United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R02-87/043
September 1987

EPA

Superfund Record of Decision:

Waldick Aerospace Devices, NJ

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

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EPA/ROD/R02-87/043		

4. TITLE AND SUBTITLE	5. REPORT DATE
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15. SUPPLEMENTARY NOTES

16. ABSTRACT

The Waldick Aerospace Devices (WAD) site is a 1.72-acre inactive industrial facility located in the Sea Girt Section of Wall Township, Monmouth County, New Jersey. The site consists of three buildings located on the northern, western and southern border. WAD was originally purchased and developed in the mid 1950s by Mr. Warren de Montmorency. The designated owner of the site since 1979 is KDD Realty Corporation of which Mr. de Montmorency is president. In 1979 the site was leased to Waldick Aerospace Devices, Inc. This firm manufactured and electroplated quick-release pins for the aerospace industry for five to six years. For at least the first three years of operations, waste water containing heavy metals and organic solvents was discharged directly onto the ground on either side of the southern corner of the main building. Additionally, spent machine oil was allowed to drain out of perforated drums onto the ground at the rear (western side) of the main building. In 1982, acting on information received from a former Waldick employee, the New Jersey Department of Environmental Protection (NJDEP) conducted an inspection of the Waldick facility. Numerous violations were recorded and, in 1982, NJDEP ordered Waldick to undertake cleanup activity. Some measures were taken; however, subsequent sampling indicated continued contamination of soil and ground water by heavy metals and volatile organics. In 1986 a removal action was undertaken by the U.S. EPA to repack and remove several chemical containers containing granite and a
(See Attached Sheet)

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Waldick Aerospace, NJ First Remedial Action Contaminated Media: buildings, soil, gw Key contaminants: VOCs, PHCs, cadmium, chromium		

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16. ABSTRACT (continued)

wide range of chemicals. The western soil area is contaminated primarily with VOCs and petroleum hydrocarbons (PHCs). The southern and eastern areas contain high levels of cadmium and chromium, as well as VOCs and PHCs.

The selected remedial action for this source control operable unit includes: in-situ air stripping of contaminated soils under and around the main building (8,000 yd^3); excavation and offsite disposal of treated soils (2,500 yd^3) with residual contamination above action levels; demolition or decontamination of onsite building, depending on the volume of soils beneath the main building requiring excavation and offsite disposal; and installation of ground water monitoring wells, site fence and well restrictions. The estimated capital cost of the selected remedy is $2,602,118 with annual O&M of $55,000.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: SEP 16 1987

SUBJECT: Record of Decision for Waldick Aerospace Devices

FROM: Stephen D. Luftig, Director
Emergency and Remedial Response Division

TO: Christopher J. Daggett
Regional Administrator

Attached for your approval is the Record of Decision (ROD) for the Waldick Aerospace Devices site in Wall Township, New Jersey. You verbally concurred with the preferred alternative for this site at our July 15, 1987 briefing on the results of the remedial investigation and feasibility study.

The selected remedy is the first operable unit at the Waldick site. It involves a source control action including building remediation and treatment of the contaminated soils. Excavation and off-site disposal of some of the treated soils will be necessary, although the actual volume removed will depend on the effectiveness of the treatment process. Future actions at Waldick will focus on off-site ground and surface waters and be the subject of a subsequent ROD. The capital cost for the source control action is $2.6 million, with a present worth of $3.2 million.

A public meeting to discuss the recommended alternative was held on July 23, 1987. The public did express its agreement with the source control action at that time. However, some residents were concerned about their drinking water and whether the buildings would be safe for occupancy after decontamination. Assurances were provided that the ground water investigation would continue and, further, that we expected the decontamination procedures to render the buildings safe for future use.

The ROD has been reviewed by the appropriate program offices within Region II and the State of New Jersey, and their input and comments are reflected in this document. In addition, a letter from the Commissioner of the New Jersey Department of Environmental Protection, Richard T. Dewling, concurring with the selected remedy, is attached.

If you have any questions, I will be happy to discuss them at your convenience.

Attachments

DECLARATION STATEMENT

RECORD OF DECISION

Waldick Aerospace Devices

SITE NAME AND LOCATION

Waldick Aerospace Devices, Wall Township, Monmouth County, New Jersey

STATEMENT OF PURPOSE

This decision document presents the selected remedial action for the Waldick Aerospace Devices site, developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300, published November 20, 1985.

STATEMENT OF BASIS

I am basing my decision primarily on the following documents, which are contained in the administrative record and characterize the area and evaluate the relative merits of remedial alternatives for the Waldick site:

- Draft Remedial Investigation Report, Waldick Aerospace Devices, prepared by Camp Dresser & McKee, July 1987
- Draft Feasibility Study Report, Waldick Aerospace Devices, prepared by Camp Dresser & McKee, July 1987
- Proposed Remedial Action Plan, Waldick Aerospace Devices, July 1987
- The attached Decision Summary for the Waldick site
- The attached Responsiveness Summary for the site, which incorporates public comments received
- Staff summaries and recommendations

DESCRIPTION OF SELECTED REMEDY (Source Control Operable Unit)

The remedial alternative presented in this document is the first operable unit of a permanent solution for the Waldick site. It focuses on the contamination associated with the buildings on the site and the soils around and under those buildings. Following these source control actions, the ground water, surface water, and stream sediments will be addressed in a future operable unit, which will focus on the off-site migration of contaminants.

This source control operable unit consists of the following components:

- In-situ air stripping to treat contaminated soils around and under the main building

- Excavation and off-site disposal of all treated soils with residual contamination above action levels

- Appropriate remediation of on-site buildings by decontamination or demolition, depending on the volume of soils beneath the main building that require excavation and off-site disposal

- Installation of additional ground water wells, establishment of an environmental monitoring program, complete fencing of the site to restrict access, and well restrictions

DECLARATIONS

Consistent with the Comprehensive Environmental Response, Compensation and Liability Act, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300, I have determined that the selected remedy is protective of human health and the environment, attains federal and state requirements that are applicable or relevant and appropriate for this source control operable unit, and is cost-effective. Furthermore, this remedy satisfies the preference for treatment that reduces toxicity, mobility, or volume as a principal element. Finally, I have determined that this remedy utilizes permanent solutions and alternate treatment technologies to the maximum extent practicable.

The State of New Jersey has been consulted and agrees with the selected remedy, as is documented in the attached letter of concurrence.

I have also determined that the actions being taken at the Waldick site are appropriate when balanced against the availability of Superfund monies for use at other sites.

September 29, 1987
Date

Christopher J. Daggett
Regional Administrator

Decision Summary

Waldick Aerospace Devices

SITE DESCRIPTION

The Waldick Aerospace Devices site is an inactive industrial facility located at 2121 Highway 35 in the Sea Girt section of Wall Township, Monmouth County, New Jersey (Figure 1). The 1.72-acre site is bordered to the east by Route 35, to the south by commercial property, and to the north and west by undeveloped woodland (Figure 2).

The site consists of three buildings, which stand near the northern, western, and southern borders, as shown in Figure 2. Most of the industrial operations that produced the contamination occurred in the main (southern) building. Both the main and auxiliary (western) buildings became contaminated in the course of these activities. The north building was not used by the Waldick company and operated as a separate storefront, most recently as a retail paint store. This building has recently reopened as a retail store for sprinkler system equipment and is isolated from the site proper by a stockade fence.

Highway 35 is an industrial-commercial corridor that separates largely undeveloped land to the west from developed land to the east. Land use west of the highway consists mainly of woodland, agriculture, and scattered residential areas, although a 20-unit housing development is currently planned just north of the site. East of the highway, most properties are residential, with some waterways and recreational areas. The nearest residence to the site is downgradient and approximately one-quarter mile away, and the few residential wells present in this area are located out-of-doors and are used for irrigation. The nearest drinking water well is on a residential property approximately three-eighths of a mile upgradient of the site. Figure 3 shows the commercial buildings and residential streets downgradient of the site.

Two aquifers exist beneath the site, separated by a clay layer ten feet thick. This layer occurs between 35 and 45 feet below grade and, being somewhat permeable, allows a hydraulic connection between the two aquifers. Hannabrand Brook, shown in Figure 3, flows approximately 900 feet south of the site. It merges with a smaller stream northeast of the site and flows eastward into Wreck Pond, which drains into the Atlantic Ocean. These water bodies are used recreationally for swimming and fishing. Both ground water and surface runoff flow generally to the southeast in this area.

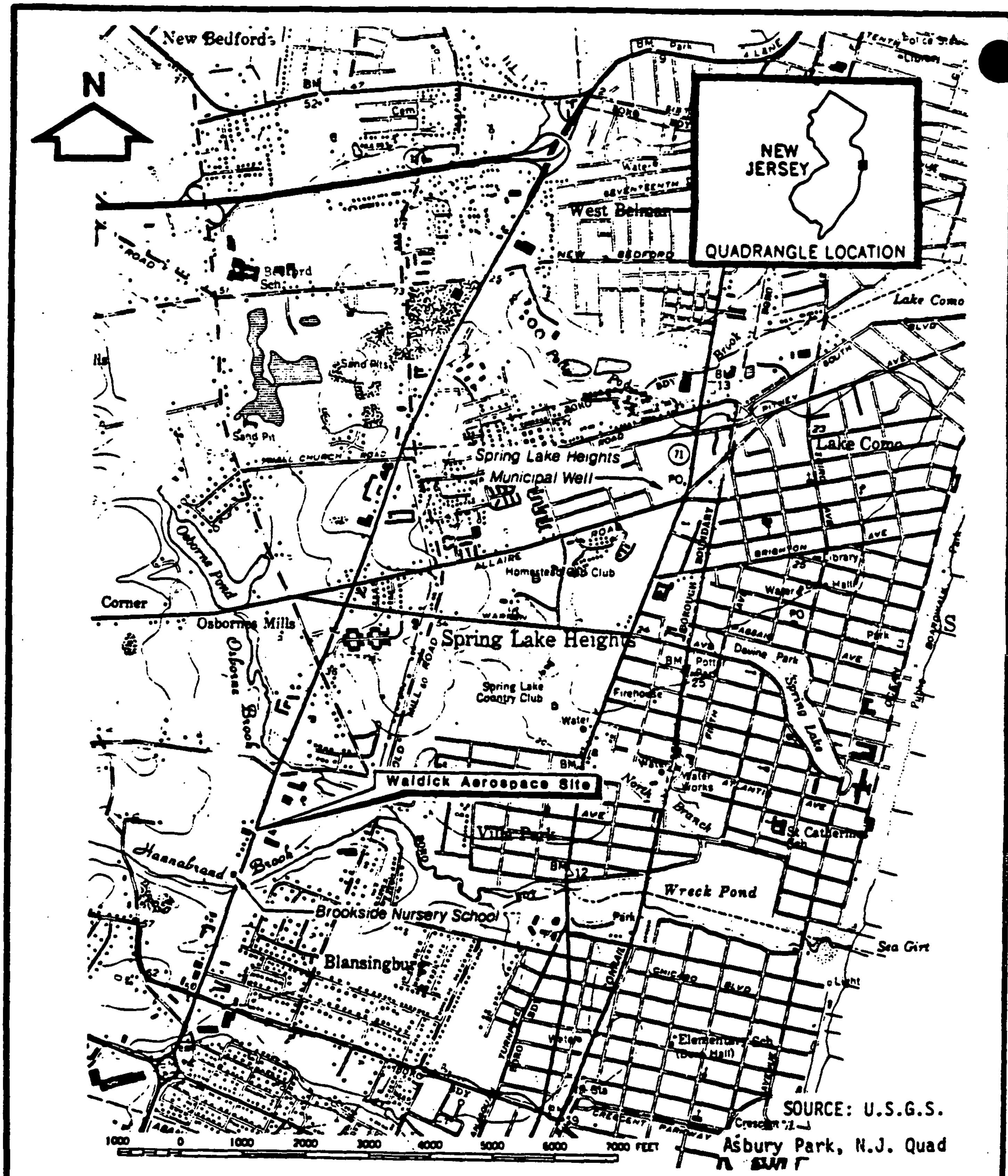

Figure 1

General Area Map

Waldick Aerospace Devices Inc., Wall Township, New Jersey

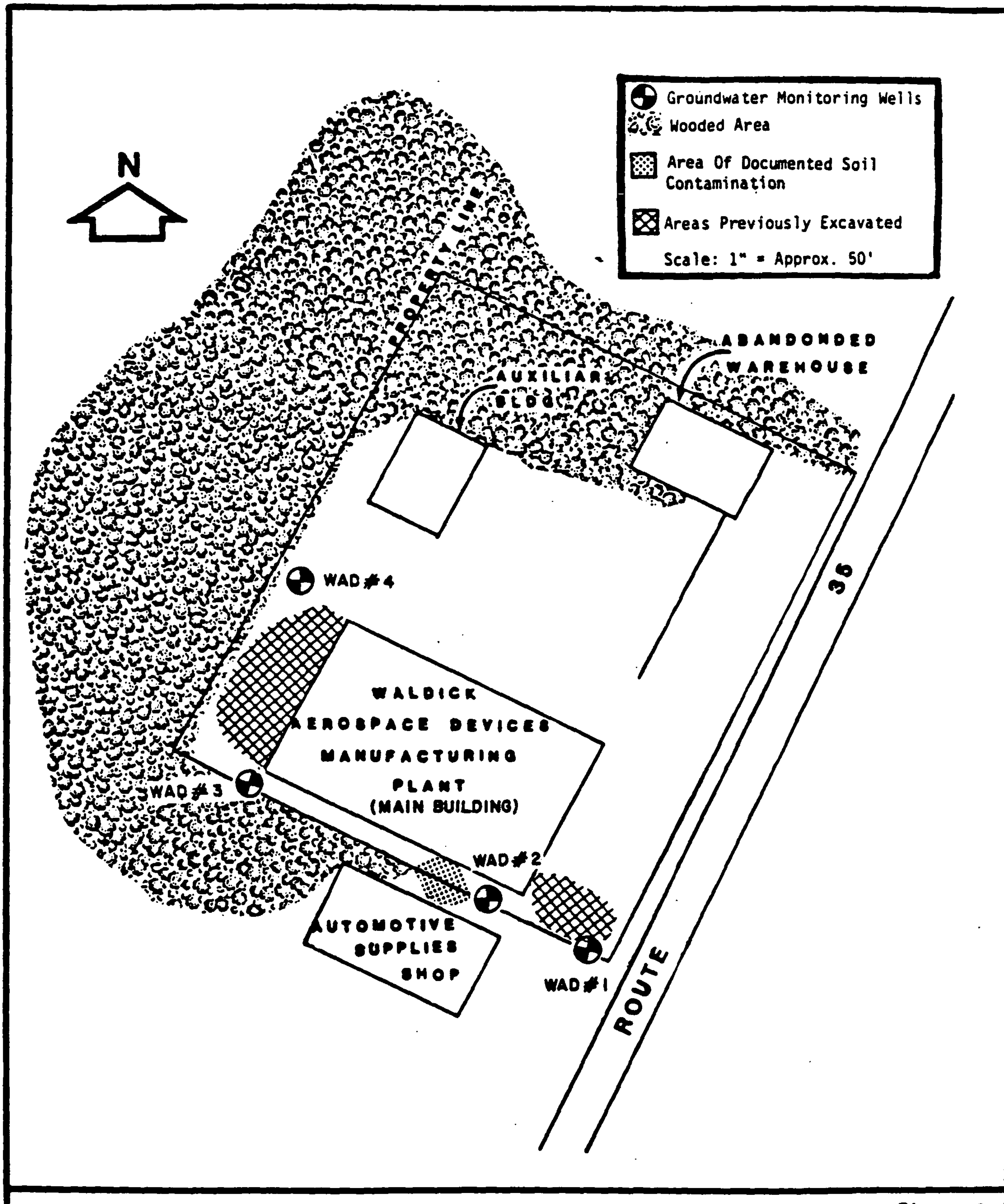

Figure 2

General Site Map

Waldick Aerospace Devices Inc., Wall Township, New Jersey

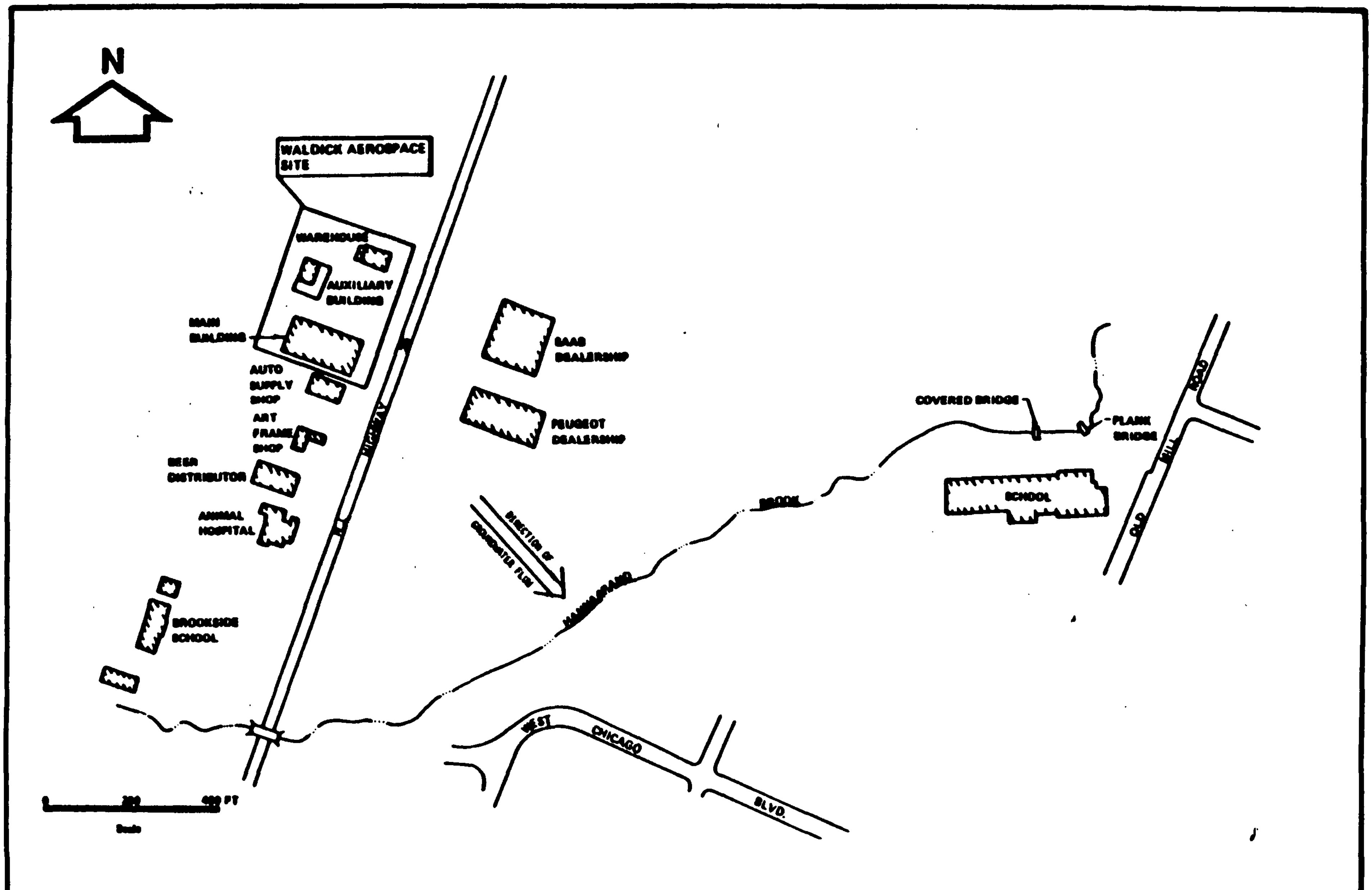

Figure 3

Study Area

Waldick Aerospace Devices Inc., Wall Township, New Jersey

SITE HISTORY

Origin of Problem

The early history of the Waldick site is summarized in Table 1. The Waldick Aerospace site was originally purchased and developed in the mid-1950's by Mr. Warren deMontmorency. The designated owner of the site since 1979 is KDD Realty Corporation, of which Mr. deMontmorency is president. For approximately 25 years, the main and auxiliary buildings were used primarily for storage and handling of plumbing supplies, as well as for office space. For several years in the late 1960's, however, the buildings were leased to the American Filter Press Company, which manufactured wooden filters for the dye industry.

In 1979, the property was leased to Waldick Aerospace Devices, Inc. This firm manufactured and electroplated quick-release pins for the aerospace industry for five to six years. For at least the first three years of operations, waste water containing heavy metals and organic solvents was discharged directly onto the ground on either side of the southern corner of the main building. In addition, used machine oil was allowed to drain out of perforated drums onto the ground at the rear (western side) of the main building.

Initial Enforcement Actions and Subsequent Remedial Measures

Based on a referral from a former Waldick employee, the New Jersey Department of Environmental Protection (NJDEP), the Monmouth County Division of Criminal Justice (MCDCJ), and the Monmouth County Board of Health (MCBH) conducted an initial inspection of the facility in June 1982. This inspection revealed that a series of degreasing, dip, rinse, and plating tanks, along with a polishing machine, were discharging wastewater through polyvinyl chloride (PVC) pipes directly onto the ground around the main building. The runoff from this effluent sometimes flowed across the front lawn and onto the adjacent property. Soils at the rear (western side) of the plant, in an area approximately 30 feet by 70 feet, appeared to be saturated with oil. Strong organic odors were noted and 30 to 40 drums were scattered throughout this area. A 2,000-gallon storage tank was also located above the ground behind the plant.

In October 1982, NJDEP sent a letter to Waldick Aerospace Devices, Inc. to demand cleanup of the site. In January 1983, the company implemented some remedial measures under the supervision of NJDEP, including installation of four on-site monitoring wells to assess the impact on ground water resources. Subsequent

TABLE 1

SUMMARY OF THE INITIAL HISTORY OF THE WALDICK AEROSPACE SITE

DATE	ACTIVITY	RESULT
Late 1979	Waldick Aerospace Devices, Inc. leases property and begins operations in Wall Township	Waste water from manufacturing and electroplating processes discharged directly onto ground outside building
June 1982	Initial site inspection by State and County agencies (NJDEP, MCDCJ, MCBH)	Evidence of illegal waste disposal practices and contamination discovered
October 1982	NJDEP requests site cleanup	Four monitoring wells installed at the site
January 1983	On-site monitoring wells sampled by NJDEP	Sampling results indicated ground water and soil contamination
June 1983	Soil excavation at southeast corner and western side of main building	80 cu ft of soil excavated and stored on-site; removed one year later
March 1984	Responsible parties prosecuted in NJ Superior Court; KLS Industries (sister company) named as sole defendant	Company officers ordered to clean up the site by September 1, 1984
October 1984	Site inspection and follow-up sampling by MCBH after cleanup deadline	Excavated soil and drummed waste found to have been removed from site. Sampling indicated high levels of metals in both soil and ground water. MCBH recommended additional cleanup.
October 1984	Site proposed for inclusion on National Priorities List (NPL) to become eligible for Superfund monies	Final approval for NPL given 6/86; ranked No. 258 on 3/87 listing.
January 1985	Facility found to be inactive and unoccupied	Site secured; buildings and front gate locked
April 1985	County Prosecutor sends memo to responsible parties to request additional remedial measures	No further actions taken by company officers
April 1985	EPA begins a RI/FS for the Waldick Aerospace Site	CDM, EPA's prime contractor, begins preliminary investigation

soil and ground water sampling conducted in February and March 1983 indicated contamination of both the soil and ground water by heavy metals and organic compounds.

On June 16 and 17, 1983, 40 cubic feet of soil were excavated from the southeast corner of the building, where NJDEP had previously observed waste water discharging from the sink drains. In addition, two feet of topsoil were removed from the visibly contaminated area behind the building. All excavated material, comprising approximately 80 cubic feet, was stockpiled on a polyethylene membrane on the northeast side of the building pending removal to an approved disposal facility. The soil was finally removed for off-site disposal in September 1984.

That same month, NJDEP drafted an Administrative Consent Order and a Notice of Civil Administrative Penalty Assessment for the Waldick company. Due to a pending Monmouth County grand jury action on the case, however, further enforcement activities were deferred.

In March 1984, Waldick Aerospace Devices, Inc. and its sister company, KLS Industries (the responsible parties for the site), were prosecuted in the Superior Court of New Jersey, Criminal Law Division of Monmouth County, for criminal violation of State and Federal environmental laws. Both Waldick Aerospace Devices and KLS Industries were incorporated in October 1978 and are owned by the same individuals. As a result of this litigation, both corporations were placed on probation for a period of three years and ordered to pay all financial obligations rendered by the Court, including restitution to Monmouth County for investigative expenses. KLS Industries, named as the sole defendant in subsequent legal actions, was ordered to clean up the site in an environmentally appropriate manner by September 1, 1984, under the supervision of the MCBH.

On July 20, 1984, KLS again appeared before the Court for sentencing on a violation of probation based on failure to pay the court-ordered finanical obligations and failure to clean up the site. KLS subsequently paid the fine and court costs and probation was continued. Appearing before the Court again on September 21, 1984, KLS was granted an additional 45 days (until October 16, 1984) to clean up the site.

In October 1984, the MCBH inspected the site and noted that the pile of excavated material and drums had been removed from the property. Nevertheless, samples from the four monitoring wells indicated that the levels of cadmium in the ground water below the areas where the illegal discharges were observed were significantly greater than the National Primary Drinking Water Standard (NPDWS) of 0.01 parts per million (ppm).

In addition, a comparison of ground water quality taken by NJDEP in February 1983 and MCBH in October 1984 indicated increased ground water contamination over time, as shown in the following table:

TABLE 2

Concentration of Cadmium in Ground Water at Waldick

(National Primary Drinking Water Standard = 0.01 ppm)

Well	NJDEP (sampled 2/83)	MCBH (sampled 10/84)
1	<0.001 ppm	6.3 ppm
2	<0.001	3.2
3	.027	12.6
4	.081	6.7

Based on these results, MCBH recommended additional downgradient excavation and another round of soil samples to determine the adequacy of earlier excavation efforts. Soon after, on January 9, 1985, MCBH personnel visited the site and found it vacant. The attorney for KLS Industries subsequently informed MCBH that the company had relocated but had not abandoned the site. Meanwhile, the Monmouth County Prosecutor's Office took additional legal action against KLS Industries and set deadlines for the cleanup of the site by KLS or its contractor, including preparation and submittal of a written plan of action. As of this writing, however, no documents have been submitted by KLS, nor has any further remedial action been taken by the company.

Remedial Actions by EPA

The U.S. Environmental Protection Agency (EPA) performs remedial actions at toxic waste sites in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, which was amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. These actions are conducted in three major phases. First, a remedial investigation and feasibility study (RI/FS) is done to determine the nature and extent of the contamination present at the site, and to develop and evaluate a range of remedial action alternatives to deal with that contamination. After the RI/FS is complete and a Record of Decision is written to document the remedy selected, the remedial design (RD) phase begins, followed by the remedial action (RA), during which the design is actually constructed. In addition to these scheduled activities, an emergency action may be taken at any time to address acute hazards posed by the site.

The Waldick Aerospace Devices site was proposed for inclusion on the National Priorities List (NPL) in October 1984 and given final approval in June 1986, thus making it eligible for CERCLA funding. The EPA assumed primary responsibility for the remediation of the site and signed a Superfund contract with the NJDEP to establish agency roles and financial contributions.

Removal Actions

In January 1986, a detailed investigation of the on-site buildings and their contents revealed a container of cyanide in the auxiliary building, as well as a wide range of chemicals in poorly sealed or unsealed containers. Some of these chemicals were incompatible compounds stored in close proximity to one another.

In a succession of subsequent site visits, EPA and its contractor inventoried all materials present in and around the two buildings, tested these materials for composition and compatibility, separated or bulked the materials as appropriate, and repacked them or overpacked the original containers. All materials were taken off-site to a waste broker for temporary storage at a private facility pending proper ultimate disposal.

Remedial Investigation

In accordance with the National Oil and Hazardous Substance Pollution Contingency Plan (NCP), EPA conducted a remedial investigation and feasibility study (RI/FS) for the Waldick site. Preliminary sampling on and around the Waldick site was performed during May and June of 1985. The field work for the RI officially began in November 1985 and was completed in September 1986. Major contaminants in the soil around the main building are listed in Table 3, which includes data from the two rounds of sampling conducted in June and November 1985.

The RI results documented the existence of three sources of contamination in the soils along the west, south, and east sides of the main building. The western soil area is contaminated mainly with volatile organic compounds (VOCs) and petroleum hydrocarbons (PHCs). The southern and eastern areas contain high levels of cadmium and chromium, as well as volatile organic compounds and petroleum hydrocarbons.

In addition to the soils, the interiors of the two buildings occupied by the Waldick company constituted two additional contamination sources. A wide range of compounds were found in each building, although the types of compounds identified varied considerably between the two buildings.

Although a clay layer separates the upper and lower aquifers beneath the site, a hydraulic connection appears to exist between them. However, neither the horizontal nor the vertical extent of the contaminant plume could be determined from the

TABLE 3
(page 1 of 2)

MAJOR SOIL CONTAMINANTS FOUND AT THE WALDICK AEROSPACE SITE

A. Between Main Building and Auto Supply Store (included in Area 2)

ORGANIC CONTAMINANTS (all units in ppm)	Depth (ft)	Sampling Dates 6/85	11/85	NJDEP Cleanup Objectives
Tetrachloroethene	1	>6,400	76	
	3	0.630		
Trichloroethene	1	47	21	1 ppm (one part per million) for Total Volatile Organics (TVOs)
Trans-1,2-dichloroethene	1		0.250	
Chlorobenzene	1	0.140		
Ethylbenzene	1	0.140		
1,1-Dichloroethene	1		0.120	
Toluene	1		0.080	
Chloroform	1		0.040	
1,1,1-Trichloroethane	1	>0.021		
	3		>0.006	
Bis (2-ethylhexyl) phthalate	1		400	10 ppm for Base/Neutral Extractables
INORGANIC CONTAMINANTS (ppm)				
Cadmium	1	16,200	2,270	3
	3	288		
Chromium (total)	1	3,160	4,390	100
	3	66		
Aluminum	1		11,800	NA
Zinc	1		3,840	350
Lead	1	625		250-1,000
Nickel	1	140	100	100
Cyanide	1		84	NA

TABLE 3
(page 2 of 2)

MAJOR SOIL CONTAMINANTS FOUND AT THE WALDICK AEROSPACE SITE
(continued)
All units in ppm

B. Front Lawn of Main Building (included in Area 2)

ORGANICS	Depth (ft)	Sampling Dates 6/85	11/85	NJDEP CO
Tetrachloroethene	1	4.9		1 ppm (one part per million) for Total Volatile Organics
	2	1.0		
1,1,1-Trichloroethane	2	>0.009		
Toluene	2	>0.009		
Trichloroethene	3.5	>0.005		
INORGANICS				
Cadmium	1	520		3 ppm
	2	1,420		
	3.5	139		

C. Rear of Main Building (included in Area 1)

ORGANICS	Depth (ft)	Sampling Dates 6/85	11/85	NJDEP COs
1,1,1-Trichloroethane	1	>0.005		1 ppm (one part per million) for Total Volatile Organics
	2	10		
	3		5.2	
Tetrachloroethene	2	4.6		
	3		0.580	
Toluene	3		0.040	
Bis (2-ethylhexyl) phthalate	3		2.2	10 ppm for Base/Neutral Extractables

data collected during the RI. Similarly, Hannabrand Brook showed some contamination in both water and sediment samples by a wide range of organic and inorganic compounds, but again, the actual pathways are not clear.

The results of the RI revealed that, although all contaminated media were studied, only two--soils and buildings--had been characterized sufficiently to proceed with the feasibility study to develop and evaluate remedial alternatives for the site. Accordingly, it was decided to address the sources of on-site contamination as the first operable unit for the Waldick site. The ground water, surface water, and stream sediments will be characterized more fully in a separate RI/FS. This document, as a result, will focus on the contamination present in the buildings and surrounding soils. The data collected to date indicate that no immediate risks currently exist involving ground water or surface water exposure pathways, especially since the use of ground water downgradient of the site is limited to a few residential irrigation wells.

As described in the RI report, six indicator chemicals were identified in accordance with the Superfund Public Health Evaluation Manual. This list was modified for use as a screening tool on all future soil samples collected during the RI. The modified list comprised tetrachloroethene (PCE), trichloroethene (TCE), petroleum hydrocarbons (PHCs), Hazardous Substances List (HSL) metals, and cyanide. (Note: the HSL is now referred to as the TCL, or Target Compound List.)

<u>Contaminant Pathways</u>

Overland flow was a major pathway while the Waldick company was in business and may still be significant. In addition, since the soils at the Waldick site are relatively permeable, infiltration of precipitation is high. However, excavation and backfilling of two of the three primary areas of soil contamination have reduced the potential for entrainment of contaminants at or near the surface.

Based on ground-water flow data, the Cohansey Sand aquifer, which underlies the Waldick site, flows to the southeast and at least partially discharges into Hannabrand Brook. However, some contaminants may be carried beyond the brook. Downgradient domestic wells that draw water from this aquifer could thus be affected by such contamination. Based on the well construction data, however, no downgradient residential wells exist within one-half mile of the site that use the Cohansey aquifer as a source of drinking water. A few irrigation wells are known to exist on residential properties. The northernmost of these wells, however, gave no indication that the contaminant plume had extended that far downgradient and traversed the brook.

The surrounding community could be exposed to this contamination by dermal contact, with or without inhalation or ingestion of the chemicals. The importance of this route depends on site characteristics and uses. Currently, for example, the north building, which has not been implicated as a source of contamination, is now in use as a retail outlet for plumbing supplies. However, this operation is isolated from the rest of the site by stockade fencing, and the two Waldick buildings remain vacant.

The site is partially fenced and has a padlocked gate at the entrance. Additional stockade fencing was installed to isolate the north building from the two Waldick buildings prior to its being utilized as a retail store for sprinkler system components. No additional access control measures have been installed for the northern and southern perimeters of the site. However, trees and other vegetation discourage access to the unfenced areas. Estimation of exposure to the surrounding population is discussed in the Public Health Evaluation section of the RI report.

ENFORCEMENT ACTIVITIES

Seven potentially responsible parties (PRPs) were identified for the Waldick site. All of the PRPs were notified in writing and given the opportunity to perform the RI/FS under EPA supervision. However, none of them elected to undertake remediation of the site. The 30-day public comment period ended on August 9, 1987 and notice letters were sent out the following month to the previously identified PRPs. These letters included an update on the status of the site and gave the PRPs another opportunity to become involved--this time, to perform the remedial design and remedial construction. To date, however, none of the PRPs have chosen to become involved in any remedial activities.

COMMUNITY RELATIONS ACTIVITIES

A Community Relations Plan for the Waldick site was approved on October 18, 1985. This document lists contacts and interested parties throughout government and the local community. It also establishes communication pathways to ensure timely dissemination of pertinent information.

EPA presented the work plan for the RI/FS at a public meeting held December 11, 1985. In addition, the obtaining of access agreements from the owners and tenants of the various properties around the site involved numerous informal meetings with EPA, the purposes of which were to inform the public of the site's history, its current status, and the Superfund program.

Throughout the RI phase, EPA worked closely with local officials, residents, and businesspeople to resolve incidental problems involving field work and normal business activities and economic development.

The RI/FS reports were sent to the three local information repositories to initiate the public comment period, which extended from July 9 to August 9, 1987. A public meeting was held on July 23, 1987 to present the results of the RI/FS, along with the preferred alternative for the site, which was developed by EPA and NJDEP.

DESCRIPTION OF REMEDIAL ALTERNATIVES

This section describes the remedial alternatives that were developed, using suitable technologies, to meet the objectives of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). These alternatives were developed by screening a wide range of technologies for their applicability to site-specific conditions and evaluating them for effectiveness, implementability, and cost.

To ensure that all aspects of the site were adequately addressed, the contaminated soils were divided into two discrete areas according to the presence or absence of heavy metals. Although both areas contain volatile organic compounds (VOCs) and petroleum hydrocarbons (PHCs), the soils at the front and south side of the main building also have high levels of cadmium and chromium. These areas are identified as Area 1 (5,500 cubic yards, or CY) and Area 2 (2,500 CY), respectively. Figure 4 shows the relative locations and extents of these two areas. Note that Area 1 includes soils beneath the main building, as well as behind it.

In general, applicable or relevant and appropriate requirements (ARARs) are promulgated to address a specific contaminant (such as cadmium), location (such as a wetland), or action (such as incineration). Contaminant-specific ARARs can be applied to the RI results, before any remedial alternatives are developed. However, no federal or state ARARs have yet been established for soils. As such, the standards applied to the soil on the Waldick site are cleanup objectives (COs) developed by the NJDEP. The indicator chemicals identified for the site are covered by the following COs: 1 part per million (ppm) for total volatile organics (includes PCE and TCE), 100 ppm for total petroleum hydrocarbons, 3 ppm for cadmium, and 100 ppm for total chromium.

A comprehensive list of candidate remedial technologies was compiled to characterize each technology and determine its applicability to the Waldick site. The original list is included as Table 4 and provides brief rationales as to why some of the technologies were excluded from further consideration.

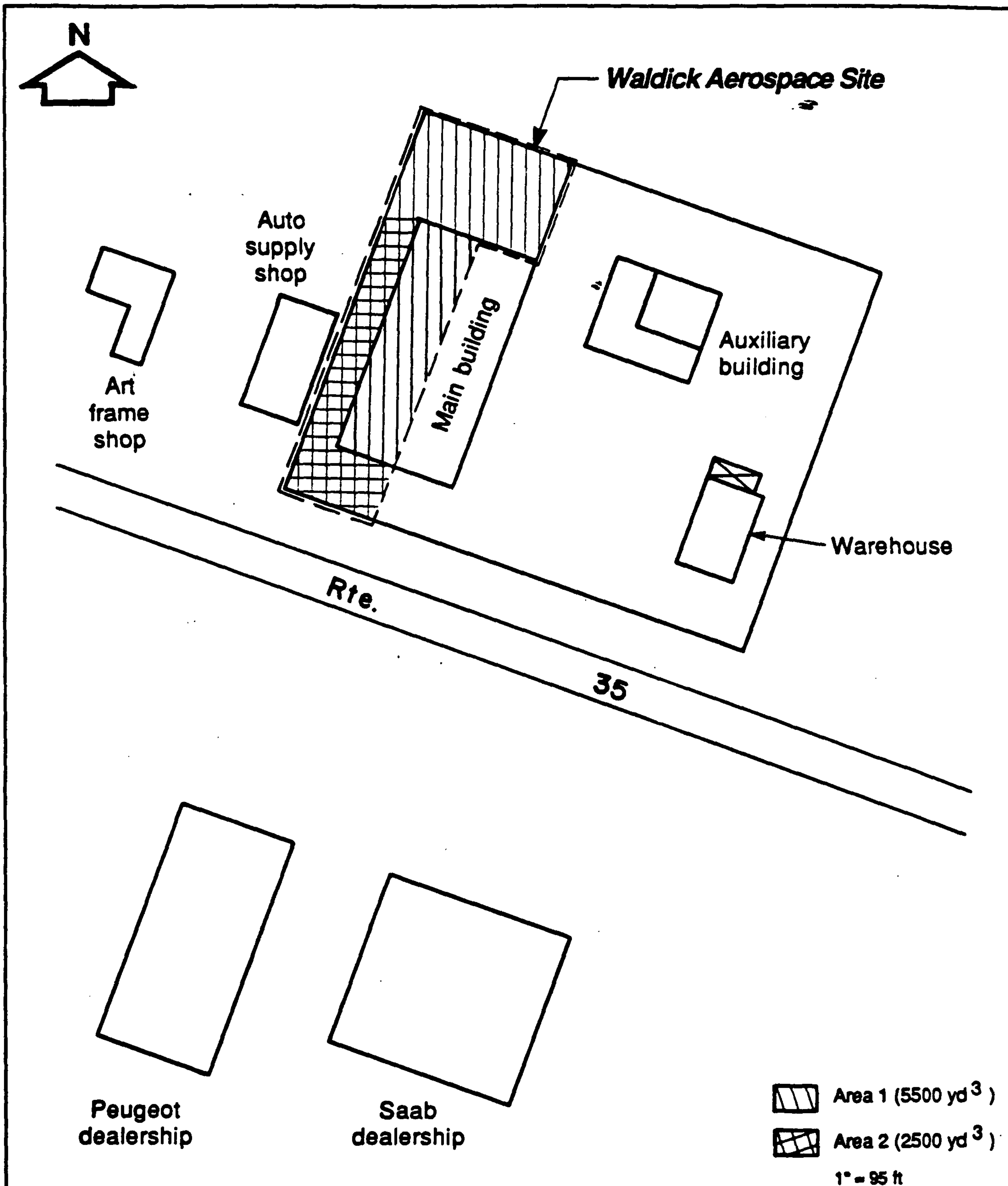

Figure 4

Zones of Contamination

Waldick Aerospace Devices Inc., Wall Township, New Jersey

TABLE 4
(page 1 of 4)

SCREENING OF REMEDIAL TECHNOLOGIES
Waldick Aerospace Devices Site

Technology	Applicability: Overall Site	Soil Area 1	Soil Area 2	Limitations/ Disadvantages	Technology retained
I. CONTAINMENT/ENCAPSULATION					
Slurry Wall	yes	yes	yes	No confining layer.	yes
Steel Sheet Piles	no	yes	yes	Questionable seal integrity.	no
Surface Cap	yes	yes	yes	Horizontal migration unaffected.	yes
Water Table Adjustment:					
- Active (pumping)	no	no	no	Contamination is above water table.	no
- Passive (subsurface drains)	yes	yes	yes	Subject to clogging.	yes
II. IN-SITU TREATMENT					
Physical Treatment					
Air Stripping	yes	yes	yes	Does not treat metals.	yes
Vitrification	no	yes	yes	Limited in-situ use. Off-gases must be treated. Piloting required.	no
Heating	no	yes	yes	Does not treat metals. Energy-intensive. No confining layer. Steam injection generates large amounts of liquid wastes that must be treated.	no

TABLE 4
(page 2 of 4)

Technology	Applicability: Overall Site	Applicability: Soil Area 1	Applicability: Soil Area 2	Limitations/ Disadvantages	Technology retained
Freezing	no	yes	yes	Energy-intensive. Site must be kept frozen.	no
Solidification	no	yes	yes	Not designed to treat volatiles. Difficulties in-situ. Mixing difficult. Waste volume increase. Subject to leaching.	no
Biological Treatment					
Aerobic/ Anaerobic	no	yes	yes	No confining layer. Not appropriate for metals. Anaerobic products may be more toxic than original contaminants. Reactions may mobilize some contaminants.	no
Chemical Treatment					
Soil Flushing	no	yes	yes	No confining layer. Only water-soluble contaminants removed. Soil contamination may persist. Wastewater generated would require treatment and disposal.	no
Immobilization					
Chemical Precipitation	no	no	no	Contaminant-specific. Field conditions not suitable. Permanency not assured.	no

TABLE 4
(page 3 of 4)

Technology	Applicability: Overall Site	Applicability: Soil Area 1	Applicability: Soil Area 2	Limitations/ Disadvantages	Technology retained
Polymerization	no	no	no	Questionable due to complex contaminants. May be effective only for high concentrations. Intended for liquid wastes.	no
Adsorption	no	no	no	No confining layer. No universal adsorbents.	no
Detoxification					
Reduction	no	yes	yes	Limited potential for use on chromium. Treatment of organics not yet demonstrated. Products may be more toxic than reactants. No confining layer.	no
Neutralization	no	no	no	Contaminant-specific. No single pH applies.	no
Oxidation	no	yes	yes	Mixing difficulties.	no
III. ON-SITE TREATMENT					
Physical treatment					
Air stripping	yes	yes	yes	Metals not treated. No advantages over in-situ treatment.	no
Vitrification	yes	yes	yes	High temperatures may damage structures. Not feasible for in-situ treatment.	yes

TABLE 4
(page 4 of 4)

Technology	Applicability: Overall Site	Applicability: Soil Area 1	Applicability: Soil Area 2	Limitations/ Disadvantages	Technology retained
Mechanical Aeration	no	yes	yes	Metals not treated. Requires a large land area and elaborate air emission controls.	no
Thermal Treatment	yes	yes	yes	Metals not treated. Requires air emission controls. No advantages over air stripping and less cost-effective.	no
<u>Incineration</u>					
Multiple Hearth/ Rotary Kiln	yes	yes	yes	Energy-intensive. Piloting required. Capture of volatilized metals difficult. Treated soils will require placement or disposal.	yes
<u>Chemical Treatment</u>					
Soil Washing	yes	yes	yes	May not work on complex wastes or organics. Generates large volumes of liquid wastes. Requires piloting. Not yet demonstrated as a full-scale operation.	no
IV. ON-SITE DISPOSAL					
RCRA Facility	no	yes	yes	Site conditions are unsuitable.	no
V. OFF-SITE DISPOSAL					
RCRA Facility	yes	yes	yes	Lack of RCRA-approved facilities in New Jersey.	yes

The technologies that were retained after the preliminary screening process were assembled in various combinations to form six general alternatives for remedial action. These technologies fall into seven groups: no action, on-site source control and containment, in-situ treatment, on-site treatment, off-site treatment, on-site disposal, and off-site disposal.

Table 5 lists the present-worth estimates for eight different alternatives: the original six options, including two variations for Alternative 1, plus a modification of Alternative 5. The components of each alternative are presented below.

ALTERNATIVE 1A: NO ACTION

Under this alternative, the contaminated soils of both Area 1 and Area 2 would be left in place untreated and the site would remain in its present condition. No remedial measures would be implemented to control further migration of contaminants. If this approach were taken, further ground water and surface water degradation would be anticipated and dermal contact with the wastes would still impose substantial risks.

ALTERNATIVE 1B: LIMITED ACTION

Under this alternative, the contaminated soils of Areas 1 and 2 would be left in place without treatment. However, access to these areas would be prevented by installing additional chain-link fence to secure the site completely. In addition, well and deed restrictions would be implemented to prevent the use of water from either the Cohansey or the Kirkwood aquifer. Finally, a comprehensive ground-water sampling program would entail installation of ten additional wells, to monitor the effect of the source contamination on local ground water quality and track the movement of the contaminant plume in each aquifer. Under current conditions, contaminant movement and dispersion should continue to follow the path of natural ground water flow, which may significantly impact water quality southeast of the site.

To minimize potential human contact with contaminated water, no new or existing water supply wells would be allowed within a specified area that would completely surround the contaminant plume. If monitoring indicated that contaminants were migrating beyond the original boundaries delineated for this area, the extent would be increased accordingly.

The three major elements of this alternative--environmental monitoring, improved site security, and well and deed restrictions --are incorporated into each of the remaining alternatives. Accordingly, the following discussions will focus on those elements that directly address the on-site contamination.

TABLE 5

COMPARISON OF PRESENT WORTH FOR REMEDIAL ALTERNATIVES

Alter-native	Alternative Description	Capital Cost ($)	Annual O & M ($)	Present Worth ($)
1A	No Action	0	0	0
1B	Limited Action	192,000	90,000	1,040,000
2	Slurry Wall with Subsurface Drains and Surface Cap	632,000	68,000	1,273,000
3	Air Stripping of Area 1 and Vitrification of Area 2	2,384,000	55,000	2,902,000
4	Air Stripping of Area 1 and Incineration of Area 2	7,006,000	55,000	7,524,000
5	Air Stripping of Area 1 and Off-site Disposal of Area 2	2,216,000	55,000	2,734,000
5A	Air Stripping of Areas 1 & 2 and Off-site Disposal of Area 2	2,602,000	55,000	3,121,000
6	Air Stripping of Areas 1 & 2 and Off-site Disposal of Areas 1 & 2	5,462,000	55,000	5,980,000

Present-worth estimates are calculated using a factor of 9.427, based on an interest rate of 10% and a project duration of 30 years (including operation and maintenance activities).

ALTERNATIVE 2: CONTAINMENT OF CONTAMINATED SOIL

The objective of this alternative is to prevent the further spread of contamination from the soil into the ground water below the Waldick site by installing a slurry wall around the main building and the adjacent soils. A system of subsurface drains would be installed beneath the wall to prevent upgradient ground water from coming into contact with the contaminated soil, should extreme fluctuations in ground water levels occur. An impermeable cap would then be placed over the enclosed area to prevent rain-water infiltration. The ground water collected by the drain system would be stored temporarily on-site before being transported to an off-site treatment facility, which would be built and operated in accordance with the Resource Conservation and Recovery Act (RCRA).

Note that this and every other action-based alternative incorporates appropriate remediation of the two on-site buildings.

ALTERNATIVE 3: IN-SITU AIR STRIPPING OF AREA 1 AND EXCAVATION AND ON-SITE VITRIFICATION OF AREA 2

Under this alternative, contaminated soils in Area 1 would be treated in-situ by air stripping, while soils in Area 2 would be excavated and treated by vitrification. The soil beneath and behind the main building (Area 1) would be air-stripped to remove volatile organics. This process consists of injecting heated air into the area of contamination, collecting emissions in an off-gas hood, and removing volatile constituents from the off-gases by vapor-phase carbon adsorption. When saturated, carbon adsorption units will be transported to an approved handling facility for regeneration or disposal, as appropriate.

The contaminated material adjacent to the main building in Area 2 would be excavated and vitrified to immobilize the inorganic contaminants. Vitrification involves inserting electrodes into the soil and applying heat until the soil melts, which then cools into a glasslike, impermeable mass. The heating of the contaminated soils will drive off the volatile organics, which will be collected by a special hood. Because of the extremely high temperatures generated by the vitrification process, the soils to be treated must be excavated and relocated to the center of the site to avoid damaging the building foundations.

ALTERNATIVE 4: IN-SITU AIR STRIPPING OF AREA 1 AND EXCAVATION AND ON-SITE INCINERATION OF AREA 2

This alternative involves the treatment of volatile organics in Area 1 by air stripping, as in Alternative 3, and the treatment of volatile organics and other contaminants in Area 2 by incineration in an on-site facility. Area 2 soils, which are contaminated by heavy metals as well as volatile organics and petroleum hydrocarbons, are more difficult to treat effectively. Currently, no demonstrated technologies exist to remove metals effectively from contaminated soils under the conditions found

EVALUATION OF ALTERNATIVES

Pursuant to CERCLA, as amended, EPA must evaluate each alternative developed with respect to three major criteria--effectiveness, implementability, and cost--which comprise six categories and numerous subcategories. These elements are considered over both the short term (through remedial construction and initial operations) and the long term (which represents the final status of the site, after any operation and maintenance functions involved have ceased). Table 6 indicates the various levels of evaluation criteria and the interrelationships between them.

This type of comprehensive analysis helps to identify those criteria that are most important in evaluating the alternatives developed. Accordingly, the discussions given below focus on the significant evaluation criteria as they pertain to the site. Any criterion judged to be sufficiently important for at least one alternative is discussed for all the other alternatives, as well, to ensure consistency and minimize subjectivity.

ALTERNATIVE 1A: NO ACTION

Because hazardous wastes are known to exist on and around the Waldick site, in concentrations associated with significant health risks, the concept of a no-action alternative is untenable. Moreover, this alternative does not comply with any applicable or relevant and appropriate requirements (ARARs) or cleanup objectives.

Each alternative must be evaluated for the degree of on- and off-site protection required (and thus to be provided) by the actions involved, as part of the overall effectiveness. Since this alternative entails taking no action, this criterion does not apply, and any protection that might be necessary stems not from the actions taken, but from the present conditions at the site and the associated contaminant pathways identified.

No reduction in existing risk means that the residual risk would be at least as high as it is now, and may increase if the contamination on-site is left in place. Regarding other long-term aspects, there would be no long-term reliability, no reduction of mobility, toxicity, or volume, and the highest likelihood for future exposure of any alternative.

The likelihood of favorable community response is very low, as the need for direct action has been stressed in correspondence and at public meetings.

Under amendments to CERCLA, should a remedial action result in hazardous substances, pollutants, or contaminants remaining at the site, the remedial action taken must be reviewed within five years to evaluate if the actions taken are protective of public health and the environment. Potential remedial action costs would thus be maximized, since all the contaminants present might have to be remediated as a result of this review. Natural attenuation of contamination is the only process that could reduce such costs, but due to the composition and concentrations of the wastes present, such factors cannot be seriously considered.

ALTERNATIVE 1B: LIMITED ACTION

Taking limited action at the site confers some benefits, with a correspondingly slight increase in costs. Still, this alternative involves no direct measures to resolve the contamination, thereby maintaining the threat to human health and the environment.

The effectiveness of this alternative is only slightly higher than that for Alternative 1. No compliance with ARARs is afforded, although some state and local ordinances would be satisfied. The degree of protection required is mainly for on-site workers, but the long-term aspects are the same as those for Alternative 1, stemming from the site conditions themselves. The long-term reliability is good, but only when considered in terms of these actions, not the contamination present on-site. By securing the site with a continuous fence, the likelihood of future exposure is reduced substantially. Still, however, there would be no reduction of volume, toxicity, or mobility.

Short-term implementability presents little or no problems. In fact, well restrictions like those included here have recently been imposed by Wall Township due to a water shortage. Again, however, the community may feel that more substantial action is necessary. Long-term implementability is extremely high, as additional actions and O&M activities could be easily performed, and monitoring the effectiveness of the remedy is built into every alternative except for 1A (no action).

Although the costs involved here are low, a five-year review would be required and the potential costs of future actions are high, again because the contamination associated with the site is not being directly addressed.

ALTERNATIVE 2: CONTAINMENT OF CONTAMINATED SOIL

The containment alternative is more effective than either the no-action alternative or the limited-action alternative, since it reduces the mobility of the contaminants in the ground water in regard to off-site migration, regardless of any continued leaching from on-site soils. In addition, the surface cap would eliminate the possibility of direct contact with soil contaminants. However, exposure and disruption of subsurface soils during excavation operations may result in volatilization of some organic contaminants. Accordingly, moderate protection and air monitoring would be required for on-site workers. Reduction of contaminant mobility would produce corresponding decreases in the residual risk and the likelihood of future exposure. In addition, some cleanup objectives would be met, although indirectly for the most part. Because the technologies to be applied here are well-established, long-term reliability is high.

The ability to construct these components and the availability of the necessary resources are both high, while the relative resource demand is low. Within the context of a first operable unit, a favorable community response for this alternative is likely. Monitoring the effectiveness of this remedy is already incorporated, and operation and maintenance (O&M) activities would be easily performed. The only significant problem with future actions involves penetration or disruption of the surface cap, especially the synthetic liner (if one were to be used), to install wells or probes or to excavate the subsurface soils.

The five-year review would be required to determine the level of protectiveness conferred by this remedy, and any potential future actions would probably be substantial. As such, the associated costs are comparable to those for Alternative 1B.

ALTERNATIVE 3: IN-SITU AIR STRIPPING OF AREA 1 AND EXCAVATION AND ON-SITE VITRIFICATION OF AREA 2

Each of the remaining alternatives entails a specific treatment for each of the two discrete areas of soil contamination identified. Air stripping soils to treat volatile organics addresses the principal threat at the site, has high short- and long-term effectiveness, and has high implementability and competitive capital costs. Petroleum hydrocarbons may be more resistant to treatment, but the NJDEP soil cleanup objective for total PHCs is substantially higher than that for volatile organics.

This alternative is considered to be effective enough to meet site ARARs and cleanup objectives, as it involves direct treatment of wastes. Due to the excavation and handling of contaminated soils, however, it also requires increased protection for on-site personnel and more extensive on- and off-site monitoring. By minimizing the volume of volatile organics and reducing the mobility and toxicity of heavy metals, both the residual risk and the likelihood of future exposure are greatly reduced. Long-term reliability is high for vitrification but is not applicable to air stripping, since treatment would be completed in the short term.

Short-term implementability is high for this alternative, although the Area 2 soils must be excavated and relocated to the center of the site to prevent any damage to the building foundations. Should temporary on-site storage be necessary for the excavated soils from Area 2, there is adequate space available on-site. The vitrification process is both energy- and cost-intensive.

Favorable community response to this alternative appears likely, although there may be some concern about the high temperatures to be generated during vitrification. Long-term monitoring is the major O&M requirement for this alternative and is already included as part of the design. However, while air stripping presents no obstacles whatsoever to future actions involving Area 1, the Area 2 soils will be solidified and, therefore, resistant to further treatment or excavation.

The costs to implement this alternative are intermediate relative to the others. However, vitrification will require extensive pilot-scale testing to determine its actual effectiveness and applicability to the site more precisely. Potential future action costs are high but are balanced against the effectiveness and reliability attributed to the vitrification process.

ALTERNATIVE 4: IN-SITU AIR STRIPPING OF AREA 1 AND EXCAVATION AND ON-SITE INCINERATION OF AREA 2

The air-stripping component of this alternative is identical to that just discussed for Alternative 3, so this section will focus on incineration of Area 2 soils. Like vitrification, incineration would require testing (test burns, in this case) and so would take longer to implement than some other alternatives.

This alternative could comply with all ARARs and COs, although operating specifications to achieve this compliance would have to be finalized in the design phase. Like Alternative 3, the degree of protection required is substantial. The long-term effectiveness is also similar to that for Alternative 3, since incineration and vitrification have comparable long-term reliability factors.

Short-term implementability is moderate, as the ability to remove metals by incineration and scrubbing must be determined during design. In addition, the availability of portable incinerator systems may be limited, depending on when the system needs to be installed on the site and the nature of the metal stripping units. Depending on the availability of suitable incineration systems, the resource demand of this alternative may be relatively high. Further, although the immediate area surrounding the site is commercial rather than residential, there may be local opposition to installation of an on-site incinerator, regardless of the safeguards incorporated into the design. Finally, disposal of the treated soils could present problems under the land ban.

The long-term implementability of air stripping plus incineration is the highest of any alternative. O&M functions are routine and not treatment-specific, monitoring of the remedy is already incorporated, and no physical or other obstacles would remain on the site to impair any further actions taken in the future.

The cost of this alternative is the highest of any alternative considered, as incineration is both cost- and energy-intensive. In addition, the incinerated soils may require off-site disposal if the treatment is insufficient, which would raise the cost still higher, although the long-term effectiveness would also increase substantially. The potential costs of future remedial actions are high, like those for Alternative 3. With the treated soil placed back on the site, the potential for future costs in the long term may be significant, if further treatment or removal is required later to maximize protectiveness.

ALTERNATIVE 5: IN-SITU AIR STRIPPING OF AREA 1 AND EXCAVATION, REMOVAL, AND OFF-SITE DISPOSAL OF AREA 2

The combination of air stripping of Area 1 soils with excavation and off-site disposal of untreated Area 2 soils provides high effectiveness and implementability at moderate cost. Each of the disposal alternatives removes the organic contamination from the soils in Area 1, and removes the contamination together with the soils in Area 2.

Although short-term effectiveness of this approach is high, the major potential problem with compliance involves the pending land disposal restrictions or "land ban", which will require treatment of hazardous wastes prior to consideration for off-site disposal as of November 8, 1988. Since it is unlikely that the remedial construction will begin before this deadline, some type of prior treatment will be necessary. As with the other treatment alternatives, short-term risks would be involved, so all necessary precautions would be taken. Long-term effectiveness is largely negated by the fact that physical removal of contaminated soils to a disposal facility does not constitute a permanent solution.

Short-term implementability of this alternative is low or zero, since it is dependent on the availability of a EPA-approved off-site disposal facility and the pending requirement for prior treatment of wastes taken off-site. The extenuating circumstance here is the low soil volume to be removed

(2,500 cubic yards), which constitutes a correspondingly low demand on Superfund resources--specifically, the capacity of available disposal sites. Because at least some of the soil contaminated by the Waldick company's operations is to be taken off-site, community response is expected to be favorable.

The long-term implementability of this alternative is essentially as high as that for Alternative 4, even though the technology involved for Area 2 soils is considerably different. There are no treatment-related O&M functions required and no reasons to take additional remedial action.

In summary, this alternative entails off-site disposal of a minimal amount of soil, utilizes in-situ treatment to reduce excavation and handling costs, and tends to minimize costs for potential future actions.

ALTERNATIVE 5A: IN-SITU AIR STRIPPING OF AREAS 1 & 2, FOLLOWED BY EXCAVATION AND OFF-SITE DISPOSAL OF AREA 2

This is a modification of Alternative 5, in that air stripping would be applied to both Area 1 and Area 2 soils (8,000 CY total). Still, however, only the Area 2 soils (2,500 CY) will be removed for off-site disposal. The corresponding cost increase to cover the expansion of the air stripping system is slight and the cost-effectiveness of selective excavation is maintained. More importantly, this alternative treats the principal threat throughout the site and so is consistent with agency goals and the land disposal restrictions, unlike Alternative 5.

Compliance with all ARARs, COs, and "to be considereds" (TBCs) is expected, since treating the Area 2 soils prior to off-site removal should satisfy the land ban stipulation. All other aspects of short- and long-term effectiveness and implementability are identical to those discussed under Alternative 5.

As already mentioned, the costs associated with this alternative are only slightly higher than those for Alternative 5, yet its implementability and effectiveness are both increased substantially. As such, the cost-effectiveness of this alternative is higher than that for Alternative 5.

ALTERNATIVE 6: IN-SITU AIR STRIPPING OF AREAS 1 & 2, FOLLOWED BY EXCAVATION AND OFF-SITE DISPOSAL OF AREAS 1 & 2

Reduction of existing risk under this alternative is even greater than that of Alternative 5, as no soil with measureable contamination would be left on-site. However, off-site disposal of Area 1 soils may not be necessary if air-stripping adequately removes the organic contaminants present from Area 1 soils. If so, the cost-effectiveness would be lowered.

Compliance with applicable regulations is essentially guaranteed under this alternative, due to the intensive application of appropriate technologies. However, the one factor that impairs acceptance of treated wastes for off-site disposal is the increase in soil volume, from 2,500 CY to 8,000 CY. The possible redundancy of removing Area 1 soils that have been adequately treated becomes more important when viewed in light of the general shift away from land-based disposal and the dwindling capacity of the few remaining land disposal facilities.

All other aspects of short- and long-term effectiveness and implementability are identical to those already discussed for Alternative 5, with two exceptions. First, relative resource demand is higher due to the larger volume occupied by the soil at the off-site disposal facility selected, as well as to the higher costs. Second, the ability to construct is complicated by the need to remove at least part of the floor slab to excavate the contaminated soils beneath the main building. If building demolition were selected, however, this task could be consolidated.

This alternative is extremely costly, being twice as expensive as Alternative 5A and exceeded only by Alternative 4, which involves on-site incineration. This enormous expense stems from the high costs for off-site disposal of the additional soil volume from Area 1: 8,000 CY here versus 2,500 CY for Alternative 5. Other aspects of costs are as already discussed.

Building Remediation

As already mentioned, on-site treatment and/or disposal of contaminated material is preferred as long as protectiveness (and implementability) criteria are satisfied. Complete demolition of both buildings would reduce long-term risks, but the same level of risk reduction may be possible without demolition, using decontamination and sealing of interior surfaces, instead. As in Alternative 6, therefore, the question of redundancy is involved. That is, if soils and structures can be adequately remediated to justify leaving them in place or re-depositing them on the site, then demolition and off-site disposal would not be preferred or defensible, especially with regard to cost and land disposal restrictions.

The major remedial options of decontamination versus demolition represent on-site treatment and off-site disposal, respectively. These are the same aspects incorporated into the three air stripping and removal alternatives, so the same general arguments apply, according to whether the contaminant source is removed from the medium or along with the medium. However, the volume of Area 1 soils beneath the main building that will need to be excavated and removed off-site will not be determined until air stripping is completed. In light of this fact, the main building will help to control incidental air emissions and fugitive dust, but may need to be demolished to facilitate soil excavation. Accordingly, this element of the operable unit will remain open.

SELECTED REMEDY

After review and evaluation of the remedial alternatives presented in the feasibility study to achieve the best balance of all evaluation criteria, EPA and NJDEP presented Alternative 5A to the public as the preferred remedy for the Waldick site. The input received during the public comment period, consisting primarily of questions and statements transmitted at the public meeting held on July 23, 1987, is presented in the attached Responsiveness Summary. Public comments received encompassed a wide range of issues but did not necessitate any major changes in the remedial approach taken at the site. Accordingly, the preferred alternative was selected by EPA and NJDEP as the first operable unit of a permanent solution for the site. Table 7 itemizes the costs associated with this action. The major components of this alternative are:

- In-situ air stripping of all contaminated soils on-site to reduce the levels of volatile organics and petroleum hydrocarbons

- Excavation and off-site disposal of all treated soils with residual contamination above the cleanup objectives for the site (Area 2 soils, as a minimum, comprising approximately 2,500 cubic yards)

- Appropriate remediation of the main and auxiliary buildings, either by decontamination or demolition, depending largely on the degree of residual contamination in the soils beneath the main building

- Site fencing, well restrictions, and installation of additional ground water wells for use in a comprehensive environmental monitoring program.

Performance Goals

Alternative 5A is primarily a source-control measure, as it removes or reduces contamination in or on the soils and buildings on the Waldick site.

This alternative addresses two of the five contaminated media known to exist for the site. The other three--ground water, surface water, and stream sediments--will be addressed in a future operable unit, which will focus on management of migration. Performance of the site remedy in phases is justified and necessary because the data collected in the course of the RI are insufficient to characterize the off-site contamination. In addition, the potential receptors downgradient of the site are supplied with public water and so are not dependent on local ground water. Consequently, based on the contaminant levels measured during the RI and the exposure pathways identified, there appears to be little or no risk currently associated with the ground-water contamination. Further, by remediating the source of contamination, no further degradation of ground water will occur.

TABLE 7

COST SUMMARY FOR REMEDIAL ALTERNATIVE 5A:

IN-SITU AIR STRIPPING OF AREAS 1 AND 2
AND OFF-SITE DISPOSAL OF AREA 2

1. Site Security	$ 176,000
2. Construction of Temporary Facilities	$ 84,200
3. In-Situ Air Stripping	$ 739,080
4. Excavation, Transportation, and Disposal	$ 825,000
5. Backfill and Site Restoration	$ 70,125
6. Initial Round of Sampling and Laboratory Analysis	$ 33,090
Subtotal:	$1,927,495
Engineering and Contingencies (35%):	$ 674,623
TOTAL CAPITAL COST:	$2,602,118
O&M PRESENT WORTH:	$ 518,485
TOTAL PRESENT WORTH:	$3,120,603

In-situ air stripping will treat 8,000 cubic yards (CY) of soil to reduce volatile organics and petroleum hydrocarbons. Subsequently, only those treated soils with residual concentrations of heavy metals or other contaminants above target levels will be removed for off-site disposal. The soil volume involved in the second phase is estimated to be 2,500 CY, but final determination of the soil volume to be taken off-site will be made based on confirmatory sampling after treatment.

The target residual levels applied to the site are: 1 part per million (ppm) for VOCs, 100 ppm for PHCs, 3 ppm for cadmium, and 100 ppm for total chromium. These values are the cleanup objectives established by the NJDEP for general application and reflect the relative persistences and mobilities of the organics, as well as the relative toxicities of the metals.

The air stripping component of the remedy will require an estimated six months for completion, while the selective excavation should last for an additional three to six months. Operation and maintenance activities will constitute the rest of the projected project duration.

Protectiveness

The operable unit selected protects human health and the environment by dealing effectively with the principal threat posed by the Waldick site. Air stripping should reduce levels of VOCs and PHCs to below the NJDEP cleanup objectives. In addition, performing this alternative treatment in place will minimize soil disturbance prior to treatment, thereby facilitating control of incidental air emissions.

The excavation component will ensure that any soil with significant residual contamination is removed off-site. This action will thus eliminate the long-term potential for direct contact with contaminated soil. Further, well and deed restrictions will minimize the potential for direct contact with ground water until the contamination in this medium can be addressed as a future operable unit.

Consistency with Other Laws

One of the primary statutes that governs CERCLA activities is the Solid Waste Disposal Act (SWDA), particularly Section 1003(a), which emphasizes maximum protectiveness through safe hazardous waste management practices, implementation of permanent solutions, and minimization of both generation and land-based disposal of hazardous wastes. The combination of in-situ air stripping and selective off-site disposal provides protection to public health and the environment through the use of established technologies.

The selected remedy for the Waldick site represents a permanent solution by (1) removing the contaminant source from the medium by air stripping and (2) removing any residual source together with the medium from the site to a secured facility. In doing this, the selected remedy employs on-site treatment to minimize the soil volume that must be taken off-site. As a result, residual risk becomes negligible and long-term reliability is high.

Under the pending land disposal restrictions, any materials containing hazardous wastes must be treated before off-site disposal can be considered. In-situ air stripping is expected to satisfy this treatment stipulation. In addition, this remedial action should also satisfy the soil cleanup objectives provided by the NJDEP for application to the Waldick site.

The principal threats associated with the Waldick site involve inhalation of volatilized compounds or direct contact with contaminants in soils and buildings. The first operable unit addresses these contaminant pathways specifically. The six indicator chemicals identified for the public health evaluation, which is contained in the RI report, include tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE), vinyl chloride, cadmium, and chromium. Air stripping of soils and solvent washing of building surfaces will effectively eliminate the volume of contaminants, thereby reducing toxicity and mobility at the same time.

The Waldick site is in the coastal zone as designated by the State of New Jersey under the Coastal Zone Management Act. Accordingly, a review was performed and the selected remedy was determined to be consistent with the New Jersey Coastal Zone Management Plan.

Based on a review of the selected remedy for compliance with the National Historic Preservation Act, this operable unit should have no effect on cultural resources on or eligible for nomination to the National Register of Historic Places.

Regarding other location-specific ARARs, it has been determined that no wetlands, floodplains, federal endangered or threatened species, or federally designated wild and scenic rivers exist in the vicintiy of the Waldick site. Accordingly, Executive Orders 11988 and 11990, the Endangered Species Act, and the Wild and Scenic Rivers Act do not apply in this case.

RCRA regulations require decontamination or removal of all hazardous waste residues, contaminated structures, and contaminated debris from hazardous waste sites. Treated soil constitutes the primary hazardous waste residue for this operable unit and the main and auxiliary buildings are the primary contaminated structures. Both categories have already been addressed in this document.

Since all chemicals and containers were taken off-site in 1986 in a removal action by EPA, the contaminated debris to be addressed comprises mainly contractor-generated materials (e.g., protective clothing, decontamination solvents). Wastes produced in the course of the RI have been drummed and stored temporarily on-site. Owing to their relatively low volume, these materials will be added to those generated during the remedial design and remedial construction phases, consolidated with the excavated soil, and removed for off-site disposal.

Cost-Effectiveness and Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

Alternative 5A represents a permanent solution with respect to the Waldick site per se. However, off-site disposal cannot be considered a permanent solution, since although their mobility is physically reduced in an EPA-approved disposal facility, the hazardous wastes involved will retain at least some of their toxicity. Moreover, the volume of hazardous wastes is affected only slightly by off-site disposal. Nevertheless, this alternative will remediate on-site wastes to the maximum extent practicable through the use of in-situ air stripping, which complies with the statutory preference for treatment as a primary element of the selected remedy.

In summary, this operable unit combines an alternative treatment technology (air stripping) to reduce organic contamination with selective excavation and off-site disposal to eliminate inorganic contamination, along with any residual organics. The selected remedy is cost-effective in that it maximizes on-site treatment of soils and buildings to minimize the volumes of soil and any demolition debris requiring off-site disposal. At the same time, however, selective excavation of a relatively low soil volume will eliminate residual contamination of persistent substances from the Waldick site.

PERFORMANCE OF REMEDIAL RESPONSE ACTIVITIES AT UNCONTROLLED HAZARDOUS WASTE SITE (REM II)

FINAL RESPONSIVENESS SUMMARY

WALDICK AEROSPACE DEVICES SITE

WALL TOWNSHIP, NEW JERSEY

Work Assignment Number: 96-2LF4.9
Document Control Number: 196-CR2-RT-FCZS-1

Prepared for:

U.S. Environmental Protection Agency
Region II
26 Federal Plaza
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September 18, 1987

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Subject: Final Responsiveness Summary for the Waldick Aerospace Devices Site

Work Assignment No.: 96-2LF4.9

EPA Contract No.: 68-01-6939

Document No.: 196-CR2-RT-FCZS-1

Dear Mr. Alvi, Ms. Johnson, and Mr. Stoddard:

Camp Dresser & McKee, Inc. is pleased to submit this final Responsiveness Summary for the Waldick Aerospace site in Wall Township, New Jersey.

If you have any questions or comments, please contact me or Carl Zoephel, REM II Community Relations Specialist in Region II.

Very truly yours,

CAMP DRESSER & McKEE, INC.

James L. Brown
(for) George A. Rief, P.E.
REM II Regional Manager

PERFORMANCE OF REMEDIAL RESPONSE ACTIVITIES AT UNCONTROLLED HAZARDOUS WASTE SITES (REM II)

U.S. EPA CONTRACT NO.: 68-01-6939

FINAL RESPONSIVENESS SUMMARY FOR THE WALDICK AEROSPACE DEVICES SITE WALL TOWNSHIP, NEW JERSEY

REM II DOCUMENT NO.: 196-CR2-RT-FCZS-1

Prepared by: Carl Zoephel — Date: 9/17/87
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WALDICK AEROSPACE DEVICES SITE
WALL TOWNSHIP, NEW JERSEY

FINAL RESPONSIVENESS SUMMARY

The U.S. Environmental Protection Agency (EPA) established a public comment period from July 9, 1987 through August 9, 1987 for interested parties to comment on EPA's Remedial Investigation and Feasibility Study (RI/FS), and Proposed Remedial Action Plan (PRAP) for the first operable unit of the Waldick Aerospace Devices site.

During this comment period, EPA held a public meeting on July 23, 1987 at the Wall Township Police Building to describe the remedial alternatives developed and present EPA's preferred remedial alternative for the Waldick site.

A responsiveness summary is required by Superfund policy for the purpose of providing EPA and the public with a summary of citizen comments and concerns about the site, as raised during the public comment period, and EPA's responses to those concerns. All of the comments summarized in this document will be factored into EPA's final decision of the preferred alternative for cleanup of the Waldick site.

This responsiveness summary for the Waldick Aerospace Devices site is divided into the following sections:

I. <u>Background on Community Involvement and Concerns.</u> This section provides a brief history of community interest and concerns regarding the Waldick site.

II. <u>Summary of Major Questions and Comments Received During the Public Comment Period and EPA Responses</u>. This section presents both oral and written comments submitted to EPA during the public comment period, and provides EPA's responses to these comments.

III. <u>Remaining Concerns</u>. This section discusses community concerns that EPA should be aware of as it prepares to design and implement the first operable unit, and plan the necessary steps to address the second operable unit for the Waldick site.

IV. <u>Correspondence</u>. This section serves as an attachment for correspondence received and responded to during the public comment period.

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERN

The Wall Township community has been aware of the contamination problem at the Waldick Aerospace Devices site for several years. In response to complaints received, the New Jersey Department of Environmental Protection (NJDEP), the Monmouth County Division of Criminal Justice (MCDCJ), and the Monmouth County Board of Health (MCBH) conducted an initial site inspection of the facility in June 1982 and discovered evidence of illegal waste disposal practices. EPA began its remedial investigation/feasibility study (RI/FS) of the Waldick Aerospace Devices site in April 1985.

In July 1985 EPA conducted interviews with community residents and local officials to assess the nature of their concerns regarding the contamination and the site investigation process at the Waldick Aerospace Devices site. The key issues and concerns identified were:

Financial concerns. Nearby business representatives were worried that the presence of a Superfund site near their properties would have a negative impact on their businesses and revenues. A nearby school was concerned that enrollment would drop because of the Superfund site, and local officials expressed concern about whether property values would decline.

Regional hazardous waste problems in Monmouth County. Area residents and local officials were concerned about the number of hazardous waste problems discovered recently in Monmouth County. Local officials believed that state and federal government agencies had not been responsive enough to the county-wide hazardous waste situation.

Coordination with local officials. Officials from the Monmouth County Board of Health and Wall Township expressed a desire to be kept informed about activities and developments at the Waldick Aerospace Devices site. The officials emphasized that this would be necessary in order to share information with the community and be responsive to the residents' questions and concerns.

In December 1985 EPA held a public scoping meeting to discuss the planned RI/FS with area residents and officials. Approximately 100 people attended the meeting, which was part of a regularly scheduled township committee meeting.

The concerns previously identified were among those expressed by residents and officials at the scoping meeting. Additional concerns expressed involved:

Funding of investigation and cleanup. Residents and business representatives expressed interest in knowing who would be responsible for funding any cleanup that might be necessary at properties beyond the site.

Liability concerns. Business representatives questioned whether owners of off-site properties would be held liable for any harm occurring to individuals occupying their properties as a result of contaminant migration.

Private well testing. Several individuals in the community who use private residential wells for irrigation and lawn watering were interested in having their wells tested for possible contamination.

II. SUMMARY OF MAJOR QUESTIONS AND COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA RESPONSES

Comments raised during the public comment period are summarized below. The comment period was held from July 9, 1987 to August 9, 1987 to receive comments on the RI/FS and the PRAP. The comments received during the comment period are summarized and organized according to the following categories:

A. Potential health hazards;

B. Risks associated with possible fires;

C. Time frame for remediation of site and completion of site clean-up;

D. Building decontamination versus demolition;

E. Technical questions regarding air stripping; and

F. Other concerns.

There were also comments pertaining to site ground-water contamination; however, these will be addressed in Section III: REMAINING CONCERNS, as ground water will be addressed as a separate operable unit in another FS.

A. POTENTIAL HEALTH HAZARDS

1. Comment: A resident living downgradient of the site is using shallow well water for irrigation because of a township restriction on water usage. The resident asked if there are any current or future health hazards that might be associated with this practice.

   EPA Response: There has been no indication of contamination at those wells and therefore, use of ground water from the immediate vicinity of these wells currently does not pose a public health risk. EPA will continue to monitor these wells during remediation, and if any contamination is detected, the situation will be reevaluated and appropriate action taken at that time. Even if contamination is detected in ground water used for irrigation, it is unlikely to lead to substantial exposure and public health risk. This is because irrigation is generally infrequent (less than daily use for only a small fraction of any day) and because contact with any contaminated water is likely to occur even less frequently.

2. Comment: Several residents asked if the contamination would worsen or continue to migrate off-site during implementation of the remedial action at the site.

   EPA Response: EPA will continue to monitor the site and the level of ground water contamination until site remediation is completed. If a problem does develop, residents will be promptly notified.

3. Comment: EPA listed vinyl chloride as one of the contaminants identified at the site. A resident stated that vinyl chloride is known to be a dangerous, cancer-causing chemical, and asked if this should be cause for concern.

   EPA Response: Vinyl chloride is classified as a human carcinogen by EPA. However, only low levels of vinyl chloride have been detected in one ground-water well at the Waldick site. As this ground water is currently not used, exposure does not occur and this contamination does not currently pose a risk. In the unlikely event that exposure to the contaminated water did occur, such exposure could pose a public health risk, but the risk of cancer would be extremely small (less than a one in one million chance of getting cancer as a direct result of exposure) under most potential exposure scenarios.

4. Comment: Many people still fish at Old Mill Pond and Hannabrand Brook. A resident expressed concern that there is potential for fishing to be unsafe, and that NO FISHING signs should be posted.

   EPA Response: The Monmouth County Board of Health and the New Jersey Department of Fish, Game, and Wildlife have investigated this issue, and believe that even though the situation merits further investigation, there is no need at this time to suspend fishing in the area. EPA will continue to monitor this situation during remediation, and will focus on surface waters as part of the next operable unit for this site.

B. RISKS ASSOCIATED WITH POSSIBLE FIRES

1. Comment: A resident asked if there was any risk of fire or explosion at the site now or in the course of site clean-up activities.

   EPA Response: All containerized materials on site were carefully removed and the site is clear of chemicals except for those in the ground. The levels of the contaminants in the ground are such that they do not pose a risk of fire or explosion.

2. Comment: The individual followed up by asking what protection firemen would require if a fire did have to be fought on the site, and whether respirators would be necessary.

   EPA Response: Respirators were not used during field sampling at the site and would not be necessary for firefighters in the unlikely event of a fire at the site. As noted above, the contaminants currently present at the site are in the ground and exposure to these contaminants is highly unlikely to be increased by a fire.

3. Comment: A volunteer fireman was concerned that toxic or noxious fumes might still escape in the event of a fire, which could necessitate evacuation of the area.

   EPA Response: Volatile contaminants have most likely evaporated from soils to depths that would be heated by a fire. No fumes that would require evacuation are anticipated in the event of a fire.

C. TIME FRAME FOR REMEDIATION OF SITE AND COMPLETION OF SITE CLEAN-UP.

1. Comment: An individual wanted EPA's assurance that the area would be completely remediated and wanted to know if anything would be left behind after clean-up of the site.

   EPA Response: Extensive testing at the site will help ensure that no significant contamination remains after clean-up. Monitoring at the site will continue to ensure that any treated materials left on or under the site do not cause residual problems.

2. Comment: Several residents were interested in knowing the time frame for remediation of the site. They asked when the Record of Decision (ROD) would be signed, if the remedial design (RD) would start before the end of the year, and how long the remedial action (RA) would take to complete.

   EPA Response: Once a final decision is made on which remedial alternative will be used at the first operable unit at the site, EPA will proceed according to the time table outlined in the Proposed Remedial Action Plan. The RD will take approximately six months, and the RA should take two to three years to implement, depending on the alternative selected. The ROD will be signed in September after due consideration of all comments received during the public comment period.

D. BUILDING DECONTAMINATION VERSUS DEMOLITION

1. Comment: A resident asked whether the buildings on the site were badly contaminated in the walls and floors, or if just the surfaces were contaminated. The resident also wanted to know if the floors would have to be destroyed, and whether the buildings would ever be safe for future workers.

   EPA Response: Based on representative sampling, the floors showed the greatest range of contaminants and the highest levels of contamination both at the surface and within the concrete. If at all possible, they will be washed with a solvent and then sealed. This is a proven and acceptable method of remediation, and provides a good margin of safety for future workers.

2. Comment: A resident asked why the on-site buildings were not just demolished.

   EPA Response: Demolition of buildings may not be warranted in this case. EPA always looks for remediation techniques that avoid or minimize destruction of property. There is a good possibility that the buildings can be used again.

3. Comment: The same resident followed up his question by asking if the property owner could demolish the buildings after the cleanup.

   EPA Response: EPA's responsibility is to maximize the potential for re-use of Superfund sites. Any owner(s) of the remediated property can do as they please with the buildings. If demolition did occur, the rubble could then be taken to a standard landfill, as opposed to a RCRA approved disposal facility.

E. TECHNICAL QUESTIONS REGARDING AIR STRIPPING.

1. Comment: A citizen asked if the volatiles go into a carbon filter during air stripping, and what would happen to the carbon when it became saturated.

   EPA Response: When the carbon filter becomes saturated, it will be sent to a permitted facility for regeneration or disposal, as appropriate.

2. Comment: A resident requested more information on the potential dangers of air stripping.

   EPA Response: Air stripping is an effective technology and has been utilized successfully elsewhere in the country. Air stripping can be used in different ways, and a pilot study will be conducted during the remedial design to determine the most effective use of the technology at the Waldick site.

3. Comment: The resident followed up his previous question by asking about the record of performance of air stripping.

   EPA Response: Air stripping has a high record of performance.

F. OTHER CONCERNS

1. Comment: A resident wanted to know if anything would be done with the monitoring wells in Brook Plaza.

   EPA Response: EPA would like to keep the wells available for future monitoring. However, at the developer's request, they will be flush-mounted to avoid any impact on normal activities and parking lot capacity.

2. Comment: Two residents asked about potentially responsible parties (PRPs) at the site. They also asked if any PRPs had been identified upgradient of the site. They wanted to know if there was a possibility for financial recovery of the costs incurred at the Waldick Aerospace Devices site.

   EPA Response: There is no evidence of contamination from upgradient sources, although three potential sources have been identified and investigated. EPA typically asks any identified PRPs to clean up a site with EPA supervision, but if no cooperation is forthcoming, then EPA does the job and seeks reimbursement after completion and the total cost is known.

3. Comment: A resident was concerned about access to the site, and asked if the site was fenced and secure.

   EPA Response: There is limited access beyond the front fence. The initial EPA removal team evaluated all existing access routes and pedestrian traffic and concluded that the existing security was adequate. The access will be re-evaluated during remediation.

4. Comment: A resident questioned whether EPA was aware of a housing development being built near the Waldick Aerospace Devices site. The resident is concerned that private wells might be utilized at the development, or that overflow from the retention basin might flow over the Waldick site and pick up surface contaminants.

   EPA Response: EPA was not aware of the development; however, there are a number of zoning restrictions imposed by local, county, and state officials, and if there were any problems then EPA would be informed though the communication channels established in the Community Relations Plan developed by EPA.

   Update: EPA personnel visited the Land Use Department's office in Wall Township to discuss this housing development and obtain copies of the plans. The development is well upgradient of the Waldick site, just southeast of the intersection of Ocean Road & Bailey's Corner Road. Flood control issues appear to have been adequately addressed in the engineering report, but EPA will continue to monitor this project after construction begins. In addition, most of the contamination at the Waldick site is underground, so surface runoff is not considered a primary means of contaminant migration.

III. REMAINING CONCERNS

This section describes community concerns that EPA will take into account during the remedial design and remedial action at the Waldick Aerospace Devices site.

The current draft FS and PRAP focus on the soil and building contamination at the site. Contamination in the ground water, surface water, and sediments will be addressed as a future operable unit. The issue of potential ground-water contamination was a significant concern of residents and local officials during EPA's public comment period. Some of these concerns have already been documented in this responsiveness summary in conjunction with other categories of concern, such as potential health hazards and the possibility of the contamination migrating through the ground water. Several residents also asked about the use of shallow well water for irrigation, and whether off-site ponds and streams were safe for fishing. Other ground-water contamination concerns are addressed below:

A. Comment: A resident asked if ground-water contamination would continue to be monitored after EPA implements the chosen remedial alternative at the site.

   EPA Response: The ground water issue will be the subject of separate RI, which will fully examine the ground water to determine if the ground water will require remediation. After the final operable unit has been implemented, the ground water will be sampled periodically as part of the long-term environmental monitoring program. This activity will ensure that no residual problems develop to endanger public health or the environment.

B. Comment: An individual living southeast of the site inquired if her well was contaminated, as EPA's investigations have shown that ground water in the area flows in a southeasterly direction.

   EPA Response: The available data indicate that the resident's well should not be contaminated at this time. EPA has monitoring wells in place to determine the extent of off-site contaminant migration.