United States
Environmental Protection
Agency

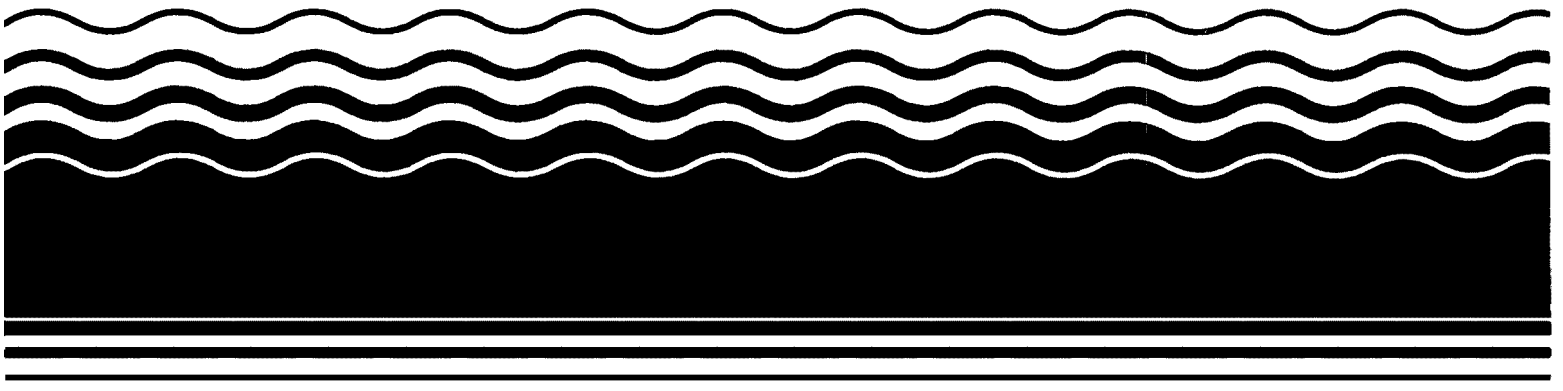
Office of
Emergency and
Remedial Response

EPA/ROD/R02-93/215
September 1993
PB94-963828

EPA

# Superfund Record of Decision:

## Naval Air Engineering Center (Operable Unit 15), NJ



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4. Title and Subtitle
SUPERFUND RECORD OF DECISION
Naval Air Engineering Center (Operable Unit 15), NJ
Fifteenth Remedial Action

5. Report Date 09/27/93

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address

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(G)

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U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

13. Type of Report & Period Covered 800/800

14.

15. Supplementary Notes
PB94-963828

16. Abstract (Limit: 200 words)

The Naval Air Engineering Center (Operable Unit 15) site is an inactive sanitary landfill, which 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,

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Naval Air Engineering Center (Operable Unit 15), NJ
Fifteenth Remedial Action
Contaminated Medium: None
Key Contaminants: None

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

| 18. Availability Statement | 19. Security Class (This Report) None | 21. No. of Pages 28 |
|---|---|---|
| | 20. Security Class (This Page) None | 22. Price |

Abstract (Continued)

storage, and occasional onsite disposal of hazardous substances. During the operational period of the facility, there were reported and suspected 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 ground water contamination at the former sanitary landfill (Site 31). Site 31 is located in Area D, southwest of the installation golf course and Calloway Road. The 34-acre landfill operated from 1960 until 1980; when the landfill was closed it was capped with 6 inches of topsoil. During its 20 years of operation the landfill received trash and garbage from the entire facility. Potentially hazardous materials including solvents, hydraulic fluid, oils, asbestos, and debris contaminated with pesticides, PCBs, and other organic materials, were also reportedly disposed of at the site. Between 1981 and 1984, under the direction of the Navy, seven monitoring wells were installed and sampling was conducted around the perimeter of Site 31. These investigations indicated the presence of VOCs in the ground water downgradient of the site. Subsequent investigations, conducted from 1986 to 1992, confirmed the presence of VOCs in the ground water as well as low levels of other organic compounds. These investigations also indicated that the plume of VOC contamination had migrated from the former landfill to the site boundary. An assessment of the potential threat to human and health and the environment was conducted for contaminants in the ground water downgradient of Site 31. This assessment revealed that the levels of organic contaminants in the ground water do not pose a risk to human health or the environment. Previous 1991 and 1992 RODs addressed OUs 1, 2, 3, and 4; and OUs 5, 6, and 7, respectively. This ROD addresses any ground water contamination at Site 31, as OU15. Other 1993 RODs address OUs 8, 9, 10, 11, 12, 13, 14, 22, and 23. EPA has determined that, based on the results of health assessment, the site does not present a threat to human health or the environment and that no cleanup activities are required at this site; therefore, there are no contaminants of concern affecting this site.

The selected remedial action for this site is no further action with ground water monitoring. EPA has determined that conditions at the site pose no risk to human health or the environment; however, a five year monitoring plan will be implemented to ensure continued compliance with ground water standards and to monitor the risk to human health and the environment. The estimated present worth cost for this remedial action is $509,000, which includes an estimated annual O&M cost of $99,000 for 5 years.

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 w/ground water monitoring |
| Operating Unit Number: | OU-15 (Site 31) |
| Capital cost: | $13,500 |
| Construction Completion: | N/A |
| O & M in 1994: | $99,000 |
| 1995: | $99,000 |
| 1996: | $99,000 |
| 1997: | $99,000 |
| 1998: | $99,000 |
| Present worth: | $509,500 |

**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 | volatile organics |
| Medium | ground water |
| Origin | landfill leachate |
| Est. quantity | diffuse - N/A |

NAWC
Aircraft Division
NAVAL AIR WARFARE CENTER
LAKEHURST

# RECORD OF DECISION
# FOR
# SITE 31

OU-15

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

NAVAL AIR WARFARE CENTER
ENVIRONMENTAL MANAGEMENT
LAKEHURST, NJ

RECORD OF DECISION
DECLARATION
SITE 31
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 action for one site (Site 31), 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 this site, has selected the "no action with groundwater monitoring" alternative for Site 31.

DECLARATION STATEMENT

The United States Department of the Navy and the United States Environmental Protection Agency have determined that no remedial action is necessary at Site 31 to ensure protection of human health and the environment.

This Record of Decision addresses Site 31. The location of the site within NAWCADLKE is shown in Figure 2. Other areas of concern at NAWCADLKE have been or will be the subject of separate studies and Records of Decision.

13 SEP 93

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

(Date)

With the concurrence of:

9/27/93

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

(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 Mills 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 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 southeastern 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 the Manapaqua 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 Manapaqua 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

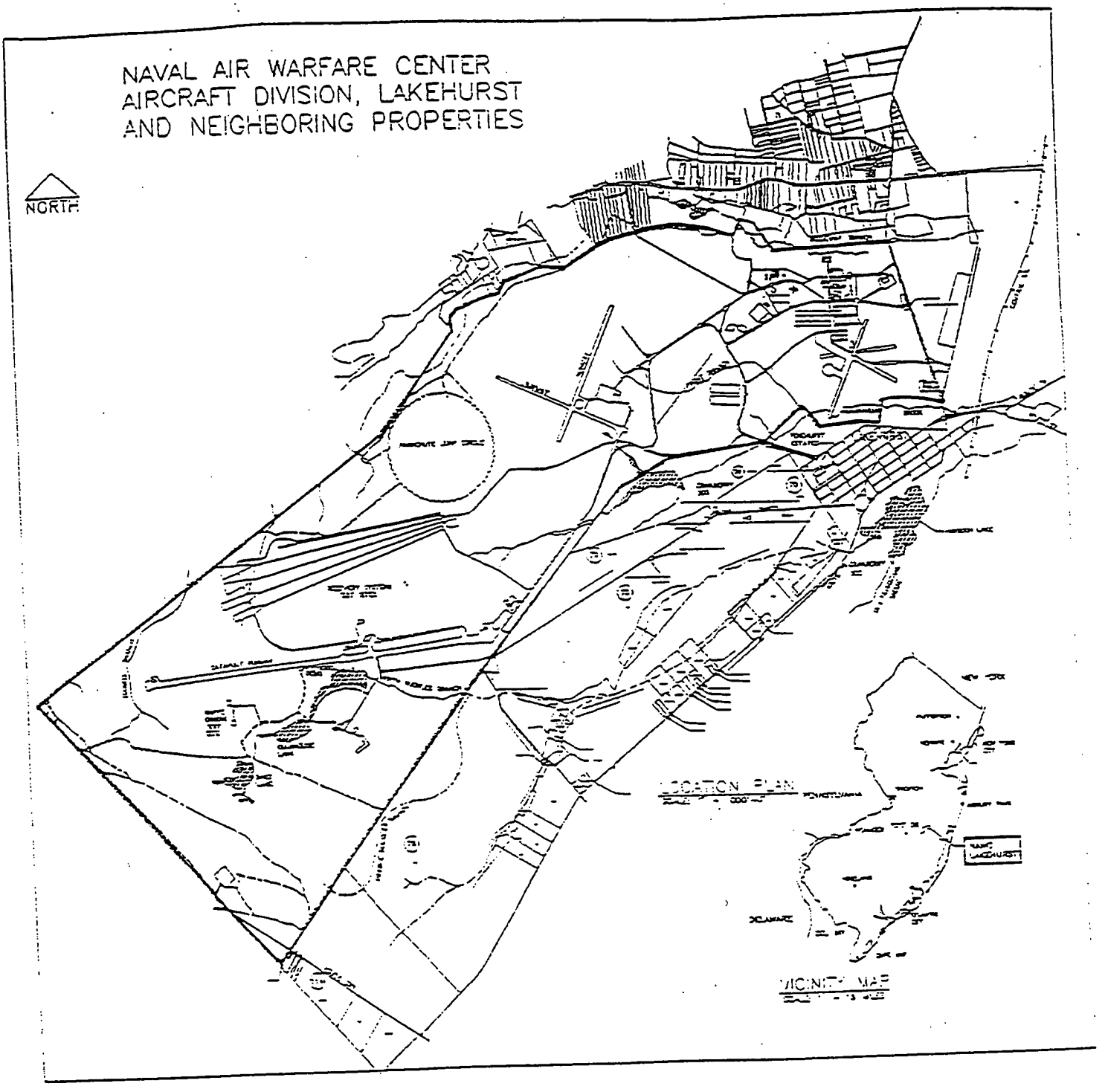


FIGURE 1 - LOCATION MAP

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 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, 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 designated by appropriate authority.

NAWCADLKE and its tenant activities now occupy more than 300 buildings, built between 1919 and 1989, totaling over 2,845,000 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, 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 RI. Two potentially contaminated sites, an ordnance site (Site 41) and an Advanced Underground Storage Facility (Site 43), were deleted from the RI because they had already been addressed. 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).

## 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 the 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 the levels of chlorinated solvents in the groundwater at and downgradient of Site 31 are not consistently revealed through numerous sampling rounds and that contaminants do not pose a risk to human health and the environment.

## STATUTORY DETERMINATIONS

The NJDEPE soil cleanup criteria (SCC) 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 which are determined to require active remediation.

Section 121(d) of the Comprehensive Emergency Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), requires that any remedial action comply with any standard, requirement, criterion or limitation of Federal or more stringent State environmental statutes. These standards, referred to as "applicable or relevant and appropriate requirements" (ARARs), include the statutory requirements of the National Primary and Secondary Drinking Water Regulations; the Toxic Substances Control Act; the Clean Air Act; the Clean Water Act (CWA) (40 CFR 404) which prohibits actions that impact a wetland; NJ Pollutant Discharge Elimination System (NJAC 7:14A-1 et.seq.) which determines permit requirements for alternatives involving treatments which discharge effluent to groundwater or surface water; the NJ Water Pollution Control Act (NJAC 58:10A-1 et.seq.) which provide regulations regarding ground and surface water discharge; and the Solid Waste Disposal Act (SWDA), among others.

ARARs are developed, refined and revised to take into consideration new chemical data, site conditions, and potential remedial actions.

Promulgated standards and criteria were reviewed for application to remedial actions for groundwater cleanup. To assess the need for remediation, a set of chemical specific ARARs were developed for comparison with the analytical results from groundwater. The primary purpose of these criteria is to assess the degree of contamination on the basis of adverse impacts on human health or the environment. Therefore, regulatory health-based criteria are used whenever possible. The rationale for selection of criteria is dependent on the availability of regulatory standards for each analyte, the stringency of the standard, the applicability of an assumed exposure scenario, and the media contaminated.

EPA considers drinking water Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and State Practical Quantitation Levels (PQLs) to be potential ARARs. The determination of exactly which requirements are applicable or

relevant and appropriate to a particular Superfund site should be made on a site-specific basis.

Primary MCLs are Federally enforceable contaminant levels allowable in public drinking water supplies. They have been established from health-based data by EPA's Office of Drinking Water and are described in the National Primary Drinking Water Regulations (40 CFR 141) established under the authority of the Safe Drinking Water Act. MCLs are periodically revised as more information becomes available. When MCLs are not available, proposed MCLs (PMCLs) are used for the comparison criteria for some analytes.

On 13 January 1993, the Commissioner of the New Jersey Department of Environmental Protection and Energy signed the revised N.J.A.C. 7:9-6 which include the Groundwater Quality Criteria. The Criteria establish the groundwater classifications for the Pinelands, including Class I-PL (Preservation Area) and Class I-PL (Protection Area). The actual groundwater criteria are the natural quality and background quality, respectively (N.J.A.C. 7:9-6.7). Under these revised groundwater quality standards, NAWCADLKE groundwater is classified as Class I-PL (Pinelands).

Practical Quantitation Levels (PQLs) are the lowest concentration of a constituent that can be reliably achieved among laboratories within specified (N.J.A.C. 7:9-6.9) limits of precision and accuracy during routine laboratory operating conditions. PQLs are considered to be ARARs.

PQLs are typically much more stringent than the Federal MCLs. In order to comply with PQLs in some areas, a downgradient "line of compliance" is established with the concurrence of the EPA, NJDEPE, and local officials. This line of compliance is a monitored boundary in which contaminants are not expected to cross. If contaminant levels of concern are discovered at the line of compliance, additional actions would be conducted which could include additional monitoring and/or treatment. The establishment of a active and passive remediation zone can help to minimize potential adverse effects to the environment and minimize remediation costs while protecting human health.

## Site 31 Description and Background

The former NAWCADLKE sanitary landfill (Site 31) is located to the immediate southwest of the golf course and Callaway Road, south-southeast of the magazine bunker and north of Rounds Road and the former rifle range (see Figure 2). Site 31 and the surrounding downgradient area is referred to as Area D. The landfill became operational in 1960 or 1961. In 1980, it was capped with approximately 6" of topsoil. The New Jersey Department of

Environmental Protection approved the closure of the landfill in 1980. The landfill is now a large grassy field surrounded with trees and contains no landmarks. The area of the landfill is estimated at 34 acres. The landfill received the trash and garbage from the facility for a period of approximately 20 years.

A list of potentially hazardous materials that were reportedly disposed of at the landfill is provided in Table I.

TABLE I - POTENTIALLY HAZARDOUS MATERIALS DISCARDED AT INACTIVE SANITARY LANDFILL (SITE 31)

| Material | Estimated Time Frame | Estimated Quantity |
|---|---|---|
| Trash | 1960-1980 | Unknown |
| Cutting oil | 1964-1976 | 5,000 gallons |
| Solvents, paint, paint thinner, paint cans | 1954-1976 | 160 gal/yr |
| Hydraulic fluid | 1956-1976 | Unknown |
| Asbestos | 1960-1976 | 5 tons |
| Oil for dust control (over 1,000 yards) | 1967-1968 | 200 gallons |
| Blacktop, concrete, wood, nylon webbing | 1956-1976 | Unknown |
| Sand containing lead slugs from rifle range | 1980 | 200 cu.yds |
| Bowzers full of waste solvents and oils | 1960 | Unknown |
| Sludge from AVGAS tanks | 1968-1969 | Unknown |
| Triple rinsed pesticide cans | 1961-1976 | Unknown |
| Scrap metals | Unknown | Unknown |
| Freon Cylinders (50 lb.Bt) | 1972-1976 | 400 |
| Transformer filters with PCBs | Unknown | Unknown |
| Elemental mercury (buried after closure) | 1980 | 400 grams |
| Fluorescent tubes in bags | 1956-1976 | 1,000 tubes/year |
| Hydraulic fluid saturated aircraft filters | Unknown | 250 per month |

It is estimated, however, that these potentially hazardous wastes compose a very small percentage of total landfill waste, in comparison to the volume of normal household wastes. A compilation and analysis of landfill records on file at the NJDEPE show only two instances of hazardous materials having been placed in the landfill. One entry is hazardous waste containers (which does not denote if empty or full) and one entry of dry hazardous waste.

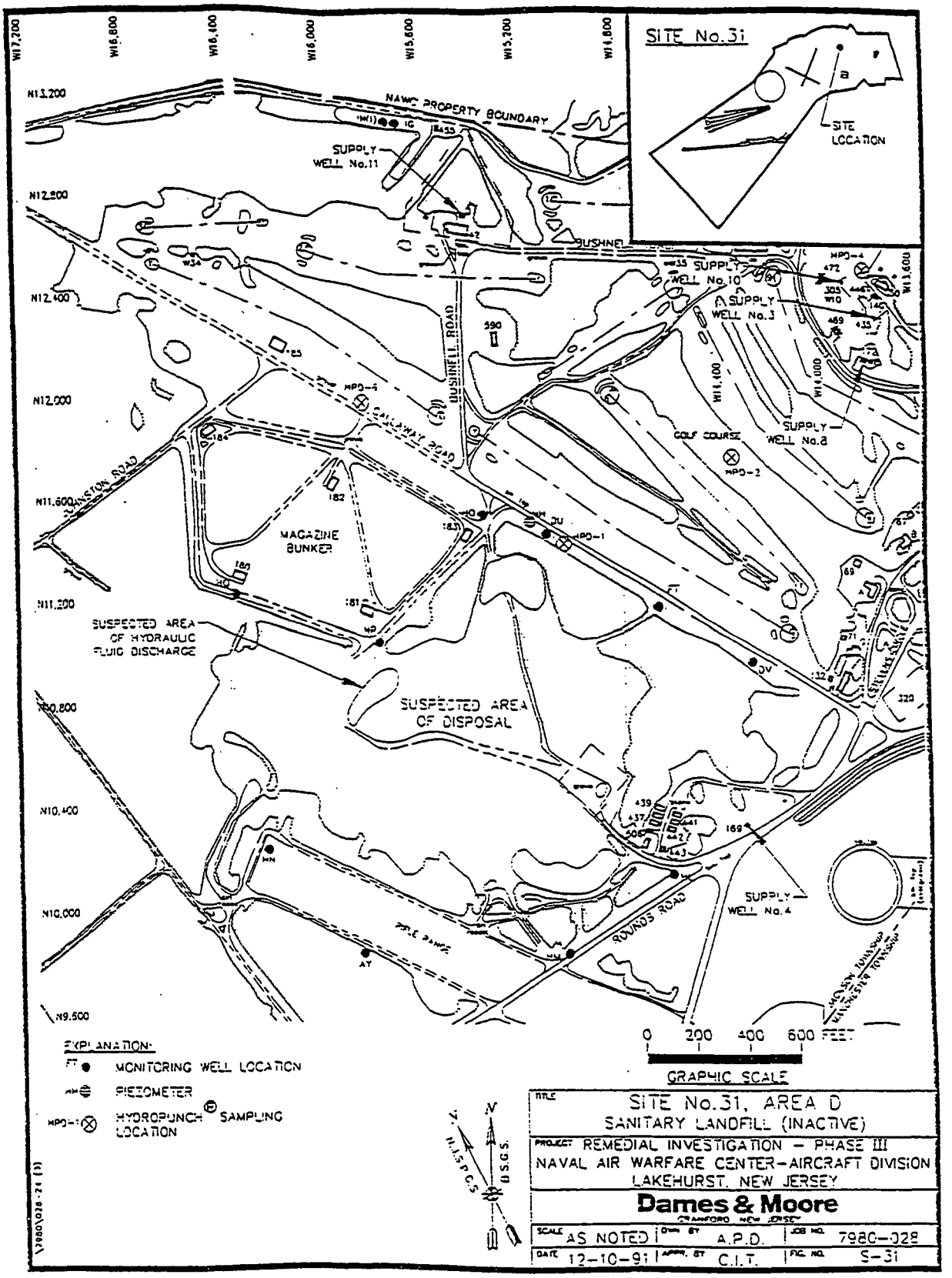


FIGURE 2. Area Map of Site 31

These wastes are not described any further. The percentage of hazardous waste disposed of between 1973-1976, according to these records, is calculated as less than 0.005 percent.

Summary of Remedial Investigations

Between 1981 and 1984, seven monitoring wells (AK, AL, AM, AP, AQ, AR and AY) were installed around the perimeter of the former landfill, under the direction of NAWCADLKE. Groundwater samples were collected from these wells in 1982, 1983, and 1984. In 1982, the samples were analyzed for organic, inorganic, and physical parameters considered by the EPA to be broadly representative of landfill leachate. In 1983 and 1984, the samples were also analyzed for the EPA priority pollutant volatile organic compounds. The 1984 analysis also included pesticides, herbicides and PCBs. No significant contamination was detected in these analyses. One priority pollutant volatile organic compound, 1,1-Dichloroethane, was detected in upgradient well AK in 1984 at a concentration of 5.2 ug/l.

In Phase I, November 1985 to January 1986, analyses of groundwater samples from three supply wells (SW-4, SW-8, SW-11) and two monitoring wells installed downgradient from the site (DU and DV) confirmed the presence of VOCs in groundwater.

In Phase II (August 1988 to December 1988), analysis of groundwater samples from nine monitoring wells and three water supply wells at, and downgradient of, the site confirmed the presence of VOCs in groundwater and also revealed low levels of SVOCs (primarily chlorobenzene) in some wells and metals, detected sporadically at levels exceeding ARARs. Except in one well, metals were not detected in filtered samples. In well AQ, metals were present at low levels (well below ARARs) in filtered samples. A high level of nitrate was detected in one of the two samples collected from one of the supply wells (SW-11). Gross alpha, gross beta, and/or radium-226 were detected at levels exceeding ARARs in some unfiltered groundwater samples. Much lower levels of these parameters (below ARARs) were detected in filtered samples from the same wells.

January 1989, a surface gamma radiation survey conducted across the site did not detect any gamma radiation above area background levels.

January 1990, an aquifer characterization study was initiated. A piezometer (HH) was installed adjacent to monitoring well DU and a short-term pumping test was performed on well DU to estimate the hydrologic properties of the aquifer. Analyses of groundwater samples collected during the pump test confirmed the presence of VOCs in the well.

In Phase II, July 1990, five monitoring wells (AL, AM, AQ, AR, and AY) in which radiological parameters have been detected at levels exceeding ARARs in unfiltered samples collected during the Phase II investigation, were resampled for radiological analysis. Neither radium-226 or uranium-238 were detected at levels exceeding ARARs in either filtered or unfiltered samples collected from these wells.

In Phase III, July 1991 to April 1992, monitoring wells HL, HM, HN, HO, HP and HQ, were installed to replace existing wells AK, AL, AM, AP, AQ, and AR, respectively, due to the fact that the screen intervals in the existing wells were entirely below the water table. Four shallow and deep well pairs were installed downgradient of the site, near the northern NAWCADLKE property boundary. Groundwater samples were collected from: 1) all monitoring wells in Area D; 2) two water supply wells and one backup potable well downgradient from Site 31; and 3) three to four different depth intervals at eight Hydropunch™ sampling locations. The analysis of these samples revealed an area of potential volatile organic contamination in groundwater extending from the location of the former landfill downgradient (northeastward) to the facility boundary and Ridgeway branch (see Figures 3 and 4).

The primary (most commonly detected) contaminants in groundwater at Site 31 are chlorinated solvents (see Table II). Three of these chlorinated compounds (chlorobenzene, 1,2,4 trichlorobenzene and vinyl chloride) are present at levels exceeding ARARs. Benzene is also present, in a very limited area, at concentrations slightly exceeding ARARs. Chromium, lead and mercury are present in groundwater at levels exceeding ARARs in the vicinity of the former base landfill. However, the presence of these metals is very inconsistent and appears to be attributable to sediment in the samples collected and not to metals dissolved in groundwater. This is based on the turbid nature of groundwater samples taken from the monitoring wells and the locally high background levels of metals typically in such sediments. Results of filtered samples taken from monitoring wells typically show metals to be undetectable or at least an order of magnitude less than the unfiltered samples.

There is one potable water well (PW-37) and several supply wells to the North and Northeast of Site 31 (see Figure 2). PW-37 has been tested during the Phase III investigation and shows no VOCs. Since this well is not downgradient of the area of contamination and because of the low concentration of contaminants that have been detected, it is highly unlikely that this potable water well will be impacted by VOC contamination.

A landfill study was conducted at NAWCADLKE between 1982 and 1984 to collect data on leachate parameters. This data was also

TABLE II - SITE 31 RESULTS SUMMARY, GROUNDWATER

| ANALYTE | Maximum Detected (ug/L) | EPA MCL | PQL | Frequency of Detection |
|---|---|---|---|---|
| Chloroform | 0.38 | 100 | 1 | |
| 1,2-Dichloroethane | 0.54 | 70 | 2 | |
| 1,1-Dichloroethane | 4.63 | NL | 2 | 13% |
| 1,2-Dichloroethene | 24.00 | 100 | 2 | |
| Cis-1,2 Dichloroethene | 9.14 | 70 | 2 | |
| Benzene | 1.7 | 5 | 1 | 4.7% |
| Toluene | 0.64 | 1000 | 5 | |
| Ethylbenzene | 3.09 | 700 | 5 | |
| P,m-xylene | 0.73 | 10,000 | 2 | |
| Chlorobenzene | 11 | NL | 2 | 6.9% |
| 1,3 Dichlorobenzene | 11 | 600 | 5 | |
| 1,2 Dichlorobenzene | 5 | 600 | 5 | |
| 1,4-Dichlorobenzene | 4.66 | 75 | 5 | 19.0% |
| Benzyl alcohol | 22 | NL | NL | |
| 1,2,4 Trichlorobenzene | 12 | 9 | 1 | 2.7% |
| 2 Methylnaphthalene | 10 | NL | NL | |
| Naphthalene | 4 | NL | NL | |
| 4 Chloro 3 Methyl phenol | 2 | NL | 20 | |
| Trans 1,2 dichloroethene | 5.62 | 100 | 2 | |
| Lead (filtered) | 3.0 | 15 | 10 | |
| Radium-226 (filtered) | 1.9 | NL | NL | |
| vinyl chloride | 49 | 2 | 5 | 4.3% |

NL - Not listed or available

compared to the Phase II (1988) leachate data in order to demonstrate trends in the parameters. The leachate data for Site 31 is shown in Table III.

Table III- Landfill Leachate Parameters

| Indicator Parameters (mg/l) | | 1982 | 1983 | 1984 | 1988 |
|---|---|---|---|---|---|
| Chloride | range | 4-16 | 6-10 | 6-13.4 | ND-7.8 |
| | mean | (9.5) | (8.1) | (8.9) | (2.86) |
| Nitrate | range | 0.24-3.5 | 0.1-2.9 | 0.12-2.1 | ND-1530 |
| | mean | (1.38) | (1.1) | (0.76) | (73) |
| Sulfate | range | 5-88 | 6-23 | 11-100 | ND-38 |
| | mean | (21.8) | (12.6) | (54.8) | (6.3) |
| Fluoride | range | 0.1 | 0.1 | 0.1 | ND |
| | mean | (0.1) | (0.1) | (0.1) | -- |

As can be seen from the data presented above, average concentrations of landfill indicator parameters did not change significantly during monitoring over the period 1982 to 1988. The exception to this was nitrate levels detected in 1988 (Phase II). The increase in nitrate concentration, however, was attributable entirely to one sample collected from supply well SW-4, in which

nitrate was present at 1530 mg/l. Nitrate was not detected in the other sample collected from this well during Phase II.

The generally low levels detected, and lack of variation in concentration with time, support the assumption that the majority of biological degradation of organic waste in the landfill occurred prior to the time monitoring began. It appears that the main contaminants of concern leaching from the landfill are volatile organic compounds including chlorinated aliphatics, chlorobenzenes, and benzene. In summary, the monitoring of landfill indicator parameters since 1982 at Site 31 has not revealed any significant upward or downward trend and levels are generally low. It appears, however, that the landfill is a source of low levels of volatile organic contamination, probably resulting from waste solvents, paint thinner, hydraulic fluid and other unidentified chemical wastes which reportedly were deposited in the landfill.

During the initial scoping of the remedial investigation, it was determined that potential impact to groundwater was of greater concern than soil contamination and that groundwater sampling would better reveal any potential contamination. Other factors that contributed to the decision not to sample the soil in the landfill include:

(1) The status of the landfill as a sanitary landfill; this denotes that it was designed to receive typical household wastes, not hazardous wastes.

(2) Size of the landfill; it was not anticipated that sampling would result in the identification of potential source areas of contamination due to the depth and large areal extent of the landfill.

(3) The existence of a sufficient soil cover and grass over the area. No visible signs of stressed vegetation or surficial soil contamination are present.

(4) The concern raised from the lead reportedly deposited in the form of sand from the rifle range was dismissed since it is believed to be in the form of slugs or cartridges which could not become airborne or pose other risks.

## ENDANGERMENT ASSESSMENT

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 groundwater detected during past and on-going site investigations.

For Site 31, 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.

More complete EA information for Site 31 can be found in Volume VI of the Phase III RI, which is available as part of the NAWCADLKE Administrative Record.

For Site 31, 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.

CONTAMINANTS OF CONCERN

The contaminants identified at the site that were addressed by the endangerment assessment included: 1,4 Dichlorobenzene which was detected in 19% of all samples, 1,1 Dichloroethane which was detected in 13% of all samples, and Chlorobenzene at 6.9%; with no levels detected above MCLs. Although other contaminants (chlorinated compounds and benzene) were found at Site 31, they were only detected in less than 5% of all the samples (tested for that parameter). Compounds such as benzene, 1,2,4 trichlorobenzene, and vinyl chloride have been detected once or twice out of 70 to 83 samples (less than 3% of samples) above NJ groundwater standards or EPA acceptable limits. The lack of consistent or frequent detection is the basis for screening out these contaminants since risk scenarios assume daily or consistent exposure to a contaminant.

LAND USE AND EXPOSURE ASSESSMENT

For Site 31, light industrial and residential exposures to groundwater was assumed to be potential future exposure pathways. Future residential exposure is based on the proximity of the site and associated contaminant detection range to base housing areas and the occurrence of existing nearby shallow non-potable water supply wells.

HUMAN HEALTH RISK AND HAZARD FINDINGS

The results of the baseline endangerment assessment for groundwater at Site 31 indicate that the hazard index resulting from chemicals exhibiting noncarcinogenic hazard potential is 0.0057 under a potential light industrial scenario and 0.1883 under a potential future residential scenario. Both these hazard indices are below the EPA limit of 1.0.

Carcinogenic risks from groundwater may result from 1,4 Dichlorobenzene. The risk under a potential light industrial scenario is 1.24 x $10^{-6}$ and under a potential future residential scenario is 4.16 x $10^{-6}$.

The results of the endangerment assessment for groundwater at Site 31 indicate that potential carcinogenic risks resulting from carcinogenic chemicals do not exceed the EPA's risk level point of departure value of $10^{-6}$.

ECOLOGICAL ASSESSMENT FINDINGS

Site 31 is located between a runway and base housing areas. A drainage basin associated with Site 31 surrounds the eastern portion of the Ridgeway stream branch. Wetlands surround the entire length of the stream. The surface drainage pattern is from the south to the northeast toward Ridgeway Branch. The grasshopper sparrow has been sighted in this area. The grasshopper sparrow is a State-listed threatened species that is considered secure globally, but rare in the State. It is limited to cultivated and fallow fields, and open grasslands.

Rainbow pond, located downgradient of Site 31 adjacent to the northeast corner of the golf course, was constructed by the U.S Department of Agriculture Soil Conservation Service in the 1950's. This pond is used primarily for fishing and is posted with a sign indicating it is to be used by youths up to 16 years in age.

Sampling of the surface water and sediment in Rainbow pond and the Ridgeway Branch downgradient from the landfill indicate no VOC contamination. Therefore, no adverse ecological effects on aquatic species are determined to be present resulting from landfill wastes.

SUMMARY

Potential present and future risks resulting from groundwater do not exceed the EPA's acceptable risk level of $10^{-6}$. The need for treatment and/or monitoring of groundwater should be further evaluated. Groundwater contaminants at Site 31 are not at levels that would pose an unacceptable risk to human health. In addition, no adverse ecological effects due to contamination at the site were found.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Proposed Plan for Site 31 was issued to interested parties on June 4, 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. On June 18, 1993, a notification also appeared in The Air Scoop, the Center's weekly

publication. 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 June 30, 1993 at the Manchester Branch of the Ocean County Library at 7:00 p.m. At this meeting, representatives from the Navy, USEPA, and NJDEPE were available to answer questions about the site, and the "No Action with Groundwater Monitoring" determination. A list of attendees is attached to this Record of Decision as Appendix A. Comments received and responses provided during the public meeting are included in the Responsiveness Summary, which is part of this Record of Decision. No written comments were received during the public comment period. A transcript of the meeting is available as part of the Administrative Record.

The decision document presents the selected action (ie. No Action with Groundwater Monitoring) for Site 31 at 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 site 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 the environmental investigations conducted show no verifiable evidence of significant contamination at Site 31. The levels of chlorinated solvents have been determined to not pose a risk to human health or the environment. However, a five year monitoring plan will be implemented to ensure continued compliance with groundwater standards and monitor the risk to human health and the environment.

## SUMMARY OF SITE CHARACTERISTICS

The location of Site 31 within NAWCADLKE is shown in Figure 2. The general direction of groundwater flow at NAWCADLKE is to the east-northeast. Summary of the chemicals detected in the analyses of groundwater collected at the site is provided in Table II.

The results of the Remedial Investigations, including the endangerment assessment, indicate that conditions at Site 31 pose no unacceptable risk to human health and the environment.

## DESCRIPTION OF ALTERNATIVES

Three remedial alternatives (and the "no action" alterative) were developed for analysis in the FFS for Site 31. Each of these

alternatives is described in detail below.

Alternative 2, Limited Action- Restricted use of Groundwater, has been implemented to ensure protectiveness of human health.

ALTERNATIVE 1: **NO ACTION**

| |
|---|
| Estimated Construction Cost: $0<br>Estimated Net O&M Cost: $0<br>Estimated Implementation Time Frame: N/A |

This alternative involves no additional actions at Site 31.

Alternative 2: **LIMITED ACTION/ GROUNDWATER USE RESTRICTION**

| |
|---|
| Estimated Construction Cost: $0<br>Estimated O&M Cost: $0<br>Estimated Implementation Time: 1 month |

There are a number of backup potable wells and supply wells affected by the groundwater contamination from Site 31 (See Table IV). Groundwater use restrictions would be implemented by inactivating the identified wells until further study is completed. Wells affected by Site 31 are: SW-3, SW-8, SW-10, and SW-11. A study is currently underway for supply wells 3, 8 and 10 to determine if these wells should be refurbished, replaced or even relocated. The study will determine the costs associated with treating the water from these wells, replacing the wells with higher capacity, deeper wells, or relocating the supply wells to another location on base. Potentially affected wells near Site 31 will not be used. The buildings surrounding Site 31 are supplied with potable water from the Center's Hill water system.

Table IV - Supply Wells Downgradient of Site 31

| SUPPLY WELL | CONTAMINANT | CONCENTRATION ppb | NJ DRINKING WATER STANDARD | WELL DEPTH AND USAGE |
|---|---|---|---|---|
| SW-8 | not sampled | | | 51 feet, Old standby well, not used. |
| SW-10 | not sampled | | | 51 feet, Golf course irrigation. |
| SW-3 | 1,1 DCA | 9.0 | 2.0 | 54 feet Standby well, not used |
| | 1,2 DCE | 3.0(J) | 10 | |
| SW-11 | 1,2 DCE | 2.0 | 10 | 22 feet, not used. |
| | Lead | Filt=3.0 | 15 | |

Consumption of contaminated groundwater from Site 31 through off-base drinking wells is unlikely. The closest private wells are more than half a mile from the NAWCADLKE boundary. In addition, the stretch of wetlands at the base boundary is expected to act as a hydraulic barrier. In the unlikely case of off-base contamination, restrictions on private wells have already been put in place by Jackson Township officials. The residences which might be affected (those on Route 571) were put on the Jackson Township municipal water supply due to their proximity to the Legler Landfill, which is also an NPL site.

ALTERNATIVE 3: **GROUNDWATER MONITORING**

Estimated Construction Cost: $ 11,000 for monitoring wells and $3,500 for monitoring points
Estimated Net O&M Cost: $99,000/yr (semi-annual sampling)
Five year cost: $509,500
Estimated Implementation Time Frame: 3 months

This alternative involves groundwater monitoring of the aquifer. No contaminants would be treated or contained unless results of the monitoring shows a sustained increase in concentration of any contaminants of concern to levels above ARARs or are at levels that may pose an unacceptable risk to human health and the environment. Under this alternative, no further action to control the source in Site 31 would be taken. Monitoring of the site can be implemented by using previously installed monitoring wells and adding additional well points where required.

In addition, the design of the monitoring system would include shallow well points in the downgradient wetlands or across major water bodies to act as a "line of compliance" for Area D. These well points could be installed with minimal disruption of the

wetlands.

Monitoring would consist of taking samples from all monitoring wells at the site semi-annually for 5 years, followed by a comprehensive evaluation of the data. The sampling program would be re-evaluated based upon each set of results. All sampling and analytical procedures would follow USEPA standards. Testing parameters and additional well locations would be determined during the remedial design. The monitoring system would be capable of achieving results necessary for the evaluation of ARARs compliance. The monitoring plan (ie. remedial design) will be submitted to the EPA and NJDEPE for review and concurrence prior to initiation.

The sampling data generated by monitoring can be assimilated into a groundwater model as part of our in-house Geographic Information System (GIS). This database system is an excellent tool that will allow the Navy to effectively model rates of contaminant flow and predict contaminant plume attenuation.

ALTERNATIVE 4: **GROUNDWATER PUMPING, PRETREATMENT FOR INORGANICS, AIR STRIPPING, CARBON TREATMENT AND AQUIFER RECHARGE**

| |
|---|
| Estimated Construction Cost: $1,339,425 |
| Estimated Net O&M Cost: $150,000/yr |
| Total cost: **$2,839,425**<br>Estimated Implementation Time Frame: 12 months<br>Time frame for operation of system: 10 years |

This alternative involves groundwater pumping from recovery wells to retrieve contaminants. To treat the volatile organic contaminants in the extracted groundwater, an initial flow equalizer, a pretreatment unit for removal of metals and solids, air stripping columns (99% VOC removal), an activated carbon adsorber for air stripper effluent and a granular activated carbon polishing filter would be required.

The number of wells and pumping rate would need to be determined through groundwater modelling during the design phase of the remedial action implementation.

The effluent exiting the air stripper will comply with the Clean Air Act and federal and state discharge limits. The treated groundwater, which will meet Federal and State drinking water standards, will be recharged to the aquifer through irrigation/ infiltration piping or spraying upgradient of the site.
This alternative will halt the continued migration of the contaminated plume and enhance groundwater quality.

## SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The alternatives identified above were evaluated using criteria derived from the National Contingency Plan (NCP) and SARA of 1986. These criteria relate to the SARA amendment of Section 121 of CERCLA (Section 121(b)(1)) and Section 300.430(e)(9) of the NCP and are as follows:

During the detailed evaluation of remedial alternatives, each alternative is assessed against the nine evaluation criteria which are summarized below.

1. Overall Protection of Human Health and the Environment draws on the assessments conducted under other evaluation criteria and considers how the alternative addresses site risks through treatment, engineering, or institutional controls.

2. Compliance with ARARs evaluates the ability of an alternative to meet applicable or relevant and appropriate requirements (ARARs), and/or provides the basis for a waiver.

3. Long Term Effectiveness and Permanence evaluates the ability of an alternative to provide long term protection of human health and the environment and the magnitude of residual risk posed by untreated wastes or treatment residuals.

4. Reduction of Toxicity, Mobility or Volume through Treatment evaluates an alternatives ability to reduce risks through treatment technology.

5. Short Term Effectiveness addresses the cleanup time frame and any adverse impacts posed by the alternative during construction and implementation phase until clean up goals are achieved.

6. Implementability is an evaluation of the technical feasibility, administrative feasibility and availability of services and material required to implement the alternatives.

7. Cost includes an evaluation of capitol costs, annual operation and maintenance (O&M) costs, and net present worth costs.

8. Agency Acceptance indicates whether the EPA and State concurs with, opposes or has no comment on the preferred alternative in terms of technical and administrative issues and concerns.

9. Community Acceptance will be addressed in the Record of Decision (ROD) following review of public comments on the RI/FS reports and the Proposed Plan.

This section will compare all of the alternatives for Site 31 using the nine criteria outlined above.

ALTERNATIVE 1: NO ACTION
ALTERNATIVE 2: GROUNDWATER USE RESTRICTION
ALTERNATIVE 3: GROUNDWATER MONITORING
ALTERNATIVE 4: GROUNDWATER PUMPING, PRETREATMENT FOR INORGANICS, AIR STRIPPING, CARBON TREATMENT AND AQUIFER RECHARGE

Overall Protection of Human Health and the Environment. Alternative 1, the no action alternative is currently protective of human health and the environment since risks are within EPA acceptable guidelines. However, long term protectiveness cannot be ensured under the no action alternative if the levels of contaminants leaching from the landfill increase. Alternative 2 would allow for the most immediate and effective protection of human health. Alternative 4 would treat the groundwater, thereby eliminating contaminants. However, alternative 3 will track pollutant levels and movement, thereby allowing for a decision to implement a remedial action if required.

Compliance with ARARs. At Site 31, the VOCs have been detected very inconsistently over time.

Alternative 4 would retrieve and treat any existing VOC contamination of the groundwater. However, alternative 4 may contribute to significant drawdown in the downgradient wetlands regions. This drawdown could lower surface water levels thereby harming portions of the wetlands.

Alternative 3 includes a "line of compliance". At this line, groundwater will be monitored to determine whether ARARs are achieved. If, based on monitoring, contaminants are consistently detected above ARARs, active remediation at the site would be reconsidered.

Alternative 1 and 2 may comply with ARARs in the short term, but because contaminants are left in place at the Site 31 sanitary landfill, and because of the fluctuating, inconsistent, low level contaminant concentrations over time and location, the long term prospects of compliance can only be determined through monitoring, as detailed in Alternative 3.

Long-Term Effectiveness and Permanence. Alternative 4 offers the greatest long-term effectiveness and permanence since it will recover and treat contamination. Alternative 2 will not treat contamination. However, alternative 2 is protective of human health through the elimination of receptor pathways via institutional controls. Alternative 3 can monitor contaminant concentrations and will provide information as to whether levels are found consistently above ARARs in the future or if an

unacceptable risk to human health and the environment is shown.

Reduction of Toxicity, Mobility or Volume. Alternative 4 offers the greatest reduction of toxicity, mobility and volume of the plume since it recovers and treats contaminated groundwater. Alternatives 1, 2 and 3 will not reduce the mobility or volume of the plume. However, alternative 2, which has already been implemented, is protective of human health. Alternative 3 would monitor contaminant movement and levels. If contaminants are shown to pose a threat to human health and the environment under alternative 3, the need for remedial action would be re-evaluated.

Short-Term Effectiveness. Alternative 4 offers the greatest short term effectiveness in decreasing contaminant levels. However, alternative 2 is more effective in the short term of reducing potential risks to human health through restriction of groundwater usage. Alternative 3 would be effective in the short term for confirming or refuting the presence or level of contaminants which, to date, have been shown to be inconsistently present.

Implementability. Alternative 2 offers the greatest implementability followed by Alternative 3. Alternative 4 requires the construction of treatment facility capable of capturing, treating and discharging groundwater. Implementability of alternative 4 also requires computer modeling of recovery systems to limit adverse effects on the downgradient wetlands.

Cost. The costs associated with alternative 2 are minimal. Costs of monitoring, alternative 3, are significantly less than alternative 4, where a groundwater treatment facility is constructed and operated for a number of years. Costs shown below are for implementing each alternative in Area D.

| | | COSTS |
|---|---|---|
| Alternative 1: | No Action | $0 |
| Alternative 2: | Limited action/ groundwater use restrictions | $0 |
| Alternative 3: | Groundwater monitoring | $509,500 |
| Alternative 4: | Groundwater pumping, pretreatment for inorganics, air stripping, carbon treatment, and aquifer recharge | $2,839,425 |

State Acceptance. The State of New Jersey concurs with the selected remedy.

Community Acceptance. All public questions were answered during the public meeting. No additional written questions or comments were received during the public comment period.

## THE SELECTED ALTERNATIVE

The preferred alternative for Site 31 is alternative 3, "no action with groundwater monitoring". Alternative 3 is protective of human health and the environment and will monitor the existence or potential migration of low levels of contaminants in groundwater. Alternative 2, restriction of groundwater usage, has already been implemented and is an important factor in assuring protection of human health.

Testing of groundwater will be conducted by a Certified Laboratory Program (CLP) or equivalent laboratory in accordance with EPA established methods and protocols. The data generated will be incorporated into a computer groundwater model which is designed to predict contaminant movement and demonstrate trends in contaminant levels. Annual reports will be delivered to the EPA and State and will become part of the NAWCADLKE Administrative Record. Although current data does not indicate impacts on human health and the environment from contaminants in groundwater, this issue will continue to be evaluated over time.

It should be noted that this Record of Decision addresses only Site 31 and is not intended to represent the remedial action status for the rest of the areas of concern at NAWCADLKE. Each site's unique environmental conditions and concerns have been or will be addressed in separate proposed plans.

Under Section 121 of CERCLA and Section 300.430(f)(5) of the NCP, selected remedies must meet certain statutory and regulatory requirements. These requirements and a description of how the selected remedy satisfies each requirement are presented below.

### Protection of Human Health and the Environment

There is no unacceptable risk to human and health and the environment posed by site. However, restriction of groundwater use in the area has been implemented to prevent its use for drinking purposes. The selected alternative will allow the groundwater to be monitored for five years. If within that timeframe, results of sampling indicate a threat to human health and/or the environment, the site will be readdressed to consider active remediation.

### Compliance with ARARs

Although sampling results have resulted in random occurrences of level above ARARs, the overall groundwater picture reveals that levels of chlorinated solvents are very low if at all present. The selected alternative enables frequent sampling so that compliance with ARARs can be determined over time.

## Cost-Effectiveness

The selected remedy is a cost-effective means to determine compliance with ARARs and potential threat to human health and/or the environment over time. Since a comprehensive network of monitoring wells already exists in the area, capital costs associated with the selected alternative is low.

## Document of Significant Changes

The Proposed Plan for Site 31 was released for public comment on June 21, 1993. The Proposed Plan identified "No Action with Groundwater Monitoring" as the preferred alternative. No written comments were received during the 30 day comment period. All verbal comments were responded to at the public meeting on June 30, 1993. Upon review of the comments, it was determined that no changes to the selected alternative, as it was originally identified in the proposed plan, were necessary.