# TECHNICAL REVIEW COMMITTEE

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

**MARCH 31, 1992**

# AGENDA

## TECHNICAL REVIEW COMMITTEE MEETING #1
## NWIRP BETHPAGE, NY
## MARCH 31, 1992

1. Welcome/Introduction
2. Purpose and Functions of the Technical Review Committee (TRC):
3. Overview of the Navy's Installation Restoration Program (IRP)
4. History of IRP at NWIRP Bethpage
5. Discussion of Remedial Investigation Fieldwork and Results
6. Question and Answer Discussion - Open Forum
7. Windshield Tour of IR Sites

# WELCOME TRC MEMBERS

## TECHNICAL REVIEW COMMITTEE

## NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
## BETHPAGE, NEW YORK
## INSTALLATION RESTORATION PROGRAM

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# PURPOSE AND FUNCTION OF TRC

# PURPOSE AND FUNCTION OF THE TECHNICAL REVIEW COMMITTEE (TRC) FOR NWIRP BETHPAGE, NEW YORK

## PURPOSE OF THE TRC

The purpose of the TRC is to establish a body which will facilitate communication and coordination among the members concerning response activities at NWIRP Bethpage. The members will review and comment on proposed Navy response actions with respect to the Navy's Installation Restoration Program (IRP) at NWIRP Bethpage.

The members will coordinate technical review procedures and schedules to be followed by the Navy during the IRP at NWIRP Bethpage.

The members shall identify and review in a timely manner any federal or promulgated state standards, requirements, criteria, or limitations that are legally applicable or relevant and appropriate under the circumstances of the release or threatened release of a hazardous substance, pollutant, or contaminant.

## FUNCTION OF THE TRC

The primary function of the TRC is to obtain coordinated direction for the IRP actions at NWIRP Bethpage through consultation with the EPA, state, local authorities, and community representatives to resolve any questions that arise from actual field activities or submitted documents. They shall recommend necessary changes based on continuing review of IRP actions at NWIRP Bethpage. All responses recommending changes or objecting to IRP actions or proposals must cite specific laws, standards, etc., and must propose viable alternatives. Individual committee members are responsible for insuring that their input reflects the position of their respective parent organization.

Navy technical data, site inspection reports, remedial investigation reports, feasibility study reports, work plans, and other documents relating to Navy response actions shall be sent to committee members as they become available. Members will submit written reviews to the RPM within 30 working days following receipt.

The Navy will respond to committee members within 30 working days of receipt of their reviews, indicating its response to all comments.

# OVERVIEW OF THE NAVY'S INSTALLATION RESTORATION PROGRAM (IRP)

# DEFENSE ENVIRONMENTAL RESTORATION PROGRAM PROFILE

- **Established by Congress in 1984**
- **Installation Restoration is the Primary Program Element**
- **1,855 Installations and 17,842 Sites**
- **7,300 Sites to be Remediated**
- **Total Estimated Program Cost of $25 Billion**

# DERP STATUS

- **Preliminary Assessments at Almost All 17,500 Sites**
- **Remedial Investigations/Feasibility Studies Ongoing or Complete at approximately 5,300 Sites**
- **Remedial Design/Remedial Action Ongoing or Complete at approximately 1,600 Sites**
- **96 Sites on EPA's National Priority List (NPL)**

# INSTALLATION RESTORATION PROGRAM

- **Navy developed the Installation Restoration Program in 1980 which requires Naval installations to investigate past hazardous waste disposal sites**

***Purpose:***

- **Identify**
- **Assess**
- **Cleanup or control contamination from past hazardous waste activities**

# NORTHERN DIVISION
## *NAVAL FACILITIES ENGINEERING COMMAND*

- **Perform site specific studies to assess and control contamination at Navy sites**
- **Project coordination with regulatory agencies**
- **Preparation of project plans, reports, contract documents, contract award, and administration**
- **Provide technical and financial oversight**
- **Establish Technical Review Committee (TRC)**

# HISTORY OF IRP AT NWIRP BETHPAGE

## CHRONOLOGICAL HISTORY OF NWIRP BETHPAGE

A chronological summary of significant environmental events and activities at the Naval Weapons Industrial Reserve Plant Bethpage.

| | |
|---|---|
| 1933 | Naval Weapons Industrial Reserve Plant Bethpage was established. |
| Early 1980s | Industrial wastewater treatment plant was constructed to process chemical effluents from the activity's manufacturing operations. |
| September 1980 | U.S. Navy implemented the Navy Assessment and Control of Installation Pollutants (NACIP) Program through OPNAVNOTE 6240 Ser 45/733503. The purpose of the program was to systematically identify, assess, and control contamination of the environment from past hazardous materials and management operations. |
| May 1983 | U.S. Navy authorized the current IRP which conforms to the scope and purpose of CERCLA and National Oil and Hazardous Substances Pollution Control Contingency Plan. The Defense Environmental Restoration Account (DERA) was established bu Congress to directly fund the IRP. |
| June 1985 | The initial IAS survey was conducted at NWIRP Bethpage under the NACIP program. |
| December 1986 | Initial Assessment Study (IAS) completed recommending three sites at NWIRP Bethpage be investigated to either confirm or refute the presence of suspected contamination. |
| June 1989 | U.S. Navy faced with a shortfall of DERA funds. Department of Navy sites listed as NPL are given top priority of DERA funds. |

| | |
|---|---|
| May 1991 | Remedial Investigation started at NWIRP Bethpage with the preparation of the Remedial Investigation Plan of Action. |
| June 1991 | US EPA Region II informs the Navy that the Preliminary Assessment (PA) and Site Inspection (SI) data requirements have been reviewed and insufficient information existed to adequately determine if NWIRP should be listed on the NPL. |
| December 1991 | U.S. Navy established a Technical Review Committee (TRC). |
| February 1992 | Remedial Investigation fieldwork complete at NWIRP Bethpage. |
| February 1992 | U.S. Navy forwards PA Scoresheets, EPA Checklist, and Site Inspection Report to EPA Region II. |
| March 31, 1992 | TRC Meeting #1 convened. |

# SITE DESCRIPTION AND LOCATION MAPS

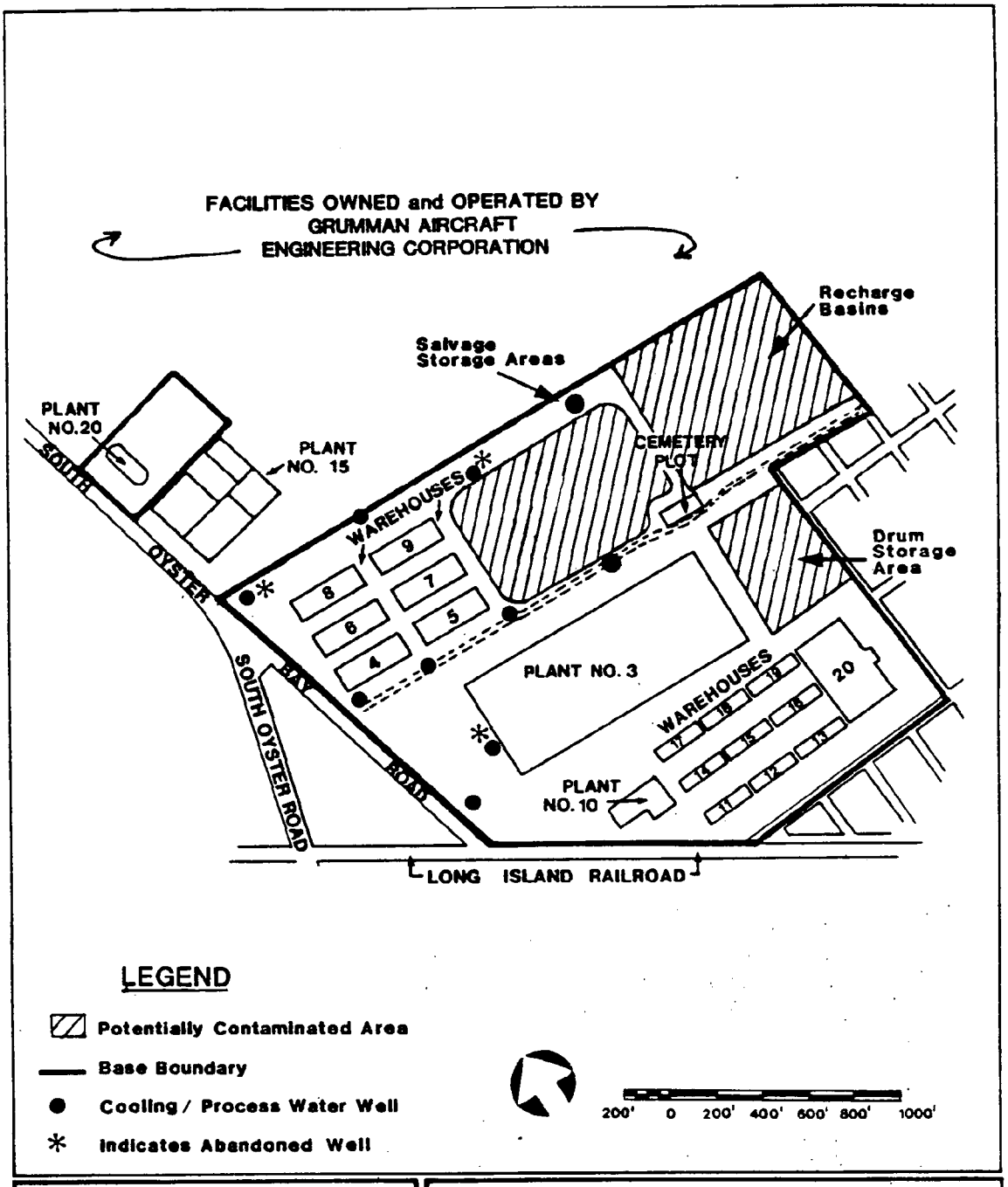


Figure 1

Three Potentially Contaminated Disposal Sites, NWIRP Bethpage, New York

**Initial Assessment Study**
Naval Weapons Industrial Reserve Plant
Bethpage and Calverton
Long Island, New York

## SITE DESCRIPTION AND LOCATION MAPS

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 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' x 100' 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 and disposal. There are no reports of leaks or spills of drum contents.

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

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).

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 basins. These waters were directly exposed to the chemicals used in industrial processes (involving the rinsing of manufactured parts). Reportedly, these discharges of dilute rinse waters did not contain chromates.

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

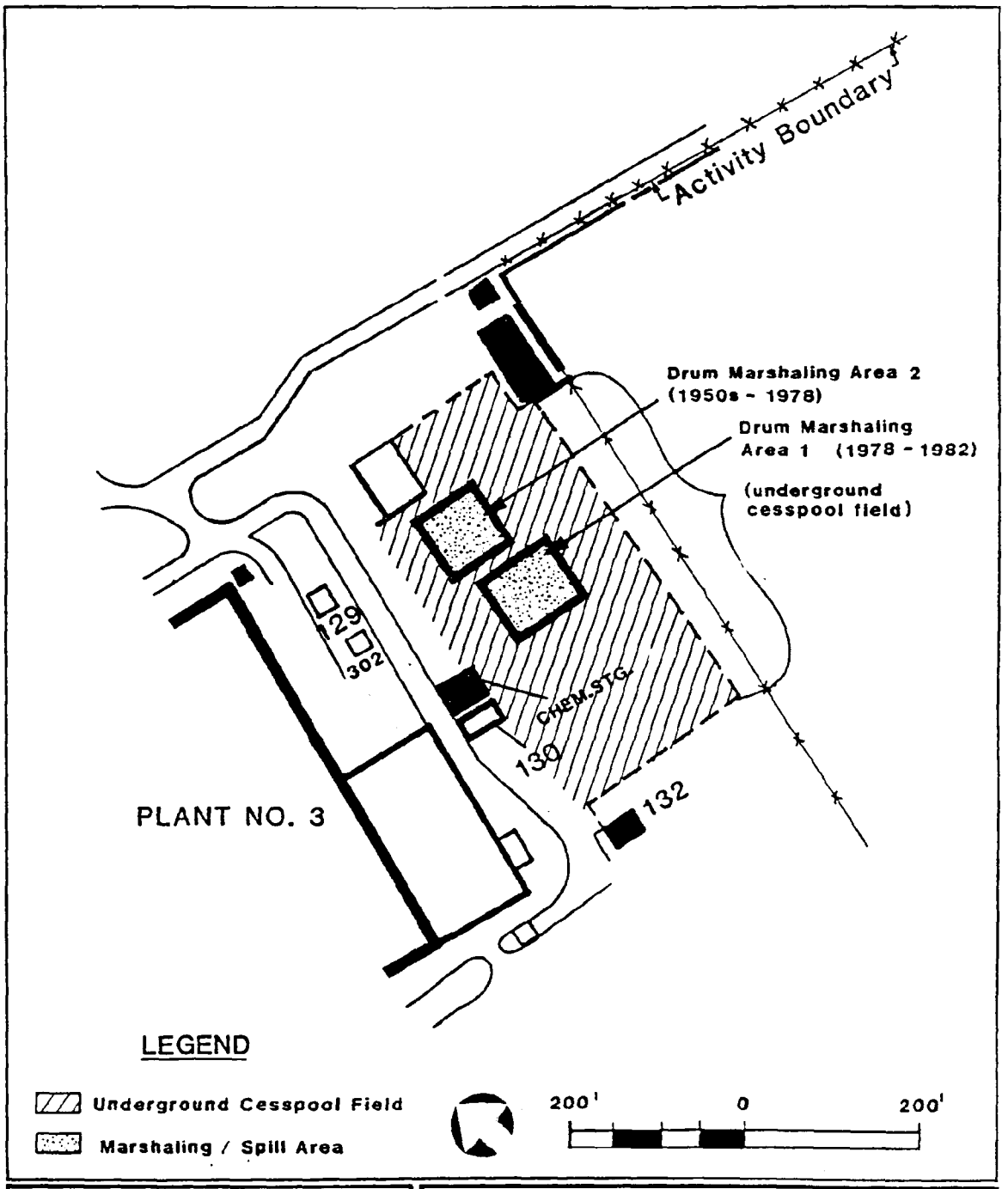


Figure 2

Site 1, NWIRP Bethpage Former
Drum Marshaling Areas

**Initial Assessment Study**
Naval Weapons Industrial
Reserve Plant
Bethpage and Calverton
Long Island, New York

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 hexavalant chromium in excess of allowable limits (RGH, Dec 1986). Grumman was notified of this noncompliance and was asked to perform remedial actions necessary to eliminate the problem. Reportedly, Grumman complied with the request.

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

Site 3 - Salvage Storage Area

The NWIRP Bethpage Salvage Storage Area is located north of the Plant 03 (See Figure 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 dropped 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, Dec 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 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. This area was covered 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. The exact location of this former drum marshaling area is uncertain, however, it is suspected to be near the current drum marshaling area.

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

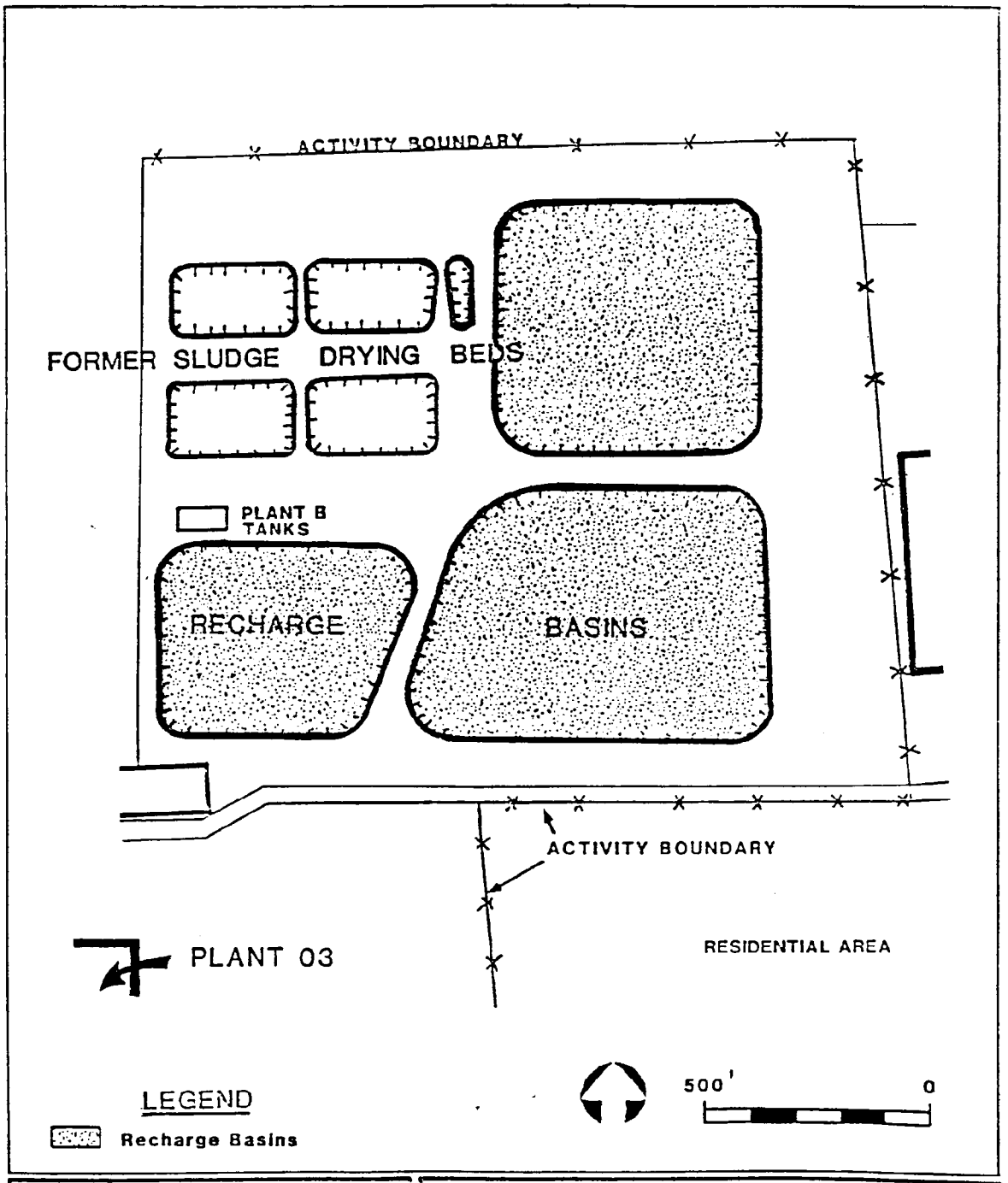


Figure 3

Site 2, NWIRP Bethpage
Recharge Basins

**Initial Assessment Study**
Naval Weapons Industrial
Reserve Plant
Bethpage and Calverton
Long Island, New York

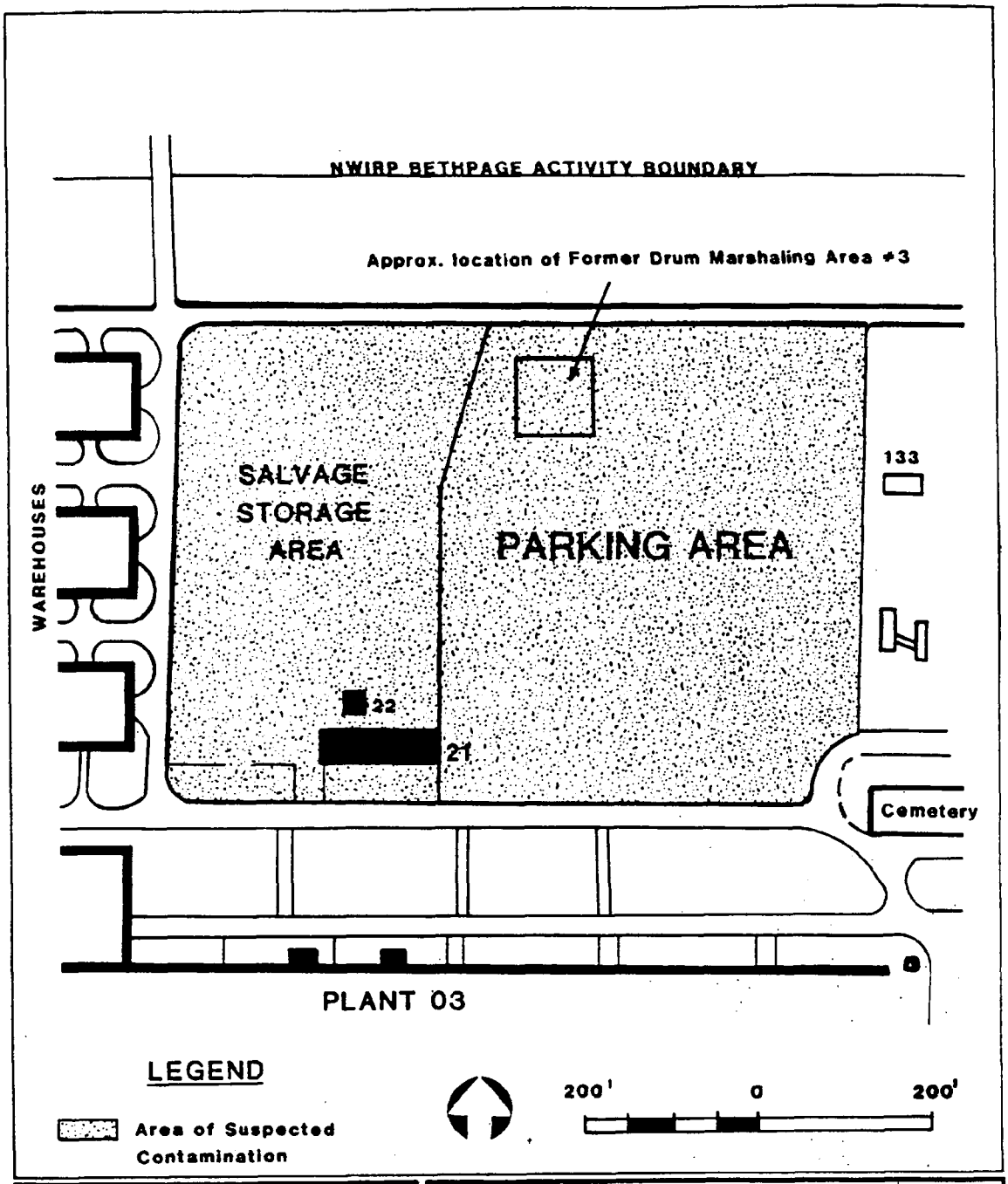


Figure 4

Site 3, NWIRP Bethpage
Salvage Storage Area

**Initial Assessment Study**
Naval Weapons Industrial
Reserve Plant
Bethpage and Calverton
Long Island, New York

## REMEDIAL INVESTIGATION FIELDWORK AND REPORT SCHEDULE FOR NWIRP BETHPAGE, NY

| MILESTONE/ACTIVITIES: | DATE: |
|---|---|
| Field Activities | 08/91 - 01/92 |
| Completion of Shallow Wells | 09/17/91 |
| Installation of Intermediate Wells | 10/17 - 11/27/91 |
| Sample Shallow, Intermediate, USGS, and Process Wells | 12/04 - 12/11/91 |
| Installation of Deep Wells | 12/11/91 - 01/17/92 |
| Sample Deep Wells | 02/11/92 |
| Receive Results (less deep wells, unvalidated) | 01/13/92 |
| Receive Deep Well Results (unvalidated) | 02/28/92 |
| Draft Remedial Investigation (RI) Report | 03/03/92 |
| Draft RI Addendum Report for Deep Wells | 03/27/92 — Comments 4/7/92 |
| Final RI Report (including deep well results) | 05/04/92 to FK |

FEASIBILITY STUDY — to start in June

Complete late FALL

ROD 12/92

NOTES

# APPENDIX I

# GLOSSARY

**ACNO:** Assistant Chief of Naval Operations

**AESO:** Aircraft Environmental Support Office

**AICUZ:** Air Installations Compatible Use Zone; established by DoD Directive 4165.57 of 8 November 1977 (NOTAL) to limit incompatible development in areas that are adjacent to air installations and subject to aircraft accident potential and high aircraft noise levels.

**APN:** Aircraft Procurement, Navy

**ARAR:** Applicable and relevant or appropriate requirements

**ARPA:** Archaeological Resources Protection Act

**ASN (I&E):** Assistant Secretary of the Navy for Installations and the Environment

**ATSDR:** Agency for Toxic Substance and Disease Registry

**BDAT:** Best demonstrated available technology

**BAT:** Best available technology

**BATAE:** Best available technology economically achievable

**BCT:** Best conventional technology

**BPCT:** Best practicable control technology

**BUMED:** U.S. Navy Bureau of Medicine and Surgery

**CAA:** Clean Air Act

**CEQ:** Council on Environmental Quality; established by the National Environmental Policy Act to advise the President in matters concerning conditions and trends in the quality of the environment.

**CERCLA:** Comprehensive Environmental Response, Compensation and Liability Act

**CFC:** Chlorofluorocarbon

**CFR:** Code of Federal Regulations; codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government; as code is updated by the individual issues of the Federal Register, these two publications must be used together to determine the latest version of any given rule.

**CFST:** Contaminated fuel settling tank

**CHINFO:** Chief of Information.

**CHT:** Collection, holding and transfer system (for shipboard sewage and waste water)

**CINC:** Commander-in-Chief.

**CINCLANTFLT:** Commander-in-Chief, U.S. Atlantic Fleet

**CINCPACFLT:** Commander-in-Chief, U.S. Pacific Fleet

**CNET:** Chief of Naval Education and Training.

**CNO:** Chief of Naval Operations

**CO:** Commanding officer

**Coastal Zone:** An area of Federal responsibility for response action under the National Contingency Plan; includes all U.S. waters subject to the tide, U.S. waters of the Great Lakes, specified ports and harbors on the inland rivers, waters of the contiguous zone, other waters of the high seas subject to the National Contingency Plan, and the land surface or land substrata, ground waters, and ambient air proximal to those waters.

COE: Corps of Engineers, Army

COMNAVFACENGCOM: Commander, Naval Facilities Engineering Command

COMNAVSUPSYSCOM: Commander, Naval Supply System Command

COMSC: Commander, Military Sealift Command

CONUS: Continental United States

COTR: Contracting officer's technical representative

CRP: Community Relations Plan

CWA: Clean Water Act

CY: Calendar year

CZMA: Coastal Zone Management Act

DASD (E): Deputy Assistant Secretary of Defense (Environment)

DCNO: Deputy Chief of Naval Operations

DCO: Delay Compliance Order

DEIS: Draft Environmental Impact Statement

DERA: Defense Environmental Restoration Account

DERP: Deficient equipage reporting procedure

DESR: Defense Environmental Status Report

DFM: Diesel fuel, marine

DLA: Defense Logistics Agency

DMSO: Directors of Major Staff Offices

DOC: Department of Commerce

DoD: Department of Defense

DoDDIR: Department of Defense Directive

DOE: Department of Energy

DOI: Department of Interior

DOJ: Department of Justice

DOL: Department of Labor

DON: Department of the Navy

DOT: Department of Transportation

DRMO: Defense Reutilization and Marketing Office

DSMOA: Defense/State memorandum of agreement

DTRC: David Taylor Research Center

EA: Environmental assessment

ECE: Environmental Compliance Evaluation

ECRS: Environmental Compliance Reporting System

EFD: Engineering Field Division

EHM: Extremely Hazardous Material

EIS: Environmental Impact Statement

Emission Offset: Reduction in the air emissions from one source equal to or greater than the increase in emissions from another source.

EO: Executive Order

EOD: Explosives ordnance disposal

EPA: Environmental Protection Agency

EPCRA: Emergency Planning and Community Right-to-Know Act

ESA: Endangered Species Act

Federal Register (FR): A document published daily, Monday through Friday, by the Office of the Federal Register, National Archives and Records Service, General Services Administration; provides a uniform system for making regulations and legal notices

issued by the Executive Branch of the Federal Government available to the public.

FEIS: Final Environmental Impact Statement

FEMA: Federal Emergency Management Agency

FFA: Federal Facility Agreement

FIFRA: Federal Insecticide, Fungicide, and Rodenticide Act

FMP: Fleet Modernization Program.

FOIA: Freedom of Information Act

FONSI: Finding of no significant impact

FS: Feasibility study

FWPCA: Federal Water Pollution Control Act

Gal: Gallon

GOCO: Government-Owned/Contractor-Operated facilities

GSA: General Services Administration

HABS/HAER: Historic American Buildings Survey/Historic American Engineering Record

HARP: Historic Archaeological Resources Protection

HAZMIN: Hazardous waste minimization

HM: Hazardous material

HMIS: Hazardous Material Information System.

HMTID: Hazardous material turned into disposal

HMTIS: Hazardous material turned into store

HRS: Hazard Ranking System

HS: Hazardous substance

HSWA: Hazardous and Solid Waste Amendments

HW: Hazardous waste

IAG: Interagency agreement

IG: Inspector General

I/M: Inspection and maintenance

IMO: International Maritime Organization (formerly IMCO).

IR: Installation Restoration

IRP: Installation Restoration Program

ISSA: Interservice support agreement

IWPP: Industrial waste pretreatment process

IWTP: Industrial waste treatment process

JAG: Judge Advocate General

kg: Kilogram

KVA: Kilovolt-ampere

LEPC: Local Emergency Planning Committee

LOGREQ: Logistics requirements

LTM: Long term monitoring

Major Claimant: A bureau/office/command headquarters that is designated as an administering office under the operation and maintenance appropriations in NAVCOMPT Manual, Volume 2, Chapter 2; receives major claimant operating budgets directly from the CNO Fiscal Management Division (OP-92).

MARCORPS: U.S. Marine Corps

MARPOL: International Maritime Convention for the Prevention of Pollution from Ships

MCL: Maximum Contaminant Level

MESO: Marine Environmental Support Office

MILCON: Military construction

MO: Manual of Operation

**MOA:** Memorandum of agreement

**MOU:** Memorandum of understanding

**MPRSA:** Marine Protection, Research and Sanctuaries Act

**MRC:** Maintenance Requirement Card

**MSC:** Military Sealift Command

**MSD:** Marine sanitation device

**MSDS:** Material Safety Data Sheet

**MWR:** Morale, welfare, and recreation

**NAAQS:** National Ambient Air Quality Standards.

**NACIP:** Navy Assessment and Control of Installation Pollutants

**NAPC:** Naval Air Propulsion Center

**NAVAIRSYSCOM:** Naval Air Systems Command

**NAVCOMPT:** Comptroller of the Navy

**NAVCOMPTINST:** Comptroller of the Navy Instruction

**NAVFACENGCOM:** Naval Facilities Engineering Command

**NAVFACENGCOM EFD:** Naval Facilities Engineering Command Engineering Field Division

**NAVGRAM:** A formatted document which replaces a naval message and is transmitted via the mails

**NAVOSH:** Navy Occupational Safety and Health

**NAVRESO:** Navy Resale System Office

**NAVSEASYSCOM:** Naval Sea Systems Command

**NAVSPAWARSYSCOM:** Naval Space and Warfare Systems Command

**NAVSUPSYSCOM:** Naval Supply Systems Command

**NCEL:** Naval Civil Engineering Laboratory.

**NCP:** National Contingency Plan; establishes national, regional, and local Federal organizations and plans for response to release or threatened releases of OHS; assigns responsibilities to participating Federal agencies and outlines the state, local government, and non-government cooperation needed during a response.

**NECA:** Navy Environmental Compliance Account

**NECIS:** Navy Environmental Information System

**NEESA:** Navy Energy and Environmental Support Activity

**NEPA:** National Environmental Policy Act

**NEPMG:** Navy Environmental Program Management Group

**NEPSS:** Naval Environmental Protection Support Service

**NESHAP:** National Emission Standards for Hazardous Air Pollutants

**NESO:** Navy Environmental Support Office

**NHPA:** National Historic Preservation Act

**NIF:** Navy Industrial Fund

**NJAG:** Navy Judge Advocate General

**nm:** Nautical mile

**NMFS:** National Marine Fisheries Service

**NNPI:** Nuclear propulsion plant information

**NNPS:** Nuclear propulsion plant space

**NOAA:** National Oceanic and Atmospheric Administration

**NOI:** Notice of intent

**NON:** Notice of non-compliance

**NOSC:** Navy On-Scene Coordinator

**NOSC:** Naval Ocean Systems Center

**NOSCDR:** Navy On-Scene Commander

**NOTAL:** Not to all

**NOTW:** Navy owned treatment works

**NOV:** Notice of Violation

**NPDES:** National Pollutant Discharge Elimination System

**NPL:** National Priorities List

**NRC:** National Response Center, established under the NCP to provide information regarding emergency response actions during OHS spills and releases

**NRC:** Nuclear Regulatory Commission

**NRM:** National resource management

**NRMPM:** Natural Resources Management Procedures Manual

**NRT:** National Response Team

**NSPS:** New Source Performance Standards

**NSTM:** Naval Ships Technical Manual

**NSWC:** Naval Surface Weapons Center

**OASD(E):** Office of Assistant Secretary of Defense for Environment.

**OCM:** Oil content monitor

**OESO:** Ordnance Environmental Support Office

**OGC:** Office of the General Counsel

**OHS:** Oil or hazardous substances

**Oily Waste Water:** An oil/water mixture that has a water content of greater than 50 percent. The mixture may also contain other non-petroleum matter.

**OLA:** Office of Legislative Affairs

**OMB:** Office of Management and Budget

**O&M:** Operations and maintenance

**O&MN:** Operations and Maintenance, Navy

**OP-00N:** Director, Naval Nuclear Propulsion Program

**OPN:** Other Procurement, Navy

**OPNAV:** Office of the Chief of Naval Operations

**OPNAVINST:** CNO instruction

**OPORDS:** Operational orders

**OPREP:** Operational report

**OSC:** On-Scene Coordinator

**OSCDR:** On-Scene Commander

**OSD:** Office of the Secretary of Defense

**OSHA:** Occupational Safety and Health Administration

**OSOT:** On-Scene Operation Team

**O-SWOB:** Oil-ship waste offload barges

**OWHT:** Oily waste holding tank

**OWS:** Oil/water separator

**PA:** Pollution abatement

**PA/SI:** Preliminary Assessment/Site Inspection

**PCB:** Polychlorinated biphenyl

**PCB Article:** Any manufactured article, other than a PCB container, that contains PCB and whose surface has been in direct contact with PCB; includes transformers and capacitors.

**PCR:** Pollution Control Report

**TSCA:** Toxic Substances Control Act

**TSD:** Treatment, storage, or disposal

**UIC:** Unit identification code

**UORA:** Used Oil Recovery Act

**USCG:** United States Coast Guard

**USDA:** United States Department of Agriculture

**USFWS:** U.S. Fish and Wildlife Service

**USNPS:** U.S. National Park Service

**UST:** Underground storage tank

**VOCs:** Volatile Organic Compounds.

**Water Quality Standards:** Standards and related implementation plans that have been adopted by each of the states and approved by the Office of Water Programs of the EPA pursuant to the FWPCA as amended.

**WOCT:** Waste oil collecting tank

**WPN:** Weapons Procurement, Navy

**YCC:** Youth Conservation Corps

# REMEDIAL INVESTIGATION
# NWIRP, BETHPAGE, NEW YORK

## PREPARED BY:
## HALLIBURTON NUS ENVIRONMENTAL CORPORATION
## PITTSBURGH, PENNSYLVANIA

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

## CONTRACT N62472-90-D-1298
## CONTRACT TASK ORDER 0003

P493922

- **FIELD ACTIVITIES (Collect samples of media for chemical testing and geological evaluations)**
- **NATURE AND EXTENT OF CONTAMINATION (Evaluation of analytical results to determine levels of contamination - typically relative to background)**
- **RISK ASSESSMENT (Quantification of risks to human health and the environment)**
- **RECOMMENDATIONS (For further investigation or remediation)**

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## FIELD WORK (AUGUST 1991 TO FEBRUARY 1992)

- Soil-gas Sampling and Analysis (Initial Screening - VOAs, August 1991)
  - 146 samples at 5 or 21 feet deep
  - Samples analyzed on site
  - Results used to determine location of soil and groundwater samples
- Temporary Monitoring Well Sampling and Analysis (Screening - VOAs, August/September 1991)
  - 29 temporary monitoring wells and samples Samples analyzed at local lab within 48 hours
  - Results used to determine location of additional groundwater samples

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## FIELD WORK (AUGUST 1991 TO FEBRUARY 1992) CONTINUED

- Subsurface/Subsurface Soil Sampling and Analysis (VOAs, Semi-VOAs, Inorganics, and PCBs/Pesticides, September 1991)
  - 46 Subsurface samples at 29 locations
  - 29 Surface samples
  - Samples analyzed at NEESA-approved laboratory.
  - Results used for nature and extent of contamination and risk assessment.

- Surface Water/Sediment Sampling and Analysis (VOAs, Semi-VOAs, and Inorganics, September 1991 and December 1992)
  - 2 Surface Water samples
  - 4 Sediment samples
  - Samples analyzed at NEESA-approved laboratory.
  - Results used for nature and extent of contamination and risk assessment.

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## FIELD WORK (AUGUST 1991 TO FEBRUARY 1992) CONTINUED

- **Groundwater Sampling and Analysis (VOAs, Semi-VOAs, and Inorganics, December 1991 and February 1992)**
  - 7 Shallow monitoring wells (~50 feet deep)
  - 7 Intermediate monitoring wells (100 to 150 feet deep)
  - 3 Deep monitoring wells (200 to 250 feet deep)
  - USGS Well (deep)
  - 4 Production wells (deep)
  - Samples analyzed at NEESA-approved laboratory.
  - Results used for nature and extent of contamination and risk assessment.

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## NATURE AND EXTENT OF CONTAMINATION

- Site 1 - Former Drum Marshaling Area
  - Soil-gas and temporary monitoring well results indicate the presence of a source area near the former drum marshaling area.
  - Soil results confirm VOA soil contamination in this area. TCE, PCE, and 1,1,1 TCA most significant VOAs. Results also find low levels of PCBs and inorganics in soils. Lead, arsenic, chromium, and cyanide were most significant inorganics.
  - Groundwater results indicate the presence of a significant VOA-contaminated groundwater plume originating near the former drum marshaling area. Primary contaminants are TCE, PCE, and 1,1,1-TCA with lesser but significant concentrations of inorganics including arsenic, lead, chromium, and cyanide.

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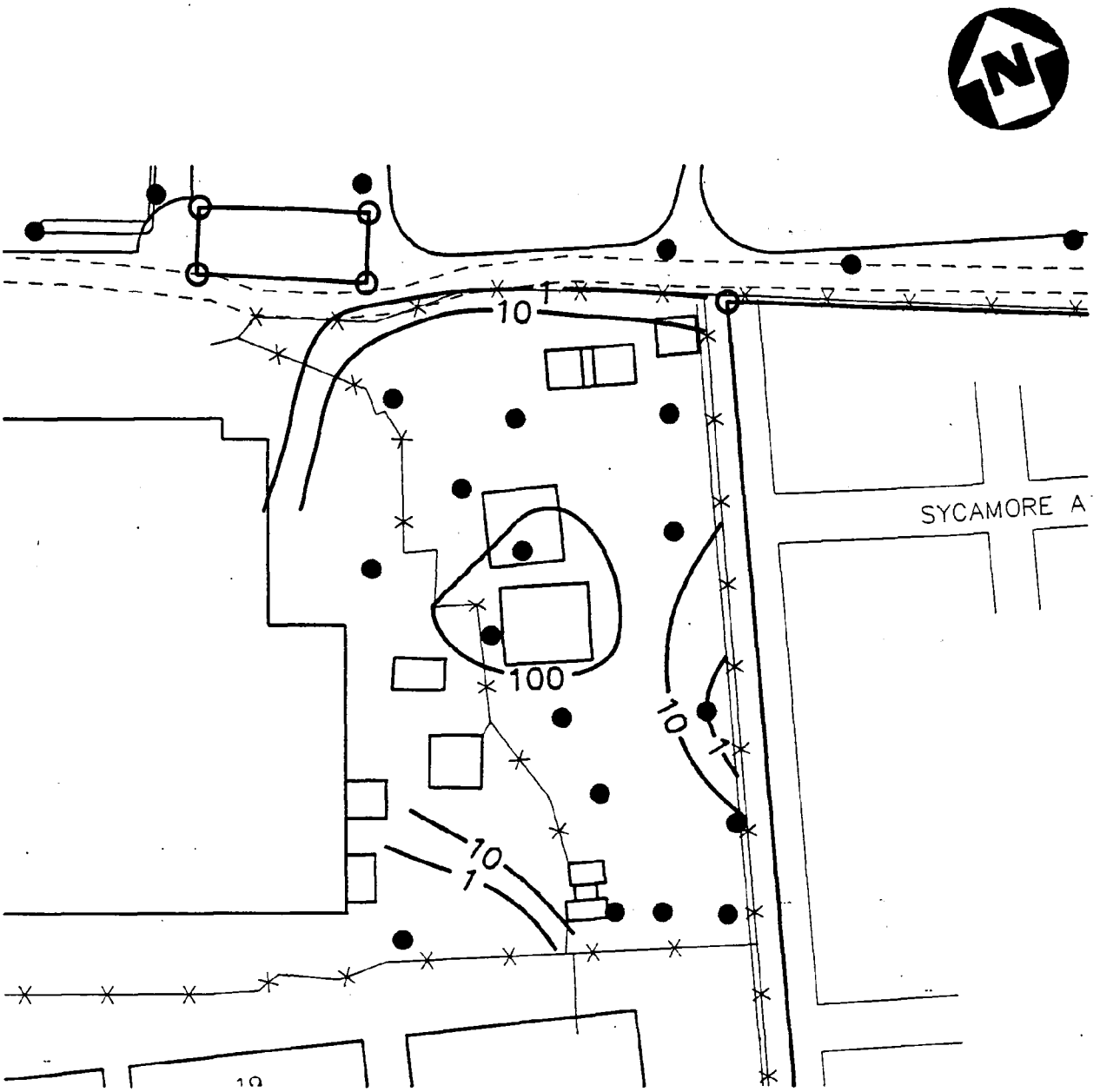


FIGURE 4-1

SOIL GAS RESULTS - SHALLOW
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NEW YORK

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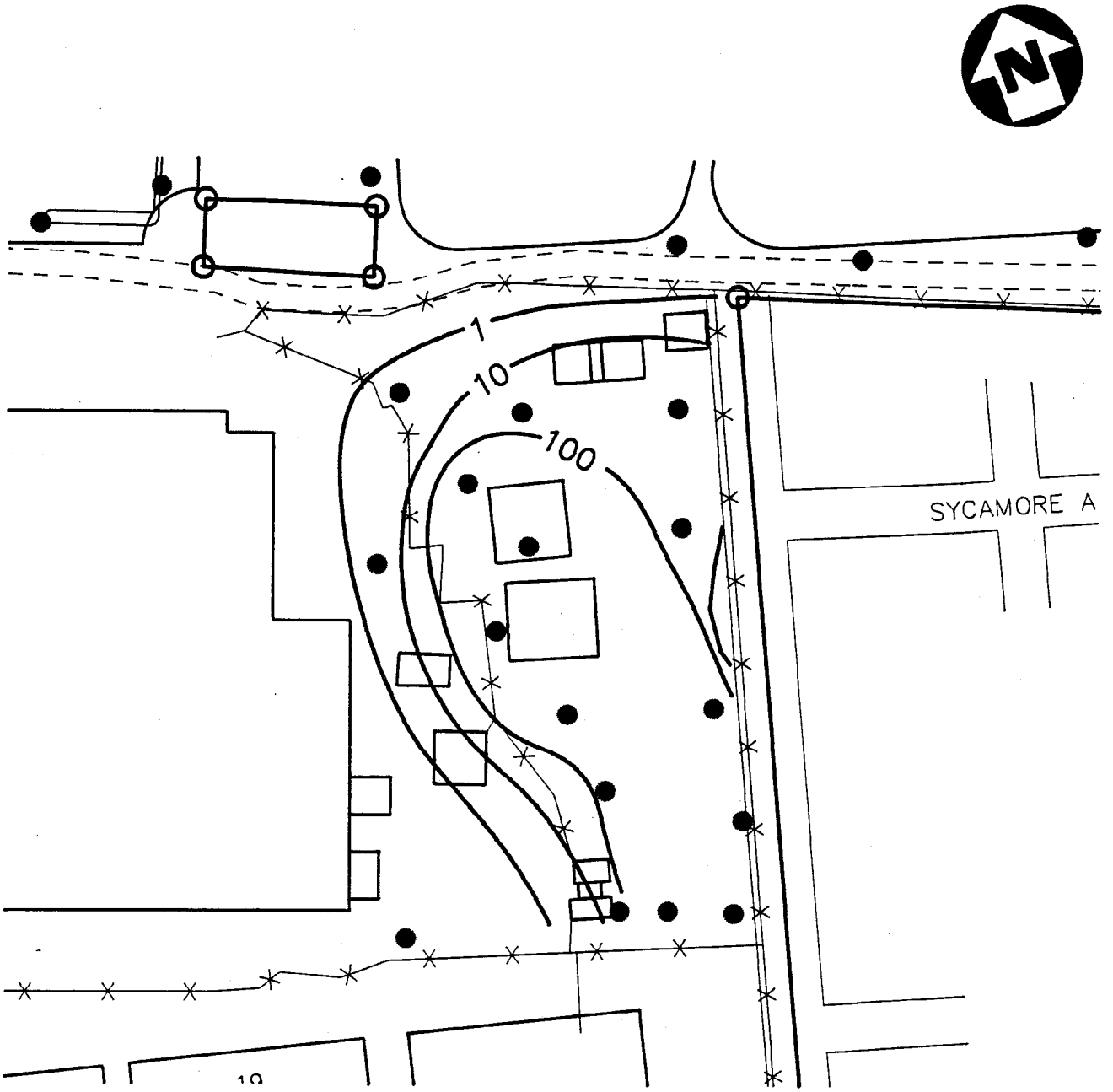
HALLIBURTON NUS
Environmental Corporation

ACAD: 3281\B200A.DWG PS-AV3 02/22/92 MJJ SG-DEEP.LAY




LEGEND

● SOIL GAS LOCATIONS

—10— TCE AND PCE (ug/l)

0 150 300
SCALE IN FEET

FIGURE 4-2

SOIL GAS RESULTS - DEEP
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NEW YORK

4-3

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NYSDEC 031146

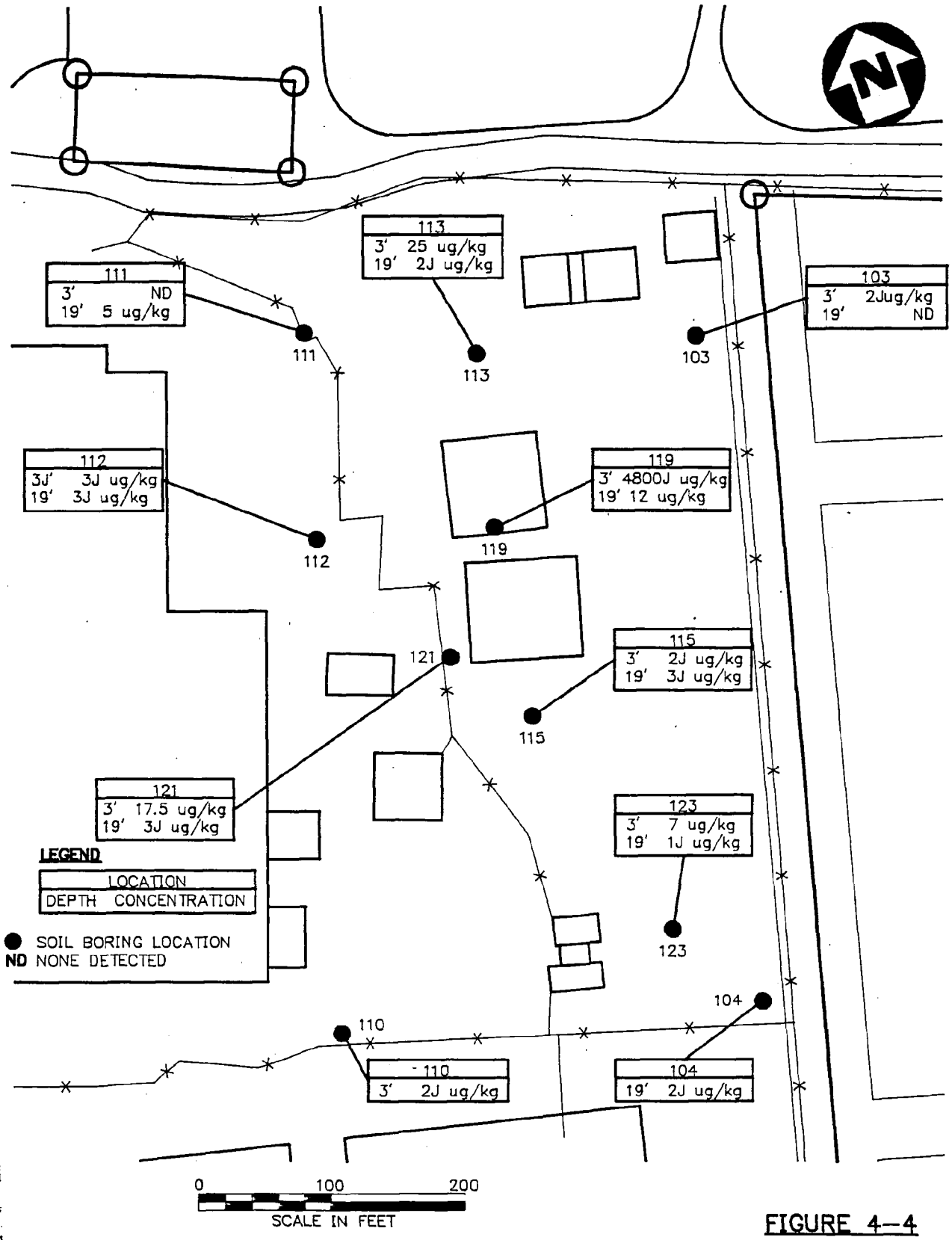


FIGURE 4-4

SITE 1 – SUBSURFACE SOIL RESULTS – PCE
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NY

4-10

HALLIBURTON NUS
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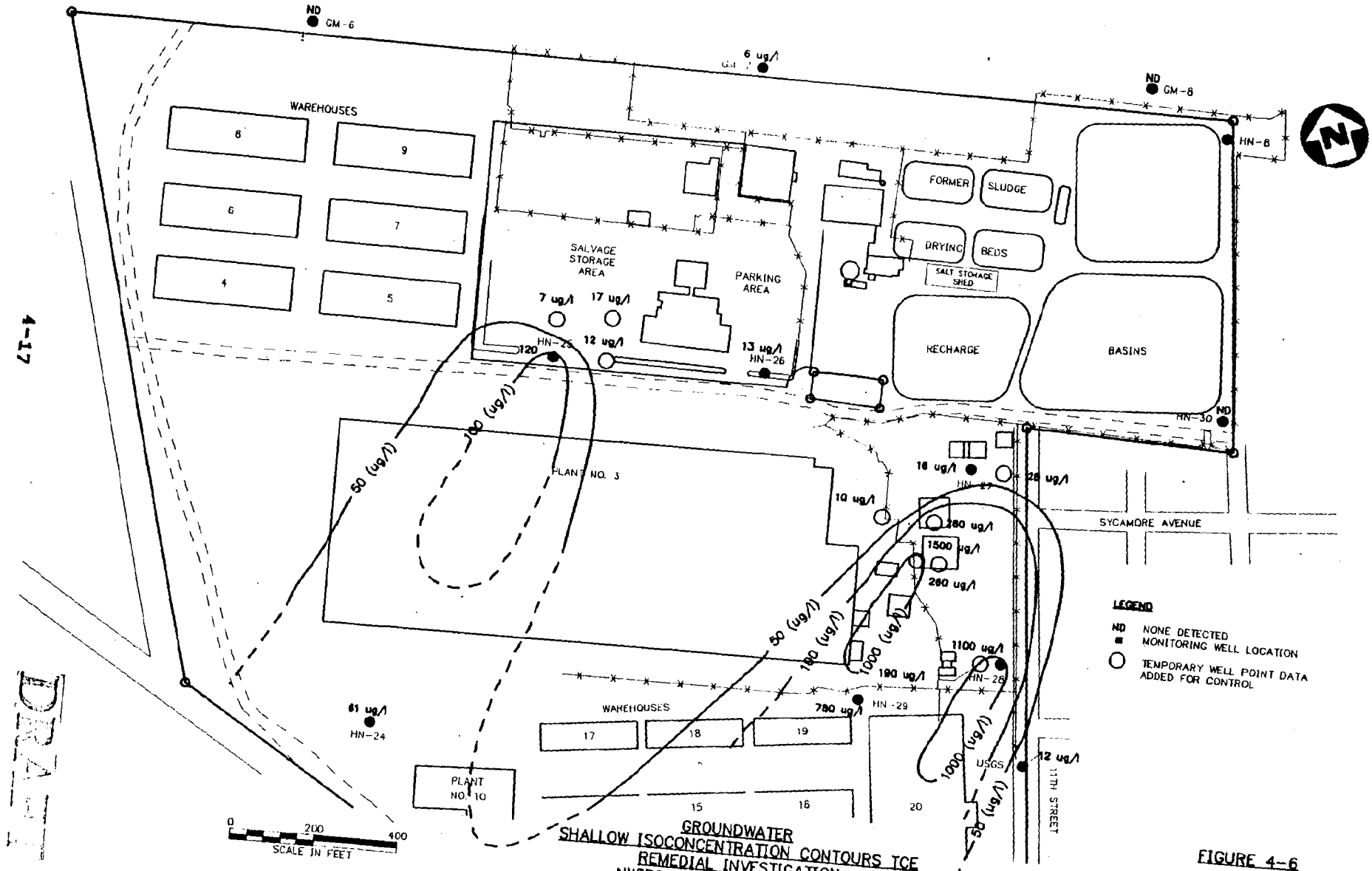


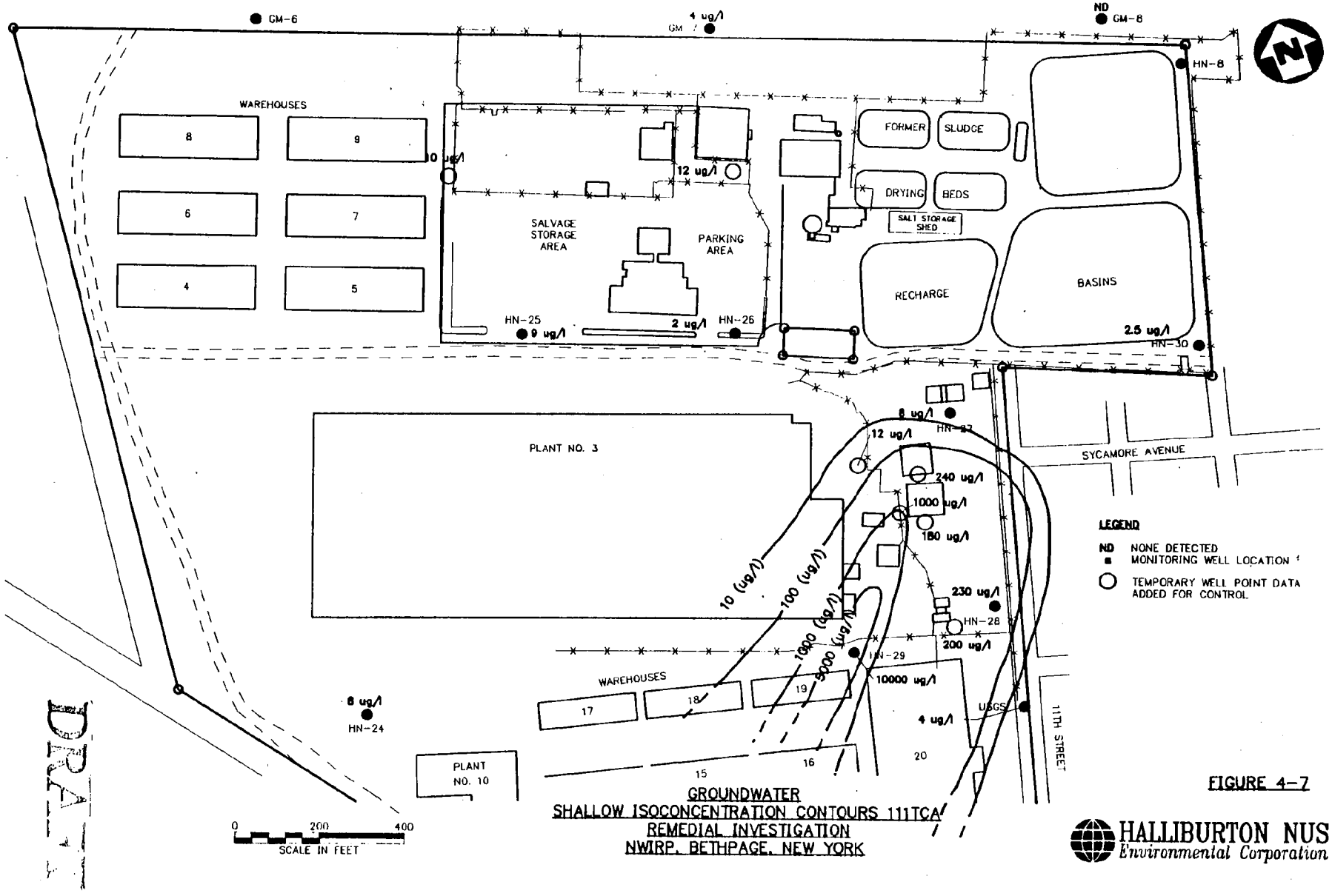

GROUNDWATER
SHALLOW ISOCONCENTRATION CONTOURS TCE
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NEW YORK

FIGURE 4-6

HALLIBURTON NUS
Environmental Corporation

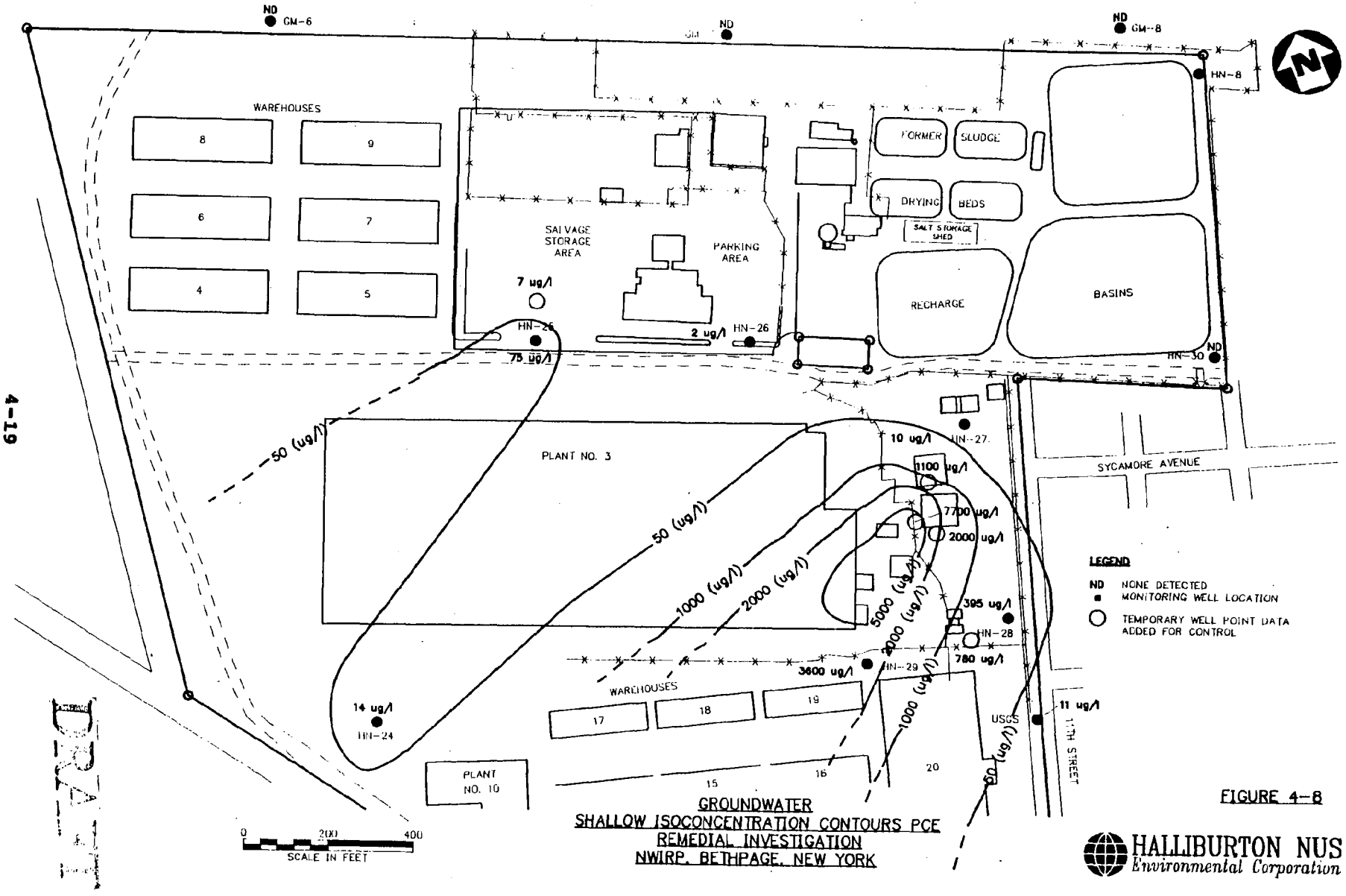
4-17

NYSDEC 031148




4-18

ACAD: 3281\98\ASE200.DWG 02/22/92 MB 4-7.LAY




GROUNDWATER
SHALLOW ISOCONCENTRATION CONTOURS PCE
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NEW YORK

FIGURE 4-8

HALLIBURTON NUS
Environmental Corporation

## NATURE AND EXTENT OF CONTAMINATION (CONTINUED)

- Site 2 - Recharge Basin Area
  - Soil-gas and temporary monitoring well results indicate the presence of a potential minor source area near the recharge basins.
  - Soil results confirm minor VOA soil contamination in this area. TCE, PCE, and 1,1,1 TCA most significant VOAs. Results also find low levels of PCBs and inorganics in soils. Lead, arsenic, chromium, and cyanide were most significant inorganics.
  - Groundwater results did not indicate the presence of a significant VOA-contaminated groundwater plume originating at this site. Low levels of VOAs and inorganics were detected.
  - Surface water and sediment results indicate that the recharge basins are not a likely significant source area of groundwater contamination. VOA contaminants detected can largely be attributed to contaminated groundwater in the production wells.

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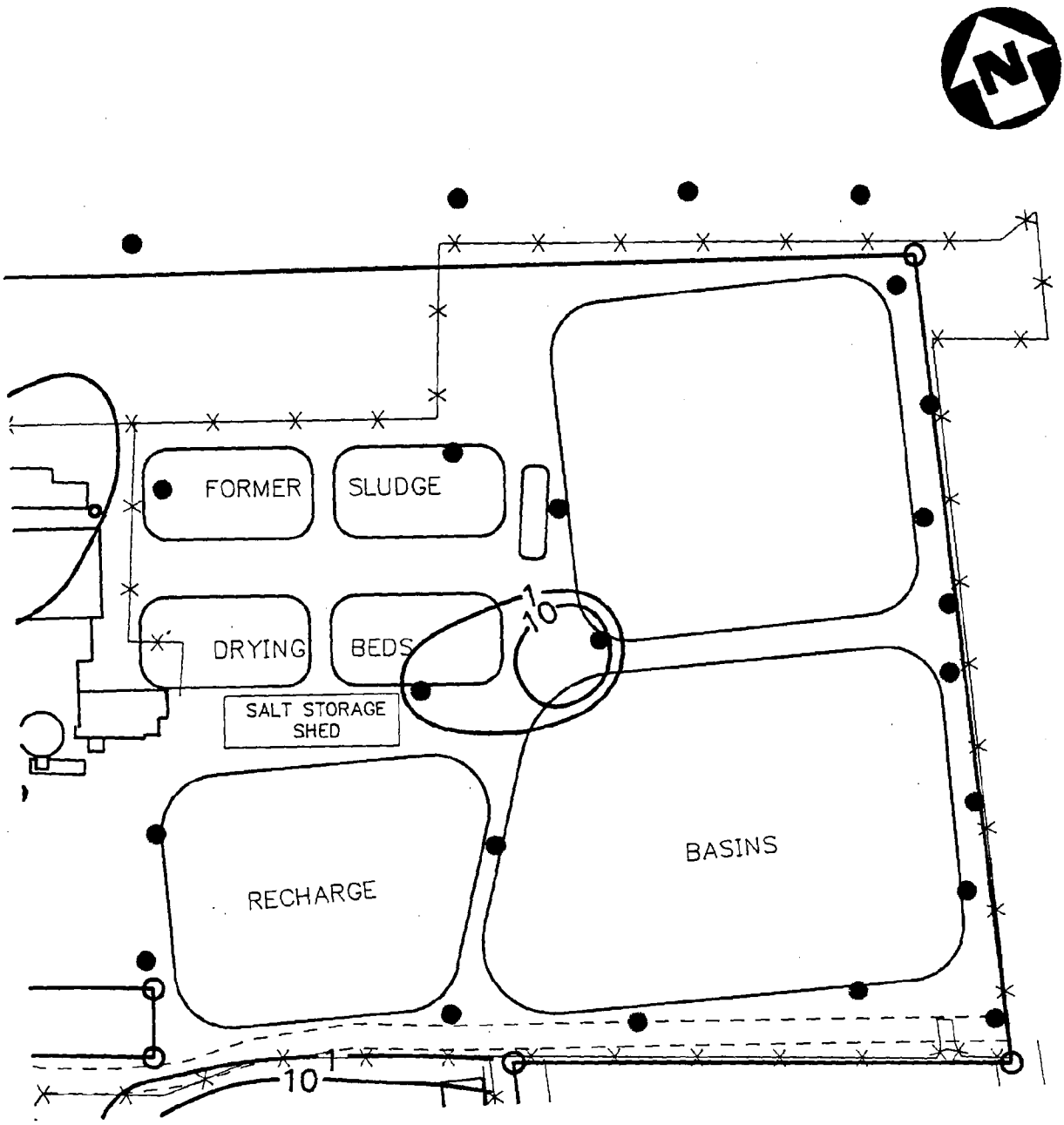
ACAD: 3281\B200A.DWG PS-AVZ 02/22/92 MJJ SG-SHALLAY




LEGEND

● SOIL GAS LOCATIONS

—10— TCE AND PCE (ug/l)

0 150 300

SCALE IN FEET

FIGURE 4-18

SOIL GAS RESULTS - SHALLOW
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NEW YORK

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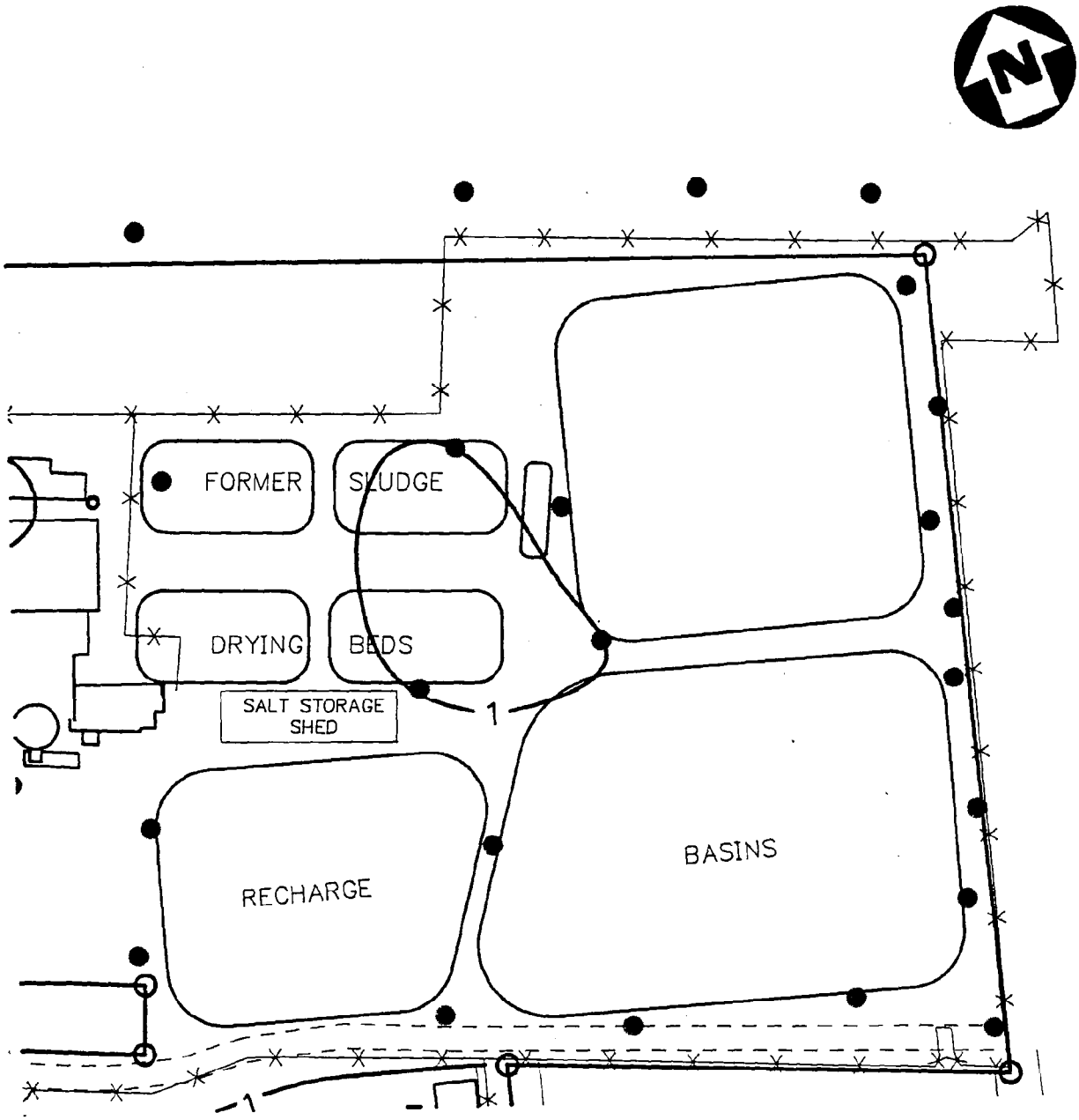
HALLIBURTON NUS
Environmental Corporation

ACAD: 3281\B200A.DWG PS-AV2 02/22/92 MJJ SG-DEEP.LAY




LEGEND

● SOIL GAS LOCATIONS

—10— TCE AND PCE (ug/l)

0 150 300

SCALE IN FEET

FIGURE 4-19

SOIL GAS RESULTS - DEEP
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NEW YORK

HALLIBURTON NUS
Environmental Corporation

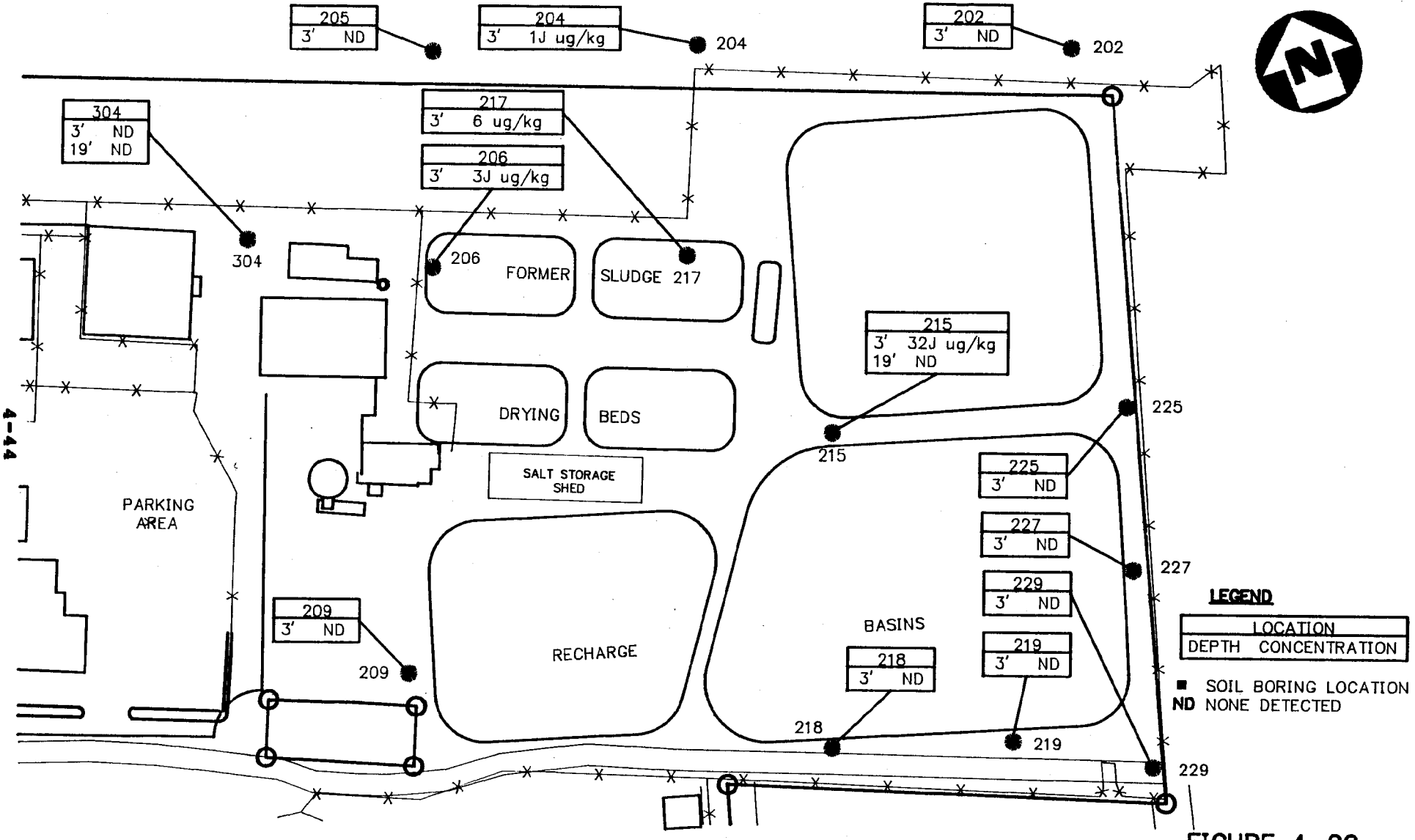



FIGURE 4-20

SITE 2 - SUBSURFACE SOIL RESULTS - TCE
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NY

HALLIBURTON NUS
Environmental Corporation

NYSDEC 031154

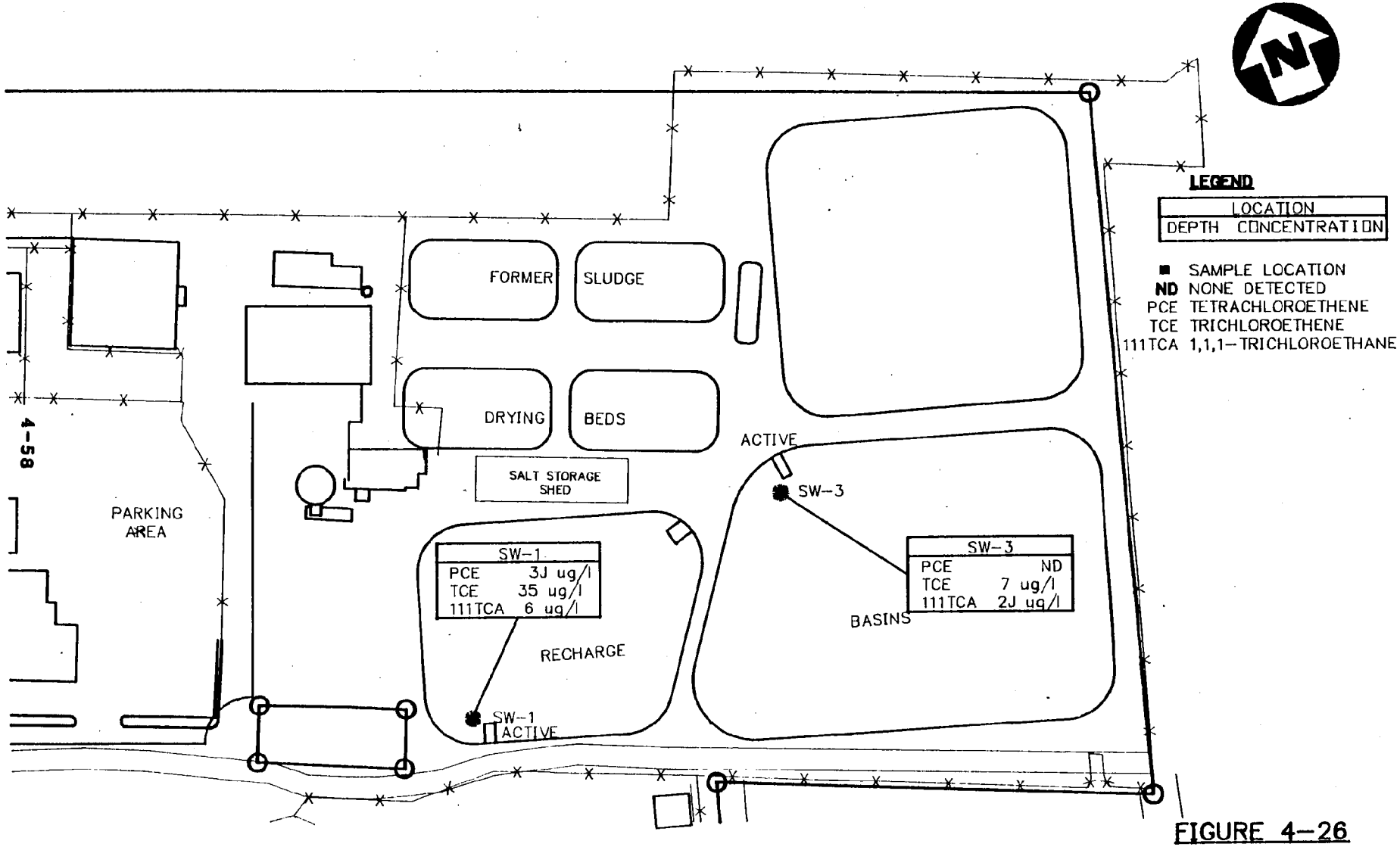



FIGURE 4-26

SITE 2 - SURFACE WATER RESULTS - ORGANICS
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NY

HALLIBURTON NUS
Environmental Corporation

NYSDEC 031155

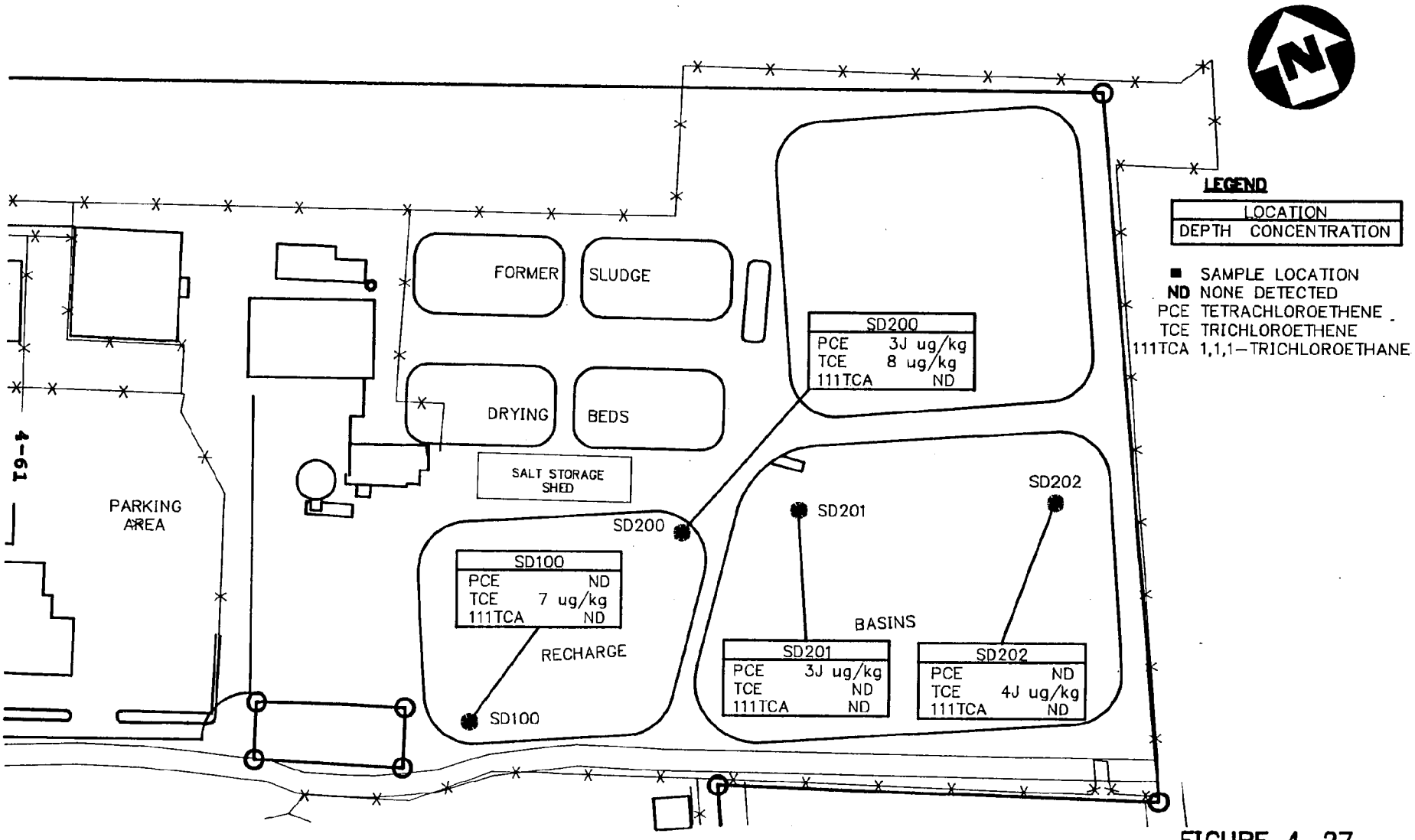



FIGURE 4-27

SITE 2 - SEDIMENT RESULTS - ORGANICS
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NY

HALLIBURTON NUS
Environmental Corporation

## NATURE AND EXTENT OF CONTAMINATION (CONTINUED)

- Site 3 - Salvage Storage Area
  - Soil-gas and temporary monitoring well results indicate the presence of a potential minor source area near the south west portion of the site.
  - Soil results confirm minor VOA soil contamination in this area. TCE, PCE, and 1,1,1 TCA most significant VOAs. Results also find low levels of PCBs and inorganics in soils. Lead, arsenic, chromium, and cyanide were most significant inorganics.
  - Groundwater results indicated the presence of a significant VOA-contaminated groundwater plume originating at or near this site. Low levels of inorganics were detected.

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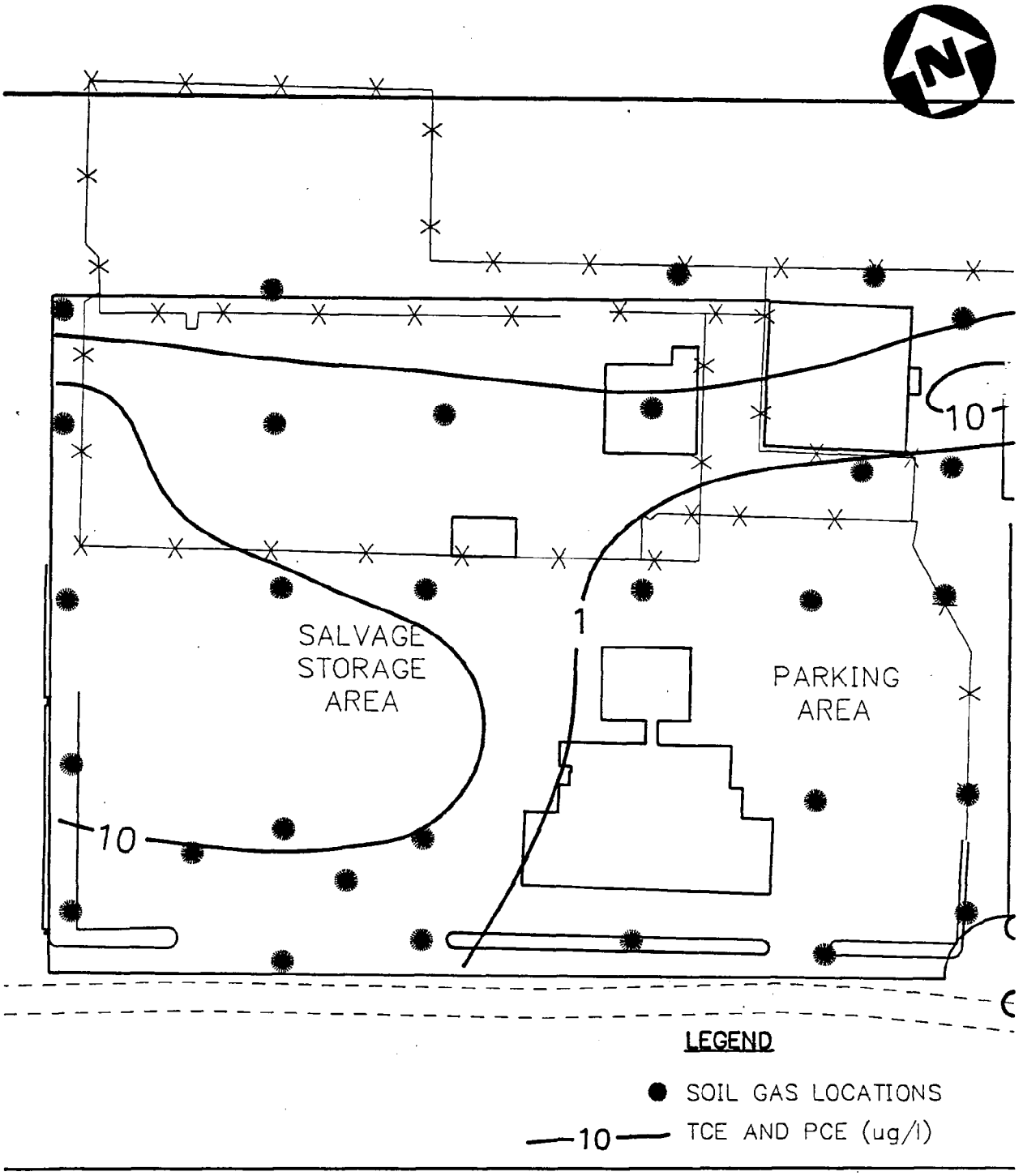



PLANT NO. 3

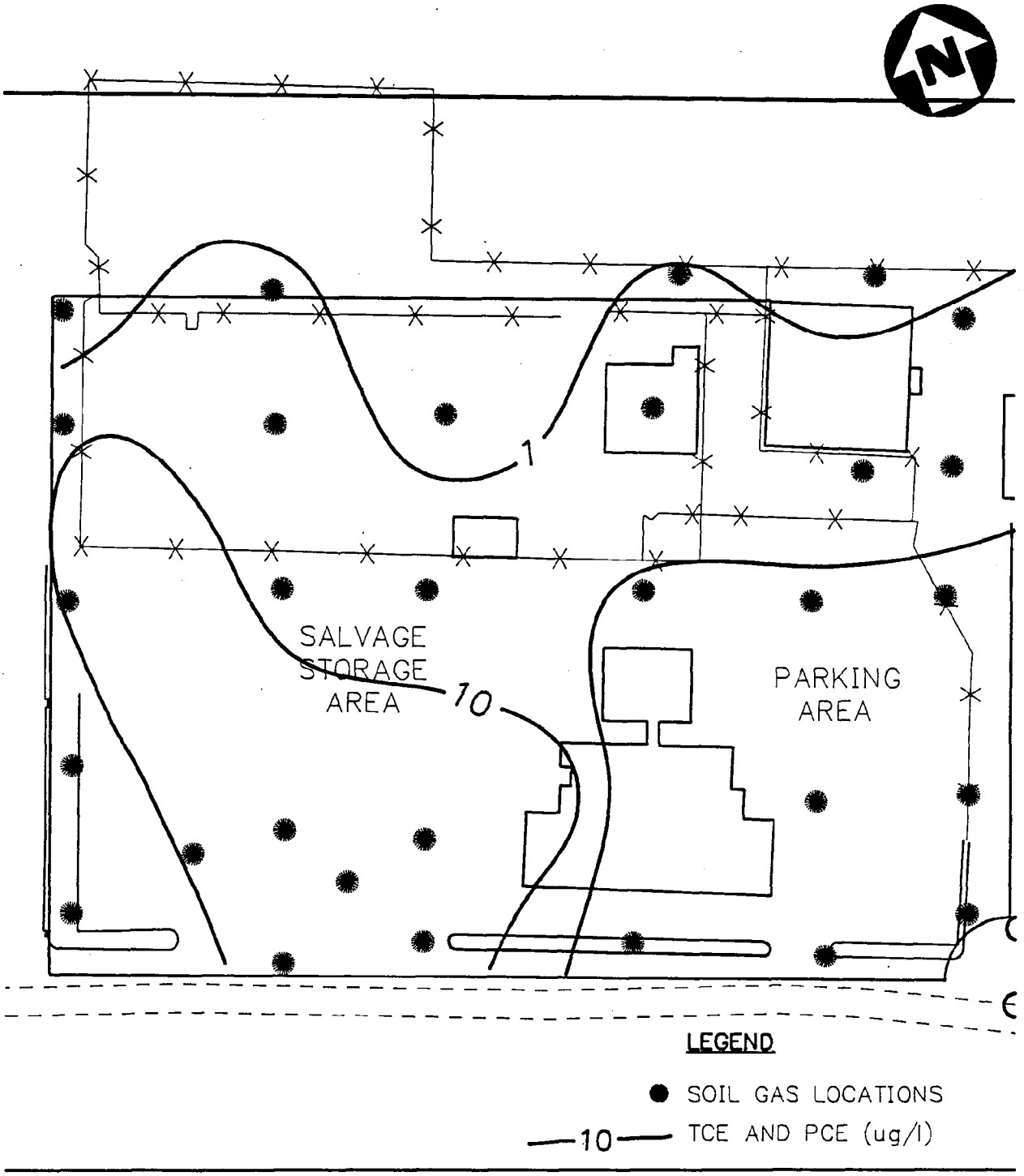
FIGURE 4-30

SOIL GAS RESULTS - DEEP
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NEW YORK



HALLIBURTON NUS
Environmental Corporation

ACAD: 3281\B200A.DWG PS-AV1 02/22/92 MJJ SG-SHALLAY




PLANT NO. 3

FIGURE 4-29

SOIL GAS RESULTS - SHALLOW
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NEW YORK



HALLIBURTON NUS
Environmental Corporation

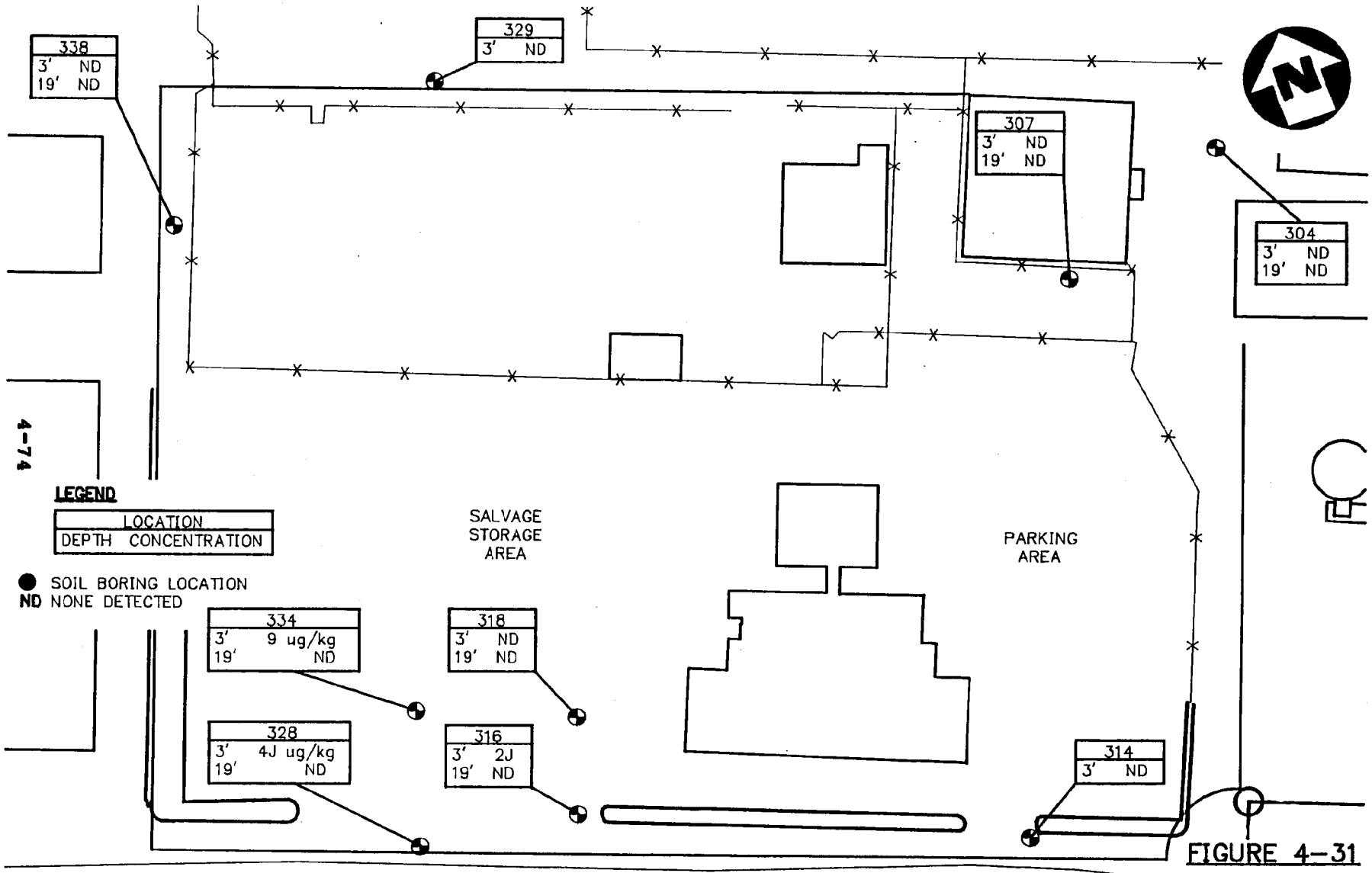



FIGURE 4-31

SITE 3 - SUBSURFACE RESULTS - TCE
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NY

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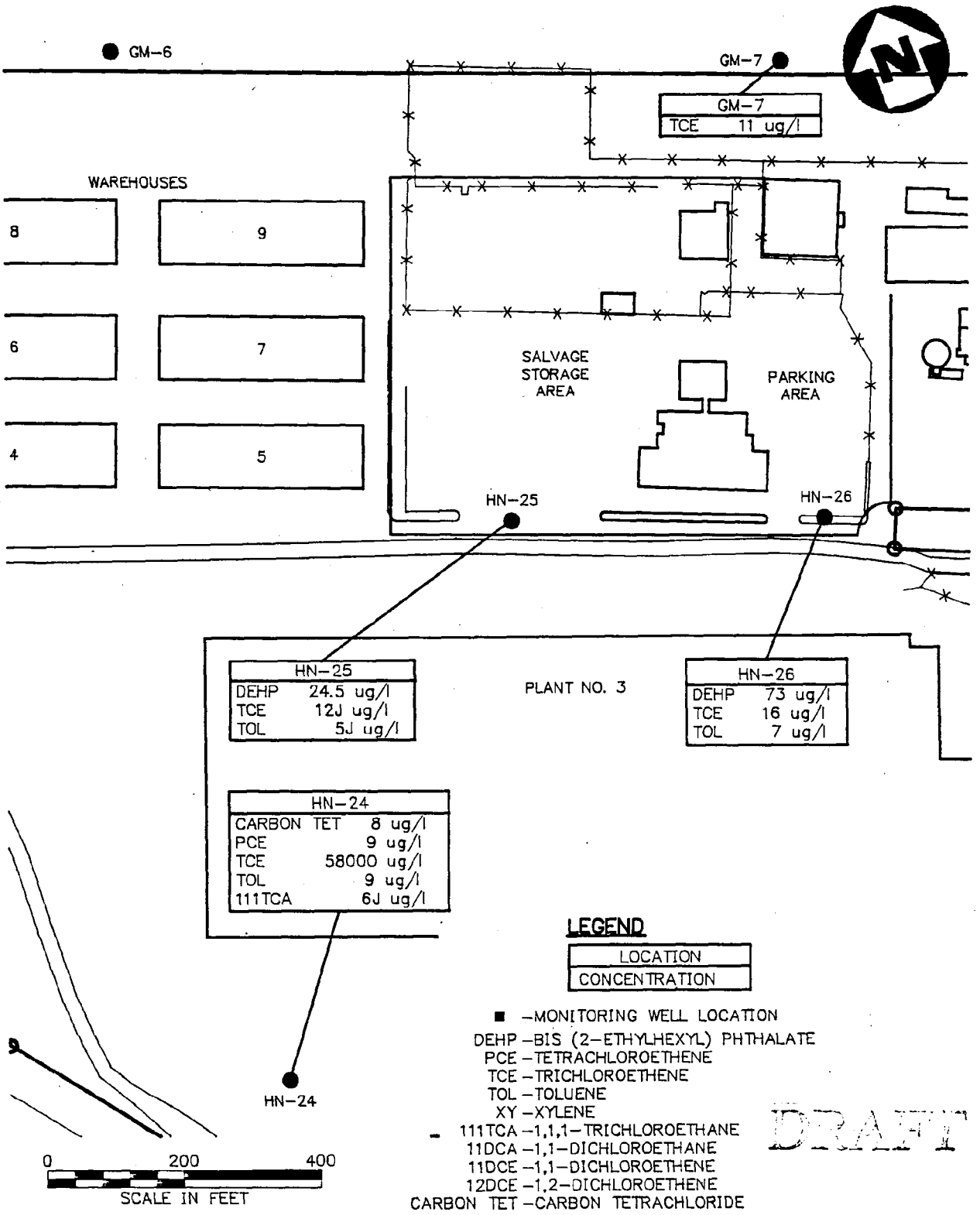
HALLIBURTON NUS
*Environmental Corporation*

ACAD: 3281\BBASE200.DWG PS-AVI 02/27/92 MJJ IGO.LAY




**LEGEND**

| LOCATION |
|---|
| CONCENTRATION |

■ –MONITORING WELL LOCATION

DEHP –BIS (2–ETHYLHEXYL) PHTHALATE
PCE –TETRACHLOROETHENE
TCE –TRICHLOROETHENE
TOL –TOLUENE
XY –XYLENE
111TCA –1,1,1–TRICHLOROETHANE
11DCA –1,1–DICHLOROETHANE
11DCE –1,1–DICHLOROETHENE
12DCE –1,2–DICHLOROETHENE
CARBON TET –CARBON TETRACHLORIDE



INTERMEDIATE GROUNDWATER ORGANICS
ABOVE MCLS. ALS. RFD
REMEDIAL INVESTIGATION
NWIRP. BETHPAGE. NEW YORK

FIGURE 4–34

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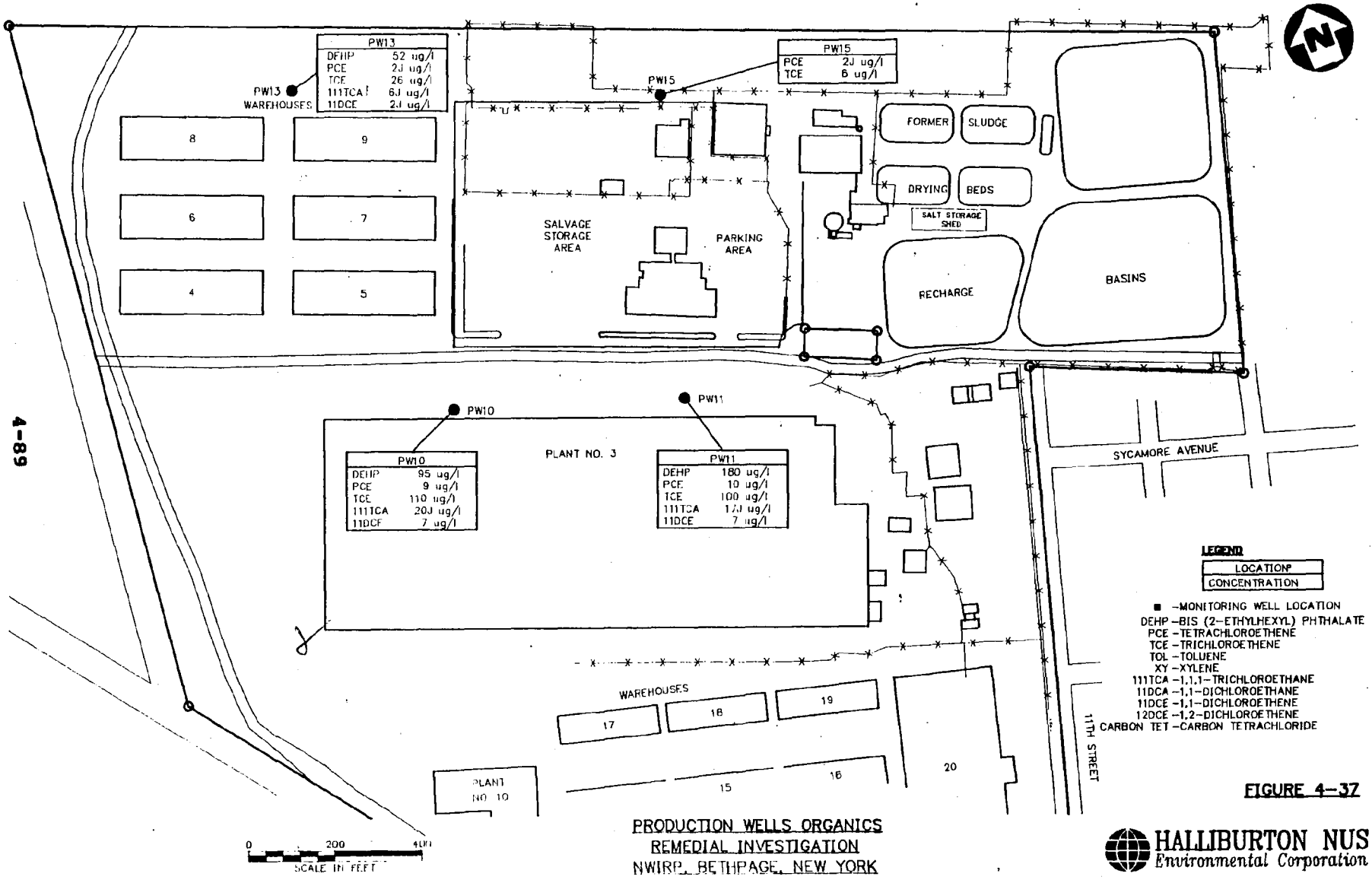


4-89

FIGURE 4-37

PRODUCTION WELLS ORGANICS
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NEW YORK

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NYSDEC 031162

TABLE 4-34

OCCURRENCE AND DISTRIBUTION
OF GROUNDWATER CONTAMINATION - ORGANIC (ug/l)
NWIRP, BETHPAGE, NY

| Compound | CRQL | Number Positive Detections/Samples Analyzed | Maximum Positive Concentration | Representative Concentration |
|---|---|---|---|---|
| Trichloroethene | 5 | 14/15 | 58000 | 12285 |
| Toluene | 5 | 5/15 | 39 | 11.5 |
| 1,1-Dichloroethane | 5 | 3/15 | 880 | 188 |
| 1,2-Dichloroethene | 5 | 3/15 | 3600 | 772 |
| 1,1,1-Trichloroethane | 5 | 12/15 | 10000 | 2113 |
| Tetrachloroethene | 5 | 12/15 | 3600 | 788 |
| 1,1-Dichloroethene | 5 | 4/15 | 250 | 54.7 |
| Carbon Tetrachloride | 5 | 1/15 | 8 | 3.7 |
| Ethylbenzene | 5 | 1/15 | 3 | 2.6 |
| Xylenes | 5 | 1/15 | 19 | 6.0 |
| TICs | | 14/15 | - | - |
| bis(2-ethylhexyl)phthalate | 10 | 2/15 | 73 | 21.5 |
| Di-n-octyl phthalate | 10 | 2/15 | 17 | 7.7 |
| 2-Methylphenol | 10 | 1/15 | 2 | 2 |
| 4-Methylphenol | 10 | 1/15 | 2 | 2 |
| 2,4-Dimethylphenol | 10 | 1/15 | 7 | 5.7 |
| Naphthalene | 10 | 1/15 | 3 | 3 |
| Acenaphthylene | 10 | 1/15 | 1 | 1 |
| Fluoranthene | 10 | 1/15 | 2 | 2 |
| Pyrene | 10 | 1/15 | 2 | 2 |
| Benzo[b]fluoranthene | 10 | 1/15 | 2 | 2 |

TICs = Tentatively Identified Compounds.
* Upper 95% confidence limit on arithmetic average, or maximum if UCL exceeds maximum positive detection.
\- Not detected.
CRQL = Contract Required Quantitation Limit.

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## RISK ASSESSMENT

- Scenarios:
  - Direct contact of onsite workers, offsite adult and child residents with contaminated surface soils through inhalation, ingestion, and dermal adsorption.
  - Direct contact of onsite workers, offsite adult and child residents with contaminated subsurface soils through inhalation, ingestion, and dermal adsorption.
  - Consumption of contaminated groundwater by adult employees and residents.
  - Future consumption of contaminated groundwater resulting from contaminants leaching from the onsite soils to groundwater.

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## RISK ASSESSMENT (CONTINUED)

- **Acceptable Risks**
  - **Hazard Index less than 1.0** acute/chronic non-carcinogens
  - **Excess cancer risk less than 1E-4 (one in ten thousand) to 1E-6 (one in a million).**
- **Must comply with ARARs (Federal MCLs and state drinking water standards.**

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## RISK ASSESSMENT (CONTINUED)

- Site 1 - Former Drum Marshaling Area
  - Direct contact with soil under current and future scenarios result in hazard indices less than 1.0. Excess carcinogenic risks exceed 1E-6, but are less than 1E-5.
  - For current and future groundwater scenarios, hazard indices are greater than 1.0 and excess carcinogenic risks exceed 1E-4.
  - Volatile organics and inorganic contaminant concentrations exceed groundwater Federal and state ARARs.

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## RISK ASSESSMENT (CONTINUED)

- Site 2 - Recharge Basin Area
  - Direct contact with soil under current and future scenarios result in hazard indices less than 1.0. Excess carcinogenic risks exceed 1E-6, but are less than 1E-5.
  - For Current and future groundwater scenarios, hazard indices are greater than 1.0 and excess carcinogenic risks exceed 1E-4.
  - Volatile organics and inorganic contaminant concentrations exceed groundwater Federal and state ARARs.

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## RISK ASSESSMENT (CONTINUED)

- Site 3 - Salvage Storage Area
  - Direct contact with soil under current and future scenarios result in hazard indices less than 1.0. Excess carcinogenic risks exceed 1E-6, but are less than 1E-5.
  - For current and future groundwater scenarios, hazard indices are greater than 1.0 and excess carcinogenic risk exceed 1E-4.
  - Volatile organics and inorganic contaminant concentrations exceed groundwater Federal and state ARARs.

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## CONCLUSIONS AND RECOMMENDATIONS

- There are no significant data gaps. Additional data can be collected during Remedial Design and Remedial Action activities
- Proceed to Feasibility Study to address:
  - Sites 1, 2, and 3 soils, particularly Site 1 VOAs.
  - Contaminated groundwater (VOAs and metals)

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