United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R02-93/208
June 1993
PB94-963816

EPA

# Superfund Record of Decision:

## Naval Air Engineering Center (Operable Unit 8), NJ

50272-101

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15. Supplementary Notes

PB94-963816

16. Abstract (Limit: 200 words)

The Naval Air Engineering Center (Operable Unit 8) 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 mixed undeveloped woodlands, open areas, and limited 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 formally was 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 disposal of hazardous

(See Attached Page)

17. Document Analysis a. Descriptors

Record of Decision - Naval Air Engineering Center (Operable Unit 8), NJ
Eighth 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 22 |
|---|---|---|
| | 20. Security Class (This Page) None | 22. Price |

(See ANSI-Z39.18) *See Instructions on Reverse* OPTIONAL FORM 272 (4-77) (Formerly NTIS-35) Department of Commerce

Abstract (Continued)

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 soil and ground water contamination at the Blimp Crash Site (Site 1), the Hangar 5 Storage Area (Site 11), and the Helicopter Defueling Area (Site 35). Site 1 is the location of a 1931 blimp crash which resulted in the release of approximately 1,000 gallons of fuel and hydraulic fluid to the ground. During cleanup operations in 1981, two areas of contamination were identified at Site 1, to the west and east of the roadway. To the west of the roadway, where the blimp crashed, the site contained debris and an abandoned car, and to the east of the roadway, the site was covered with black sludge resembling No. 6 fuel oil. In 1981, 5 empty 55-gallon drums and 100 $yd^3$ of visually-stained soil were removed from the eastern portion of Site 1, along with the debris from the western portion. Subsequent investigations revealed organic contamination of soil and ground water at the site. In 1991, approximately 7 $yd^3$ of contaminated soil were removed from the western portion and shipped offsite for disposal. In 1992, subsequent sampling resulted in the removal of 230 $yd^3$ of contaminated soil from the site. Site 11 consists of a 20,000 $ft^2$ former drum storage area located about 50 yards north of Hangar 5. From 1981 to 1984, approximately 350 $yd^3$ of organic-contaminated soil was removed from an area adjacent to Site 11. Ground water investigations conducted in the early 1980s revealed the presence of free floating products in the wells downgradient of the site. This contamination was attributed to spills at other waste units, however, any potential ground water contamination will be addressed by a pump and treat system, located downgradient of Site 11. Soil sampling conducted in 1988 and 1992 revealed two areas of elevated organic contamination at Site 11. To address these areas, approximately 76 $yd^3$ of soil was excavated from Site 11 and staged at Site 35 for ultimate disposal. Site 35 was used as the helicopter and aircraft defueling area until 1986 and, is located 2,000 feet from the southern facility boundary, northwest of Hangar 5. The defueling process may have involved the disposal of fuel directly to the ground. In 1986, several dark soil stains and areas of stressed vegetation were observed at the site. In 1988, soil gas and ground water investigations revealed slightly elevated levels of organic contamination. Subsequent investigations indicated no ground water contamination and elevated organic contamination in soil at Site 35. In 1992, three distinct areas of elevated organic contamination were identified. These areas of contamination were subsequently removed and staged for ultimate disposal. Previous 1991 and 1992 RODs addressed OUs 1, 2, 3, and 4, and OUs 5, 6, and 7, respectively. This ROD addresses any potential remaining soil contamination at Sites 1, 11, and 35, as OU8. Other 1993 RODs address OUs 9, 10, 11, 12, 13, 14, 15, 22, and 23. EPA has determined that the previously implemented removal actions have eliminated the need to conduct additional cleanup activities at the OU8 sites; therefore, there are no contaminants of concern affecting Sites 1, 11, and 35.

The selected remedial action for this site is no further action with ground water monitoring at Site 1. EPA has determined that 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 or the environment. There are no 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: | June 21, 1993 |
| Remedy: | No Action; Site 1 includes gw monitoring |
| Operating Unit Number: | OU-8 (Sites 1, 11, 35) |
| 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, Organics |
| Medium | Soil, Groundwater |
| Origin | Assorted spills |
| Est. quantity | N/A |

RECORD OF DECISION
FOR
SITES 1, 11, AND 35

OU-8

NAVAL AIR WARFARE CENTER
AIRCRAFT DIVISION
LAKEHURST, NEW JERSEY

17 MARCH 1993

# RECORD OF DECISION
# DECLARATION
# SITES 1, 11 AND 35
# 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 three individual sites (Sites 1, 11 and 35), 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

Based on the effectiveness of prior removal actions to remove petroleum contaminated soils, the United States Department of the Navy, the lead agency for these Sites, has selected the "no action" alternative for Sites 1, 11 and 35. The Site 1 alternative includes a program to monitor the status of groundwater quality.

**DECLARATION STATEMENT**

The United States Department of the Navy and the United States Environmental Protection have determined that no additional remedial action is necessary at Sites 1, 11 and 35 to ensure protection of human health and the environment. The removal actions implemented previously at these sites, in which soil contaminated with unacceptable levels of petroleum hydrocarbons was removed, have eliminated the need to conduct additional remedial action.

This Record of Decision concerns Sites 1, 11 and 35 only. 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 studies and Records of Decision.

Captain David Raffetto
Commanding Officer
Naval Air Warfare Center
Aircraft Division
Lakehurst, New Jersey

16 MAR 93
(Date)

With the concurrence of:

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

21 June 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 ar 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 eastcentral 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 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 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).

## 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.

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 only significant contamination present at levels of concern at Sites 1, 11, and 35 was total petroleum hydrocarbons (TPHC) in soil. As a result, additional soil sampling was conducted by NAWCADLKE at the sites in the winter of 1991 and the spring of 1992 to delineate the extent of PHC contamination. Based on the results of this and prior sampling, small-scale soil removals were conducted at each of the sites, after which, post-removal samples were collected to confirm the removal of contaminated soil. The analyses of these samples revealed TPHC at levels below the NJDEPE Soil Cleanup Criteria of 10,000 ppm and no semi-volatile organic compounds (SVOCs) above the USEPA acceptable risk range and the NJDEPE Soil Cleanup Criteria.

The individual Site histories and summaries of past remedial and removal activities at each of the three Site are provided in the following sections.

## Site 1 (Blimp Crash Site) Background
### Site Description

Site 1 is located at a 1931 blimp crash site (See Figure 2). This crash resulted in the release of approximately 1,000 gallons of fuel and hydraulic fluid onto the ground. At the time of cleanup operations in 1981, two areas were identified as contaminated. These areas are located west of the roadway, where the blimp crashed, and east of the roadway where visually stained soil was identified. The west site contained remnants of the crashed blimp and an abandoned car. The east site was covered with what appeared to be black sludge resembling No. 6 fuel oil. The east site also contained five empty 55-gallon drums (removed in 1981), whose compressed appearance suggested that they had been dropped from some height or crushed. The approximate area, which contained the drums, was 50 feet by 60 feet.

The site is approximately 3,190 feet from the nearest NAWCADLKE boundary. A small fire water pond is located to the west of the Site. The groundwater table is at an approximate depth of 2 feet. There are no potable water wells in the vicinity of the site. Monitoring well GP is located in the eastern portion of the site. Trace amounts of floating product (<1/16") can be found in the well on occasions. (See Figure 3)

### Summary of Remedial Investigation and Removal Actions

In 1981, five 55-gallon drums and 100 cubic yards of visually stained soil were removed from the eastern portion of the site, along with the debris from the blimp crash on the western portion of the site. The Remedial Investigation - Phase I, conducted in November 1985 - January 1986, revealed elevated levels of petroleum hydrocarbons (PHCs) in the soil (54,000 ppm PHC).

In May - June 1988, a groundwater screening survey revealed elevated levels of petroleum hydrocarbons and low levels of chlorinated hydrocarbons in shallow groundwater at the site.

A monitoring well designated GP was installed during the Remedial Investigation - Phase II, conducted from August - December 1988. Samples collected from this well contained chromium (14-360.4 ug/l), lead (7-67.7 ug/l) and mercury (ND-2.23 ug/l) at levels exceeding ARARs. The analysis of two soil samples (S1-2 and S1-3) collected at the site revealed elevated levels of PHCs (4,847 and 455 ppm respectively). One of the soil samples also revealed low levels of volatile organic compounds (VOCs) (51 ug/kg toluene, 11 ug/kg ethylbenzene, and 23 ug/kg xylene), semi-volatile organic compounds (SVOCs) (40 ug/kg pyrene) and polychlorinated biphenyls (PCBs) (270 ug/kg aroclor 1254). Analysis of a sediment and surface water sample from the fire water pond (near the western portion of the site) did not reveal

elevated levels of contaminants.

During the Remedial Investigation - Phase II Addendum, both unfiltered and filtered groundwater samples were collected from well GP and analyzed for chromium, lead and mercury. None of the metals were detected at concentrations exceeding ARARs in the unfiltered sample (chromium 14.3 ug/l and lead 2.7 (B) ug/l) and all three metals were nondetect in the filtered sample.

PHC contamination in soil was confirmed during grid sampling of both the western and eastern portions of the site in February 1991. The concentrations ranged from nondetect to 59,000 ppm TPHC. Based on these findings, approximately 7 cubic yards of soil, exhibiting PHC concentrations greater than 1,000 ppm, were removed from the western portion of the site. The soil was shipped for disposal off-site to Atlantic Thermal Soil Remediation, Inc. in Delaware. Two post excavation samples were taken and tested for TPHC and one was tested for SVOC's. One of the samples showed an elevated level of PHCs (18,000 ppm); no base neutral acid extractables were identified. In August of 1992, the western portion of the site was excavated approximately 6 inches further. This excavation was based on the original post excavation sample taken in 1991 and grid sampling results from both 1991 and 1992. After this excavation, one post excavation sample was taken from the area which registered 18,000 ppm PHC in the 1991 post excavation sampling, and analyzed by an EPA Certified Laboratory Program (CLP) Laboratory for TPHC and base neutral/acid extractables. The results indicated that the sample contained 5760 ppm PHC and no base neutrals above the USEPA acceptable risk range and the NJDEPE Soil Cleanup Criteria.

During the July 1991 - April 1992 Remedial Investigation - Phase III, groundwater samples were collected, using a Hydropunch, at two locations. Three samples were collected at each location at different depths. Two VOCs were detected in groundwater, 1,1,1-trichloroethane and xylene, at concentrations below ARARs. 1,1,1-trichloroethane was found in five of the six samples collected, at concentrations ranging from 0.43 to 2.57 ug/l and xylene was detected in three of six samples at concentrations ranging from 0.6 to 6.65 ug/l(total xylene).

A piezometer (HR) was installed downgradient of well GP to monitor the potential presence of floating fuel product. No product was found in the piezometer. Trace amounts of floating product (1/16") are found periodically in well GP, located in the north eastern portion of the site.

The area on the eastern portion of the site was also excavated in August 1992. The extent of the excavation was based on delineation sampling results and the visual examination of the soil during excavation. The delineation sampling, during the spring of 1991 and the spring of 1992, identified areas of soil

which ranged from nondetect (ND)-170,000 ppm PHCs. The soil was excavated to an approximate depth of 36 inches. Approximately 230 cubic yards of contaminated soil was removed. Groundwater and free product seeped into the pit soon after excavation of the area commenced. (The water table is only 2 feet below ground surface in this area.) Approximately 3000 gallons of groundwater was pumped from the excavation area to a tank truck in order for the excavation to proceed as planned. A sample from the tanker of the residual oily product was collected and analyzed for VOCs. The results of this test indicated the following: methylene chloride 3 ug/l, toluene 5 ug/l, ethylbenzene 3 ug/l, o-xylene 9 ug/l and m+p xylene 13 ug/l. A sample was also taken from the oily residue left on the soil after the water was removed. This sample was analyzed for SVOCs and the results indicated di-n-butylphthalate at a level of 6400J ug/kg (J= detected below the method detection limit) (the complete results are located in the Confirmation Sampling Plan and Report). The moderate levels of tentatively identified SVOCs found are indicative of an old, highly weathered fuel oil. (See Figure 4 for excavated areas)

After the excavation on the eastern portion of Site 1, three post removal samples were collected and analyzed for TPHC. One of the three was analyzed for SVOCs. The results indicate that PHC is below the NJDEPE Soil Cleanup Criteria of 10,000 ppm PHC (ND-4720 ppm PHC) and that there are no SVOCs above the USEPA acceptable risk range and the NJDEPE Soil Cleanup Criteria. The excavated area on the west side will be filled with clean soil in 1993. The excavation on the east side of the Site will be left as a fire pond. This will enable continuous monitoring, as part of a groundwater monitoring plan, for floating free product.

The Site 1 alternative will include a program to monitor the status of groundwater quality. This five year program will consist of a general groundwater monitoring plan which will evaluate any continuing potential impacts of the site upon groundwater or the created ponded area. At the completion of the monitoring program the need for further action will be evaluated.

Site 11 (Hangar 5 Storage) Background
Site Description

Site 11 consists of a former drum storage area approximately 200 ft. by 100 ft. located about 50 yards north of Hangar 5. The drum storage area may have been a source of contamination although no information is available regarding its history or past usage. Adjacent to the site was an area about 1,000 by 300 feet from which approximately 350 cubic yards of surficial PHC contaminated soil was removed between 1981-1984. The removal was conducted based on visual examination and odor. The visual discoloration was found to a depth of five inches. The site was

subsequently expanded to include this area.

Site 11 is located approximately 830 feet upgradient from the Paint Branch, a relatively small stream which feeds the Manapaqua Brook. There is a shallow groundwater table depth of approximately 8 feet at Site 11. (See Figure 5)

Summary of Remedial Investigations and Removal Actions

As stated above, in the early 1980s, approximately 350 cubic yards of PHC contaminated soil were excavated from the site. To assess groundwater contamination in the area, four shallow monitoring wells (N, O, P and BG) were installed near the site. Additional monitoring wells were also installed near the site (approximately 1200 feet south and southwest) as part of the investigation of nearby Sites 16 and 17. On November 13, 1982, it was reported that a trace of floating product was detected in well N, and a 1/8 inch of floating product was detected in well P. No floating product has been detected in well N since that time. A trace of floating product was detected in well P on July 20, 1984. No product was detected in these wells during the Phase I, or subsequent, investigations. It is possible that this contamination was due to the fuel spill which occurred in September 1981 at the nearby Fuel Farm 196 (Site 17). Although no free product has been detected in recent years, any potential contamination emanating from the site will be captured and treated by the Area C Pump and Treat Facility located downgradient of Site 11.

During the Remedial Investigation - Phase I, an additional monitoring well (DN) was installed at the site. Analyses of groundwater samples revealed cyanide at a concentration of 225 ppb.

The Remedial Investigation - Phase II failed to confirm the presence of cyanide. The investigation did reveal low levels of 1,2-Dichloroethene in groundwater (ND-7 ug/l), below ARARs, and levels of lead slightly above ARARs in one well. High levels of petroleum hydrocarbons (21,489.75 ug/g) were detected in a soil sample collected near the dirt road in the middle of the site.

Groundwater samples were collected with a Hydropunch from three depth intervals during the Remedial Investigation - Phase III. No contaminants were detected at levels exceeding ARARs in these samples. Also, no targeted VOCs or SVOCs were detected, with the exception of di-n-butylphthalate, which is believed to be a sampling or laboratory artifact. Well DN was also resampled during Phase III to confirm the presence of lead at concentrations exceeding ARARs. In the unfiltered sample, lead was detected (11 ug/l), although the result was qualified during the data validation process as being unreliable and biased low.

In the filtered sample, however, lead was not detected.

Delineation sampling was undertaken in the spring of 1992, based on the high level of petroleum hydrocarbons found in the soil sample taken during the RI - Phase II. The delineation soil sampling was conducted for the whole site because of the limited petroleum hydrocarbon data. After the initial round of sampling, it was determined that the areas of concern included the area around the sample area in the RI - Phase II (near sample S1-11 on Figure 4) and adjacent to the drum storage area. The excavation for Site 11, which included two distinct areas, was based on this delineation sampling.

The contaminated area in the middle of the Site near the dirt road (where RI - Phase II sample was taken) was excavated to 40 inches and staged at Site 35 for ultimate removal. The approximate volume removed was 76 cubic yards. Also based on the delineation sampling, it was determined that the contamination in the drum storage area was surficial. One delineation sample was taken at a depth of 24 inches and was determined to contain 890 ppm PHC. The visibly stained area, approximately 5 cubic yards, was determined to contain high levels of petroleum hydrocarbons (10,000 ppm). This area was also removed and staged at Site 35. (See Figure 6 for area of excavation)

After excavation, post removal samples were taken and analyzed. Three samples were taken in the larger contaminated area and one sample was taken near the drum storage area. The samples were analyzed for TPHC and one sample from the large area was analyzed for SVOCs. The sample taken in the area near the drum storage was analyzed for SVOCs, VOCs, pesticides and polychlorinated biphenyls. The results indicated that the level of PHC is below the NJDEPE Soil Cleanup Criteria of 10,000 ppm PHC and that there are no SVOCs above the USEPA acceptable risk range and the NJDEPE Soil Cleanup Criteria. The excavated areas will be filled with clean fill in the beginning of 1993.

Site 35 (Helicopter Defueling) Background
Site Description

Site 35 is located approximately 2,000 feet from the southern facility boundary, northwest of Hangar 5 and adjacent to a black topped tarmac. The site is grassy, with a wooded area to the west. The site was the location of helicopter and aircraft defueling operations, which may have included the disposal of fuel directly onto the ground, until about 1986. Due to the turnover of military personnel, no information on the quantity of fuel disposed of could be obtained. Fuel from defueling operations is now collected and properly disposed of off-site.

The site is located near the Paint Branch of the Toms River.

Some shallow groundwater from the southern portion of the site may discharge into the Paint Branch. However, most of the groundwater flow at the site is in a generally northeasterly direction away from the Paint Branch. (See Figure 7)

## Summary of Remedial Investigations and Removal Actions

Site observations, during the Remedial Investigation - Phase I in August 1986, revealed the presence of several dark soil stains, which were due to spills of petroleum products, such as oils and fuels. Locally, a surficial dark brown to black crust had developed on the ground surface, apparently the result of old spills. Some areas of stressed vegetation were also observed. Several shallow (one foot) test pits were excavated throughout the site. Locally, discolored soil extended to a depth of 3 to 4 inches below the land surface. At one location, stains were covered with approximately 4 to 6 inches of clean fill. A maximum organic vapor analyzer (OVA) level of 320 ppm was recorded in one of the test pits excavated at this location. OVA levels in test pits excavated in areas of apparently old spills were generally between 0 and 3 ppm. In general, most of the stains were observed adjacent to the tarmac, and decreased toward the tree line to the west. A visual inspection of the Paint Branch at the point where it enters the culvert did not reveal any evidence of stained sediment or water.

In June 1988, soil gas and groundwater screening surveys revealed slightly elevated levels of both petroleum and chlorinated hydrocarbons in soil gas and shallow groundwater at the site.

As part of the Remedial Investigation - Phase II an analysis of groundwater samples from four monitoring wells installed at the site revealed no significant contamination and failed to confirm the petroleum and chlorinated hydrocarbons detected in the screening survey. Two of the six soil samples collected at the site contained elevated levels of petroleum hydrocarbons. Two rounds of groundwater samples were collected from each of the four monitoring wells located at the site (FU, FV, FW and FX), also during the RI Phase II. Duplicate samples were collected and analyzed from well FW during both rounds. The only contaminant detected was xylene at a concentration below ARARs in one of the two second round samples obtained from well FW. Xylene was not detected in an EPA split of this sample.

During the RI - Phase II soil sampling was performed in the middle of the defueling area, where surficial soil stains had been observed in 1986. Five test pits were excavated to a depth of five feet. One sample was collected from three of the pits at depths ranging from 2 to 2.5 feet. In addition, one soil boring was drilled at the site to a depth of 8 feet (where groundwater

was encountered). Two samples were collected from the boring, one at a depth of 0 to 2 feet and the other at a depth of 6 to 8 feet. A background soil sample was collected from a test pit excavated in the wooded area west of the site.

High levels of total petroleum hydrocarbons (TPHC) (up to 12,073.33 ug/g) were detected in two samples. Slightly elevated levels of tentatively identified compounds (TICs) were detected in all on-site samples, suggesting minor contamination. OVA readings above background levels were not recorded in any of the test pits or in the boring. No significant staining was observed in any of the test pits.

Analysis of three groundwater samples, collected from one bore hole at three different depth intervals using a Hydropunch, was conducted during the Remedial Investigation - Phase III. The samples were taken from a location 100 feet directly downgradient from the location of a Phase II soil sample which had contained high levels of PHC. The samples revealed no significant contamination.

In the spring of 1992, delineation soil sampling was conducted to identify areas of high PHC contamination. A biased grid sampling approach was used, which identified the extent and depth of the PHC contamination. Three distinct areas were identified that contained levels of PHC in excess of 10,000 ppm. Based on the results of this sampling an excavation was planned.

The excavation of Site 35 was planned to be done in three phases. The plan for the first phase was to remove the top layer of contaminated soil. This soil was to be staged near the site on impermeable plastic. The next phase was to remove an asphalt layer, which was discovered during the delineation sampling. This layer, approximately 4 inches, was part of the largest contaminated area. The third phase was to remove the remaining layer of contaminated soil and any visibly stained areas.

The plan proceeded as intended and the top layer was removed and placed on impermeable plastic. An attempt was made to remove the next layer, but the asphalt was not continuous throughout the excavation and it disintegrated during the excavation. Although there was not as much asphalt as believed, this layer was segregated from the other layers. The remaining contaminated soil was excavated and staged on impermeable plastic. (See Figure 8 for area of excavation)

After excavation, eleven post removal samples were taken and analyzed for TPHC. Six of the samples were also analyzed for SVOCs. The TPHC readings ranged from 20-4360 mg/kg which is below the NJDEPE Soil Cleanup Criteria of 10,000 ppm PHC. There are no SVOCs identified above the USEPA acceptable risk range and the NJDEPE Soil Cleanup Criteria. The excavated areas will be

filled with clean soil in the beginning of 1993.

## ENDANGERMENT ASSESSMENT

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

For Sites 1, 11, and 35, the EA Findings Summaries are summaries of the complete assessments, which are documented in the Endangerment Assessment. The EA is part of the NAWCADLKE Administrative Record.

### Site 1 (Blimp Crash Site)
### Endangerment Assessment Summary

Contaminants of concern (COCs) were identified for groundwater, soil, sediment and surface water. The COCs for groundwater included volatile organics and metals. The COCs for soil included volatile organic compounds, polycyclic aromatic hydrocarbons, PCBs, and total petroleum hydrocarbons. Chromium was determined to be COC for surface water.

### Human Health and Hazard Findings

Groundwater exposure is highly unlikely due to the remote location and lack of potable wells of the site making the pathway incomplete. It is also located in a wetlands area within the Pinelands Preservation area, which would make the possibility for future residential development unlikely. Groundwater contaminants do not exceed their respective Maximum Contaminant Levels (MCLs), which are imposed for the protection of human health and the environment.

A military land use scenario was assumed for soil due to the remote location of the site. Exposure pathways include ingestion and inhalation. The overall site soil hazard quotient or individual hazard indices for noncarcinogenic contaminants did not exceed the EPA's criteria value of 1.0. The total risk posed by carcinogenic chemicals detected in soil did not exceed EPA criteria of $10^{-6}$.

All contaminants were below EPA acceptable risk levels. High levels of TPHC were addressed by the removal actions. This action eliminated any potential adverse human health or ecological effects.

Ingestion of surface water by humans was not considered a significant exposure pathway. However, potential effects on

ecological receptors were evaluated to determine risks (See ecological assessment). If no elevated ecological risk is found, the risk to humans can be considered insignificant. The ecological assessment determined that contaminants in surface water did not pose a significant risk to the environment.

Ecological assessment

The ecological assessment portion of the Endangerment assessment was conducted prior to the excavation performed in 1992. Site 1 is located within a wetlands area. It is a possible habitat for many aquatic and land-dwelling species. Both the grasshopper sparrow and upland sandpiper were sighted within 2500 feet of Site 1. The upland sandpiper is a state-listed endangered species and the grasshopper sparrow is a state-listed threatened (although globally secure) species.

The results of the ecological assessment revealed that the site does not pose a sediment contamination problem. Although low levels of metals were found in sediments at Site 1, the ecological assessment determined that contamination is minimal and probably presents little, if any, potential hazard to surface-dwelling or free-swimming biota.

The excavation activity resulted in the formation of a large pond. In order to monitor the surface water at the site, the excavated area was not backfilled. The base forester has initiated planting around the edges of the pond in order to restore the area. This pond is a potential future habitat for various aquatic species.

Site 1 Summary

No groundwater contaminants exceeded MCLs, nor did contaminants in soil exceed EPA acceptable risk levels. Long term monitoring of groundwater and surface water is proposed in response to the slight oil sheen which developed during excavation. Little, if any, adverse ecological effects exist.

Site 11 (Drum Storage Area)
Endangerment Assessment Summary

The media evaluated were groundwater and soil. The COCs for groundwater include 1,2-dichloroethene and lead. Arsenic as a COC for groundwater was screened out due to its presence below maximum background level in unfiltered samples. In addition, cyanide was screened out since its presence could not be established in the last two phases of the remedial investigation. For soil, the COCs evaluated included 1,1,1-trichloroethane and TPHC.

Human Health Risk and Hazard Findings

At Site 11, a light industrial land use was employed. Due to its proximity to military aircraft hangars, a future residential land use scenario is unlikely.

Hazards resulting from soil noncarcinogens are not elevated for any chemical above EPA's hazard index criteria of 1.0. Similarly, the overall site hazard quotient does not exceed 1.0. None of the soil COCs exhibit carcinogenic potential. All contaminants were below EPA acceptable risk levels. High levels of TPHC were addressed by the removal actions. This action eliminated any potential adverse human health or ecological effects.

For groundwater the assessment showed no hazard indices for individual contaminants above 1.0 nor a hazard quotient above 1.0. None of the COCs are classified as potential carcinogens. In addition, no contaminants exceed their respective MCLs which are established to be protective of human health and the environment.

Ecological assessment

The ecological assessment portion of the Endangerment assessment was conducted prior to any excavation at the site. Sites 11 is a grassy area adjacent to two aircraft hangars and an active helicopter field. This area is not considered a wildlife dwelling. No endangered or threatened species were found in this area.

There were no COCs identified at this site. Surface water and sediments are not contained in this site, therefore no aquatic receptors exist. Other ecological receptors may use this site on a transient basis. Risks associated with soil have been addressed by the removal action.

Site 11 Summary

No groundwater contaminants exceeded MCLs, nor did contaminants in soil exceed EPA acceptable risk levels. Elevated levels of TPHC were addressed by the removal action. No ecological hazards were determined to exist.

Site 35 (Helicopter Defueling)
Endangerment Assessment Summary

The media of concern at the site are groundwater, soil and sediment. The COCs for groundwater includes xylene and various metals found at low levels. TPHC was determined to be a COC for soil. In sediment, chromium is a COC.

Human Health Risk and Hazard Findings

A light industrial land use was assumed for soil. None of the soil COCs are classified as potential carcinogens. All contaminants were below EPA acceptable risk levels. High levels of TPHC were addressed by the removal actions. This action eliminated any potential adverse human health or ecological effects.

For groundwater, the light industrial land use was also employed. The EA indicates that hazards indices resulting from noncarcinogens are not elevated for any chemical above 1.0. The overall hazard quotient estimated for groundwater is also below the EPA level of 1.0. None of the groundwater COCs are classified as potential carcinogens. In addition, no groundwater contaminants exceeded MCLs.

The ecological exposure to sediment was identified as a potential concern. Frequent direct human exposure was not considered a significant exposure pathway. The ecological affects were therefore utilized as a screening tool to determine sediment risks (see ecological assessment). Ecological effects were determined to be minimal.

Ecological assessment

The ecological assessment portion of the Endangerment assessment was conducted prior to any excavation at the site. Site 35 is a grassy area adjacent to two aircraft hangars and an active helicopter field. This area is not considered a wildlife dwelling. No endangered or threatened species were found in this area.

Chromium was considered a COC for sediment at the Paint Branch which is located sidegradient to Site 35. This was considered the only COC for sediment at this site. The ecological assessment determined that contamination is minimal and probably presents little, if any, potential hazard to surface-dwelling or free-swimming biota.

Site 35 Summary

No groundwater contaminants exceeded their respective MCLs, nor were soil contaminants above EPA acceptable risk levels. Little, if any, adverse ecological effects were determined to exist.

## SUMMARY

In summary, the EA demonstrates that groundwater and soil at the three sites do not pose human health risks in excess of EPA acceptable levels. Likewise, the sites do not pose unacceptable ecological hazards. All groundwater contaminants were below their respective MCLs. All soil contaminants were below EPA acceptable risk levels and NJDEPE Soil Cleanup Criteria. Levels of PHC in excess of the 10,000 ppm NJDEPE Soil Cleanup Criteria were addressed by the removal actions as documented in the Confirmation Sampling Plan and Report available in the Administrative Record.

## HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Proposed Plan for Sites 1, 11 and 35 was issued to interested parties on December 3, 1992. On December 7-8, 1992, a newspaper notification inviting public comment on the Proposed Plan appeared in The Asbury Park Press and The Ocean County Observer. On December 9, 1992, a notification also appeared in The Advance News. The comment period was held from December 11, 1992 to January 11, 1993. The newspaper notification also identified the Ocean County Library as the location of the Information Repository.

A Public Meeting was held on December 15, 1992. At this meeting representatives from the Navy, USEPA and NJDEPE were available to answer questions about the three 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 1, 11 and 35 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 three 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 1, 11 and 35. The PHC contamination in soil which was identified at these Sites has been remediated to levels below the NJDEPE Soil Cleanup Criteria and there are no SVOCs above the USEPA acceptable risk range and the NJDEPE Soil Cleanup Criteria. Because the available data indicate that conditions at Sites 1, 11 and 35 pose no unacceptable risks to human health or the environment, no action is necessary for these three Sites. The Site 1 plan includes a 5 year program of groundwater monitoring. Other areas of concern at NAWCADLKE will be or have been the subject of separate studies and response actions.

## SUMMARIES OF SITE CHARACTERISTICS

The locations of each of the three Sites within NAWCADLKE are shown in Figure 2. Maps of the individual sites are provided in Figures 3, 5 and 7. The areas of soil removal for each

individual Site are provided in Figures 4, 6 and 8.

The general direction of groundwater flow at NAWCADLKE is to the east-northeast. Summaries of the chemicals detected in the analyses of groundwater, soil and sediment samples collected at each of the Sites are provided in Tables 1 through 3.

The results of the Remedial Investigations, including the analytical data summarized in Tables 1 through 3, indicate that conditions at Sites 1, 11 and 35 pose no unacceptable risks to human health and the environment.