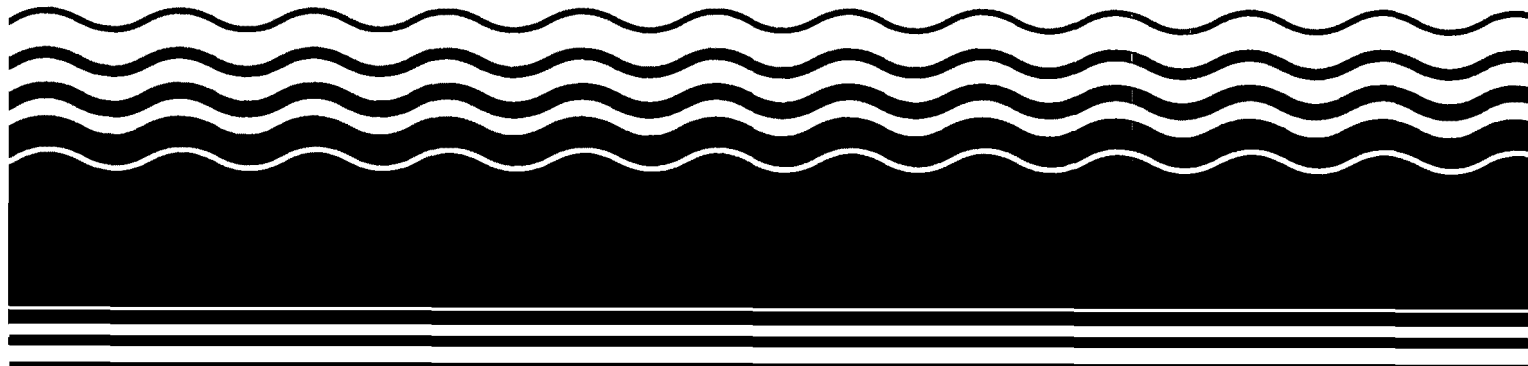




Superfund Record of Decision:

Naval Air Engineering Center
(Operable Unit 10), NJ



REPORT DOCUMENTATION PAGE		1. REPORT NO. EPA/ROD/R02-93/210	2.	3. Recipient's Accession No.																			
4. Title and Subtitle SUPERFUND RECORD OF DECISION Naval Air Engineering Center (Operable Unit 10), NJ Tenth Remedial Action				5. Report Date 09/27/93																			
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16. Abstract (Limit: 200 words) <p>The Naval Air Engineering Center (Operable Unit 10) site is part of the 7,400-acre Naval Air Warfare Center Aircraft Division located in Lakehurst, Ocean County, New Jersey, approximately 14 miles inland from the Atlantic Ocean. Land use in the area is predominantly undeveloped woodlands and open areas, and light commercial and industrial areas, with the closest residential area, the Borough of Lakehurst, located southeast of the facility. The Naval Air Engineering Center (NAEC), which lies within the Toms River Drainage Basin, contains over 1,300 acres of flood-prone areas. The estimated 65,400 people who reside in the vicinity of NAEC, use municipal wells to obtain their drinking water supply. Some private wells exist, but these are used primarily for irrigation purposes. In 1916, Eddystone Chemical Company leased the property to develop an experimental firing range for testing chemical artillery shells. In 1919, the U.S. Navy assumed control of the property, and it was formally commissioned Naval Air Station (NAS) Lakehurst in 1921. In 1974, the NAEC was moved from the Naval Base in Philadelphia to NAS Lakehurst. The NAEC's mission is to conduct research, development, engineering, testing and systems integration, limited production, and procurement for aircraft and airborne weapons systems. Historically, various operations at NAEC have required the use, handling, storage, and occasional onsite</p> <p>(See Attached Page)</p>																							
17. Document Analysis <table border="0"> <tr> <td>a. Descriptors</td> <td colspan="5">Record of Decision - Naval Air Engineering Center (Operable Unit 10), NJ Tenth Remedial Action Contaminated Medium: None Key Contaminants: None</td> </tr> <tr> <td>b. Identifiers/Open-Ended Terms</td> <td colspan="5"></td> </tr> <tr> <td>c. COSATI Field/Group</td> <td colspan="5"></td> </tr> </table>						a. Descriptors	Record of Decision - Naval Air Engineering Center (Operable Unit 10), NJ Tenth Remedial Action Contaminated Medium: None Key Contaminants: None					b. Identifiers/Open-Ended Terms						c. COSATI Field/Group					
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c. COSATI Field/Group																							
18. Availability Statement		19. Security Class (This Report) None		21. No. of Pages 38																			
		20. Security Class (This Page) None		22. Price																			

Abstract (Continued)

disposal of hazardous substances. During the operational period of the facility, there were reported and suspected improper releases of these substances into the environment. The Department of Defense's Installation Restoration Program (IRP) has identified 44 potentially-contaminated sites at NAEC, 16 of which have warranted further investigation to assess potential impacts. IRP investigations revealed soil and ground water contamination at the Former Hangar 2 Disposal Area (Site 9), the Abandoned Fuel Storage Facility 141 (Site 12), the Former Refueler Repair Shop, Building 345 (Site 33), the Former Hangar 1 Waste Disposal Area (Site 36), the Former Fuel Disposal and Drum Storage Area (Site 37), the Former Petroleum Oils and Lubricants Disposal Site (Site 39), and the Former Base Landfill (Site 42). Beginning in the early 1950s, Site 9 was used as a disposal area for unknown waste materials from Hangars 1, 2, and 3. In 1981, waste, contained in 200 55-gallon drums, was emptied onto the site. Later that year, the State required that approximately 40 yd³ of stained soil and the empty 55-gallon drums be removed from the site. From 1923 to 1980, Site 12 was used as a fuel storage facility for tanks containing heating oil and diesel fuel. While the tanks were in operation, numerous fuel spills reportedly occurred onsite. In 1980, the tanks were abandoned and filled with sand, and subsequently, in 1988, the tanks were excavated and disposed of offsite. From 1959 to 1988, Site 33 was used as a deck drain and a dry well, into which waste solvents, oils, and lubricants were poured. In 1988, the dry well was excavated and disposed of offsite. From 1921 to 1974, Site 36 was used to dispose of liquid wastes from various operations in Hangar 1 by pouring them directly onto the pavement or soil surrounding the area. Liquid wastes potentially disposed of in this area include carbon tetrachloride, kerosene, benzene, toluene, and sulfuric acid. This area also contained a 500-gallon storage tank and a dry well, which were removed in 1988. From 1957 to 1967, Site 37 was used to drain fuel trucks prior to maintenance, during which time approximately 24,000 to 48,000 gallons of fuel and 512 pounds of elemental lead were disposed of onsite. During the 1950s and 1960s, Site 39 received an unknown quantity of waste oils, solvents, contaminated fuels, aircraft cleaners, and aircraft washdown rinsate, when the area was used for the steam cleaning of various aircraft and equipment. Most of the area has been covered with blacktop or graded and replanted with grass. From the late 1920s to 1939, Site 42 received metal scrap, oily turnings, and asbestos from the metal and plumbing shops, paint thinner cans and other refuse such as dried paint residue and brushes from the paint shop, ash from the base incinerator, scrap from aircraft wrecks and fires, mercury, magnesium, vehicles, and contaminated fuels. Most of the area where the former landfill was located has been developed and is now occupied by facility buildings and above-ground fuel tanks. Two RODs signed in 1991 and 1992 addressed OUs 1, 2, 3, and 4, and OUs 5, 6, and 7, respectively. This ROD addresses any potential remaining soil contamination at Sites 9, 12, 33, 36, 37, 39, and 42, as OU10. Other 1993 RODs address OUs 8, 9, 11, 12, 13, 14, 15, 22, and 23. Based on data collected during the RI, EPA has determined that the previously implemented removal actions have eliminated the need to conduct additional cleanup activities at these sites; therefore there are no contaminants of concern affecting this site.

The selected remedial action for this site is no further action because previously implemented removal actions have eliminated the need to conduct additional remedial actions and the results of the RI indicated that conditions at the site pose no unacceptable risk to human health and the environment. There are no present worth or O&M costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

ROD FACT SHEET

SITE

Name : NAWC Lakehurst
Location/State : Lakehurst, New Jersey
EPA Region : II
HRS Score (date): 49.48 (July 22, 1987)

ROD

Date Signed: September 27, 1993
Remedy: No Action
Operating Unit Number: OU-10 (Sites 9, 12, 33, 36, 37, 39, 42)
Capital cost: \$ N/A
Construction Completion:
O & M in 1993:
1994:
1995:
1996:
Present worth: N/A

LEAD

Enforcement
Federal Facility
Primary contact Jeffrey Gratz (212) 264-6667
Secondary contact Robert Wing (212) 264-8670
Main PRP U.S. Navy
PRP Contact Lucy Bottomley (908) 323-2612

WASTE

Type Metals, Semi-volatile organics
Medium Soil
Origin Assorted spills
Est. quantity N/A



**RECORD OF DECISION
FOR**

**SITES 9, 12, 33, 36,
37, 39 AND 42**

06-10

**NAVAL AIR WARFARE CENTER
AIRCRAFT DIVISION
LAKEHURST, NEW JERSEY
September 14, 1993**



RECORD OF DECISION
DECLARATION
SITES 9, 12, 33, 36, 37, 39 AND 42
NAVAL AIR WARFARE CENTER
AIRCRAFT DIVISION
LAKEHURST, NEW JERSEY

FACILITY NAME AND LOCATION

Naval Air Warfare Center
Aircraft Division
Lakehurst, New Jersey 08733

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for seven individual sites (Sites 9, 12, 33, 36, 37, 39 and 42), located at the Naval Air Warfare Center, Aircraft Division (NAWCADLKE) in Lakehurst, New Jersey (Figure 1). The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on the Administrative Record for these sites, which is available for public review at the Ocean County Library, 101 Washington Street, Toms River, New Jersey.

Both the United States Environmental Protection Agency (USEPA), Region II Acting Administrator, and the Commissioner of the New Jersey Department of Environmental Protection and Energy (NJDEPE) concur with the selected remedy.

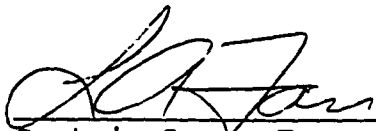
DESCRIPTION OF THE SELECTED REMEDY

The United States Department of the Navy, the lead agency for these Sites, has selected the "no action" alternative for Sites 9, 12, 33, 36, 37, 39 and 42.

DECLARATION STATEMENT

The United State Department of the Navy has determined that no additional remedial action is necessary at Sites 9, 12, 33, 36, 37, 39 and 42 to ensure protection of human health and the environment.

This Record of Decision concerns Sites 9, 12, 33, 36, 37, 39 and 42. The locations of these Sites within NAWCADLKE are shown in Figure 2. Other areas of concern at NAWCADLKE have been or will be the subject of separate Records of Decision.

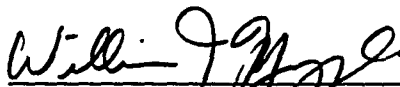


Captain Leroy Farr
Commanding Officer
Naval Air Warfare Center
Aircraft Division
Lakehurst, New Jersey

13 SEP 93

(Date)

With the concurrence of:



William J. Muszynski, P.E.
Acting Regional Administrator
U.S. Environmental Protection Agency
Region II

9/27/93

(Date)

SITE DESCRIPTION

NAWCADLKE is located in Jackson and Manchester Townships, Ocean County, New Jersey, approximately 14 miles inland from the Atlantic Ocean (Figure 1). NAWCADLKE is approximately 7,400 acres and is bordered by Route 547 to the east, the Fort Dix Military Reservation to the west, woodland to the north (portions of which are within Colliers Mill Wildlife Management Area), Lakehurst Borough and woodland, including the Manchester Wildlife Management Area, to the south. NAWCADLKE and the surrounding area are located within the Pinelands National Reserve, the most extensive undeveloped land tract of the Middle Atlantic Seaboard. The groundwater at NAWCADLKE is currently classified by NJDEPE as Class I-PL (Pinelands).

NAWCADLKE lies within the Outer Coastal Plain physiographic province, which is characterized by gently rolling terrain with minimal relief. Surface elevations within NAWCADLKE range from a low of approximately 60 feet above mean sea level in the east central part of the base, to a high of approximately 190 feet above mean sea level in the southwestern part of the base. Maximum relief occurs in the southwestern part of the base because of its proximity to the more rolling terrain of the Inner Coastal Plain. Surface slopes are generally less than five percent.

NAWCADLKE lies within the Toms River Drainage Basin. The basin is relatively small (191 square miles) and the residence time for surface drainage waters is short. Drainage from NAWCADLKE discharges to the Ridgeway Branch to the north and to the Black and Union Branches to the south. All three streams discharge into the Toms River. Several headwater tributaries to these branches originate at NAWCADLKE. Northern tributaries to the Ridgeway Branch include the Elisha, Success, Harris and Obhanan Ridgeway Branches. The southern tributaries to the Black and Union Branches include the North Ruckles and Middle Ruckles Branches and Manapagua Brook. The Ridgeway and Union Branches then feed Pine Lake; located approximately 2.5 miles east of NAWCADLKE before joining Toms River. Storm drainage from NAWCADLKE is divided between the north and south, discharging into the Ridgeway Branch and Union Branch, respectively. The Paint Branch, located in the east-central part of the base, is a relatively small stream which feeds the Manapagua Brook.

Three small water bodies are located in the western portion of NAWCADLKE: Bass Lake, Clubhouse Lake, and Pickerel Pond. NAWCADLKE also contains over 1,300 acres of flood-prone areas, occurring primarily in the south-central part of the base, and approximately 1,300 acres of prime agricultural land in the western portion of the base.

There are 913 acres on the eastern portion of NAWCADLKE that lie

within Manchester Township and the remaining acreage is in Jackson Township. The combined population of Lakehurst Borough, Manchester and Jackson Townships, is approximately 65,400, for an area of approximately 185 square miles. The average population density of Manchester and Jackson Townships is 169 persons per square mile.

The areas surrounding NAWCADLKE are, in general, not heavily developed. The closest commercial area is located near the southeastern section of the facility in the borough of Lakehurst. This is primarily a residential area with some shops but no industry. To the north and south are State wildlife management areas which are essentially undeveloped. Adjacent to and south of NAWCADLKE are commercial cranberry bogs, the drainage from which crosses the southeast section of NAWCADLKE property.

For the combined area of Manchester and Jackson Townships, approximately 41 percent of the land is vacant (undeveloped), 57 percent is residential, one percent is commercial and the remaining one percent is industrial or farmed. For Lakehurst Borough, 83 percent of the land is residential, 11 percent is vacant, and the remaining 6 percent commercially developed.

In the vicinity of NAWCADLKE, water is generally supplied to the populace by municipal supply wells. Some private wells exist, but these are used primarily for irrigation and not as a source of drinking water. In Lakehurst Borough there is a well field consisting of seven 50-foot deep wells, located approximately two-thirds of a mile south of the eastern portion of NAWCADLKE. Three of the seven wells (four of the wells are rarely operated) are pumped at an average rate of 70 to 90 gallons per minute and supply drinking water for a population of approximately 3,000. Jackson Township operates one supply well in the Legler area, approximately one-quarter mile north of NAWCADLKE, which supplies water to a very small population (probably less than 1,000) in the immediate vicinity of NAWCADLKE.

The history of the site dates back to 1916, when the Eddystone Chemical Company leased from the Manchester Land Development Company property to develop an experimental firing range for the testing of chemical artillery shells. In 1919, the U.S. Army assumed control of the site and named it Camp Kendrick. Camp Kendrick was turned over to the Navy and formally commissioned Naval Air Station (NAS) Lakehurst, New Jersey on June 28, 1921. The Naval Air Engineering Center (NAEC) was moved from the Naval Base, Philadelphia to Lakehurst in December 1974. At that time, NAEC became the host activity, thus, the new name NAEC. In January 1992, NAEC was renamed the Naval Air Warfare Center Aircraft Division Lakehurst, due to a reorganization within the Department of the Navy.

Currently, NAWCADLKE's mission is to conduct programs of

technology development, engineering, developmental evaluation and verification, systems integration, limited manufacturing, procurement, integrated logistic support management, and fleet engineering support for Aircraft-Platform Interface (API) systems. This includes terminal guidance, recovery, handling, propulsion support, avionics support, servicing and maintenance, aircraft/weapons/ship compatibility, and takeoff. The Center provides, operates, and maintains product evaluation and verification sites, aviation and other facilities, and support services (including development of equipment and instrumentation) for API systems and other Department of Defense programs. The Center also provides facilities and support services for tenant activities and units as designed by appropriate authority.

NAWCADLKE and its tenant activities now occupy more than 300 buildings, built between 1919 and 1989, totaling over 2,845,00 square feet. The command also operates and maintains: two 5,000-foot long runways, a 12,000-foot long catapult and arrest runway, one-mile long jet car test track, four one and one-quarter mile long jet car test tracks, a parachute jump circle, a 79-acre golf course, and a 3,500-acre conservation area.

In the past, the various operations and activities at the Center required the use, handling, storage and occasionally the on-site disposal of hazardous substances. During the operational period of the facility, there have been documented, reported or suspected releases of these substances into the environment.

INITIAL INVESTIGATIONS

As part of the DOD Installation Restoration Program and the Navy Assessment and Control of Installation Pollutants (NACIP) program, an initial Assessment Study was conducted in 1983 to identify and assess sites posing a potential threat to human health or the environment due to contamination from past hazardous materials operations.

Based on information from historical records, aerial photographs, field inspections, and personnel interviews, the study identified a total of 44 potentially contaminated sites. An additional site, Bomarc, was also investigated by NAWCADLKE. The Bomarc Site is the responsibility of the U.S. Air Force and is located on Fort Dix adjacent to the western portion of NAWCADLKE. A Remedial Investigation (RI) was recommended to confirm or deny the existence of the suspected contamination and to quantify the extent of any problems which may exist. Following further review of available data by Navy personnel, it was decided that 42 of the 44 sites should be included in the Remedial Investigation. Two potentially contaminated sites, an ordnance site (Site 41) and an Advanced Underground Storage Facility (Site 43), were deleted from the Remedial Investigation because they had already

been rehabilitated. In 1987 NAWCADLKE was designated as a National Priorities List (NPL) or Superfund site under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

STATUTORY DETERMINATIONS

NJDEPE Soil Cleanup Criteria (SCC) were utilized as guidance for the cleanup of soil at all seven sites. NJDEPE SCC includes soil cleanup levels for residential and non-residential direct contact scenarios and separate impact to groundwater soil cleanup criteria for the protection of groundwater. The National Oceanic and Atmospheric Administration (NOAA) guidance for sediment was used as a screening aid to determine ecological risk. A brief discussion of each of the criteria follows.

NJDEPE SCCs:

The NJDEPE soil cleanup criteria are To Be Considered (TBC) criteria for determining the need for site cleanup. Although the NJDEPE SCC are not promulgated requirements, these criteria are considered an appropriate means by which to assess the risk to human health and the environment posed by contaminants found in soil. Therefore, NAWCADLKE has been determining the need for site cleanup based upon NJDEPE SCC as well as EPA risk-based levels and other factors, such as aiding the effectiveness and duration of existing groundwater remediation systems.

The cleanup criteria provide health based levels for residential use, non-residential use and impact to groundwater (subsurface) land uses and/or impacts. NAWCADLKE has assumed a non-residential land use due to its mission and facilities is support of Naval aviation. Due to our location in the Pinelands National Preserve (Class I-PL (Pinelands)) and the shallow groundwater table, the most stringent of the surface and subsurface (impact to groundwater) non-residential cleanup criteria have been utilized in our site comparisons.

To satisfy the requirement for establishing EPA risk-based clean-up criteria, an Endangerment Assessment was performed in October 1992 which included calculated Preliminary Remedial Goals or PRGs. The PRGs are chemical specific criteria which were developed using fate and transport and the exposure equations associated with the relevant pathways. The PRGs determined by calculation the contaminant concentrations in affected media that would result in acceptable exposure levels. PRGs were developed for each site based upon one or more (current or potential) land-use scenarios. Typically the NJDEPE SCC are more stringent than the calculated PRGs. With this in mind, the SCC are also considered preliminary clean-up goals at those sites at the

Lakehurst facility which are determined to require active remediation.

NOAA:

Since no chemical specific ARARs exist for sediment contamination, the National Oceanic and Atmospheric Administration (NOAA) sediment quality criteria have been utilized at NAWCADLKE as TBC cleanup criteria for sediment. These criteria are provided in the 1990 report, "The Potential for Biological Effects of Sediment-sorbed Contaminants Tested in the National Status and Trends Program".

This report assembled and reviewed currently available information in which estimates of the sediment concentrations of chemicals associated with adverse biological effects have been determined or could be derived. The biological data for each compound was statistically calculated. An Effects Range-Low (ER-L), a concentration at the low end of the range in which effects had been observed, and a Effects Range-Median (ER-M), a concentration approximately midway in the range of reported values associated with biological effects, were derived.

In a very qualitative sense, the ER-L value can be taken as a concentration above which adverse effects may begin or are predicted among sensitive life stages and/or species. The ER-M value is taken as a concentration above which effects were frequently or always observed or predicted among most species.

NAWCADLKE has utilized the chemical specific ER-L and ER-M values to determine the need for sediment remediation. Where values have generally exceeded ER-M, further evaluation, site visits, and contaminant specific literature searches have been conducted to refute or confirm the potential for existing or future adverse ecological effects. Site information and NOAA criteria have been weighed to determine if sediment remediation is advantageous or potentially destructive to the aquatic habitat (as may be the case with excavation of sediment).

For sediments requiring remediation, the NOAA criteria are considered preliminary clean-up goals. ARARs affecting the chosen remedial alternative for sediments include the Clean Water Act (40 CFR 404) which prohibit actions that may adversely impact a wetland unless no other alternatives are available, and the NJ Water Supply Management Act (NJAC 58:1A-1 et.seq.) which require permits for groundwater diversion during recovery operations. Other ARARs which may apply include the Endangered Species Act (16 USC 1531) where adverse impacts on endangered species or their habitats must be considered in the implementation of a remedial action.

ENVIRONMENTAL INVESTIGATIONS

Phase I of the Remedial Investigation (RI-Phase I) was conducted from 1985 to 1987 to (a) confirm or refute the existence of contamination at potentially contaminated sites identified during previous studies; and (b) develop recommendations for further Phase II investigations. The results of the RI-Phase I were presented in a report issued in 1987.

Phase II of the RI was initiated in the summer of 1988 to: (a) confirm the results of the Phase I study, specifically the presence or absence of contamination; (b) identify where contamination is located; (c) assess the potential for contaminant migration; (d) define the sources of contamination; and (e) support a feasibility study and final actions at the sites. Based on the results of the Phase II investigation, several remedial actions were initiated.

Phase III of the RI was initiated in the summer of 1991 to: (a) confirm the presence or absence of contamination at sites where the results of previous investigations were not definitive; (b) delineate the lateral and vertical extent of contamination; (c) collect and evaluate data to perform a risk assessment and assess the need for remedial action at sites.

These investigations indicated that there is no significant contamination present at levels of concern at Sites 9, 12, 33, 36, 37, 39 and 42. The individual Site histories and summaries of past remedial activities at each of the Sites are provided in the following sections.

Site 9: Former Hangar 2 Disposal Area

Site Description and Background:

Site 9 is located in the asphalt-paved area to the west of Hangar 2 and is approximately 3,300 feet from the nearest (northeastern) NAWCADLKE boundary (Figure 3). It was reported that this site was used as a disposal area where unknown waste materials from Hangars 1, 2 and 3 were disposed of over a 20 year period starting in the early 1950s. In 1981, an estimated 200 55-gallon drums of unknown wastes were emptied at the site. The source of these wastes was reported to be materials from Hangar 2.

In 1981, approximately 40 cubic yards of stained soil and 200 empty 55-gallon drums were removed from the site under the direction of the NAWCADLKE.

Summary of Remedial Investigations:

During Phase II of the Remedial Investigation, one soil boring was drilled and two test pits were excavated at the site. Two samples were collected from the boring and one sample was collected from each of the test pits. Total petroleum hydrocarbons (TPHC) were detected at concentrations of 103 and 1,437 mg/kg in the two samples from the boring. No significant contamination was detected in the two test pit samples, collected from depths of 2 to 3 feet, indicating that most of the shallow, visually contaminated soil had probably been removed in 1981. In January 1990, a soil boring was drilled immediately adjacent to monitoring well G. Three samples were collected from the boring at depths of 9 to 10 feet, 15 to 16 feet and 24 to 25 feet. The analysis of these samples did not confirm the presence of elevated levels of TPHCs and no volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCs) were detected.

Site 12: Abandoned Fuel Storage Facility 141

Site Description and Background:

Site 12 is an abandoned fuel storage facility located in Area A-West, on the northwestern side of Building 266 (Figure 4). Two 5,000 gallon underground fuel tanks were located under Pad 141. Records indicate that the fuel tanks were in use from 1923 to 1980 and contained No. 1 heating oil and diesel fuel. In 1980, the tanks were abandoned and filled with sand. In 1988 the tanks were excavated and removed from the site. While the tanks were in operation, numerous fuel spills reportedly occurred at the site. However, no estimates of the quantity of fuel spilled are available.

Summary of Remedial Investigations:

A soil sample was collected from directly beneath the location of the tanks at a depth of 7 feet after their excavation and removal. Analysis of this sample revealed elevated levels of TPHC (4,294 mg/kg). Five soil borings were drilled around the perimeter of Building 266 with two samples collected from each boring. No compounds were detected in any of the samples at concentrations exceeding NJDEPE soil cleanup criteria. The two additional samples were collected from the location of the former fuel tanks. Analysis revealed TPHC concentrations of 2,300 mg/kg at a depth of 4 to 6 feet, and 2,900 mg/kg at a depth of 8.5 to 9.5 feet. No targeted VOCs or SVOCs were detected in either of these samples and no individual polycyclic aromatic hydrocarbons (PAH) compounds were present at elevated concentrations.

Sediment and surface water sampling was also conducted in the wetlands area to the immediate northwest of the site. The sediment samples detected elevated levels of metals that included lead, nickel, and vanadium. Two additional rounds of sediment

samples confirmed the elevated levels of these three metals. However, the results revealed the extent of the contamination to be limited to a small, isolated area. No contamination was detected in the surface water sample.

Site 33: Former Refueler Repair Shop, Bldg. 345

Site Description and Background:

Site 33 is a former dry well located on the north side of Building 345 in close proximity to the original channel of the Ridgeway Branch (Figure 5). Building 345 was constructed in 1959 and had a deck drain that led to a dry well on the north side of the building. It was reported that waste solvents, oils, and lubricants were poured into the deck drain and flowed into the dry well. There are no reported estimates of the quantity of wastes discharged into the well. The dry well was excavated and disposed of during the Phase II Investigation in 1988.

Summary of Remedial Investigations:

A soil sample was taken from the pit following removal of the dry well at a depth of 5 feet, which was approximately the same level as the floor of the dry well. Analysis of this sample revealed moderate levels of VOCs, low levels of SVOCs, and a TPHC concentration of 2,859 mg/kg. No individual compounds were detected at levels exceeding NJDEPE soil cleanup criteria. In addition, a soil boring was drilled approximately 20 feet east of the dry well and samples were collected at depths of 3 to 4 feet and 5 to 6 feet. Analysis revealed minimal levels of TPHCs, SVOCs, and non-targeted TICs.

Two additional soil samples were collected from the location of the former dry well at depths of 5 and 9 feet. In the shallower sample, contamination was limited to petroleum hydrocarbons at a concentration of 5,700 mg/kg, one PAH compound and a total of 10 volatile and 20 semi-volatile TICs, all at concentrations below the NJDEPE soil cleanup criteria. Petroleum hydrocarbons were not detected in the deeper sample and no other contaminants were detected at elevated concentrations.

Site 36: Former Hangar 1 Waste Disposal Area

Site Description and Background:

Site 36 encompasses the perimeter of Hangar 1 (Figure 6). From approximately 1921 to 1974, liquid wastes from various operations in the hangar were reportedly disposed of by pouring directly onto the pavement or soil surrounding the building. Liquids potentially disposed of in this area are reported to include: carbon

tetrachloride, kerosene, benzene, toluene and sulfuric acid. The combined wastes disposed of in this manner reportedly amounted to an estimated 6 gallons per day during the period between 1921 and 1974. This may have resulted in the disposal of approximately 83,000 gallons of liquid wastes over the 53 year period. At the northeast corner of Hangar 1, a 500-gallon gasoline storage tank was present atop a concrete pad and a dry well was located adjacent to (to the north of) the pad. The dry well was connected to a sink located inside Hangar 1, although it is not known what substances were disposed of in the sink. The tank and dry well were removed in 1988.

Summary of Remedial Investigations:

During the Phase II Investigation, four test pits were excavated at locations surrounding Hangar 1 and one soil sample was collected from each of the pits. Two additional samples were collected from immediately above and below a concrete pad in the northeast corner of Hangar 1 on which a gasoline tank was resting. Analysis of the samples revealed low levels of petroleum hydrocarbons in two samples, polychlorinated biphenyl (PCB) Aroclor 1254 in one sample, lead in one sample, and low levels of PAH compounds in three samples. No contaminants were detected at levels that exceed the NJDEPE soil cleanup criteria.

Four additional soil borings were drilled to a depth of 10 feet at locations surrounding Hangar 1. Two samples were collected from each boring and analyzed for TPHC and pesticides/PCBs. TPHC was detected in two of the eight samples, at concentrations of 53 and 57 mg/kg. No PCBs were detected in any of the eight samples collected. Several pesticides were detected in three of the samples collected from the borings on the north side of the site. Individual pesticide concentrations in soil ranged from 1.3 to 66 ug/kg, with no compound present at concentrations exceeding the NJDEPE soil cleanup criteria.

Site 37: Former Fuel Disposal and Drum Storage Area

Site Description and Background:

Site 37 encompasses an area to the north of Lawrence Road near Building 271 and south of Site 14 (Figure 7). Site 37 was used by the plumbing shop personnel to drain fuel trucks prior to maintenance. As part of standard practices between 1957 and 1967, approximately 200 to 400 gallons of aviation gasoline and jet fuel were disposed of each month at the site. This represents a potential of 24,000 to 48,000 gallons of fuel and 512 pounds of elemental lead.

Summary of Remedial Investigations:

During the Phase I Investigation, two shallow test pits were excavated in areas of stressed vegetation, found to the north of well AC. OVA readings taken in the pits did not exceed background levels and no contamination was detected in the analysis of a soil sample collected from one of the pits.

During the Phase II Investigation, three test pits were excavated at the site to a depth of four feet. No stained soil was observed within the test pits or elsewhere at the site. One soil sample was collected from one of the test pits at a depth of four feet. No targeted contaminants were detected in the analysis of this sample although a number of non-targeted TICs were present. In 1988, three test pits were excavated at the site to a depth of three feet. No staining was observed in any of the excavations and no contaminants were detected in a sample taken from one of the pits.

Site 39: Former Petroleum Oils and Lubricants Disposal Site

Site Description and Background:

Site 39 is located to the south of Hangar 3, between the hangar and Building 562 (Figure 8). From interviews with NAWCADLKE personnel, it was learned that this site received an unknown quantity of waste oils, solvents, contaminated fuels, aircraft cleaners, and aircraft washdown rinsate during the 1950s and 1960s when the area was reportedly used for the steam cleaning of various aircraft and equipment. Most of the site has subsequently been covered with blacktop or graded and replanted with grass.

Summary of Remedial Investigations:

During the Phase II Investigation, eight test pits were excavated at Site 39 and three additional pits were excavated in the area near Buildings 124 and 333 to the northwest of the site. No visible signs of contamination were observed in the soil and no OVA readings exceeding background levels were obtained in any of the pits. Soil samples which were collected from five of the test pits revealed low levels of several semi-volatile organic compounds (PAHs) at two locations.

During the Phase III Investigation, a soil boring was drilled to a depth of 26 feet at a location approximately 75 feet east of monitoring well EF. Samples were collected at depths of 2 to 4 feet and 24 to 26 feet below grade. Although no contamination was detected in the deeper sample, the shallower sample was contaminated with asphalt which resulted in elevated levels of PAH compounds. A second sample was taken at the same location and depth to confirm the elevated PAH and base/neutral extractable organic concentrations. No asphalt was encountered while obtaining the sample and analysis revealed only slightly elevated (below the

NJDEPE soil cleanup criteria) levels of PAH compounds.

Site 42: Former Base Landfill (Inactive)

Site Description and Background:

The exact boundaries of Site 42 are not known. Based on interviews with Base personnel, it is suspected that the former landfill is located in the area to the southwest of Building 266 and to the north of potable water well PW-5 (Figure 9). The northern limit of the landfill probably corresponds to the 6 to 8 foot embankment along the wetlands. The southern limits of the landfill may be defined by the southern limits of the wetlands. Most of the area of the former landfill has been developed and is now occupied by a variety of structures, including facility buildings and above-ground fuel tanks. It was reported that this area was used as a landfill from the late 1920s until approximately 1939. Materials which may have been discarded here include: metal scrap and oily turnings from the metal and plumbing shops; asbestos from the plumbing shop; paint thinner cans and other refuse such as dried paint residue and brushes from the paint shop; ash from the base incinerator; scrap from aircraft wrecks and fires; mercury, magnesium, vehicles and contaminated fuels.

Summary of Remedial Investigations:

During the Phase II Investigation, three test pits were excavated in areas where soil gas samples from a prior survey had detected elevated levels of petroleum hydrocarbons and chlorinated hydrocarbons. Samples from two of these test pits revealed minimal levels of VOCs and no TPHC contamination. The third test pit, was excavated above an area of groundwater known to contain several inches of free product. During excavation of the pit, a 1.5 foot thick petroleum saturated gravel layer was observed at a depth of 2 to 3.5 feet and a soil sample collected at a depth of 4 feet revealed high levels (9,248 mg/kg) of TPHC. An investigation was conducted in April 1991 to better delineate the extent of TPHC contamination in the area located directly to the north of fuel oil tank 581. Thirty-four soil borings and five test pits were excavated to check for any visible petroleum contamination in the soil. Based on the findings from this investigation, it is suspected that TPHC contaminated groundwater and subsurface soil exists north of fuel tank 581 and extends west toward monitoring well EU.

The contaminated groundwater and subsurface soil is being addressed by the groundwater treatment facility for Areas A and B. This system will be modified to include free product recovery and soil flushing. Effectiveness of this system will be evaluated prior to the final Record of Decision for Areas A and B groundwater.

During the Phase II Investigation, two rounds of sediment samples were collected from the fire water pond to the west of Site 42 and the drainage swale north of Site 26, which discharges into the Ridgeway Branch. Low levels of several PAH compounds and TPHC along with the following metals; lead, mercury, selenium and vanadium were detected in these samples. Surface water samples were also collected from these areas. Analysis revealed only low levels of several metals which included aluminum, barium, iron and manganese.

NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION, LAKEHURST AND NEIGHBORING PROPERTIES

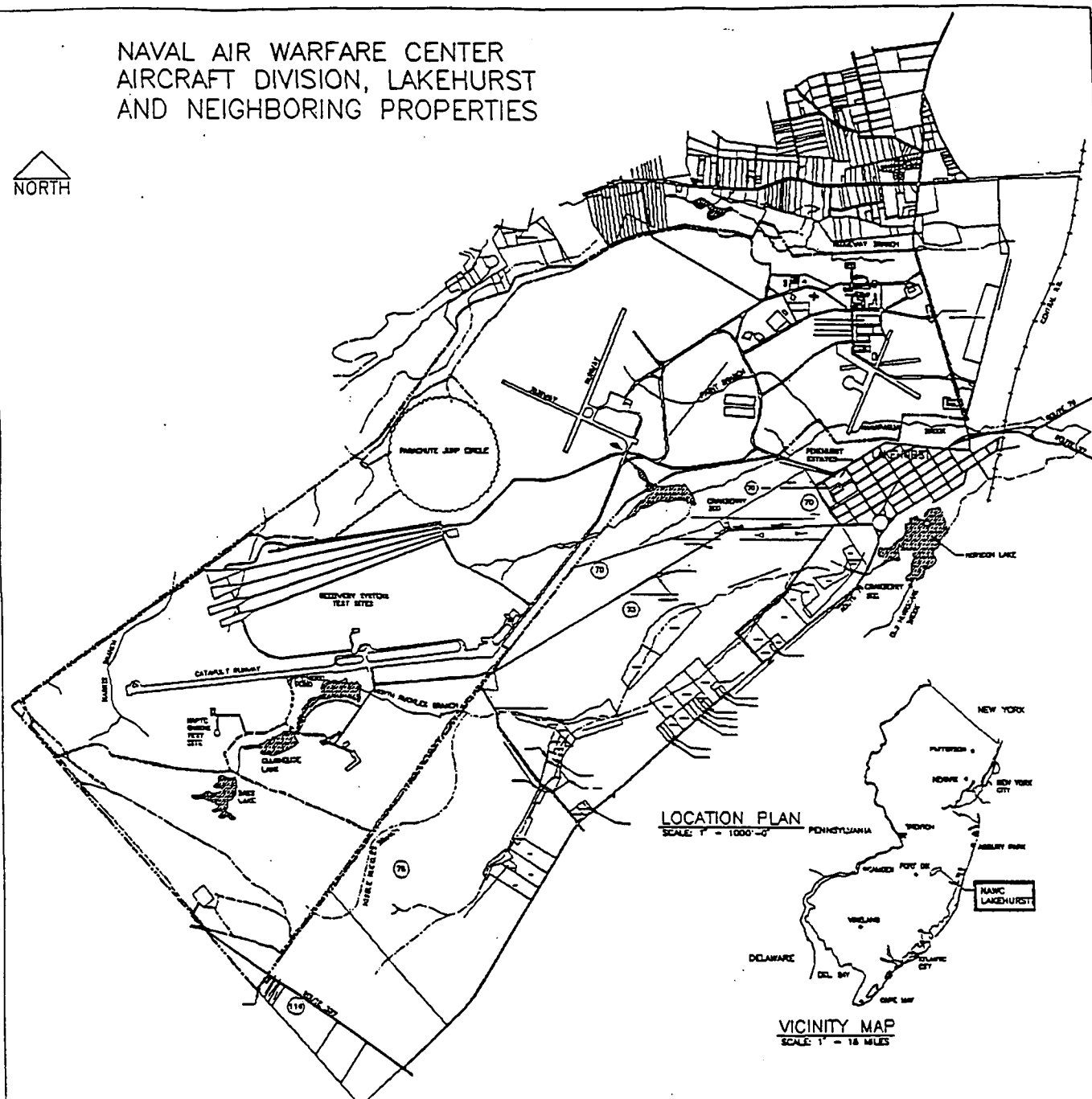


Figure (1)

AREAS A AND B

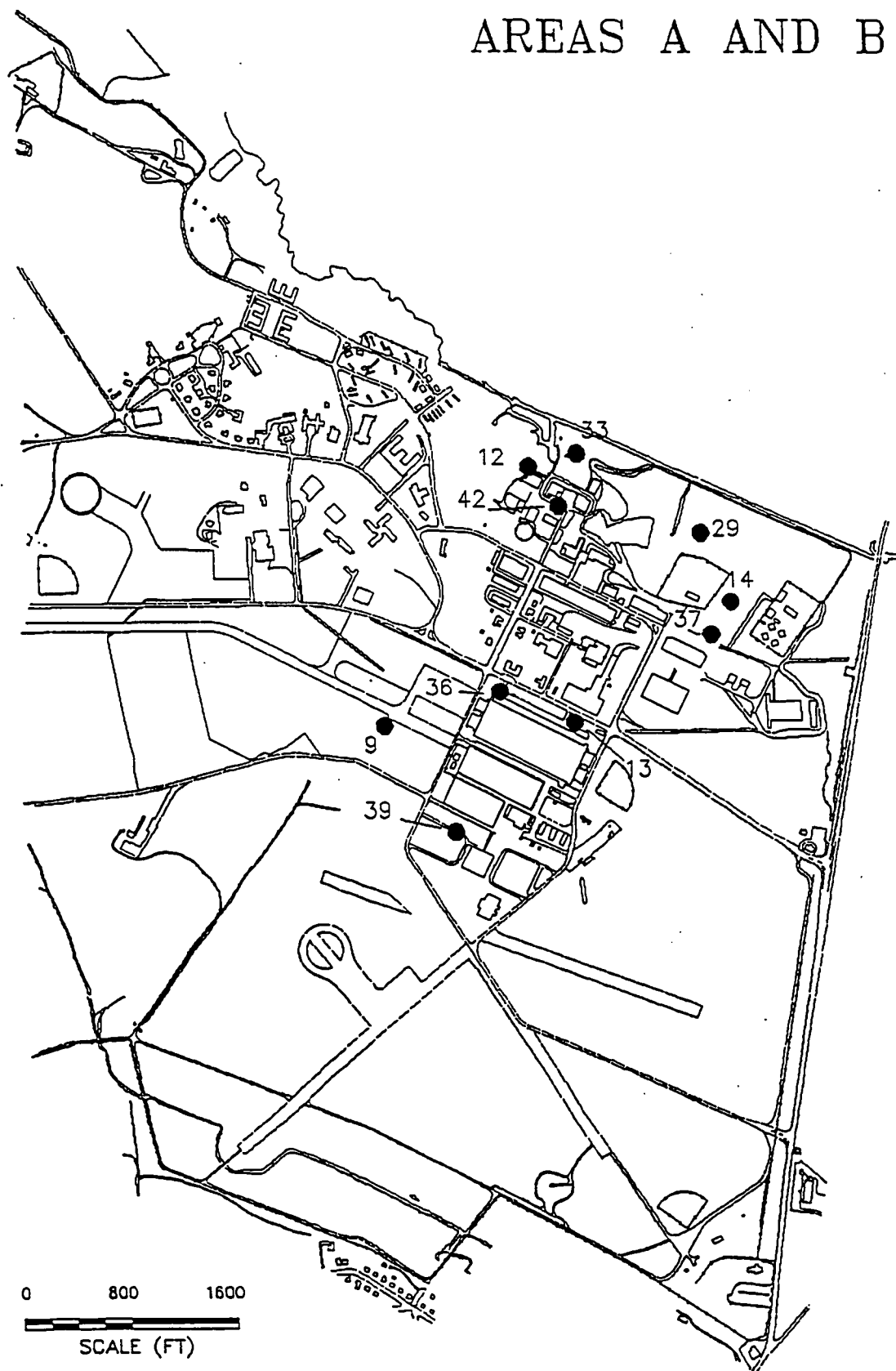


Figure (2)

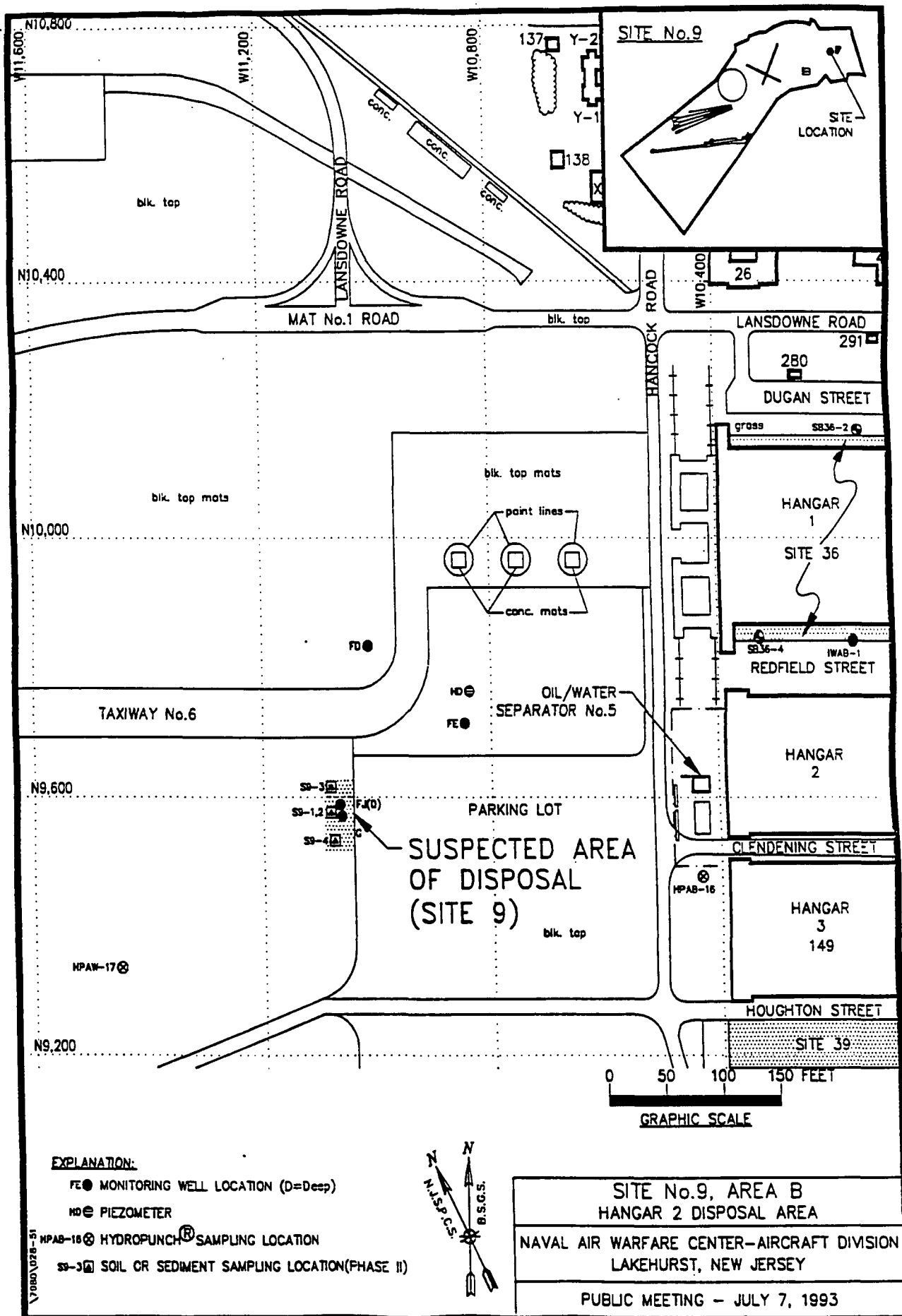


Figure (3)

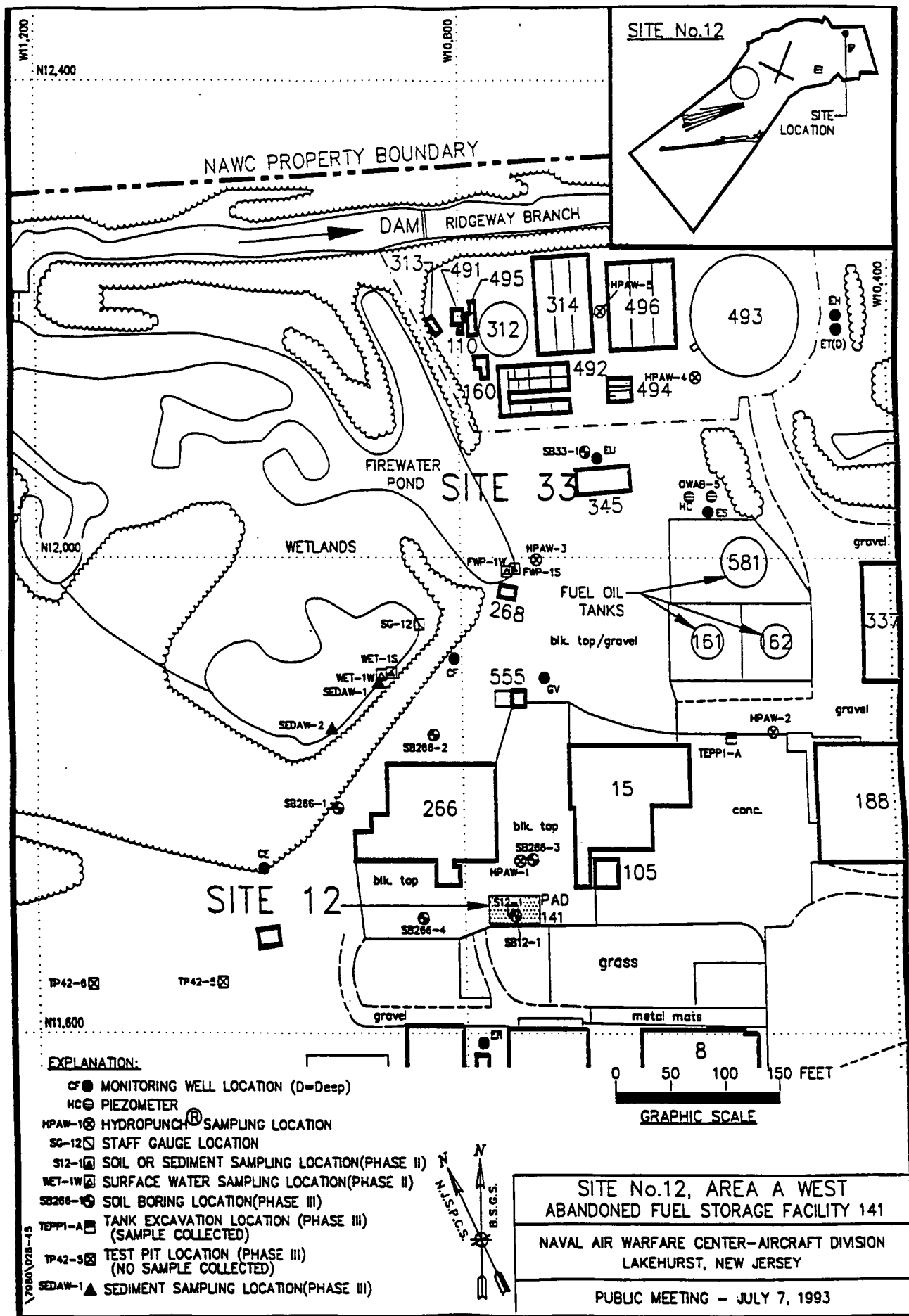
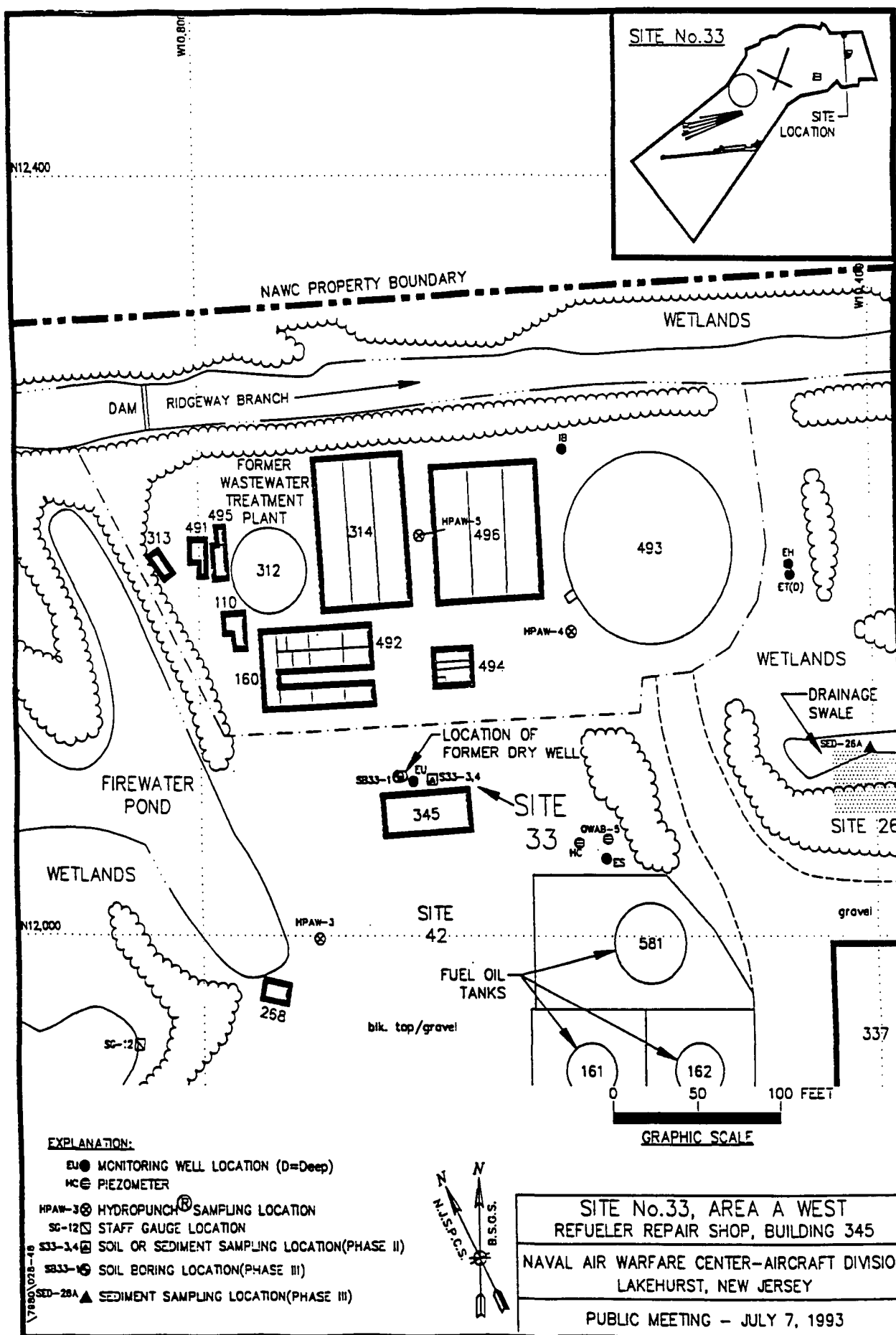
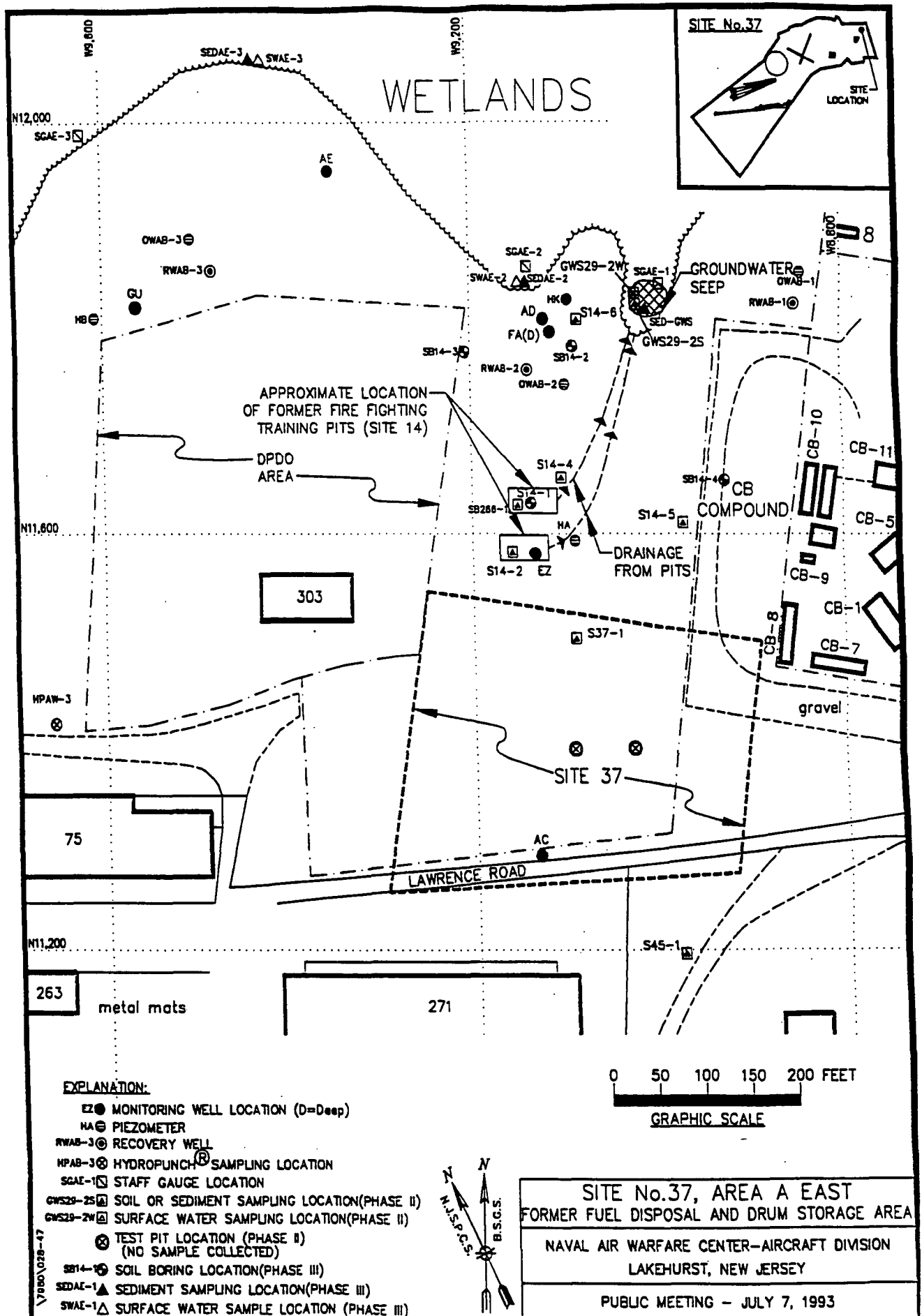
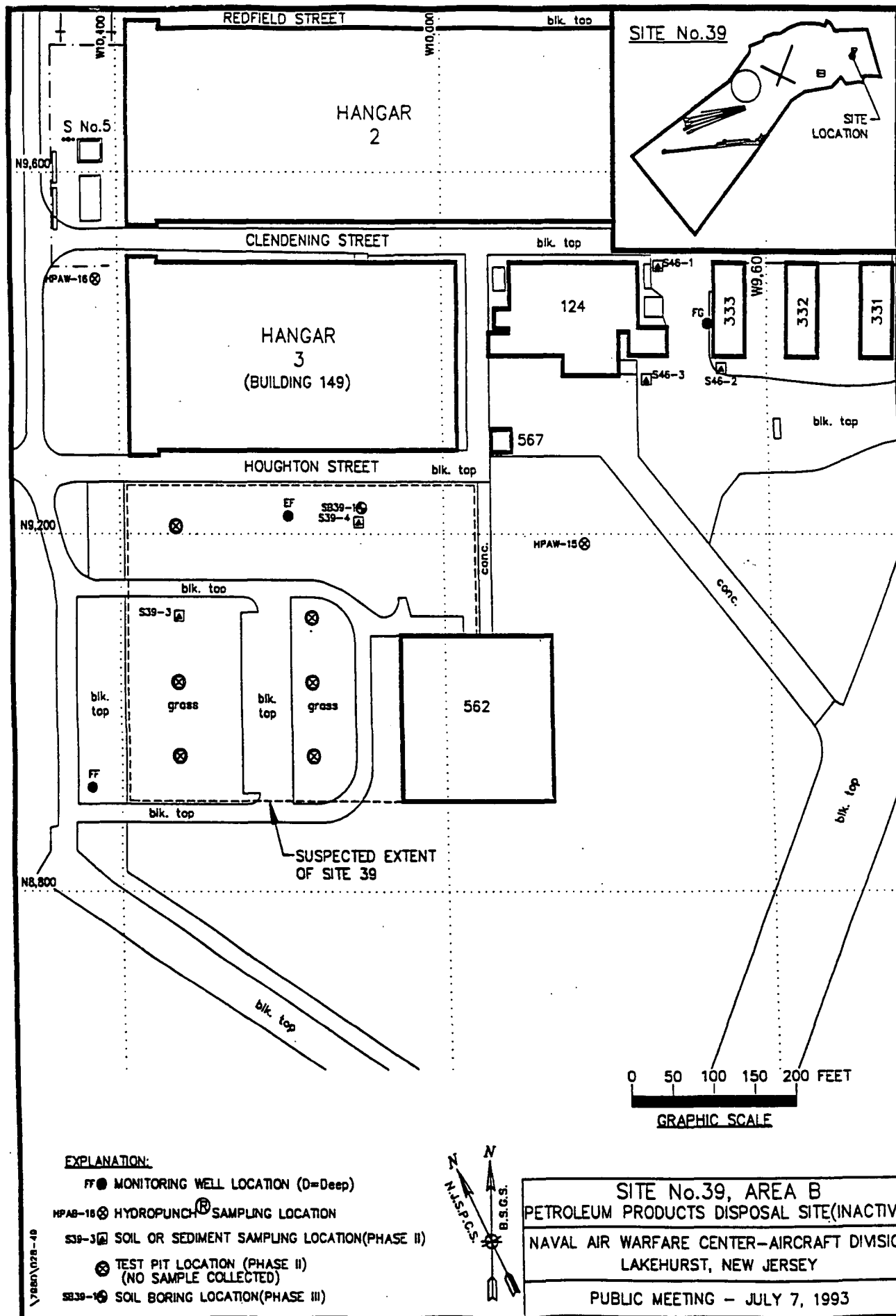


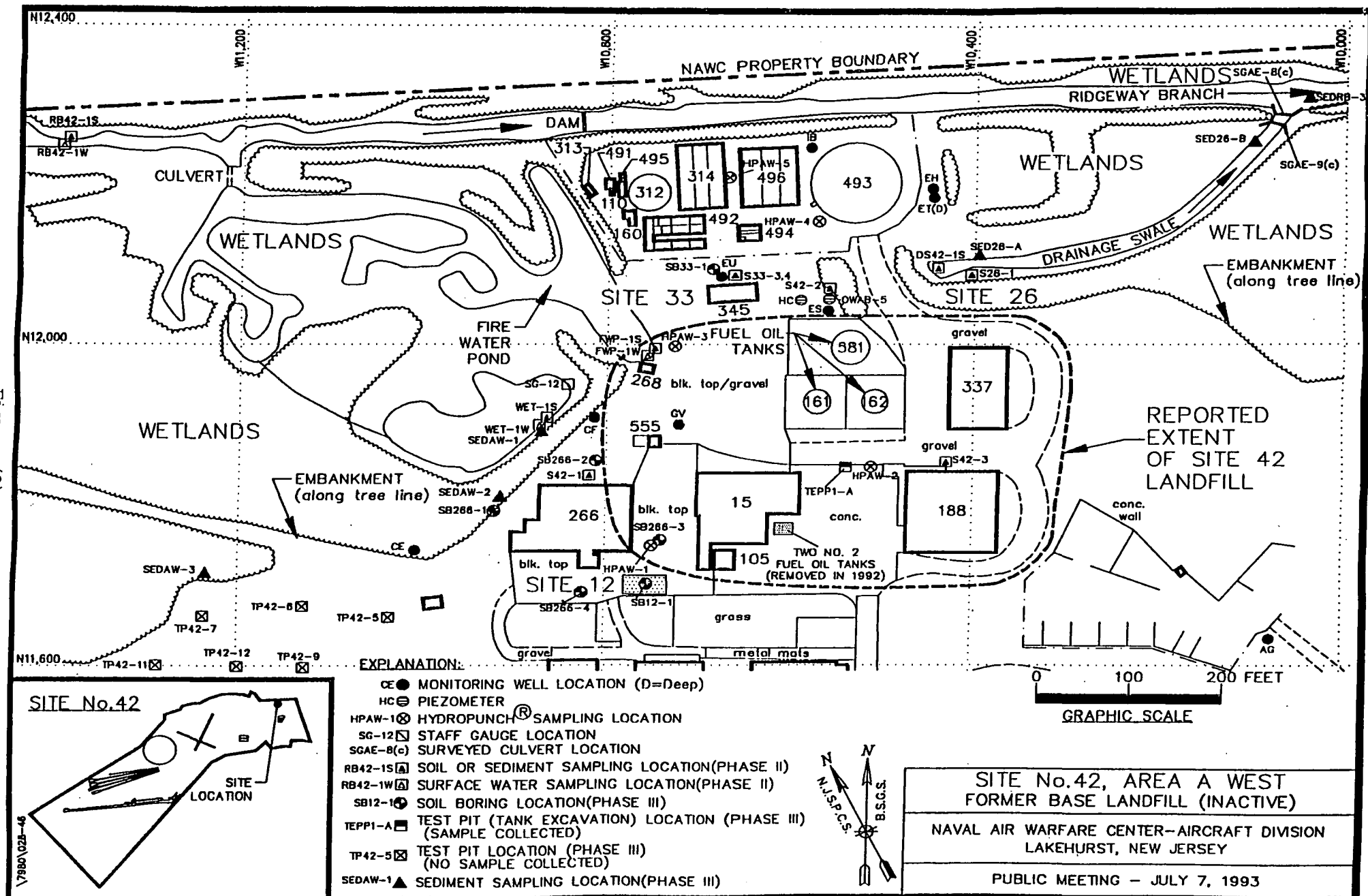
Figure 12







SITE No. 39, AREA B
PETROLEUM PRODUCTS DISPOSAL SITE (INACTIVE)
NAVAL AIR WARFARE CENTER—AIRCRAFT DIVISION
LAKEHURST, NEW JERSEY
PUBLIC MEETING — JULY 7, 1993



3.0 SUMMARY OF SITE ENDANGERMENT

An Endangerment Assessment (EA) was conducted for NAWCADLKE to assess the potential current and future human health risks and potential environmental impacts posed by contaminated soils, ground water, sediment and surface water detected during past and on-going site investigations.

For all sites, four different scenarios representing current and potential future land uses were evaluated to assess applicability to the site. Evaluated scenarios included military, light industrial, construction and residential land uses. For each of these scenarios, human exposure is affected by mechanisms that include direct contact, inhalation and ingestion. In addition, a transient scenario was developed to assess the human health risks associated with direct exposure to contaminated sediment.

More complete EA information for Sites 9, 12, 33, 36, 37, 39, and 42 can be found in Volume VI of the Phase III RI, which is available as part of the NAWCADLKE Administrative Record.

The summaries do not address groundwater. Groundwater contamination which exists beneath all of these sites is being addressed through a separate interim remedial action. A Record of Decision for that action was signed on March 16, 1992 and requires pumping and treatment of the groundwater in Areas A and B. Remediation should begin in late summer 1993. It is not believed that the sites addressed in this Proposed Plan are a continuing source of groundwater contamination.

For each site, the summary will discuss (1) the chemicals identified by the EA as contaminants of concern (COCs), (2) the land use assumptions upon which estimates of potential human exposure to site contaminants are based, (3) the quantitative estimates of carcinogenic risk and noncarcinogenic hazard, (4) a summary of the ecological concerns at the site and, (5) a summary interpretation of the EA findings with regard to need for site remediation.

3.1 SITE 9: FORMER HANGAR 2 DISPOSAL AREA

This is a summary of the EA findings for Site 9 (Former Hanger 2 Disposal Area). Soil is the media of interest for this site.

3.1.1 CONTAMINANTS OF CONCERN

For soil, various organic compounds such as xylene and polycyclic aromatic hydrocarbons (PAHs), and two inorganic metal parameters (lead and mercury) were identified as contaminants of concern.

3.1.2 LAND USE AND EXPOSURE ASSUMPTIONS

For soil, a light industrial land use scenario was assumed because Site 9 is located within an unrestricted area of the Base near Hanger 1, traversed occasionally by facility employees. By this land use scenario, exposure to contaminated soil could occur via incidental ingestion and inhalation.

3.1.3 HUMAN HEALTH RISK AND HAZARD FINDINGS

For soil, the results of the EA indicate that hazards resulting from noncarcinogens are not elevated for any chemical above EPA's hazard index criteria value of 1.0. The hazard index values ranged from a minimum of 8.16×10^{-7} for pyrene to a maximum of 2.01×10^{-4} for mercury. Similarly, the overall site soil hazard represented by the hazard quotient or sum of the chemical-specific hazard indices also does not exceed a value of 1.0. The overall hazard quotient estimated for soil is 2.02×10^{-4} .

Carcinogenic risk estimates for soil at Site 9 also are not elevated for the only chemical (chrysene) contributing to carcinogenic risk. The risk potential represented by chrysene is 6.24×10^{-8} , which is below EPA's criteria risk level of 10^{-6} . This risk value for chrysene also represents the total soil risk.

The maximum concentration of lead detected in soil at Site 9 was 33 mg/kg which is well below the NJDEPE criteria value for lead (600 mg/kg) in surface soils and the EPA criteria (500 mg/kg).

Basic toxicological data are also not readily available for total petroleum hydrocarbons (TPHC). However, the maximum observed TPHC concentration (1,437 mg/kg) is below the TPHC soil cleanup criteria level of 10,000 mg/kg used as a cleanup guideline by NJDEPE.

3.1.4 ECOLOGICAL ASSESSMENT

Site 9 is an asphalt paved area to the west of Hangar 2 and is not considered a wildlife habitat. No endangered or threatened species were found in this area. In addition, surface water and sediment are not present at this site; therefore no aquatic receptors exist.

3.1.5 SITE 9 CONCLUSION

In summary, the results of the endangerment assessment indicate that soil at Site 9 does not pose unacceptable levels of risk to human health and the environment.

3.2 SITE 12: ABANDONED FUEL STORAGE FACILITY

This is a summary of the Endangerment Assessment (EA) findings for Site 12 (Abandoned Fuel Storage Facility). The media of interest at this site are soil, surface water, and sediment.

3.2.1 CONTAMINANTS OF CONCERN

For soil, a variety of organic compounds including volatiles (tetrachloroethene and xylene), PAHs, as well as total petroleum hydrocarbons were evaluated in the EA as COCs. Of the inorganic parameters, lead was the only COC.

For surface water, no analytes were determined to be COCs. For sediment, a variety of organic compounds represented by toluene and PAHs were determined to be COCs. For inorganics, the COCs were nickel, lead, and vanadium.

3.2.2 LAND USE AND EXPOSURE ASSUMPTIONS

For soil a light industrial land use was assumed, by which direct exposure to contaminated soil could occur via incidental ingestion and inhalation.

For sediment, the transient scenario developed for the EA was assumed, by which direct exposure to contaminated sediment could occur via incidental ingestion.

3.2.3 HUMAN HEALTH, AND ECOLOGICAL RISK AND HAZARD FINDINGS

For soil, hazards resulting from noncarcinogens are not elevated for any chemical above EPA's hazard index criteria value of 1.0. The hazard index values ranged from a minimum of 1.67×10^{-6} for tetrachlorethane to a maximum of 5.99×10^{-6} for naphthalene. Similarly, the overall site soil hazard represented by the hazard quotient or sum of the chemical-specific hazard indices also does not exceed a value of 1.0. The overall hazard quotient estimated for soil is 1.93×10^{-5} .

Carcinogenic risk estimates for soil at Site 12 also are not elevated for any chemical above EPA's criteria risk level of 10^{-6} . Carcinogenic risk potential is only contributed to by tetrachlorethane, the only potential carcinogen. The carcinogenic risk posed by tetrachlorethane for soil at Site 12 is 3.09×10^{-10} , which is also the total risk estimate for soil.

For sediment, based on the transient scenario, the hazards resulting from noncarcinogens are not elevated for any chemical above EPA's hazard index criteria value of 1.0. The hazard index values ranged from a minimum of 4.72×10^{-9} for toluene to 5.67×10^{-3} for vanadium. Similarly, the overall site sediment hazard represented by the hazard quotient or sum of the chemical specific hazard indices also does not exceed a value of 1.0. The overall hazard quotient estimated for sediment is 6.13×10^{-3} .

Carcinogenic risk estimates for sediment at Site 12 also are not elevated for any chemical above EPA's criteria risk level of 10^{-6} . Carcinogenic risk potential is only contributed to by chrysene, the

only potential carcinogen. The carcinogenic risk posed by chrysene for sediment at Site 12 is 1.31×10^{-8} , which is also the total risk estimate for sediment.

3.2.4 ECOLOGICAL ASSESSMENT

Site 12 is located around the dirt and blacktop paved perimeter of Building 266 and includes a portion of the wetlands area located to the immediate northwest of the building. The area around Building 266 is not considered a wildlife habitat and no endangered species were found to exist at or near the site. Aquatic receptors suspected to be present in the pond located to the northwest of the site include the following species: chain pickerel, brown bullhead, american eel, bluegill, and channel catfish. In addition, reptiles that have been observed at or near the site include the following species: snapping turtle, red-bellied turtle, spring peeper, northern water snake, black racer snake, and king snake.

To evaluate the potential for adverse ecological effects associated with contaminants in sediment, sample results were compared to guidelines established by NOAA as effects range-low (ER-L) and range-medium (ER-M).

The evaluation of sediments at Site 12 revealed that the ER-M guideline of 110 mg/kg for lead was slightly exceeded by two of nine samples which had levels of 115.5 mg/kg and 113.5 mg/kg. The average lead sediment level for Site 12 is 40.3 mg/kg which is well below the ER-M guideline of 110 mg/kg and only slightly above the ER-L guideline of 35 mg/kg.

The evaluation of sediments at Site 12 also revealed that the ER-M guideline of 50 mg/kg for nickel was exceeded by three of nine samples which had nickel concentrations of 134.5 mg/kg, 151 mg/kg, and 234 mg/kg. The average nickel concentration in sediment at Site 12 is 62.3 mg/kg which only slightly exceeds the ER-M guideline.

The Site 12 2-methylnapthalene concentration of 120 ug/kg exceeded its ER-L value of 65 ug/kg. However, this same 2-methylnapthalene concentration is less than the ER-M value of 670 ug/kg.

The ecological effects of the remaining sediment COC at Site 12, vanadium, could not be evaluated due to the lack of any NOAA screening level value.

As a result of exceedances of the NOAA ER-M guideline for nickel and lead, an Addendum to the Areas A, B, H, I & J Surface Water, Soil and Sediment Focused Feasibility Study was prepared to further evaluate the biological effects of these metals. Contaminants levels present at Site 12 were compared to the results of metal spiked-sediment bioassays performed on *Daphnia magna*, a sensitive indicator of metals intoxication. The results of this study

suggest that the highest nickel or lead sediment concentrations at Site 12 are well below the concentrations necessary for the expression unambiguous toxicity. The findings of the Addendum also indicate that the level of nickel and lead present in Site 12 sediment does not pose an unacceptable ecological hazard due to the negligible biomagnification of these metals, the limited area in which they were detected and the absence of any surface water contamination.

3.2.5 SITE 12 CONCLUSION

In summary, the EA demonstrates that soils, surface water and sediment at Site 12 do not pose an unacceptable risk to human health or the environment. For soil, the EPA's risk and hazard criteria for human health were not exceeded and no contaminants were detected above the NJDEPE soil cleanup criteria. For surface water, no analytes were determined to be COCs, and therefore no human health or ecological risks exist. For sediment, NOAA guidelines were exceeded for nickel and lead; however the potential for adverse ecological effects from these contaminants is considered to be low due to limited area of contamination (150 square feet), the negligible biomagnification of lead and nickel, the low confidence level for the NOAA nickel values, and the absence of any surface water contamination.

3.3 SITE 33: FORMER REFUELER REPAIR SHOP, BLDG. 345

This is a summary of the EA findings for Site 33 (Former Refueler Repair Shop, Building 345). The media that is the subject of interest for this site is soil.

3.3.1 CONTAMINANTS OF CONCERN

For soil, various volatile organic compounds determined to be COCs include benzene, ethylbenzene, toluene, and xylene. Semi-volatile compounds determined to be COCs included various PAHs and total petroleum hydrocarbons. The only inorganic determined to be a COC was mercury.

3.3.2 LAND USE AND EXPOSURE ASSUMPTIONS

For soil, a light industrial land use scenario is applicable because Site 33 is in an area where numerous base employees are present on a daily basis and they engage in activities similar to those associated with the light industrial land use assumptions specified by EPA. The light industrial land use scenario, and associated pathways, assume that direct exposure to contaminated soil could occur via incidental ingestion and inhalation.

3.3.2 HUMAN HEALTH RISK AND HAZARD FINDINGS

For soil, the results of the EA indicate that hazards resulting from noncarcinogenic compounds are not elevated for any chemical above EPA's hazard index criteria value of 1.0. The hazard index values ranged from a minimum of 1.38×10^{-8} for toluene to a maximum of 2.17×10^{-4} for mercury. Similarly, the overall site soil hazard represented by the hazard quotient, or sum of the chemical-specific hazard indices, also does not exceed a value of 1.0. The overall hazard quotient estimated for soil is 2.45×10^{-4} . Carcinogenic risk estimates for soil at Site 33 also are not elevated for any chemical above EPA's criteria risk level of 10^{-6} . The risk estimates ranged from a maximum of 4.75×10^{-7} for chrysene to a minimum of 1.12×10^{-10} for benzene. The overall site soil risk represented by the sum of the chemical-specific risk estimates is 1.28×10^{-6} , due to the contribution of benzo(a)anthracene, chrysene, benzo(b)fluoranthene, and benzo(a)pyrene.

The source of PAH, and other contaminants in soil at Site 33 is believed to be releases of various liquid wastes, including fuels, from an unlined dry well formerly present at the site. This dry well, which was excavated and removed in 1988, received discharges from a sink drain inside the adjacent refueler repair shop. In using the results of the EA for assessing the potential need for remedial action at the site, it should be considered that the results of the RI have indicated that soil contamination at the site appears to be localized in the immediate vicinity of the former dry well. None of the NJDEPE soil cleanup criteria for PAHs in soil were exceeded by the Site 33 PAH results.

3.3.4 ECOLOGICAL ASSESSMENT

Site 33 is a dirt paved area located on the north side of Building 345 and is not considered a wildlife habitat. No endangered or threatened species were found in this area. Contamination was found in subsurface soils which are not part of a complete pathway. In addition, surface water and sediment are not present at this site; therefore no aquatic receptors exist.

3.3.5 SITE 33 CONCLUSION

In summary, there is no continuing source of soil contamination at Site 33. Soil in the unsaturated zone (above the groundwater table) has been determined to meet NJDEPE soil cleanup criteria and does not pose a risk to human health or the environment. The presence of free product and petroleum contaminated soil in the saturated zone at the site will be addressed by the groundwater treatment facility for Areas A and B. This system will be modified to include free product recovery and soil flushing. Effectiveness of this system will be evaluated prior to the final Record of Decision for Areas A and B groundwater.

3.4 SITE 36: FORMER HANGAR 1 WASTE DISPOSAL AREA

This is a summary of the endangerment assessment findings for Site 36 (Former Hanger 1 Waste Disposal Area). The media that is the subject of interest for this site is soil.

3.4.1 CONTAMINANTS OF CONCERN

For soil, various semi-volatile organics (PAHs, a pesticide, and a PCB) and one metal (lead) were determined to be COCs.

3.4.2 LAND USE AND EXPOSURE ASSUMPTIONS

For soil, a light industrial land use was assumed because access to the site is not restricted and the site is not extremely remote. Under such a land use scenario human exposure to contaminated soil could occur via incidental ingestion and inhalation.

3.4.3 HUMAN HEALTH RISK AND HAZARD FINDINGS

For soil, the results of the EA for soil at Site 36 indicate that hazards resulting from noncarcinogens are not elevated for any chemical above EPA's hazard index criteria value of 1.0. The hazard index values ranged from a minimum of 3.75×10^{-6} for pyrene to a maximum of 6.47×10^{-5} for 4,4'-DDT. Similarly, the overall site soil hazard represented by the hazard quotient or sum of the chemical-specific hazard indices also does not exceed a value of 1.0. The overall hazard quotient estimated for soil is 7.22×10^{-5} .

Carcinogenic risk estimates for soil at Site 36 also are not elevated for any chemical above EPA's criteria risk level of 10^{-4} . The risk estimates ranged from a minimum of 3.95×10^{-9} for 4,4'-DDT to a maximum of 4.85×10^{-7} for Aroclor 1254. The overall site soil risk represented by the sum of the chemical-specific risk estimates is 1.40×10^{-6} , due primarily to five PAHs compounds.

In using the results of the EA for assessing the potential need for remedial action at the site, it should be considered that the maximum observed concentration of the five PAH compounds of concern were approximated due to the fact that they were below method detection limits. Also, none of the NJDEPE soil cleanup criteria for PAHs in soil were exceeded by the Site 36 PAH results.

The highest detected concentration of lead at Site 36 was 25.9 mg/kg. This level is well below the NJDEPE soil cleanup criteria of 600 mg/kg for non-residential surface soil and the EPA's soil cleanup standard of 500 mg/kg. The level of lead detected also does not represent a risk or hazard criteria exceedance.

The PCB Aroclor 1254 which was the only other contaminant to significantly impact the site risk, was only detected in one sample

from throughout Site 36. The concentration of Aroclor 1254, like the five PAH compounds, was approximated due to the fact that it was below method detection limits.

3.4.4 ECOLOGICAL ASSESSMENT

Site 36 encompasses the asphalt paved perimeter of Hangar 1 which is not considered a wildlife habitat. No endangered or threatened species were found in this area. In addition, surface water and sediment are not present at this site; therefore no aquatic receptors exist.

3.4.5 SITE 36 CONCLUSION

In summary, the results of the EA indicate that soil contamination detected at Site 36 does not pose an unacceptable risk to human health or the environment.

3.5 SITE 37: FORMER FUEL DISPOSAL AND DRUM STORAGE AREA

This is a summary of the EA findings for Site 37 (Former Fuel Disposal and Drum Storage Area). The media that is the subject of interest for this site is soil.

3.5.1 CONTAMINANTS OF CONCERN

For soil, no significant organic contamination was detected. Numerous inorganic parameters were detected; however, none were selected as COCs because they failed to pass the background and essential nutrient screening process.

3.5.2 ECOLOGICAL ASSESSMENT

Site 37 is a grassy area located to the north of Lawrence Road between the DRMO Storage Area and the CB Compound. The site is also within the borders of Site 29 (Original Base Landfill) and is not considered a wildlife habitat. No endangered or threatened species were found in this area. In addition, surface water and sediment are not present at this site; therefore, no aquatic receptors exist.

3.5.3 SITE 37 CONCLUSION

In summary, since no significant organic or inorganic contamination was detected in soil at Site 37 during the RI, there is no apparent risk to human health or the environment.

3.6 SITE 39: FORMER PETROLEUM OILS AND LUBRICANTS DISPOSAL SITE

This is a summary of the EA findings for Site 39 (Former Petroleum Oils and Lubricants Disposal Site). The media that is the subject of interest for this site is soil.

3.6.1 CONTAMINANTS OF CONCERN

For soil, various organic compounds such as pyrene and polycyclic aromatic hydrocarbons (PAHs) were determined to be COCs. The inorganic COCs were lead, mercury, nickel, and silver.

3.6.2 LAND USE AND EXPOSURE ASSUMPTIONS

For soil, a light industrial land use was assumed because site access is uncontrolled and the site is not extremely remote. Under such a land use scenario human exposure to contaminated soil could occur via incidental ingestion and inhalation.

3.6.3 HUMAN HEALTH RISK AND HAZARD FINDINGS

For soil, the results of the EA at Site 39 indicate that hazards resulting from noncarcinogens are not elevated for any chemical above EPA's hazard index criteria value of 1.0. The hazard index values ranged from a minimum of 5.49×10^{-6} for fluoranthene to a maximum of 4.40×10^{-4} for nickel. Similarly, the overall site soil hazard represented by the hazard quotient or sum of the chemical-specific hazard indices also does not exceed a value of 1.0. The overall hazard quotient estimated for soil is 7.95×10^{-4} .

Carcinogenic risk estimates for soil at Site 39 also are not elevated for any chemical above EPA's criteria risk level of 10^{-6} . The risk estimates ranged from a minimum of 7.3×10^{-8} for benzo(ghi)perylene to a maximum of 5.13×10^{-7} for benzo(b)fluoranthene. The overall site soil risk represented by the sum of the chemical-specific risk estimates is 2.07×10^{-6} , due primarily to five PAH compounds.

In using the results of the EA for assessing the potential need for remedial action at the site, it should be considered that the maximum observed concentration of the five PAH compounds of concern were approximated due to the fact that they were below method detection limits. Also, none of the NJDEPE soil cleanup criteria for PAHs in soil were exceeded by the Site 39 PAH results.

3.6.4 ECOLOGICAL ASSESSMENT

Site 39, which encompasses the blacktop paved and grassy areas between Hanger 3 and Building 562, is not considered a wildlife habitat. Contamination was detected in subsurface soils which are not part of a complete pathway. No endangered or threatened species were found in this area. In addition, surface water and

sediment are not present at this site, therefore no aquatic receptors exist.

3.6.5 SITE 39 CONCLUSION

In summary, the results of the EA indicate that soil contamination detected at Site 39 does not pose an unacceptable risk to human health or the environment. Since the PAH compounds were detected at a depths below 2.5 feet, direct exposure to the soil via incidental ingestion and inhalation, as assumed by the light industrial land use scenario is considered extremely unlikely.

3.7 SITE 42: FORMER BASE LANDFILL (INACTIVE)

This is a summary of the EA findings for Site 42 (Former Base Landfill (Inactive)). The media that are the subject of interest for this site are soil, surface water, and sediment.

3.7.1 CONTAMINANTS OF CONCERN

For soil, the inorganic COCs were arsenic, beryllium, lead, mercury, nickel, and vanadium. The organic COCs were tetrachloroethene, and numerous polycyclic aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons.

For surface water, the COCs were aluminum, barium, iron and magnesium.

For sediment, the inorganic COCs were iron, lead, mercury, and selenium. The organic COCs were phenanthrene, fluoranthene, pyrene, benzo(a)anthracene and chrysene.

3.7.2 LAND USE AND EXPOSURE ASSUMPTIONS

For soil, a light industrial land use was assumed because a variety of buildings used for office, maintenance, and warehouse purposes currently exist in the area. Under such a land use scenario human exposure to contaminated soil could occur via incidental ingestion and inhalation.

For surface water, frequent direct human exposure was determined to be relatively unlikely due to the limited extent of contamination as well as the industrial nature of the area and the minor nature of the water bodies near this site which make them unattractive for purposes that would encourage exposure.

For sediment, a transient scenario was assumed, by which direct exposure to contaminated sediment could occur via incidental ingestion.

3.7.3 HUMAN HEALTH RISK AND HAZARD FINDINGS

For soil, the results of the EA indicate that hazards resulting from noncarcinogens are not elevated for any chemical above EPA's hazard index criteria value of 1.0. The hazard index values ranged from a minimum of 9.79×10^{-8} for anthracene to a maximum of 3.99×10^{-2} for vanadium. Similarly, the overall site soil hazard represented by the hazard quotient or sum of the chemical-specific hazard indices also does not exceed a value of 1.0. The overall hazard quotient estimated for soil is 5.63×10^{-2} . The carcinogenic risk estimates for soil at Site 42 ranged from a minimum of 1.0×10^{-9} for tetrachloroethene to a maximum of 3.45×10^{-6} for arsenic. The overall risk estimate for soil at Site 42 is 5.72×10^{-6} . While this level is slightly above the EPA's point of departure of 10^{-6} , it is within the EPA's acceptable risk range of 10^{-4} to 10^{-6} .

For sediment, based on the transient scenario, the hazards resulting from noncarcinogens are not elevated for any chemical above EPA's hazard index criteria value of 1.0. The hazard index values ranged from a minimum of 2.83×10^{-6} for pyrene to 1.75×10^{-4} for mercury. Similarly, the overall site sediment hazard represented by the hazard quotient or sum of the chemical specific hazard indices also does not exceed a value of 1.0. The overall hazard quotient estimated for sediment is 1.92×10^{-4} .

Carcinogenic risk estimates for sediment at Site 42 also are not elevated for any chemical above EPA's criteria risk level of 10^{-6} . Carcinogenic risk potential is contributed to by chrysene and benzo(a)anthracene, the only potential carcinogens. The carcinogenic risk posed by chrysene is 4.03×10^{-8} while the carcinogenic risk for benzo(a)anthracene is 3.70×10^{-8} . The overall site sediment risk represented by the sum of these two contaminants is 7.73×10^{-8} .

3.7.4 ECOLOGICAL ASSESSMENT

Site 42 is located in a highly developed area of the base which is occupied by a variety of structures including a facility building and above ground fuel tanks. The site is not considered a wildlife dwelling and no endangered species were found in the area.

Sediment and surface water exist along the northern and western boundaries of the site. Potential ecological effects associated with contaminants in sediment were evaluated by comparing the sample results to guidelines established by NOAA as effects range-low (ER-L) and range-medium (ER-M). This evaluation of sediments at Site 42 revealed that the site does not appear to pose a significant ecological concern. Evidence includes the observation that there were relatively few exceedances of the ER-L sediment guideline values and no exceedances of the ER-M values. The observed ER-L exceedances were noted for the maximum detected concentrations of mercury (0.39 mg/kg), phenanthrene (0.85 mg/kg),

fluoranthene (0.86 mg/kg), pyrene (0.63 mg/kg), and benzo(a)anthracene (0.43 mg/kg). Even though exceedances were noted for these contaminants, the maximum detected concentrations are close to the ER-L sediment criteria values.

Ecological concerns associated with the western boundary of the site have been addressed as part of Site 12.

3.7.5 SITE 42 CONCLUSION

In summary, with the exception of the TPHC contaminated groundwater and subsurface soil located to the north of the tank storage area, contamination at Site 42 does not pose an unacceptable risk to human health or the environment. This decision is based on the conclusions of the endangerment assessment, along with the lack of evidence of landfill wastes, the age of the site, the lack of soil or sediment contamination exceeding action levels, and the questionable accuracy of the Base records and personnel communications describing the contents, quantity and location of the landfill wastes.

In addition, surface soil located in the TPHC contaminated region north of the tank storage area is not a continuing source of contamination. Soil in the unsaturated zone (above the groundwater table) has been determined to meet the NJDEPE soil cleanup criteria and does not pose a risk to human health or the environment. The presence of free product at the site will be addressed by the groundwater treatment facility for Areas A and B. This system will be modified to include free product recovery and soil flushing. Effectiveness of this system will be evaluated prior to the final Record of Decision for Areas A and B groundwater.

SUMMARY

In summary, the EA demonstrates that soil, surface water and sediment at the seven sites does not pose human health risks in excess of EPA acceptable levels. Likewise, the sites do not pose unacceptable ecological hazards. All soil contaminants were below EPA acceptable risk levels and NJDEPE Soil Cleanup Criteria.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Proposed Plan for Sites 9, 12, 33, 36, 37, 39 and 42 was issued to interested parties on June 7, 1993. On June 16 and 17, 1993, a newspaper notification inviting public comment on the Proposed Plan appeared in The Asbury Park Press and The Ocean County Observer and The Advance News. The comment period was held from June 21, 1993 to July 21, 1993. The newspaper notification also identified the Ocean County Library as the location of the Information Repository.

A Public Meeting was held on July 7, 1993. At this meeting representatives from the Navy, USEPA and NJDEPE were available to answer questions about the seven Sites, and the "No Action" determination. A list of attendees is attached to this Record of Decision as Appendix A. Comments received and responses provided during the public hearing are included in the Responsiveness Summary, which is part of this Record of Decision. No written comments were received during the public comment period.

The decision document presents the selected action (i.e., No Action) for Sites 9, 12, 33, 36, 37, 39 and 42 of NAWCADLKE in Ocean County, New Jersey, chosen in accordance with CERCLA, as amended by SARA and, to the extent practicable, the National Contingency Plan (NCP). The decision for the seven sites is based on the information contained in the Administrative Record, which is available for public review at the Ocean County Library, 101 Washington Street, Toms River, New Jersey.

SCOPE AND ROLE OF RESPONSE ACTION

The results of environmental investigations conducted show no evidence of any significant contamination remaining at Sites 9, 12, 33, 36, 37, 39 and 42. No unacceptable risks to human health or the environment exist at these sites; no action is necessary for these seven sites.

SUMMARIES OF SITE CHARACTERISTICS

The locations of each of the seven sites within NAWCADLKE are shown in Figures 1 and 2. Maps of the individual sites are provided in Figures 3 through 9.

The results of the Remedial Investigations indicate that conditions at Sites 9, 12, 33, 36, 37, 39 and 42 pose no unacceptable risks to human health and the environment.