United States
Environmental Protection
Agency

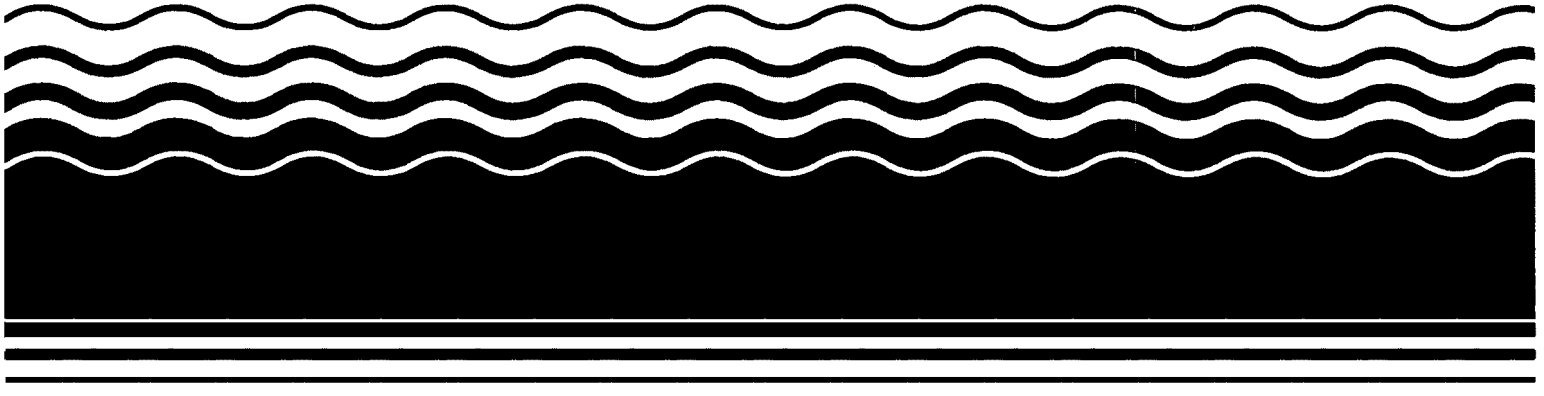
Office of
Emergency and
Remedial Response

EPA/ROD/R02-93/214
September 1993
PB94-963827

EPA

Superfund Record of Decision:

Naval Air Engineering Center (Operable Unit 14), NJ



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SUPERFUND RECORD OF DECISION
Naval Air Engineering Center (Operable Unit 14), NJ
Fourteenth Remedial Action

5. Report Date 09/27/93

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

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PB94-963827

16. Abstract (Limit: 200 words)

The Naval Air Engineering Center (Operable Unit 14) site is part of the 7,400-acre Naval Air Warfare Center Aircraft Division located in Lakehurst, Ocean County, New Jersey, approximately 14 miles inland from the Atlantic Ocean. Land use in the area is predominantly undeveloped woodlands, 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

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Naval Air Engineering Center (Operable Unit 14), NJ
Fourteenth Remedial Action
Contaminated Medium: soil
Key Contaminants: VOCs (toluene, xylenes), other organics (oils), metals

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 27
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(See ANSI-Z39.18) *See Instructions on Reverse*

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

Abstract (Continued)

operations at NAEC have required the use, handling, storage, and occasional onsite disposal of hazardous substances. During the operational period of the facility, there were reported and suspected improper releases of these substances into the environment. The Department of Defense's Installation Restoration Program (IRP) has identified 44 potentially-contaminated sites at NAEC, 16 of which have warranted further investigation to assess potential impacts. IRP investigations revealed soil contamination at the launch end of the test tracks (Site 32). Site 32 consists of the launching ends of five recovery system test tracks and ancillary facilities built in 1958. The test tracks are used to launch sled mounted aircraft jet engines, simulating aircraft landings on aircraft carrier decks. The ancillary facilities are used to store equipment and supplies, and a drainage system is used to receive oil and fuel runoff. Each track drainage system consisted of a catch basin at the end of the track. The catch basin was connected to a dry well located adjacent to the track. Fuel drained from the jet engines into the catch basins, and ultimately into the dry wells. Storm water also entered the system, mixed with the fuel, and drained to the dry wells which were intended to act as oil/water separators with the fuel floating on top and rain water percolating through to the ground water. In 1986, the dry wells were taken out of service, and, in 1988, were removed. During the period that the dry wells were not serviced, oily waste overflowed from the concrete dry well at Track 4 and into the swales between Tracks 3 and 4. There is no estimate of what or how much waste may have been released. In 1958, a 1,500-gallon UST was installed and used for holding jet fuels. In 1985, it was taken out of service, and in 1989, was removed. A distinct fuel odor was reported when the tank was removed, and soil adjacent to the tank was saturated with fuel. Other primary sources of fuel releases were the leaky valves in the pump house and spills from refueling. Two RODs signed in 1991 and 1992 addressed OUs 1, 2, 3, and 4, and OUs 5, 6, and 7, respectively. This ROD addresses an interim remedy for the contaminated soil at Site 32, as OU14. A 1991 ROD addressed the onsite ground water contamination, as OU2. Other 1993 RODs address OUs 8, 9, 10, 11, 12, 13, 15, 22, and 23. The primary contaminants of concern affecting the soil are VOCs, including toluene and xylenes; other organics, including oils; and metals.

The selected remedial action for this site includes excavating, analyzing, and sorting approximately 250 yd^3 of contaminated soil; disposing of soil with a total petroleum hydrocarbon (TPHC) concentration greater than 30,000 mg/kg offsite in a hazardous waste treatment and disposal facility; recycling the remaining soil onsite into cold mix asphalt or offsite into hot batch asphalt; shipping offsite or containerizing onsite the petroleum-contaminated soil; backfilling the excavated areas with clean fill, as necessary; and sampling to ensure that the site meets remediation goals. The estimated present worth cost for this remedial action is $39,000.

PERFORMANCE STANDARDS OR GOALS:

Soil cleanup goals are based on State soil cleanup criteria, State To Be Considered (TBC) criteria, and EPA risk-based levels. Chemical-specific soil cleanup goals include cadmium 100 mg/kg; ethylbenzene 100 mg/kg; fluoranthene 500 mg/kg; fluorene 100 mg/kg; mercury 270 mg/kg; naphthalene 100 mg/kg; toluene 500 mg/kg; TPHC 10,000 mg/kg; and xylenes 10 mg/kg.

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:	Asphalt Batch Recycling/Offsite Disposal
Operating Unit Number:	OU-14 (Site 32)
Capital cost:	$39,000
Construction Completion:	December, 1994
O & M in 1993:	N/A
1994:	
1995:	
1996:	
Present worth:	$39,000 (no O & M)

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	Petroleum Hydrocarbons
Medium	Soil, Sediment
Origin	Assorted spills
Est. quantity	700 cubic yards

NAWC
Aircraft Division
NAVAL AIR WARFARE CENTER
LAKEHURST

RECORD OF DECISION
FOR
SITE 32

OU-14

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 32
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 an individual site (Site 32), 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 Excavation with On-Site Recycling and Off-Site Disposal as the selected remedy for Site 32. Implementation of this alternative entails excavation and removal of all contaminated soil at the site above EPA risk based levels or NJDEPE soil cleanup criteria.

DECLARATION STATEMENT

The United States Department of the Navy has determined that remedial action is necessary at Site 32 to ensure protection of human health and the environment.

This Record of Decision addresses Site 32. The other areas of concern at NAWCADLKE have been or will be the subject of separate 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 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 the 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 test runway, one-mile long jet car test track, four one and one-quarter mile long jet car test tracks, a parachute jump circle, a 79-acre golf course, and a 3,500-acre conservation area.

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

INITIAL INVESTIGATIONS

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

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

deleted from the Remedial Investigation because they had already been rehabilitated. In 1987 NAWCADLKE was designated as a National Priorities List (NPL) or Superfund site under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

STATUTORY DETERMINATIONS

NJDEPE Soil Cleanup Criteria (SCC) were utilized as guidance for the cleanup of soil at Site 32. NJDEPE SCC includes soil cleanup levels for residential and non-residential direct contact scenarios and separate impact to groundwater soil cleanup criteria for the protection of groundwater. The National Oceanic and Atmospheric Administration (NOAA) guidance for sediment was used as a screening aid to determine ecological risk. A brief discussion of each of the criteria follows.

NJDEPE SCCs:

The NJDEPE soil cleanup criteria are To Be Considered (TBC) criteria for determining the need for site cleanup. Although the NJDEPE SCC are not promulgated requirements, these criteria are considered an appropriate means by which to assess the risk to human health and the environment posed by contaminants found in the 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 which support 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 cleanup goals at those sites at the

Lakehurst facility which are determined to require active remediation.

ENVIRONMENTAL INVESTIGATIONS

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

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

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

These investigations indicated that significant contamination is present at levels of concern at Site 32.

The site history and a summary of past remedial and removal activities at the site is provided in the following sections.

Site 32 - Launch End of the Test Tracks - Site Description

Site 32 consists of the launching ends of five recovery system test tracks and ancillary facilities, all built in 1958. The test tracks are used to launch sled mounted aircraft jet engines, simulating aircraft landings on aircraft carrier decks. The ancillary facilities consist of several buildings used for storage of equipment and supplies. A drainage system, located at the launch end of each of the five test tracks, was designed to receive oil and fuel runoff.

Site 32 is located approximately 4,000 feet from the nearest NAWCADLKE boundary. Approximately 1,200 feet to the southeast is the Manapaqua Brook; the general direction of groundwater flow at this site is to the southeast. The water table ranges from eight

to twelve feet below the ground surface. The drainage swales are located between each of the test tracks which generally drain to the east, except Track 1 which drains to the north through a culvert. The swales are not connected to a stream.

An interim remedial action for groundwater was initiated in the spring of 1992 in the area encompassing Site 32 (Area H). A recovery well is located immediately in Site 32, downgradient of the drainage system at the launch end of the tracks.

Each of the track drainage systems consisted of a catch basin at the end of the tracks. The catch basin was connected to a dry well located adjacent to the track. Fuel drained from the jet engines into the catch basins and ultimately into the dry wells. Storm water also entered the system, mixed with the fuel, and drained to the dry wells which were intended to act as oil/water separators with the fuel floating on top and rain water percolating through to groundwater. The intent of the original design was to pump out the top of the dry wells and reuse or dispose of the fuels. At some time between 1958 and 1979, the manhole covers to the dry wells were paved or covered over with fill material. They were not pumped out until 1979 when access ports to the dry wells were discovered. The dry wells were taken out of service in 1986 and removed in 1988.

During the period that the dry wells were not serviced, oily waste overflowed from the concrete drywell (seepage pit) at Track 4. Because this drywell had a bottom, the rain water could not percolate through the bottom. Consequently, the oily waste was forced out of the top and ran off into the swales between Track 3 and Track 4. There is no estimate of what or how much waste may have been released.

A 1,500 gallon underground storage tank (UST) was installed in 1958 and was used for holding JP-4 and JP-5 fuels. It was then taken out of service in 1985 and removed in April of 1989. A distinct fuel odor was reported when the tank was removed and soil adjacent to the tank on the north side was determined to be saturated with fuel. The primary sources of fuel releases were leaky valves in the pump house and spills from refueling.

Site 32: Summary of Remedial Investigations

During the initial site investigation it was assumed that the areas between the jet car tracks would be carrying water most of the time. The result was that the investigation included samples which were labeled as sediment, deposited during water flows through the site. However, it is rare that any water flows or pools in this area. Also, the swales are man made ditches and

any contaminated soil (or sediment) could be directly acted upon, or removed without any ecological effects. Therefore, all soil and sediment samples taken at Site 32 are considered to be soil in the argument presented in the discussion that follows, even if referred to as sediment during the RI. All contaminants of concern for soils at Site 32 are listed in Table 1.

1981 - 1984: Six monitoring wells were installed by NAWCADLKE. The wells were monitored for about three years for the presence of floating fuel product. None was detected. Groundwater samples were not collected for analysis.

November 1985 - January 1986: Remedial Investigation - Phase I. Groundwater samples collected from two monitoring wells and one nonpotable water supply well. Other media were not investigated. Additional investigations were recommended.

May - June 1988: A soil gas and groundwater screening survey indicated the presence of floating product in the drainage swale between test tracks 1 and 2. The data suggested that more than one source of contamination may exist. Additional investigations were recommended.

August - December 1988: Remedial Investigation - Phase II. Analysis of groundwater, soil and sediment samples revealed contamination of all media. Five drywells were excavated and removed from the site. Post excavation samples were collected.

January 1990: Aquifer Characterization Study. Soil samples were collected from a test pit excavated at the site for soil flushing, biological and stabilization bench-scale treatability studies. Contamination detected in the analysis of these samples was limited to low levels of a few VOC compounds.

February 1990: NAWCADLKE implemented a program to monitor the amount of floating product in well GX.

July 1991 - October 1992: The investigations conducted during this period included soil, groundwater, surface water and sediment sampling.

To evaluate the extent of soil contamination in areas where previous sampling had revealed contamination or where potential contamination sources (e.g., underground storage tanks (USTs) and dry wells) existed, seven soil borings were collected. Contamination consisting of volatile and semi-volatile fuel components and total petroleum hydrocarbons was found, extending to the saturated zone at the locations of the former dry wells and surficial staining between Tracks 3 and 4. Petroleum contamination of soils was highest at the former UST at Track 1.

No significant contamination was detected in the analysis of

sediment and surface water samples collected from the man made ponds downgradient of the site and Manapaqua Brook, and from a drainage swale near Track 1.

The results of the Phase III Investigation generally confirm those of prior investigations and indicate that there are isolated soil locations at Site 32 where contamination levels exceed the NJDEPE Soil Cleanup Criteria (SCC) for xylene and TPHC.

In late 1990, NAWCADLKE designed a groundwater recovery and treatment system to be installed at Site 32, as an interim remedial action to recover, treat, and further impede the downgradient migration of contaminated groundwater, thus minimizing future environmental impacts. Construction of this system, which includes two groundwater recovery wells at the site (GX and GG) became operational in May 1992.

Investigations conducted at Site 32 have identified contamination in the surficial soils in the drainage swales at the launching end of the test tracks, particularly between Tracks 3 and 4. The soils under the dry wells at Tracks 1, 2, 3, and 5 also exhibited a higher degree of contamination. The analyses also confirmed the contamination suspected when the 1,500 gallon tank was removed at the launch end of Track 1. The primary contaminant present in soil is TPHC. Some metals were detected sporadically in soil samples but none above NJDEPE soil cleanup criteria.

The soil contamination at Site 32 does exceed cleanup levels recommended by the NJDEPE for xylene and TPHC and will be remediated. The Navy and members of the Technical Review Committee further note that the remediation will expedite the groundwater cleanup operations by eliminating the contaminant pathway through the soil at Site 32.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Proposed Plan for Site 32 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 preferred alternative. A list of attendees is attached to the 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 od 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 (i.e., Excavation and On-base Recycling and Off-site Disposal) for Site 32 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 Focused Feasibility Study (FFS) for Site 32 evaluates several possible alternatives for remediating the site and this ROD identifies the Preferred Alternative for remediating the site contamination. The Remedial Action Objectives (RAO) of the remedy are to:

1. Prevent further contamination of groundwater and surface water from leaching of contaminants from the soil.

2. Remediate soils to levels that are protective to human health and the environment.

SUMMARIES OF SITE CHARACTERISTICS

The location of Site 32 within NAWCADLKE is shown in Figure 1. A map of the site is provided in Figure 2.

A summary of the chemicals detected in the analyses of soil, sediment and surface water samples collected at the site is provided in Table 1.

The results of the Remedial Investigations, including the analytical data summarized in Table 1, indicates that soil conditions at Site 32 pose an unacceptable risk to human health and/or the environment.

SUMMARY OF SITE 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 soils, groundwater, sediment and surface water detected during past and

on-going site investigations.

For Site 32, 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 32 can be found in Volume VI of the Phase III RI, which is available as part of the NAWCADLKE Administrative Record.

Remediation of groundwater is being addressed through a separate remedial action. Therefore, groundwater is not discussed within the following summaries.

For Site 32, 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.

SITE 32 RECOVERY SYSTEMS TRACK SITES, LAUNCH END
Endangerment Assessment Summary

This is a summary of the endangerment assessment (EA) findings for Site 32 (Recovery System Track Sites, Launch End). The media that is the subject of this site-specific EA for this site is soil.

CONTAMINANTS OF CONCERN

For soil, COCs for which hazard quotients or risks were calculated are cadmium, mercury, ethylbenzene, toluene, 2-methylnaphthalene, dibenzofuran, fluoranthene, fluorene, naphthalene, phenanthrene, xylene, and TPHC. Of these COCs, only TPHC exceeded the non-residential NJDEPE soil cleanup criteria. However, since the Impact to Groundwater SCC values are more stringent, both xylene and TPHC exceed the cleanup criteria.

LAND USE AND EXPOSURE ASSESSMENT

For Site 32, the light industrial scenario has been chosen because it is the current land use and expected future land use.

HUMAN HEALTH RISK AND HAZARD FINDINGS

For soil at Site 32, the overall hazard index is 0.00236, well below the EPA criteria of 1.0. The overall risk estimate for soil is 1.39×10^{-8} based on cadmium, well below the EPA acceptable level of 10^{-6}.

ECOLOGICAL ASSESSMENT FINDINGS

An endangerment assessment was performed to determine ecological risks. Based on the results, contaminants at Site 32 have limited potential to adversely effect terrestrial or avian biota. Since Federal Ambient Water Quality Criteria (AWQC) and National Oceanic and Atmospheric Administration criteria are not applicable to terrestrial or avian biota, the risk assessment consisted of identifying indicator species, identifying the COCs for the indicator species, and comparing estimated contaminant uptakes to acceptable levels. The acceptable levels are based on toxicological data.

The indicator species chosen for the analysis are the field mouse, northern bobwhite, and barred owl. These species were chosen because they are well represented at NAWCADLKE, have restricted home ranges, and have been extensively studied in toxicological experiments.

The extent of contaminant-related impact to terrestrial or avian receptors is minimal at Site 32. The maximum inorganic soil concentrations for Site 32 are well below the 95 percent upper confidence level (UCL) New Jersey background concentrations. The only COCs found in soil are xylene and TPHC, which appear at low levels. These findings indicate that the contamination in this area does not constitute a current ecological threat to the resident indicator species.

CONCLUSION

Soils at Site 32 do not pose unacceptable risks to human health or the environment. However, the presence of high levels of TPHC and xylenes warrant action, since these compounds at their respective concentrations may be a continuing source of groundwater contamination in Area H.

SUMMARY OF REMEDIAL ALTERNATIVES

Under CERCLA the alternative selected must protect both human health and the environment, be cost effective and comply with statutory requirements. Permanent solutions to contamination problems are to be achieved whenever possible and there is a bias for treatment of waste rather than disposal. All of the Remedial

Alternatives which are discussed in more detail in the Feasibility Study for Site 32, are summarized below.

ALTERNATIVE 1: No Action

Estimated Construction Cost: $ 0
Estimated Net Annual O&M Cost: $ 0

This alternative involves no additional actions at the sites. No contaminants would be treated or contained and the existing health and environmental risks would remain. No further action to control the source would be taken.

ALTERNATIVE 2: Groundwater Monitoring

Estimated Construction Cost: $ 0[1]
Estimated Net Annual O&M Cost: $ 0
Net Present Worth: $ 0

This alternative would provide no reduction in risk to human health or the environment or reduce contamination at the site. Long term monitoring of the site would evaluate the effects of the source area on groundwater and can be accomplished by using the extensive array of existing monitoring wells utilizing personnel skilled in sampling. Sampling would be conducted quarterly for a period of thirty years as required by the existing pump and treat operations. If contaminant levels started to increase, an active form of remediation would have to be pursued.

ALTERNATIVE 3: Capping and Groundwater Monitoring

Estimated Construction Cost: $ 42,000
Estimated Net Annual O&M Cost: $ 30,000
Net Present Worth: $ 218,000

This alternative would act as a source control action by minimizing the infiltration of precipitation into the contaminated soil, thus reducing the amount of leachate. Prior to capping, backfill would be required to establish a 3 to 5 percent grade over the area. The backfill material can be obtained at the center and would be spread and compacted in 6-inch lifts to provide uniform support for the cap and to minimize settlement. Upon completion of the cap construction the area would be vegetated to decrease erosion and promote the development of a stable surface. Maintenance and monitoring of

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[1] The cost associated with the construction, annual O&M and the net present worth are included in the ongoing interim remedial action for groundwater at Area H. There would be no additional cost associated with soil remediation at SIte 32.

this alternative would include inspection of the cap to detect signs of erosion or settlement. Since the contamination would still be present at the site, groundwater monitoring would still have to be performed downgradient of the site.

ALTERNATIVE 4: Excavation and Off-Site Disposal

Estimated Construction Cost:	$ 104,000
Estimated Net Annual O&M Cost:	$ 0
Net Present Worth:	$ 104,000

This alternative includes the removal of all TPHC contaminated soil exceeding the NJDEPE SCC from the site through excavation. Approximately 250 cubic yards would be excavated from Site 32. Soil excavation could be accomplished with a backhoe which could easily excavate to the depths required. Once removed, the soil would be disposed of at a landfill as industrial waste or at a hazardous waste landfill, depending upon its petroleum hydrocarbon content. The contaminated soils would either be containerized or bulk transported depending on contamination levels and quantity.

Following excavation, sampling would be performed to determine that the site meets remediation goals. Clean fill would be applied as needed.

ALTERNATIVE 5: Excavation and Off-Site Recycling and Off-Site Disposal

Estimated Construction Cost:	$ 40,000
Estimated Net Annual O&M Cost:	$ 0
Net Present Worth:	$ 40,000

This alternative includes the excavation of all TPHC contaminated soil from the site exceeding NJDEPE SCC as described in Alternative 4. Once the waste is removed, it would be analyzed for petroleum content and other contaminants. All portions of the soil that have a petroleum concentration greater than 30,000 ppm or exhibit Resource Conservation and Recovery Amendment (RCRA) hazardous waste characteristics (approximately 10% of the estimated volume for each site) would be sent to a hazardous waste landfill for treatment and disposal as described in Alternative 4. The remaining soil would be sent to a permitted off-base plant for reuse in the making of asphalt. Shipping of the petroleum contaminated soil would be done as described in Alternative 4.

Following excavation sampling would be performed to determine that the site meets remediation goals. Clean fill would be applied as necessary.

ALTERNATIVE 6: Excavation and On-Site Recycling and Off-Site

Disposal

Estimated Construction Cost: $ 39,000
Estimated Net Annual O&M Cost: $ 0
Net Present Worth: $ 39,000

This alternative includes the excavation described in Alternative 4. Once the waste is removed it would be analyzed for petroleum content and other contaminants. All portions of the soil that contain petroleum concentration greater than 30,000 ppm or exhibit hazardous waste characteristics will be sent to a hazardous waste landfill for disposal as described in Alternative 4. A portable asphalt batching system would be brought on base to allow reuse of contaminated soil containing petroleum concentrations below 30,000 ppm and not having RCRA hazardous waste characteristics in making asphalt for the bases roads.

Following excavation, sampling would be performed to determine that the site meets applicable standards. Clean fill would be applied as necessary.

ALTERNATIVE 7: Excavation and On-Site Thermal Treatment

Estimated Construction Cost: $ 84,000
Estimated Net Annual O&M Cost: $ 0
Net Present Worth: $ 84,000

This alternative includes the excavation of all contaminated soil from the site as described in Alternative 4. Once the waste is removed it would be thermally treated. Thermal treatment involves the permanent removal of contaminants by exposure to elevated temperatures, typically greater than 1000°F, which causes the volatilization, combustion, and destruction of the contaminants. This process has been proven effective in treating soils containing contaminants such as those present at Site 32.

Three waste streams would be generated by this technology: solids (ash and treated soils) from the treatment system, water from the air pollution control (APC) system and air emissions. Solids would remain on-site and, after testing, may be used as fill material. Liquid waste from the APC system that contains substances such as caustic high chlorides, volatile metals, trace organics, metal particulates and inorganic particulates would be treated prior to discharge. Flue gases would be treated by the APC system prior to discharge from the stack. Permits or permit equivalents for the discharges of the process would be obtained prior to implementing this process.

Following excavation sampling would be done to determine that the site meets remediation goals. The site would be leveled with clean fill as needed.

ALTERNATIVE 8: Excavation and On-Site Recycling/On-Site Thermal Treatment

Estimated Construction Cost: $ 141,000
Estimated Net Annual O&M Cost: $ 0
Net Present Worth: $ 141,000

This alternative includes the excavation of all contaminated soil from the site as described in Alternative 4. Once the soil is removed it would be analyzed for total petroleum hydrocarbon and hazardous waste characteristics. All portions of the soil that are unsuitable for recycling would be treated at an on-site thermal treatment unit as described in Alternative 7. A portable asphalt batching plant would then be brought on base to use the recyclable contaminated soil in making asphalt for the bases roads.

Following excavation, sampling would be performed to determine that the site meets RAOs. Clean fill would be applied as necessary.

COMPARATIVE ANALYSIS OF ALTERNATIVES

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 Federal 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 cleanup 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 evaluates the issues and concerns the public may have regarding the alternatives. Acceptance will be gauged in the Record of Decision (ROD) following a review of public comment on the RI/FFS and Proposed Plan.

This section will compare all of the alternatives for Site 32 using the nine criteria outlined above.

ALTERNATIVE 1: NO ACTION
ALTERNATIVE 2: GROUNDWATER MONITORING
ALTERNATIVE 3: CAPPING AND GROUNDWATER MONITORING
ALTERNATIVE 4: EXCAVATION AND OFF-SITE DISPOSAL
ALTERNATIVE 5: EXCAVATION AND OFF-SITE RECYCLING AND OFF-SITE DISPOSAL
ALTERNATIVE 6: EXCAVATION AND ON-SITE RECYCLING AND OFF-SITE DISPOSAL
ALTERNATIVE 7: EXCAVATION AND ON-SITE THERMAL TREATMENT
ALTERNATIVE 8: EXCAVATION AND ON-SITE RECYCLING/ON-SITE THERMAL TREATMENT

Overall Protection of Human Health

Alternatives 1 and 2 provide no protection to human health or the environment. Alternative 3 would reduce risk at the site but by leaving the contaminated soil at the site, threats to groundwater would still exist and the alternative would not meet Remedial Action Objectives (RAOs). Alternatives 4 and 5 have potential for health risks over the short term due to the transportation of the contamination over public roadways. However once completed these two alternatives would eliminate health and environmental risks at the sites. Alternatives 6, 7 and 8 would have minimal short term health risks due to excavation, however, both alternatives provide a permanent means of protecting human health.

Compliance with ARARs

Alternatives 1 and 2 would allow for the continued leaching of soil contaminants into groundwater above chemical specific ARARs. Alternative 3 would comply with ARARs but residual source areas would remain. Alternative 4 through 8 would comply with ARARs.

Long Term Effectiveness and Permanence

Alternatives 1 and 2 offer neither effectiveness or permanence.

Alternative 3 would provide partial protection. Alternatives 4, 5, 6, 7 and 8 provide permanent long term protection by totally removing all contaminants from the site.

Reduction of Toxicity, Mobility or Volume through Treatment

Alternatives 1 and 2 do not reduce any toxicity, mobility or volume of contamination at the site. Alternative 3 greatly reduces mobility of contamination , however toxicity and volume remain unchanged. Alternatives 4, 5 and 6 remove the contaminants from the sites; they are transferred to a more secure location where mobility is reduced. Alternatives 7 and 8 reduce toxicity, mobility and volume by destroying contaminants.

Short term Effectiveness

Alternatives 1 and 2 do not change any short-term risks that are presently at the sites. Alternative 3 could be implemented within 2 years time therefore rapidly reducing risk at the site. Alternatives 4, 5, 6, 7 and 8 could also be implemented quickly (under 1 year), however with minor problems over the short term by possible release of contaminants during the process.

Implementability

Alternative 2 is easily implemented and would require a short set-up time frame. Alternative 3 is easily implementable only if there is no water flow into the location where the capping would take place. Otherwise damming of the flow or tunneling below tracks 3 and 4 would need to be implemented. In addition, grading the site would be difficult due to its present elevation compared with its surroundings (it is a ditch). Alternative 4, 5, and 6 still requires a diversionary ditch yet are much more readily implemented and would require about 1 year to complete. Alternatives 7 and 8 also require a diversionary ditch and may require slightly more time to complete due to the removal of the asphalt cover.

Cost

Alternative 2 only has costs associated with operations and maintenance (O&M) and also does not meet any RAOs. Alternative 3 has significant capital and O&M costs but does meet some of the RAOs for the sites. Alternatives 4, 5, 6, 7, and 8 have only capital costs associated with their remedial efforts and all will

meet all RAOs. Alternatives to be considered for all sites have been developed and presented in the section below:

ALTERNATIVE NO.	COST OF ALTERNATIVE
1	$0
2	$0
3	$218,000
4	$104,000
5	$40,000
6	$39,000
7	$84,000
8	$141,000

State Acceptance

The State of New Jersey concurs with the selected remedial action.

Community Acceptance

All public questions were answered during the Public Meeting. No additional written questions or comments were received during the public comment period.

SELECTED REMEDY

The United States Department of the Navy, the lead agency for the site, has selected Alternative 6 which is Excavation and a combination of On-Site Recycling and Off-Site Disposal. Implementation of this alternative entails excavation and removal of all contaminated soils above EPA risk based levels or New Jersey soil cleanup criteria and the removal of soils heavily contaminated with TPHC that may be contributing to groundwater contamination.

By excavating the contaminated soils, the possibility of further bioaccumulation of contaminants in aquatic receptors thereby reducing ecological and human health risks associated with the sites. Few short-term impacts exist for the preferred alternative.

Excavated soils will be sorted based on prior sampling results

and each pile will be tested for TPHC and RCRA hazardous waste characteristics. Soil which contains concentrations of TPHC greater than 30,000 mg/kg or exceeds RCRA hazardous waste limits will be further segregated and disposed of at a hazardous waste treatment and disposal facility. The remainder of the soils will be asphalt batched on-site by transportable cold mix processing equipment. The asphalt produced by this process will be utilized at NAWCADLKE for the paving of designated existing gravel roads and parking lots.

The roads and parking lots will consist of a gravel course, a sub-base of cold mix asphalt made from the excavated soil and a final cap of hot mix asphalt for the wearing course.

Prior to full scale production of asphalt, a demonstration will be conducted at NAWCADLKE. This demonstration will be conducted indoors and will treat soils which would produce the worst case air emission scenario. The soils would be batched at the maximum usage rate for one hour. The soils, air emissions and resulting asphalt are required to meet specific NJDEPE permit requirements.

If this process cannot meet NJDEPE and EPA requirements through engineering controls, the soil will be sent to a permitted off-base asphalt recycling facility as outlined in Alternative 5, which utilizes a hot mix process.

Long term adverse impacts are not anticipated with the selected remedial action since no long term changes in the environment are being made.

The selected remedial action is the most cost effective of all the remedial technologies for the site.

This selected remedial action provides excellent protection to human health and the environment by removing all sources of contamination above EPA risk based levels and NJDEPE Soil Cleanup Criteria. Remedial Action Objectives will be met once these cleanup levels have been achieved.

For Site 32, the cleanup time frame would be approximately one year once the selected remedial action is initiated.

For Site 32, excavation of the area of contamination would be accomplished using a backhoe. The excavated soil would be staged in small mounds and each mound would then be sampled according to EPA's guidelines.

The selected remedial action utilizes permanent solutions and treats the majority of the contaminated soils from the site satisfying the statutory preference for treatment as a remedy.

It should be noted that this Record of Decision addresses only

Site 32 and it is not intended to represent the remedial action status for other areas of concern at NAWCADLKE. Each site's conditions and concerns have been or will be addressed in separate RODs. Groundwater contamination at this site has been addressed by an interim remedial action for groundwater as outlined in a Record of Decision which was signed in February 1991. A groundwater recovery and treatment facility is currently operating in Area H.

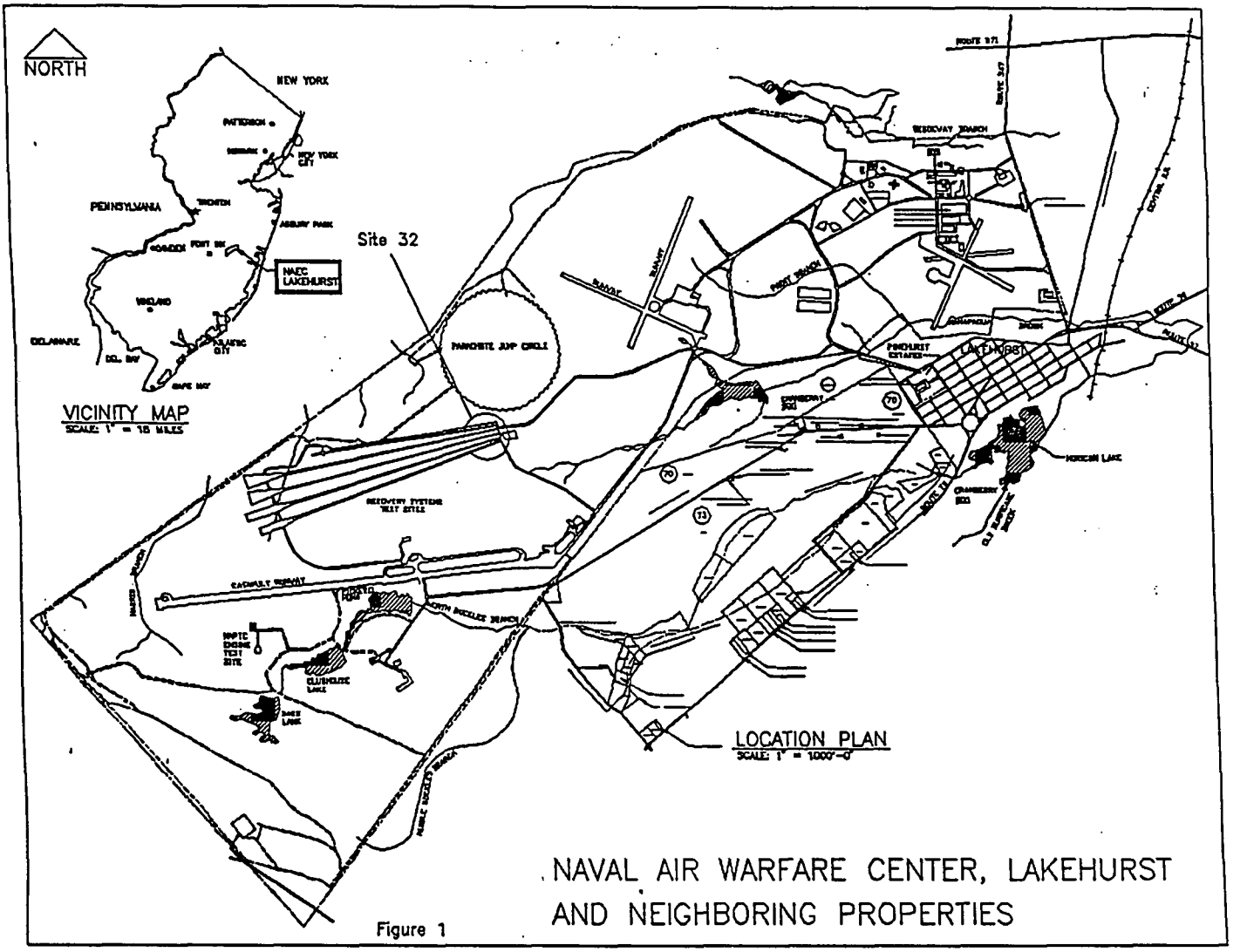
NORTH
NEW YORK
PENNSYLVANIA
NAEC LAKEHURST
VINELAND
DELAWARE
VICINITY MAP
SCALE: 1" = 10 MILES
Site 32
PARACHUTE JUMP CIRCLE
LAKEHURST
LOCATION PLAN
SCALE: 1" = 1000'-0"
NAVAL AIR WARFARE CENTER, LAKEHURST
AND NEIGHBORING PROPERTIES

Figure 1

Table 1: Contaminants of concern for Soils at Site 32

Contaminant:	Level in-situ mg/kg	PRGs mg/kg	SCC mg/kg
Ethylbenzene	0.8	380,000(H)	100
Toluene	0.38	290,000(H)	500
Xylenes (Total)	210.0	NR	10
Dibenzofuran	0.91	NL	NL
Flouranthene	0.39	81,800(H)	500
Fluorene	0.42	81,800(H)	100
2-Methylnaphthalene	27.0	81,000(H)	NL
Naphthalene	24.0	NL	100
Phenanthrene	0.076	NL	NL
Cadmium	1.7	1,020(H,C)	100
Mercury	0.2	260(H)	270
Total Petroleum Hydrocarbons (TPHC)	84,000	NR	10,000

1) H-PRG for Hazard Index
2) C-PRG for Carcinogenic
3) NL-Not listed in literature review
4) NR-Not relevant

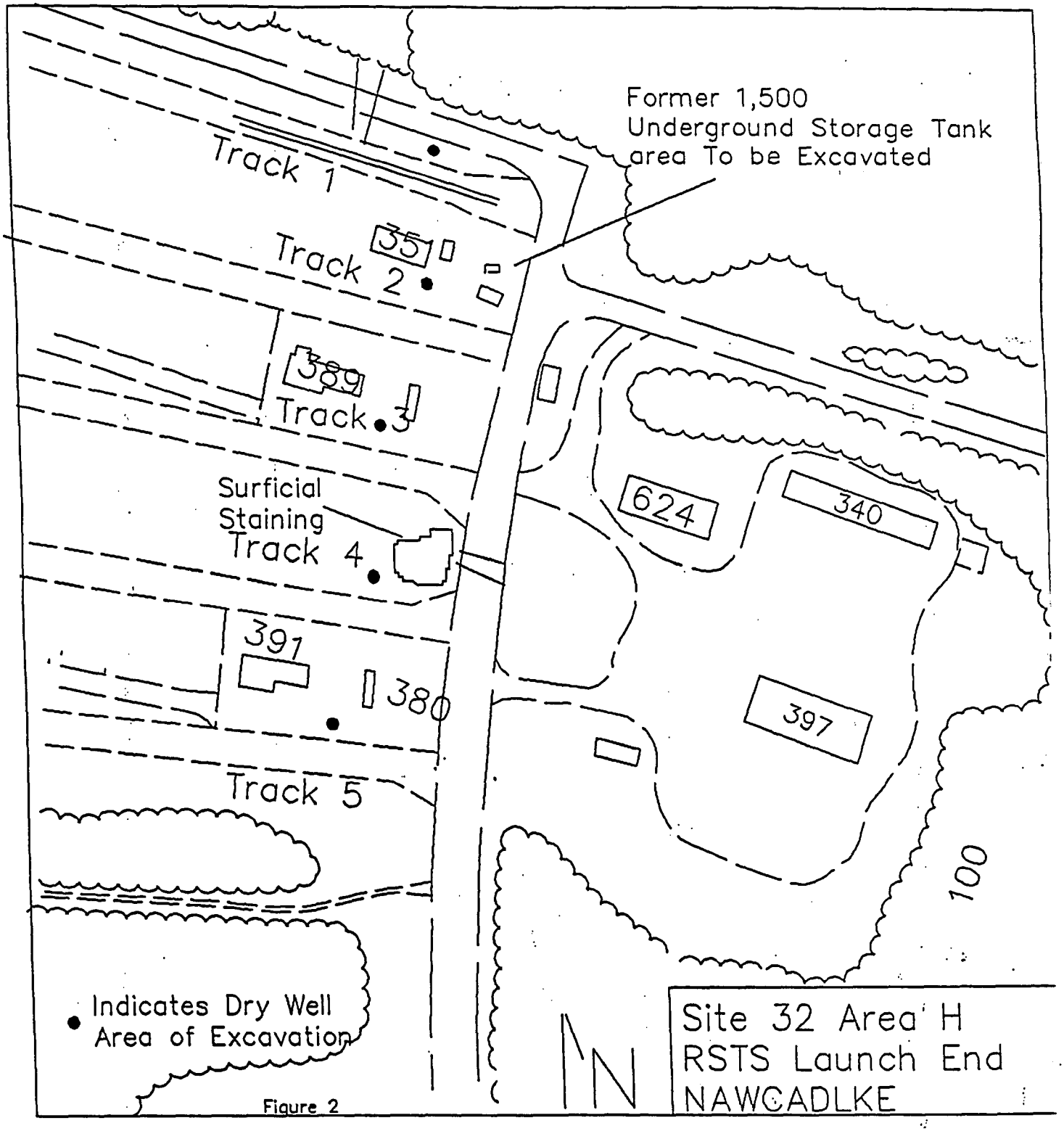
Former 1,500
Underground Storage Tank
area To be Excavated
Track 1
Track 2
Track 3
Track 4
Track 5
351
389
391
380
624
340
397
100
Surficial
Staining
Indicates Dry Well
Area of Excavation
N
Site 32 Area H
RSTS Launch End
NAWCADLKE

Figure 2