



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

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NWS EARLE
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FEB 06 1998

Mr. John Kolicius
Remedial Project Manager
Department of the Navy - Northern Division
10 Industrial Highway, Mail Stop #82
Lester, PA 19113-2090

Re: Review of the Navy's Draft *Proposed Plan for Sites 14, 20, 22, 23, 24, 25, 27, and 29 (Operable Unit 4)* for Naval Weapons Station Earle, Colts Neck, New Jersey

Dear Mr. Kolicius:

The U.S. Environmental Protection Agency (EPA), in accordance with our Federal Facility Agreement with the Navy, has reviewed the Navy's Draft *Proposed Plan for Sites 14, 20, 22, 23, 24, 25, 27, and 29 (Operable Unit 4)* for Naval Weapons Station Earle. Our comments are attached. EPA recommends condensing the document significantly and has provided a working draft of such a condensed version for your use, as well as another No Action Proposed Plan (Attachment 2) that EPA recently issued. Please feel free to submit drafts of your revision to me via e-mail or facsimile. In that way, we may come to an agreement regarding the text and content prior to finalizing the document for publication.

If you have any questions, please call me at (212) 637-4396.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Sharon Jaffess".

Sharon Jaffess, Project Manager
Federal Facilities Section

Attachments

cc: B. Marcolina, NJDEP
G. Goepfert, NWS Earle

EPA Comments on the Navy's Proposed Plan for
Sites 14, 20, 22, 23, 24, 25, 27, and 29

1. This proposed plan contains 35 pages of text, 19 figures, and 143 tables. It appears to be text, figures, and tables from the RI report, without an attempt to summarize the information for the lay community.

While the Superfund regulations do not state that a lead agency must conform to a minimum of information to be presented in a proposed plan, the regulations do specify that a proposed plan shall briefly describe the remedial alternatives; the proposed preferred alternative; and **summarize** the information relied upon to select the preferred alternative (40 CFR 300.430).

All of the details presented in this plan, while appropriate for an RI/FS report, are apt to make this document extremely cumbersome for the public to review. EPA suggests that the document be significantly condensed and suggests replacing pages 1 through 49 with text such as in Attachment 1.

2. One map should be included in the document instead of the numerous, highly detailed maps. This one map should show the Mainside area of NWSE and pinpoint the 8 Sites that are the subject of the document. All of the tables should be eliminated from the document.

3. The last section on page 49, the summary, is satisfactory and should be included in the document. However, a paragraph should be added that explains that no further action is recommended for these sites because either the remedial investigation data demonstrated that there is no unacceptable risk posed to human health and the environment from the site, or such risks were already addressed through cleanup performed via removal actions.

4. A section addressing ground water should be added that briefly explains why ground water was deemed to be either unaffected by contamination (e.g., requiring no further investigation at the remedial investigation phase) or why no further action will be needed at each of these sites (e.g., contamination was in the shallow subsurface and removed). Please note that the sections in the document on ground water, as drafted, are insufficient in that they emphasize a lack of ground water monitoring wells and sampling data. It appears to imply that ground water characteristics are unknown and that there could be contaminant problems in the ground water beneath the sites. Such statements would denote to a reader that further cleanup action in the ground water would be warranted.

It is suggested that the revised document briefly discuss information gathered on the aquifer (from monitoring wells at nearby sites), explain that such information was used during the investigation of these sites, and for the various reasons (as suggested above), additional ground water data was deemed unnecessary and further, explain why no ground water actions would be warranted at these sites.

5. With regards to Site 20, please also provide further details on the septic tank and the rationale for no further action regarding that tank.

6. A separate section summarizing site risks (human health and ecological) should also be included in the document. The risk information currently provided in the document is extremely detailed and since those risks were mitigated by the removal actions, such detailed information is extraneous. However, it is the risk section that typically provides the primary basis for the no action decisions. }
Therefore, the discussion should explain the basis for the conclusion that unacceptable exposures to hazardous substances will not occur, now that removal actions have been taken (or where no further actions were deemed appropriate pursuant to the RI data). For example, the section could briefly describe the human health and ecological risk assessments conducted at the sites (or why such assessments were not conducted). Then, briefly state that the RI data and risk results pointed to utilizing the removal response authorities under CERCLA, and once these actions were taken, the risks were mitigated and the sites no longer posed a threat or potential threat to human health and the environment.

7. Since EPA suggests that the document be significantly condensed, specific page by page comments will not be provided.

Attachment 1

PURPOSE OF PROPOSED PLAN

This Proposed Plan briefly describes the investigations, response actions, and the proposal and rationale for no further action at the following Sites at Naval Weapons Station Earle (NWSE): Mercury Spill Area (Site 14); Grit Blasting Area (Site 20); Paint Chip Disposal Area (Site 22); Paint Disposal Area (Site 23); Closed Pistol Range (Site 24); Closed Pistol Range (Site 25); Projectile Refurbishing Area (Site 27); and PCB Spill Site (Site 29).

This Proposed Plan was developed by the U.S. Navy in consultation with the U.S. Environmental Protection Agency (EPA) and the New Jersey Department of Environmental Protection (NJDEP). The Navy is issuing the Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, 42 U.S.C. §§9601 et. seq., and Section 300.430(f) of the National Contingency Plan (NCP), 40 C.F.R. Part 300. The information summarized here is described in detail in the remedial investigation report, which should be consulted for a more detailed description.

This Proposed Plan is being provided to inform the public of the Navy's preference for no further action at these Sites and to solicit public comments. Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made, if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after the Navy has taken into consideration all public comments.

COMMUNITY ROLE IN SELECTION PROCESS

The Navy relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end the RI Report, the Proposed Plan, and supporting documentation have been made available to the public for a public comment period which begins on February __, 1998 and concludes on March __, 1998.

A public meeting will be held during the public comment period at NWSE on March __, 1998 at 7 pm to present the conclusions of the RI, to elaborate further on the reasons for recommending the preferred remedial alternative, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document which formalizes the selection of the remedy. All written comments should be addressed to: John Kolicius, Remedial Project Manager, Department of the Navy - Northern Division, 10 Industrial Highway, Mail Stop #82, Lester, PA 19113-2090.

BACKGROUND

Sites 14, 20, 22, 23, 24, 25, 27, and 29 are all located on the 10,248-acre Mainside area of NWSE in Colts Neck Township, Monmouth County. Colts Neck has a population of approximately 6,500 people. Approximately 2,500 people live or work at NWSE. The Mainside area of NWSE consists of a large, undeveloped section associated with ordnance operations, production, and storage. Other land use includes residences, offices, workshops, warehouses, recreational space, and undeveloped land. NWSE is surrounded by agricultural land, vacant land, and low-density housing.

The U.S. Navy has handled, stored, renovated, and transshipped munitions at NWSE since 1943. The operations involve preserving and maintaining ammunition, missile components, and explosives; rendering safe unserviceable and/or dangerous ammunition and explosives; and providing support to the Fleet Mine Facility. NWSE also conducts or has conducted nonordnance activities, radiological operations, materials storage, and waste disposal operations.

REGULATORY HISTORY

The U.S. Navy's Installation Restoration Program (IRP) identifies environmental concerns and remediates contamination at U.S. Navy and Marine Corps facilities. The IRP is similar to EPA's Superfund process; sites undergo a preliminary assessment (PA), site investigation (SI), remedial investigation (RI), and remedial action (RA). Based on the results of PA/SI work conducted by the U.S. Navy in 1982 and 1986, NWSE was proposed to the Superfund National Priorities List (NPL) on October 15, 1984. The NPL is EPA's list of uncontrolled hazardous substance releases in the United States that are priorities for long-term remedial evaluation and response. On August 30, 1990, NWSE was added to the NPL.

Between May and December of 1995, RI field work was conducted at twenty-seven (27) Sites at NWSE. This document reflects the results of the RI at eight (8) of these Sites.

**SUMMARY OF THE REMEDIAL INVESTIGATION, REMOVAL ACTIONS, & RISK AT THE
8 SITES**

Site 14: Mercury Spill Area

One to several ounces of mercury was spilled on a concrete floor within a warehouse in 1970. The spill was reportedly cleaned-up with a vacuum at the time of the spill. Floor sweeping samples were consolidated and analyzed during the Remedial Investigation. Mercury was detected at 8.6 mg/kg, which is below the State of New Jersey Residential Direct Contact Soil Cleanup Criteria of 14 mg/kg. The corresponding EPA residential level at a Hazard Index of 1 is approximately equal to the concentration found and would therefore be considered protective of human health. The investigation also found no evidence of wider environmental contamination or risk to human health.

Site 20: Grit Blasting Area

Spent material (grit and paint chips containing lead and zinc) from the blasting of paint off of ordnance was dumped in an open pile. A field in this area was also reportedly used for leaching unknown liquid waste. This area also contains an operating septic tank. Removal of the pile was executed in two stages. In December, 1994, the Navy excavated approximately 300 cubic yards of tainted soils. Additional excavation work to meet State of New Jersey residential surface soil cleanup standards was carried out in March, 1995. Samples were obtained from surface soil, subsurface soil, and sediment in the area, as well as from the septic tank, during the Remedial Investigation in the summer of 1995.

Surface Soil: There were slightly elevated levels of beryllium in two of five samples (2.7 mg/kg and 1.4 mg/kg). The New Jersey Residential Contact Cleanup Criteria for beryllium is 1.0 mg/kg. Other metals and semivolatiles were below the New Jersey Cleanup Criteria.

Subsurface Soil: There were no elevated levels of inorganics, semivolatiles or volatiles in comparison to the New Jersey Residential Contact Cleanup Criteria.

Sediment: There were no elevated levels of inorganics, semivolatiles or volatiles in comparison to the Sediment Ecological Toxicity Threshold Values. Note that although below the Sediment Ecological Toxicity Threshold Values, the sediment sample taken where a drainage depression exits the Site did have low levels of inorganics and organics. That particular sample was taken to ascertain whether there was any off-site migration into the wetlands. The presence of these low levels is indicative of such transport. However, since the waste pile has been removed, future off-site migration should be negligible.

Septic Tank: There was no sludge in the tank, only aqueous waste. The sample showed low levels of semi-volatiles (1 ug/L - 140 ug/L) and metals (.025 ug/L - 43.2 ug/L).

The cancer risks associated with the future residential and current industrial exposure scenarios were within the mid-range of the target risk range. The noncarcinogenic hazard indices were less than 1.0, indicating no adverse noncarcinogenic effects.

Site 22: Paint Chip Disposal Area

This area was formerly used as a sand blast and paint disposal area. Contaminants of concern included cadmium, lead, petroleum hydrocarbons, 1,1,1-trichloroethane, 4,4-DDT, and two phthalates. Due to the presence of elevated levels of the aforementioned contaminants, a removal action was conducted in December 1996. Approximately 250 tons of contaminated soil was excavated and disposed off-site. Confirmatory sampling demonstrated that levels were below NJDEP Residential Direct Contact, Non-Residential Direct Contact and Impact to Groundwater Standards.

Site 23: Paint Disposal Area

This area was reportedly used to dispose of paint from the repainting and stenciling of torpedoes, aerial bombs, and other large ordnance. Approximately 86 tons of contaminated soil (chemicals of concern included lead and chromium) was excavated and disposed of off-site via a removal action in December 1996. The excavation depth was approximately 3 feet. Confirmatory sampling demonstrated that levels were below NJDEP Residential Direct Contact, Non-Residential Direct Contact and Impact to Groundwater Standards except for thallium. Thallium was present in 4 out of 8 samples within the same order of

magnitude as the direct contact standard (2 mg/kg). Such soil is currently covered and not a direct contact threat since the area was covered with clean fill. EPA deemed the removal action to be satisfactory and complete on March 27, 1997.

Site 24 & Site 25: Closed Pistol Ranges

Lead- and copper-jacketed bullets were fired into 70-foot berms (natural sand banks). A removal action was conducted in 1996. Approximately 10-tons of metal bullets was mechanically removed from the soil and the soil itself was washed. Approximately 1500 tons of soil was processed during this action. The recovered bullets were sold to a local metal recycler. Lead-containing sludge from the soil washing system was sent to an asphalt batch plant for recycling. The washed soils were backfilled at each site and the wash water was discharged to the base's wastewater treatment plant for final processing. Confirmatory soil samples collected after the excavation demonstrated lead levels below State of New Jersey Residential Direct Contact Soil Cleanup Criteria.

Site 27: Projectile Refurbishing Area

Oil-contaminated rags, paint chips, and spent sandblasting shot were disposed in this area which was used for the refurbishing (shot-blasting, repainting, and restenciling) of projectiles. Contaminants of concern included metals, PCBs, and semivolatiles. Approximately 54 tons of contaminated soil were excavated and disposed of off-site during a 1996 removal action. Additional soil was excavated subsequent to this action to meet State of New Jersey Impact to Ground Water criteria and then the area was covered with clean soil. EPA deemed the removal action to be satisfactory and complete on March 27, 1997.

Site 29: PCB Spill Site

An unknown quantity of PCBs spilled from a transformer in a storage yard in 1981. Within five days of the spill, the Navy excavated and disposed of off-site, over 120 cubic yards of discolored soil. Surface soil and subsurface soil only showed trace levels of pesticides, PCBs, and total petroleum hydrocarbons (TPH), with the exception of one elevated level of TPH (28,000 mg/kg). No PCBs were detected in sediment samples or ground water. Any residual PCBs, pesticides, and petroleum hydrocarbons are not expected to significantly migrate via overland runoff or infiltration, nor is there evidence that they may have migrated before they were removed.



HOPKINS FARM SUPERFUND SITE
PLUMSTED TOWNSHIP, OCEAN COUNTY, NEW JERSEY

PROPOSED PLAN

JULY 1996

► **PURPOSE OF THE PROPOSED PLAN**

This Proposed Plan presents the preferred No Further Action remedy for the Hopkins Farm Superfund Site located in Plumsted, Ocean County, New Jersey. This document is issued jointly by the U.S. Environmental Protection Agency (EPA) and the New Jersey Department of Environmental Protection (NJDEP). It presents EPA's and NJDEP's rationale for the selection of a No Further Action alternative for the site.

EPA and NJDEP are issuing this Proposed Plan as part of their public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made if public comments and other information indicates that such a change will result in a more appropriate remedial action.

EPA, in conjunction with the NJDEP, will select the remedy to be implemented at the site only after all public comments have been taken into consideration.

✓✓ *Mark Your Calendar* ✓✓
PUBLIC MEETING
Tuesday, August 6, 1996
7:00 pm
Plumsted Township Municipal Bldg

The preferred alternative is based on EPA's and NJDEP's careful evaluation of data collected at the site. Most of the data is contained in a number of key documents, including: the *Remedial Investigation (RI)*

Report which describes the site characterization performed; data collected during and after the Removal Action performed at the site which is summarized in the report titled *Final Summary Report, Surficial Waste and Subsurface Soil Removal Program*; and the *Baseline Risk Assessment Report* which evaluates risks currently posed to human health and the environment by the site.

These documents, as well as other information related to this No Further Action recommendation, can be found in each of the public information repositories which have been established to provide information to the public about the investigations at the site and the proposed remedy. EPA and NJDEP encourage the public to review these documents in order to gain a more comprehensive understanding of the site and activities that have been conducted.

The information repositories have been established at the locations listed below:

New Jersey Department of
Environmental Protection
CN 413
401 East State Street
Trenton, New Jersey 08625
Contact: Heather Swartz
(609) 984-3081

and

New Egypt Library
10 Evergreen Road
New Egypt, NJ 08533
Contact: Barbara Rothlein
(609)758-7888

► **COMMUNITY ROLE IN THE SELECTION PROCESS**

NJDEP and EPA solicit input from the community involving the cleanup methods proposed at each Superfund site. Public input is an important part of the remedy selection process. A public comment period of 30 days has been scheduled from **July 25, 1996 to August 23, 1996** and includes a public meeting, at which time NJDEP and EPA will present the Proposed Plan, answer questions and accept both oral and written comments.

A public meeting is scheduled for August 6, 1996 beginning at **7:00 p.m.** in the Plumsted Township Municipal Building. Comments on the Proposed Plan, the RI Report, the Risk Assessment Report, removal activities, or any other information or activities performed at the site which support the proposed No Further Action alternative will be welcomed through August 23, 1996. Public comments will be summarized and responded to in the Responsiveness Summary section of the Record of Decision (ROD) for the Hopkins Farm site. The ROD is a document that presents the final selection of the cleanup alternative for the site. Availability of the ROD will be announced and copies will be made available to the public at the information repositories listed above.

Written comments and requests for further information should be directed to:

Mary Anne Rosa
Southern New Jersey Superfund Section
U. S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866
212-637-4407

► **SCOPE AND ROLE OF ACTION**

This Proposed Plan addresses the first and only projected operable unit at the Hopkins Farm Superfund site. A number of organic and inorganic contaminants were detected in site soil, sediment and ground water during the Remedial Investigation performed by NJDEP from 1987 through 1991. In 1992 and 1994, two phases of a Removal Action were

performed. During the Removal Action, all contaminated soil and debris were excavated and transported off-site for disposal. The contaminated soil and debris had acted as a source of groundwater and sediment contamination. Based on an analysis of groundwater data collected after the Removal Action, as well as surface water and sediment data collected prior to and during the Removal Action, EPA and NJDEP have determined that the site does not pose any unacceptable human health or ecological risks. Therefore, as further explained in this Proposed Plan, EPA and NJDEP are proposing a No Further Action alternative for the Hopkins Farm site.

► **SITE DESCRIPTION**

Site Location and Characteristics

The Hopkins Farm site is located approximately one-quarter mile north of State Highway Routes 528 and 539, on the east side of Route 539, in Plumsted Township, Ocean County, New Jersey (Figure 1). The site is located on Block 48, Lot 16 in Plumsted Township and is privately owned. The site property consists of approximately 57 acres, of which approximately one acre was previously used for disposal of waste materials. The site is bordered on the west by Route 539 and on the other sides by undeveloped, wooded lots. Access to the site is through an unimproved, dirt road which enters the wooded area at the southeastern corner of the Hopkins Farm field. Access to the field is via a dirt road off of Pinehurst Road. The area surrounding the site is rural-residential. The nearest residence is located approximately 500 feet southeast of the site. Approximately 200 residences are located within a one mile radius of the site.

The site property is divided approximately in half by a fresh water stream, which is an unnamed tributary to Lahaway Creek. The stream flows from south to north along the eastern site boundary and turns to flow westward along the northern site boundary before it joins Crosswicks Creek approximately two miles downstream. The stream is three to five feet wide and

approximately six inches deep. Marshy areas are present along the stream valley. An exceptional value wetland has been identified in the vicinity of the stream and supports a number of colonies of swamp pink (*Helonias bullata*), a federally listed threatened plant species. The central portion of the site slopes eastward toward the stream. A narrow ditch (also referred to as a swale) runs along the toe of the slope and channels water toward the stream. The central portion of the site is the area where most of the waste material was previously observed at the site.

Site History

The Hopkins Farm site is one of seven sites in the area of Plumsted Township allegedly used to dispose of chemical wastes from the Thiokol Corporation during the late 1950s and early 1960s. Investigations by the Ocean County Health Department, Plumsted Township representatives and NJDEP began

in 1980 and led to the installation of six groundwater monitoring wells in June of that year. Chemical analyses were performed on two groundwater samples and one soil sample during that investigation. Contaminants detected in the ground water included organic chemicals such as ethylbenzene, toluene and benzene. Traces of pesticides were also detected. Inorganic chemicals detected in the ground water included antimony, arsenic and chromium. The soil sample contained the contaminants ethylbenzene, toluene and benzene.

An unnamed stream and wetland area are adjacent to the area formerly used for waste disposal. These wetlands lie in a valley approximately ten feet lower than the surrounding ground surface. A portion of the wetland area forms a swale which drains surface water runoff from the upland area of the site into the stream. Evidence of waste dumping such as laboratory glassware, rusted

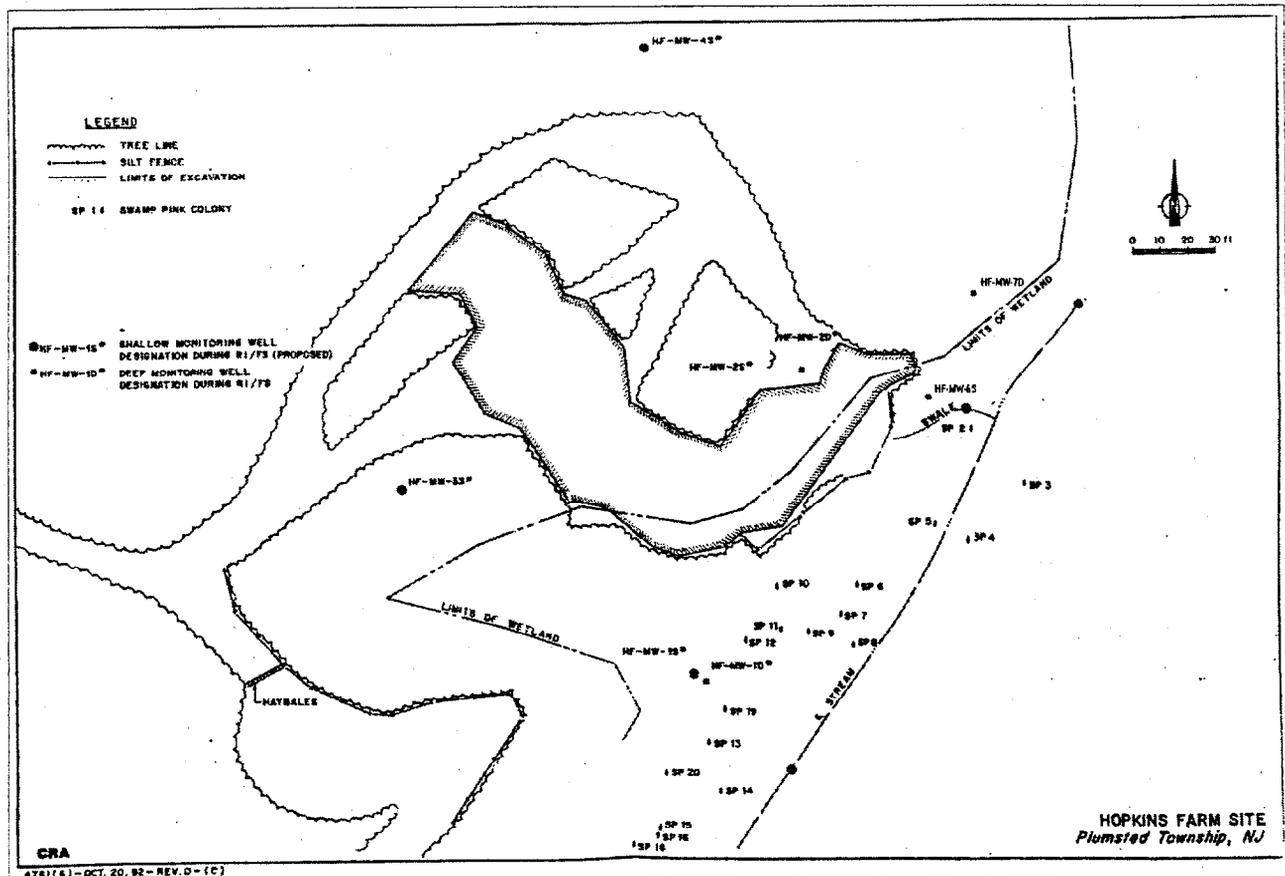


Figure 1 - Site Map

pails, chemical materials and household wastes were once visible on the western bank of the stream/wetland valley and, also, in a small depression in the upland area, west of the valley. Most of the industrial waste was found in the central area of the site and consisted of a rubbery, tar-like mass that covered the bottom of what appeared to be a natural depression. The depression was ringed with five-gallon pails, laboratory glassware, small patches of industrial waste and other debris.

In November of 1982, NJDEP inspected the site and scored it according to the Hazard Ranking System. Based on this ranking, the site was included on the National Priorities List on September 1, 1984.

As a precaution, to protect any new potable wells from potential groundwater contamination from the site, in 1987, NJDEP established a Well Restriction Area (WRA) at the Hopkins Farm and surrounding properties within approximately 2,000 feet of the site, based on hydrological estimates of the potential extent of any groundwater contamination. The WRA advised that any new wells to be installed on the restricted properties be drilled at least 150 feet deep. This would insure that the wells would be located in an aquifer separate from the upper, potentially contaminated one.

In July 1986, NJDEP issued a directive to Morton Thiokol, Incorporated (MTI, now Morton International, Inc. (MII)) requiring the company to pay NJDEP for the cost of a Remedial Investigation and Feasibility Study (RI/FS) at the site. On December 3, 1987, NJDEP and MTI entered into an Administrative Consent Order (ACO) in which MTI agreed to comply with this directive.

In January 1987, Acres International Corporation was contracted by NJDEP to perform the remedial investigation and feasibility study (RI/FS) to determine the nature and extent of contamination at the site and to recommend cleanup alternatives. The RI was performed in two phases from 1987 through 1991. The results of the RI/FS are

summarized in the May 1991 RI Report and the February 1992 FS Report which are included in the Administrative Record for this site and are summarized in this document.

Based on the findings of the RI, on August 23, 1991, NJDEP entered into an Administrative Consent Order (Order) with MII. Under the terms of this Order, MII agreed to perform a Removal Action at the site to address surficial waste and associated soil. The removal action was performed in two phases and included the excavation and off-site disposal of waste materials and contaminated soils. A detailed description of the Removal Action is included in the December 1994 report titled *Final Summary Report, Surface Waste and Subsurface Soil Removal Program* which is included in the Administrative Record for this site and is summarized below.

Remedial Investigation Findings

The RI included: a geophysical survey; a soil gas survey; waste material investigations; soil sampling; groundwater monitoring; surface water sampling; sediment sampling; and a qualitative health and environmental risk assessment. Note that the findings of the RI are reflective of site conditions in 1991, prior to the removal of waste materials and associated soils. The results of the RI are presented here to provide a historical perspective of the site and to provide a basis for comparison of current site conditions. The site conditions described in the RI Report are not, for the most part, reflective of current site conditions. Current site conditions are described in the Removal Action section of this Proposed Plan.

The results of the RI are summarized as follows:

Hydrology

Geotechnical analysis of deep soil borings indicates that the site is underlain by recent sand or fill deposits up to four feet thick. In the stream valley, recent deposits consist of a two foot thick layer of organic soils over up to six feet of sand. The next formation

encountered is the Cohansey Sand/Upper Kirkwood Formation with a thickness of 26 to 32 feet. Underlying the Cohansey Sand/Upper Kirkwood Formation is the Lower Member of the Kirkwood Formation which is 13 to 18 feet thick and consists of silty sand to sandy clay. Underlying the Kirkwood Formation is the Lower Manasquan Formation composed of sand to sandy clay, at depths of 47 to 53 feet. The Vincetown Formation was encountered at depths of approximately 85 feet and consists of extremely dense sands. The Lower Kirkwood and Lower Manasquan Formations are thought to form a composite aquitard below 40 to 50 feet, discouraging any transfer of contaminants to deeper aquifers. Due to its density, the Vincetown Formation is also considered a confining layer, incapable of carrying significant water flow, to a depth of 100 feet.

Waste Materials

Three general types of industrial waste material were found on-site including: grey-green, tar-like material; reddish brown to black, tar-like material; and a yellow to light brown solid with a vesicular texture. Some laboratory glassware, rusted five-gallon pails and household trash were found mixed with the waste. The waste materials were found to contain hazardous organic chemicals including: methylene chloride; acetone; chloroform; 2-butanone; trichloroethene; benzene; toluene; xylenes; phenol; bis(2-chloroethoxy)methane and bis(2-ethylhexyl)phthalate. Inorganic chemicals were also detected including arsenic, chromium, lead, mercury, cyanide, copper and zinc.

The industrial waste material had been dumped over the edge of an embankment and down onto a low lying area. The waste dumping occurred over an area of less than an acre in size. Surrounding this central area was an area containing mixed wastes, including various forms of industrial and household wastes. Industrial wastes observed at the site included glassware, metal containers, rubbery masses, and foam-like material.

Soils

Analytical results from a total of 13 soil samples were presented in the RI Report. These samples included three surface soil samples (from a depth of zero to two feet) and soil samples collected from a variety of depths from borings installed during monitoring well construction.

Two of the three surface soil samples were collected in the area of disposal. The other sample was taken from a background location. A number of volatile organic compounds (VOCs) including acetone, 1,1,1-trichloroethane, vinyl acetate and benzene were detected. The semi-volatile organic compounds phenol, bis(2-chloroethoxy) methane, 4,6-dinitro-2-methylphenol, bis(2-ethylhexyl)phthalate, and benzo(a)pyrene were detected. In addition, the pesticides 4,4'-DDT, Endosulfan Sulfate, and Endrin Ketone were detected in these samples at low levels. Several inorganic compounds were detected at elevated levels.

Of the subsurface soil samples, the levels of total VOCs ranged from 3.6 parts per billion (ppb) to 4,380 ppb. The VOC contaminants detected at the highest levels were acetone, methylene chloride, and vinyl acetate. A number of semi-volatile compounds including benzo(a)pyrene, bis(2-ethylhexyl)phthalate, and phenol as well as several inorganic compounds were also detected at elevated levels in some of the subsurface soil samples. Some additional compounds were detected in the subsurface soil as compared to the surface soil.

Analytical results from all soil samples were compared to New Jersey Soil Action Levels, which were guidelines recommended for site cleanups by NJDEP at that time. Only one soil sample located in the central area of the site exceeded these guidelines. The inorganic compounds antimony, copper and lead were noted to exceed the 1991 Soil Action Levels established for these compounds.

Ground Water

Seven monitoring wells were installed and

sampled during the RI. Of these wells, five

are considered shallow wells and two are deep wells. The shallow wells are screened to monitor the uppermost 10 feet of the shallow, unconfined water table aquifer. The two deep wells, designated as MW-1D and MW-2D, are set to screen the bottom of the unconfined water table aquifer and are screened to a depth of 40 and 45 feet, respectively. In addition to these wells, ground water was sampled from two residential wells located within one mile of the site. At the beginning of RI activities in 1987, six wells installed in 1980 were deemed unsuitable for groundwater sampling, as they had not been secured with protective casings and some wells were missing caps. These wells were used, however, to provide supplemental groundwater elevation data, and they were later sealed.

Based on water level measurements, the direction of shallow groundwater flow was determined to be east to northeasterly. Shallow groundwater discharge to the stream on-site was evidenced by the upward gradient observed in the two deep wells. The depth to ground water from the ground surface ranges from 11.5 feet in the upland portion of the site to approximately the land surface in the stream valley. Regional groundwater flow direction in the deeper portion of the Kirkwood/Cohansey aquifer system is generally eastward.

There were two rounds of groundwater sampling performed during the RI. These rounds are referred to as Phase I and Phase II sampling. Phase I sampling was performed in January 1988. Seven VOCs were detected at low levels. However, it should be noted that different VOC compounds were identified at different wells, thereby indicating the absence of a VOC plume. Total VOC concentrations ranged from non-detect in three wells (MW-1S, MW-2S and MW-2D) to 41.8 ppb in well MW-5S. Bis(2-ethylhexyl) phthalate, a semi-volatile organic compound, was detected in three wells. A number of inorganic compounds were also detected in the wells.

Phase II sampling was performed in May 1990. Four VOC compounds detected in Phase I were again detected in Phase II

(carbon disulfide, toluene, 1,1,1-trichloroethane and xylene), and four additional VOCs were detected in Phase II at low levels. The semi-volatile compound, bis(2-ethylhexyl)phthalate was detected in both phases of sampling. All contaminants detected in groundwater were compared to existing health-based standards at the time of the RI. Only one compound, tetrachloroethene, exceeded its New Jersey Safe Drinking Water Standard, which is 1 ppb. Tetrachloroethene was detected in MW-2D at an estimated level of 3 ppb, and in MW-1S at an estimated level of 1 ppb. Resampling of these wells was performed and the samples were analyzed for VOCs. Tetrachloroethene was not detected in the additional samples, however, carbon disulfide and 1,1,2,2-tetrachloroethane were detected at levels of 2 ppb and 7 ppb, respectively.

Residential Wells

Two residential wells were sampled in January 1988. Both of these wells were upgradient of groundwater flow from the site. No potable wells were located downgradient within one half mile of the site. No organic or inorganic contaminants were confirmed to be present in these wells at levels above established drinking water standards.

Surface Water and Sediments

The stream located on-site, an unnamed tributary to Lahaway Creek, is typically three to six feet wide and six inches deep. It flows year round and is fed by groundwater seepage. A ditch that occasionally holds standing water is located at the site. During Phase I of the RI (January 1988), three surface water and sediment samples were collected from the stream: upstream, downstream and adjacent to the site. A surface water and sediment sample was also collected from the ditch. During Phase II of the RI (May 1990), one surface water and sediment sample was taken from the on-site ditch. No industrial waste was ever observed in the stream, but waste material as well as visible sediment contamination was observed in the ditch. Additional sediment sampling was performed in 1992, after the first phase of

the Removal Action was performed at the site (that data is discussed in the Removal Action section, below).

No VOCs were detected in site surface water samples. Bis(ethylhexyl)phthalate was reported in the upstream surface water sample at an estimated level of 30 ppb. A pesticide, methoxychlor, was detected in a downstream sample at a level of 9 ppb. A number of contaminants at elevated levels were detected in the surface water sample from the ditch.

In the May 1991 RI report, the risk to ecological receptors via contact with and/or ingestion of surface water was estimated by comparing contaminant levels detected in the stream and ditch surface water to the Ambient Water Quality Criteria (AWQC). For VOCs, none of the AWQC were exceeded in the stream or ditch. In the stream, no inorganic AWQC were exceeded. In the ditch, six contaminants in the standing water exceeded AWQC for acute and/or chronic exposure. These contaminants are: cadmium; copper; lead; silver; zinc, and mercury.

Two VOCs, one semi-volatile compound and six inorganic compounds were detected in stream sediment. A greater variety and higher concentrations of contaminants were detected in ditch sediment. No sediments standards were available for comparison, however, the levels of contaminants in sediment were compared to the New Jersey Soil Action Guidelines in the RI Report. Stream sediment samples did not exceed any NJDEP Soil Action Guideline criteria. However, ditch sediment samples did exceed the guidelines for lead. Note that contaminated ditch sediments were later excavated and removed from the site for disposal.

Air

Ambient air monitoring for organic contamination was performed at the site during the RI. No contamination was detected during the monitoring program. A faint odor was noticeable at the site, mostly near the exposed waste. The inability to detect the odor with instruments may be attributable to either its inorganic nature, or

due to high molecular weight compounds which were not detectable by the sampling equipment. Since the chemical wastes at the site have been removed, the odor problem has been mitigated.

Removal Action

As stated above, based on the findings of the RI, on August 23, 1991, NJDEP entered into an Order with MII. Under the terms of this Order, MII agreed to perform a Removal Action at the site to address surficial waste. The Removal Action was performed in two phases and included the excavation and off-site disposal of waste material, and underlying contaminated soils.

Prior to the initiation of excavation activities, additional sediment samples were collected from the on-site ditch to further define the extent of contamination. The first phase of the Removal Action was performed in July and August of 1992. Activities included excavation, sampling and appropriate off-site disposal of waste materials and associated soils. The extent of waste materials was discovered to extend approximately three to five feet below grade. During Phase I of the Removal Action, 841.95 tons (565 cubic yards) of waste material were excavated and transported off-site for treatment by stabilization and then disposal in a hazardous waste landfill due to elevated levels of lead. This excavation addressed soils in and around the area of disposal, including impacted soils in the ditch. After this first phase of the Removal Action, a number of soil samples were collected to determine if any additional excavations were necessary. From this data, NJDEP identified as contaminants of concern all compounds detected at levels above the NJDEP Soil Cleanup Criteria, which are used as guidelines for soil cleanup. The contaminants of concern included: bis(2-chloroethyl)ether; cadmium; selenium; and 1,2-dichloroethane. In addition, bis(2-chloroethoxy)methane was identified at elevated concentrations, although no cleanup standard was available for comparison.

After these contaminants of concern were

identified by NJDEP, MII collected additional groundwater, surface water, sediment and soil samples in November 1992 and January 1993. In addition, samples were also collected in April 1994. NJDEP recommended that MII take additional measures to mitigate the potential spread of contaminants remaining in site soils to the adjacent wetlands and ground water. MII agreed to excavate and properly dispose of additional soils in a second phase of the Removal Action.

The groundwater sampling performed during the Removal Action indicated some elevated levels of contaminants primarily in the center of the former disposal area of the site. NJDEP Ground Water Quality Standards were exceeded for the following compounds: 1,2-dichloroethane; benzene; chloroform; methylene chloride; toluene; bis(2-chloroethyl)ether; cadmium; tetrachloro-ethylene; and selenium. Contaminants were detected at three sample locations at elevated levels and most of the elevated levels of these contaminants were detected in one groundwater sample.

Surface water and sediment sampling was also performed during the Removal Action. Bis(2-chloroethyl)ether, bis(2-chloroethoxy)methane, bis(2-chloroisopropyl)ether, cadmium and selenium were detected in one of the two sediment samples collected. The other sediment sample did not contain any contaminants. Bis(2-chloroethyl)ether, bis(2-chloroethoxy)methane, and cadmium were detected in stream surface water samples. The level of cadmium detected in the surface water sample exceeded established criteria for the protection of aquatic life.

Phase II of the Removal Action was initiated in June 1994 and resulted in the excavation and off-site disposal of 599.45 tons (450 cubic yards) of subsurface soils. These soils were classified as non-hazardous and were disposed of at an off-site landfill. Phase II included soil excavation down to and within the saturated zone in impacted areas. Therefore, after completion of Phase II of the Removal Action, no post-excavation soil samples were collected from the bottom of the excavation. A number of soil samples taken around the

edges of the excavation during the Removal Action confirmed that the full extent of lateral contamination had been addressed. Only two contaminants were detected in wetland areas outside the area of excavation, bis(2-ethyl-hexyl)phthalate and selenium. The levels of these contaminants detected were well below NJDEP proposed standards established for protection of humans from direct contact risks.

In 1995, two additional groundwater monitoring wells (referred to as HF-MW-6S and HF-MW-7D) were installed at the site. The purpose of these wells was to provide for a more detailed evaluation of the extent of groundwater contamination at the site after the excavation of waste materials and impacted soils. Two rounds of groundwater sampling were then performed at all nine of the on-site wells. These sampling events took place in May and July of 1995. None of the groundwater samples collected after completion of the second phase of the Removal Action contained contaminants at levels that exceeded federal or state risk-based standards. The results of the groundwater analyses are discussed in detail in the Summary of Site Risks section of this document, below.

► SUMMARY OF SITE RISKS

The May 1991 RI Report included a Public Health and Environmental Assessment. This assessment provided a qualitative assessment of the health effects at the site as it existed prior to the Removal Action. At that time, industrial waste and debris were present at the site and hazardous substances had been detected in waste material, soil, ground water, surface water, and sediment. The conclusions of this assessment can be found in the May 1991 RI Report, which is part of the Administrative Record for the site. These conclusions are not presented in this document, as they are no longer relevant based on current site conditions.

In 1992 and 1994, a two-phased Removal Action was performed at the site, as described above, which included the excavation and off-site disposal of all waste materials, debris and

contaminated soils at the Hopkins Farm site. This Removal Action was performed by MII, under NJDEP oversight. The risks once posed to human health or the environment by these materials no longer exist. In June 1996, EPA completed a document titled "Baseline Risk Assessment" for the Hopkins Farm Site (Risk Assessment). This Risk Assessment evaluated risks posed by any residual contaminants currently present at the site.

► HUMAN HEALTH RISK ASSESSMENT

In June 1996, EPA completed a Baseline Risk Assessment for the Hopkins Farm Superfund site. This risk assessment evaluated human health risks associated with both current and future land uses, were there to be no further remedial actions taken. Risks were evaluated based on potential human exposure to contaminants currently present in site soil, sediment and ground water. To be most protective of human health, the baseline risk assessment assumed that the site would be developed for residential use in the future. This is based on the current use of property in the area of the site as rural-residential.

The data used in the baseline risk assessment was collected during and after the Removal Action performed at the site. During the second phase of the Removal Action in 1994, all waste materials and contaminated soils were excavated below the water table and properly disposed of at an off-site facility. Soils around the limits of excavation, as well as stream surface water and sediment were sampled and analyzed. The results of the analysis of the soils and sediment, as well as groundwater sampling performed in nine monitoring wells in 1995 were evaluated as part of the human health risk assessment. Contaminants present in stream surface water were evaluated in the ecological assessment.

A four-step process is utilized for assessing site-related human health risks for a reasonable exposure scenario: "Hazard Identification" identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence and concentration. "Exposure Assessment" estimates the magnitude of actual and/or

potential human exposures, and the pathways (e.g., ingestion of contaminated well water) by which humans are potentially exposed. "Toxicity Assessment" determines the types of adverse health effects associated with the chemical exposures and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). "Risk Characterization" summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative (e.g., one-in-one million excess cancer risk) assessment of site-related risks.

The baseline risk assessment began with selecting contaminants of concern which would be representative of site risks. Because relatively few contaminants were detected in site soils, sediments and ground water, all of the detected contaminants were considered potential contaminants of concern. These contaminants included acetone, chloroform, trichloroethylene, benzene, toluene, bis(2-chloroethoxy)methane, cadmium, chromium, selenium and lead.

The baseline risk assessment evaluated the human health risks posed by the site by comparison of identified contaminants of concern to established Federal and State drinking water standards and EPA's Soil Screening Levels Guidance, as appropriate. Based on the current residential use of the area surrounding the site, the risk assessment evaluated residential exposure scenarios for exposure to potential site-related contaminants in surface soils, sediments and ground water.

In ground water, a total of 13 contaminants were detected. The levels detected for 12 of these compounds were well below both Federal and State risk-based standards established for these compounds. The other compound, bis(2-chloroethoxy)methane, was detected at a maximum level of 1 part per billion. EPA lacks sufficient data to generate and estimate of the toxicity of this compound, and there are no established Federal or State risk-based standards or guidelines established for this compound. However, bis(2-chloroethoxy)methane was detected rarely and was estimated to be present at very low

levels at the site. Furthermore, a well restriction area in place at the site would prevent any resident from coming into contact with this contaminant in drinking water.

In site soils and sediments, a total of five compounds were detected during the Removal Action in a total of six samples. Three of these contaminants, bis(2-chloroethyl)ether, bis(2-chloroethoxy)methane, and cadmium, were only detected in one of the six samples. Bis(2-ethylhexyl)phthalate was detected in four out of six samples, and selenium was detected in five out of six samples collected. The levels of these contaminants were compared to levels established in EPA's Soil Screening Guidance. The Soil Screening Guidance has been developed by EPA as a tool to help standardize and accelerate the evaluation and cleanup of contaminated soils at Superfund sites. Generic Soil Screening Levels (SSLs) are risk-based comparison values for protection of ground water and ingestion of soils that are derived from equations combining conservative exposure scenarios and toxicity values obtained from EPA databases. Generally, at sites where contaminant levels are below SSLs, no further action or study is warranted. Maximum levels of contaminants detected in soils and sediments were compared to their SSLs in EPA's Baseline Risk Assessment. With the exception of bis(2-chloroethyl)ether, no SSLs were exceeded. The concentration of bis(2-chloroethyl)ether in a single sample at the site exceeded the generic SSL for protection of ground water. However, this compound was not detected in ground water at the site. The estimated concentration of bis(2-chloroethyl)ether was considerably below the SSL for ingestion of soil and the low concentration of this compound is unlikely to be of concern at the site.

In summary, the Baseline Risk Assessment concluded that the levels of compounds detected in ground water, soils and sediments at the Hopkins Farm site, evaluated under conservative scenarios for exposure to humans, did not present significant risks to human health or the environment.

► ECOLOGICAL RISK ASSESSMENT

A flora and fauna survey was conducted at the site during the RI in May 1990 by NJDEP. The goal of the survey was to compile a site inventory of plants and animals, and to identify any rare and endangered species or their habitat. Details regarding this survey are presented in the RI Report. The RI Report indicates that no rare or endangered species were identified at that time.

In May 1992, during a visit to the site to evaluate potential requirements for restoration related to the ongoing Removal Action, MII's consultant observed swamp pink (Helonias bullata). Swamp pink is a federally listed threatened plant species. The species is listed as endangered by the State of New Jersey. Based on this finding, modifications were made to plans for the second phase of the Removal Action to provide monitoring of water levels around the swamp pink colonies and to assure the protection of the plants.

As all known waste, debris and associated soil contamination has been addressed in the Removal Action performed at the site, the primary media of concern in evaluating ecological risks were determined to be the surface water and sediment in the stream. There is not a direct route of exposure to groundwater contamination by ecological receptors. Prior to the Removal Action performed at the site, standing water and sediment associated with the ditch had elevated levels of contaminants in them and presented an ecological risk. However, since these risks have been mitigated by the removal of all contaminated materials, this area is not considered to pose any current ecological risk.

Analytical data collected during the RI and the Removal Action on sediment samples were compared to sediment screening values to evaluate any ecological risk that these sediments may pose. The screening values that were used for comparison were included in the "Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario" (D.Persaud, et al.) The contaminant levels detected in these samples are not significantly elevated. However, the concentrations of copper and zinc in one

sediment sample collected in 1992 exceeded the screening levels for these compounds. These exceedences at a single location may not indicate the likelihood for significant risks to ecological receptors, however, additional monitoring along the stream is appropriate to ensure that contaminants have not concentrated on the sediments or are not migrating downstream where they may pose some environmental risk.

Surface water in the stream was sampled between 1992 and 1993 (between the two phases of the Removal Action). Surface water was only found to be impacted in a limited manner by previous waste disposal at the site. During this sampling event, only three compounds were detected in surface water samples in the stream. These compounds are: bis(2-chloroethyl)ether; bis(2-chloroethoxy)methane; and cadmium. After this sampling event, additional contaminated soils, which are the likely source of any surface water contamination in the stream, were excavated and removed from the site. The level of cadmium detected in one surface water sample exceeded established standards for protection of aquatic life. However, based on the fact that after this sample was collected additional contaminated soils were removed from the site, it is believed that surface waters at the site do not currently pose a significant ecological risk. This will be verified with additional sampling. Furthermore, since all known areas of soil contamination have been removed from the site in the second phase of the Removal Action, it is believed that there is not a future risk posed to ecological receptors at the site from surface water.

Based on the evaluation of data collected at the site, the actual or threatened releases of hazardous substances from this site are not considered to present a current or potential threat to public health or the environment.

► **EVALUATION AND SUMMARY OF THE PREFERRED "NO FURTHER ACTION" REMEDY**

The No Further Action Remedy would involve no further remedial action at the site. The Removal Action performed by MII and

completed in 1994 has effectively removed the source of contamination. The human health risk assessment performed for the site has indicated that the site, as it currently exists, poses no unacceptable risks to human health.

A qualitative environmental assessment was also performed which indicated no contaminants currently present at the site pose an ecological risk warranting an action at this time.

As part of the No Further Action Remedy, a minimum five year period of groundwater, surface water, and sediment monitoring will be required. Samples will be collected and analyzed for VOCs, semi-volatile, and inorganic compounds for the first year on approximately a quarterly basis. The monitoring program may be modified based upon sampling results collected during the first year. Annual monitoring will be the minimum requirement. Currently, EPA and NJDEP do not believe that additional groundwater monitoring wells will be required for the purpose of the sampling program. However, if the results of the initial rounds of sampling indicate that additional wells are necessary, then they will be installed. In addition to monitoring for chemical contamination, qualitative monitoring of the revegetated area will be conducted to insure that the planted species survive or are replaced, as needed. The swamp pink plants will also be monitored to insure protection of the plants.

After five years, or less if the sampling and analyses indicate the need for action, the potential risks to human health and the environment will be reassessed. The groundwater monitoring would then either be continued for another five year period, or other action considered. If monitoring reveals that contamination at the site increases so that an unacceptable risk to human health or the environment develops, an appropriate action can be initiated at any time during the five year period to address the risks.

Restoration of the site has already taken place as part of Removal Action activities. After

removal of contaminated soils, the site was backfilled with clean soil from an off-site source. Final surface contour grades were established to restore the site to what were believed to be natural grades existing prior to waste disposal. The wetland areas and wetland/upland transition areas which were impacted by the Removal Action were replanted with approved species. The site restoration planting will be monitored and maintained throughout the period of long-term monitoring.

Under the No Further Action alternative, the existing Well Restriction Area would continue in effect for the Hopkins Farm site for at least five years. This will prevent

human contact with the shallow ground water by advising any persons drilling new potable wells to install the wells to a depth of at least 150 feet deep. The Well Restriction Area may be modified by the NJDEP depending on the results of groundwater monitoring data.

The present worth cost of the initial five year monitoring program is estimated to be \$417,000.

The preferred No Further Action alternative for the site has been developed based on the findings of the RI Report, the Baseline Risk Assessment Report and data collected during and after the completion of the Removal Action. The remedy is protective of human health and the environment and is cost-effective. The public is encouraged to review these findings and offer comments on these documents.