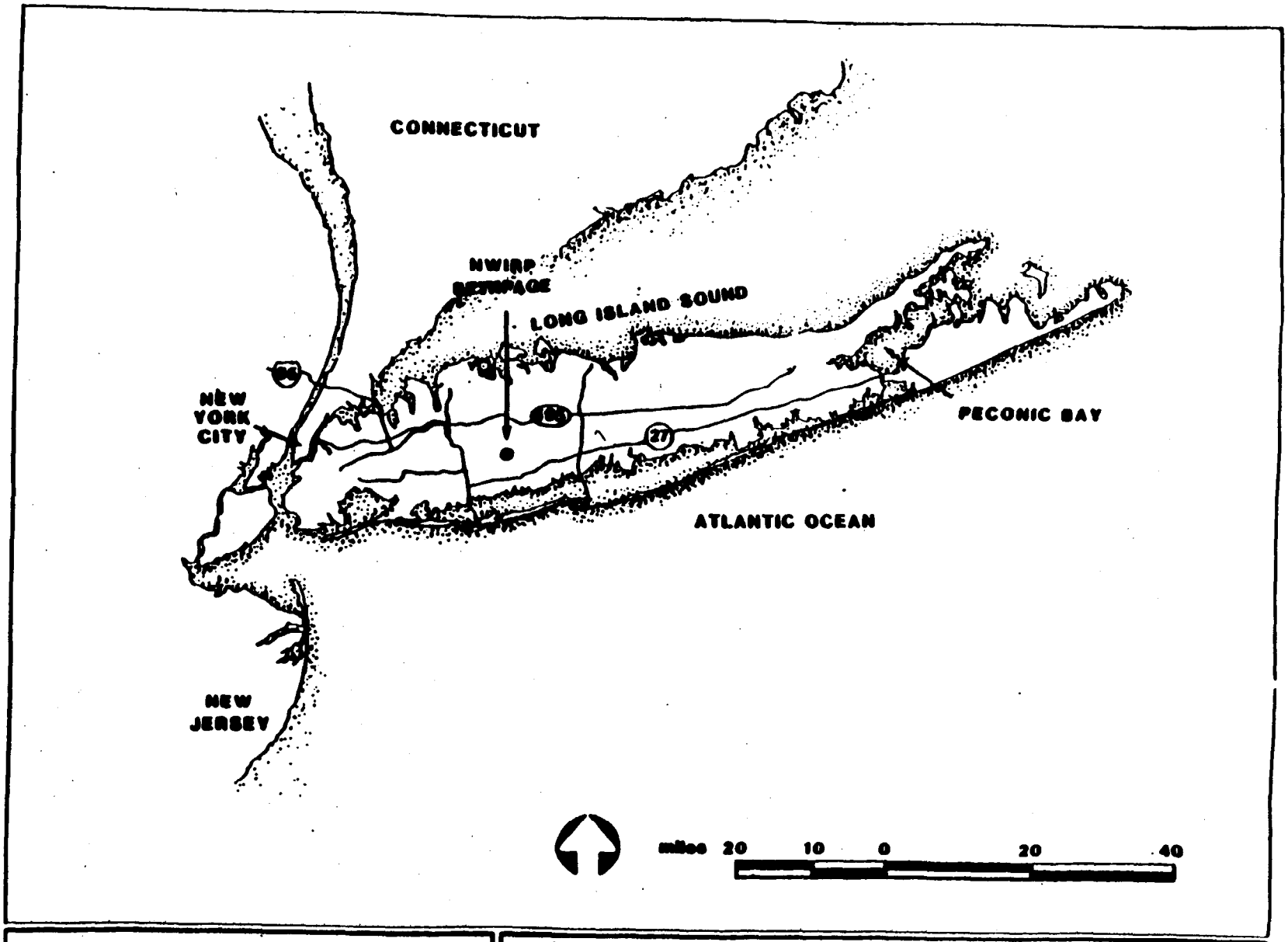

Figure 1-1

General Location Map,
NWIRP Bethpage, New York

Remedial Investigation
Naval Weapons Industrial Reserve Plant
Bethpage
Long Island, New York

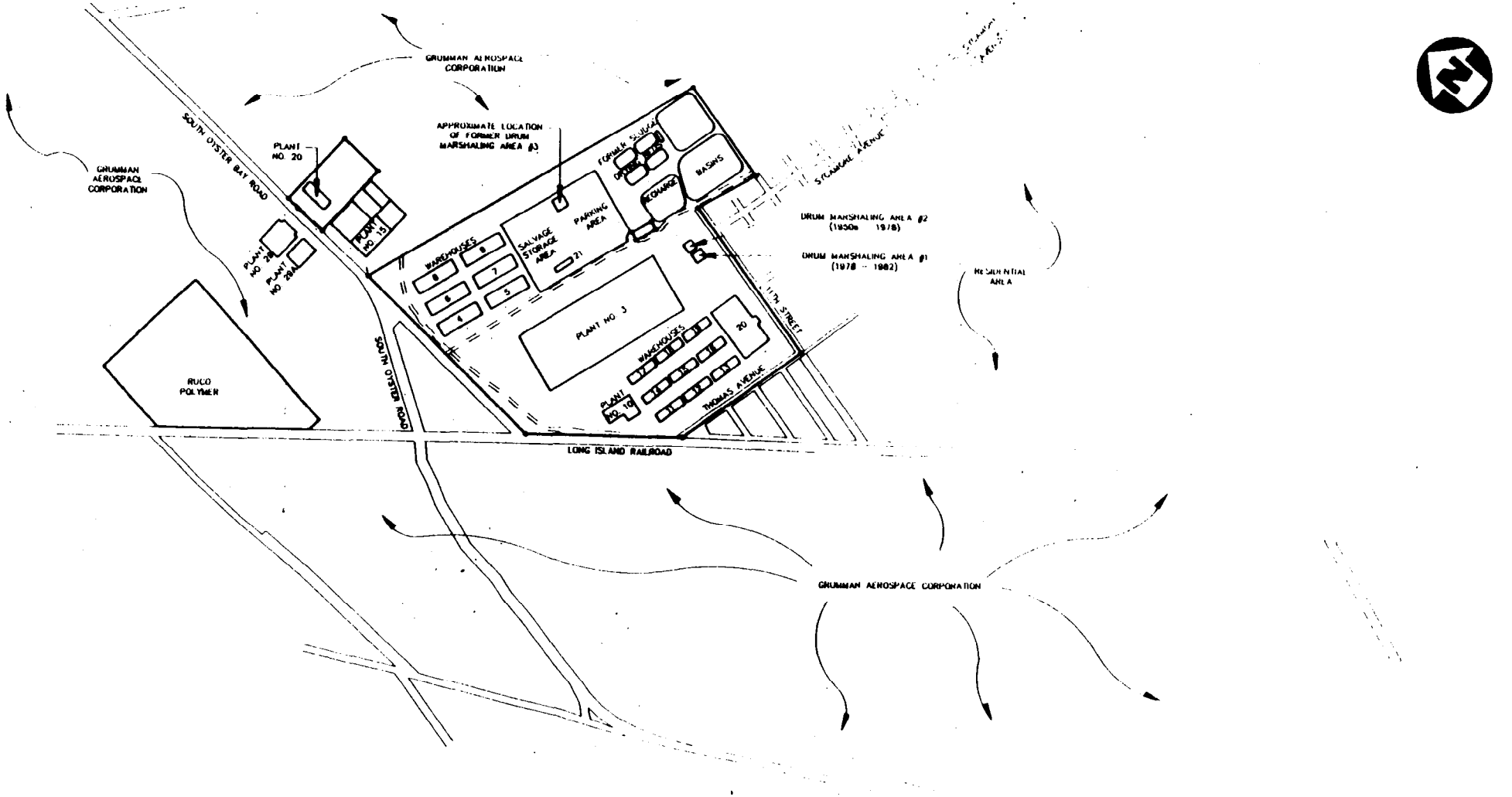

FIGURE 1-2

GENERAL LAYOUT OF NWIRP FACILITIES
[redacted], NEW YORK

SCALE IN FEET

NUS CORPORATION

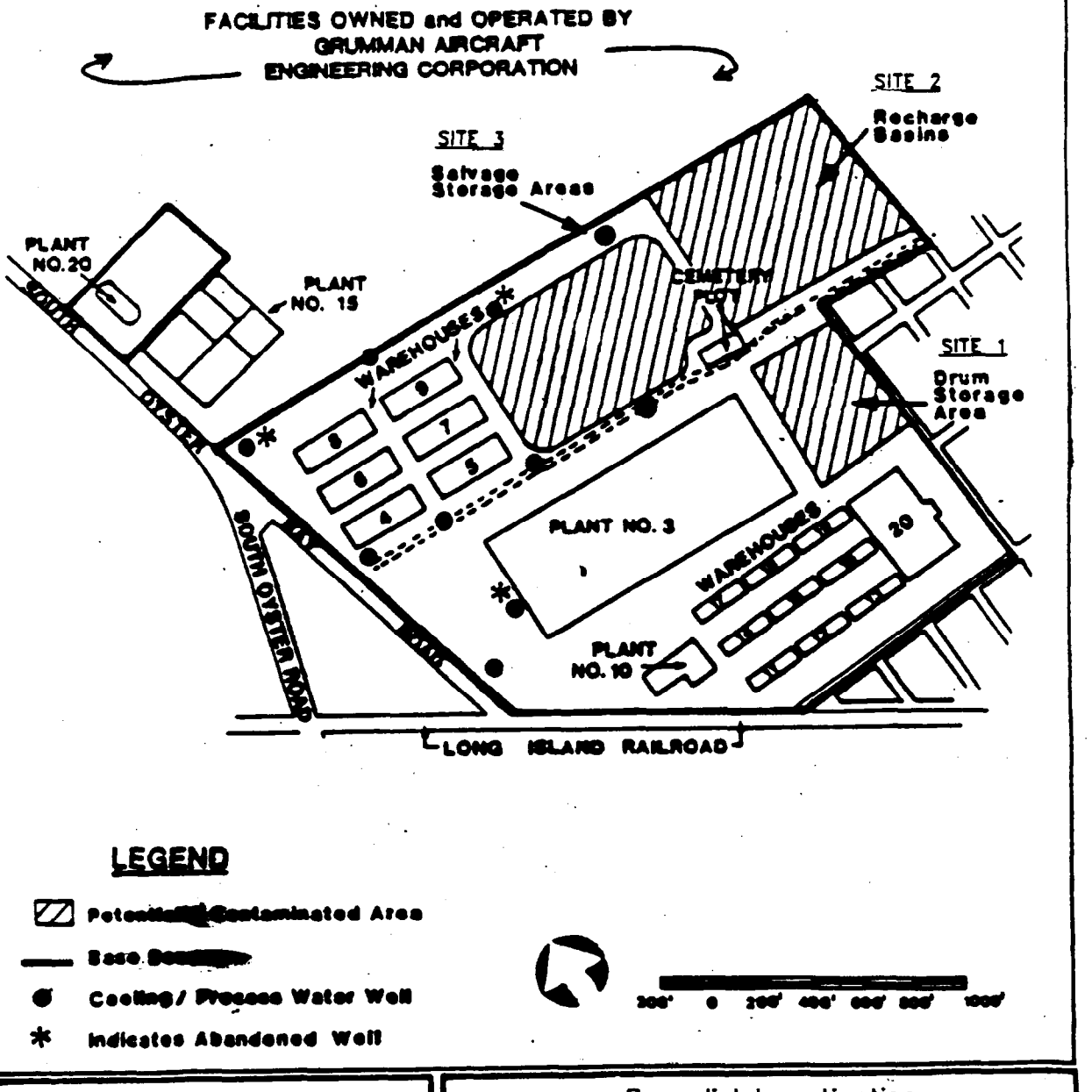

Figure 1-3

Location of Potentially Contaminated Sites NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial Reserve Plant
Bethpage
Long Island, New York

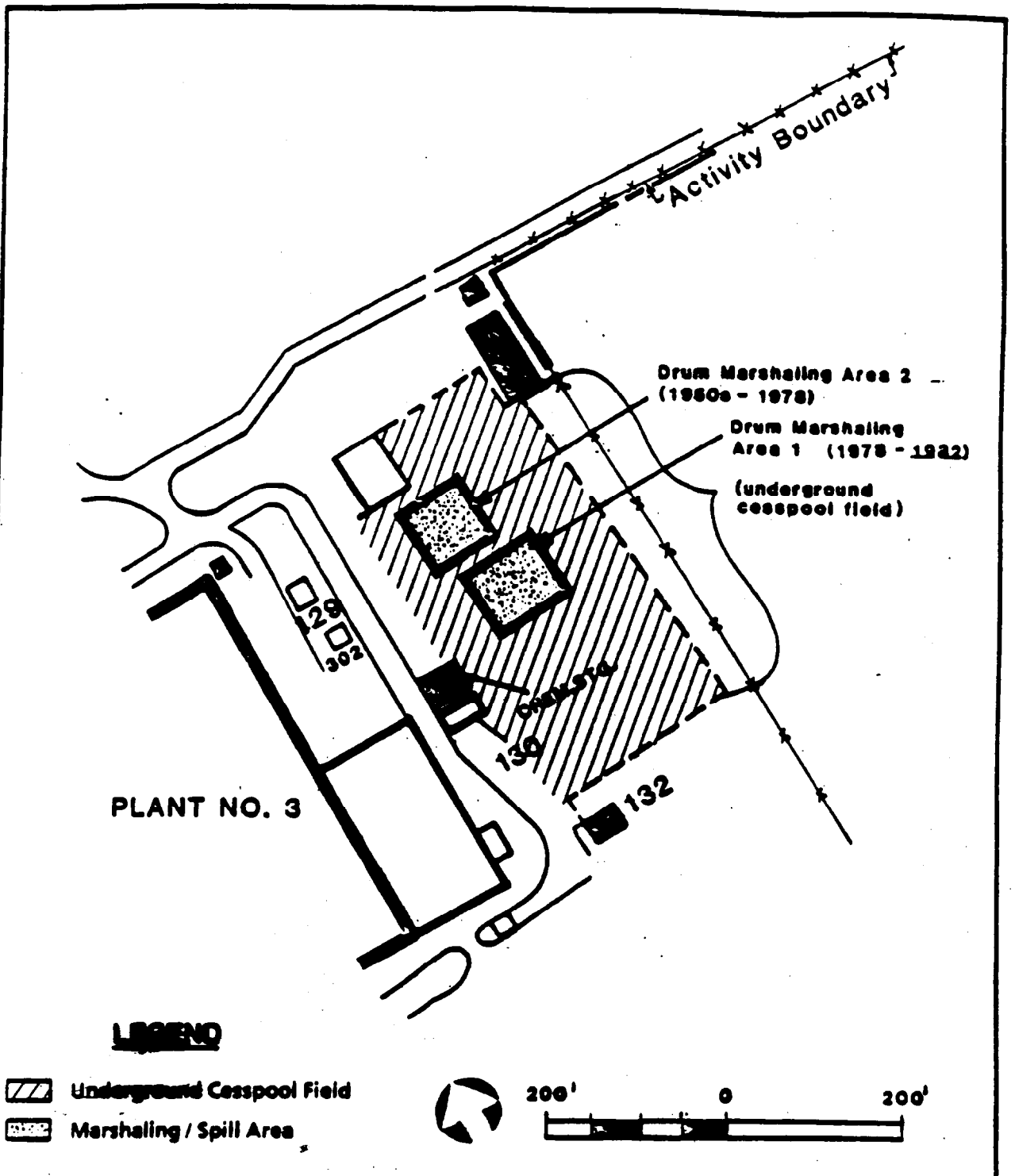

Figure 1-4

SITE 1
Former Drum Marshaling Areas
NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial Reserve Plant
Bethpage and Calverton
Long Island, New York

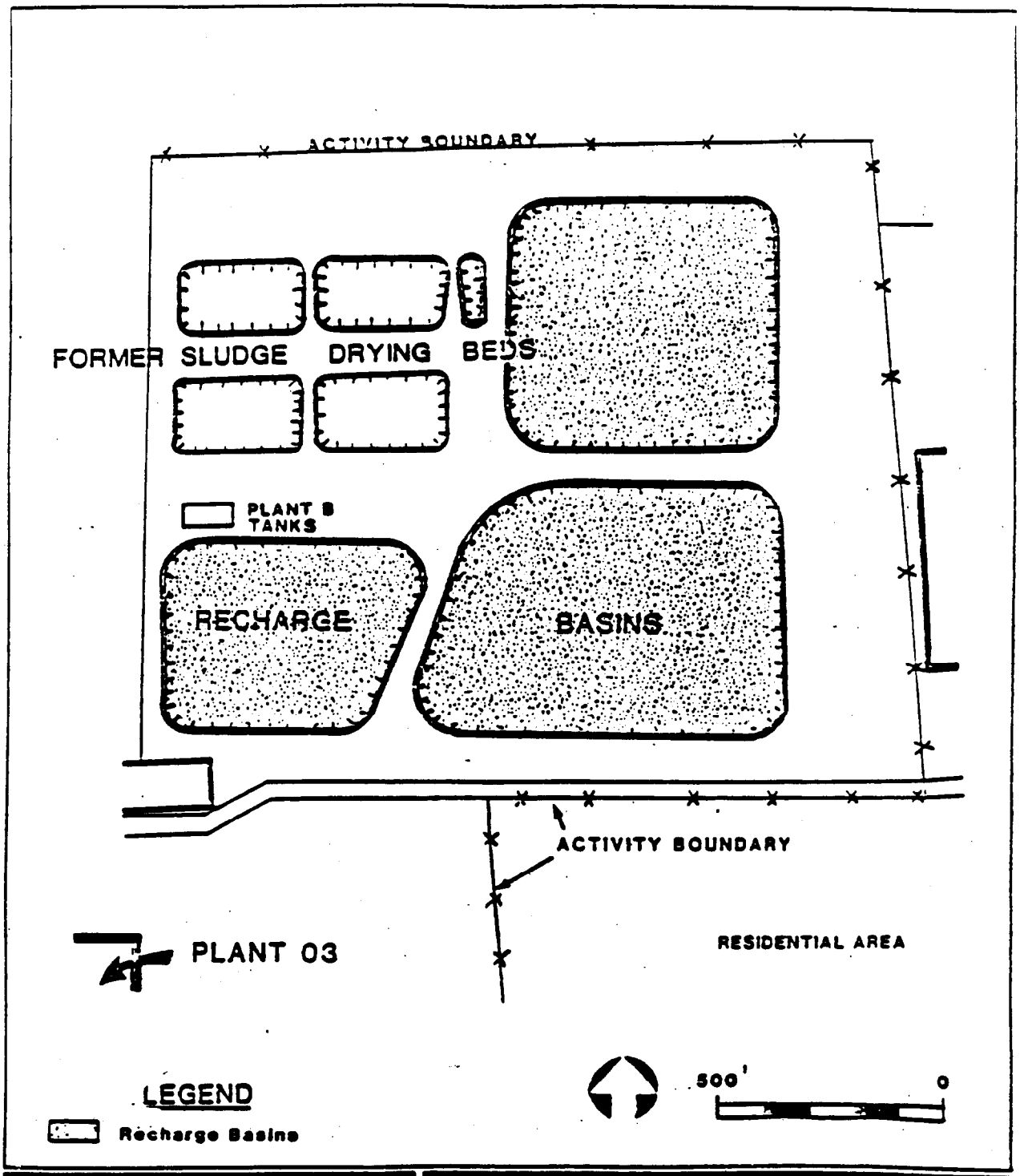

Figure 1-5

SITE 2
Recharge Basins
NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial Reserve Plant
Bethpage and Calverton
Long Island, New York

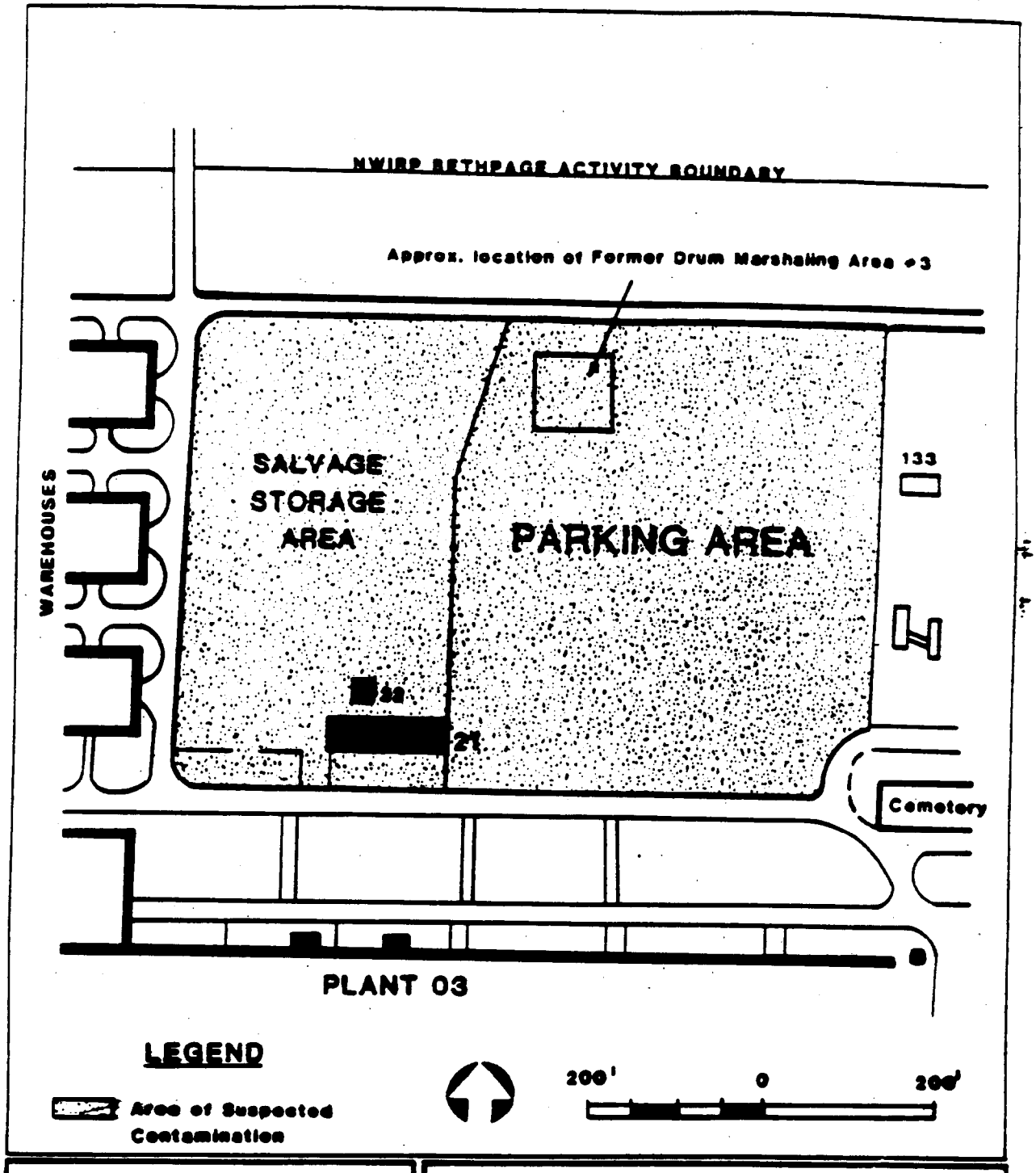

Figure 1–6

SITE 3
Salvage Storage Area
NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial Reserve Plant
Bethpage and Calverton
Long Island, New York

2.0 SITE BACKGROUND INFORMATION

2.1 Activity Location

The United States Naval Weapons Industrial Reserve Plant (NWIRP) is situated on 108 acres in Nassau County in the Hamlet of Bethpage, Town of Oyster Bay, New York (see Figure 1-1). The NWIRP lies entirely within the Grumman Aerospace complex, which covers approximately 605 acres (see Figure 1-2). The NWIRP is bordered on the north, west, and south by Grumman facilities, and on the east by a residential neighborhood.

2.2 Activity Mission and History

The histories of the NWIRP and Grumman Aerospace facilities are discussed in detail in the Initial Assessment Study of the NWIRP and the RI/FS Work Plan for the Grumman facility prepared by Geraghty and Miller (G&M, 1990). The following synopsis is from those discussions.

The NWIRP was established in 1933. Since its inception, the plant's primary mission has been the research prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft.

The facilities at NWIRP (see Figure 1-3) include four plants (Nos. 3, 15, and 20, used for assembly and prototype testing, and No. 10, (a group of quality control laboratories), two warehouse complexes (north and south), a salvage storage area, water recharge basins, the Industrial Wastewater Treatment Plant (to process chemical effluents from the activity's manufacturing operation), and several smaller support buildings.

2.3 Regional and Site Geology

The NWIRP is underlain by approximately 1,100 feet of unconsolidated sediments that unconformably overlie crystalline bedrock. The unconsolidated sediments consist of four distinct geologic units that, in descending order, are the Upper Glacial Formation, the Magothy Formation, the Raritan Clay Member of the Raritan Formation, and the Lloyd Sand Member of the Raritan Formation. The crystalline bedrock consists of schist, gneiss, and granite. The regional dip is to the south and southeast. All of the geologic units dip in these directions, although to varying degrees (RGH, 1986; G&M, 1990).

The NWIRP lies on a featureless glacial outwash plain that slopes gently to the south. The region was subjected to several episodes of Pleistocene glaciation that resulted in the deposition of two moraines. The younger Harbor Hill end moraine trends roughly east-west along Long Island's northern shore. The older Ronkonkoma

terminal moraine lies north of the site, trends east-west, and basically bisects Long Island. As the glaciers retreated, large volumes of sediment were transported downgradient by meltwater-supplied streams and were deposited either in intermorainal areas or on large, topographically subdued glacial outwash plains. The NWIRP site lies upon such an outwash plain (RGH, 1986; G&M, 1990).

The glacial deposits beneath the site range in thickness from approximately 40 to 130 feet and consist chiefly of well-sorted and stratified sand and gravel. Laminar deposits of silt and clay are interspersed throughout the stratigraphic section. One important characteristic of fluvioglacial outwash deposits is their high degree of heterogeneity. Lithologies beneath the site are expected to vary in both a vertical and horizontal direction (RGH 1986, G&M 1990).

The Cretaceous age Magothy Formation underlies the Upper Glacial deposits and is approximately 600 feet thick. The Magothy Formation chiefly consists of interbedded, fine to coarse sand, clayey sand, silt, and clay, with thin beds of lignite and pyrite. Gravel deposits are common near the base of the formation (RGH, 1986; G&M, 1990).

The Cretaceous age Raritan Clay Member of the Raritan Formation underlies the Magothy Formation and is approximately 100 to 150 feet thick. The Raritan Clay consists chiefly of clay and silty clay with scattered lenses of sand and gravel (RGH, 1986; G&M, 1990).

The Cretaceous age Lloyd Sand Member of the Raritan Formation underlies the Raritan Clay and is approximately 300 feet thick. The Lloyd Sand consists chiefly of beds and lenses of sand and gravelly sand with interbeds and lenses of silt and clay (RGH, 1986; G&M, 1990).

2.4 Regional Physiography

The NWIRP site lies on a relatively flat, featureless, glacial outwash plain. The site and nearby vicinity are highly urbanized. Because of this, most of the physical features have been reshaped or destroyed. The slope across the site is described as very regular, with no breaks in grade and no topographic features. Elevations range from greater than 140 feet at the northwest corner of the site to less than 110 feet at the southwest corner (RGH, 1986).

The climate at NWIRP is described as a fairly humid, modified continental climate. The nearby Atlantic Ocean and Long Island Sound tend to reduce the temperature range commonly encountered further inland. The highest monthly mean temperature occurs in July (74.9 degrees); the lowest occurs in January (31.4 degrees).

The mean annual precipitation is 45 inches, and the mean annual evapotranspiration is about 22 inches (RGH, 1986).

2.5 Regional and Site Hydrology

The Upper Glacial Formation, the Magothy Formation, and the Lloyd Sand are the main regional aquifers. The principal aquifers of concern in this investigation are the Upper Glacial and Magothy aquifers because of their proximity to the land surface. The Magothy aquifer is the major source of public water in Nassau County. The Lloyd Sand is not widely exploited because of its depth (RGH, 1986; G&M, 1990).

The Upper Glacial deposits are also a source of potable water in Nassau County; well yields as high as 1,100 gallons per minute (gpm) have been reported. The glacial deposits are characterized by a high primary porosity and permeability. The porosity is reported to exceed 30 percent. The estimated average values of hydraulic conductivity and transmissivity are 2,000 gallons per day per square foot (gpd/ft^2) and 100,000 gallons per day per foot (gpd/ft), respectively (RGH, 1986; G&M, 1990).

The Magothy aquifer is the major source of public water in Nassau County. The most productive water-bearing units are the basal gravels; well yields from this section are as high as 1,400 gpm. The estimated average values of hydraulic conductivity and transmissivity are 400 gpd/ft^2 and 300,000 gpd/ft, respectively (RGH, 1986; G&M, 1990).

The Raritan Clay has a very low permeability (approximately 2×10^{-4} gpd/ft^2) and hydrologically acts as a regional confining layer. The confining nature of this unit is believed to minimize the local risk of contamination to the underlying Lloyd Sand aquifer (RGH, 1986; G&M, 1990).

The water table beneath the site is estimated to lie within the Upper Glacial deposits at depths between 40 and 50 feet. Groundwater within the glacial deposits occurs under unconfined conditions. Groundwater in the underlying Magothy Formation may be confined or unconfined and is dependent on local occurrences of confining clay layers. The groundwater in the Magothy aquifer beneath the site is believed to occur under unconfined conditions (RGH, 1986; G&M, 1990).

Most of Long Island is bisected by an east-west trending, regional groundwater divide. The NWIRP lies to the south of this divide. Groundwater beneath the site flows in a generally southerly direction, toward the Atlantic Ocean. Most published data indicate that local groundwater flow is to the south and southeast. Geraghty and Miller, however, in its work plan for the surrounding Grumman complex, report that recent data from local sources indicate a consistent horizontal flow direction to the south and

southwest. Seven production wells and three recharge basins are located on the NWIRP site. These undoubtedly influence groundwater flow, although the magnitude and extent of this influence is currently unknown. The actual local horizontal flow patterns and vertical gradients will be determined as part of this investigation.

The three onsite recharge basins will be investigated as part of this study; they form the bulk of Site 2. These basins are periodically filled with water as they receive non-contact cooling water discharge from the facility. This water rapidly infiltrates the surface and recharges the groundwater system because of the highly permeable nature of the substrate and the fact that the bottom of the basin is at a higher elevation than the water table (RGH, 1986).

No surface water bodies are located on site. This is primarily due to the high permeability of the surficial deposits. Several southerly flowing streams originate in the morainal highlands north of the area but disappear as they flow over the outwash plain (RGH, 1986; G&M, 1990).

3.0 SCOPING OF REMEDIAL INVESTIGATION

This section presents a summary of existing analytical data, a summary of the RI/FS activities at the bordering Grumman Aerospace Corporation Plant, a brief description of each of the three sites to be investigated, data limitations and requirements, and data quality objectives. Since much of this work has already been conducted by Geraghty and Miller for Grumman, the Navy has requested that HALLIBURTON NUS avoid redundancies between the two plans. As a result, this Work Plan will only summarize the data available. Additional detail is provided in the Remedial Investigation/Feasibility Study Work Plan for the Grumman Aerospace Corporation, Bethpage New York (G&M, 1990). Figures and tables that are referenced in this section are provided in Appendix A.

3.1 Summary of Existing Analytical Data

The two media which are potentially contaminated at the Bethpage Plant are soil and groundwater. No data are available on the potential soil contamination. However, there is a significant amount of data available on regional groundwater contamination (G&M, 1990). The Grumman Work Plan presents results of volatile organic testing of groundwater from monitoring wells within a 3-mile radius of the plant. The sample dates varied from 1982 to 1989. The location of the wells, a description of the wells, and the detailed analytical data are presented in Appendix A. The five volatile organics detected in the groundwater at the highest concentrations and greater frequency are as follows:

Maximum Volatile Organic Concentrations
in Groundwater

Parameter	Concentration (ug/l)	Location
Trichloroethene	1,600	Well 7635
Tetrachloroethene	2,400	Well 10595
1,1,1-Trichloroethane	650	Well 10595
1,1-Dichloroethane	160	Well 10595
1,2-Dichloroethane	340	Well 10629

Wells 10595 and 10629 are located about 400 feet south of Site 1; Well 7635 is located about 1300 feet southwest of Site 3 (see Figure 3-1).

Analytical data on wells located on or near the Navy property are summarized as follows (see Figure 3-1).

Groundwater Analytical Data
for Wells on the Navy Property
Maximum Concentration (ug/l)

Parameter	Well 10623 (USGS Well)	Well 7637	Well 7636	Well 10625	Well 8816	Well 7535	Well 8643	Well 10594
Screened Interval (ft)	68-72	-	-	-	-	-	-	73-76
Trichloroethene	580	14	54	120	35	150	37	440
Tetrachloroethane	550	6	5	25	6	160	120	ND
1,1,1-Trichloroethane	260	2	9	31	4	130	1	4
Vinyl Chloride	21	1	3	1	4	4	3	1
1,1-Dichloroethane	26	ND	ND	2	ND	ND	ND	ND
1,1-Dichloroethene	38	ND	ND	ND	ND	-	-	ND
1,2-Dichloroethene	130	ND	ND	ND	ND	-	-	ND

ND: None detected
-: Indicates that data are not available

There is currently analytical data on only one additional groundwater well located within 1000 feet north of the Navy property (Well 8454 is believed to be hydraulically upgradient of the NWIRP). This well was found to have low (less than 10 ug/l) or nondetectable concentrations of volatile organics.

Only minimal data are available on potential metal and semivolatile organic contamination in the groundwater. In 1956, the recharge basin water for Plant No. 3 was measured to contain 0.24 parts per million (ppm) of hexavalent chromium and 0.04 ppm of cadmium.

3.2 Summary of Grumman RI/FS Activities

The purpose of the Grumman RI/FS is to execute a series of tasks that will lead to the identification and definition of potential contamination attributable to the Grumman facility and provide sufficient data for the conceptual design of a remedial action alternative (if needed) for the site. The Grumman RI/FS will be conducted in a phased approach. Phase 1 (the initial field investigation) will define the nature and extent of potential on-site contamination attributable to the Grumman facility. If needed, a Phase 2 will be conducted for additional on- and/or off-site work.

Phase 1 will include a limited soil-gas survey, collection and analysis of water and bottom-sediment samples from four of the seven south recharge basins, installation and/or sampling of several shallow soil borings (3 locations) and monitoring well clusters (new and existing - 23 locations), and measurement of on-site water levels (23 locations). Phase 2, if needed, may include drilling, installing, and sampling of additional on- and/or offsite borings and monitoring wells. The location of these sampling activities is presented in Appendix A.

Three of the Grumman well clusters are located north of Site 2 and Site 3, (GM-6, GM-7, and GM-8). These well clusters could potentially be used for upgradient wells for the NWIRP.

3.3 Sites to be Investigated under the Navy Program

3.3.1 Site 1: Former Drum Marshaling Area

Starting in 1969, hazardous waste management practices for Grumman facilities on Long Island included marshaling of drummed wastes on the Navy property at NWIRP Bethpage. Such storage first took place on a cinder-covered surface over the cesspool field east of Plant 03 (see Figure 3-2). From the early 1950s through about 1978, drums containing liquid cadmium waste were stored here. In 1978, the collection and marshaling point was moved a few yards south of the original unpaved site, to an area on a 100- by 100-foot concrete pad. This pad had no cover, nor did it have berms for containment of spills. In 1982, drummed waste storage was transferred to the present Drum Marshaling facility, located in the Salvage Storage Area (Site 3); a cover was added in 1983.

Reportedly, all drums of waste marshaled at the Former Drum Marshaling Areas were taken off-activity by a private contractor for treatment or disposal. There are no reports of leaks or spills of drum contents.

Materials stored at the Former Drum Marshaling Areas included waste halogenated and nonhalogenated solvents. Cadmium and cyanide were also stored in Area 2 from the early 1950s through 1974. Reportedly, 200 to 300 drums were stored at each area at any one time.

3.3.2 Site 2: Recharge Basins

Surface water drainage on Long Island is, for the most part, locally controlled, with numerous recharge basins used to channel this resource back to the groundwater. Several such recharge basins are located at NWIRP Bethpage (see Figure 3-3).

Prior to 1984, some Plant 03 production-line rinse waters were discharged to the recharge basins. The Environmental/Energy Survey of the activity, published in 1976, states that 1.85 million

gallons per week were discharged to the recharge beds. These waters were directly exposed to chemicals used in industrial processes (involving the rinsing of manufactured parts). Reportedly, these discharges of dilute rinsewaters did not contain chromates.

Since about 1977, the discharge rate has been 1.4 million gallons per week of non-contact cooling water. All discharge currently goes to the Industrial Wastewater Treatment Plant.

Also, adjacent to the recharge basins are the former sludge drying beds. Sludge from the Plant 02 Industrial Waste Treatment Facility was dewatered in the drying beds before offsite disposal.

On at least one occasion, sampling performed by the Nassau County Department of Health detected levels of hexavalent chromium in excess of allowable limits (RGH, 1986). Grumman was notified of this noncompliance and asked to perform remedial actions necessary to eliminate the problem. Reportedly, Grumman complied with the request.

Contaminants of concern include the hexavalent (and other valence) chromium, aluminum, nitric acid, and sulfuric acid.

3.3.3 Site 3: Salvage Storage Area

The NWIRP Bethpage Salvage Storage Area is located north of the Plant 03 (see Figure 3-4). Fixtures, tools, and metallic wastes were stored here prior to recycling from the early 1950s through 1969.

Stored materials included aluminum and titanium scraps and shavings. While in storage, cutting oils dripped from some of this metal. In 1985, IAS team members observed oil-stained ground at the site. However, soil tests performed by Grumman in 1984 revealed that oil stains were superficial; oil residues were not detected below the top several inches of soil material in the Salvage Storage Area at the locations tested (RGH, 1986).

About 1960, the Salvage Storage Area was reduced in size to accommodate parking. About 1970, it was reduced again for the same reason. Consequently, storage facility locations at this site have been periodically moved to accommodate changes in storage area size.

In addition to salvage storage, a 100- by 100-foot area within the boundary of the Salvage Storage area was used for the marshaling of drummed waste. The area was paved with coal ash cinders. Drum marshaling continued here from the early 1950s to 1969. Wastes marshaled throughout the area included waste oils as well as waste halogenated and nonhalogenated solvents.

Potential contaminants of concern at Site 3 (from both drum marshaling and salvage storage) include cutting oils, aluminum, titanium, and halogenated and nonhalogenated solvents.

3.4 Data Limitations and Requirements

The existing analytical data focuses on volatile organic contamination in groundwater on a regional basis; there are no data available for soil contamination.

Additional data are required to identify the nature and extent of soil and groundwater contamination on the Navy property and to access risks to human health and the environment. To identify the nature and extent of contamination, analytical testing of surface and subsurface soils, recharge basin water and sediment, and groundwater is required. The history of the sites indicates that there is the potential for these media to be contaminated with volatile organics, semivolatile organics, metals, and cyanide. Also, there is the potential for PCBs and pesticides to be present in the soils.

An preliminary assessment of risk to human health and the environment at the NWIRP Bethpage site reveals two potential exposure pathways: direct contact of contaminated media by activity personnel and contaminant migration with the groundwater. The direct contact risks can occur as a result of accidental ingestion of contaminated soils or groundwater, and inhalation of dust or organics volatilized from groundwater. The contaminant migration occurs as a result of precipitation infiltration contacting contaminated soils and leaching contaminants into the groundwater, recharge basin water discharge to groundwater and interactions with potentially contaminated sediments, and groundwater migration.

Since there is minimal data available regarding the source and location of potential soil and groundwater contamination, a phased approach is planned to optimize soil and groundwater testing efforts. To accomplish this, three phases would be used. These phases would overlap to minimize schedule delays. The first phase would be a site-wide soil-gas survey coupled with a field GC to initially identify potential areas of subsurface soil and/or groundwater contamination. The second phase would be to collect groundwater samples for field GC analysis and soil samples for fixed-base laboratory analysis. The field GC groundwater analysis results would be used to select the location of the permanent groundwater monitoring wells. The soil samples would be used to quantify soil contamination. The third phase would be used to collect groundwater samples for fixed-base laboratory analysis to quantify groundwater contamination. During the third phase, sampling and analysis of the Recharge Basins sediment and surface water, wastes at the former sludge drying beds (if present), and surface soils would be conducted to characterize the contamination

potential contamination of these media. Additional detail on the approach and use of the field generated results in presented in Section 4.0. The basis for selecting the fixed-base analytical parameters for each media is presented in Table 3-1.

Additional data are required regarding the groundwater flow patterns on the Navy property and how the groundwater interacts with the surrounding areas. To accomplish this, water-level measurements and pumping/slug tests are typically required. The water-level are being conducted at the adjacent Grumman Plant and should be applicable to the NWIRP, however additional measurements at the NWIRP will be required. The pump tests will be conducted at a later time, if necessary.

3.5 Data Quality Objectives

The overall objective of the RI will be to characterize the nature and extent of potential environmental contamination and associated risks to human health and the environment at the NWIRP. The data collected will also be used to evaluate potential remedial options. The specific objectives for the Bethpage plant are to identify the location and concentration of potential solvent and metal contamination of soil and groundwater at three sites identified in the Initial Assessment Study (RGH 1986) and to determine whether these sites are the source of a trichloroethene (TCE) contaminated groundwater plume in the Bethpage area. The NWIRP, Grumman, and RUCO are potential sources of this contamination.

The uses of the data collected are to characterize the nature and extent of contamination, to assess the potential risks to human health and the environment, and for engineering purposes to develop remedial actions. The nature and extent of contamination will include the areas and depths of contamination and contaminant concentrations. The risk assessment will address the contaminants, receptors, and pathways for exposure. The engineering parameters were selected based on potential remedial actions including groundwater pump-and-treat options and soil treatment/offsite disposal options.

The NWIRP Bethpage site is not currently on NPL list. However, it is possible that the site may be placed on the NPL list and that legal actions may be taken in the future. In accordance with Naval Energy and Environmental Support Activity (NEESA), for sites which are on or about to be placed on the NPL, Data Quality Objective (DQO) Level D quality control and CLP methods and protocol are to be used. These sites are typically near populated areas and are likely to undergo litigation.

DQO Level D QC includes review and approval of the laboratory QA Plan, the site work plan, and the field QA plan. The laboratory must successfully analyze a performance sample, undergo an audit, correct deficiencies found during the audit, and provide monthly

progress reports on QA. The laboratory that performs Level D QC must have passed the performance sample furnished through the Superfund Contract Laboratory Protocol (CLP) and must be able to generate the CLP deliverables. An analytical laboratory has not yet been selected for this work. However, only NEESA-approved laboratories which are in compliance with these requirements will be considered.

Table 3-1
Basis of Analytical Testing
Bethpage, New York

Site	Sample Type	Number of Samples	Rationale
1	Soils	Five to ten borings to be located in the field based on the results of the soil-gas testing with one to two samples per boring. Samples will be collected at depths where elevated soils gas readings were detected. Sample depths will be at 5 feet and/or 21 feet. Surface samples will be collected in a grid pattern with two additional samples selected based on apparent visual contamination. Analysis: TCL VOA on all samples plus SVOA, TCL metals, and cyanide on samples collected at the surface and at a depth of five feet. TCL PCBs and pesticides will also be conducted on visually stained soils. CLP procedures will be used.	Site 1 was used to store halogenated and nonhalogenated solvents, cyanide, and cadmium wastes. Although there were no reported spills in the area, there are potential unreported spills and leaks in this area. PCB-filled transformers and pesticides may also have been stored at the area. Residual soil contamination may remain at the site. Two of the samples will be tested for the general engineering/ remediation parameters of TOC, bulk density, grain size, moisture content, and pH.
1	Groundwater	Three well clusters to be located in the field based on soil-gas and temporary monitoring well testing with two to three wells per cluster and one sample per well. Well clusters to be located along the hydraulic upgradient and downgradient borders of the site. Analysis: TCL VOA and SVOA, TCL metals, Cr^{+6}, and cyanide using CLP procedures.	Site 1 was used to store halogenated and nonhalogenated solvents, cyanide, and cadmium wastes. Although there were no reported spills in the area, there are potential unreported spills and leaks in this area. Any potential spills may have migrated to the groundwater. One sample will be analyzed for the general engineering/remediation parameters of TDS, alkalinity, hardness, BOD, COD, and TSS.
2	Soils	Five to ten borings to be located in the field based on the results of the soil-gas testing with one to two samples per boring. Samples will be collected at depths where elevated soils gas readings were detected. Sample depths will be at 5 feet and/or 21 feet. Surface samples will be collected in a grid pattern with two additional samples selected based on apparent visual contamination. Analysis: TCL VOA on all samples plus SVOA, TCL metals, and cyanide on samples collected at the surface and at a depth of five feet. TCL PCBs and pesticides will also be conducted on visually stained soils. CLP procedures will be used.	Site 2 was used to treat and discharge production wastewaters. Halogenated and nonhalogenated solvents, metals, and cyanide may have been present in the treatment plant waste waters and sludges. These sludges were dried on site prior to offsite disposal. PCB-filled transformers and pesticides may also have been stored at the area. Residual soil contamination may remain at the site. Two of the samples will be tested for the general engineering/ remediation parameters of TOC, bulk density, grain size, moisture content, and pH.

Table 3-1
Basis of Analytical Testing
Bethpage, New York
Page Two

Site	Sample Type	Number of Samples	Rationale
2	Groundwater	Two well clusters to be located in the field based on soil-gas and temporary monitoring well testing with one to two wells per cluster and one sample per well. Well clusters to be located along the hydraulic upgradient and downgradient borders of the site. A Grumman well cluster may be usable as an additional upgradient data point and a Site 1 well cluster may be usable as an additional down gradient data point. Analysis: TCL VOA and SVOA, TCL metals, Cr^{+6}, and cyanide using CLP procedures.	Site 2 was used to treat and discharge production wastewaters. Halogenated and nonhalogenated solvents, metals, and cyanide may have been present in the treatment plant waste waters and sludges. These sludges were dried on site prior to off site disposal. Any releases of contaminants may have migrated to the groundwater. One sample will be analyzed for the general engineering/remediation parameters of TDS, alkalinity, hardness, BOD, COD, and TSS.
2	Surface Water	Collect two surface water samples from the influent to the operating basin. One sample is to be collected during normal operations, and one sample is to be collected during a precipitation event. Analysis: TCL VOA and SVOA, TCL metals, Cr^{+6}, and cyanide using CLP procedures.	Site 2 was used to treat and discharge production wastewaters. Halogenated and nonhalogenated solvents, metals, and cyanide may have been present in the treatment plant waste waters and sludges. These sludges were dried on site prior to offsite disposal. Currently it is reported that this water is noncontact; however, this classification needs to be confirmed. The precipitation event sample would be collected to determine whether contaminated runoff is entering the basins.
2	Sediment	Sample three recharge basins with two samples per basin. Analysis: TCL VOA and SVOA, TCL metals, and cyanide using CLP procedures.	Site 2 was used to treat and discharge production wastewaters. Halogenated and nonhalogenated solvents, metals, and cyanide may have been present in the treatment plant wastewaters and sludges. These sludges were dried on site prior to offsite disposal. These sediments may be contaminated from past practices or from periodic current contamination.
2	Waste	If encountered during drilling activities, take one sample of the waste in the former sludge-drying areas. Analysis: TCL VOA and SVOA, TCL metals, Cr^{+6}, PCBs, pesticides, and cyanide using CLP procedures.	Site 2 was used to treat and discharge production wastewaters. Halogenated and nonhalogenated solvents, metals, and cyanide may have been present in the treatment plant wastewaters and sludges. These sludges were dried on site prior to off site disposal. There is no evidence that the sludges remain at the site, however, if during the drilling program sludges are encountered, they will be sampled.

Table 3-1
Basis of Analytical Testing
Bethpage, New York
Page Three

Site	Sample Type	Number of Samples	Rationale
3	Soils	Five to ten borings to be located in the field based on the results of the soil-gas testing with one to two samples per boring. Samples will be collected at depths where elevated soils gas readings were detected. Sample depths will be at 5 feet and/or 21 feet. Surface samples will be collected in a grid pattern with two additional samples selected based on apparent visual contamination. Analysis: TCL VOA on all samples plus SVOA, TCL metals, and cyanide on samples collected at the surface and at a depth of five feet. TCL PCBs and pesticides will also be conducted on visually stained soils. CLP procedures will be used.	Site 3 was used to store halogenated and nonhalogenated solvents, cyanide, and cadmium wastes. Although there were no reported spills in the area, there are potential unreported spills and leaks in this area. Site 3 was also used to store fixtures, tools, and metallic wastes. There are also reports of surface oil contamination. PCB-filled transformers and pesticides may also have been stored at the area. Residual soil contamination may remain at the site. Two of the samples will be tested for the general engineering/ remediation parameters of TOC, bulk density, grain size, moisture content, and pH.
3	Groundwater	Two to three well clusters. One well cluster will be located southwest of Plant 3. This well point will be used to fill in a data gap for the overall Bethpage plant. The second cluster will be located downgradient of Site 3 and the third cluster (if necessary) will be located upgradient of Site 3. Exact locations for the two well cluster at Site 3 will be determined in the field based on soil-gas and temporary monitoring well testing with two wells per cluster and one sample per well. Analysis: TCL VOA and SVOA, TCL metals, Cr^{+6} and cyanide using CLP procedures.	Site 3 was used to store halogenated and nonhalogenated solvents, cyanide, and cadmium wastes. Although there were no reported spills in the area, there are potential unreported spills and leaks in this area. Site 3 was also used to store fixtures, tools, and metallic wastes. There are also reports of surface oil contamination. These contaminants may have migrated into the groundwater. One sample will be analyzed for the general engineering/remediation parameters of TDS, alkalinity, hardness, BOD, COD, and TSS.
None	Groundwater	Collect one groundwater sample from each of four operating production wells and the USGS well located at the NWIRP in Bethpage. Analysis: TCL VOA and SVOA, TCL metals, Cr^{+6}, and cyanide using CLP procedures.	These samples will provide an indication of local groundwater quality at the NWIRP.

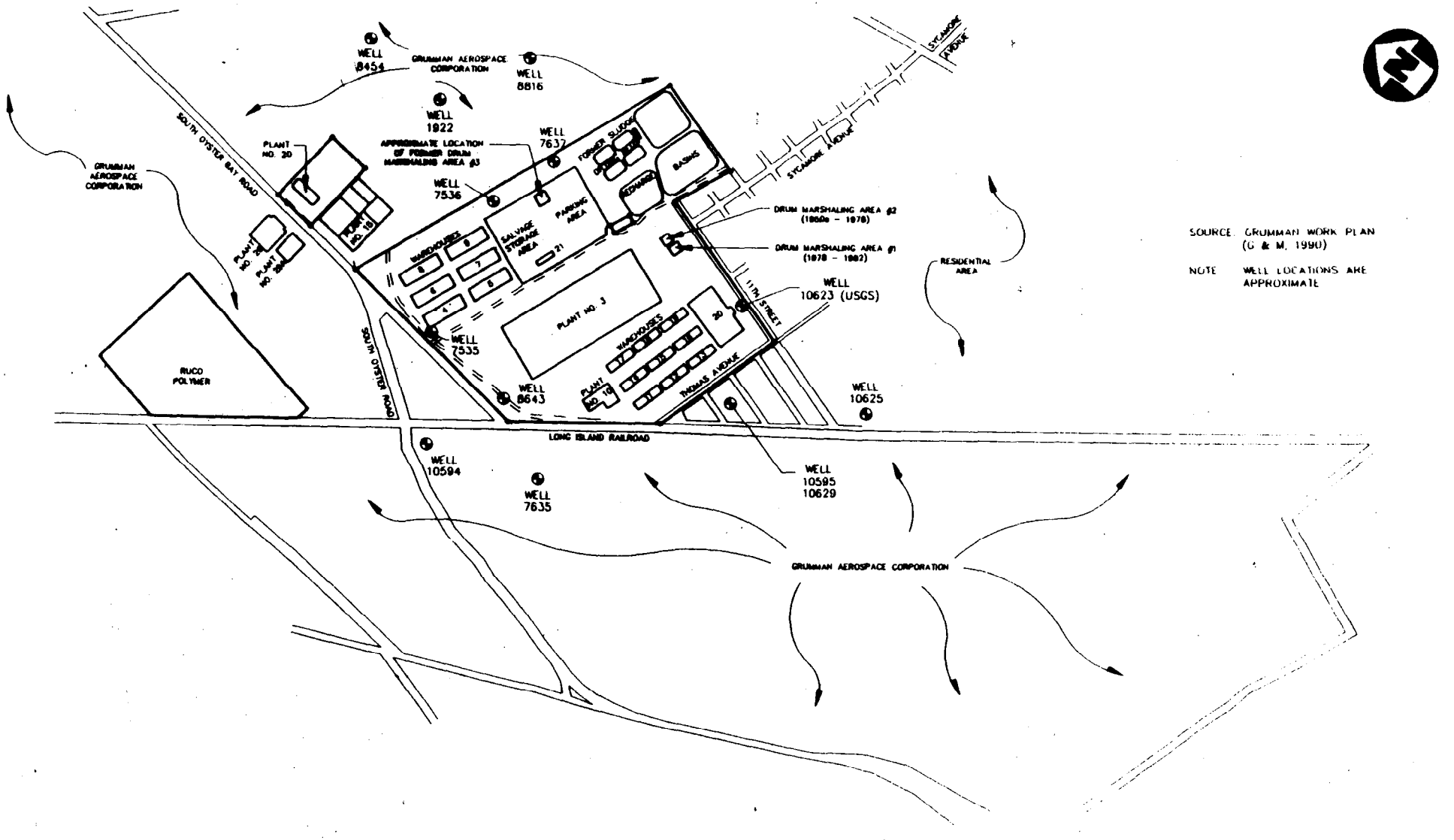

FIGURE 3-1

LOCATION OF EXISTING NEAR-REGIONAL GROUNDWATER WELLS
MWRP, BETHPAGE, NEW YORK

NUS CORPORATION

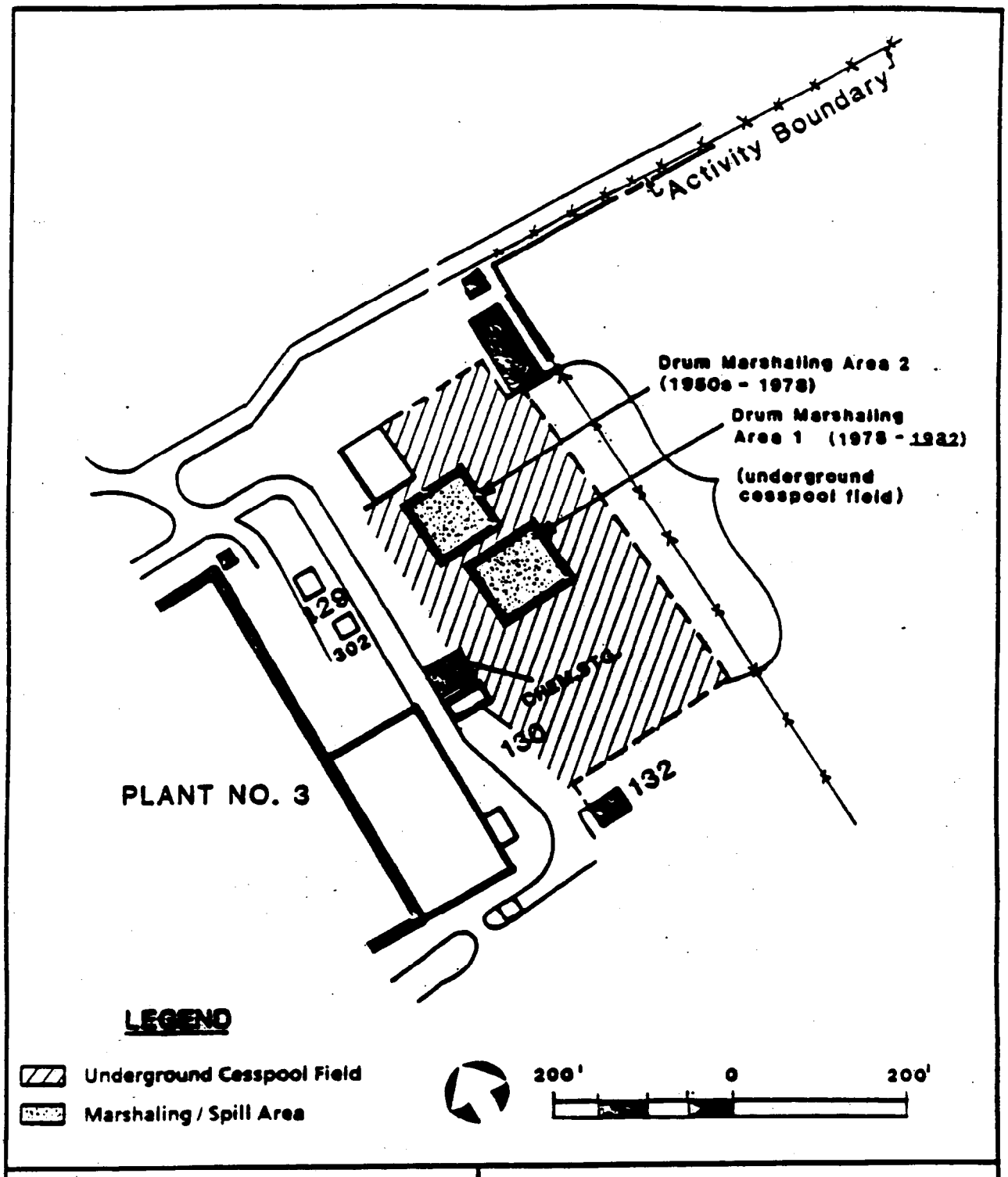

Figure 3-2

Site 1
Former Drum Marshaling Areas
NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial Reserve Plant
Bethpage and Calverton
Long Island, New York

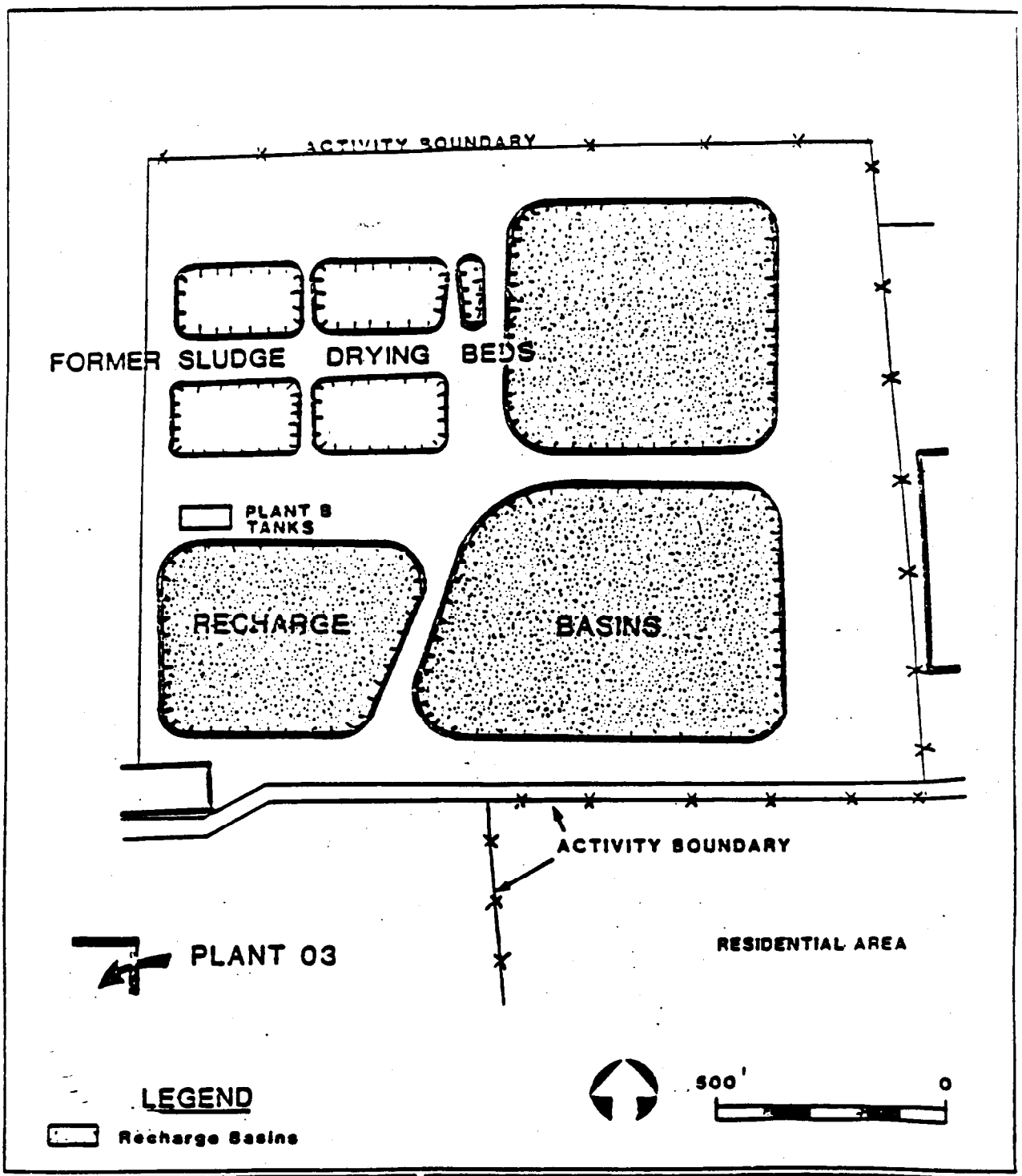

Figure 3–3

SITE 2
Recharge Basins
NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial Reserve Plant
Bethpage and Calverton
Long Island, New York

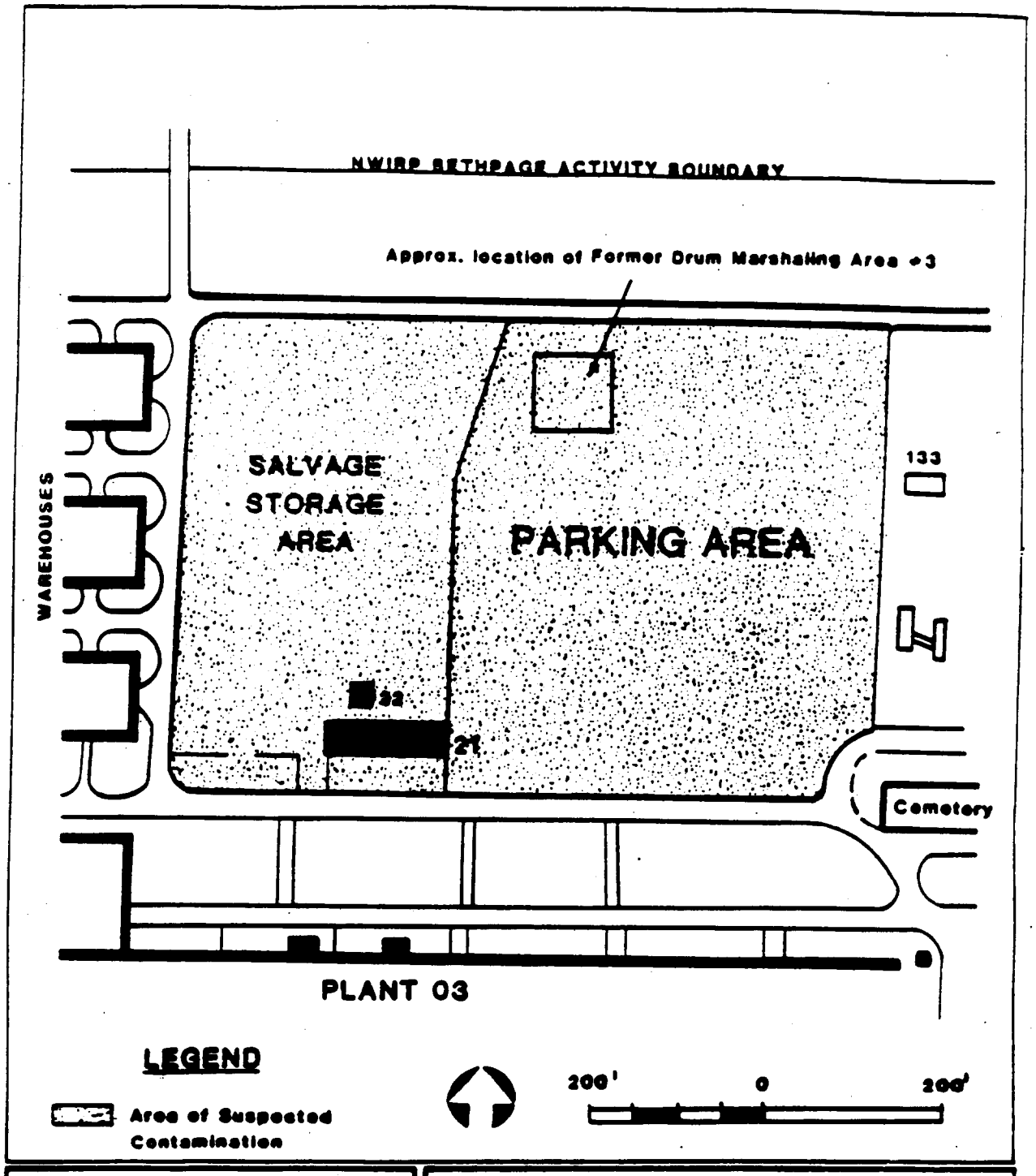

Figure 3–4

SITE 3
Salvage Storage Area
NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial Reserve Plant
Bethpage and Calverton
Long Island, New York

4.0 CTO TASK PLAN

The CTO Task Plan is divided into seven tasks. These tasks are as follows.

Task 1 - Scoping for the RI
Task 2 - Work Plan for the RI
Task 3 - Site Investigation
Task 4 - Site Investigation Analysis
Task 5 - Laboratory and Bench-Scale Studies
Task 6 - Reports
Task 7 - Community Relations Support

4.1 Task 1 - Scoping for the RI

Task 1 consists of the Remedial Investigation scoping. This task is used to define the location and area of the site; review and prepare a summary of previous actions at the site; conduct an initial visit at the site; establish the site boundaries; and prepare a site map. Each of these items are discussed below.

4.1.1 Regional Location

The NIWRP Bethpage Plant is located in Nassau County, on Long Island, New York (see Figure 1-1). Additional details on the pertinent area boundary features, general site physiography, hydrology, and geology are presented in Section 2.0 of the RI Work Plan. The IAS (RGH, 1986) and Grumman Work Plan (G&M, 1990) were used as a basis for this information.

4.1.2 Area of the Site

The area of the three sites (1, 2, and 3), general nature of the problem at the site, and historic use are defined in the Initial Assessment Study (IAS) (RGH, 1986). This document was supplemented by the Grumman Work Plan (G&M, 1990) and is discussed further in Section 2.0.

4.1.3 Prepare/Review Previous Actions

Previous actions taken at this site, as well as the surrounding Grumman Site, are summarized in the Grumman Work Plan (G&M, 1990). Relevant sections of this report are present in Appendix A of this RI Work Plan.

4.1.4 Conduct an Initial Site Visit

An initial site visit was conducted by HALLIBURTON NUS on May 8, 1990. This visit was used to become familiar with the site topography, access routes, and proximity of receptors to possible contamination. This investigation found the topography to be relatively flat, with the exception of the recharge basins. Public access to the area is highly restricted by fencing and security forces. Residential areas were observed to be located within about a half mile south and east of the three sites. Plant personnel do have access to the specific areas of concern.

4.1.5 Establish/Review Site Boundary Conditions

The boundary conditions were initially established in the Initial Assessment Study (RGH, 1986). Based on the site visit and the Grumman Work Plan (G&M, 1990), the areas established in IAS as potential locations of soil contamination appear to be relatively accurate. However, it is possible that contaminated groundwater may have migrated across the plant boundary and off the plant property. Particular areas of concern are north, east, and south of Sites 1 and 2. To accurately define this potential offsite migration, groundwater monitoring near the boundary needs to conducted. If the contamination is found at the boundary, then a supplemental RI may be required to define offsite contamination.

4.1.6 Prepare a Site Map

A preliminary map illustrating the general layout of the NWIRP has been prepared. During the course of the RI, additional data will collected on the potential presence of a 100-year floodplain and wetlands at the site. This information will be summarized in the RI Report. Wetlands and the floodplain are not anticipated to be present at the NWIRP Sites 1, 2, and 3.

4.1.7 Applicable or Relevant and Appropriate Requirements

Applicable or Relevant and Appropriate Requirements (ARARs) are presented in the RI Work Plan to identify potential remedial goals for the groundwater at the site. The ARARs for NWIRP would be identical to those developed for the Grumman activities. Table 9 of the Grumman Work Plan identifies these ARARs. Therefore, to minimize the duplication of efforts with those conducted by Grumman, this table is presented Appendix B.

4.1.8 Preliminary Remedial Alternatives

The preliminary remedial alternatives are presented in the RI Work Plan to identify potential technologies needed to reduce or eliminate risks from the contaminants at the site. The preliminary remedial althernatives would be identical to those developed by for the Grumman Activities. Table 8 of the Grumman Work Plan

identifies these alternatives. Therefore, to minimize the duplication of efforts with those conducted by Grumman, this is presented in Appendix B.

4.2 Task 2 - Work Plan for the RI

This submittal is the final RI Work Plan, which was revised based on comments from the Navy and the New York Department of Environmental Conservation.

The components of the RI Work Plan are as follows:

- Technical Approach
- Personnel Requirements
- Schedules
- Site Background

In addition to these requirements, three additional plans will be prepared. They are as follows:

1. QA/QC and Sampling Plan
2. Site and Data Management Plan
3. Health and Safety Plan

4.2.1 Site Background

The site background information is presented Section 2.0 and will be repeated and expanded upon in the RI Report. The information to be presented includes the following items:

Plant history
Regional physiography (climate and terrestrial features)
Geology
Hydrology (surface water and groundwater)
Previous studies
Site maps illustrating site characteristics

4.2.2 Areas of Investigation

This RI Work Plan identifies the areas of investigation, sampling locations, sample media, and analytical testing to be performed.

4.2.3 QA/QC and Sampling Plan

A QA/QC and Sampling Plan is being prepared concurrently with the Work Plan. As requested by the Navy, HALLIBURTON NUS is attempting to avoid duplication of Grumman's effort at the Bethpage Activity. As a result, the Grumman QA/QC Plan is being used as the basis for this Plan. For the laboratory QA/QC components of the plan, only laboratories with Navy approval (in accordance with NEESA guidance) will be used. The laboratory QA/QC Plan will be submitted when a laboratory is selected.

The format used by Grumman in its RI/FS is the same as the suggested format from the EPA RI/FS guidance. This format is as follows.

Field Sampling Plan

1. Site Background
2. Sampling Objectives
3. Sample Location and Frequency
4. Sample Designation
5. Sampling Equipment and Procedures
6. Sample Handling and Analysis

Quality Assurance Plan

Title Page
Table of Contents
1. Project Description
2. Project Organization and Responsibilities
3. QA Objectives for Measurement
4. Sampling Procedure
5. Sample Custody
6. Calibration Procedures
7. Analytical Procedures
8. Data Reduction, Validation, and Reporting
9. Internal Quality Control
10. Performance and Systems Audits
11. Preventative Maintenance
12. Data Assessment Procedures
13. Corrective Actions
14. Quality Assurance Reports

4.2.4 Site and Data Management Plan

The Site and Data Management Plan is being prepared concurrently with this Work Plan. As requested by the Navy, HALLIBURTON NUS is attempting to avoid duplication of efforts at the Bethpage Activity. As a result, the Grumman Site and Data Management Plan is being used for the basis of this plan. The components of the Site and Data Management Plan are as follows.

Site Management Plan

Site Access
Site Security
Site Clearance
Decontamination
Disposal of Drill Cuttings, Fluids, and Development Water
Contingency Plans
Project Coordination

Data Management Plan

Organization
Data Transfer
Data Reduction and Computer Storage
Quality Assurance Reports
Corrective Efforts

4.2.5 Health and Safety Plan

A Health and Safety Plan (HASP) is being prepared concurrently with the Work Plan to cover the health and safety aspects of HALLIBURTON NUS field personal while conducting activities at the Bethpage Activity. The components of the HASP are as follows:

- Introduction
- Site Location and Description
- Scope of Work
- Decontamination
- Hazard Assessment
- Personal Protective Equipment
- Air Monitoring
- Medical Surveillance
- Training
- Standard Work Practices
- Confined Space Entry
- Emergency Response Plan

4.2.6 Address Comments

The Work Plan, QA/QC and Sampling Plan, Site and Data Management Plan, and HASP have been submitted as a rough draft, draft, and final. The Navy's comments on the documents were addressed in the revisions of the rough draft to generate the draft document. The state's comments were addressed in the revisions of the draft document to generate the final document.

4.3 Task 3 - Site Investigation

4.3.1 Mobilization

Mobilization is used to prepare for the field activities. The equipment and expendable materials are collected and checked prior to shipment to the plant. Also, site-specific health and safety training will be provided to HALLIBURTON NUS and subcontractor personnel at this time.

4.3.2 Soil-Gas and Drilling Subcontract

The field activities will be conducted using a drilling subcontractor(s). The specific activities included in this subcontract are the construction of a decontamination pad, the

collection of soil-gas samples, the drilling of soil borings, the collection of temporary monitoring well groundwater samples, GC analysis of soil-gas and temporary monitoring well groundwater samples, and the installation of monitoring wells. Up to four subcontractors may be used to perform the work on schedule and cost effectively.

4.3.3 Field Activities

A concurrent, three-phase field investigation is planned at this facility. These three phases are a soil-gas survey, a soil sampling and temporary monitoring well groundwater sampling investigation, and a perminent monitoring well groundwater sampling investigation. The first phase will be a soil-gas survey to identify potential areas of soil and groundwater contamination. The soil-gas samples will be analyzed at an onsite mobile field GC laboratory. Locations for the Phase 2 activities will be selected at the areas found to have high soil-gas contaminant concentrations. The second phase will consist of a soil sampling and a temporary monitoring well groundwater sampling investigation. The soil samples will be collected at 5 feet and/or 21 feet and coincide with elevated concentrations in the soil-gas measurements. These samples will be analyzed at an offsite fixed-base laboratory. The temporary monitoring well samples will be collected approximately 5 feet into the water table and analyzed at a local laboratory using a GC. The temporary monitoring well groundwater survey will be used to determine the location of groundwater contamination and to place the monitoring well clusters. The third phase will consist of the installation of perminent monitoring wells and the sampling and chemical analysis of surface soils, groundwater, sediment, surface water, and wastes, (if present). These samples will be analyzed at an offsite fixed-base laboratory. The three phases will overlap in order to avoid schedule delays. All of the samples will be analyzed for TCL (Target Compound List) volatile organics. Soil samples at the surface and up to five feet deep, groundwater (except the temporary monitoring well samples), sediments, surface water, and the waste (if found) will be analyzed for TCL semivolatile organics, TAL (Target Analyte List) metals, and cyanide. The water samples (except the temporary monitoring well samples) and waste sample will also be analyzed for hexavalent chromium. Soil samples which are visually identified as being stained and the waste sample will also be analyzed for PCBs and pesticides. In addition, select soil, sediment, and groundwater samples will be analyzed for engineering parameters.

4.3.3.1 Soil-Gas

The soil-gas survey will consist of placing soil-gas points in a uniform grid pattern in each of the three sites. A grid spacing of 150-foot centers will be used. In addition, opportunity locations will be selected in the field based on results from grid pattern soil-gas locations, as well as areas of suspected to be

contaminated, (drum marshaling areas). At each location, soil gas samples will be obtained at two depths, 5 feet and 21 feet. The 5-foot depth represents potential contamination in the soil near the source of a spill. Elevated soil-gas measurements at this depth would likely be an indication of soil contamination. The 21-foot depth represents the practical depth of this technique and the results would likely be influenced by both soil and groundwater contamination. The samples will be analyzed in the field using a field GC.

A 3-point by 4-point grid would be used at Site 1, see Figure 4-1. In addition, four opportunity sample locations would be selected in the field. A potential location of several of the opportunity locations would be near the former drum marshaling areas.

A 5-point by 5-point grid would be used at Site 2, see Figure 4-2. In addition, four opportunity sample locations would be selected in the field. A potential location of several of the opportunity locations would be near the former sludge drying beds.

A 6-point by 5-point grid would be used at Site 3, see Figure 4-3. In addition, four opportunity sample locations would be selected in the field. A potential location of several of the opportunity locations would be near the drum marshaling area.

The results of this testing are expected to provide a three dimension map of volatile organic contaminants in the soil vadose zone. These results would then be mapped for each site. Soil contamination would be expected to result in a relatively confined area of elevated soil gas readings at the 5-foot depth, or at the 5-foot depth and the 21-foot depth. Whereas groundwater contamination would be expected to extend in the direction of the groundwater flow and result in higher readings at the 21-foot depth than at the 5-foot depth.

The sample collection procedure consists of advancing a 1"-diameter steel pipe to the sampling depth and then opening the bottom of the pipe. A probe is lowered to the bottom of the pipe and the annulas is sealed. The gas line is purged with the soil gas and then a sample is injected into a pre-evacuated glass vile and pressured to 15 psig.

A research grade gas chromatograph (Shimadzu CR14A) equiped with capillary columns are used for analyzing the samples. The samples are injected into the GC by hand or with an automated sampler. Calibration procedures consist of a 3 point calibration curve at the beginning of the project and field control samples are analyzed at the beginning of each day, after every twentieth sample, and at the conslusion of each day. Also, twice per day, calibration checks will be performed using an instrument-response curve and injection of known standard concentrations. Duplicate samples will be performed in the field on every tenth field sample. In

addition, 5 duplicate samples (total) will be submitted to the subcontractor fixed-base laboratory for analysis.

The soil-gas samples will be analyzed for the following chemicals.

Chemical	Detection Limit (ug/l)
Trichloroethene	0.10
Tetrachloroethene	0.05
1,1,1-Trichloroethane	0.10
1,1-Dichlorothane	1.00
cis-1,2-Dichloroethene	1.00
trans-1,2-Dichloroethene	1.00
1,1-Dichloroethene	1.00

Based on this testing, temporary monitoring well groundwater sample locations and soil sample locations and depths would be selected. If minimal or no elevated soil gas readings are found, then the temporary monitoring well sample points would be located primarily along the hydraulic upgradient and downgradient boundaries of the three sites. If elevated soil-gas readings are found, then 2 to 3 temporary monitoring well groundwater points would be located along the hydraulic downgradient boundary of each site; 2 to 3 temporary monitoring well groundwater points would be located along the hydraulic upgradient border of each site; and 3 to 4 temporary monitoring well groundwater points would be located in the center of the contamination at each site.

4.3.3.2 Soil Sampling

Surface and subsurface soil samples will be collected at the site. The surface sample locations will consist of points in a relatively uniform 300-foot by 300-foot grid plus field determined opportunity sample locations. Areas covered by buildings and asphalt would not be considered for the predetermined sample locations. The soil borings and soil samples during the collection of temporary monitoring well groundwater samples will be used to investigate the subsurface soil contamination.

The grid of predetermined surface soils samples is illustrated in Figure 4-4. There would be a 2-point by 3-point grid at Site 1; a 3-point by 4-point grid at Site 2; and a 2-point by 3-point grid at Site 3. The opportunity samples would be selected in the field during the field activities. Soils which appear to be stained or visually discolored would be selected. The total number of surface samples would be 29 samples. These samples would be collected at

a depth of 1 to 6 inches and would be analyzed for TCL volatile and semivolatile organics, TAL metals, and cyanide. In addition, samples identifed as being stained will be analyzed for PCBs and pesticides. The results will be used to determine the nature and extent of soil contamination and to prepare a risk assessment.

The subsurface samples will be collected at a depth of 5 feet and/or 21 feet. For each location, the decision to sample is dependent on the soil-gas measurement at that location of depth. In general, if volatile organics were detected at that point, then a soil sample will also be obtained for offsite fixed-base laboratory analysis. And if volatile organics were not detected at that point, then a sample would not be obtained. However, a minimum of two soil samples will be collected at points were soil-gas measurements indicated the absence of contamination. These samples would be analyzed offsite at a fixed-base laboratory to confirm the absence of soil contamination. There will be an estimated 29 locations for the soil augering with an estimated 1.5 soil samples (for offsite analysis) at each location.

Samples will be collected with a split-spoon device. The split spoon samples will be used to collect samples for analytical testing, and to identify the depth of the groundwater table and the lithology. For analytical testing, the split spoon samples will be collected at a depth of 3 to 5 feet and/or at 19 to 21 feet. To identify the depth of the groundwater table and the lithology, the split spoon sampling would start again at about 40 to 45 feet and be conducted continuously until a suitable lithology for use of the temporary monitoring well point is encountered in the groundwater.

The location of the soil borings will be established through a site survey.

All the soil samples will be analyzed for TCL volatile organics. The surface and near surface (3 to 5 feet deep) soil samples will also be analyzed for semivolatile organics, TAL metals, and cyanide. In addition, samples identifed as being stained will be analyzed for PCBs and pesticides. These results primarily will be used to determine the nature and extent of soil contamination and to prepare a risk assessment.

In addition to these chemical analyses, select samples will also be evaluated for engineering parameters. Two samples will be selected at each site (for a total of 6), based on the field screening data. For each site, one sample should represent a relatively low level of contamination, and the second sample should represent an intermediate or high level of contamination. The engineering parameters consist of:

- Total organic carbon (TOC) to evaluate the potential for groundwater contamination through an estimate of the contaminant soil/water partition coefficient,

- Bulk density, grain size, moisture content, and pH for general engineering considerations.

4.3.3.3 Temporary Monitoring Well Survey

A temporary monitoring well survey will be conducted to aid in the placement of the permanent monitoring wells. The groundwater samples will be collected using either a temporary well point or a HydroPunch technique. The temporary monitoring well points will be selected based on the results of the soil-gas survey. As a result, the location cannot be presented at this time. Potential sample point location scenarios were presented in Section 4.3.3.1. At present, 29 sampling points coinciding with the soil sample locations are planned for the three sites.

The well point consists of installing a 2-inch well screen through the hollow stem auger. The augers are pulled back to expose the screen. The well point is purged and a sample is collected using a bailer.

The HydroPunch (HP) instrument allows for the collection of groundwater samples without the installation of permanent monitoring points. A soil auger with periodic split spoon samples is used to advance a hole to the water table. The HP is then driven or pushed to the sampling horizon. At this point, a sampling port is exposed and a groundwater sample is taken. The minimum depth at which a sample may be collected is 5 feet below the water table because 5 feet of head is required to fill the HP.

All sampling equipment will be decontaminated between sampling events.

The sample is submitted to a local laboratory for analytical testing using a gas chromatgraph. The samples will be analyzed for the following parameters using GC Method SW 846 8010. Detection limits are 5 to 10 ug/l.

Chemical
Trichloroethene
Tetrachloroethene
1,1,1-Trichloroethane
1,1-Dichlorothane
1,2-Dichloroethene
1,2-Dichloroethane
vinyl chloride
1,1-Dichloroethene

4.3.3.4 Monitoring Wells

Monitoring wells will be installed to evaluate the impact of the three sites being investigated on the local groundwater quality and to assess the potential vertical and lateral migration of any contaminants. The potential vertical migration of the contaminants will be investigated through the construction of well clusters composed of shallow (50- to 60-foot deep), intermediate (100- to 150-foot deep), and deep (200- to 250-foot deep) monitoring wells. These will yield groundwater quality analyses from various depths and define the magnitude and direction of local vertical hydraulic gradients. The potential lateral migration of any contaminants will be investigated through the placement of wells both upgradient and downgradient from the sites. These wells will define the slope and gradient of the water table and thereby yield local directions of flow. A comparison of water quality analyses from the upgradient and downgradient wells will show the impact of each site on the local groundwater quality.

Two rounds of water-level measurements will be conducted to better define groundwater flow paths and horizontal and vertical gradients. The measurements will be conducted at each of the HALLIBURTON NUS-installed monitoring wells, the USGS well located south of Site 1, and five of the Grumman monitoring well clusters (GM-6, GM-7, GM-8, GM-12, and GM-13, see Figure 4-5).

4.3.3.4.1 Monitoring Well Locations

A total of 17 monitoring wells (7 shallow, 7 intermediate, and 3 deep) will be installed at the NWIRP. Two additional monitoring well may be added at Site 2 or Site 3, if the soil-gas and temporary monitoring well programs indicate that a plume of contamination is bypassing Grumman wells GM-6, GM-7, and/or GM-8. The preliminary locations of these wells are illustrated in Figure 4-5. As discussed above, the results of the soil-gas and temporary

monitoring well program will be used to determine the exact locations of the wells. Because of the proximity and location of the three sites, some wells between Site 1 and Site 2 and 3 will perform two functions. That is, they will serve as downgradient wells for sites 2 and 3 and will serve as upgradient wells for site 1. Also, three of the Grumman wells (GM-6, GM-7, and GM-8) may be usable as upgradient well clusters. Where possible, the site process-water wells will serve as medium or deep wells.

Site 1 - Drum Marshaling Area

The reported direction of groundwater flow at Site 1 is to the south. However, the groundwater direction in this area is likely influenced by the recharge basins located north of Site 1, as well as the process water extraction wells located northwest of Site 1. Sites 2 and 3, which are located north and northwest of Site 1, are also potentially contaminated and may result in contamination in the upgradient wells.

Well clusters will be installed in 3 locations at Site 1, (see Figure 4-5). Two well clusters may be located along the south and southeast border of the site to serve as downgradient wells and the third well cluster may be located along the northern border of the site to serve as an upgradient well. Each well cluster would consist of at least two wells, one well monitoring the shallow zone (screened between 2 feet above and 8 feet below the water table), and the second well monitoring the intermediate zone (screened between 50 and 100 feet below the water table). In addition, the well cluster along the southwest border of the Site 1 would also include a deep well (screened between 150 and 200 feet below the water table). There will be a total of 7 monitoring wells installed at Site 1.

Site 2 - Recharge Basins

The reported direction of groundwater flow at Site 2 is to the southeast. However, the groundwater direction in this area is likely influenced by the process water extraction wells located west of Site 2. The Grumman areas north and northwest are also potentially contaminated and may result in contamination in the upgradient wells.

Well clusters will be installed in two or three locations (see Figure 4-5). One well cluster may be located near the southeast corner of the site. The well cluster would include a shallow and intermediate well. This well cluster, as well as the upgradient well cluster for Site 1, would be used to monitor the groundwater downgradient of Site 2. The second well cluster would be located along the north border of the site to also monitor the upgradient groundwater. The Grumman monitoring well cluster GM-8 would be used to monitor the shallow and intermediate zone at this location (as well as Grumman analytical data). HALLIBURTON NUS would

install a deep monitoring well at this location. The third well cluster, if required may be located near the northwest corner of the site to monitor the upgradient groundwater. The well cluster would include a shallow and intermediate well. There will be a total of three (five) monitoring wells installed at Site 2.

Site 3 - Salvage Storage Area

The reported direction of groundwater flow at Site 3 is to the southeast. However, the groundwater direction in this area is likely influenced by the process water extraction wells located west of Site 3 and the infiltration basins located east of Site 3. The Grumman areas north and northwest of Site 3 are also potentially contaminated and may result in contamination in the upgradient wells.

Well clusters will installed in three locations (see Figure 4-5). Two of the well clusters may be located along the downgradient perimeter of Site 3. The third well cluster would be located southwest of Plant No. 3. Each well cluster would consist of a shallow and intermediate well. The well cluster near the southeast corner of Site 3 would also include a deep well. The process water extraction wells will serve as additional upgradient and downgradient wells, and the Grumman wells GM-6 and GM-7 will serve as upgradient wells. In addition, the upgradient well cluster for Site 1 may be used as a down-gradient well. Based on the soil-gas and temporary monitoring well program, the well cluster conditionally planned for Site 2 may be used at Site 3, instead. There will be a total of 7 (9) monitoring wells installed at Site 3.

4.3.3.4.2 Monitoring Well Construction

The shallow and intermediate wells will be drilled with hollow stem augers. Formation samples will be collected every 5 feet with a split-spoon sampler. Every 10 feet, a portion of the split spoon sample will be placed in a jar and a HNU reading will be performed on the head space. The placement depth of the well screens will be based on the highest head space measurement in a screen zone and lithologic information obtained from these samples.

The drilling of the deep wells presents problems. These wells are too deep to be drilled with the required large ID hollow stem augers. The potential presence of running or heaving sands presents special geotechnical problems. In addition, the New York State Department of Environmental Conservation (NYSDEC) has informed Geraghty and Miller, Inc., working on the adjacent Grumman facility, that the use of the mud rotary technique will not be allowed through the depth interval to be screened and monitored. Therefore, HALLIBURTON NUS plans to drill the deep wells with a hybrid technique currently being employed by Geraghty and Miller at the Grumman facility. This technique calls for the wells to be

drilled with the mud rotary technique until the depth to be screened is reached. At this depth, a reverse-circulation water rotary technique will be used to advance the borehole through the interval to be screened to the total depth of the well.

An obvious requirement of this hybrid drilling technique is that the interval to be screened must be identified prior to the drilling of the well. To accomplish this, pilot holes will be drilled with small ID, hollow-stem augers. Continuous split-spoon samples will be taken to identify the lithologies present at that location; the screen depth for the wells will be based on the lithology encountered in the pilot hole. Upon completion, the pilot holes will be backfilled with a bentonite/cement grout and abandoned.

The monitoring wells will be composed of Schedule 40 PVC well casing and 010-slot PVC well screen. The well screens will be 10 feet in length. The screens will be surrounded by a filter pack, which will extend to a height of 3 to 5 feet above the top of the screen. A bentonite seal with a minimum thickness of 2 feet will be emplaced above the filter pack. The remainder of the annulus will be backfilled with a bentonite/cement grout. A steel guard surface casing will be cemented in place around each PVC riser pipe.

4.3.3.5 Monitoring Well Sampling

One round of groundwater sampling will be conducted. Each new monitoring well will be sampled. The samples will be analyzed for TCL volatile and semivolatile organics and TAL metals. In addition, the samples will be analyzed for cyanide and hexavalent chromium. During the evaluation of the metal data, turbidity from the surrounding sediments often results in an over-estimation of risks associated with metal contaminants. As a result, the groundwater samples will be analyzed for total TAL metals and field-filtered TAL metals. These chemical analyses would be used to determine the nature and extent of contamination and to prepare a risk assessment.

In addition to the chemical analysis used for the nature and extent of contamination and risk assessment, select samples will also be evaluated for engineering parameters. A total of three samples will be selected from all of the monitoring wells, based on the field screening data. One sample should represent a relatively low level of contamination, one sample should represent an intermediate level of contamination, and one sample should represent a high level of contamination. The selection of these wells will be determined based on the temporary monitoring well program. These engineering parameters consist of:

- pH, total dissolved solids (TDS), alkalinity, and hardness to evaluate the scaling potential of the groundwater;

- Biological oxygen demand (BOD), total organic carbon (TOC), chemical oxygen demand (COD), and total suspended solids (TSS) to evaluate other contamination in the groundwater and potential treatment requirements.

Four process water wells are located around Site 3 and a USGS well is located south of Site 1. Samples will be collected of the water in these wells and analyzed for TCL volatile and semivolatile organics and total TAL metal, cyanide, and hexavalent chromium.

4.3.3.6 Surface Water/Sediment Sampling

Two samples of the surface water will be collected from one of the basins and two samples of the sediment from each of the three basins (total of 6 sediment samples).

One surface water sample will be collected during a precipitation event to evaluate the potential transport of sediments into the basins, and the second sample will be collected during a non-precipitation event to evaluate potential contamination in process-generated wastewaters. The samples will be analyzed for TCL volatile and semivolatile organics and TAL metals. In addition, the samples will be analyzed for cyanide and hexavalent chromium. During the evaluation of the metal data, turbidity from the surrounding sediments often results in the over estimation of risks associated with the metals. As a result, the surface-water samples will be analyzed for total TAL metals and field-filtered TAL metals. These chemical analysis would be used to confirm the reported noncontact source of this waste water.

The six sediment samples will be analyzed as the soil samples. The samples will be analyzed for TCL volatile and semivolatile organics, TAL metals, and cyanide. These results will be used to primarily determine the nature and extent of contamination and to prepare a risk assessment.

4.3.3.7 Waste Sampling

During the drilling operations in Site 2, sludge from the area of the former sludge drying beds may be encountered. One sample of this sludge will be collected to evaluate potential direct contact and groundwater contamination risks. This sample will be analyzed for TCL volatile and semivolatile organics, PCBs, pesticides, TAL metals, hexavalent chromium and cyanide. The results primarily will be used to determine the nature and extent of contamination and to prepare a risk assessment.

4.3.3.8 Summary of Additional Data Collection

The proposed field activities and sampling are summarized in Table 4-1. For Sites 1, 2, and 3, a total of 78 soil gas locations will be evaluated with the collection of 156 soil gas samples; 29 temporary monitoring well points will be installed and 29 temporary monitoring well groundwater samples collected; 29 soil borings installed and an estimated 44 subsurface soil samples collected; 29 surface soil samples collected; 17 (19) monitoring wells installed and 24 groundwater samples collected; 2 surface water samples collected; 6 sediment samples collected; and 1 waste sample collected. Each of these samples will be analyzed. The soil-gas will be analyzed in the field using a GC; the temporary monitoring well groundwater samples will be analyzed at a local laboratory using a GC: and the balance of the samples will be analyzed at a fixed-base laboratory using CLP protocol.

4.3.4 Demobilization/Residue Management

At the completion of the field activities, the area will be returned to current conditions. All contaminated field-generated expendables will be disposed of by incineration off site. There will be an estimated six drums of contaminated expendable materials generated. The only residues which will remain on site are the soil cuttings from the soil borings and monitoring wells. The eventual fate of these materials will be determined based on the results of chemical analysis from each location. These materials will be stored on site, in drums or with plastic placed above and below the material. Groundwater, drilling fluids, and decontamination water generated can be disposed of at one of two industrial waste treatment plants located at the Bethpage Plant. These materials will be transported to the treatment plants in bulk.

4.3.5 Analytical Subcontract

The analytical testing will be conducted at a Navy-approved laboratory under a competitive bidding process in accordance with the FAR. DQO Level D quality control and CLP methods and protocol will be used.

4.3.6 Analytical Testing

The proposed analytical schedule is provided in Table 4-2.

4.3.7 Survey

The location of each soil boring and the location and elevation of each monitoring well will be established through the use of a licensed survey.

4.4 Task 4 - Site Investigation Analysis

Four subtasks are considered under the Site Investigation task, namely, Analysis and Summary of the Site Investigation, Nature and Extent of Contamination, Data Storage, and the Baseline Risk Assessment. A discussion of these tasks is presented below.

4.4.1 Analysis and Summary of Site Investigation

The objective of this investigation is to ensure that the information collected is sufficient in quality and quantity to support a risk assessment and Feasibility Study. The findings of this study will be presented in the RI Report.

4.4.2 Nature and Extent of Contamination

Under this subtask, the analytical data collected will be summarized and quantified. The results will be presented in summary tables and graphically in a figure for each site. Specific items to be addressed include the chemicals present, chemical concentrations and quantities, and total volume of each contaminated media. The nature and extent of contamination results will be presented in the RI Report. The other items discussed under the Standard IR Scope of Work will be discussed in the RI Report under the Contaminant Fate and Transport Section and the Risk Assessment Section.

4.4.3 Data Storage

The analytical data will submitted to the Navy on an IBM-compatible, microcomputer diskette (5 1/4") after data validation in either an ASCII or other Navy-approved, similar spreadsheet format.

4.4.4 Baseline Risk Assessment

A Risk Assessment of the chemical data will be prepared in accordance with the EPA Guidance for Conducting Remedial Investigation and Feasibility Studies. This risk assessment will contain the following elements.

- Contaminant Identification
- Exposure Assessment
- Toxicity Assessment
- Risk Assessment

4.5 Task 5 - Laboratory and Bench-Scale Studies

Laboratory and bench-Scale Treatability Studies are not currently planned.

4.6 Task 6 - Reports

The reports under this task consist of the monthly reports and the RI Report. These reports are discussed below.

4.6.1 Monthly Reports

Site-specific monthly reports will be prepared.

4.6.2 Rough Draft RI Report

A rough draft RI Report will be prepared for review by the Navy. A potential format for the RI Report is as follows.

- Introduction
- Study Area Investigation
- General Characteristics of the Site
- Nature and Extent of Contamination
- Contaminant Fate and Transport
- Baseline Public Health Risk Assessment
- Summary and Conclusions

4.6.3 Draft RI Report

The Navy's comments on the rough draft RI Report will be incorporated, and the revised report will be submitted as the Draft RI Report.

4.6.4 Draft Final RI Report

Comments from other government agencies, such as the Environmental Protection Agency and the State of New York, will be addressed and submitted as the draft final Report.

4.6.5 Presentation at Bethpage

The findings of the RI will be presented to the Navy at the Bethpage Plant.

4.6.6 Final RI Report

A final RI Report will be prepared which incorporates the Navy's comments on the draft final Report.

4.7 Task 7 - Community Relations Support

This task is divided into the preparation and implementation of the Community Relations Plan and public meetings.

4.7.1 Community Relations Plan

A formal Community Relations Plan will be prepared, implemented, revised as necessary, and assessed. In the preparation of this plan, it is anticipated that there will be limited, onsite discussion and community interviews and that an analysis of the community attitudes is reasonably well established from prior public meetings.

4.7.2 Public Meetings

Up to six public meetings will be conducted, several of which may include activity and state briefings.

Table 4-1
Sample Collection Summary[1]
Bethpage, New York

Media	Activity	Site 1	Site 2	Site 3	Total
Soil-Gas	Soil-Gas Measurements	16	29	33	78
Soils	Soil Borings	10	10	9	29
	Subsurface Soil Samples	15	15	14	44
	Surface Soil Samples	8	14	9	31
Groundwater	Monitoring Wells	7	4(6)	6	17(19)
	Groundwater Samples	7	4(6)	11	22(24)
	Temporary Monitoring Wells	10	10	9	29
Sediment	Sediment Samples	0	6	0	6
Surface Water	Surface Water Samples	0	2	0	2
Waste	Waste Sample	0	1	0	1

1 - Number of samples is exclusive of QA/QC requirements.

Table 4-2
Analytical Testing Summary[1]
Bethpage, New York

Parameter	Soil Gas	TMW - GW	Soil	Ground-water	Sediment	Surface Water	Sludge
Total Samples	156	29	75	24	6	2	1
Volatile Organics (GC)	156	29	0	0	0	0	0
TCL Volatile Organics	0	0	75	24	6	2	1
TCL Semivolatile Organics	0	0	53	24	6	2	1
TCL PCBs/Pesticides	0	0	10	0	0	0	1
TAL Metals - Total	0	0	53	24	6	2	1
TAL Metals - Filtered	0	0	0	24	0	0	0
Cyanide	0	0	53	24	0	2	1
Hexavalent Chromium	0	0	0	24	0	0	1
pH, TOC, Grain Size, Moisture Content, Bulk Density	0	0	6	0	1	0	1
pH, TOC, COD, TDS, BOD, Alkalinity, Hardness, TSS	0	0	0	3	0	0	0

1 - Number of samples is exclusive of QA/QC requirements.
TPM - GW: Temporary Monitoring Well - Groundwater Samples

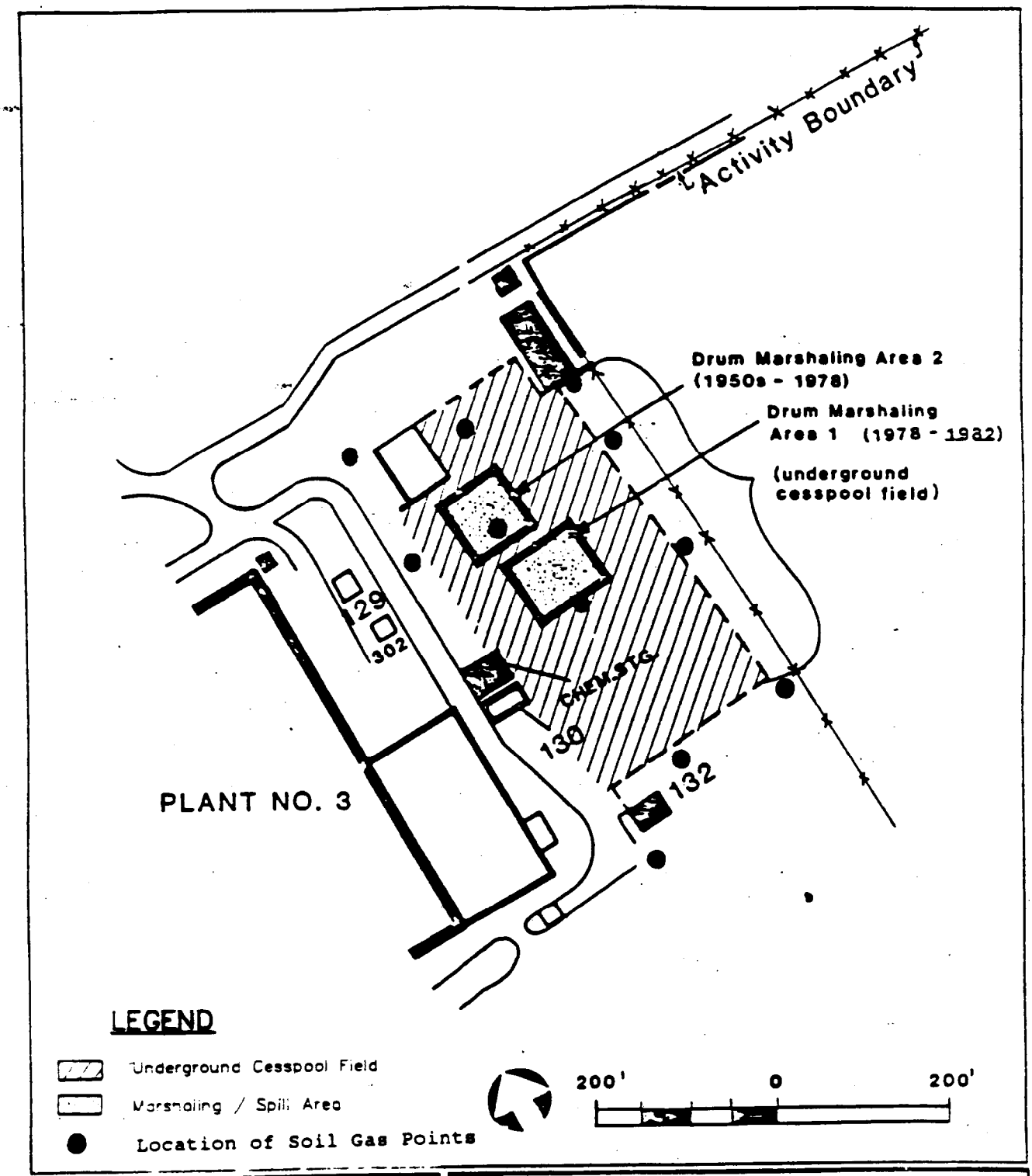

Figure 4-1

Location of Soil Gas Points
Site 1 Drum Marshaling Area
NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial
Reserve Plant
Bethpage and Calverton
Long Island, New York

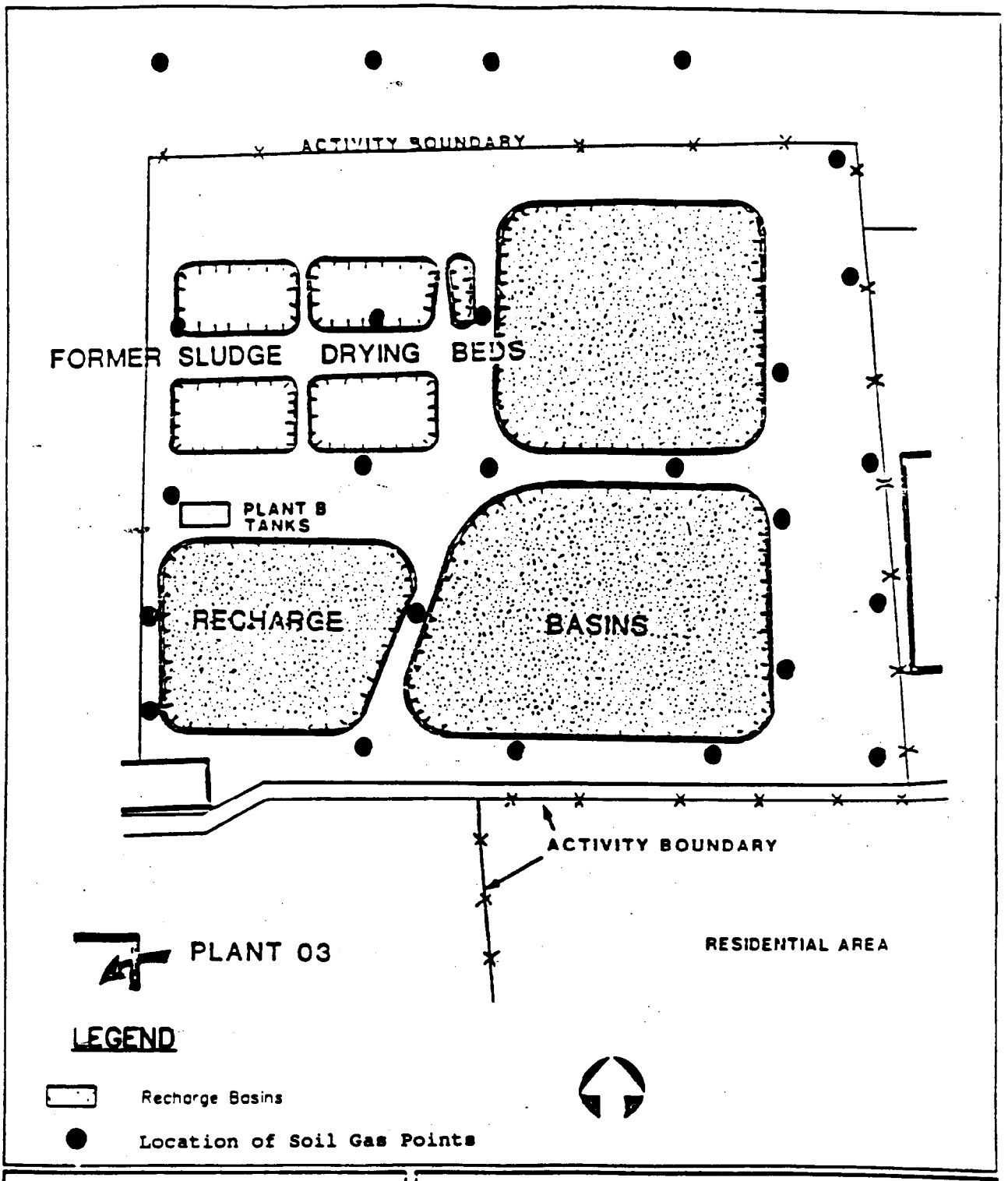

Figure 4-2

Location of Soil Gas Points
Site 2 Recharge Basins
NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial
Reserve Plant
Bethpage
Long Island, New York

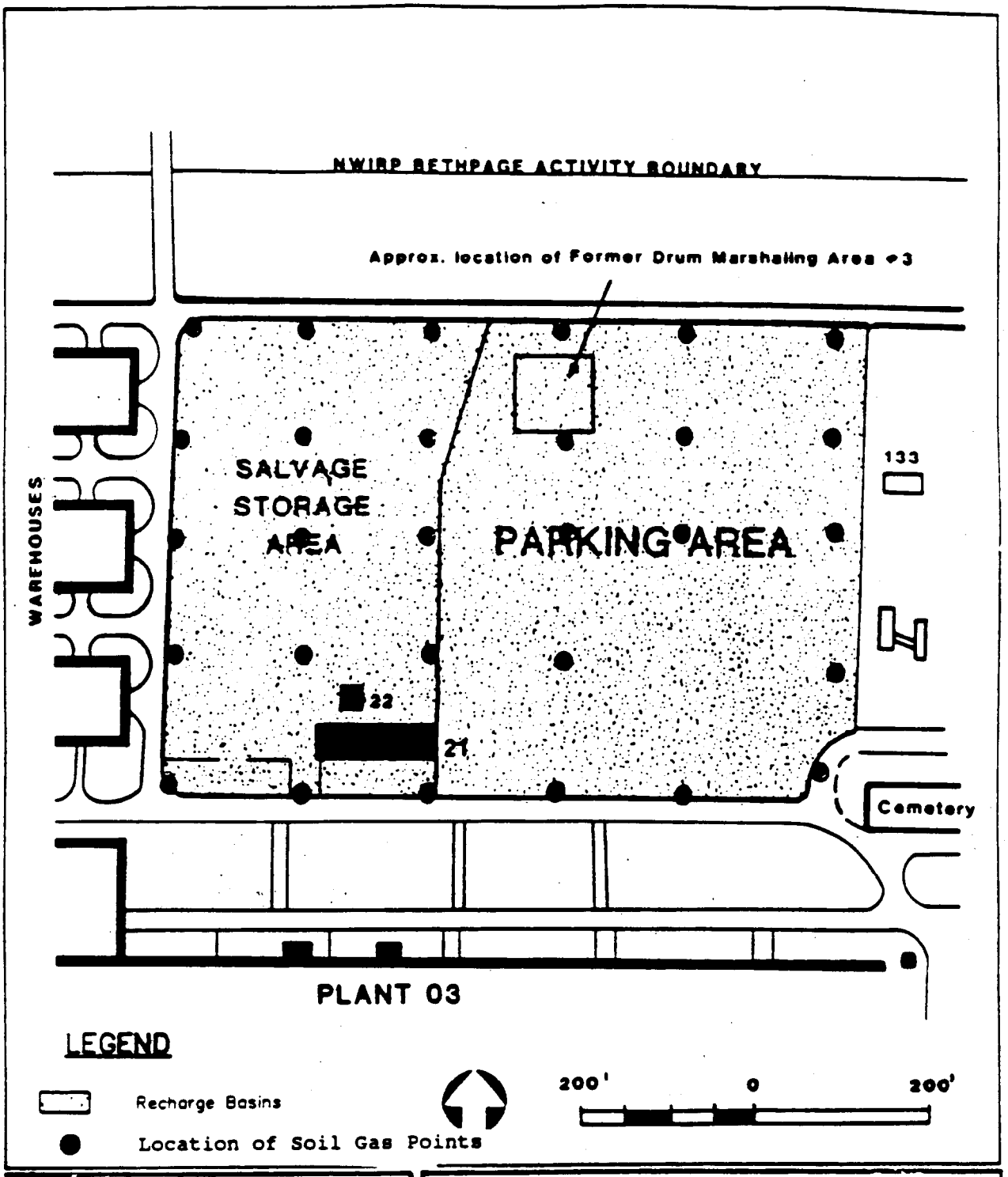

Figure 4-3

Location of Soil Gas Points
Site 3 Salvage Storage Area
NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial Reserve Plant
Bethpage and Calverton
Long Island, New York

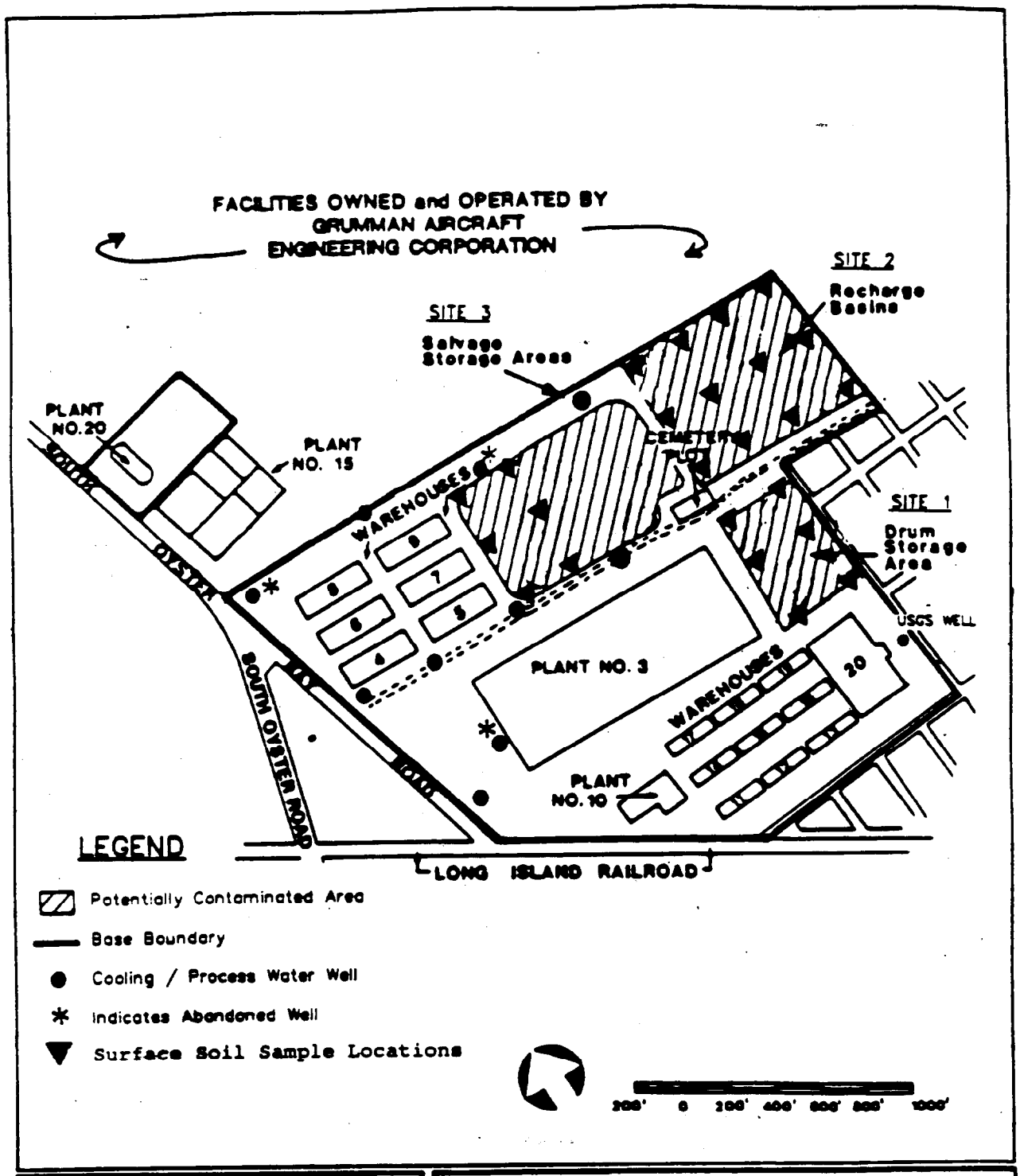

Figure 4-4

Surface Soil Sample Locations
NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial
Reserve Plant
Bethpage
Long Island, New York

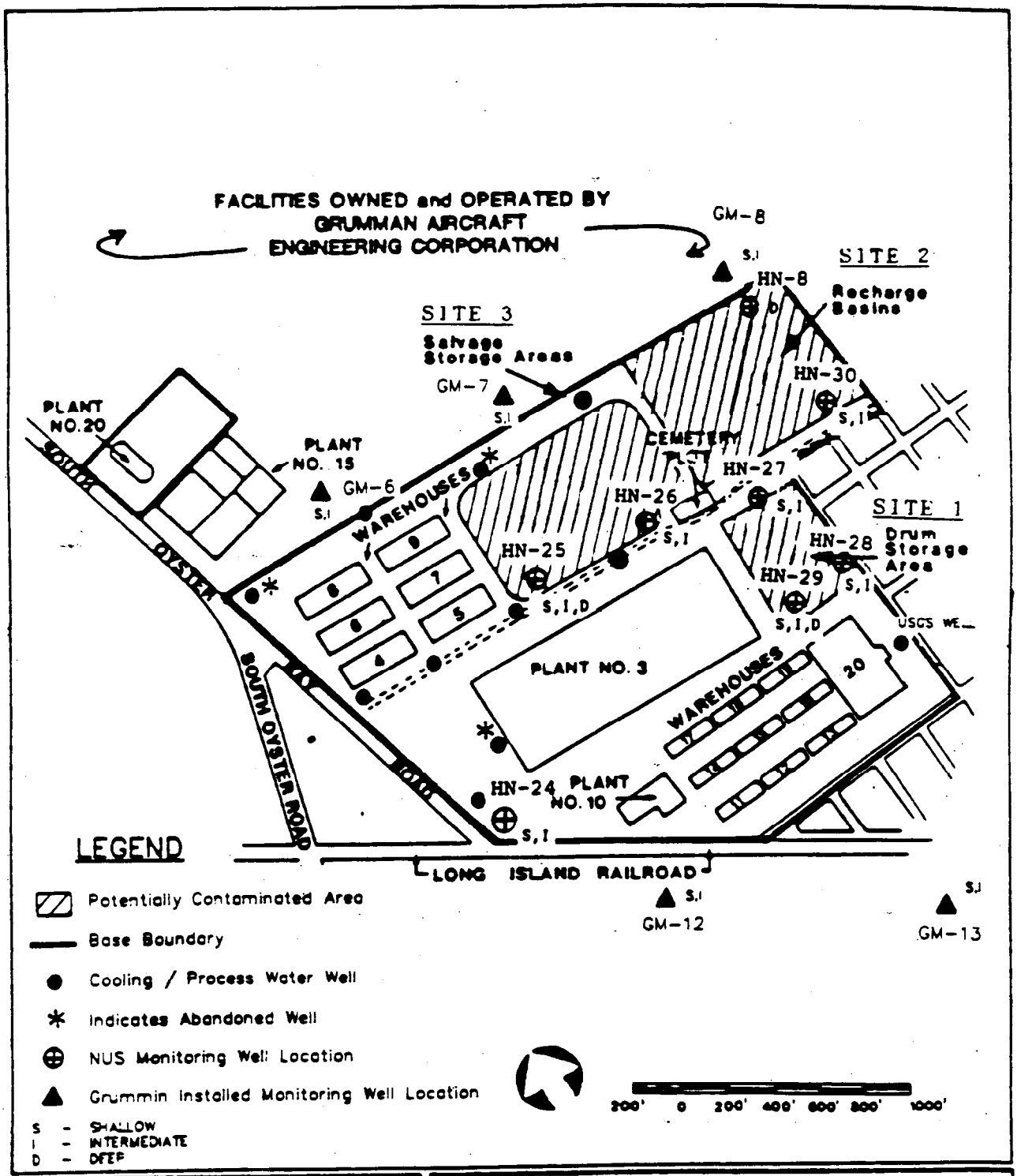

Figure 4-5

Preliminary
Monitoring Well Location
NWIRP Bethpage, NY

Remedial Investigation
Naval Weapons Industrial
Reserve Plant
Bethpage
Long Island, New York

5.0 PROJECT MANAGEMENT APPROACH

5.1 Organization and Approach

The Program Manager and Deputy Program Manager for HALLIBURTON NUS are Mr. Arthur K. Bomberger, P.E., and Mr. John J. Trepanowski, P.E., respectively. Mr. David D. Brayack, P.E., will serve as the Project Manager (PM). The PM has primary responsibility for implementing and executing the RI. The Field Operations Leader (FOL) and RI Leader will be Mr. Kevin Kilmartin. The PM will be assisted by various health and safety, risk assessment, and other technical staff.

5.2 Project Schedule

The project schedule is presented in Table 5-1. This schedule consists of deliverable dates defined by the CTO (indicated by a *) and tentative dates for critical-path items such as field and analytical activities. A double "**" indicates that the proposed deliverable date differs from that presented in the CTO.

Table 5-1
Project Schedule
Bethpage, New York

Notice to Proceed - Plans	05/24/91
Project Work Plan	06/14/91 *
RI Work Plan - Rough Draft	07/01/91 *
QA Project Plan	07/03/91
Data Management Plan	07/03/91
Health and Safety Plan	07/08/91
RI Work Plan - Draft	07/22/91
RI Work Plan - Final	08/23/91 **
Field Work (7 weeks)	08/19/91-09/27/91
Analytical Testing	08/27/91-10/25/91
Data Storage - Unvalidated	11/01/91 **
Community Relations Plan - Draft	11/15/91 *
RI Report - Rough Draft	11/22/91 **
Data Storage - Validated	12/02/91 **
RI Report - Draft	12/15/91 *
Community Relations Plan - Final	12/15/91 *
RI Report - Draft Final	01/15/92 *
Minutes of Presentation	02/05/92 *

REFERENCES

G&H (Geraghty and Miller), 1990. Remedial Investigation/Feasibility Study Work Plan, Grumman Aerospace Corporation, Bethpage New York. Planview, New York. March.

RGH (Rogers, Golden, & Halpein), 1986. Initial Assessment Study of NWIRP Bethpage NY and NWIRP Calverton, NY. Contract No. N62474-84-3386, Environmental Restoration Department, Naval Energy and Environmental Support Activity, December.

Appendix A

Portions of the Grumman Work Plan (G&M, 1990)

A.1 Table 1 - Wells within a three-Mile Radius of Grumman Aerospace Corporation, Bethpage, New York

A.2 Table 2 - Volatile Organic Compounds Detected in Wells Within a Three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York

A.3 Table 3 - Production Well Water-Quality Data, Grumman Aerospace Corporation, Bethpage, New York

A.4 Figure 5 - Waste Table Elevation on June 2, 1988 in the Vicinity of the Grumman Aerospace Corporation, Bethpage, New York

A.5 Figure 7 - Proposed Soil-Gas Survey and Recharge Basin Sampling Locations, Grumman Aerospace Corporation, Bethpage, New York; and Figure 8 - Proposed Soil Boring and Monitoring Well Locations, Grumman Aerospace Corporation, Bethpage, New York

A.1 Table 1 - Wells within a Three-Mile Radius of Grumman Aerospace Corporation, Bethpage, New York

Table 1. Wells Within a three-Mile Radius of Grumman Aerospace Corporation, Bethpage, New York.

NYS Well ID #	Owner/ User	Total Depth of Well (feet)	Diameter of Well (inches)	Screened Interval (feet)	Use of Well	Use of Water	Aquifer Screened	Compass Directions/ Distance(1) (feet)	Pumpage(2)
192	Bethpage Water Dist.	176	10	112-173	Withdrawal	Public Supply	Magothy	SE/4800	327*
525	Village of Farmingdale	68	12	50-68	Withdrawal	Public Supply	--	SE/17,100	103*
576	LIRR	409	8	399-409	Industrial	Locomotive Boilers	Magothy	NW/10,300	--
706	Village of Farmingdale	70	11.5	55-70	--	--	--	SE/17,100	500*
746	Bethpage Water Dist.	120	10	81.5-120	Withdrawal	Public Supply	Magothy	SE/4800	610*
747	Bethpage Water Dist.	242	5	192-232	Withdrawal	Public Supply	Magothy	SE/4092	610*
1232	NCDPW	57	4	--	Observation	--	Magothy	NE/6700	--
1233	NCDPW	40	1.25	--	Observation	--	Upper Glacial	E/6100	--
1234	NCDPW	65	1.25	--	Observation	--	Upper Glacial	SE/8400	--
1658	Grumman	112	8	87-112	Withdrawal (3)	Air Cond. & Plant Use	Magothy	S/1500	500*
1665	Grumman	101	15	67-100	Industrial (3)	Air Cond. & Plant Use	Magothy	SW/1400	1075*
1666	Grumman	108	15	74-98.5	Industrial (3)	Air Cond. & Plant Use	Magothy	W/1200	1060*
1797	U.S. Navy	96	10	74-94	Industrial (3)	Plant Use	Magothy	NW/1452	330*
1798	U.S. Navy	103	12	80-103	Industrial (3)	Air Cond.	Magothy	N/1848	930*
1859	U.S. Navy	165	8	140-170	Industrial (3)	Air Cond. & Plant Use	Magothy	N/1400	850*
1911	U.S. Navy	178	12	133-163	Industrial (3)	Air Cond. & Plant Use	Magothy	NW/2100	800*
1912	U.S. Navy	159	12	119-149	Industrial (3)	Air Cond. & Plant Use	Magothy	N/1716	800*
1922	U.S. Navy	187	12	130-160	Industrial (3)	Plant Use	Magothy	N/2000	760*

Table 1. Wells Within a three-Mile Radius of Grumman Aerospace Corporation, Bethpage, New York.

NYS Well ID #	Owner/ User	Total Depth of Well (feet)	Diameter of Well (inches)	Screened Interval (feet)	Use of Well	Use of Water	Aquifer Screened	Compass Directions/ Distance(1) (feet)	Pumpage(2)	P... Pe...
1923	Grumman	359	16	293-348	Industrial (3)	Air Cond. & Plant Use	Magothy	S/2100	76949	...
1937	Village of Farmingdale	151	12	120-151	Withdrawal	Public Supply	--	SE/12000	758*	...
1960	U.S. Navy	200	12	130-160	Industrial (3)	Air Cond. & Plant Use	Magothy	W/1500	900*	8/...
1961	U.S. Navy	274	8	213-263	Industrial (3)	Air Cond. & Plant Use	Magothy	N/2700	--	...
1963	U.S. Navy	186	17	97-127	Industrial (3)	Air Cond. & Plant Use	Magothy	W/2200	--	...
2066	Bethpage Water Dist.	158	12	121-153	Withdrawal	Public Supply	Magothy	NE/6250	820*	...
2240	M. Catapano	89	8	73-89	Withdrawal	Irrigation	Upper Glacial	SW/2600	340*	5/...
2580	Levitt & Sons, Inc.	357	12	310-357	Withdrawal	Public Supply	--	SW/13,200	1200*	...
2587	--	61	--	26-61	Withdrawal	Irrigation	--	S/9000	--	...
3142	Bethpage Water Dist.	163	12	122-163	Withdrawal	Public Supply	Magothy	NE/6250	175*	8/...
3147	Bethpage Water Dist.	233	12	192-233	Withdrawal	Public Supply	Magothy	NE/6250	730*	9/...
3193	Levittown Water Dist.	316	8	274-316	Withdrawal	Public Supply	Magothy	S/1000	--	...
3194	Levittown Water Dist.	256	12	219-256	Withdrawal	Public Supply	Magothy	SW/9600	--	...
3312	Levittown Water Dist.	304	12	252-304	Withdrawal	Public Supply	Magothy	S/12,200	--	...
3428	--	611	--	--	--	--	--	NE/6250	--	...
3435	--	111.3	--	33-111.3	Withdrawal	Public Supply	--	SW/8100	--	...
3450	Hooker	147	12	122-147	Industrial	Cooling	Magothy	NW/1050	--	...
3488	Hicksville Water Dist.	169	12	114-167	Withdrawal	Public Supply	Magothy	W/6600	1540*	11...

Table 1. Wells Within a three-Mile Radius of Grumman Aerospace Corporation, Bethpage, New York.

NYS Well ID #	Owner/ User	Total Depth of Well (feet)	Diameter of Well (inches)	Screened Interval (feet)	Use of Well	Use of Water	Aquifer Screened	Compass Directions/ Distance(1) (feet)	Pumpage(2)	Pump. Per.
3552	Hicksville Water Dist.	169	12	116-169	Formation Test Hole	--	Magothy	W/10,800	--	-
3554	NCDPW	288	4	64.5-268.5	Observation	--	Magothy	SE/8300	--	-
3618	Levittown Water Dist.	418	16	377-418	Withdrawal	Public Supply	Magothy	SW/9600	75471	138
3666	--	68.5	--	29.2-68.5	Industrial	Air Cond.	--	SW/10,600	--	-
3780	N.Y. Water Service Corp.	142	16	89-142	Withdrawal	Public Supply	--	S/15,350	1800*	11/
3876	Bethpage Water Dist.	386	16	328-385	Withdrawal	Public Supply	Magothy	S/7128	1500*	3/
3893	N.Y. Water Service Corp.	151	14	96-151	Withdrawal	Public Supply	--	S/15,350	1809*	6/
3898	LILCO	138	12	107.5-129	Industrial	Cooling	Upper Glacial	NW/6864	300*	10/
3899	LILCO	134	8	13.5-124.5	Industrial	Cooling	Upper Glacial	NW/6864	115*	6/
3900	LILCO	156	8	36.5-147.5	Industrial	Cooling	Upper Glacial	NW/6864	106*	8/
4042	S. Farmingdale Water Dist.	157	12	96-154	--	--	--	SE/14,400	1250*	2/
4043	S. Farmingdale Water Dist.	374	12	322-374	--	--	--	SE/14,400	1200*	
4063	Bethpage Water Dist.	233	16	139-233	Withdrawal	Public Supply	Magothy	NE/4750	1529*	1/
4146	Bethpage Water Dist.	235	16	133-235	Withdrawal	Public Supply	Magothy	NE/5000	1480*	10
4175	--	69	--	54-69	Withdrawal	Irrigation	--	NE/4000	--	
4176	--	310	--	44-310	Industrial	Cooling	--	--	--	
4450	Levittown Water Dist.	472	12	415-472	Withdrawal	Public Supply	--	SW/13,200	1250*	7
4451	Levittown Water Dist.	403	12	231-281	Withdrawal	Public Supply	Magothy	SW/6300	204506	1
4708	Pittsburgh Plate Corp.	169	10	149-169	Industrial	Industrial	Magothy	NW/3036	439*	7

Table 1. Wells Within a three-Mile Radius of Grumman Aerospace Corporation, Bethpage, New York.

NYS Well ID #	Owner/ User	Total Depth of Well (feet)	Diameter of Well (inches)	Screened Interval (feet)	Use of Well	Use of Water	Aquifer Screened	Compass Directions/ Distance(1) (feet)	Pumpage(2)
5026	--	109	--	72-109	Industrial	Cooling	--	N/7000	--
5148	S. Farmingdale Water Dist.	369	12	295-369	Withdrawal	Public Supply	--	SE/14,400	1300*
5149	LILCO	193	12	21.5-173.5	Industrial	Cooling	Magothy	NW/7128	527*
5301	Levittown Water Dist.	377	18	324-377	Withdrawal	Public Supply	Magothy	SW/10,500	--
5302	Levittown Water Dist.	487	12	431-487	Withdrawal	Public Supply	--	SW/16,3000	1212*
5303	Levittown Water Dist.	512	12	545-512	Withdrawal	Public Supply	Magothy	S/13,700	--
5304	Levittown Water Dist.	472	12	415-472	Withdrawal	Public Supply	--	S/17,200	1230*
5305	U.S. Navy	167	12	115.5-167	Industrial (3)	General Supply	Magothy	N/2376	1016*
5306	U.S. Navy	256	12	173-206 233-255	Industrial (3)	General Supply	Magothy	N/2244	1016*
5368	Hooker	150	10	10.5-141.5	Industrial	Processing	Magothy	NW/3700	723*
5390	Hooker	145	12	82-137	Industrial	Cooling & Processing	Magothy	NW/3300	412*
5588	--	45	--	22-45	Industrial	Cooling	--	S/8700	--
6078	Bethpage Water Dist.	275	24	225-275	Industrial	Public Supply	Magothy	NE/5000	6677
6150	S. Farmingdale Water Dist.	612	12	545-612	Withdrawal	Public Supply	--	S/14,250	1420*
6192	Hicksville Water Dist.	626	20	575-526	Industrial	Public Supply	Magothy	W/6072	53503
6193	Hicksville Water Dist.	467	12	396-456	Industrial	Public Supply	Magothy	NW/6468	1900*
6417	Levittown Public School	60	6	49-60	Withdrawal	Irrigation	Upper Glacial	SW/11,000	--
6463	--	27	--	16-27	Industrial	Cooling	--	SW/3300	--

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NYS Well ID #	Owner/ User	Total Depth of Well (feet)	Diameter of Well (inches)	Screened Interval (feet)	Use of Well	Use of Water	Aquifer Screened	Compass Directions/ Distance(1) (feet)	Pumpage(2)	Pl Pa
6517	DPW	58.5	--	10.4-58.5	--	--	--	SE/8000	--	
6580	Plainview Water Dist.	596	20	523-596	Withdrawal	Public Supply	Magothy	N/8700	306029	1
6620	Nat. Metal Process	87	--	82-87	Industrial	Factory & Shop	Upper Glacial	W/3000	--	
6630	--	586	--	--	--	--	--	SE/8250	--	
6632	DPW	210	--	36-210	--	--	--	S/3950	--	
6633	DPW	216	--	37-216	--	--	--	SE/4400	--	
6634	DPW	226	--	--	--	--	--	SE/4900	--	
6635	DPW	219	--	--	--	--	--	S/4400	--	
6644	Village of Farmingdale	227	12	128-227	Withdrawal	Public Supply	--	SE/12000	1212*	3
6775	Plastic Materials	105	6	87-105	Industrial	Cooling	Magothy	NW/4620	50*	11
6683	--	135	--	60-135	Industrial	Plant use	--	W/2500	--	
6781	--	74	--	37-74	Industrial	Cleaning	--	SE/4750	--	
6904	--	693	--	--	--	--	--	SW/10,000	--	
6915	Bethpage Water Dist.	608	20	442-482	Withdrawal	Public Supply	Magothy	SE/8184	227148	19
6916	Bethpage Water Dist.	611	20	535-605	Withdrawal	Public Supply	Magothy	SE/8184	47639	19
6970	National Par 3 Golf	82	6	69.5-81.5	Industrial	Sprinkling	Upper Glacial	SW/2800	48*	10
6996	Sonic Recording	120	8	103-119	Industrial	Cooling	Upper Glacial	NW/5016	--	
7004	GAM Assoc.	150	6	124-150	Industrial	Cooling	Magothy	NW/4350	--	

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NYS Well ID #	Owner/ User	Total Depth of Well (feet)	Diameter of Well (inches)	Screened Interval (feet)	Use of Well	Use of Water	Aquifer Screened	Compass Direction*/ Distance(1) (feet)	Pumpage(2)
7076	Levittown Water Dist.	674	20	569-674	Withdrawal	Public Supply	Magothy	S/9600	329873
7094	--	97	--	25-97	Industrial	Cooling	--	S/9300	--
7120	Sonia Recording	120	8	104-120	Industrial	Cooling	Upper Glacial	NW/3016	37*
7164	--	83	--	28-83	Industrial	Air Cond.	--	S/9200	--
7377	S. Farmingdale Water Dist.	738	12	607-738	Withdrawal	Public Supply	--	SE/13,300	1400*
7438	Bethpage State Park	585	20	486-585	Withdrawal	Irrigation	Magothy	S/9500	--
7514	--	65	--	30-65	Industrial	Plant use	--	S/9300	--
7515	S. Farmingdale Water Dist.	352	12	289-352	Withdrawal	Public Supply	--	SE/14,300	1438*
7516	S. Farmingdale Water Dist.	589	12	493-589	Withdrawal	Public Supply	--	SE/14,300	1399*
7518	Grumman	379	16	314-379	Industrial	Cooling	Magothy	N/3100	543283
7523	Levittown Water Dist.	684	12	590-684	Withdrawal	Public Supply	Magothy	S/11,900	--
7531	LILCO	187	12	145-187	Industrial	Air Cond.	Magothy	NW/7120	654*
7534	U.S. Navy	366	16	288-318 338-366	Industrial	Cooling	Magothy	W/2280	217012
7535	U.S. Navy	357	12	280-298 308-357	Industrial	Cooling	Magothy	NW/2100	189360
7536	U.S. Navy	436	12	373-436	Industrial	Cooling	Magothy	N/1848	13236
7633	U.S. Navy	394	12	314-344 364-394	Industrial	Cooling	Magothy	W/1500	336480
7634	U.S. Navy	373	12	312-373	Industrial	Cooling	Magothy	N/1716	1336
7637	U.S. Navy	490	12	429-480	Industrial	Cooling	Magothy	N/1400	11376
7708	Island Trees Public School	64	8	49-64	Withdrawal	Irrigation	Upper Glacial	S/10,100	--

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NYS Well ID #	Owner/ User	Total Depth of Well (feet)	Diameter of Well (inches)	Screened Interval (feet)	Use of Well	Use of Water	Aquifer Screened	Compass Directions/ Distance(1) (feet)	Pumpage(2)	Pump Per
7832	Village of Farmingdale	497	12	400-487	Withdrawal	Public Supply	--	SE/17,100	1248*	8.
7876	--	68	--	30-68	Industrial	Car Wash	--	S/9300	--	
8004	Bethpage Water Dist.	748	20	679-748	Withdrawal	Public Supply	Magothy	S/9100	82031	11
8019	--	72	--	36-72	Industrial	Cooling	--	S/9400	--	
8072	--	41	--	--	--	--	--	SW/10,400	--	
8134	Grumman	543	16	483-543	Industrial	--	Magothy	SW/2200	5799	1
8154	U.S. Navy	528	12	424-528	Industrial	Cooling	Magothy	SW/1400	548014	1
8163	--	536	--	52-536	--	--	--	SW/3300	--	
8179	Levittown Water Dist.	567	12	189-547	Withdrawal	Public Supply	Magothy	S/13,200	--	
8321	Levittown Water Dist.	674	12	569-674	Withdrawal	Public Supply	--	SW/11,500	1250*	
8434	Grumman	566	12	499-566	Industrial	Cooling	Magothy	S/2376	173789	
8480	N.Y. Water Service Corp.	635	12	556-635	Withdrawal	Public Supply	--	S/15,150	2200*	
8522	Mid Island Hospital	125	10	105-125	Withdrawal	Institutional	Upper Glacial	S/9650	--	
8523	Hicksville Water Dist.	503	20	433-483 493-503	Withdrawal	Public Supply	Magothy	W/6600	300343	
8526	Hicksville Water Dist.	661	20	528-661	Withdrawal	Public Supply	Magothy	W/10,800	196266	
8643	U.S. Navy	487	12	416-487	Industrial	Cooling	Magothy	NW/1650	312225	
8767	Bethpage Water Dist.	640	10	579-640	Withdrawal	Public Supply	Magothy	NE/4750	555918	
8768	Bethpage Water Dist.	678	16	605-678	Withdrawal	Public Supply	Magothy	NE/5000	194371	
8778	Hicksville Water Dist.	590	20	529-590	Withdrawal	Public Supply	Magothy	NW/6872	87657	

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8778	Hicksville Water Dist.	585	20	524-585	Withdrawal	Public Supply	Magothy	NW/3900	221640
8799	Wheatley Hills G & C	221	8	190-221	Withdrawal	Irrigation	Magothy	S/9200	--
8816	U.S. Navy	500	12	450-500	Industrial	General	Magothy	E/2000	148019
8842	Grumman	570	12	519-570	Industrial	Multi-Purpose	Magothy	S/2600	106294
8941	Bethpage Water Dist.	778	12	698-728 750-775	Withdrawal	Public Supply	Magothy	S/7300	393563
9079	NCDPW	70	4	--	Observation	--	Upper Glacial	W/3300	--
9086	NCDPW	68	4	--	Observation	--	Upper Glacial	NW/9000	--
9106	McLellan Stores	60	4	53-60	Withdrawal	Air Cond.	--	SE/15,100	30*
9180	Hicksville Water Dist.	630	20	545-567 586-630	Withdrawal	Public Supply	Magothy	W/6072	346335
9338	N.Y. Water Services Corp.	646	10	584-646	Withdrawal	Public Supply	--	S/15,350	1725*
9392	Bethpage Water Dist.	682	20	616-682	Withdrawal	Public Supply	Magothy	E/6000	37672
9434	NCDPW	53	2	--	Observation	--	Upper Glacial	S/10,000	--
9461	NCDPW	37	2	--	Observation	--	Upper Glacial	SE/11,400	--
9918	NCDPW	77	4	--	Observation	--	Magothy	SW/6200	--
9920	NCDPW	89	4	--	Observation	--	Magothy	NW/7400	--
9921	NCDPW	68	4	--	Observation	--	Upper Glacial	S/3658	--
9927	NCDPW	94	4	--	Observation	--	Upper Glacial	NW/11,400	--
9929	NCDPW	48	4	--	Observation	--	Upper Glacial	S/9400	--
9931	NCDPW	73	4	--	Observation	--	Upper Glacial	E/1650	--
9932	NCDPW	105	4	--	Observation	--	Upper Glacial	E/6000	--
9935	NCDPW	138	4	--	Observation	--	Magothy	NE/12,500	--
10308	Hicksville Water Dist.	649	12	572-649	Withdrawal	Public Supply	--	SW/6000	1387*

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10555	Hicksville Water Dist.	693	12	608-693	Withdrawal	Public Supply	--	NW/7200	1380*	
10588	USGS	76	2	70.5-74.5	Observation	--	Upper Glacial	W/7600	--	
10589	USGS	76	2	73-76	Observation	--	Upper Glacial	W/5800	--	
10590	USGS	76	2	73-76	Observation	--	Upper Glacial	W/4106	--	
10591	USGS	78	2	72-76	Observation	--	Upper Glacial	NE/4100	--	
10592	USGS	73	2	67-71	Observation	--	Upper Glacial	E/5450	--	
10593	USGS	77	2	73-77	Observation	--	Upper Glacial	NW/3000	--	
10594	USGS	76	2	73-76	Observation	--	Upper Glacial	NW/2150	--	
10595	USGS	67	2	63-67	Observation	--	Upper Glacial	S/350	--	
10596	USGS	71	2	68-71	Observation	--	Upper Glacial	W/2500	--	
10597	USGS	66	2	63-66	Observation	--	Upper Glacial	W/3500	--	
10598	USGS	77	2	73-77	Observation	--	Upper Glacial	W/3500	--	
10599	USGS	67	2	63-67	Observation	--	Upper Glacial	S/3278	--	
10600	USGS	61	2	57-61	Observation	--	Upper Glacial	S/4244	--	
10601	USGS	67	2	63-67	Observation	--	Upper Glacial	S/4100	--	
10602	USGS	56	2	52-56	Observation	--	Upper Glacial	S/6100	--	
10603	USGS	61	2	57-61	Observation	--	Upper Glacial	S/6969	--	
10623	USGS	72	2	68-72	Observation	--	Upper Glacial	NE/750	--	
10624	USGS	194	2	190-194	Observation	--	Upper Glacial	S/4800	--	
10625	USGS	67	2	63-67	Observation	--	Upper Glacial	SE/1000	--	
10626	USGS	67	2	63-67	Observation	--	Upper Glacial	SE/2600	--	
10627	USGS	318	4	300	Observation	--	Upper Glacial	S/3037	--	
10628	USGS	67	2	63-67	Observation	--	Upper Glacial	SE/5350	--	
10629	USGS	109	2	105-109	Observation	--	--	S/350	--	
10630	USGS	300	4	280-285	Observation	--	--	SW/3500	--	
10631	USGS	67	2	63-67	Observation	--	--	S/3800	--	

Table 1. Wells Within a three-Mile Radius of Grumman Aerospace Corporation, Bethpage, New York.

NYS Well ID #	Owner/ User	Total Depth of Well (feet)	Diameter of Well (inches)	Screened Interval (feet)	Use of Well	Use of Water	Aquifer Screened	Compass Directions/ Distance(1) (feet)	Pumpage(2)	Pe
10632	USGS	67	2	63-67	Observation	--	--	SE/3950	--	
10633	USGS	67	2	63-67	Observation	--	--	SE/5120	--	
10634	USGS	67	2	63-67	Observation	--	--	SE/5200	--	
10635	USGS	45	2	45-49	Observation	--	--	S/6250	--	
10636	USGS	56	2	52-56	Observation	--	--	SW/6200	--	
10812	USGS	93	2	89-93	Observation	--	Magothy	NW/4050	--	
10813	USGS	67	2	63-67	Observation	--	Upper Glacial	S/4750	--	
10814	USGS	72	2	68-72	Observation	--	Magothy	SE/7300	--	
10815	USGS	61	2	57-61	Observation	--	Upper Glacial	SW/7700	--	
10817	USGS	51	2	47-51	Observation	--	Upper Glacial	SE/8,900	--	
10818	USGS	56	2	52-56	Observation	--	--	SE/8000	--	
10820	USGS	72	2	68-72	Observation	--	Magothy	W/6000	--	
10821	USGS	56	2	52-56	Observation	--	--	SE/6700	--	
10822	USGS	130	2	126-130	Observation	--	--	S/3950	--	
10977	DPW	693.5	4	668-693.5	Observation	--	--	SE/8200	--	
10997	USGS	525.3	4	510-525	Withdrawal	Public Supply	--	--	--	
10998	USGS	324	2	309-324	Withdrawal	Public Supply	--	--	--	
10999	USGS	335	4	320-335	Withdrawal	Public Supply	--	--	--	
11000	USGS	131	2	121-131	--	--	--	--	--	
11004	Village of Farmingdale	347	12	260-347	Withdrawal	Public Supply	--	SE/12000	1287*	
11145	--	--	--	--	--	--	--	SE/12000	--	
A-1	Hooker/Ruco	67	2	54-67	Observation	--	--	NW/3896	--	
A-2	Hooker/Ruco	112	2	105-112	Observation	--	--	NW/3896	--	
B-1	Hooker/Ruco	69	2	49-69	Observation	--	--	NW/4000	--	
B-2	Hooker/Ruco	104	2	86-104	Observation	--	--	NW/4000	--	
C-1	Hooker/Ruco	70	2	50-70	Observation	--	--	NW/3300	--	

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NYS Well ID #	Owner/ User	Total Depth of Well (feet)	Diameter of Well (inches)	Screened Interval (feet)	Use of Well	Use of Water	Aquifer Screened	Compass Directions/ Distance(1) (feet)	Pumpage(2)	Pumpage Period
C-2	Hooker/Ruco	124	2	114-124	Observation	--	--	NW/3300	--	--
D-1	Hooker/Ruco	65	2	45-65	Observation	--	--	NW/3100	--	--
D-2	Hooker/Ruco	91	2	86-91	Observation	--	--	NW/3100	--	--
E-1	Hooker/Ruco	66	2	46-66	Observation	--	--	NW/3000	--	--
E-2	Hooker/Ruco	90	2	75-90	Observation	--	--	NW/3000	--	--
F-1	Hooker/Ruco	68	2	47.5-67.5	Observation	--	--	NW/2850	--	--
F-2	Hooker/Ruco	110	2	90-110	Observation	--	--	NW/2850	--	--

-- The information was either not available or not applicable.
* Units are in gallons per minute (gpm).
(1) Distance from center of Grumman facility.
(2) Units are in thousands of gallons unless indicated differently.
(3) Well has been abandoned.

Sources:

USGS (1982, 1987, 1988)
NYSDEC (1984, 1987, 1988)
LBG (1984)
Kilburn (1982)

A.2 Table 2 - Volatile Organic Compounds Detected in Wells Within a Three-Mile Radius of the Grumman Aerospace Corporation, Bethpage New York

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	1232	1937	1937	2240	2580	2580
Sample Date:	9/82	7/86	8/86	10/82	6/86	12/87
Well Depth (ft):	57	151	151	89	357	357
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<1	<1	140	<1	<1
Tetrachloroethylene	<1	<1	<1	22	<1	<1
1,1,2-Trichlorotrifluoroethane	<1	<1	--	<1	<9	<1
1,1,1-Trichloroethane	<1	<4	3	1	<1	<1
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	--
Chloroform	<1	<1	<1	1	<1	<1
Bromoform	<1	<1	<2	<1	<2	<1
Vinyl chloride	--	<1	--	--	--	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	<5	<1	--	<5	<9	--
Dibromochloromethane	<1	<1	<1	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<4	4	<9	<4	<11	--
1,2-Dichloroethane	<4	<1	--	<4	--	<1
1,1-Dichloroethylene	<1	<1	--	<1	<9	--
Benzene	<4	<1	<3	<4	<4	<1
Chlorobenzene	<5	<1	<9	<5	<7	--
Dichlorobenzene	<10	--	<20	<10	<16	--
Ethylbenzene	<3	<1	<6	<3	<5	<1
Toluene	<4	<1	<7	<4	<5	<1
Xylene	<4	--	<9	<4	<9	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	4	3	164	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	2580	2580	2580	2580	3618	3618
Sample Date:	3/88	6/88	9/88	12/88	11/86	3/88
Well Depth (ft):	357	357	357	357	420	420
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<0.5	<0.5	<0.5	<1	<1
Tetrachloroethylene	<0.5	<0.5	<0.5	<0.5	<1	1
1,1,2-Trichlorotrifluoroethane	<0.5	<0.5	<0.5	<0.5	<8	<8
1,1,1-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<1	<1
1,1,2-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<2	<2
Chloroform	1	<0.5	<0.5	1	<1	<1
Bromoform	<0.5	<0.5	<0.5	<0.5	<2	<1
Vinyl chloride	<0.5	<0.5	<0.5	<0.5	<1	--
Carbon tetrachloride	<0.5	<0.5	<0.5	<0.5	<1	<1
Methylene chloride	<0.5	<0.5	<0.5	<0.5	--	<8
Dibromochloromethane	<0.5	<0.5	<0.5	<0.5	<1	<1
Bromodichloromethane	<0.5	<0.5	<0.5	<0.5	<1	<1
1,1-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<5	<5
1,2-Dichloroethane	<0.5	<0.5	<0.5	<0.5	--	--
1,1-Dichloroethylene	<0.5	<0.5	<0.5	<0.5	--	<8
Benzene	<0.5	<0.5	<0.5	<0.5	<3	<3
Chlorobenzene	<0.5	<0.5	<0.5	<0.5	<3	<3
Dichlorobenzene	--	--	--	--	<25	<30
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<5	<6
Toluene	<0.5	<0.5	<0.5	<0.5	<3	<3
Xylene	--	--	--	--	<6	<8
Trichlorofluoromethane	--	--	--	--	<1	--
1,2-Dichloroethylene	--	--	--	--	<5	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	1	0	0	1	0	1

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	3876	3876	4043	4043	4043	4043
Sample Date:	11/86	3/88	1/86	2/86	5/87	12/87
Well Depth (ft):	385	385	374	374	374	374
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	6	2	<1	<1	<1	<1
Tetrachloroethylene	<1	<1	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<8	<8	<8	<1	<1	<10
1,1,1-Trichloroethane	<1	<1	<1	<10	<1	<1
1,1,2-Trichloroethane	<2	<2	<1	<1	<1	<1
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<1	<2	<1	<1	<1
Vinyl chloride	<1	--	--	<1	<1	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	--	--	<8	<2	<1	<10
Dibromochloromethane	1	<1	<1	<1	<1	<2
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<5	<14	<1	<1	<5
1,2-Dichloroethane	--	--	--	<1	<1	--
1,1-Dichloroethylene	--	--	<8	<1	<1	<10
Benzene	<3	<3	<3	<1	<1	<3
Chlorobenzene	<3	<3	<3	<1	<1	<3
Dichlorobenzene	<25	<30	<9	--	--	<20
Ethylbenzene	<5	<6	<6	<1	<1	<5
Toluene	<3	<3	<6	<1	<1	<3
Xylene	<6	<8	<6	--	--	<6
Trichlorofluoromethane	<1	--	--	--	--	--
1,2-Dichloroethylene	<5	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	7	2	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	4043	4043	4043	4043	4043	4043
Sample Date:	2/88	4/88	7/88	10/88	12/88	1/89
Well Depth (ft):	374	374	374	374	374	374
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Tetrachloroethylene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
1,1,2-Trichlorotrifluoroethane	--	--	--	--	--	--
1,1,1-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<1	<0.5
1,1,2-Trichloroethane	<0.5	<0.5	<0.5	<0.5	--	<0.5
Chloroform	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Bromoform	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Vinyl chloride	<0.5	<0.5	<0.5	<0.5	--	<0.5
Carbon tetrachloride	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Methylene chloride	<0.5	<0.5	<0.5	<0.5	--	<0.5
Dibromochloromethane	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Bromodichloromethane	<0.5	<0.5	<0.5	<0.5	<1	<0.5
1,1-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<1	<0.5
1,2-Dichloroethane	<0.5	<0.5	<0.5	<0.5	--	<0.5
1,1-Dichloroethylene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Benzene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Chlorobenzene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Dichlorobenzene	--	--	--	--	<1	--
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Toluene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Xylene	--	--	--	--	<1	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	4043	4451	4451	5302	5302	5302
Sample Date:	4/89	11/86	2/88	1/86	1/87	12/87
Well Depth (ft):	374	408	408	487	487	487
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<1	<1	<1	<1	<1
Tetrachloroethylene	<0.5	4	9	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	--	<8	<9	<8	<9	<1
1,1,1-Trichloroethane	<0.5	<1	<1	<1	<2	<1
1,1,2-Trichloroethane	<0.5	<2	<1	<1	<4	--
Chloroform	<0.5	<1	<1	<1	<1	<1
Bromoform	<0.5	<2	<2	<2	<3	<1
Vinyl chloride	<0.5	<1	--	--	--	--
Carbon tetrachloride	<0.5	<1	<1	<1	<1	<1
Methylene chloride	<0.5	--	--	<8	<9	--
Dibromochloromethane	<0.5	<1	<2	<1	<3	<1
Bromodichloromethane	<0.5	<1	<1	<1	<2	<1
1,1-Dichloroethane	<0.5	<5	<6	<14	<6	--
1,2-Dichloroethane	<0.5	--	--	--	--	<1
1,1-Dichloroethylene	<0.5	--	--	<8	<9	--
Benzene	<0.5	<3	<3	<3	<3	<1
Chlorobenzene	<0.5	<3	<5	<3	<4	--
Dichlorobenzene	--	<25	<20	<9	<32	--
Ethylbenzene	<0.5	<5	<7	<6	<3	<1
Toluene	<0.5	<3	<4	<6	<3	<1
Xylene	--	<6	<8	<6	<4	--
Trichlorofluoromethane	--	<1	--	--	--	--
1,2-Dichloroethylene	--	<5	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	4	9	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	5302	5302	5302	5302	5302	5302
Sample Date:	3/88	6/88	8/88	9/88	12/88	3/89
Well Depth (ft):	487	487	487	487	487	487
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	--	<1	<0.5	<0.5	<0.5
Tetrachloroethylene	<0.5	--	<1	<0.5	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	<0.5	--	<10	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	<0.5	--	<1	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	<0.5	--	<1	<0.5	<0.5	<0.5
Chloroform	<0.5	--	2	3	<0.5	<0.5
Bromoform	<0.5	--	<2	<0.5	<0.5	<0.5
Vinyl chloride	<0.5	--	--	<0.5	<0.5	<0.5
Carbon tetrachloride	<0.5	--	<1	<0.5	<0.5	<0.5
Methylene chloride	<0.5	--	<10	<0.5	<0.5	<0.5
Dibromochloromethane	<0.5	--	<2	<0.5	<0.5	<0.5
Bromodichloromethane	<0.5	--	<2	<0.5	<0.5	<0.5
1,1-Dichloroethane	<0.5	--	<2	<0.5	<0.5	<0.5
1,2-Dichloroethane	<0.5	--	--	<0.5	<0.5	<0.5
1,1-Dichloroethylene	<0.5	--	<10	<0.5	<0.5	<0.5
Benzene	<0.5	<0.5	<3	<0.5	<0.5	<0.5
Chlorobenzene	<0.5	<0.5	<5	<0.5	<0.5	<0.5
Dichlorobenzene	--	--	<12	--	--	--
Ethylbenzene	<0.5	<0.5	<4	<0.5	<0.5	<0.5
Toluene	<0.5	<0.5	<5	<0.5	<0.5	<0.5
Xylene	--	--	<3	--	--	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	2	3	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	6150	6150	6150	6150	6150	6150
Sample Date:	1/86	2/86	6/87	12/87	3/88	4/88
Well Depth (ft):	612	612	612	612	612	612
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<1	<1	<1	<0.5	<0.5
Tetrachloroethylene	<1	<1	<1	<1	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	<8	<1	<1	<10	--	--
1,1,1-Trichloroethane	<1	<10	<1	<1	<0.5	<0.5
1,1,2-Trichloroethane	<1	<1	<1	<1	<0.5	<0.5
Chloroform	<1	<1	<1	<1	<0.5	<0.5
Bromoform	<2	<1	<1	<1	<0.5	<0.5
Vinyl chloride	--	<1	<1	--	<0.5	<0.5
Carbon tetrachloride	<1	<1	<1	<1	<0.5	<0.5
Methylene chloride	<8	<2	<1	<10	<0.5	<0.5
Dibromochloromethane	<1	<1	<1	<2	<0.5	<0.5
Bromodichloromethane	<1	<1	<1	<1	<0.5	<0.5
1,1-Dichloroethane	<14	<1	<1	<5	<0.5	<0.5
1,2-Dichloroethane	--	<1	<1	--	<0.5	<0.5
1,1-Dichloroethylene	<8	<1	<1	<10	<0.5	<0.5
Benzene	<3	<1	<1	<3	<0.5	<0.5
Chlorobenzene	<3	<1	<1	<3	<0.5	<0.5
Dichlorobenzene	<9	--	--	<20	--	--
Ethylbenzene	<6	<1	<1	<5	<0.5	<0.5
Toluene	<6	<1	<1	<3	<0.5	<0.5
Xylene	<6	--	--	<6	--	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	6150	6150	6150	6150	6192	6193
Sample Date:	7/88	10/88	1/89	4/89	4/86	3/86
Well Depth (ft):	612	612	612	612	632	472
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<0.5	<0.5	<0.5	<1	<1
Tetrachloroethylene	<0.5	<0.5	<0.5	<0.5	<1	<1
1,1,2-Trichlorotrifluoroethane	--	--	--	--	<1	<1
1,1,1-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<10	<10
1,1,2-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<1	<1
Chloroform	<0.5	<0.5	<0.5	<0.5	--	<1
Bromoform	<0.5	<0.5	<0.5	<0.5	<1	<1
Vinyl chloride	<0.5	<0.5	<0.5	<0.5	<1	<1
Carbon tetrachloride	<0.5	<0.5	<0.5	<0.5	<1	<1
Methylene chloride	<0.5	<0.5	<0.5	<0.5	--	<1
Dibromochloromethane	<0.5	<0.5	<0.5	<0.5	<1	<1
Bromodichloromethane	<0.5	<0.5	<0.5	<0.5	<1	<1
1,1-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<1	<1
1,2-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<1	<1
1,1-Dichloroethylene	<0.5	<0.5	<0.5	<0.5	--	<1
Benzene	<0.5	<0.5	<0.5	<0.5	--	<1
Chlorobenzene	<0.5	<0.5	<0.5	<0.5	<1	<1
Dichlorobenzene	--	--	--	--	--	--
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	--	<1
Toluene	<0.5	<0.5	<0.5	<0.5	--	<1
Xylene	--	--	--	--	--	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	6417	6417	6580	6644	6644	6644
Sample Date:	8/82	7/86	11/86	7/86	8/86	10/87
Well Depth (ft):	60	60	601	227	227	227
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	1	<1	<1	<1	<1	<1
Tetrachloroethylene	2	1	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	--	<9	<8	<1	--	--
1,1,1-Trichloroethane	28	7	<1	<5	<1	<1
1,1,2-Trichloroethane	<1	<1	<2	<1	<1	<1
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<1	<2	<2	<1	<2	<1
Vinyl chloride	--	--	<1	<1	--	<1
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	14*	<9	<8	<1	--	<1
Dibromochloromethane	<1	<1	<1	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	23	<11	<5	<1	<9	<1
1,2-Dichloroethane	<5	--	--	<1	--	<1
1,1-Dichloroethylene	2	<9	<8	<1	--	<1
Benzene	<4	<4	<3	<1	<3	<2
Chlorobenzene	<5	<7	<3	<1	<9	<1
Dichlorobenzene	<10	<10	<25	--	<20	--
Ethylbenzene	<3	<5	<5	<1	<6	<2
Toluene	<4	<5	<3	<1	<7	<2
Xylene	<4	<9	<6	--	<9	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	70*	8	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	6644	6644	6644	6644	6644	6644
Sample Date:	12/87	3/88	6/88	9/88	11/88	12/88
Well Depth (ft):	227	227	227	227	227	227
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	1	0.7	<0.5	1.4	1	0.6
Tetrachloroethylene	<1	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	<8	--	--	--	--	--
1,1,1-Trichloroethane	1	<0.5	<0.5	1.9	<0.5	0.6
1,1,2-Trichloroethane	<1	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	<1	0.8	<0.5	<0.5	<0.5	<0.5
Bromoform	<2	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	--	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	<1	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	<8	<0.5	<0.5	<5	<0.5	<0.5
Dibromochloromethane	<1	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	<1	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	<6	0.5	<0.5	0.9	<0.5	<0.5
1,2-Dichloroethane	--	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	<8	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	<3	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	<3	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorobenzene	<30	--	--	--	--	--
Ethylbenzene	<5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	<3	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene	<8	--	--	--	--	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	2	2	0	4.2	1	1.2

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	6644	6644	6915	6916	6916	7004
Sample Date:	3/89	6/89	11/86	11/86	3/88	10/86
Well Depth (ft):	227	227	516	613	613	150
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<0.5	<1	<1	<1	59
Tetrachloroethylene	<0.5	<0.5	<1	<1	<1	5
1,1,2-Trichlorotrifluoroethane	--	--	<8	<8	<8	<8
1,1,1-Trichloroethane	<0.5	<0.5	<1	<1	<1	<1
1,1,2-Trichloroethane	<0.5	<0.5	<2	<2	<2	<2
Chloroform	<0.5	<0.5	--	15	<1	<1
Bromoform	<0.5	<0.5	3	3	<1	<2
Vinyl chloride	<0.5	<0.5	<1	<1	--	--
Carbon tetrachloride	<0.5	<0.5	<1	<1	<1	<1
Methylene chloride	<0.5	<0.5	<8	<8	<8	<8
Dibromochloromethane	<0.5	<0.5	--	--	<1	<1
Bromodichloromethane	<0.5	<0.5	1	1	<1	<1
1,1-Dichloroethane	<0.5	<0.5	<5	<5	<5	<5
1,2-Dichloroethane	<0.5	<0.5	--	--	--	--
1,1-Dichloroethylene	<0.5	<0.5	<8	<8	<8	<8
Benzene	<0.5	<0.5	<3	<3	<3	<3
Chlorobenzene	<0.5	<0.5	<3	<3	<3	<6
Dichlorobenzene	--	--	<25	<25	<30	<20
Ethylbenzene	<0.5	<0.5	<5	<5	<6	<10
Toluene	<0.5	<0.5	<3	<3	<3	<4
Xylene	--	--	<6	<6	<8	<10
Trichlorofluoromethane	--	--	<1	<1	--	<1
1,2-Dichloroethylene	--	--	<5	<5	--	9
1,3-Dichloropropene	--	--	2	2	--	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	6	21	0	73

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	7004	7076	7076	7377	7377	7377
Sample Date:	5/87	11/86	1/88	3/86	5/86	7/86
Well Depth (ft):	150	674	674	758	758	758
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	54	<1	<1	<1	<1	<1
Tetrachloroethylene	4	<1	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<7	<8	<11	<1	<1	<9
1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	<2	<2	<3	<1	<1	<1
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<1	<1	<1	<2
Vinyl chloride	<1	<1	--	<1	<1	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	<7	<8	<11	<1	<1	<9
Dibromochloromethane	<2	<1	<1	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<5	<6	<1	<1	<11
1,2-Dichloroethane	--	--	--	<1	<1	--
1,1-Dichloroethylene	<7	<8	<11	<1	<1	<9
Benzene	<3	<3	<3	<1	<1	<4
Chlorobenzene	<4	<3	<4	<1	<1	<7
Dichlorobenzene	<20	<25	<20	--	--	<16
Ethylbenzene	<4	<5	<5	<1	<1	<5
Toluene	<4	<3	<4	<1	<1	<5
Xylene	<6	<6	<6	--	--	<9
Trichlorofluoromethane	--	<1	--	--	--	--
1,2-Dichloroethylene	7	<5	--	--	--	--
1,3-Dichloropropene	<2	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	65	0	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	7377	7377	7377	7377	7377	7377
Sample Date:	5/87	3/88	6/88	7/88	10/88	12/88
Well Depth (ft):	758	758	758	758	758	758
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<0.5	<0.5	<0.5	<0.5	<1
Tetrachloroethylene	<1	<0.5	<0.5	<0.5	<0.5	<1
1,1,2-Trichlorotrifluoroethane	<1	--	--	--	--	--
1,1,1-Trichloroethane	<1	<0.5	<0.5	<0.5	<0.5	<1
1,1,2-Trichloroethane	<1	<0.5	<0.5	<0.5	<0.5	--
Chloroform	<1	<0.5	<0.5	<0.5	<0.5	<1
Bromoform	<1	<0.5	<0.5	<0.5	<0.5	<1
Vinyl chloride	<1	<0.5	<0.5	<0.5	<0.5	--
Carbon tetrachloride	<1	<0.5	<0.5	<0.5	<0.5	<1
Methylene chloride	<1	<0.5	<0.5	<0.5	<0.5	--
Dibromochloromethane	<1	<0.5	<0.5	<0.5	<0.5	<1
Bromodichloromethane	<1	<0.5	<0.5	<0.5	<0.5	<1
1,1-Dichloroethane	<1	<0.5	<0.5	<0.5	<0.5	<1
1,2-Dichloroethane	<1	<0.5	<0.5	<0.5	<0.5	--
1,1-Dichloroethylene	<1	<0.5	<0.5	<0.5	<0.5	<1
Benzene	<1	<0.5	<0.5	<0.5	<0.5	<1
Chlorobenzene	<1	<0.5	<0.5	<0.5	<0.5	<1
Dichlorobenzene	--	--	--	--	--	--
Ethylbenzene	<1	<0.5	<0.5	<0.5	<0.5	--
Toluene	<1	<0.5	<0.5	<0.5	<0.5	--
Xylene	--	--	--	--	--	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	7377	7515	7515	7515	7515	7515
Sample Date:	3/89	2/86	11/86	5/87	12/87	2/88
Well Depth (ft):	758	352	352	352	352	352
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<1	<1	<1	<1	<0.5
Tetrachloroethylene	<0.5	<1	<1	<1	<1	<0.5
1,1,2-Trichlorotrifluoroethane	--	<1	<8	<1	<10	--
1,1,1-Trichloroethane	<0.5	<5	<1	<1	<1	<0.5
1,1,2-Trichloroethane	<0.5	<1	<2	<1	<1	<0.5
Chloroform	2.60	<1	<1	<1	<1	<0.5
Bromoform	<0.5	<1	<2	<1	<1	<0.5
Vinyl chloride	<0.5	<1	--	<1	--	<0.5
Carbon tetrachloride	<0.5	<1	<1	<1	<1	<0.5
Methylene chloride	<0.5	<2	<8	<1	<10	<0.5
Dibromochloromethane	<0.5	<1	<1	<1	<2	<0.5
Bromodichloromethane	0.5	<1	<1	<1	<1	<0.5
1,1-Dichloroethane	<0.5	<1	<5	<1	<5	<0.5
1,2-Dichloroethane	<0.5	<1	--	<1	--	<0.5
1,1-Dichloroethylene	<0.5	<1	<8	<1	<10	<0.5
Benzene	<0.5	<1	<3	<1	<3	<0.5
Chlorobenzene	<0.5	<1	<3	<1	<3	<0.5
Dichlorobenzene	--	--	<25	--	<20	--
Ethylbenzene	<0.5	<1	<5	<1	<5	<0.5
Toluene	<0.5	<1	<3	<1	<3	<0.5
Xylene	--	--	<6	--	<6	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	3.1	0	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	7515	7515	7515	7515	7515	7516
Sample Date:	4/88	7/88	10/88	1/89	4/89	3/86
Well Depth (ft):	352	352	352	352	352	589
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Tetrachloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1,2-Trichlorotrifluoroethane	--	--	--	--	--	<1
1,1,1-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1,2-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Chloroform	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Bromoform	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Vinyl chloride	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Carbon tetrachloride	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Methylene chloride	<0.5	<0.8	<0.5	<0.5	<0.5	<1
Dibromochloromethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Bromodichloromethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,2-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1-Dichloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Chlorobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Dichlorobenzene	--	--	--	--	--	--
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Xylene	--	--	--	--	--	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	7516	7516	7516	7516	7516	7516
Sample Date:	3/88	5/88	8/88	10/88	12/88	1/89
Well Depth (ft):	589	589	589	589	589	589
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Tetrachloroethylene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
1,1,2-Trichlorotrifluoroethane	--	--	--	--	--	--
1,1,1-Trichloroethane	<0.5	--	<0.5	<0.5	<1	<0.5
1,1,2-Trichloroethane	<0.5	<0.5	<0.5	<0.5	--	<0.5
Chloroform	<0.5	--	<0.5	<0.5	<1	<0.5
Bromoform	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Vinyl chloride	<0.5	<0.5	<0.5	<0.5	--	<0.5
Carbon tetrachloride	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Methylene chloride	<0.5	<0.5	<3.5	<0.5	--	<0.5
Dibromochloromethane	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Bromodichloromethane	<0.5	<0.5	<0.5	<0.5	<1	<0.5
1,1-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<1	<0.5
1,2-Dichloroethane	<0.5	<0.5	<0.5	<0.5	--	<0.5
1,1-Dichloroethylene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Benzene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Chlorobenzene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Dichlorobenzene	--	--	--	--	<1	--
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Toluene	<0.5	<0.5	<0.5	<0.5	<1	<0.5
Xylene	--	--	--	--	<1	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	7516	7518	7518	7534	7534	7535
Sample Date:	4/89	9/86	7/88	10/86	7/88	10/86
Well Depth (ft):	589	375	375	366	366	357
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	7	7	62	130	150
Tetrachloroethylene	<0.5	<1	<1	84	96	50
1,1,2-Trichlorotrifluoroethane	--	<10	<9	26	--	110
1,1,1-Trichloroethane	<0.5	5	5	24	17	75
1,1,2-Trichloroethane	<0.5	<2	<2	<2	<2	<2
Chloroform	<0.5	<1	<1	<1	<1	<1
Bromoform	<0.5	<3	<2	<2	<2	<2
Vinyl chloride	<0.5	<1	<1	170	--	4
Carbon tetrachloride	<0.5	<1	<1	<1	<1	<1
Methylene chloride	<0.5	<10	--	--	--	--
Dibromochloromethane	<0.5	<1	<2	<1	<2	<1
Bromodichloromethane	<0.5	<1	<1	<1	<1	<1
1,1-Dichloroethane	<0.5	<9	<5	<5	<5	<5
1,2-Dichloroethane	<0.5	--	--	--	--	--
1,1-Dichloroethylene	<0.5	<10	--	--	--	--
Benzene	<0.5	<3	<3	<3	<3	<3
Chlorobenzene	<0.5	<5	<4	<3	<4	<3
Dichlorobenzene	--	<25	<17	<25	<17	<25
Ethylbenzene	<0.5	<4	<4	<5	<4	<5
Toluene	<0.5	<5	<4	<3	<4	<3
Xylene	--	<6	<5	<20	<5	<6
Trichlorofluoromethane	--	<1	<1	<1	<1	88*
1,2-Dichloroethylene	--	<4	<8	38	82	<5
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	12	12	404	325	477*

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	7535	7536	7536	7635	7635	7636
Sample Date:	7/88	9/86	7/88	9/86	7/88	10/86
Well Depth (ft):	357	436	436	394	394	373
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	68	59	82	810	1600	3
Tetrachloroethylene	160	5	7	130	88	4
1,1,2-Trichlorotrifluoroethane	37	10	22	47	--	<8
1,1,1-Trichloroethane	130	37	55	12	10	6
1,1,2-Trichloroethane	<2	<2	<1	<2	<2	<2
Chloroform	2	<1	<1	<1	<1	<1
Bromoform	<2	<3	<2	<2	<2	<2
Vinyl chloride	<1	<1	4	8.7	2	--
Carbon tetrachloride	3	<1	<1	<1	<1	<1
Methylene chloride	--	--	--	--	--	--
Dibromochloromethane	<2	<1	<1	<1	<2	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<9	<4	<5	<5	<5
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	--	--	--	--	--	--
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<4	<5	<3	<6	<4	<6
Dichlorobenzene	<17	<25	<20	<20	<17	<20
Ethylbenzene	<4	<6	<4	<10	<4	<10
Toluene	<4	<5	<3	<4	<4	<4
Xylene	<5	<6	<5	<10	<5	<10
Trichlorofluoromethane	55	<2	<1	<1	<1	<1
1,2-Dichloroethylene	<8	<4	<8	25	25	<4
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	455	111	170	1032.7	1725	13

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	7636	7637	7637	7798	7852	7852
Sample Date:	7/88	9/86	7/88	5/87	7/86	8/86
Well Depth (ft):	436	490	490	64	457	457
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	54	13	14	<1	<1	<1
Tetrachloroethylene	5	6	5	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<10	<10	<10	<7	<1	--
1,1,1-Trichloroethane	9	2	2	<1	<2	<1
1,1,2-Trichloroethane	<1	<2	<1	<2	<1	<1
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<3	<2	<2	<1	<2
Vinyl chloride	3	<1	1	<1	<1	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	--	--	--	--	<1	--
Dibromochloromethane	<1	<1	<1	<2	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<4	<9	<4	<5	<1	<9
1,2-Dichloroethane	--	--	--	--	<1	--
1,1-Dichloroethylene	--	--	--	--	<1	--
Benzene	<3	<3	<3	<3	<1	<3
Chlorobenzene	<3	<5	<3	<4	<1	<9
Dichlorobenzene	<20	<25	<20	<20	--	<20
Ethylbenzene	<4	<6	<4	<4	<1	<6
Toluene	<3	<5	<3	<4	<1	<7
Xylene	<5	<6	<5	<6	--	<9
Trichlorofluoromethane	<1	<1	<1	<1	--	--
1,2-Dichloroethylene	<8	<4	<8	<7	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	71	21	22	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	7852	7852	7852	7852	7852	7852
Sample Date:	10/87	12/87	3/7/88	6/88	9/88	11/88
Well Depth (ft):	457	457	457	457	457	457
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<1	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	<1	<1	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	--	<8	--	--	--	--
1,1,1-Trichloroethane	<1	<1	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	<1	<1	<0.5	<0.5	<0.5	<0.5
Chloroform	<1	<1	<0.5	<0.5	<0.5	<0.5
Bromoform	<1	<2	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	<1	--	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	<1	<1	<0.5	<0.5	<0.5	<0.5
Methylene chloride	<1	<8	2.5*	<0.5	<6	<0.5
Dibromochloromethane	<1	<1	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	<1	<1	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	<1	<6	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	<1	--	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	<1	<8	<0.5	<0.5	<0.5	<0.5
Benzene	<2	<3	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	<1	<3	<0.5	<0.5	<0.5	<0.5
Dichlorobenzene	--	<30	--	--	--	--
Ethylbenzene	<2	<5	<0.5	<0.5	<0.5	<0.5
Toluene	<2	<3	<0.5	<0.5	<0.5	<0.5
Xylene	--	<8	--	--	--	--
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	2.5*	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	7852	7852	7852	8004	8124	8124
Sample Date:	12/88	3/89	6/89	11/86	10/86	7/88
Well Depth (ft):	457	457	457	745	543	543
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<0.5	<0.5	<1	320	170
Tetrachloroethylene	<0.5	<0.5	<0.5	<1	20	33
1,1,2-Trichlorotrifluoroethane	--	--	--	<8	--	--
1,1,1-Trichloroethane	<0.5	<0.5	<0.5	<1	<1	1
1,1,2-Trichloroethane	<0.5	<0.5	<0.5	<2	<2	<2
Chloroform	<0.5	<0.5	<0.5	<1	<1	<1
Bromoform	<0.5	<0.5	<0.5	<2	<2	<2
Vinyl chloride	<0.5	<0.5	<0.5	<1	--	<1
Carbon tetrachloride	<0.5	<0.5	<0.5	<1	<1	<1
Methylene chloride	<0.5	<0.5	<0.5	--	--	--
Dibromochloromethane	<0.5	<0.5	<0.5	<1	<1	<2
Bromodichloromethane	<0.5	<0.5	<0.5	<1	<1	<1
1,1-Dichloroethane	<0.5	<0.5	<0.5	<5	<5	<5
1,2-Dichloroethane	<0.5	<0.5	<0.5	--	--	--
1,1-Dichloroethylene	<0.5	<0.5	<0.5	--	--	--
Benzene	<0.5	<0.5	<0.5	<3	<3	<3
Chlorobenzene	<0.5	<0.5	<0.5	<3	<6	<4
Dichlorobenzene	--	--	--	<25	<20	<17
Ethylbenzene	<0.5	<0.5	<0.5	<5	<10	<4
Toluene	<0.5	<0.5	<0.5	<3	<4	<4
Xylene	--	--	--	<6	<10	<5
Trichlorofluoromethane	--	--	--	<1	<1	<1
1,2-Dichloroethylene	--	--	--	<5	<4	12
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	0	340	216

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	8154	8154	8321	8321	8321	8321
Sample Date:	9/86	7/88	4/86	3/87	12/87	2/88
Well Depth (ft):	520	520	674	674	674	674
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	500	800	<1	<1	<1	<1
Tetrachloroethylene	27	35	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	37	--	<11	<7	<1	<9
1,1,1-Trichloroethane	8	10	<1	<1	<1	<1
1,1,2-Trichloroethane	<2	<2	<1	<1	--	<1
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<2	<1	--	<2
Vinyl chloride	<1	--	--	--	--	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	--	--	<11	<7	--	<9
Dibromochloromethane	<1	<2	<1	<1	<1	<2
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<5	<18	<4	--	<6
1,2-Dichloroethane	--	--	--	--	<1	--
1,1-Dichloroethylene	37	--	<11	<7	--	<9
Benzene	<3	<3	<3	<3	<1	<3
Chlorobenzene	<6	<4	<4	<4	--	<5
Dichlorobenzene	<20	<17	<15	<10	--	<20
Ethylbenzene	<10	<4	<5	<4	<1	<7
Toluene	<4	<4	--	<4	<1	<4
Xylene	<10	<5	<5	<4	--	<8
Trichlorofluoromethane	<1	<1	--	--	--	--
1,2-Dichloroethylene	18	21	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	627	866	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	8321	8321	8321	8321	8321	8454
Sample Date:	3/88	6/88	9/88	12/88	3/89	9/86
Well Depth (ft):	674	674	674	674	674	560
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Tetrachloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1,2-Trichlorotrifluoroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<10
1,1,1-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1,2-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<2
Chloroform	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Bromoform	<0.5	<0.5	<0.5	<0.5	<0.5	<3
Vinyl chloride	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Carbon tetrachloride	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Methylene chloride	<0.5	<0.5	<0.5	<0.5	<0.5	--
Dibromochloromethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Bromodichloromethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<9
1,2-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	--
1,1-Dichloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	--
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<3
Chlorobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Dichlorobenzene	--	--	--	--	--	<25
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<4
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Xylene	--	--	--	--	--	<6
Trichlorofluoromethane	--	--	--	--	--	<1
1,2-Dichloroethylene	--	--	--	--	--	<4
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDE (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	8454	8480	8480	8480	8480	8480
Sample Date:	7/88	7/86	1/87	9/87	2/88	4/88
Well Depth (ft):	560	655	655	655	655	655
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<1	<1	<1	<0.5	<0.5
Tetrachloroethylene	<1	<1	<1	<1	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	<10	<9	<9	<6	--	--
1,1,1-Trichloroethane	<1	<1	<2	<1	<0.5	<0.5
1,1,2-Trichloroethane	<1	<1	<4	<1	<0.5	<0.5
Chloroform	<1	<1	<1	<1	<0.5	<0.5
Bromoform	<2	<2	<3	<2	<0.5	<0.5
Vinyl chloride	<1	--	--	--	<0.5	<0.5
Carbon tetrachloride	<1	<1	<1	<1	<0.5	<0.5
Methylene chloride	--	<9	<9	<6	<0.5	<0.5
Dibromochloromethane	<1	<1	<3	<1	<0.5	<0.5
Bromodichloromethane	<1	<1	<2	<2	<0.5	<0.5
1,1-Dichloroethane	<4	<11	<6	<5	<0.5	<0.5
1,2-Dichloroethane	--	--	--	--	<0.5	<0.5
1,1-Dichloroethylene	--	<9	<9	<6	<0.5	<0.5
Benzene	<3	<4	<3	<3	<0.5	<0.5
Chlorobenzene	<3	<7	<4	<4	<0.5	<0.5
Dichlorobenzene	<20	<16	<32	<20	--	--
Ethylbenzene	<4	<5	<3	<4	<0.5	<0.5
Toluene	<3	<5	<3	<3	<0.5	<0.5
Xylene	<5	<9	<4	<8	--	--
Trichlorofluoromethane	<1	--	--	--	--	--
1,2-Dichloroethylene	<8	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	8480	8480	8480	8480	8522	8525
Sample Date:	8/88	10/88	3/89	5/89	2/82	9/86
Well Depth (ft):	655	655	655	655	125	303
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<0.5	<0.5	<0.5	2	2
Tetrachloroethylene	<0.5	<0.5	<0.5	<0.5	<1	18
1,1,2-Trichlorotrifluoroethane	--	--	--	--	--	<10
1,1,1-Trichloroethane	<0.5	<0.5	<0.5	<0.5	8	<1
1,1,2-Trichloroethane	<0.5	<0.5	<0.5	<0.5	--	<2
Chloroform	0.5	<0.5	<0.5	<0.5	3	<1
Bromoform	<0.5	<0.5	<0.5	<0.5	<1	<3
Vinyl chloride	<0.5	<0.5	<0.5	<0.5	--	--
Carbon tetrachloride	<0.5	<0.5	<0.5	<0.5	<1	<1
Methylene chloride	<0.5	<0.5	<0.5	<0.5	--	<10
Dibromochloromethane	<0.5	<0.5	<0.5	<0.5	--	<1
Bromodichloromethane	<0.5	<0.5	<0.5	<0.5	<1	<1
1,1-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<30	<9
1,2-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<20	--
1,1-Dichloroethylene	<0.5	<0.5	<0.5	<0.5	<1	<10
Benzene	<0.5	<0.5	<0.5	<0.5	<3	<3
Chlorobenzene	<0.5	<0.5	<0.5	<0.5	<3	<5
Dichlorobenzene	--	--	--	--	<10	<25
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<3	<4
Toluene	<0.5	<0.5	<0.5	<0.5	<3	<5
Xylene	--	--	--	--	<3	<6
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0.5	0	0	0	13	20

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	8526	8643	8643	8676	8767	8768
Sample Date:	9/86	10/86	7/88	11/86	3/88	7/86
Well Depth (ft):	601	467	--	645	645	683
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	2	29	37	<1	<1	<1
Tetrachloroethylene	3	99	120	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<10	<8	<9	<8	<8	<9
1,1,1-Trichloroethane	3	<1	1	<1	<1	<1
1,1,2-Trichloroethane	<2	<2	<2	<2	<2	<1
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<3	<2	<2	<2	<1	<2
Vinyl chloride	--	--	3	<1	--	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	<10	--	--	<8	<8	<9
Dibromochloromethane	<1	<1	<2	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<9	<5	<5	<5	<5	<11
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<10	--	--	<8	<8	<9
Benzene	<3	<3	<3	<3	<3	<4
Chlorobenzene	<5	<6	<4	<3	<3	<7
Dichlorobenzene	<25	<20	<17	<25	<30	<16
Ethylbenzene	<4	<10	<4	<5	<6	<5
Toluene	<5	<4	<4	<3	<3	<5
Xylene	<6	<10	<5	<6	<8	<9
Trichlorofluoromethane	--	<1	<1	<1	--	--
1,2-Dichloroethylene	--	6	20	<5	--	--
1,3-Dichloropropene	--	--	--	<1	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	8	134	181	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	8778	8779	8816	8816	8941	9079
Sample Date:	11/86	8/86	10/86	7/88	11/86	11/82
Well Depth (ft):	590	585	500	--	775	70
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<1	35	11	4	<10
Tetrachloroethylene	<1	<1	6	3	<1	<10
1,1,2-Trichlorotrifluoroethane	<8	<9	<8	<10	<8	--
1,1,1-Trichloroethane	<1	<1	5	4	<1	<10
1,1,2-Trichloroethane	<2	<1	<2	<1	<2	<10
Chloroform	<1	<1	<1	<1	<1	12
Bromoform	<2	<2	<2	<2	<2	<10
Vinyl chloride	<1	--	--	4	<1	<10
Carbon tetrachloride	<1	<1	<1	<1	<1	<10
Methylene chloride	<8	<9	--	--	<8	400*
Dibromochloromethane	<1	<1	<1	<1	<1	<10
Bromodichloromethane	<1	<1	<1	<1	<1	<10
1,1-Dichloroethane	<5	<9	<5	<4	<5	<10
1,2-Dichloroethane	--	--	--	--	--	28
1,1-Dichloroethylene	<8	<9	--	--	<8	<10
Benzene	<3	<3	<3	<3	<3	86
Chlorobenzene	<3	<9	<6	<3	<3	<10
Dichlorobenzene	<25	<20	<20	<20	<25	--
Ethylbenzene	<5	<6	<10	<4	<5	<10
Toluene	<3	<7	<4	<3	<3	<10
Xylene	<6	<9	<10	<5	<6	<10
Trichlorofluoromethane	<1	--	<1	<1	<1	--
1,2-Dichloroethylene	<5	--	<4	<8	<5	--
1,3-Dichloropropene	<2	--	--	--	<1	--
1,2-Dibromoethene	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	46	22	4	526*

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	9079	9079	9079	9079	9088	9088
Sample Date:	10/86	6/88	10/88	5/87	9/82	10/86
Well Depth (ft):	70	70	70	70	68	68
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	12	4	3	7	2	<1
Tetrachloroethylene	<1	<1	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<8	<10	<3	<7	<1	--
1,1,1-Trichloroethane	<5	<1	<1	<1	<1	<5
1,1,2-Trichloroethane	<2	<1	<1	<2	--	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<1	<2	<1	<2
Vinyl chloride	<1	<1	<1	<1	--	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	<8	--	--	<7	7*	10*
Dibromochloromethane	<1	<1	<1	<2	--	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<4	8	<5	<4	<5
1,2-Dichloroethane	--	--	--	--	<4	--
1,1-Dichloroethylene	<8	--	<25	<7	<1	--
Benzene	<18	130	250	60	<4	<18
Chlorobenzene	<6	<3	<3	<4	<5	<6
Dichlorobenzene	<20	<20	<15	<20	<10	<20
Ethylbenzene	<10	<4	<3	<4	<3	<10
Toluene	<4	<3	<6	<4	<4	<4
Xylene	<10	14	22	<6	<4	<10
Trichlorofluoromethane	<1	<1	<1	<1	--	<1
1,2-Dichloroethylene	<4	14	<6	15	--	<4
1,3-Dichloropropene	<1	--	--	<2	--	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	12	162	283	82	9*	10*

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	9088	9180	9338	9338	9338	9338
Sample Date:	9/87	11/86	2/86	10/86	1/87	9/87
Well Depth (ft):	68	635	646	646	646	646
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	1	<1	<1	<1	<1
Tetrachloroethylene	2	20	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<6	<8	--	<8	<9	<6
1,1,1-Trichloroethane	<1	<1	<1	<5	<2	<1
1,1,2-Trichloroethane	<1	<2	<1	<2	<4	<1
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<1	<2	<3	<2
Vinyl chloride	--	<1	<1	--	--	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	<6	<8	<1	<8	<9	<6
Dibromochloromethane	<1	<1	<1	<1	<3	<1
Bromodichloromethane	<2	<1	<1	<1	<2	<2
1,1-Dichloroethane	<5	<5	<1	<5	<6	<5
1,2-Dichloroethane	--	--	<1	--	--	--
1,1-Dichloroethylene	<6	<8	<1	<8	<9	<6
Benzene	<3	<3	<1	<18	<3	<3
Chlorobenzene	<4	<3	<1	<6	<4	<4
Dichlorobenzene	<20	<25	--	<20	<32	<20
Ethylbenzene	<4	<5	<1	<10	<3	<4
Toluene	<3	<3	<1	<4	<3	<3
Xylene	<6	<6	<1	<10	<4	<6
Trichlorofluoromethane	--	<1	--	--	--	--
1,2-Dichloroethylene	--	<15	--	--	--	--
1,3-Dichloropropene	--	<1	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	2	21	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	9338	9338	9338	9338	9338	9591
Sample Date:	2/88	4/88	5/88	8/88	6/89	11/86
Well Depth (ft):	646	646	646	646	646	682
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Tetrachloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1,2-Trichlorotrifluoroethane	--	--	--	--	--	<8
1,1,1-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1,2-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<2
Chloroform	<0.5	<0.5	<0.5	0.5	<0.5	<1
Bromoform	<0.5	<0.5	<0.5	<0.5	<0.5	<2
Vinyl chloride	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Carbon tetrachloride	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Methylene chloride	<0.5	<0.5	<0.5	<7.5	<0.5	<8
Dibromochloromethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Bromodichloromethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<5
1,2-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	--
1,1-Dichloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	<8
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<3
Chlorobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<3
Dichlorobenzene	--	--	--	--	--	<25
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<3
Xylene	--	--	--	--	--	<6
Trichlorofluoromethane	--	--	--	--	--	<1
1,2-Dichloroethylene	--	--	--	--	--	<5
1,3-Dichloropropene	--	--	--	--	--	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	0.5	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDE (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	9591	9654	9654	9654	9654	9918
Sample Date:	3/88	9/86	4/87	6/88	10/88	9/86
Well Depth (ft):	682	53	53	77	77	77
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<1	<1	<1	<1	<1
Tetrachloroethylene	<1	<1	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<9	<10	<7	<10	<3	<10
1,1,1-Trichloroethane	<1	17	4	<1	<1	<1
1,1,2-Trichloroethane	<1	<2	<2	<1	<1	<2
Chloroform	<1	<1	<1	<1	1	<1
Bromoform	<2	<3	<2	<2	<1	<3
Vinyl chloride	--	--	<1	<1	<1	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	<9	--	--	--	--	<10
Dibromochloromethane	<2	<1	<2	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<6	<9	<5	<4	<2	<9
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<9	--	--	--	<25	<10
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<5	<5	<4	<3	<3	<5
Dichlorobenzene	<20	<25	<20	<20	<6	<25
Ethylbenzene	<7	<4	<4	<4	<3	<4
Toluene	<4	<5	<4	<3	<6	<5
Xylene	<8	<6	<6	<5	<4	<6
Trichlorofluoromethane	--	<1	<1	<1	<1	<1
1,2-Dichloroethylene	--	<4	<7	<8	<6	<4
1,3-Dichloropropene	--	--	--	--	--	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	17	4	0	1	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	9920	9920	9920	9921	9921	9921
Sample Date:	5/82	9/86	11/88	4/82	10/86	5/87
Well Depth (ft):	89	89	89	62	62	62
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	2	<1	<2	66	63	64
Tetrachloroethylene	8	<1	<1	3	3	2
1,1,2-Trichlorotrifluoroethane	--	<10	<2	--	<8	<7
1,1,1-Trichloroethane	22	<1	<1	13	<5	<1
1,1,2-Trichloroethane	<1	<2	<2	<1	<2	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<1	<3	<2	<1	<2	<2
Vinyl chloride	--	--	<1	--	<1	<1
Carbon tetrachloride	<1	<1	<2	<1	<1	<1
Methylene chloride	<10	<10	--	<10	<8	<7
Dibromochloromethane	<1	<1	<1	<1	<1	<2
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<30	<9	<2	<30	<5	<5
1,2-Dichloroethane	<20	--	--	<20	--	--
1,1-Dichloroethylene	1	<10	<25	<1	<8	<7
Benzene	<3	<3	<3	<3	<18	260
Chlorobenzene	<3	<5	<3	<3	<6	<4
Dichlorobenzene	<10	<25	<12	<10	<20	<20
Ethylbenzene	<3	<6	<3	<3	<10	<4
Toluene	<3	<5	<5	<3	<4	<4
Xylene	<3	<6	<3	16	<10	27
Trichlorofluoromethane	--	<1	<1	--	--	<1
1,2-Dichloroethylene	--	<4	<15	--	<14	<7
1,3-Dichloropropene	--	<1	--	--	<1	<2
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	33	0	0	98	66	353

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	9921	9921	9922	9922	9929	9929
Sample Date:	6/88	10/88	6/88	10/88	5/82	9/86
Well Depth (ft):	62	62	41	41	42	42
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	50	77	<1	<1	<1	<1
Tetrachloroethylene	2	3	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<10	<2	<10	<3	--	<10
1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	<1	<2	<1	<1	--	<2
Chloroform	7	6	<1	<1	2	<1
Bromoform	<2	<2	<2	<1	<1	<3
Vinyl chloride	<1	<1	<1	<1	--	--
Carbon tetrachloride	<1	<2	<1	<1	<1	<1
Methylene chloride	--	--	--	--	<10	<10
Dibromochloromethane	<1	<1	<1	<1	--	<1
Bromodichloromethane	<1	<1	<1	<1	1	<1
1,1-Dichloroethane	<4	6	<4	<2	<30	<9
1,2-Dichloroethane	--	--	--	--	<20	--
1,1-Dichloroethylene	--	<25	--	<25	<1	<10
Benzene	190	250	<3	<3	<3	<3
Chlorobenzene	<3	<3	<3	<3	<3	<5
Dichlorobenzene	<20	<12	<20	<6	--	<25
Ethylbenzene	<4	<3	<4	<3	<3	<4
Toluene	<3	<5	<3	<6	<3	<5
Xylene	47	92	<5	<4	<3	<6
Trichlorofluoromethane	<1	<1	<1	<1	--	<1
1,2-Dichloroethylene	<8	<15	<8	<6	--	<4
1,3-Dichloropropene	--	--	--	--	--	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	296	434	0	0	3	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	9929	9931	9931	9931	9931	9931
Sample Date:	2/87	3/82	12/86	9/87	6/88	10/88
Well Depth (ft):	43	73	73	73	73	73
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	7	<1	1	<1	1
Tetrachloroethylene	<1	4	<1	3	<1	1
1,1,2-Trichlorotrifluoroethane	<8	--	<9	<6	<10	<3
1,1,1-Trichloroethane	<1	5	<1	2	<1	<1
1,1,2-Trichloroethane	<1	<1	<2	<1	<1	<1
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<1	<2	<2	<2	<2
Vinyl chloride	--	--	--	--	<1	<1
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	<8	<10	<9	<6	--	--
Dibromochloromethane	<2	<1	<1	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<2	<1	<1
1,1-Dichloroethane	<5	<30	<10	<5	<4	<2
1,2-Dichloroethane	--	<20	--	--	--	--
1,1-Dichloroethylene	<8	<1	<9	<6	--	<25
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<7	<3	<3	<4	<3	<3
Dichlorobenzene	<25	<10	<35	<20	<20	<6
Ethylbenzene	<6	<3	<4	<4	<4	<3
Toluene	<4	<3	<4	<3	<3	<6
Xylene	<4	<3	<7	<6	<5	<4
Trichlorofluoromethane	--	--	--	--	<1	<1
1,2-Dichloroethylene	--	--	--	--	<8	<6
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	16	0	6	0	2

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	9932	9932	9935	10208	10208	10208
Sample Date:	6/82	4/86	12/82	3/86	8/86	12/87
Well Depth (ft):	105	105	135	649	649	649
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	1	1	<1	<1	<1	<1
Tetrachloroethylene	4	4	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	--	<11	<1	--	<9	<10
1,1,1-Trichloroethane	69	7	<1	<1	<1	<1
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1
Chloroform	2	1	<1	<1	<1	<1
Bromoform	<1	<2	<1	<1	<2	<1
Vinyl chloride	--	--	--	<1	--	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	11*	<11	<5	<1	<9	<10
Dibromochloromethane	<1	<1	<1	<1	<1	<2
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	67	<18	<4	<1	<9	<5
1,2-Dichloroethane	<5	--	<4	<1	--	--
1,1-Dichloroethylene	6	<11	<1	<1	<9	<10
Benzene	<4	<3	<4	<1	<3	<3
Chlorobenzene	<5	<4	<5	<1	<9	<3
Dichlorobenzene	<10	<15	<10	--	<20	<20
Ethylbenzene	<3	<5	<3	<1	<6	<5
Toluene	<4	<4	<4	<1	<7	<3
Xylene	<4	<5	<4	--	<9	<6
Trichlorofluoromethane	--	--	--	--	--	--
1,2-Dichloroethylene	--	--	--	--	--	--
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	160*	13	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10208	10208	10208	10208	10208	10588
Sample Date:	2/88	9/88	10/88	3/89	6/89	9/86
Well Depth (ft):	649	649	649	649	649	76
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Tetrachloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1,2-Trichlorotrifluoroethane	--	--	--	--	--	<10
1,1,1-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1,2-Trichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<2
Chloroform	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Bromoform	<0.5	<0.5	<0.5	<0.5	<0.5	<3
Vinyl chloride	<0.5	<0.5	<0.5	<0.5	<0.5	--
Carbon tetrachloride	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Methylene chloride	<0.5	<0.5	<0.5	<0.5	<0.5	<10
Dibromochloromethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Bromodichloromethane	<0.5	<0.5	<0.5	<0.5	<0.5	<1
1,1-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	<9
1,2-Dichloroethane	<0.5	<0.5	<0.5	<0.5	<0.5	--
1,1-Dichloroethylene	<0.5	<0.5	<0.5	<0.5	<0.5	<10
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<3
Chlorobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Dichlorobenzene	--	--	--	--	--	<25
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<4
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Xylene	--	--	--	--	--	<6
Trichlorofluoromethane	--	--	--	--	--	<1
1,2-Dichloroethylene	--	--	--	--	--	<4
1,3-Dichloropropene	--	--	--	--	--	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	0	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10589	10589	10589	10589	10590	10591
Sample Date:	10/86	5/87	7/88	11/88	10/86	9/86
Well Depth (ft):	76	76	76	76	76	78
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<1	<1	<2	<1	<1
Tetrachloroethylene	<1	<1	1	1	<1	<1
1,1,2-Trichlorotrifluoroethane	<8	<7	<9	<2	<8	<10
1,1,1-Trichloroethane	4	3	<1	<1	<1	6
1,1,2-Trichloroethane	<2	<2	<2	<2	<2	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<2	<2	<2	<3
Vinyl chloride	--	<1	<1	<1	--	--
Carbon tetrachloride	<1	<1	<1	<2	<1	<1
Methylene chloride	<8	<7	--	--	<8	<10
Dibromochloromethane	<1	<2	<2	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<5	<5	<2	<5	<9
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<8	<7	--	<25	<8	<10
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<6	<4	<4	<3	<6	<5
Dichlorobenzene	<20	<20	<17	<12	<20	<25
Ethylbenzene	<10	<4	<4	<3	<10	<6
Toluene	<4	<4	<4	6	<4	<5
Xylene	<10	<6	<5	<3	<10	<6
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<4	<7	<8	<15	<4	<4
1,3-Dichloropropene	<1	<2	--	--	<1	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	4	3	1	7	0	6

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10591	10591	10592	10593	10593	10593
Sample Date:	6/88	11/88	9/86	10/86	4/87	7/88
Well Depth (ft):	78	78	73	77	77	77
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<2	<1	--	36	40
Tetrachloroethylene	<1	<1	<1	--	2	78
1,1,2-Trichlorotrifluoroethane	<10	<2	<10	--	<7	<9
1,1,1-Trichloroethane	3	1	<1	--	<1	<1
1,1,2-Trichloroethane	<1	<2	<2	--	<2	<2
Chloroform	<1	<1	<1	--	<1	<1
Bromoform	<2	<2	<3	--	<2	<2
Vinyl chloride	<1	<1	--	67.4	--	72
Carbon tetrachloride	<1	<2	<1	--	<1	<1
Methylene chloride	--	--	<10	--	<7	--
Dibromochloromethane	<1	<1	<1	--	<2	<2
Bromodichloromethane	<1	<1	<1	--	<1	<1
1,1-Dichloroethane	<4	<2	<9	--	<5	<5
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	--	<25	<10	--	<7	--
Benzene	<3	<3	<3	--	5	7
Chlorobenzene	<3	<3	<5	--	<4	<4
Dichlorobenzene	<20	<12	<25	--	<20	<17
Ethylbenzene	<4	<3	<4	--	<4	<4
Toluene	<3	8	<5	--	<4	<4
Xylene	<5	<3	<6	--	<6	<5
Trichlorofluoromethane	<1	<1	<1	--	<1	<1
1,2-Dichloroethylene	<8	<15	<4	--	340	330
1,3-Dichloropropene	--	--	<1	--	<2	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	3	9	0	67.4	383	527

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10593	10593	10594	10594	10594	10594
Sample Date:	11/88	12/88	10/86	4/87	7/88	11/88
Well Depth (ft):	77	77	76	76	76	76
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	51	65	83	170	230	440
Tetrachloroethylene	9	30	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<2	--	<8	<7	<10	<2
1,1,1-Trichloroethane	<1	--	2	3	2	4
1,1,2-Trichloroethane	<2	--	<2	<2	<1	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<1	<2	<2	<2	<2
Vinyl chloride	--	776	<1	<1	1	<1
Carbon tetrachloride	<2	<1	<1	<1	<1	<2
Methylene chloride	--	--	<8	<7	<10	--
Dibromochloromethane	<1	<1	<1	<2	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<2	<1	<5	<5	<4	<2
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<25	3	<8	<7	<10	<25
Benzene	8	17	<3	<3	<3	<3
Chlorobenzene	<3	1	<6	<4	<3	<3
Dichlorobenzene	<12	3	<20	<20	<20	<12
Ethylbenzene	<3	<1	<10	<4	<4	<3
Toluene	<5	8	<4	<4	4	<5
Xylene	<3	2	<10	<6	<5	<3
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	26	264	<4	<7	<8	<15
1,3-Dichloropropene	--	--	<1	<2	--	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	94	1169	85	173	237	444

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10595	10595	10595	10596	10596	10596
Sample Date:	9/86	4/87	7/88	10/86	5/87	8/88
Well Depth (ft):	67	67	67	71	71	71
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	1200	540	520	<1	<1	<1
Tetrachloroethylene	2400	920	1200	4	3	2
1,1,2-Trichlorotrifluoroethane	--	--	--	--	--	<10
1,1,1-Trichloroethane	650	300	300	97	120	52
1,1,2-Trichloroethane	<2	<2	<2	<2	<2	<1
Chloroform	7	1	4	<1	<1	<1
Bromoform	<2	<2	<2	<2	<2	<2
Vinyl chloride	3.8	--	48	22.4	6	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	--	--	--	--	--	--
Dibromochloromethane	<1	<2	<2	<1	<2	<2
Bromodichloromethane	<1	<1	<1	<1	<1	<2
1,1-Dichloroethane	89	37	56	53	72	120
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	160	130	--	12	14	--
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<6	<4	<4	<6	<4	<5
Dichlorobenzene	<20	<20	<17	<20	<20	<12
Ethylbenzene	<10	<4	<4	<10	<4	<4
Toluene	4	<4	<4	<4	<4	<5
Xylene	<10	<6	<5	<10	<6	<3
Trichlorofluoromethane	<1	<1	2	<1	<1	<1
1,2-Dichloroethylene	260	90	140	<4	<7	<11
1,3-Dichloropropene	<1	<2	--	<1	<2	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	4773.8	2018	2270	188.4	215	174

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1986, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10596	10597	10597	10597	10597	10598
Sample Date:	11/88	10/86	5/87	6/88	11/88	10/86
Well Depth (ft):	71	66	66	66	66	77
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<2	4	5	3	<2	5
Tetrachloroethylene	4	120	320	52	9	1100
1,1,2-Trichlorotrifluoroethane	<2	<8	<7	<10	<2	--
1,1,1-Trichloroethane	63	<5	<1	<1	<1	<5
1,1,2-Trichloroethane	<2	<2	<2	<1	<2	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<2	<2	<2	<2
Vinyl chloride	23	--	<1	<1	<1	<1
Carbon tetrachloride	<2	<1	<1	<1	<2	<1
Methylene chloride	--	<8	<7	--	--	--
Dibromochloromethane	<1	<1	<2	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	120	<5	<5	<4	<2	<5
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<25	<8	<7	--	<25	35
Benzene	<3	<18	<3	<3	<3	<18
Chlorobenzene	<3	<6	<4	<3	<3	<6
Dichlorobenzene	<12	<20	<20	<20	<12	<20
Ethylbenzene	<3	<10	<4	<4	<3	<10
Toluene	<3	<4	<4	<3	<3	<4
Xylene	<3	<10	<6	<5	<3	<10
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<15	<4	15	<8	<15	<4
1,3-Dichloropropene	--	<1	<2	--	--	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	210	124	340	55	9	1140

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10598	10598	10598	10599	10599
Sample Date:	5/87	6/88	10/88	10/86	5/87
Well Depth (ft):	77	77	77	67	67
Volatile Organic Compounds (concentrations in ug/L)					
Trichloroethylene	5	--	20	840	880
Tetrachloroethylene	790	--	230	18	17
1,1,2-Trichlorotrifluoroethane	--	--	54	<8	<7
1,1,1-Trichloroethane	<1	<1	<1	<5	5
1,1,2-Trichloroethane	<2	<1	<1	<2	<2
Chloroform	<1	<1	<1	<1	<1
Bromoform	--	<2	<1	<2	<2
Vinyl chloride	6	<1	<1	--	<1
Carbon tetrachloride	<1	<1	<1	<1	<1
Methylene chloride	--	--	--	<8	<7
Dibromochloromethane	<2	<1	<1	<1	<2
Bromodichloromethane	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<4	<2	<5	<5
1,2-Dichloroethane	--	--	--	--	--
1,1-Dichloroethylene	30	--	<25	<8	<7
Benzene	<3	<3	<3	<18	<3
Chlorobenzene	<4	<3	<3	<6	<4
Dichlorobenzene	<20	<20	<6	<20	<20
Ethylbenzene	<4	<4	<3	<10	<4
Toluene	<4	<3	<6	<4	<4
Xylene	<6	<5	<4	<10	<6
Trichlorofluoromethane	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<7	<8	<6	<4	10
1,3-Dichloropropene	<1	--	--	<2	<1
1,2-Dibromoethane	--	--	--	--	--
Total Volatile Organic Compounds	831	0	304	858	912

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10599	10599	10600	10600	10600	10600
Sample Date:	6/88	10/88	10/86	4/87	6/88	10/88
Well Depth (ft):	67	67	61	61	61	61
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	810	470	620	460	350	350
Tetrachloroethylene	15	21	13	9	12	13
1,1,2-Trichlorotrifluoroethane	<10	<2	<8	<7	<10	<2
1,1,1-Trichloroethane	3	4	2	1	1	2
1,1,2-Trichloroethane	<1	<2	<2	<2	<1	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<2	<2	<2	<2
Vinyl chloride	3	<1	<1	--	1	<1
Carbon tetrachloride	<1	<2	<1	<1	<1	<2
Methylene chloride	--	--	<8	<7	--	--
Dibromochloromethane	<1	<1	<1	<2	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<4	<2	<5	<5	<4	<2
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	--	<25	<8	<7	--	<25
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<3	<3	<6	<4	<3	<3
Dichlorobenzene	<20	<12	<20	<20	<20	<12
Ethylbenzene	<4	<3	<10	<4	<4	<3
Toluene	<3	<5	<4	<4	<3	<5
Xylene	<5	<3	<10	<6	<5	<3
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<8	<15	7	<7	8	<15
1,3-Dichloropropene	--	--	<1	<2	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	831	495	642	470	372	365

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10601	10601	10601	10601	10602	10602
Sample Date:	10/86	5/87	6/88	11/88	10/86	6/88
Well Depth (ft):	67	67	67	67	56	56
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	56	87	78	76	56	2
Tetrachloroethylene	8	3	6	11	2	<1
1,1,2-Trichlorotrifluoroethane	<8	<7	<10	<2	<8	<10
1,1,1-Trichloroethane	1	2	1	1	<5	<1
1,1,2-Trichloroethane	<2	<2	<1	<2	<2	<1
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<2	<2	<2	<2
Vinyl chloride	<1	<1	2	<1	--	<1
Carbon tetrachloride	<1	<1	<1	<2	<1	<1
Methylene chloride	<8	<7	--	--	<8	--
Dibromochloromethane	<1	<2	<1	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<5	<4	<2	<5	<4
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<8	<7	--	<25	<8	--
Benzene	<3	<3	<3	<3	<18	<3
Chlorobenzene	<6	<4	<3	<3	<6	<3
Dichlorobenzene	<20	<20	<20	<12	<20	<20
Ethylbenzene	<10	<4	<4	<3	<10	<4
Toluene	<4	<4	<3	<5	<4	<3
Xylene	<10	<6	<5	<3	<10	<5
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<4	<7	<8	<15	<4	<8
1,3-Dichloropropene	<1	<2	--	--	<1	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	65	92	87	88	58	2

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10602	10602	10603	10603	10603	10603
Sample Date:	11/88	4/87	10/86	4/87	6/88	11/88
Well Depth (ft):	56	56	61	61	61	61
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	12	19	37	32	48	48
Tetrachloroethylene	<1	<1	<1	1	3	3
1,1,2-Trichlorotrifluoroethane	<2	<7	<8	<7	<10	<2
1,1,1-Trichloroethane	<1	<1	8	5	7	7
1,1,2-Trichloroethane	<2	<2	<2	<2	<1	<2
Chloroform	<1	<1	<1	<1	1	2
Bromoform	<2	<2	<2	<2	<2	<2
Vinyl chloride	<1	--	--	--	2	1
Carbon tetrachloride	<2	<1	<1	<1	<1	<2
Methylene chloride	--	<7	--	--	--	--
Dibromochloromethane	<1	<2	<1	<2	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<2	<5	5	<5	5	9
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<25	<7	--	--	--	<25
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<3	<4	<6	<4	<3	<3
Dichlorobenzene	<12	<20	<20	<20	<20	<12
Ethylbenzene	<3	<4	<10	<4	<4	<3
Toluene	<5	<4	<4	<4	<3	<5
Xylene	<3	<6	<10	<6	<5	<3
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<15	<7	<4	<7	<8	<15
1,3-Dichloropropene	--	<2	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	12	19	50	38	66	70

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10623	10623	10623	10623	10623	10624
Sample Date:	9/86	5/87	7/88	8/88	12/88	10/86
Well Depth (ft):	72	72	72	72	72	194
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	110	390	580	280	40	24
Tetrachloroethylene	110	400	550	290	35	<1
1,1,2-Trichlorotrifluoroethane	--	--	14	<10	--	<8
1,1,1-Trichloroethane	89	180	260	73	22	<1
1,1,2-Trichloroethane	<2	<2	<1	<1	--	<2
Chloroform	<1	1	2	<1	--	<1
Bromoform	<2	<2	<2	<2	<1	<2
Vinyl chloride	4.4	3	--	5	21	27.8
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	--	--	--	--	--	<8
Dibromochloromethane	<1	<1	<1	<2	<10	<1
Bromodichloromethane	<1	<1	<1	<2	<10	<1
1,1-Dichloroethane	22	21	26	17	5	<1
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	9	38	--	--	1	<8
Benzene	<3	<3	<3	<3	<1	<3
Chlorobenzene	<6	<4	<3	<5	<1	<6
Dichlorobenzene	<20	<20	<20	<12	<1	<20
Ethylbenzene	<10	<4	<4	<4	<1	<10
Toluene	<4	<4	<3	<5	<1	<4
Xylene	<10	<6	<5	<3	<1	<10
Trichlorofluoromethane	2*	<1	<1	<1	<1	<1
1,2-Dichloroethylene	21	44	130	51	10	<4
1,3-Dichloropropene	<1	<1	--	--	--	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	367.4*	1077	1562	716	134	51.8

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10624	10625	10625	10625	10625	10626
Sample Date:	5/87	9/86	4/87	6/88	10/88	10/86
Well Depth (ft):	194	67	67	67	67	67
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	120	32	2	120	66	<1
Tetrachloroethylene	5	6	4	21	25	<1
1,1,2-Trichlorotrifluoroethane	<7	<8	<8	<10	<3	<8
1,1,1-Trichloroethane	<1	11	1	31	17	<1
1,1,2-Trichloroethane	<2	<2	<2	<1	<1	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<1	<2	<1	<2
Vinyl chloride	--	<1	--	1	<1	--
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	<7	<8	<8	--	--	<8
Dibromochloromethane	<2	<1	<1	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<5	<4	<4	2	<5
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<7	<8	<8	--	<25	<8
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<4	<6	<3	<3	<3	<6
Dichlorobenzene	<20	<20	<30	<20	<6	<20
Ethylbenzene	<4	<10	<7	<4	<3	<10
Toluene	<4	<4	<3	<3	<6	<4
Xylene	<6	<10	<12	<5	<4	<10
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<7	<4	<5	<8	<6	<4
1,3-Dichloropropene	<2	<1	<1	--	--	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	125	49	7	173	110	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10626	10626	10626	10627	10628	10628
Sample Date:	5/87	6/88	10/88	6/88	10/86	5/87
Well Depth (ft):	67	67	67	310	67	67
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<1	<1	600	<1	<1
Tetrachloroethylene	<1	<1	<1	18	<1	<1
1,1,2-Trichlorotrifluoroethane	<7	<10	<3	<11	<8	<7
1,1,1-Trichloroethane	<1	<1	<1	1	<1	<1
1,1,2-Trichloroethane	<2	<1	<1	<1	<2	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<1	<1	<2	<2
Vinyl chloride	<1	<1	<1	6	--	<1
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	<7	--	--	--	<8	<7
Dibromochloromethane	<2	<1	<1	<1	<1	<2
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<4	<2	<5	<5	<5
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<7	--	<25	--	<8	<7
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<4	<3	<3	<3	<6	<4
Dichlorobenzene	<20	<20	<6	<15	<20	<20
Ethylbenzene	<4	<4	<3	<4	<10	<4
Toluene	<4	<3	<6	<3	<4	<4
Xylene	<6	<5	<4	<4	<10	<6
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<7	<8	<6	9	<4	<7
1,3-Dichloropropene	<2	--	--	--	<1	<2
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	0	0	634	0	0

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10628	10629	10629	10629	10629	10629
Sample Date:	7/88	10/86	6/87	7/88	8/88	12/88
Well Depth (ft):	67	109	109	109	109	109
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	260	530	440	450	210
Tetrachloroethylene	<1	370	1000	990	870	390
1,1,2-Trichlorotrifluoroethane	<10	--	--	150	<10	--
1,1,1-Trichloroethane	<1	320	500	320	280	150
1,1,2-Trichloroethane	<1	<2	<1	<1	<1	--
Chloroform	<1	2	2	2	<1	2
Bromoform	<2	<20	<20	<40	<2	<1
Vinyl chloride	<1	22.7	--	--	8	19
Carbon tetrachloride	<1	<1	<1	<1	<1	<1
Methylene chloride	--	--	--	--	--	--
Dibromochloromethane	<1	<1	<2	<1	<2	<1
Bromodichloromethane	<1	<1	<1	<1	<2	<1
1,1-Dichloroethane	<4	81	84	49	76	42
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	--	96	220	--	--	47
Benzene	<3	<3	<3	<3	<3	<1
Chlorobenzene	<3	<3	<3	<3	<5	<1
Dichlorobenzene	<20	<25	<20	<20	<12	<1
Ethylbenzene	<4	<5	<7	<4	<4	<1
Toluene	<3	<3	<3	5	<5	2
Xylene	<5	<6	<10	<5	<3	<1
Trichlorofluoromethane	<1	<1	<1	2	<1	<1
1,2-Dichloroethylene	<8	137	340	280	190	140
1,3-Dichloropropene	--	<1	<2	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	0	1286.7	2676	2238	1874	1002

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10630	10630	10631	10631	10631	10631
Sample Date:	6/88	12/88	11/86	5/87	6/88	11/88
Well Depth (ft):	300	300	67	67	67	67
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<1	380	310	46	43
Tetrachloroethylene	<2	2	9	3	3	3
1,1,2-Trichlorotrifluoroethane	<11	--	<8	<7	<10	<2
1,1,1-Trichloroethane	2	2	2	1	2	7
1,1,2-Trichloroethane	<1	--	<2	<2	<1	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<1	<1	<2	<2	<2	<2
Vinyl chloride	1	3	<1	<1	2	<1
Carbon tetrachloride	<1	<1	<1	<1	<1	<2
Methylene chloride	--	--	--	<7	--	--
Dibromochloromethane	<1	<1	<1	<2	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	5	<5	<5	<4	<2
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	--	1	--	<7	--	<25
Benzene	<3	<1	<3	<3	<3	<3
Chlorobenzene	<3	<1	<3	<4	<3	<3
Dichlorobenzene	<15	17	<25	<20	<20	<12
Ethylbenzene	<4	<1	<5	<4	<4	<3
Toluene	<3	2	<3	<4	5	<5
Xylene	<4	<1	<6	<6	<5	<3
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<8	<1	<5	<7	<8	<15
1,3-Dichloropropene	--	--	--	<2	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	3	32	391	314	58	53

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10632	10632	10632	10632	10633	10633
Sample Date:	11/86	5/87	6/88	11/88	11/86	5/87
Well Depth (ft):	67	67	67	67	67	67
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	53	87	130	110	81	54
Tetrachloroethylene	6	7	6	13	7	8
1,1,2-Trichlorotrifluoroethane	<8	<7	<10	<2	<8	<7
1,1,1-Trichloroethane	2	2	<1	1	1	3
1,1,2-Trichloroethane	<2	<2	<1	<2	<2	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<2	<2	<2	<2
Vinyl chloride	<1	<1	2	<1	<1	<1
Carbon tetrachloride	<1	<1	<1	<2	<1	<1
Methylene chloride	<8	<7	--	--	<8	<7
Dibromochloromethane	<1	<2	<1	<1	<1	<2
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<5	<4	<2	<5	<5
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<8	<7	--	<25	<8	<7
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<3	<4	<3	<3	<3	<4
Dichlorobenzene	<25	<20	<20	<12	<25	<20
Ethylbenzene	<5	<4	<4	<3	<5	<4
Toluene	<3	<4	<3	<5	<3	<4
Xylene	<6	<6	<5	<3	<6	<6
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<5	<7	<8	<15	<5	<7
1,3-Dichloropropene	<1	<2	--	--	<1	<2
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	61	96	138	124	89	65

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10633	10633	10634	10634	10634	10634
Sample Date:	5/88	11/88	11/86	4/87	6/88	11/88
Well Depth (ft):	67	67	67	67	67	67
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	57	56	580	280	78	110
Tetrachloroethylene	7	8	9	7	8	11
1,1,2-Trichlorotrifluoroethane	<9	<3	<8	<7	<10	<2
1,1,1-Trichloroethane	1	1	2	1	1	1
1,1,2-Trichloroethane	<1	<1	<2	<2	<1	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<1	<1	<2	<2	<2	<2
Vinyl chloride	1	<1	--	--	3	<1
Carbon tetrachloride	<1	<1	<1	<1	<1	<2
Methylene chloride	--	--	<8	<7	--	--
Dibromochloromethane	<1	<1	<1	<2	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<4	<2	<5	<5	<4	<2
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	--	<25	<8	<7	--	<25
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<4	<3	<3	<4	<3	<3
Dichlorobenzene	<18	<6	<25	<20	<20	<12
Ethylbenzene	<8	<3	<5	<4	<4	<3
Toluene	<3	<6	<3	<4	<3	<5
Xylene	<9	<4	<6	<6	<5	<3
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<8	<6	<5	<7	<8	<15
1,3-Dichloropropene	--	--	<1	<2	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	66	65	591	288	90	122

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10635	10635	10635	10636	10636	10636
Sample Date:	11/86	6/88	10/88	11/86	4/87	6/88
Well Depth (ft):	43	45	45	56	56	56
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	95	31	8	<1	<1	<1
Tetrachloroethylene	4	1	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<8	<10	<3	<8	<8	<10
1,1,1-Trichloroethane	3	<1	<1	<1	<1	5
1,1,2-Trichloroethane	<2	<1	<1	<2	<1	<1
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<1	<2	<1	<2
Vinyl chloride	--	1	<1	--	<1	3
Carbon tetrachloride	<1	<1	<2	<1	<1	<1
Methylene chloride	<8	--	--	<8	<8	--
Dibromochloromethane	<1	<1	<1	<1	<2	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<4	<2	<5	<4	8
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<8	--	<25	<8	<8	--
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<3	<3	<3	<3	<3	<3
Dichlorobenzene	<25	<20	<6	<25	<30	<20
Ethylbenzene	<5	<4	<3	<5	<7	<4
Toluene	<3	<3	<8	<3	<3	<3
Xylene	<6	<5	<4	<6	<12	<5
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<5	<8	<6	<5	<5	<8
1,3-Dichloropropene	<1	--	--	<1	<2	<1
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	102	33	8	0	0	16

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10636	10812	10812	10812	10813	10813
Sample Date:	10/88	4/87	6/88	11/88	4/87	6/88
Well Depth (ft):	56	93	93	93	67	67
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<1	<1	<1	<2	6	6
Tetrachloroethylene	<1	3	8	7	<1	1
1,1,2-Trichlorotrifluoroethane	<3	<7	<10	<2	<8	<10
1,1,1-Trichloroethane	10	<1	<1	<1	4	<1
1,1,2-Trichloroethane	<1	<2	<1	<2	<1	<1
Chloroform	<1	<1	<1	<1	<1	3
Bromoform	<1	<2	<2	<2	<1	<2
Vinyl chloride	4	<1	<1	<1	--	<1
Carbon tetrachloride	<1	<1	<1	<2	<1	<1
Methylene chloride	--	<7	--	--	--	--
Dibromochloromethane	<1	<2	<1	<1	<2	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	20	<5	<4	<2	<5	<4
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<25	<7	--	<25	--	--
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<3	<4	<3	<3	<3	<3
Dichlorobenzene	<6	<20	<20	<12	<30	<20
Ethylbenzene	<3	<4	<4	<3	<7	<4
Toluene	<6	<4	<3	<5	<3	<3
Xylene	<4	<6	<5	<3	<12	<5
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<6	<7	<8	<15	<5	<8
1,3-Dichloropropene	<1	<2	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	34	3	8	7	10	10

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10813	10814	10814	10814	10815	10815
Sample Date:	10/88	5/87	6/88	11/88	4/87	6/88
Well Depth (ft):	67	72	72	72	61	61
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	9	73	72	68	<1	<1
Tetrachloroethylene	1	3	4	4	<1	<1
1,1,2-Trichlorotrifluoroethane	<3	<7	<10	<2	<7	<10
1,1,1-Trichloroethane	1	5	3	2	1	2
1,1,2-Trichloroethane	<1	<2	<1	<2	<2	<1
Chloroform	3	<1	<1	<1	<1	<1
Bromoform	<1	<2	<2	<2	<2	<2
Vinyl chloride	<1	<1	2	<1	<1	<1
Carbon tetrachloride	<1	<1	<1	<2	<1	<1
Methylene chloride	--	<7	--	--	--	--
Dibromochloromethane	<1	<2	<1	<1	<2	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<2	5	<4	2	<5	<4
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<25	<7	--	<25	--	--
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<3	<4	<3	<3	<4	<3
Dichlorobenzene	<6	<20	<20	<12	<20	<20
Ethylbenzene	<3	<4	<4	<3	<4	<4
Toluene	<6	<4	<3	<5	<4	<3
Xylene	<4	<6	<5	<3	<6	<5
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<6	<7	<8	<15	<7	<8
1,3-Dichloropropene	--	<2	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	14	86	81	76	1	2

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10815	10816	10816	10817	10817	10817
Sample Date:	11/88	6/88	11/88	5/87	6/88	11/88
Well Depth (ft):	61	130	130	51	51	51
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	<2	49	66	3	2	2
Tetrachloroethylene	<1	2	2	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	<2	<10	<3	<7	<10	<3
1,1,1-Trichloroethane	2	12	11	11	11	9
1,1,2-Trichloroethane	<2	<1	<1	<2	<1	<1
Chloroform	<1	1	2	<1	<1	<1
Bromoform	<2	<2	<1	<2	<2	<1
Vinyl chloride	<1	5	4	<1	<1	<1
Carbon tetrachloride	<2	<1	<1	<1	<1	<1
Methylene chloride	--	--	--	<7	--	--
Dibromochloromethane	<1	<1	<1	<2	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	2	11	15	<5	<4	<2
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<25	--	<25	<7	--	<25
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<3	<3	<3	<4	<3	<3
Dichlorobenzene	<12	<20	<6	<20	<20	<6
Ethylbenzene	<3	<4	<3	<4	<4	<3
Toluene	<5	<3	<6	<4	<3	<6
Xylene	<3	<5	<4	<6	<5	<4
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<15	<8	<6	<7	<8	<6
1,3-Dichloropropene	--	--	--	<2	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	4	80	100	14	13	11

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10818	10818	10818	10820	10820	10820
Sample Date:	5/87	7/88	11/88	4/87	6/88	11/88
Well Depth (ft):	56	56	56	72	72	72
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	10	29	30	160	280	290
Tetrachloroethylene	<1	1	1	7	10	12
1,1,2-Trichlorotrifluoroethane	<7	<9	<2	<7	<10	5
1,1,1-Trichloroethane	<1	<1	<1	7	6	5
1,1,2-Trichloroethane	<2	<2	<2	<2	<1	<2
Chloroform	<1	<1	<1	<1	<1	1
Bromoform	<2	<2	<2	<2	<2	<2
Vinyl chloride	<1	1	<1	--	8	<1
Carbon tetrachloride	<1	<1	<2	<1	<1	<2
Methylene chloride	<7	--	--	<7	--	--
Dibromochloromethane	<2	<2	<1	<2	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<5	<2	6	<4	4
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<7	--	<25	<7	--	<25
Benzene	<3	<3	<3	<3	<3	<3
Chlorobenzene	<4	<4	<3	<4	<3	<3
Dichlorobenzene	<20	<17	<12	<20	<20	<12
Ethylbenzene	<4	<4	<3	<4	<4	<3
Toluene	<4	<4	18	<4	3	<5
Xylene	<6	<5	<3	<6	<5	<3
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	<7	<8	<15	<7	<8	<15
1,3-Dichloropropene	<2	--	--	<2	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	10	31	49	180	307	317

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10821	10821	10821	10822	10997	10997
Sample Date:	4/87	6/88	11/88	4/87	6/88	12/88
Well Depth (ft):	56	56	56	122	694	694
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	31	7	3	4	280	150
Tetrachloroethylene	<1	<1	<1	3	<1	1
1,1,2-Trichlorotrifluoroethane	<7	<10	<2	<7	<11	--
1,1,1-Trichloroethane	6	<1	<1	6	1	1
1,1,2-Trichloroethane	<2	<1	<2	<2	<1	--
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<2	<2	<1	<1
Vinyl chloride	--	1	<1	2	8	1
Carbon tetrachloride	<1	<1	<2	<1	1	1
Methylene chloride	<7	--	--	--	--	--
Dibromochloromethane	<2	<1	<1	<2	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<5	<4	<2	13	<5	--
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	<7	--	<25	--	--	3
Benzene	<3	<3	<3	<3	<3	<1
Chlorobenzene	<4	<3	<3	<4	<3	<1
Dichlorobenzene	<20	<20	<12	<20	<15	<1
Ethylbenzene	<4	<4	<3	<4	<4	<1
Toluene	<4	4	<5	<4	<3	<1
Xylene	<6	<5	<3	<6	<4	<1
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	10	<8	<15	<7	<8	3
1,3-Dichloropropene	<2	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	47	12	3	28	290	160

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

Table 2. Volatile Organic Compounds Detected in Wells Within a three-Mile Radius of the Grumman Aerospace Corporation, Bethpage, New York.

Well Number:	10998	10988	10999	10999	11000	11000
Sample Date:	6/88	11/88	6/88	12/88	6/88	11/88
Well Depth (ft):	324	324	335	335	131	131
Volatile Organic Compounds (concentrations in ug/L)						
Trichloroethylene	200	170	<1	<1	9	6
Tetrachloroethylene	4	4	<1	<1	<1	<1
1,1,2-Trichlorotrifluoroethane	95	63	<11	--	<10	<2
1,1,1-Trichloroethane	16	15	<1	<1	<1	1
1,1,2-Trichloroethane	<1	<2	<1	--	<1	<2
Chloroform	<1	<1	<1	<1	<1	<1
Bromoform	<2	<2	<1	<1	<2	<2
Vinyl chloride	48	3	<1	<1	1	<1
Carbon tetrachloride	<1	<2	<1	<1	<1	<2
Methylene chloride	--	--	--	--	--	--
Dibromochloromethane	<1	<1	<1	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	6	5	<5	<1	<4	<2
1,2-Dichloroethane	--	--	--	--	--	--
1,1-Dichloroethylene	--	<25	--	<1	--	<25
Benzene	<3	<3	<3	<1	<3	<3
Chlorobenzene	<3	<3	<3	<1	<3	<3
Dichlorobenzene	<20	<12	<15	<1	<20	<12
Ethylbenzene	<4	<3	<4	1	<4	<3
Toluene	<3	<3	<3	6	<3	<3
Xylene	<5	<3	<4	6	<5	<3
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1
1,2-Dichloroethylene	11	<20	<8	<1	<8	<15
1,3-Dichloropropene	--	--	--	--	--	--
1,2-Dibromoethane	--	--	--	--	--	--
Total Volatile Organic Compounds	380	260	0	13	10	7

ug/L Micrograms per liter.
* Laboratory contamination suspected.
-- Not analyzed.

Source:

NCDH (1988, 1989)

A.3 Table 3 - Production Well Water-Quality Data, Grumman Aerospace Corporation, Bethpage, New York

Table 3. Production Well Water-Quality Data, Grumman Aerospace Corporation, Bethpage New York.

Well Number:	1	2	3	4	5	6	8	9
Sample Date:	3/17/89	3/22/89	3/22/89	3/22/89	3/17/89	3/22/89	3/17/89	3/20/89
Parameters (concentration in ug/ml unless indicated)								
Inorganic Compounds								
Alkalinity	1.2	1.2	1.7	0.82	4.12	3.3	5.4	1.7
Aluminum	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ammonia	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Calcium	3.0	4.1	4.1	4.4	7.7	7.0	10.8	6.6
Chloride	9.8	13.5	11.9	14.4	23.6	16.8	22.8	14.0
Chromium (hexavalent)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium (total)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Conductivity (umhos/cm)	68.5	104.5	81.8	94.4	146.6	149.3	179.9	118.2
Copper	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoride	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Hardness	11.8	15.1	15.9	18.4	32.2	27.3	43.7	26.5
Iron	<0.1	<0.1	<0.1	<0.1	0.24	0.41	<0.1	<0.1
Magnesium	1.2	1.6	1.5	1.6	2.8	2.5	4.1	2.3
Manganese	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate	4.5	4.7	4.0	4.8	5.3	5.8	4.9	6.0
Nitrite	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phosphate	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Silcon	3.5	4.0	3.5	3.7	4.0	4.5	4.8	3.8
Sodium	7.5	13.4	9.1	11.0	14.9	14.1	16.5	11.9
Sulfate	<5.0	5.8	<5.0	<5.0	8.9	8.6	22.0	5.1
Surfactants (MBAS)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Dissolved Solids	53.0	75.0	58.0	66.0	128.0	91.0	157.0	87.0
Zinc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

ND Not detected.
ug/ml Micrograms per milliliter.
ug/L Micrograms per liter.

Table 3. Production Well Water-Quality Data, Grumman Aerospace Corporation, Bethpage New York.

Well Number:	10	11	13	14	15	16
Sample Date:	3/17/89	3/20/89	3/14/89	3/20/89	3/22/89	3/14/89
Parameters (concentration in ug/ml unless indicated)						
Inorganic Compounds						
Alkalinity	2.7	2.5	2.47	5.2	0.82	2.9
Aluminum	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ammonia	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Calcium	2.4	6.3	1.1	3.9	3.0	8.6
Chloride	22.8	15.3	3.8	10.3	12.9	19.4
Chromium (hexavalent)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium (total)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Conductivity (umhos/cm)	168.6	121.4	26.9	78.1	85.5	167.0
Copper	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoride	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Hardness	9.4	25.7	4.5	16.7	11.0	36.3
Iron	<0.1	<0.1	<0.1	<0.1	0.18	<0.1
Magnesium	0.78	2.2	0.43	1.5	1.1	2.9
Manganese	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate	5.4	6.1	1.1	4.0	4.1	6.8
Nitrite	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phosphate	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Silcon	3.4	3.7	3.1	3.3	3.6	3.9
Sodium	31.3	13.0	3.2	8.6	11.5	16.5
Sulfate	20.1	<5.0	<5.0	<5.0	<5.0	6.0
Surfactants (MBAS)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Dissolved Solids	138.0	93.0	21.0	49.0	57.0	141.0
Zinc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

ND Not detected.
ug/ml Micrograms per milliliter.
ug/L Micrograms per liter.

Table 1. Production Well Water-Quality Data, Grumman Aerospace Corporation, Bethpage New York.

Well Number:	1	2	3	4	5	6	8	9
Sample Date:	3/17/89	3/22/89	3/22/89	3/22/89	3/17/89	3/22/89	3/17/89	3/20/89
Parameters (concentration in ug/L unless indicated)								
Organic Compounds								
Acetone	2.0	2.0	ND	4.0	6.0	2.0	2.0	1.0
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	9.0	ND	ND	ND	ND	ND	4.0	ND
Chloroform	ND	<1.0	<1.0	<1.0	1.0	ND	2.0	ND
1,1-Dichloroethylene	6.0	5.0	<1.0	2.0	17.0	3.0	83.0	10.0
1,2-Dichloroethylene (total)	5.0	11.0	4.0	5.0	19.0	ND	3.0	<1.0
Methylene Chloride	<1.0	<1.0	ND	<1.0	2.0	<1.0	2.0	<1.0
Methylethyl Ketone	9.0	6.0	7.0	3.0	3.0	<1.0	2.0	1.0
Methylisobutyl Ketone	ND	1.0	ND	2.0	2.0	ND	1.0	ND
Phenol	<1.0	1.0	<1.0	1.2	<1.0	1.0	<1.0	<1.0
Tetrachloroethylene	28.0	30.0	12.0	10.0	96.0	ND	162.0	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	<1.0
1,1,1-Trichloroethane	5.0	6.0	<1.0	2.0	20.0	ND	150.0	43.0
Trichloroethylene	14300.0	671.0	86.0	242.0	1478.0	<1.0	146.0	54.0
Trichlorotrifluoroethane	9.0	5.0	6.0	ND	30.0	ND	4.0	1.0
Vinyl Chloride	ND	ND	ND	ND	52.0	ND	ND	ND
Xylene (total)	<1.0	<1.0	<1.0	<1.0	3.0	<1.0	<1.0	ND

ND Not detected.
ug/ml Microgrames per milliliter.
ug/L Microgrames per liter.

Table 3. Production Well Water-Quality Data, Grumman Aerospace Corporation, Bethpage New York.

Well Number:	10	11	13	14	15	16
Sample Date:	3/17/89	3/25/89	3/14/89	3/20/89	3/22/89	3/14/89
Parameters (concentration in ug/L unless indicated)						
Organic Compounds						
Acetone	1.0	10.0	2.0	9.0	<1.0	2.0
Benzene	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	1.0	ND
Chloroform	<1.0	<1.0	<1.0	ND	<1.0	<1.0
1,1-Dichloroethylene	2.0	2.0	<1.0	2.0	<1.0	2.0
1,2-Dichloroethylene (total)	2.0	<1.0	ND	14.0	<1.0	<1.0
Methylene Chloride	<1.0	<1.0	<1.0	3.0	ND	<1.0
Methylethyl Ketone	ND	ND	1.0	ND	ND	ND
Methylisobutyl Ketone	ND	ND	ND	ND	1.0	ND
Phenol	<1.0	<1.0	<1.0	<1.0	1.0	<1.0
Tetrachloroethylene	ND	ND	ND	132.0	ND	ND
Toluene	ND	ND	<1.0	ND	ND	<1.0
1,1,1-Trichloroethane	7.0	4.0	<1.0	3.0	<1.0	5.0
Trichloroethylene	23.0	41.0	<1.0	42.0	4.0	6.0
Trichlorotrifluoroethane	1.0	3.0	ND	1.0	2.0	ND
Vinyl Chloride	ND	ND	ND	205.0	ND	ND
Xylene (total)	<1.0	<1.0	<1.0	<1.0	<1.0	1.0

ND Not detected.
ug/ml Micrograms per milliliter.
ug/L Micrograms per liter.

A.4 Figure 5 - Water Table Elevation on June 2, 1988 in the Vicinity of the Grumman Aerospace Corporation, Bethpage, New York

GERAGHTY & MILLER, INC.
Ground-Water Consultants

EXPLANATION

- LOCATION AND DESIGNATION OF WELL
- PROPERTY BOUNDARY OF GRUMMAN AEROSPACE CORPORATION
- PROPERTY BOUNDARY OF GRUMMAN MEMORIAL
- 65 — WATER-TABLE ELEVATION, IN FEET ABOVE MEAN SEA LEVEL
- INFERRED DIRECTION OF GROUND WATER FLOW

N

0 1000 FT

WATER-TABLE ELEVATION
ON JUNE 2, 1988 IN THE VICINITY OF
GRUMMAN AEROSPACE CORPORATION
Bethpage, New York

FIGURE 5

A.5 Figure 7 - Proposed Soil-Gas Survey and Recharge Basin Sampling Locations, Grumman Aerospace Corporation, Bethpage, New York; and Figure 8 - Proposed Soil Boring and Monitoring Well Locations, Grumman Aerospace Corporation, Bethpage, New York

GERAGHTY & MILLER, INC.
Environmental Services

PREPARED FOR: GRUMMAN AEROSPACE CORP.
Bethpage, New York

GM-1 GM-15, 17
GM-2 GM-25 (N-10590) GM-21
GM-3 GM-31 (N-10812) GM-35
GM-4 GM 45, 41 (6)
GM-5 GM-55, 51 (7)
GM-6 GM-65 (P-3)
GM-7 GM-75, 77, 79
GM-8 GM-85, 81
GM-9 GM-95, 91 (K)
GM-10 GM-105 (P-5) GM-101
GM-11 GM-111 (N-8685)
GM-12 GM-125, 121
GM-13 GM-135, 131 (N-10595, N-10629) GM-130
GM-14 GM-145 (N-10625) GM-141
GM-15 GM-155 (N-10626) GM-151
GM-16 GM-165, 161
GM-17 GM-175
GM-18 GM-181 GM-185 (N-10599)
GM-19 GM-195, 191
GM-20 GM-205 (N-10632) GM-201, 200
GM-21 GM-215 (N-10601) GM-211
GM-22 GM-225, 221
GM-23 GM-235, 231

RUCO POLYMER CORP

1 2 3 4

EXPLANATION

- GM-25 (N-10590) — EXISTING WELL LOCATION AND DESIGNATION
- GM-15 — PROPOSED WELL LOCATION AND DESIGNATION
- GM-1 — PROPOSED WELL CLUSTER LOCATION AND DESIGNATION
- 1 — LOCATION AND DESIGNATION OF SITE AREAS
- ( ) — INDICATES EXISTING WELL DESIGNATION
- B-1 — PROPOSED SOIL BORING LOCATION AND DESIGNATION

SUBJECT: PROPOSED SOIL BORING AND MONITORING WELL LOCATIONS

FIGURE 8

GERAGHTY & MILLER, INC.
Environmental Services

PREPARED FOR: GRUMMAN AEROSPACE CORP.
Bethpage, New York

PREPARED BY: E.D. COMPILED BY: C.S. PROJECT MGR.: A.B. BAR SCALE: 0

SG-1 SG-2 SG-3 SG-4 SG-5, SG-6 SG-7 SG-8 SG-9 SG-10 SG-11
RW/BS-1 RW/BS-2 RW/BS-3 RW/BS-4 RW/BS

EXPLANATION

- SG-1 — PROPOSED LOCATION AND DESIGNATION OF SOIL-GAS SURVEY SITES
- RW/BS-1 — PROPOSED LOCATION AND DESIGNATION OF RECHARGE BASIN WATER AND BOTTOM-SEDIMENT SAMPLES

0 1000 FT
SCALE

SUBJECT: PROPOSED SOIL-GAS SURVEY AND RECHARGE BASIN SAMPLING LOCATIONS

FIGURE 7

APPENDIX B

B.1 Table 9 of the Grumman Work Plan

B.2 Table 8 of the Grumman Work Plan

APPENDIX B.1

TABLE 9 OF THE GRUMMAN WORK PLAN

Table 9. Preliminary Applicable or Relevant and Appropriate Requirements Identified for the Grumman Aerospace Corporation Site, Bethpage, New York. (a)

A. Preliminary Ground Water ARARs

Parameters	USEPA MCL	Revised 10NYCRR Subpt 5-1	10NYCRR Part 170	6NYCRR Part 703	TOGS Values
Inorganics:					
Aluminum	--	--	--	--	--
Antimony	--	--	--	--	0.003
Arsenic	0.05	0.05	0.05	0.025	--
Barium	1.0	1.0	1.0	1.0	--
Beryllium	--	--	--	--	0.003
Cadmium	0.01	0.01	0.01	0.01	--
Calcium	--	--	--	--	--
Chromium	0.05	0.05	--	--	--
Chromium (VI)	--	--	0.05	0.05	--
Cobalt	--	--	--	--	--
Copper	1.0	1.0	<0.2	1.0	--
Iron	0.3	0.3 (c)	--	0.3 (c)	--
Lead	0.05	0.05	0.05	0.025	--
Magnesium	--	--	--	--	35
Manganese	0.05	0.3 (c)	--	0.3 (c)	--
Mercury	0.002	0.002	0.005	0.002	--
Nickel	--	--	--	--	--
Potassium	--	--	--	--	--
Selenium	0.01	0.01	0.01	0.02	--
Silver	0.05	0.05	0.05	0.05	--
Sodium	--	--	<20	--	--
Thallium	--	--	--	--	0.004
Vanadium	--	--	--	--	--
Zinc	5.0	5.0	<0.3	5	--
Cyanide	--	--	<0.1	0.2	--

All ARARs are given in Milligrams per Liter unless indicated (mg/L).

ARARs Applicable or Relevant and Appropriate Requirements.
MCL Maximum Contaminant Levels.
TOGS New York State Department of Environmental Conservation Technical and Operational Guidance Series.
PCBs Polychlorinated biphenyls.
SPDES State Pollutant Discharge Elimination System.
ND Not Detected.
-- No standard available.
(a) Currently there are no Federal or New York State standards for soil or sediment samples.
(b) Effluent standards provided are those specified in the current Grumman SPDES Permit (effective date July 1, 1989).
(c) Combined concentration of Iron and Manganese shall not exceed 0.5 mg/L.
(d) Total Trihalomethanes shall not exceed 0.1 mg/L.
(e) Total Phenolic Compounds.
(f) Applies to total of Para (i.e., 1,4-) and Ortho (i.e., 1,2-) isomers only.
(g) MCL for Styrene will be set after public comment period.
(h) Flow limit is not applicable to stormwater runoff conditions.
(i) Sum of concentrations of parameters given above.

Table 9. Preliminary Applicable or Relevant and Appropriate Requirements Identified for the Grumman Aerospace Corporation Site, Bethpage, New York. (a)

A. Preliminary Ground Water ARARs

Parameters	USEPA MCL	Revised 10NYCRR Subpt 5-1	10NYCRR Part 170	6NYCRR Part 703	TOGS Values
Volatile Organics:					
Chloromethane	--	0.005	--	--	--
Bromomethane	--	0.005	--	--	--
Vinyl Chloride	0.002	0.002	--	0.005	--
Chloroethane	--	0.005	--	--	--
Methylene Chloride	--	0.005	--	--	0.05
Acetone	--	0.05	--	--	--
Carbon Disulfide	--	0.05	--	--	--
1,1-Dichloroethene	0.007	0.005	--	--	0.00007
1,1-Dichloroethane	--	0.005	--	--	0.05
1,2-Dichloroethene	--	0.005	--	--	--
Chloroform	0.1 (d)	0.1 (d)	--	0.1	--
1,2-Dichloroethane	0.005	0.005	--	--	0.0008
2-Butanone	--	0.05	--	--	--
1,1,1-Trichloroethane	0.2	0.005	--	--	0.05
Carbon Tetrachloride	0.005	0.005	--	0.005	--
Vinyl Acetate	--	0.05	--	--	--
Bromodichloromethane	0.1 (d)	0.1 (d)	--	--	0.05
1,1,2,2-Tetrachloroethane	--	0.005	--	--	0.0002
1,2-Dichloropropane	--	0.005	--	--	0.05
trans-1,2-Dichloropropene	--	0.005	--	--	--
Trichloroethene	0.005	0.005	--	0.010	--
Dibromochloromethane	0.1 (d)	0.1 (d)	--	--	0.05

All ARARs are given in Milligrams per Liter unless indicated (mg/L).

ARARs Applicable or Relevant and Appropriate Requirements.
MCL Maximum Contaminant Levels.
TOGS New York State Department of Environmental Conservation Technical and Operational Guidance Series.
PCBs Polychlorinated biphenyls.
SPDES State Pollutant Discharge Elimination System.
ND Not Detected.
-- No standard available.
(a) Currently there are no Federal or New York State standards for soil or sediment samples.
(b) Effluent standards provided are those specified in the current Grumman SPDES Permit (effective date July 1, 1989).
(c) Combined concentration of Iron and Manganese shall not exceed 0.5 mg/L.
(d) Total Trihalomethanes shall not exceed 0.1 mg/L.
(e) Total Phenolic Compounds.
(f) Applies to total of Para (i.e., 1,4-) and Ortho (i.e., 1,2-) isomers only.
(g) MCL for Styrene will be set after public comment period.
(h) Flow limit is not applicable to stormwater runoff conditions.
(i) Sum of concentrations of parameters given above.

Table 9. Preliminary Applicable or Relevant and Appropriate Requirements Identified for the Grumman Aerospace Corporation Site, Bethpage, New York. (a)

A. Preliminary Ground Water ARARs

Parameters	USEPA MCL	Revised 10NYCRR Subpt 5-1	10NYCRR Part 170	6NYCRR Part 703	TOGS Values
Volatile Organics:(continued)					
1,1,2-Trichloroethane	--	0.005	--	--	0.0006
Benzene	0.005	0.005	--	ND	--
cis-1,3-Dichloropropene	--	0.005	--	--	--
Bromoform	0.1 (d)	0.1 (d)	--	--	0.05
2-Hexanone	--	0.05	--	--	0.05
4-Methyl-2-pentanone	--	0.05	--	--	--
Tetrachloroethene	--	0.005	--	--	0.0007
Toluene	--	0.005	--	--	0.05
Chlorobenzene	--	0.005	--	--	0.02
Ethylbenzene	--	0.005	--	--	0.05
Styrene(g)	--	0.005	--	0.931	--
Total Xylenes	--	0.005	--	--	0.05
Pesticides/PCBs:					
alpha-BHC	--	0.005	--	ND	--
beta-BHC	--	0.005	--	ND	--
delta-BHC	--	0.005	--	ND	--
gamma-BHC(Lindane)	0.004	0.004	0.036	ND	--
Heptachlor	--	0.005	0.018	ND	--
Aldrin	--	0.005	0.017	ND	--
Heptachlor Epoxide	--	0.005	0.018	ND	--
Endosulfan I	--	0.005	--	--	--
Dieldrin	--	0.005	0.017	ND	--
4,4'-DDE	--	0.005	--	ND	--

All ARARs are given in Milligrams per Liter unless indicated (mg/L).

ARARs Applicable or Relevant and Appropriate Requirements.
MCL Maximum Contaminant Levels.
TOGS New York State Department of Environmental Conservation Technical and Operational Guidance Series.
PCBs Polychlorinated biphenyls.
SPDES State Pollutant Discharge Elimination System.
ND Not Detected.
-- No standard available.
(a) Currently there are no Federal or New York State standards for soil or sediment samples.
(b) Effluent standards provided are those specified in the current Grumman SPDES Permit (effective date July 1, 1989).
(c) Combined concentration of Iron and Manganese shall not exceed 0.5 mg/L.
(d) Total Trihalomethanes shall not exceed 0.1 mg/L.
(e) Total Phenolic Compounds.
(f) Applies to total of Para (i.e., 1,4-) and Ortho (i.e., 1,2-) isomers only.
(g) MCL for Styrene will be set after public comment period.
(h) Flow limit is not applicable to stormwater runoff conditions.
(i) Sum of concentrations of parameters given above.

Table 9. Preliminary Applicable or Relevant and Appropriate Requirements Identified for the Grumman Aerospace Corporation Site, Bethpage, New York. (a)

A. Preliminary Ground Water ARARs

Parameters	USEPA MCL	Revised 10NYCRR Subpt 5-1	10NYCRR Part 170	6NYCRR Part 703	TOGS Values
Pesticides/PCBs:(continued)					
Endrin	0.0002	0.0002	0.001	ND	--
Endosulfan II	--	0.005	--	--	--
4,4'-DDD	--	0.005	--	ND	--
Endosulfan Sulfate	--	0.005	--	--	--
4,4'-DDT	--	0.005	0.042	ND	--
Methoxychlor	0.1	0.05	0.065	0.035	--
Chlordane(alpha and/or gamma)	--	0.005	0.006	0.0001	--
Toxaphene	0.005	0.005	0.005	ND	--
Arochlor-1016	--	0.001	--	0.0001	--
Arochlor-1221	--	0.001	--	0.0001	--
Arochlor-1232	--	0.001	--	0.0001	--
Arochlor-1242	--	0.001	--	0.0001	--
Arochlor-1248	--	0.001	--	0.0001	--
Arochlor-1254	--	0.001	--	0.0001	--
Arochlor-1260	--	0.001	--	0.0001	--
Endrin Ketone	--	0.005	--	--	--

All ARARs are given in Milligrams per Liter unless indicated (mg/L).

ARARs Applicable or Relevant and Appropriate Requirements.
MCL Maximum Contaminant Levels.
TOGS New York State Department of Environmental Conservation Technical and Operational Guidance Series.
PCBs Polychlorinated biphenyls.
SPDES State Pollutant Discharge Elimination System.
ND Not Detected.
-- No standard available.
(a) Currently there are no Federal or New York State standards for soil or sediment samples.
(b) Effluent standards provided are those specified in the current Grumman SPDES Permit (effective date July 1, 1989).
(c) Combined concentration of Iron and Manganese shall not exceed 0.5 mg/L.
(d) Total Trihalomethanes shall not exceed 0.1 mg/L.
(e) Total Phenolic Compounds.
(f) Applies to total of Para (i.e., 1,4-) and Ortho (i.e., 1,2-) isomers only.
(g) MCL for Styrene will be set after public comment period.
(h) Flow limit is not applicable to stormwater runoff conditions.
(i) Sum of concentrations of parameters given above.

Table 9. Preliminary Applicable or Relevant and Appropriate Requirements Identified for the Grumman Aerospace Corporation Site, Bethpage, New York. (a)

A. Preliminary Ground Water ARARs

Parameters	USEPA MCL	Revised 10NYCRR Subpt 5-1	10NYCRR Part 170	6NYCRR Part 703	TOGS Values
Semivolatiles:					
Phenol(s)	--	0.05	0.001	0.001 (e)	--
bis(-2-Chloroethyl)ether	--	0.005	--	0.001	--
2-Chlorophenol	--	0.005	--	0.001 (e)	--
1,3-Dichlorobenzene	--	0.005	--	--	--
1,4-Dichlorobenzene	0.075	0.005	--	4.7 (f)	--
Benzyl Alcohol	--	0.05	--	--	--
1,2-Dichlorobenzene	--	0.005	--	4.7 (f)	--
2-Methylphenol	--	0.05	--	0.001 (e)	--
bis(2-Chloroisopropyl)ether	--	0.005	--	--	--
4-Methylphenol	--	0.05	--	0.001 (e)	--
n-Nitroso-di-propylamine	--	0.05	--	--	--
Hexachloroethane	--	0.005	--	--	--
Nitrobenzene	--	0.005	--	--	0.03
Isophorone	--	0.05	--	--	0.05
2-Nitrophenol	--	0.005	--	0.001 (e)	--
2,4-Dimethylphenol	--	0.05	--	0.001 (e)	--
Benzoic Acid	--	0.05	--	--	--
bis(-2-Chloroethoxy)methane	--	0.005	--	--	--
2,4-Dichlorophenol	--	0.005	--	0.001 (e)	0.0003
1,2,4-Trichlorobenzene	--	0.005	--	--	0.01
Naphthalene	--	0.05	--	--	0.01
4-Chloroaniline	--	0.005	--	--	--

All ARARs are given in Milligrams per Liter unless indicated (mg/L).

ARARs Applicable or Relevant and Appropriate Requirements.
MCL Maximum Contaminant Levels.
TOGS New York State Department of Environmental Conservation Technical and Operational Guidance Series.
PCBs Polychlorinated biphenyls.
SPDES State Pollutant Discharge Elimination System.
ND Not Detected.
-- No standard available.
(a) Currently there are no Federal or New York State standards for soil or sediment samples.
(b) Effluent standards provided are those specified in the current Grumman SPDES Permit (effective date July 1, 1989).
(c) Combined concentration of Iron and Manganese shall not exceed 0.5 mg/L.
(d) Total Trihalomethanes shall not exceed 0.1 mg/L.
(e) Total Phenolic Compounds.
(f) Applies to total of Para (i.e., 1,4-) and Ortho (i.e., 1,2-) isomes only.
(g) MCL for Styrene will be set after public comment period.
(h) Flow limit is not applicable to stormwater runoff conditions.
(i) Sum of concentrations of parameters given above.

Table 9. Preliminary Applicable or Relevant and Appropriate Requirements Identified for the Grumman Aerospace Corporation Site, Bethpage, New York. (a)

A. Preliminary Ground Water ARARs

Parameters	USEPA MCL	Revised 10NYCRR Subpt 5-1	10NYCRR Part 170	6NYCRR Part 703	TOGS Values
Semivolatiles (continued):					
Hexachlorobutadiene	--	0.005	--	--	0.0005
4-Chloro-3-methylphenol	--	0.005	--	0.001 (e)	--
2-Methylnaphthalene	--	0.05	--	--	--
Hexachlorocyclopentadiene	--	0.005	--	--	0.001
2,4,6-Trichlorophenol	--	0.005	--	0.001 (e)	--
2,4,5-Trichlorophenol	--	0.005	--	0.001 (e)	--
2-Chloronaphthalene	--	0.005	--	--	0.01
2-Nitroaniline	--	0.005	--	--	--
Dimethylphthalate	--	0.05	--	--	0.05
Acenaphthylene	--	0.05	--	--	--
3-Nitroaniline	--	0.005	--	--	--
Acenaphthene	--	0.05	--	--	0.02
2,4-Dinitrophenol	--	0.005	--	0.001 (e)	--
4-Nitrophenol	--	0.005	--	0.001 (e)	--
Dibenzofuran	--	0.05	--	--	--
2,4-Dinitrotoluene	--	0.005	--	--	--
2,6-Dinitrotoluene	--	0.005	--	--	0.00007
Diethylphthalate	--	0.05	--	--	0.05
4-Chlorophenyl-phenylether	--	0.005	--	--	--
Fluorene	--	0.05	--	--	0.05
4-Nitroaniline	--	0.005	--	--	--
4,6-Dinitro-2-methylphenol	--	0.005	--	0.001 (e)	--

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ARARs Applicable or Relevant and Appropriate Requirements.
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PCBs Polychlorinated biphenyls.
SPDES State Pollutant Discharge Elimination System.
ND Not Detected.
-- No standard available.
(a) Currently there are no Federal or New York State standards for soil or sediment samples.
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(c) Combined concentration of Iron and Manganese shall not exceed 0.5 mg/L.
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(e) Total Phenolic Compounds.
(f) Applies to total of Para (i.e., 1,4-) and Ortho (i.e., 1,2-) isomers only.
(g) MCL for Styrene will be set after public comment period.
(h) Flow limit is not applicable to stormwater runoff conditions.
(i) Sum of concentrations of parameters given above.

Table 9. Preliminary Applicable or Relevant and Appropriate Requirements Identified for the Grumman Aerospace Corporation Site, Bethpage, New York. (a)

A. Preliminary Ground Water ARARs

Parameters	USEPA MCL	Revised 10NYCRR Subpt 5-1	10NYCRR Part 170	6NYCRR Part 703	TOGS Values
Semivolatiles (continued):					
N-Nitrosodiphenylamine	--	0.005	--	--	0.05
4-Bromophenyl-phenylether	--	0.005	--	--	--
Hexachlorobenzene	--	0.005	--	0.00035	--
Penta-chlorophenol	--	0.005	--	0.021	--
Phenanthrene	--	0.05	--	--	0.05
Anthracene	--	0.05	--	--	0.05
Di-n-butylphthalate	--	0.05	--	0.77	--
Fluoranthene	--	0.05	--	--	0.05
Pyrene	--	0.05	--	--	0.05
Butylbenzylphthalate	--	0.05	--	--	0.05
3,3'-Dichlorobenzidine	--	0.005	--	--	--
Benzo(a)anthracene	--	0.05	--	--	0.000002
bis(2-Ethylhexyl)phthalate	--	0.05	--	4.2	--
Chrysene	--	0.05	--	--	0.000002
Di-n-octyl phthalate	--	0.05	--	--	0.05
Benzo(b)fluoranthene	--	0.05	--	--	0.000002
Benzo(k)fluoranthene	--	0.05	--	--	0.000002
Benzo(a)pyrene	--	0.05	--	ND	--
Indeno(1,2,3-c d)pyrene	--	0.05	--	--	0.000002
Dibenz(a,h)anthracene	--	0.05	--	--	--
Benzo(g,h,i)perylene	--	0.05	--	--	--

All ARARs are given in Milligrams per Liter unless indicated (mg/L).

ARARs Applicable or Relevant and Appropriate Requirements.
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(g) MCL for Styrene will be set after public comment period.
(h) Flow limit is not applicable to stormwater runoff conditions.
(i) Sum of concentrations of parameters given above.

APPENDIX B.2

TABLE 8 OF THE GRUMMAN WORK PLAN

Table 8. General Response Actions and Associated Remedial Technologies, Grumman Aerospace Corporation, Bethpage, New York.

General Response Action	Technologies
No Action	Some monitoring and analyses may be performed.
Containment	Capping; ground-water containment barrier walls; bulkheads.
Pumping	Ground-water pumping; liquid removal; dredging.
Collection	Sedimentation basins; French drains.
Diversion	Grading; dikes and berms; stream diversion ditches; trenches; terraces and benches; chutes and downpipes; levees; seepage basins.
Complete Removal	Tanks; drums; soils; sediments; liquid wastes; contaminated structures; sewers and water pipes.
Partial Removal	Tanks; drums; soils; sediments; liquid wastes.
On-Site Treatment	Incineration; solidification; land treatment; biological, chemical, and physical treatment.
In-Situ Treatment	Permeable treatment beds; bioreclamation; soil flushing; neutralization; land farming.
Storage	Temporary storage structures.
On-Site Disposal	Land application.
Off-Site Disposal	Landfills; surface impoundments; land application.
Alternative Water Supply	Cisterns; aboveground tanks; deeper or upgradient wells; municipal water system; reloction of intake structure; individual treatment devices.
Relocation	Relocate residents temporarily or permanently.