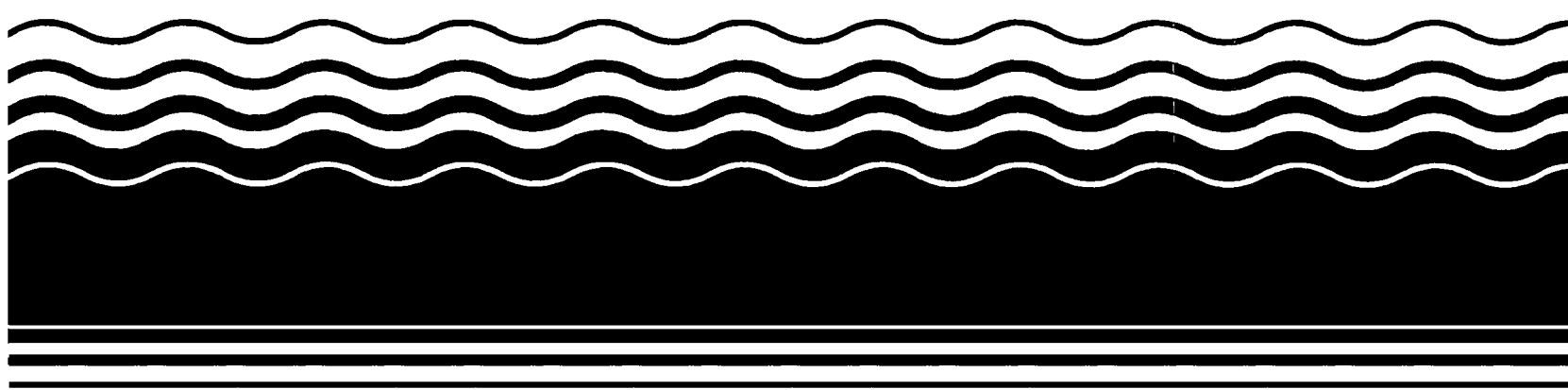




Superfund Record of Decision:

Industrial Latex, NJ



REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R02-92/185	2.	3. Recipient's Accession No.
4. Title and Subtitle SUPERFUND RECORD OF DECISION Industrial Latex, NJ First Remedial Action - Subsequent to follow			5. Report Date 09/30/92
7. Author(s)			6.
9. Performing Organization Name and Address			8. Performing Organization Rept. No.
			10. Project/Task/Work Unit No.
			11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460			13. Type of Report & Period Covered 800/000
15. Supplementary Notes PB93-963824			14.
16. Abstract (Limit: 200 words) <p>The 9.67-acre Industrial Latex site is a chemical adhesives and natural and synthetic rubber compounds manufacturer in Wallington, Bergen County, New Jersey. Land use in the area is predominantly residential, industrial, and recreational, with a wetland area located near the northeast corner of the site. The estimated 17,500 people who reside within 1 mile of the site used four of the five public water supply wells as their drinking water supply; however, these wells have been closed since 1985 because of ground water contamination. From 1951 to 1980, the Industrial Latex Corporation manufactured both chemical adhesives and natural and synthetic rubber compounds. Adhesives were initially formulated using vegetable protein in a solvent base. Solvents used in the process included acetone, heptane, hexane, methyl ethyl ketone (MEK), and methylene chloride. To reduce flammability, PCBs were introduced as a fire retardant. In the late 1970's, solvent-based adhesives were replaced by water-based latex adhesives. Poor operational procedures and onsite waste disposal practices, including chemical dumping, resulted in widespread areas of surface and subsurface</p> <p>(See Attached Page)</p>			
17. Document Analysis a. Descriptors Record of Decision - Industrial Latex, NJ First Remedial Action - Subsequent to follow Contaminated Media: soil, sediment, sludge, debris Key Contaminants: VOCs (PCE, TCE, toluene, xylenes), other organics (PAHs, PCBs, pesticides, phenols), metals (arsenic, lead) b. Identifiers/Open-Ended Terms c. COSATI Field/Group			
18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 70	
	20. Security Class (This Page) None	22. Price	

EPA/ROD/R02-92/185
Industrial Latex, NJ
First Remedial Action - Subsequent to follow

Abstract (Continued)

contamination. In 1980, the state conducted a site inspection and found approximately 250 leaking drums of various chemical compounds. The state discovered that VOCs and materials contaminated with PCBs were disposed of in an onsite sanitary septic system. After site operations ceased in 1983, the state conducted a second site inspection and discovered approximately 1,600 leaking and open drums. Analyses of the drums' contents revealed the presence of numerous VOCs and PCBs. In 1985, the state ordered the site owner to properly dispose of the drums; however, only about 400 drums were removed. In 1986, EPA initiated a removal action to address the remaining 1,200 drums and 22 USTs at the site. This ROD addresses the final remedy for the contamination present in the soil, sediment, buildings and equipment, drums, sludge, septic system, and hardened latex, as the first of two operable units. A future ROD will address ground water contamination, as OU2. The primary contaminants of concern affecting the soil, sediment, sludge, and debris are VOCs including PCE, TCE, toluene, and xylenes; other organics, including PAHs, PCBs, pesticides, and phenols; and metals, including arsenic and lead.

The selected remedial action for this site includes excavating approximately 600 buried drums with offsite disposal or incineration; dismantling 30 production vats from their steel supports and draining any remaining material that is not hardened into drums for offsite disposal or incineration, disposing of the vats in an offsite landfill; removing the floor drains and demolishing 41,000 square feet of the onsite buildings with offsite disposal; excavating the septic system along with 800 gallons of associated liquids and 6 cubic yards of sludge with offsite disposal; excavating and treating onsite an estimated 34,700 cubic yards of contaminated soil and sediment using low thermal desorption; testing soil to determine the need for stabilization prior to disposal, then, and backfilling treated material onsite; transporting residuals generated during the treatment process offsite for disposal or treatment; treating offgases using carbon adsorption or another appropriate treatment; monitoring air; assessing the wetland area and performing additional ground water investigations during the remedial design phase; implementing institutional controls, if necessary and site access restrictions including fencing. The estimated present worth cost for this remedial action is \$17,883,600, which includes an annual O&M cost of \$4,848,700 for 1 year.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil clean-up goals, which are based on the EPA Risk Assessment Guidance for Superfund (RAGS), include PCBs 1 mg/kg; heptachlor epoxide 0.1 mg/kg; benzo(a)anthracene 0.4 mg/kg; chrysene 13 mg/kg; bis (2-ethylhexyl)phthalate 46 mg/kg; indeno (1,2,3-cd) pyrene 0.2 mg/kg; arsenic 3.6 mg/kg; and lead 500 mg/kg. Building material contaminated with PCBs greater than 50 mg/kg will be disposed of in accordance with TSCA/RCRA requirements.

ROD FACT SHEET

SITE

Name	Industrial Latex
Location/State	Wallington, Bergen County, New Jersey
EPA Region	II
HRS Score (date)	36.45

ROD

Date Signed	9/30/92
Remedy/ies	Contaminated soil will be excavated and treated by low temperature thermal desorption, and then backfilled on the site. Buried drums present at the site will be excavated also, and will be disposed of or incinerated at an off-site facility. The vats will be dismantled and disposed of in an appropriate off-site landfill. Two buildings on the site will be demolished and also disposed of in an appropriate off-site landfill.
Capital Cost	\$11,263,600
O & M/year	\$4,848,700
Present worth	\$17,883,600

LEAD

Lead agency	U.S. EPA
Primary contact (phone)	Paolo Pascetta (212) 264-9001
Secondary contact (phone)	Robert McKnight (212) 264-1870
Main PRP(s)	N/A

WASTE

Type (metals, PCB, &c)	PCB
Medium (soil, g.w., &c)	soil, vats, drums, buildings
Origin	Company manufactured chemical adhesives, and natural and synthetic rubber compounds
Est. quantity cu.yd.	38,000 cu. yd. of soil
gal.	800 gallons of liquid and six cu. yd. of sludge
# drums	approx. 600 buried drums and 30 vats
etc.	approx. 41,000 sq. ft. of interior bldg. surfaces (walls and floors) and an exterior concrete pad

SEP 29 1992

Record of Decision for the
Industrial Latex Site

Kathleen C. Callahan, Director
Emergency and Remedial Response Division (2ERRD)

Constantine Sidamon-Eristoff
Regional Administrator (2RA)

Attached for your approval is the Record of Decision (ROD) for the contaminated soil, vats, and buildings at the Industrial Latex site. The site is located in Bergen County, New Jersey.

The selected remedial action represents the first of two planned operable units for the site. This action will address the contamination present in the soil, vats, and buildings at the site. The groundwater will be the subject of the second operable unit.

Contaminated soil will be excavated and treated by low temperature thermal desorption, and then backfilled on the site. Buried drums present at the site will be excavated also, and will be disposed of or incinerated at an off-site facility. The vats will be dismantled and disposed of in an appropriate off-site landfill. Two buildings on the site will be demolished and also disposed of in an appropriate off-site landfill.

The estimated present worth cost to perform the remedial action at the site is \$18 million.

A remedial investigation and feasibility study (RI/FS) to identify the nature and extent of contamination at the site was completed in July 1992. The results of the RI/FS and the Proposed Plan for the site were released to the public on July 16, 1992. The 30-day public comment period ended on August 15, 1992. In addition, a public meeting was held on August 10, 1992. The comments provided by local residents and officials on the proposed remedial action did not necessitate a modification of the proposed remedy.

The attached ROD was developed by EPA and has been reviewed by the New Jersey Department of Environmental Protection and Energy, and the appropriate offices within Region II. Their input and comments are reflected in the document.

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

Attachment

NJSB1:NNJS1:MCKNIGHT:G:\USER\SHARE\NJSB1\LATEX_RA.MEM:9/28/92

SYMBOL --->	NNJS1	NJSB1	ORC	DO-NJP	ERRD	OEP	DRA	RA
SURNAME -->	MCKNIGHT	WYNCH	URDAZ/ROONEY	FRISCO	CALLAHAN	MARSHALL	MUSZYNSKI	SIDAMON-ERISTOFF
DATE ----->	9/28/92	9/28/92	9/29/92	9/29/92	9/29/92	9/29/92		

DECLARATION STATEMENT

RECORD OF DECISION

INDUSTRIAL LATEX

Site Name and Location

Industrial Latex
Wallington, Bergen County, New Jersey

Statement of Basis and Purpose

This decision document presents the selected remedial action for contaminated soil, vats, buildings, and buried drums at the Industrial Latex site. The remedial action was chosen 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. This decision is based on the administrative record for the site.

Assessment of the Site

Actual or threatened releases of hazardous substances from the Industrial Latex site, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of the Selected Remedy

The remedy described in this document represents the first operable unit for the Industrial Latex site. It addresses the current and future threats to human health and the environment associated with the contamination present in the soil, vats, buildings, and buried drums at the site, and is the final remedial action for these media. Additional investigation will be undertaken to characterize the nature and extent of any site-related groundwater contamination. A subsequent decision document will address the need for groundwater remediation.

The major components of the selected remedy include:

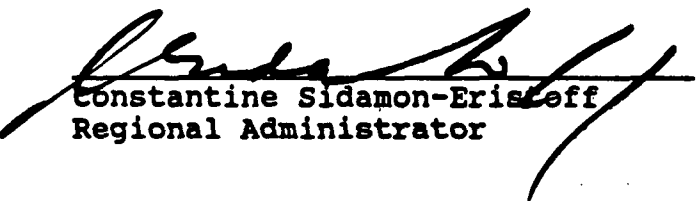
- Excavation of contaminated soil exceeding remediation goals above the water table, on-site treatment by low temperature thermal desorption, and on-site backfilling of the treated soil;

- Removal and off-site disposal of contaminated vats in an approved landfill under the Toxic Substances Control Act and the Resource Conservation and Recovery Act;
- Demolition and off-site disposal of buildings in an appropriate landfill;
- Excavation and off-site treatment or disposal of buried drums; and
- Appropriate environmental monitoring to ensure the effectiveness of the remedy.

Statutory Determinations

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element. Subsequent actions may be necessary to address groundwater contamination at the site.

Because this remedy will not result in hazardous substances remaining on the site above health-based levels, the five-year review will not apply to this action.


Constantine Sidamon-Eristeff
Regional Administrator


Date

DECISION SUMMARY

RECORD OF DECISION

INDUSTRIAL LATEX

SITE NAME, LOCATION AND DESCRIPTION

The Industrial Latex site is located at 350 Mount Pleasant Avenue in the Borough of Wallington, Bergen County, New Jersey. It is situated in a small valley between two northeast-southwest trending hills. The property encompasses 9.67 acres in a mixed residential/industrial neighborhood. The site is bordered by a residential area including an elementary school to the west; a tractor trailer storage area to the north; the CONRAIL/New Jersey Transit railroad line to the east; and an outdoor recreational complex, residences, and an undeveloped lot to the south (Figure 1). The undeveloped lot is owned by the Borough of Wallington and is utilized for storage (road salt, sand, gravel, and construction debris), and for composting (grass, leaves, etc.). The Borough of Wood-Ridge is located directly east of the railroad line.

The site is southeast of an extensive industrial development bordering the CONRAIL/New Jersey Transit rail corridor. Industrial facilities near the site include the Curtiss-Wright Corporation located in Wood-Ridge and Farmland Dairies in Wallington. The Curtiss-Wright and Farmland Dairies facilities are currently undergoing environmental investigations under the New Jersey Environmental Cleanup Responsibility Act (ECRA).

The majority of the land use within a one-half mile radius of the Industrial Latex site is residential, while some land is zoned for commerce and industry. Major residential developments are closely situated to the east, west, and south of the site. According to 1990 census data, approximately 17,500 people live in the Boroughs of Wallington and Wood-Ridge.

Until 1985, the Borough of Wallington had maintained five public water supply wells within the Borough (Figure 2). Four of these wells are located within one mile of the site. However, the wells have been closed since 1985 due to groundwater contamination of volatile organic compounds (VOCs) such as trichloroethene (TCE), tetrachloroethene (PCE), and trans-1,2-dichloroethene. The Passaic Valley Water Commission currently supplies potable water to the Wallington Water Company for distribution to the Borough.

Two buildings are present on the site. Building 1 housed the offices and laboratory of the Industrial Latex Corporation and served as the shipping warehouse. Some chemical processing was performed in this building. A floor drain runs down the center of Building 1 discharging to the ground at the rear of the

property. Off-specification product was allegedly dumped in the floor drain. Four on-site septic tanks were also used for disposal of chemical wastes: Tanks 1 and 2 are located immediately adjacent to the southeast side of Building 1 and Tanks 3 and 4 are located approximately 125 feet northeast of Building 1. A boiler located in Building 1 may be a source of dioxin contamination found at the site due to the alleged combustion of oil containing polychlorinated biphenyls (PCBs). The larger building, Building 2, served as the main production facility. Most of the production equipment still remains in the building along with rolls of finished materials and miscellaneous pieces of small equipment. Four rooms were added to the original structure of Building 2 after 1960. The additional portions of this building may be built on buried debris. Thirty chemical-processing vats were used to formulate the latex products; six vats are located in Building 1 and 24 vats are located in Building 2. Latex product has solidified on the interior and exterior surfaces of the vats.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Industrial Latex Corporation manufactured chemical adhesives, and natural and synthetic rubber compounds from 1951 until 1980. Adhesives were initially formulated using vegetable protein in a solvent base. Solvents utilized in the process included acetone, heptane, hexane, methyl ethyl ketone (MEK), and methylene chloride. To reduce flammability, PCBs were introduced as a fire retardant. In addition, the PCBs also had excellent bonding properties.

In the late 1970s, solvent-based adhesives were replaced by water-based latex adhesives. Intermittent processing of latex compounds continued at the site until October 1983, when all operations ceased. Poor operational procedures and on-site waste disposal practices resulted in widespread areas of surface and subsurface soil contamination.

Prompted by numerous complaints from local officials about the misuse of solvents and the dumping of trash and chemicals on the property, the New Jersey Department of Environmental Protection and Energy (NJDEPE) conducted a site inspection in 1980 and found approximately 250 leaking drums of various chemical compounds. In addition, NJDEPE discovered that VOCs and materials contaminated with PCBs had been disposed of in an on-site sanitary septic system. NJDEPE conducted a second site inspection in 1983 and discovered approximately 1,600 drums which were open, leaking, or lying on their sides. Analyses of the drum contents revealed the presence of acetone, hexane, MEK, dimethyl formamide, and 1,1,1-trichloroethane (TCA).

In 1985, NJDEPE began enforcement efforts to have the site owner remove and properly dispose of all on-site drums and contaminated soil. By March 1986, however, only about 400 drums had been removed.

Because of the owner's inability to conduct a timely removal of the material, the United States Environmental Protection Agency (EPA) initiated a removal action in April 1986 to address immediate contaminant hazards present at the site. Sampling and analyses of on-site drums revealed the presence of benzene, ethylbenzene, toluene, xylene, and extensive PCB contamination. By January 1987, EPA had removed 1,200 drums and 22 underground storage tanks from the site.

From May 1987 until January 1988, EPA conducted an expanded site inspection for the purpose of collecting additional data on the nature and extent of contamination. In addition, a fence was installed to restrict access to the site and reduce direct exposure to surface contamination. The data collected during the expanded site inspection was used as supporting documentation in ranking the Industrial Latex site for inclusion on the National Priorities List (NPL) of Superfund sites. The site was proposed for inclusion on the NPL in June 1988 and finalized in March 1989. EPA initiated a remedial investigation and feasibility study (RI/FS) to determine the nature and extent of contamination at the Industrial Latex site in June 1989.

On March 26, 1986, EPA sent notice letters to five potentially responsible parties (PRPs). On July 31, 1986, EPA issued a Unilateral Administrative Order to all five of these PRPs demanding that they perform removal actions at the site. None of the PRPs offered to perform this work. In January 1988, EPA filed a lien on the site pursuant to Section 113 of the Comprehensive Environmental Response, Compensatory and Liability Act (CERCLA), as amended. In addition, EPA sent a letter, dated January 4, 1988, to two of the PRPs demanding that they reimburse EPA for \$1,524,000 in past costs related to removal activities at the site. Neither party offered to provide EPA with such reimbursement. On March 17, 1992, EPA sent information request letters to three firms believed to have information relating to the disposal of waste material at the site. The responses did not indicate that the firms had any involvement with the Industrial Latex site. EPA will evaluate further enforcement activities.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

A Community Relations Plan (CRP) was developed to ensure the public opportunities for involvement in site-related decisions. In addition, the CRP was used by EPA to determine, based on community interviews, activities to ensure public involvement and

to provide opportunities for the community to learn about the site.

EPA held a public meeting and distributed a fact sheet in June 1989 to explain the initial RI/FS to the public and to report on the progress being made at the site.

The RI and FS reports were released to the public in July 1992. A Proposed Plan, that identified EPA's preferred remedial alternative, was released on July 16, 1992. These documents were made available to the public at the information repositories at the John F. Kennedy Memorial Library, located on Hathaway Street in Wallington, New Jersey, and the Wood-Ridge Memorial Library, located on Hackensack Street in Wood-Ridge, New Jersey, and in the administrative record file at the EPA Docket Room in Region II, New York, New York. A copy of the administrative record is also located at the John F. Kennedy Memorial Library. The notice of availability for the above-referenced documents was published in The Record (Bergen/Hudson Edition) on July 16, 1992. The public comment period on these documents was held from July 16, 1992 to August 15, 1992.

On August 10, 1992, EPA conducted a public meeting at the Wallington Civic Center, to present the findings of the RI/FS and the Proposed Plan, and to respond to questions and comments from area residents and other attendees.

Responses to the comments received during the public comment period are included in the Responsiveness Summary, which is part of this Record of Decision (ROD).

This decision document presents the selected remedial action for the Industrial Latex site, chosen in accordance with the CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The selection of the remedy for this site is based on the administrative record.

SCOPE AND ROLE OF RESPONSE ACTION

This Record of Decision was developed by EPA.

As with many Superfund sites, the problems at the Industrial Latex site are complex. As a result, EPA has organized the site into two remedial phases or operable units, in addition to the removal action that was conducted between April 1986 and January 1987. This ROD addresses the first operable unit for the site and identifies the selected remedy for the contaminated soils and sediments, buildings and equipment, drums, septic system, and

hardened latex material. This is a final remedy for the first operable unit.

Because the results of the groundwater investigation were not conclusive, a second operable unit to more fully characterize the presence and extent of contamination will be performed. A subsequent investigation will be performed to determine the nature and extent of any site-related groundwater contamination. A final remedy for the groundwater contamination will be determined after collecting and evaluating additional groundwater information.

SUMMARY OF SITE CHARACTERISTICS

Site Geology and Hydrology

The Industrial Latex site lies within the physiographic region known as the Triassic Lowlands which is a subdivision of the Piedmont Province. In general, the lowland terrain consists of a gently rolling surface that varies in altitude from one foot to 200 feet. The lowland is underlain by igneous and sedimentary rocks of Jurassic and Triassic Age, respectively. The sedimentary bedrock deposits of shale, siltstone and sandstone belong to the Brunswick Formation of the Newark Group. The Brunswick Formation is also referred to as the Passaic Formation. The igneous bedrock consists of basalt and diabase intrusions which form highly resistant ridges, known as the Watchung Mountains. The site is located in a small valley between two northeast-southwest trending hills. The site has an average elevation of 63 feet above mean sea level (MSL). The hill to the west of the site has an elevation of 120 feet above MSL. To the east, another ridge of hills rises to an altitude of 200 feet above MSL.

The sedimentary beds strike north to northeast and dip west to northwest at 10 degrees. A prominent set of joints parallels the strike of the beds; a less prominent set strikes in a northwest direction. The United States Geological Survey (USGS) performed geophysical logging on the Borough of Wallington's Spring Street well, located approximately 450 feet south of the site. Based on this logging, the USGS inferred that major fracture zones exist at 36 to 40 feet and 53 to 66 feet below ground surface, with numerous small fractures down the rest of the 392-foot well.

Bedrock at the site is overlain by approximately 35 feet of glacial deposits. The glacial deposits are thick (30 to 50 feet) in the eastern portion of the site and relatively thin (6 to 8 feet) in the western portion of the site due to the sharp rise in bedrock elevation in this area.

Low portions of the site to the east have accumulated marshland organic substratum of the Udorthents Series. However, development of the area and reworking of the on-site soils have disturbed the original soils significantly. In general, soils found at the Industrial Latex site are classified as soils of the Boonton Series Urban Land Complex.

The Industrial Latex site is located in the Passaic River basin. Generally, on-site surface runoff flows eastward across the site to an intermittent drainage channel which parallels the railroad tracks. This drainage channel ordinarily flows only during periods of excessive precipitation.

Groundwater is present in both consolidated and unconsolidated subsurface material at the Industrial Latex site. Formerly, five municipal wells supplied the Borough of Wallington with its potable water. All wells were completed in the Brunswick Formation, at depths ranging from approximately 350 to 400 feet below the ground surface. As shown in Figure 2, the municipal wells are situated throughout the Borough. Since 1985, the municipal wells have been closed due to VOC contamination. The primary contaminants are trans-1,2-dichloroethene, PCE, and TCE.

In 1986, the USGS conducted a survey of the groundwater quality in the area of the Industrial Latex site. In addition to the Wallington municipal wells, analytical data were reviewed from a municipal test well immediately south of the site, monitoring wells at the Curtiss-Wright Facility in Wood-Ridge northeast of the site, and production wells at the Farmland Dairies in the Borough of Wallington north of the site. Based on this water quality data, the USGS inferred that groundwater in the unconsolidated and bedrock materials around the site are contaminated with VOCs, petroleum hydrocarbons, and phthalate esters. This may indicate that groundwater contamination is a regional problem in the area.

The RI also investigated groundwater quality both on and off the Industrial Latex site. However, because groundwater sampling produced inconsistent results, and only relatively low concentrations of contaminants were detected, no conclusions could be drawn from that part of the investigation.

The depth to water at the Industrial Latex site was found to range from approximately 10 feet below the ground surface in the eastern portion of the property to about 20 feet in the western portion. The water level difference in the depth corresponds to a change in topography between the eastern and western portions of the site.

Using the U.S. Fish and Wildlife Service (USFWS) Wetland Classification System, the wetlands identified at the Industrial Latex site were classified as palustrine wetlands. The water

regime at the site could be classified as seasonally/temporarily flooded. This indicates that water is present for both brief and extended periods during the growing season. When surface water is absent, the water table usually occurs closely below the ground surface early in the season and drops lower as the growing season continues. Palustrine emergent wetlands are located near the northeast corner of the site. The palustrine scrub/shrub and forested wetlands, in the northern section of the site between the fence and the property boundary, are characterized by hardwood shrub and tree vegetation. A scrub/shrub wetland borders the surface drainage ditch adjacent to the eastern property boundary. Past human activities have disturbed these wetlands causing alterations in typical wetland hydrology, soil and vegetation. Perturbations found on site include altered drainage patterns, buried hydric soils (i.e., filled wetlands), scraped and/or removed hydric soils, buried plant materials, mounded dirt and debris on buried hydric soils, ditched wetland areas, and removed vegetation.

A Stage IA Cultural Resource Survey performed as part of the RI concluded that there is little likelihood that significant prehistoric or historic activities occurred at the site. In addition, due to the extensive reworking of the site soils over the last 40 years, any archeological remains of such activities would have been likely obliterated. Therefore, no additional investigation is considered necessary.

Nature and Extent of Contamination

A series of field investigations, collectively referred to as the remedial investigation, was completed in June 1992. The purpose of the RI was to determine the nature and extent of contamination associated with the site.

To assess the nature and extent of contamination, 256 samples were obtained from surface and subsurface soil, 54 samples from groundwater, 24 from sediments, and 86 samples of building components including interior building surfaces, floor drains, septic systems, and equipment.

The major conclusions of the RI for the site are summarized below:

- ♦ Approximately 32,000 cubic yards of soil on the site are contaminated with PCB Aroclor 1260, bis(2-ethylhexyl) phthalate, metals, and polynuclear aromatic hydrocarbons (PAHs). This volume is based on an estimate of soil containing more than 1 part per million (ppm) of PCBs, and includes soil in the wetland portion of the site as well as beneath the buildings. The highest levels of soil contamination are found along the eastern boundary and in the southeast corner of the site (Figures 3 to 6). PCB

Aroclor 1260 is found in concentrations up to 4,000 ppm, bis(2-ethylhexyl)phthalate up to 280 ppm, and antimony up to 12.6 ppm. An additional 2,700 cubic yards of soil contain metals at concentrations consistent with background levels for the area. The background levels were based on off-site sampling of soil.

- ♦ Approximately 600 buried drums containing latex-type material and other material are present along the eastern boundary and southeastern corner of the site at a depth of one-half foot to 10 feet below the ground surface. Samples of this material detected PCB Aroclor 1260 at concentrations as high as 43,700 ppm. In addition, drums and related latex-type material are exposed along the railroad corridor.
- ♦ Approximately 2,700 cubic yards of soil and sediments in a drainage channel along the eastern border of the site are contaminated with PCB Aroclor 1260 (up to 250 ppm), bis(2-ethylhexyl)phthalate (up to 150 ppm), PAHs (up to 13 ppm), and metals (up to 654 ppm). The surface water in the drainage channel did not contain any compounds which exceed promulgated New Jersey Surface Water Quality Criteria.
- ♦ Groundwater beneath the eastern portion of the site may be contaminated with low concentrations of VOCs, PCB Aroclor 1260, bis(2-ethylhexyl)phthalate, and metals, but the results from several rounds of groundwater sampling were not consistent. Additionally, because background conditions were not sufficiently established, it could not be determined if the groundwater was actually contaminated as a result of the site. However, all residences in the area are served by the Passaic Valley Water Commission.
- ♦ Approximately 41,000 square feet of interior building surfaces (walls and floors) and an exterior concrete pad are contaminated with PCB Aroclor 1260 at a level up to 95 ppm. The floor drains in one of the buildings, the processing vats, and miscellaneous equipment within both buildings are also contaminated with PCB Aroclor 1260 (as high as 570 ppm). The floor drains are also contaminated with VOCs, phthalates, and metals.
- ♦ Approximately 800 gallons of liquids and six cubic yards of sludges from the septic tanks are contaminated with VOCs (up to 2,800 ppm), PCBs (up to 22,000 ppm), phthalates (up to 5,600 ppm), and metals (up to 13,000 ppm).
- ♦ Thirty vats are present in the two buildings on the site and are primarily contaminated with surficial PCBs (up to 21,100 ppm), metals, and VOCs (up to 24,800 ppm).

SUMMARY OF SITE RISKS

Based upon the results of the RI, a baseline risk assessment was conducted to estimate the risks associated with current and future site conditions. The baseline risk assessment estimates the human health and environmental risk which could result from the contamination at the site if no remedial action were taken.

Human Health Risk Assessment

For the human health risk assessment, a reasonable maximum human exposure was evaluated. A four-step process was utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: Hazard Identification--identified the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence, and concentration; Exposure Assessment--estimated the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated soil) by which humans are potentially exposed; Toxicity Assessment--determined the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and Risk Characterization--summarized and combined outputs of the exposure and toxicity assessments to provide a quantitative (e.g., one-in-a-million excess cancer risk) assessment of site-related risks.

Under current EPA guidelines, the likelihood of carcinogenic (cancer causing) and noncarcinogenic effects due to exposure to site chemicals are considered separately. It was assumed that the toxic effects of the site-related chemicals would be additive. Thus, carcinogenic and noncarcinogenic risks associated with exposures to individual indicator compounds were summed to indicate the potential risks associated with mixtures of potential carcinogens and noncarcinogens, respectively. Table 1 shows the chemicals detected in soil and sediments at the site, and identifies the chemicals of potential concern. The health effects criteria for the chemicals of potential concern are presented in Table 2.

Noncarcinogenic risks were assessed using a Hazard Index (HI) approach, based on a comparison of expected contaminant intakes and safe levels of intake (Reference Doses). Reference Doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects. RfDs, which are expressed in units of milligrams per kilogram per day (mg/kg-day), are estimates of daily exposure levels for humans which are thought to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) are compared with the RfD to derive the hazard quotient for the contaminant in the particular media. The HI is obtained by

adding the hazard quotients for all compounds across all media. An HI greater than 1.0 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

Potential carcinogenic risks were evaluated using the cancer potency factors developed by EPA for the indicator compounds. Cancer potency factors (CPFs) have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of $(\text{mg/kg-day})^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day , to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPFs. Use of this approach makes underestimation of the risk highly unlikely.

For known or suspected carcinogens, EPA considers excess upper-bound individual lifetime cancer risks of between 1×10^{-4} to 1×10^{-6} to be acceptable. This level indicates that an individual has no greater than a one in ten thousand to one in a million chance of developing cancer as a result of exposure to site conditions over a 30-year period.

To evaluate human health risk, several exposure pathways were selected for detailed evaluation under both current and future land-use conditions. Under current land-use conditions (Table 3), the dominant health risk is posed by the ingestion of on-site surface soil (0 to 2 feet) by a trespasser. Ingestion of soil poses the greatest carcinogenic and noncarcinogenic risk. The estimated cancer risk is 9×10^{-4} (nine in ten thousand), primarily due to PCB Aroclor 1260. The HI related to ingestion of on-site surface soil is 7.8.

The estimated cancer risk for dermal contact with on-site soil and for incidental ingestion of, or dermal contact with, off-site surface soil are within EPA's target cancer risk range of 10^{-4} to 10^{-6} . The HIs for these exposure pathways are less than one. Both excess cancer risk and the HI for the remaining exposure pathways are also within acceptable levels.

The following exposure pathways were evaluated in detail under future land-use conditions:

- ♦ Incidental ingestion and dermal absorption of on-site surface soils by a hypothetical future worker.

- ◆ Incidental ingestion and dermal absorption of on-site surface soils by a hypothetical future resident (Birth to 30 years old).

Under future land-use conditions (Table 4), the dominant health risk is posed by the ingestion of on-site surface soil by a future resident. Based on contaminant concentrations identified in the on-site surface soil, ingestion of the soil poses the greatest carcinogenic and noncarcinogenic risk. The estimated excess cancer risk is 2×10^{-2} (two in a hundred), due primarily to PCB Aroclor 1260. The HI is 48, also due to PCB Aroclor 1260.

The estimated excess cancer risk for dermal contact with on-site surface soil for a future resident is 5×10^{-3} (five in a thousand), and the HI is 14. The estimated excess cancer risk for incidental ingestion of on-site surface soil by a future worker is 3×10^{-3} , and 5×10^{-4} for dermal contact with the soil. The HIs are 9.5 and 1.6, respectively.

A qualitative risk assessment was performed for the building surfaces and vats on the site because of the difficulty in adequately quantifying those exposure risks. Generally, the chemicals detected on the building and vat surfaces were present at concentrations significantly higher than the maximum concentrations found in on-site soil. Dermal absorption of PCB Aroclor 1260 and bis(2-ethylhexyl)phthalate are the most serious health threats, and chronic exposure may result in elevated cancer risks, adverse liver effects, and fetotoxicity. Short-term exposures via inhalation to high concentrations of VOCs in the floor drains may result in neurological effects. The high concentrations of inorganic chemicals are not likely to penetrate the skin; however, the risks due to incidental ingestion may be significant due primarily to antimony and zinc.

Ecological Risk Assessment

For the ecological risk assessment, a reasonable maximum environmental exposure was evaluated. A four-step process was utilized for assessing site-related ecological risks for a reasonable maximum exposure scenario: Problem Formulation--a qualitative evaluation of contaminant release, migration, and fate; identification of contaminants of concern, receptors, exposure pathways, and known ecological effects of the contaminants; and selection of endpoints for further study; Exposure Assessment--a quantitative evaluation of contaminant release, migration, and fate; characterization of exposure pathways and receptors; and measurement or estimation of exposure point concentrations; Ecological Effects Assessment--literature reviews, field studies, and toxicity tests, linking contaminant concentrations to effects on ecological receptors; and Risk

Characterization--measurement or estimation of both current and future adverse effects.

The ecological assessment is summarized as follows:

- ♦ PCBs have the greatest potential to adversely impact the soil-dwelling invertebrates and small mammals because they are widely distributed in the soil throughout the site, and have a relatively high toxicity and propensity to bioconcentrate.
- ♦ Chemical concentrations in the surface water of the drainage channel are generally below concentrations likely to impact aquatic communities. Some impacts might occur to sensitive aquatic species and/or life stages as a result of inorganic contaminants in the sediment.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the contaminants of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the contaminants of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the Risk

Assessment provides upper-bound estimates of the risks to populations near the site, and is highly unlikely to underestimate actual risks related to the site.

More specific information concerning human health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the Risk Assessment Report.

Conclusion

Actual or threatened releases of hazardous substances from the Industrial Latex site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

REMEDIAL ACTION OBJECTIVES

The following remedial action objectives have been established for this operable unit of the Industrial Latex site:

- ♦ Reduce risks associated with inadvertent ingestion of, and direct contact with, contaminated soil and sediments
- ♦ Reduce risks associated with continued release of contaminants from other known source areas, such as buried drums, buried off-specification product, and septic tanks
- ♦ Reduce risks associated with potential future releases from equipment, building process vats, floor drains, and buildings
- ♦ Reduce ecological risks associated with current site conditions and potential future releases from equipment, building process vats, floor drains, and buildings

To achieve these objectives, EPA will utilize the risk-based remediation goals developed for the Industrial Latex site shown on Table 5. The remediation goals were based on an assumption that the site could be developed for residential use at some future time. Additionally, the relatively close proximity of current residences to the contaminated area (several residential backyards extend onto uncontaminated portions of the Industrial Latex property) further substantiates the basis for this assumption. The remediation goals will decrease the risks to the 10^{-6} range. These risk-based remediation goals were derived in order to reflect the potential risk from exposure to a chemical given a specific pathway, medium, and land-use combination. By setting the total risk for carcinogenic effects at an acceptable risk level (i.e., one in a million), it is possible to calculate

a remediation level for carcinogens in that exposure pathway. For noncarcinogens, total risk is set at an HI of 1 for each chemical in a particular medium. It is then possible to calculate a remediation level for each noncarcinogen within that particular medium. Because significant contaminant concentrations are present near the groundwater table in some areas of the site, soil will be remediated to the average water table (approximately ten feet below the ground surface).

DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA, as amended by SARA, requires that each selected site remedy be protective of human health and the environment, comply with applicable or relevant and appropriate requirements, utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable, and be cost effective. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of hazardous substances.

The FS evaluated in detail eight alternatives for remediating the soil, three alternatives for remediating hardened material in vats, and four alternatives for remediating building surfaces. Under the soil remedial alternatives, Alternative S-1 (A), No Action, also includes no action for the hardened material in vats and the building surfaces. Alternatives S-2 through S-6 each include the excavation of buried drums which would be transported off site for treatment or disposal. Alternatives S-4, S-5, and S-6 also include the removal of the septic system and its contents for off-site treatment or disposal.

The estimated capital cost, operation and maintenance costs (O&M), and net present worth costs of each alternative discussed below are provided for comparison. The estimated implementation time reflects only the time required to construct or implement the remedy, and does not include the time required to design the remedy, negotiate with the responsible parties, or procure contracts for design and construction. A brief description of each alternative follows.

SOIL (INCLUDING BURIED DRUM/LATEX) REMEDIATION ALTERNATIVES

Alternative S-1 (A): No Action (Soil, Vats, and Building Surfaces)

Estimated Capital Cost:	\$ 0
Estimated Annual O&M Costs:	\$30,000
Estimated Present Worth:	\$83,000
Estimated Implementation Timeframe:	none

A No Action alternative is evaluated for every Superfund site to establish a baseline for comparison of remedial alternatives. Under this alternative, no further action would be taken to address contamination at the site.

The fence which currently surrounds the site would remain in place, however, it would not be maintained. No measures would be taken to reduce the potential for exposures to the contaminated soil, hardened material in vats, or the building surfaces. No environmental monitoring activities would be performed, other than a review after five years to determine if contamination has spread. The cost estimates above include the cost to perform this review.

Alternative S-1 (B): Minimal Action

Estimated Capital Cost:	\$ 167,000
Estimated Annual O&M Costs:	\$ 237,200
Estimated Present Worth:	\$3,434,000
Estimated Implementation Timeframe:	30 years

Under the Minimal Action alternative, no measures would be taken to remediate the contamination on the site. However, certain capital costs which include extending the existing fence and groundwater monitoring would be included in this alternative.

Site conditions would also be periodically monitored to evaluate the migration of contaminants from the site and to monitor the effects of natural attenuation. As with the No Action alternative, a review would be required after five years. The estimated implementation timeframe for this alternative is for the monitoring program.

Alternative S-2: Capping

Estimated Capital Cost:	\$4,940,000
Estimated Annual O&M Costs:	\$ 240,000
Estimated Present Worth:	\$7,090,000
Estimated Implementation Timeframe:	6 months

Capping represents an alternative that utilizes containment with no treatment. Capping would reduce the mobility of the soil contaminants by minimizing water infiltration and subsequent leaching of soil contaminants into the groundwater. Various capping methodologies were evaluated in the FS including a Resource Conservation and Recovery Act (RCRA) type cap, multi-media cap, asphalt cap, and soil cap. For cost estimation purposes, an asphalt cap with an underlying High Density Polyethylene liner was selected as the representative process option for the capping alternative.

Prior to construction of the cap, buried drums would be excavated and transported off site for treatment or disposal. Contaminated sediments from the drainage ditch and contaminated soil from the wetland area at the northeastern portion of the site would be excavated and relocated to the area to be capped.

During construction and related activities, an air monitoring program would be implemented to assure that no significant airborne contamination migrates off site. Dust suppression measures would be undertaken during soil excavation and related activities. Additionally, an assessment of the wetlands would be performed to determine the potential impact of the remedial action. If necessary, a detailed plan for wetland mitigation or restoration would be developed.

Following the installation of the cap, a long-term monitoring program would be undertaken to ensure the effectiveness of the remedy. Deed restrictions would be sought for the property, if necessary.

Alternative S-3: In-situ Stabilization

Estimated Capital Cost:	\$ 9,100,000
Estimated Annual O&M Costs:	\$ 240,000
Estimated Present Worth:	\$11,200,000
Estimated Implementation Timeframe:	6 months

Under this alternative, contaminated soil would be mixed with setting agents, such as cement or lime, to form a hard, durable product in which contaminants are chemically bound and/or entrapped in the solidified mass.

Approximately 28,100 cubic yards of contaminated surface and subsurface soil can be stabilized in place. The remaining soil,

an estimated 6,600 cubic yards, is in the wetland area, confined areas where the soil mixing equipment cannot reach, or under the buildings. Soils in the wetland area would be excavated and stabilized ex-situ to facilitate wetland restoration. Soils removed from wetland would be relocated on site after treatment. Soils excavated from the confined area between the buildings would be treated ex-situ and used to backfill the same area from which they were removed. If the buildings were demolished, that soil could be also stabilized in place, as well as the soil under the buildings. If the buildings were not demolished, the soil under them would not be stabilized.

An asphalt cap would be constructed over the stabilized soils to isolate them and to reduce the infiltration of precipitation into the treated soils. Prior to the stabilization of the soil, buried drums would be excavated and transported off site for treatment or disposal. During construction and related activities, an air monitoring program would be implemented to assure that no significant airborne contamination migrates off site. Dust suppression measures would be undertaken during soil excavation and related activities. Deed restrictions would be sought for the property, if necessary. Additionally, an assessment of the wetlands would be performed to determine the potential impact of the remedial action. If necessary, a detailed plan for wetland mitigation or restoration would be developed.

Alternative S-4: Low Temperature Thermal Desorption

Estimated Capital Cost:	\$10,480,000
Estimated Annual O&M Costs:	\$ 4,848,700
Estimated Present Worth:	\$17,100,000
Estimated Implementation Timeframe:	1 year

Alternative S-4 involves excavation of an estimated 34,700 cubic yards of contaminated soil, on-site treatment by low temperature thermal desorption (LTTD), and backfilling of treated material. Buried drums and the septic system would be excavated and transported off site for treatment or disposal.

LTTD is a treatment process for solids and sludges which uses thermal forces to remove PCBs and other organic contamination. Contaminated soil is indirectly heated causing the volatilization of organic compounds. The process off-gas is then treated using a scrubber and activated carbon filters, or some other appropriate gas treatment approach. The residuals from this process, which include spent carbon and small amounts of waste water, would be transported off site for treatment or disposal. Data available from the treatability study show that PCBs have been reduced to less than 2 parts per million (ppm) (the treatability study treatment goal). It is anticipated that the EPA remediation goal of 1 ppm can be satisfied by modifying

treatment conditions such as residence time and temperature, if necessary. If the remediation goal of 1 ppm cannot be satisfied, the residual soils may need additional remedial measures (e.g., stabilization) prior to backfilling. If necessary, a waiver of TSCA chemical waste landfill requirements would be sought under 40 CFR 761.75(c)(4).

Treated soil would be tested to determine the need for stabilization of metals prior to backfilling. After backfilling, the treated soil would be graded, covered with topsoil, and seeded. During construction and related activities, an air monitoring program would be implemented to assure that no significant airborne contamination migrates off site. Dust suppression measures would be undertaken during soil excavation and related activities. Additionally, an assessment of the wetlands would be performed to determine the potential impact of the remedial action. If necessary, a detailed plan for wetland mitigation or restoration would be developed. Deed restrictions would be sought for the property, if necessary.

Alternative S-5: Dechlorination

Estimated Capital Cost:	\$ 5,760,000
Estimated Annual O&M Costs:	\$ 5,073,600
Estimated Present Worth:	\$16,800,000
Estimated Implementation Timeframe:	2 years

The dechlorination alternative involves excavation of approximately 34,700 cubic yards of contaminated soils, on-site treatment by dechlorination, and backfilling of the treated material. Buried drums and the septic system would be excavated and transported off site for treatment or disposal.

Dechlorination is a chemical treatment process in which a glycol reagent is used to displace chlorine molecules from certain classes of chlorinated organic wastes, producing a less toxic, water-soluble species. Dechlorination can be used to treat liquids, soils, and sludges containing PCBs, chlorobenzenes, and dibenzofurans. The soil pH would be neutralized prior to backfilling on site, coupled with leachate testing to demonstrate that treated soils would not contribute to groundwater contamination. Process fluids may require off-site treatment or disposal. Toxicity testing of treated soils would be performed to ensure that terrestrial organisms can be supported. Solid residuals would be sampled and analyzed for toxicity characteristic leaching procedure (TCLP) and total constituents, and other RCRA characteristics necessary for off-site disposal.

Treated soil would be tested to determine the need for stabilization of metals prior to backfilling. After backfilling, the treated soil would be graded, covered with topsoil, and seeded. During construction and related activities, an air

monitoring program would be implemented to assure that no significant airborne contamination migrates off site. Dust suppression measures would be undertaken during soil excavation and related activities. Additionally, an assessment of the wetlands would be performed to determine the potential impact of the remedial action. If necessary, a detailed plan for wetland mitigation or restoration would be developed. Deed restrictions would be sought for the property, if necessary.

Alternative 8-6: Solvent Extraction

Estimated Capital Cost:	\$16,200,000
Estimated Annual O&M Costs:	\$ 5,716,900
Estimated Present Worth:	\$23,700,000
Estimated Implementation Timeframe:	1 year

This alternative involves excavation of an estimated 34,700 cubic yards of contaminated soil, on-site treatment by solvent extraction, and backfilling of the treated material. Treated soil would be tested to determine the need for stabilization of metals prior to backfilling. Buried drums and the septic system would be excavated and transported off site for treatment or disposal.

Solvent extraction is a physical treatment process in which an organic solvent is used to extract organic contaminants from the soils and sediments. The solvent extraction process would separate the contaminated soils into three distinct fractions: dry, oil-free solids; water; and oil. This separation occurs in a two-stage process consisting of a cold stage followed by a hot stage. During the cold stage, the screened, contaminated soil is mixed with a solvent such as triethylamine (TEA), and two phases are formed: a TEA/oil/water phase, and a solids phase. The solids are removed with a filter or centrifuge and dried to recover the solvent. Since the environment is alkaline, the metals are converted to hydrated oxides, which precipitate and exit the process with the solids. After the TEA/oil/water phase leaves the cold stage, it is heated to 130°F at which point two separate phases are formed: a TEA/oil phase, and a TEA/water phase. Solvent is recovered by drying the solids, and steam stripping the oil and water phases.

Confirmatory sampling of treated soils and sediments would be conducted prior to backfilling. This would consist of sampling each batch of treated material and analyzing for PCBs and full TCLP and total analyses. Toxicity testing would also be conducted to ensure that treated soils can support terrestrial organisms.

Residual PCB-contaminated oil from the treatment process would be sampled for total and TCLP constituents, and other RCRA characteristics necessary for off-site disposal. No other

residuals are anticipated to be generated which would require off-site disposal. However, material that cannot be processed in the solvent extraction system (e.g., rocks, tree roots) may also require off-site disposal.

After backfilling, the treated soil would be graded, covered with topsoil, and seeded. During construction and related activities, an air monitoring program would be implemented to assure that no significant airborne contamination migrates off site. Dust suppression measures would be undertaken during soil excavation and related activities. Additionally, an assessment of the wetlands would be performed to determine the potential impact of the remedial action. If necessary, a detailed plan for wetland mitigation or restoration would be developed. Deed restrictions would be sought for the property, if necessary.

Alternative 8-7: On-site Incineration

Estimated Capital Cost:	\$ 7,190,000
Estimated Annual O&M Costs:	\$ 8,872,900
Estimated Present Worth:	\$25,300,000
Estimated Implementation Timeframe:	3 years

Alternative S-7 would involve the excavation of approximately 34,700 cubic yards of contaminated soil followed by thermal destruction of organic chemicals (PCBs, VOCs and PAHs) using a mobile on-site incineration unit. Contaminated materials (i.e., soils, sediments, hardened latex product and drums) would be incinerated on site. Materials handling may be necessary to shred drums and latex material prior to feeding into the incinerator.

The rotary kiln incineration process evaluated for this alternative involves the introduction of wastes and auxiliary fuel into the high end of an inclined cylindrical refractory-lined kiln. Wastes are substantially oxidized to gases and ash as they pass through the rotating kiln. Rotation of the combustion chamber creates turbulence and improves the degree of oxidation. Solids retention time varies from several minutes to more than an hour depending on waste characteristics. Exhaust gases from the kiln enter a secondary chamber afterburner to complete oxidation of the combustible waste. Prior to release to the atmosphere, exhaust gases from the afterburner pass through air pollution control units for particulate and acid gas removal. Ash residue (i.e., treated soil) is discharged at the bottom of the kiln. Treated soil would be tested to assure the organic contaminants are destroyed and to determine the need for stabilization of metals prior to backfilling. After backfilling, the treated soil would be graded, covered with topsoil, and seeded.

During construction and related activities, an air monitoring program would be implemented to assure that no significant airborne contamination migrates off site. Dust suppression measures would be undertaken during soil excavation and related activities. Additionally, an assessment of the wetlands would be performed to determine the potential impact of the remedial action. If necessary, a detailed plan for wetland mitigation or restoration would be developed. Deed restrictions would be sought for the property, if necessary.

Alternative S-8: Off-site Landfilling

Estimated Capital Cost:	\$ 4,900,000
Estimated Annual O&M Costs:	\$ 6,886,600
Estimated Present Worth:	\$13,600,000
Estimated Implementation Timeframe:	1 year

This alternative consists of the excavation and off-site disposal of approximately 34,700 cubic yards of contaminated material.

Composite soil and sediment samples would be analyzed for PCB content to characterize the level of contamination. Off-site landfilling of contaminated soils and sediments would be conducted in accordance with RCRA and TSCA regulations, including transport via a licensed firm in accordance with Department of Transportation requirements and disposal in an appropriately permitted landfill(s). Soil containing less than 50 ppm of PCBs could be sent to an industrial solid waste landfill, while soil contaminated above 50 ppm would be sent to a RCRA/TSCA landfill. RCRA Land Disposal Restrictions (40 CFR 268) would be satisfied for all excavated soil prior to landfilling.

During construction and related activities, an air monitoring program would be implemented to assure that no significant airborne contamination migrates off site. Dust suppression measures would be undertaken during soil excavation and related activities. Additionally, an assessment of the wetlands would be performed to determine the potential impact of the remedial action. If necessary, a detailed plan for wetland mitigation or restoration would be developed. Deed restrictions would be sought for the property, if necessary. For shipment to the off-site landfill, a rail spur would be constructed on the Industrial Latex site. It would take approximately 100 shipments utilizing five rail cars per day to transport the contaminated soil from Industrial Latex site. Clean fill would be transported to the site and placed into the excavated area. Utilizing a 20 cubic yard dump truck, it would take approximately 1,540 truckloads to backfill the site. After backfilling, the site would be graded, covered with topsoil, and seeded.

REMEDIAL ALTERNATIVES FOR HARDENED MATERIAL IN VATS

The No Action alternative for the hardened material in vats is presented as Alternative S-1 (A) under the soil remedial alternatives. Under that alternative, no measures would be taken to reduce exposures to the hardened material in the vats on the site. Although combined with the no action alternative for soil, no action for the hardened material in vats could be independently selected.

Alternative V-1: Disposal of Vats in Off-site Landfill

Estimated Capital Cost:	\$140,200
Estimated Annual O&M Costs:	\$ 0
Estimated Present Worth:	\$140,200
Estimated Implementation Timeframe:	2 months

Alternative V-1 involves dismantling the production vats from their steel supports and draining any remaining unhardened material into drums for transportation off site for disposal in an off-site landfill or incineration. The vats containing hardened material would then be transported to an approved TSCA/RCRA landfill via flat bed truck. The floor drains would also be removed and transported for disposal with the vats.

Alternative V-2: Disposal of Vats through Off-site Incineration

Estimated Capital Cost:	\$646,500
Estimated Annual O&M Costs:	\$ 0
Estimated Present Worth:	\$646,500
Estimated Implementation Timeframe:	2 months

This alternative is similar to Alternative V-1, except that the vats would be transported off site for incineration. Because of their large size, the vats would likely require shredding prior to incineration. The material in the floor drains would also be disposed of through off-site incineration.

Alternative V-3: Blast Hardened Material from Vats

Estimated Capital Cost:	\$286,000
Estimated Annual O&M Costs:	\$ 0
Estimated Present Worth:	\$286,000
Estimated Implementation Timeframe:	3 months

Under this alternative, the hardened material in the vats and the floor drains would be removed using dry ice pellet blasting. Dry ice pellets would impact the hardened material at a high rate of speed, shearing the material from the surface of the vats. Because dry ice consists entirely of carbon dioxide which would evaporate as the dry ice thaws, no residuals would be generated

beyond the removed material. The removed material would be transported off site for incineration.

REMEDIAL ALTERNATIVES FOR BUILDING SURFACES

The No Action alternative for the building surfaces is presented as Alternative S-1 (A) under the soil remedial alternatives. Under that alternative, no measures would be taken to reduce exposures to the contaminated building surfaces on the site. Although combined with the no action alternative for soil, no action for the building surfaces could be independently selected.

Alternative B-1: Solvent/Detergent Washing Followed by Surface Sealing

Estimated Capital Cost:	\$450,700
Estimated Annual O&M Costs:	\$ 21,000
Estimated Present Worth:	\$773,700
Estimated Implementation Timeframe:	6 months

Alternative B-1 involves surface cleaning of the walls and floors with a two-part, non-flammable solvent/detergent-based cleaner where PCB contamination is present only on the surface.

The effectiveness of this alternative is highly dependent on the depth of PCB contamination and the selection of a cleaning solution. Where the contaminants have migrated below the concrete surface, it may be difficult to utilize this technology. To reduce the chance of exposure to this subsurface contamination, it would be necessary to seal the surface with an epoxy coating. Surface washing generates additional contaminated liquid that would be disposed of off site.

Alternative B-2: Blasting of Building Surfaces

Estimated Capital Cost:	\$799,700
Estimated Annual O&M Costs:	\$ 0
Estimated Present Worth:	\$799,700
Estimated Implementation Timeframe:	4 months

Similar to the process described under Alternative V-3, the building surfaces would be cleaned using dry ice pellet blasting. The PCB-contaminated concrete removed from the building surfaces would be disposed of in an off-site TSCA-permitted landfill. Because the PCB contamination on the walls and floors has no apparent thickness, and the blasting action is most effective for thick layers of surface contamination, field testing would be required to evaluate the effectiveness of the technology for application at the site. Shrouds would be erected in the area of operation to protect against flying debris and to contain waste material. Because the dry ice pellets would lift the

contamination away from the concrete rather than pulverizing the concrete, there should not be a significant airborne particulate exposure problem. Air monitoring would be performed to confirm this during remediation.

Alternative B-3: Scabbling of Building Surfaces

Estimated Capital Cost:	\$320,900
Estimated Annual O&M Costs:	\$ 0
Estimated Present Worth:	\$320,900
Estimated Implementation Timeframe:	3 months

This alternative is proven effective for removal of PCB contamination that has penetrated into a concrete substrate. A scabbling device, consisting of pneumatic pistons tipped with carbide teeth, would be used to break off building material to a pre-determined depth. A vacuum system attached to the scabbling device would reduce the amount of dust generated and would be capable of containerizing the dust in one step. Scabbling generates no waste in addition to the contaminated concrete that is being removed. However, this alternative could permanently damage the thin concrete block walls rendering the buildings useless or potentially unsafe. PCB-contaminated concrete would be disposed in an off-site TSCA-permitted landfill. Scabbling presents some risk of exposure to PCB-contaminated dust if the vacuum system is not operated properly to contain the pulverized concrete. Standard health and safety and fugitive dust control practices should be sufficient to manage this risk.

Alternative B-4: Building Demolition

Estimated Capital Cost:	\$643,400
Estimated Annual O&M Costs:	\$ 0
Estimated Present Worth:	\$643,400
Estimated Implementation Timeframe:	6 months

This alternative would remove the PCB-contaminated structures from the site. If completed in phases, it may be possible to segregate the uncontaminated concrete from the contaminated concrete. Testing during remedial design would determine the ability to separate the material. If it is possible to separate the material by level of contamination, several options would be available for disposal. The PCB-contaminated concrete which contains greater than 50 ppm of PCBs, would be disposed of at a TSCA-permitted facility, while the concrete containing between 1 and 50 ppm PCB could be disposed of at an industrial solid waste facility. The uncontaminated concrete could be used as fill on site or disposed of in an approved landfill off site. Building demolition presents potential short-term exposure to PCB-contaminated dust. Therefore, appropriate dust control measures would need to be employed during demolition. Air monitoring would also be performed during remediation.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In accordance with the NCP, a detailed analysis of each remedial alternative was performed with respect to each of the nine evaluation criteria. This section discusses and compares the performance of the remedial alternative under consideration against these criteria. These criteria were developed to address the requirements of Section 121 of CERCLA to ensure all important considerations are factored into remedy selection decisions. All selected remedies must at least satisfy the Threshold Criteria. The selected remedy should provide the best trade-offs among the Primary Balancing Criteria. The Modifying Criteria are evaluated following the public comment period.

Threshold Criteria

1. Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
2. Compliance with ARARs addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements (ARARs) of federal and state environmental statutes and requirements and/or provide grounds for invoking a waiver.

Primary Balancing Criteria

3. Long-term effectiveness and permanence refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once remedial objectives have been met.
4. Reduction of toxicity, mobility or volume through treatment addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility or volume of the hazardous substances as a principal element.
5. Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until the remedial objectives are achieved.
6. Implementability is the technical and administrative feasibility of a remedy, including the availability of

materials and services needed to implement a particular alternative.

7. Cost includes estimated capital and operation and maintenance costs, and the present worth costs.

Modifying Criteria

8. State acceptance indicates whether, based on its review of the RI/FS and the Proposed Plan, the State supports, opposes, and/or has identified any reservations regarding the preferred alternative.
9. Community acceptance refers to the community's comments on the alternatives described in the Proposed Plan, and the RI and FS reports. Responses to public comments are addressed in the Responsiveness Summary section of this Record of Decision.

The three categories of contaminated media (i.e., soil, vats, and buildings) are evaluated separately utilizing the above criteria. A comparative analysis of the remedial alternatives based upon the evaluation criteria noted above, follows.

SOIL (INCLUDING BURIED DRUM/LATEX) REMEDIATION ALTERNATIVES

A comparison of the soil remediation alternatives follows.

Overall Protection of Human Health and the Environment

Alternatives S-1 (A), No Action, and S-1 (B), Minimal Action, are not protective of human health and the environment because the risks associated with the Industrial Latex site would persist for the foreseeable future. Alternative S-2, Capping, reduces the possibility of direct contact with contaminated soils through containment and, therefore, reduces human health risks associated with direct contact with contaminated soil. However, the existing contaminated soil would remain on the site. Alternative S-3, In-situ Stabilization, also reduces the possibility of direct contact with the contaminated soils through immobilization and containment. Although contaminated soil remains on site under both Alternatives S-2 and S-3, further migration of contaminants in the groundwater is reduced by minimizing infiltration and leaching of contaminants into the groundwater.

The remaining five alternatives are protective of human health and the environment because they remove contamination from the site, either directly, as in Alternative S-8, Off-site Landfilling, or by treating the soil to remove the risk-causing contaminants (i.e., primarily PCBs).

Wetlands would be assessed to determine the need for mitigation measures or restoration if they would be potentially impacted by remedial action.

Compliance with ARARs

While there are no ARARs for soil contamination, EPA policy has established a cleanup goal of 1 ppm for PCB-contaminated sites for residential use. EPA also developed site-specific, risk-based remediation goals for the other contaminants of concern. Alternative S-1 (A), No Action, and S-1 (B), Minimal Action, do not achieve these remediation goals. Alternatives S-2, Capping, and S-3, In-situ Stabilization, also do not comply with the remediation goals because the soil contamination would be left on site for an indefinite period of time. Although contaminant levels are not reduced, Alternatives S-2 and S-3 prevent direct contact with and migration of contaminants through capping and/or immobilization of the contaminants. While Alternative S-2 would reduce the leaching of contamination, it would not achieve RCRA-closure requirements.

Alternatives S-4 through S-8 satisfy EPA remediation goals and RCRA Land Disposal Restrictions for hazardous wastes as they apply to backfilling of treated soil, off-site landfiling, or residuals disposal. Alternative S-8 may require additional treatment, however, prior to disposal in an off-site landfill. Alternatives S-3 through S-6 would be designed to comply with RCRA requirements. Alternatives S-7, On-site Incineration, and S-8, Off-site Landfiling, comply with RCRA/TSCA regulations. Additionally, Alternative 7 complies with RCRA Subpart O Incineration Unit requirements. Alternatives S-4 through S-7 would be designed to satisfy air ARARs. Because of the presence of wetlands, wetlands mitigation or restoration requirements would be complied with for those alternatives that impact on them.

Because Alternatives S-1 (A), No Action, and S-1 (B), Minimal Action, do not meet the threshold requirements of overall protection of human health and the environment or compliance with ARARs, they will not be considered further in the evaluation of alternatives.

Long-Term Effectiveness And Permanence

Alternatives S-4, LTDD, S-5, Dechlorination, and S-7, On-site Incineration, are the most effective in the long term and the most permanent because the contamination is removed from the soil at the site and destroyed either on or off site. Treatability study results show that LTDD provided significant removal of PCBs from Industrial Latex site soils. Data available from the treatability study show that PCBs have been reduced to less than 2 ppm (the treatability study treatment goal). It is anticipated

that the EPA risk-based remediation goal of 1 ppm can be satisfied by modifying treatment conditions such as residence time and temperature, if necessary. If it is not possible to achieve the remediation goal, a waiver of TSCA chemical waste landfill requirements would be sought under 40 CFR 761.75(c)(4). The long-term effectiveness of Alternative S-6, Solvent Extraction, is less certain than the other technologies because of the uncertainty about the fate of the residual solvent used in the treatment process. Alternative S-8, Off-site Landfilling, provides long-term effectiveness at the site, but relies on the long-term integrity of off-site disposal facilities.

The long-term effectiveness of Alternative S-3, In-situ Stabilization, is also less certain because it relies on the ability of the soil-fixing techniques to permanently immobilize the contaminants. With this technology, there is no certainty that the organic contaminants could be effectively immobilized. Alternative S-2, Capping, is effective and prevents direct contact with contaminated soil only as long as the integrity of the cap is maintained. Therefore, continued maintenance would be required for an indefinite period of time.

Reduction of Toxicity, Mobility, and Volume Through Treatment

Alternatives S-2 through S-8 all involve the removal and disposal of buried drums and hardened latex material. However, in dealing with the contaminants in the soil at the Industrial Latex site, some alternatives provide a greater reduction in toxicity, mobility, and volume. Alternatives S-5, Dechlorination, and S-7, On-site Incineration, provide the greatest reduction in toxicity, mobility, and volume because the organic contaminants which pose the major problem at the Industrial Latex site (PCBs) are destroyed in the treatment process. Alternatives S-4, LTSD, and S-6, Solvent Extraction, also substantially reduce the toxicity, mobility and volume of contamination by extracting organic compounds from the soil and further treating the residuals off site. Alternative S-3, In-situ Stabilization, relies solely on reduction of the contaminant mobility of both organic and inorganic contaminants, and there is no certainty that the organic contaminants could be effectively immobilized. Alternative S-2, Capping, uses no form of treatment and relies solely on the ability of the cap to prevent direct contact and to prevent soil contamination from further adversely affecting surface water and groundwater. Alternative S-8, Off-site Landfilling, does not affect the toxicity or volume of contaminants, but it somewhat reduces the mobility by containing excavated soils in a regulated landfill.

Short-Term Effectiveness

Alternative S-2, Capping, involves the least intrusive activity and, as a result, poses the least threat to the surrounding

community and to on-site workers. Alternative S-2 also requires the shortest period of time to implement, less than six months. Alternative S-3, In-situ Stabilization, requires somewhat more intrusive activity and, as a result, has a greater impact in the short term. All of the remaining alternatives have a greater potential impact in the short term due to excavation of soils, which would require engineering controls to minimize these impacts. For Alternatives S-4 through S-7, risks associated with treatment system mobilization and start-up are expected to be minimal. The system vendor would be required to develop and implement a health and safety plan to protect nearby residents and on-site workers. This plan would address chemical usage, operator safety, and responses to process leaks and unanticipated system upsets during start-up. Wetlands disturbed by excavation and treatment system construction activities would be appropriately addressed as part of these alternatives, where necessary. Alternative S-8, Off-site Landfilling, would involve transportation of hazardous wastes over long distances, potentially creating additional exposure risks.

Implementability

Alternative S-2, Capping, is the easiest alternative to implement and uses the most commonly available materials and equipment. The proposed asphalt cap is technically feasible to construct. Since the remediation area is relatively flat, only minor grading would be required to prepare the area for construction. Alternative S-8, Off-site Landfilling, can also be implemented, provided that existing landfills continue to be capable of receiving the waste at the time remediation occurs. Alternative S-7, On-site Incineration, has been successful in the remediation of hazardous waste problems, but has a potentially long start-up process in order to demonstrate that applicable requirements will be met. Alternatives S-4, LTTD, S-5, Dechlorination, and S-6, Solvent Extraction, utilize processes which are relatively new in the remediation of hazardous waste sites, and rely on the availability of off-site facilities for the disposal or treatment of residuals. Although treatability studies were performed for LTTD during the RI/FS, Alternative S-4 may require pilot studies to determine the optimal operating parameters during design. Because there is some uncertainty as to the residuals associated with Alternatives S-5 and S-6, toxicity testing would need to be performed prior to implementation. Alternative S-3, In-situ Stabilization, has been successful for remediating inorganic contaminants, but is relatively new and uncertain in the treatment of organic contaminants. Additives to the basic cement-based stabilizers would have to be carefully determined through pilot-scale testing and may have to be varied throughout the site to address the variability of the organic contamination.

Cost

Estimated capital costs, annual O&M costs, total present worth costs, and the implementation timeframes of all of the soil remedial alternatives are summarized in Table 6. Present worth costs are based on a 30-year period and a discount rate of 5 percent.

Alternative S-2, Capping, is overall the least costly alternative. Among the treatment alternatives that remove PCBs from the soil, Alternatives S-5, Dechlorination, and S-4, LTDD, were about equally low in cost and were slightly more than twice as costly as Alternative S-2. Alternative S-8, Off-site Landfilling, costs more than Alternative S-2 (Capping) and S-3 (In-situ Stabilization), but less than all of the ex-situ treatment alternatives.

State Acceptance

The State of New Jersey has not as yet concurred with the selected soil remediation alternative.

Community Acceptance

Community Acceptance was evaluated after the close of the public comment period. Written comments received during the public comment period, as well as verbal comments during the public meeting on August 10, 1992, were evaluated. Several reservations were expressed regarding EPA's proposed soil remediation alternative at the public meeting. The responses to those comments are addressed in the Responsiveness Summary.

REMEDIAL ALTERNATIVES FOR HARDENED MATERIAL IN VATS

The No Action alternative for the hardened material in vats is presented as Alternative S-1 (A) under the soil remedial alternatives. A comparison of the alternatives for remediating the hardened material follows.

Overall Protection of Human Health and the Environment

The No Action alternative, S-1 (A), would not be protective of human health and the environment. The risk of exposure to the material in the vats would not be reduced to any degree under this alternative.

All of the active remedial alternatives reduce the current and future potential risks associated with direct contact with hardened material in the vats by either completely removing the vats for off-site disposal at a permitted landfill (Alternative V-1) or incinerator (Alternative V-2), or by removing the

hardened material from the vats using a blasting technology (Alternative V-3) for off-site treatment or disposal.

Because the No Action alternative is not protective of human health and the environment, it is not considered further in this analysis.

Compliance with ARARs

For Alternative V-1, by removing all production vats and disposing of them in a TSCA/RCRA-permitted landfill along with the latex material from the floor drains, all ARARs for transportation and disposal will be satisfied.

For Alternative V-2, compliance with Federal regulations (RCRA and TSCA) would be achieved by properly manifesting and transporting the vats to a TSCA/RCRA-permitted incinerator. According to the TSCA regulations, 40 CFR Part 761.60, solid PCB-contaminated waste material containing more than 50 ppm must be managed in a TSCA-permitted waste management facility.

For Alternative V-3, waste material would be properly disposed of in accordance with TSCA and RCRA regulations, as appropriate. Following vat and floor drain cleaning, confirmatory wipe sampling would be performed to ensure that the surfaces have been thoroughly cleaned to appropriate standards.

Long-Term Effectiveness And Permanence

Alternative V-2, Disposal of Vats Through Off-site Incineration, destroys the contaminant-bearing material and, as such, offers a permanent, long-term solution. Alternative V-3 would effectively decontaminate the vats, and, through off-site incineration, could offer a permanent remedy. While not treating or destroying contaminants, Alternative V-1, Disposal of Vats in Off-site Landfill, provides an effective means of disposal because the contamination, which is essentially bound in the hardened material, is further placed in a secure, regulated environment.

Reduction of Toxicity, Mobility, and Volume through Treatment

Alternatives V-2, Disposal of Vats Through Off-site Incineration, and V-3, Blast Hardened Material from Vats, reduce the toxicity, mobility, and volume through thermal or other treatment. Alternative V-1, Disposal of Vats in Off-site Landfill, utilizes no treatment to reduce the toxicity, mobility, and volume, but does provide containment for the contaminants. Additionally, because the material in the vats is hardened, the mobility of contaminants is already greatly reduced.

Short-Term Effectiveness

Alternatives V-1, Disposal of Vats in Off-site Landfill, and V-2, Disposal of Vats Through Off-site Incineration, are most effective in the short term because the vats are removed intact, resulting in less potential exposure to workers and a shorter duration of remedial activity. Alternative V-3, Blast Hardened Material from Vats, requires the containment and collection of residuals for disposal, and, as a result, is somewhat more difficult to implement in the short term. In addition, Alternative V-3 has the potential to produce an oxygen-deficient environment for workers. Engineering controls would be utilized to prevent disruption of the surrounding community.

Implementability

All of the alternatives are easy to implement, use widely available equipment and materials, and use well-established methods. All three alternatives can be implemented concurrently with the soil and building surface alternatives.

Cost

Estimated capital costs, annual O&M costs, total present worth costs, and the implementation timeframes of all of the remedial alternatives for the vats are summarized in Table 7. Present worth costs are based on a 30-year period and a discount rate of 5 percent.

Alternative V-1, Disposal of Vats in Off-site Landfill, has the lowest overall cost. The next lowest cost is for Alternative V-3, Blast Hardened Material from Vats, which costs twice as much as Alternative V-1. Alternative V-2 is the most costly of the three alternatives.

State Acceptance

The State of New Jersey has not as yet concurred with the selected alternative for the remediation of the hardened material in vats.

Community Acceptance

Community Acceptance was evaluated after the close of the public comment period. Written comments received during the public comment period, as well as verbal comments during the public meeting on August 10, 1992, were evaluated. Comments made at the public meeting generally supported EPA's proposed remedial alternative for the hardened material in vats. Those comments are addressed in the Responsiveness Summary.

REMEDIAL ALTERNATIVES FOR BUILDING SURFACES

The No Action alternative for the building surfaces is presented as Alternative S-1 (A) under the soil remedial alternatives. A comparison of the building remediation alternatives follows.

Overall Protection of Human Health and the Environment

The No Action alternative, S-1 (A), would not be protective of human health and the environment. The risk of exposure to the contaminated building surfaces would not be reduced to any degree under this alternative.

All four of the active remedial alternatives reduce the current and future risks associated with direct contact with building and equipment surfaces and, as a result, are protective of human health and the environment. Alternative B-1, Washing/Surface Sealing, uses surface sealing as the primary isolating mechanism, while Alternative B-2, Blasting, and B-3, Scabbling, attempt to remove contaminants. Alternative B-3, Scabbling, is not appropriate for equipment surfaces, however, and would have to be combined with one of the other alternatives to be truly effective if equipment were to be left in place in the plant. Alternative B-4 removes the entire buildings from the site, thereby removing the contaminants and more fully protecting human health and the environment.

Because the No Action alternative is not protective of human health and the environment, it is not considered further in this analysis.

Compliance with ARARs

If Alternative B-1 were selected, the underlying surface would be decontaminated to comply with TSCA regulations. Confirmatory wipe sampling and chip sampling would be conducted, following cleaning, to ensure that contaminants have been removed.

For Alternative B-2, compliance with TSCA regulations would be achieved by removing the surface contamination on the concrete walls and floors, as confirmed by wipe sampling and chip sampling subsequent to surface cleaning.

For Alternative B-3, compliance with TSCA regulations would be achieved by removing the surface contamination on the concrete walls and floors, as confirmed by wipe and chip sampling subsequent to scabbling.

Disposal of material under Alternative B-4 would comply with TSCA regulations.

Long-Term Effectiveness and Permanence

Alternative B-2, Blasting, and Alternative B-3, Scabbling, both remove contaminated concrete for treatment and provide a permanent, long-term solution. With Alternative B-1, Washing and Surface Sealing, only the surface contamination is removed, and any remaining contamination that may have penetrated beneath the surface is sealed in place. Alternative B-1 is effective only as long as the sealant is maintained and re-applied periodically. As a result, it is not a truly permanent solution. However, Alternative B-2, Blasting, and B-3, Scabbling, may permanently damage the walls and floors if too much concrete is removed. Alternative B-4, Building Demolition, removes the entire buildings and provides a permanent solution to site contamination, but relies on the integrity of off-site disposal facilities.

Reduction of Toxicity, Mobility, and Volume Through Treatment

None of the four alternatives employ treatment, except that used for the disposal of residual, contaminated concrete or washing solution. Alternative B-1, Washing/Surface Sealing, does not reduce the toxicity or volume of contaminants, but reduces the mobility through containment. Alternatives B-2 (Blasting), B-3 (Scabbling), and B-4 (Building Demolition) do not reduce the toxicity, mobility, or volume of contaminants, but merely removes them from the site.

Short-Term Effectiveness

Alternatives B-1 (Washing/Surface Sealing), B-2 (Blasting), and B-3 (Scabbling) are expected to take approximately the same amount of time to implement. Each of these alternatives should be completed within one to two months from initiation. Alternative B-4, Building Demolition, is expected to take approximately six months to complete. While there would be some increase in traffic as a result of the off-site disposal of the building materials, coordination with local authorities would allow the development of safe transportation measures. However, because the buildings would be removed from the site, Alternative B-4 would enhance the soil remediation alternatives by providing added space with which to work.

Workers will be potentially exposed to the solvent mixture during implementation of Alternative B-1, and to airborne dust during implementation of Alternatives B-2, B-3 and B-4. Personal protective equipment and dust control practices can be used to manage the risk.

Implementability

All four alternatives are relatively easy to implement, use widely available equipment and materials, and use well established methods. Off-site disposal can be implemented along with off-site disposal of drums, treatment residuals, and vat waste.

Cost

Estimated capital costs, annual O&M costs, total present worth costs, and the implementation timeframes of all of the remedial alternatives for the buildings are summarized in Table 8. Present worth costs are based on a 30-year period and a discount rate of 5 percent.

Alternative B-3, Scabbling, has the lowest overall cost. Alternative B-1, Washing and Surface Sealing, has the second lowest capital cost. However, when additional application of sealant is considered, the cost of Alternative B-1 is approximately equal to Blasting (Alternative B-2), the most expensive option. Alternative B-4, Building Demolition, has the second lowest cost overall, which is approximately twice that of Alternative B-3.

State Acceptance

The State of New Jersey has not as yet concurred with the selected alternative for building remediation.

Community Acceptance

Community Acceptance was evaluated after the close of the public comment period. Written comments received during the public comment period, as well as verbal comments during the public meeting on August 10, 1992, were evaluated. Comments made at the public meeting generally supported EPA's proposed remedy for the buildings on the site. Those comments are addressed in the Responsiveness Summary.

SELECTED REMEDY

Section 121(b) of CERCLA, as amended, requires EPA to select remedial actions which utilize permanent solutions and alternative treatment technologies or resource recovery options to the maximum extent practicable. In addition, EPA prefers remedial actions that permanently and significantly reduce the mobility, toxicity, or volume of site wastes.

After careful review and evaluation of the alternatives evaluated in detail in the feasibility study, and consideration of all

evaluation criteria, EPA presented Alternative S-4, Low Temperature Thermal Desorption, for soils; Alternative V-1, Disposal of Vats in Off-site Landfill; and Alternative B-4, Building Demolition, to the public as the preferred remedy. This remedy includes excavation of contaminated soils, on-site treatment by low temperature thermal desorption, and backfilling of treated material; excavation of the septic system and buried drums for off-site treatment or disposal; dismantling the production vats from their steel supports, draining any remaining unhardened material into drums for off-site disposal or incineration, and disposal of vats in an approved TSCA/RCRA landfill; removal of the floor drains for disposal with the vats; demolition and off-site disposal of the two on-site buildings; and a performance monitoring program. The performance monitoring program will include sufficient air monitoring prior to and during remedial action to ensure that there are no significant emissions to off-site areas.

The input received during the public comment period, consisting primarily of questions and statements submitted at the public meeting held on August 10, 1992, is presented in the Responsiveness Summary. Public comments did not necessitate any changes to the preferred alternatives. Accordingly, the preferred alternatives have been selected by EPA as the remedial solution for the site.

Some additional activities will be performed during the remedial design and remedial action phases for the site. These activities are described below.

- ♦ Extend the fence to include the contaminated areas beyond the existing fenceline
- ♦ Further assess wetland area
- ♦ Perform additional groundwater investigations to determine the impact of the site on groundwater

STATUTORY DETERMINATIONS

Superfund remedy selection is based on CERCLA, as amended and the regulations contained in the NCP. Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when complete, the selected remedial action for this site must comply with applicable, or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is justified. The selected remedy also must be cost-effective and utilize permanent

solutions and alternative treatment technologies or resource-recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes, as their principal element. The following sections discuss how the selected remedy meets these statutory requirements for the Industrial Latex site.

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment, dealing effectively with the threats posed by the contaminants which were identified. The remedy will attain 10^{-4} to 10^{-6} risk level for carcinogens and the HI will be less than 1 for noncarcinogens. The action will eliminate contamination in remediating the soil and sediments, vats, buildings and equipment, drums and hardened latex material, all of which contribute to an increased health and environmental risk posed by the site.

There are no short-term threats associated with the selected remedy which cannot be readily controlled. In addition, no adverse cross-media impacts are expected from the remedy.

Compliance with ARARs

The selected remedy will comply with the substantive requirements of the following statutes and regulations. These ARARs are listed in Table 9.

Chemical-Specific ARARs

The contaminants of concern in the site soils will be remediated to meet EPA Risk-Based Remediation Goals. The Remediation Goals for the soil contaminants are listed in Table 5. All soils that exceed these levels will be excavated to the average groundwater table (approximately 10 feet below the ground surface), for on-site treatment in the LTTD unit. During excavation, confirmatory sampling will be conducted around the perimeter of the excavation zones to ensure complete removal of soils exceeding remediation goals.

The remediation goals also represent the maximum concentrations which will be attained in the treated soil before backfilling. Treated soils will be backfilled on site provided confirmatory sampling shows that the remediation goals have been achieved, and provided that the treated soil passes TCLP tests. If the soil fails the TCLP test, it will be a characteristic hazardous waste, and will be managed in accordance with all applicable RCRA regulations, including Land Disposal Restrictions (LDR; 40 CFR 268). The treatment process will be designed such that the LDR

standard for each applicable contaminant, as listed in 40 CFR 268.43, is satisfied.

EPA recognizes NJDEPE's request that soil at the site be remediated to the levels specified in the proposed "Cleanup Standards for Contaminated Sites" which NJDEPE distributed to the public for comments earlier this year. EPA has not identified these proposed state regulations as ARARs since they have not been promulgated by the state at this time. Therefore, any additional actions which might be required (beyond the remedy selected in this ROD) to remediate soil, vats, or buildings at the site to the levels specified in the proposed state regulations are not required by CERCLA, nor are they eligible for federal funding under CERCLA. Any such additional actions may be undertaken if they are not inconsistent with the remedy selected in this ROD, and if they are performed with NJDEPE funding.

Location-Specific ARARs

The soil remediation will be designed and constructed to minimize the disturbance of areas identified as wetlands and to comply with the requirements of Executive Order No. 11990 for the Protection of Wetlands and the New Jersey Wetlands Act of 1970. Before beginning remedial activities, an assessment of the wetlands would be performed to determine the potential impact of the remedial action. If necessary, a detailed plan for wetland mitigation or restoration would be developed. The site is not within the coastal zone as defined by the State of New Jersey. The project area is not sensitive to the discovery of cultural resources. Therefore, no additional investigation is considered necessary.

Action-Specific ARARs

The process vats will be transported off site in accordance with all RCRA regulations to an approved TSCA/RCRA landfill for disposal.

The construction debris from the demolition of the buildings will be segregated, if possible, according to the level of contamination, for proper management.

Water sprays, dust suppressant chemicals, and other appropriate control measures will be used as necessary during building demolition and soil excavation to minimize dust emissions. Air monitoring will be conducted to ensure compliance with air ARARs (Table 7).

During excavation activities, appropriate erosion control and soil conservation measures will be implemented.

Excavated drums and latex material that are determined by laboratory analysis to be characteristic hazardous waste will be disposed off site in accordance with all RCRA and TSCA requirements, including 40 CFR 263 standards for manifesting, transporting, and recordkeeping.

Since the potential exists for treatment of soils classified as RCRA characteristic waste, the LTTD treatment system will be operated in accordance with RCRA Subpart X Miscellaneous Unit requirements, if necessary.

LTTD will comply with air regulations, including the New Jersey Air Pollution Control Regulations for VOC and toxic emissions (NJAC 7:27-11 and 17), since airborne contaminants liberated from the waste during treatment are carried via the nitrogen gas carrier to the off-gas treatment system.

Sludge produced by the LTTD soil treatment system, which contains the contaminants removed from the soil, will be disposed in accordance with RCRA and TSCA requirements at a RCRA/TSCA-permitted facility.

The production of noise in Bergen County, New Jersey, is regulated by the Noise Pollution Code. This code states that a sound source from within an industrial site may not exceed receiving levels of 55 decibels in a residential zone. Local ordinances on noise in Wallington and Wood-Ridge indicate no noise after 10:00 p.m.; noise reducers (such as mufflers for machinery, sound barriers along the affected property line, and temporary building enclosures for treatment equipment) will be specified during the design phase, as necessary, to comply with noise ordinances.

In order to mitigate risks, a site health and safety plan will be developed and implemented. This plan will address personal protective equipment for remediation workers, minimizing dust exposure through water sprays or suppressant chemicals, and restricting access to the excavation zone. This plan will also address chemical usage, operation safety, and responses to process leaks and unanticipated system upsets during start-up associated with the LTTD equipment.

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

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner for the Industrial Latex site. EPA has determined that the selected remedy provides the best balance of trade-offs in terms of long-term effectiveness and permanence, reduction in toxicity, mobility, or volume achieved through treatment, short-term

effectiveness, implementability, cost and State and community acceptance.

The selected remedy utilizes permanent solutions and treatment technologies to the maximum extent practicable. The selected remedy represents the best balance of trade-offs among the alternatives with respect to the evaluation criteria.

Cost-Effectiveness

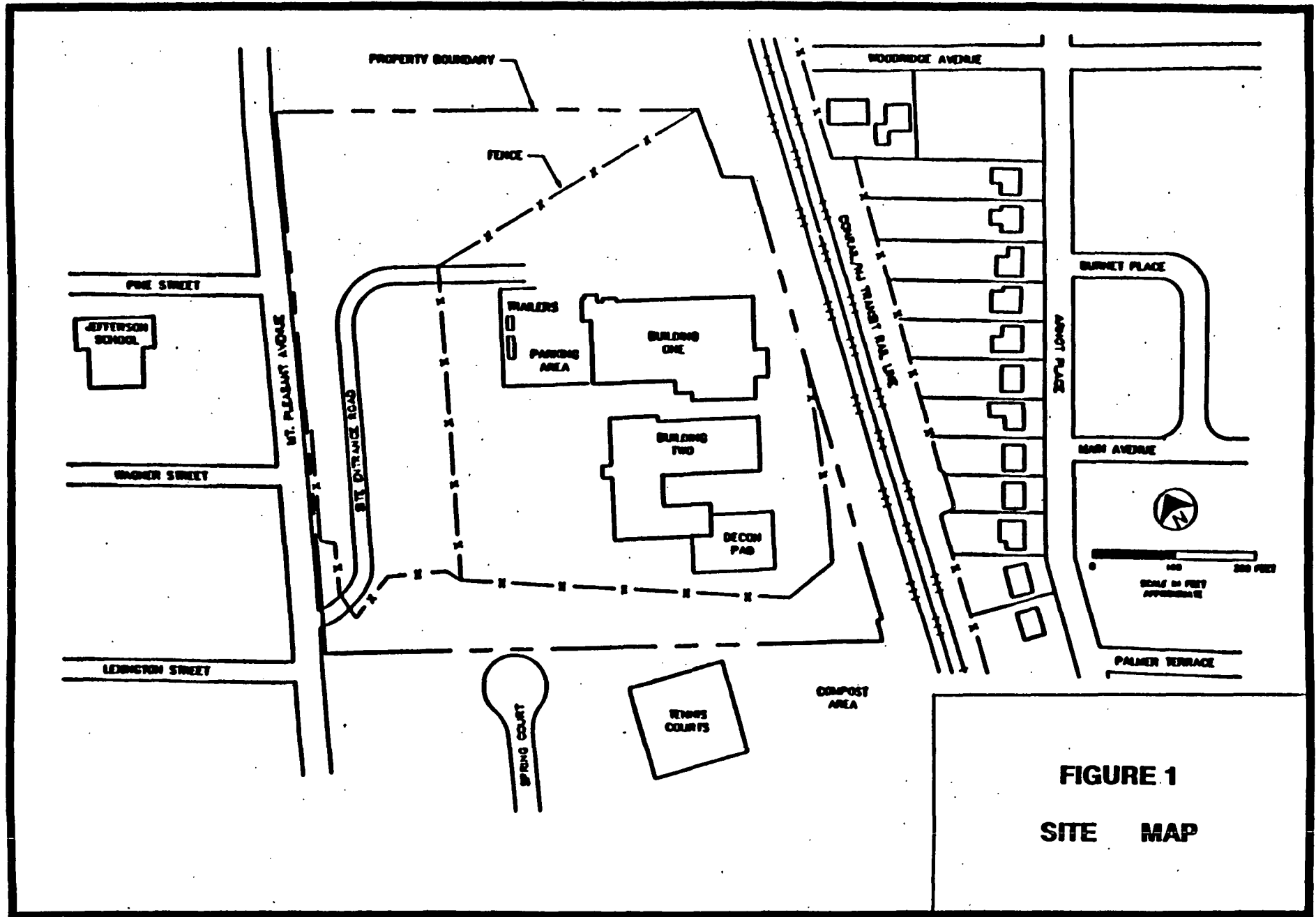
The selected alternatives are determined to be cost-effective because they provide the highest degree of protectiveness among the alternatives evaluated, while representing cost value. The estimated total project cost is \$18,000,000.

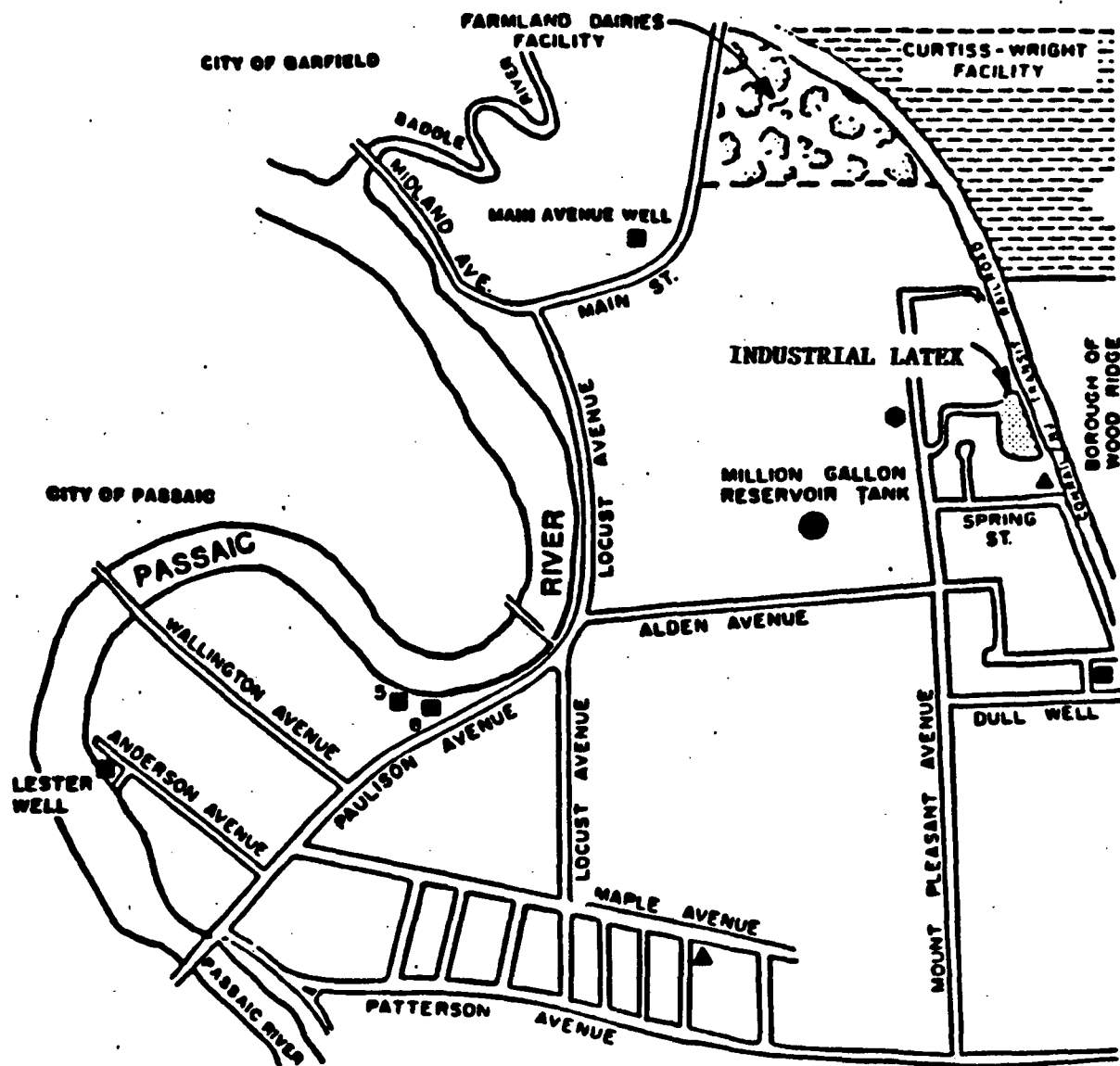
Preference for Treatment as a Principal Element

By treating contaminated soil on site through the use of an innovative process, the selected remedy addresses the threats posed by the site through the use of treatment technologies. Therefore, the statutory preference for remedies that employ treatment as a principal element is satisfied.

DOCUMENTATION OF SIGNIFICANT CHANGES

There are no significant changes from the preferred alternative presented in the Proposed Plan.





LEGEND:



CURTIS-WRIGHT FACILITY



FARMLAND DAIRIES FACILITY



INDUSTRIAL LATEX FACILITY



WALLINGTON MUNICIPAL WELLS



WALLINGTON TEST WELLS



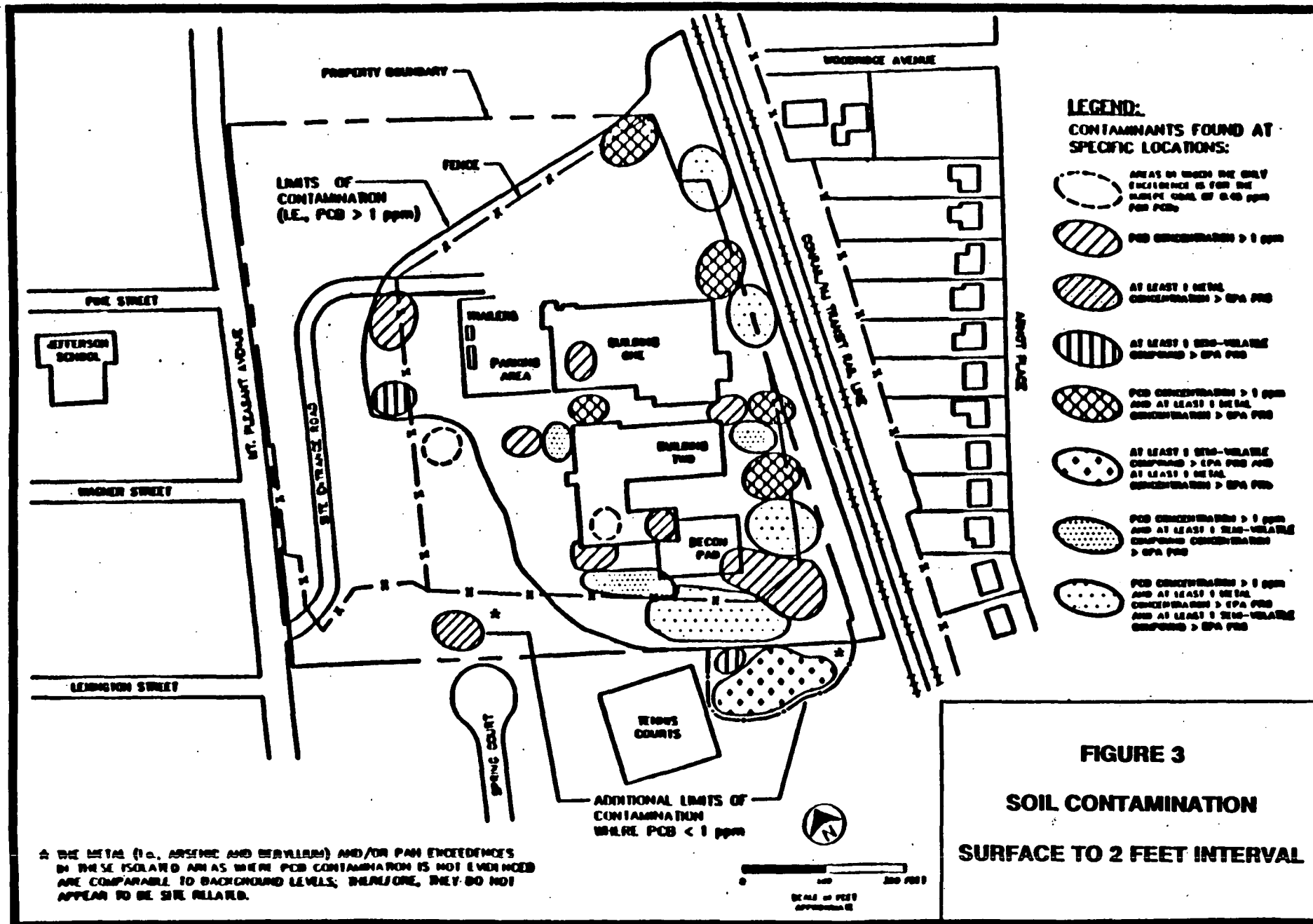
SCHOOL

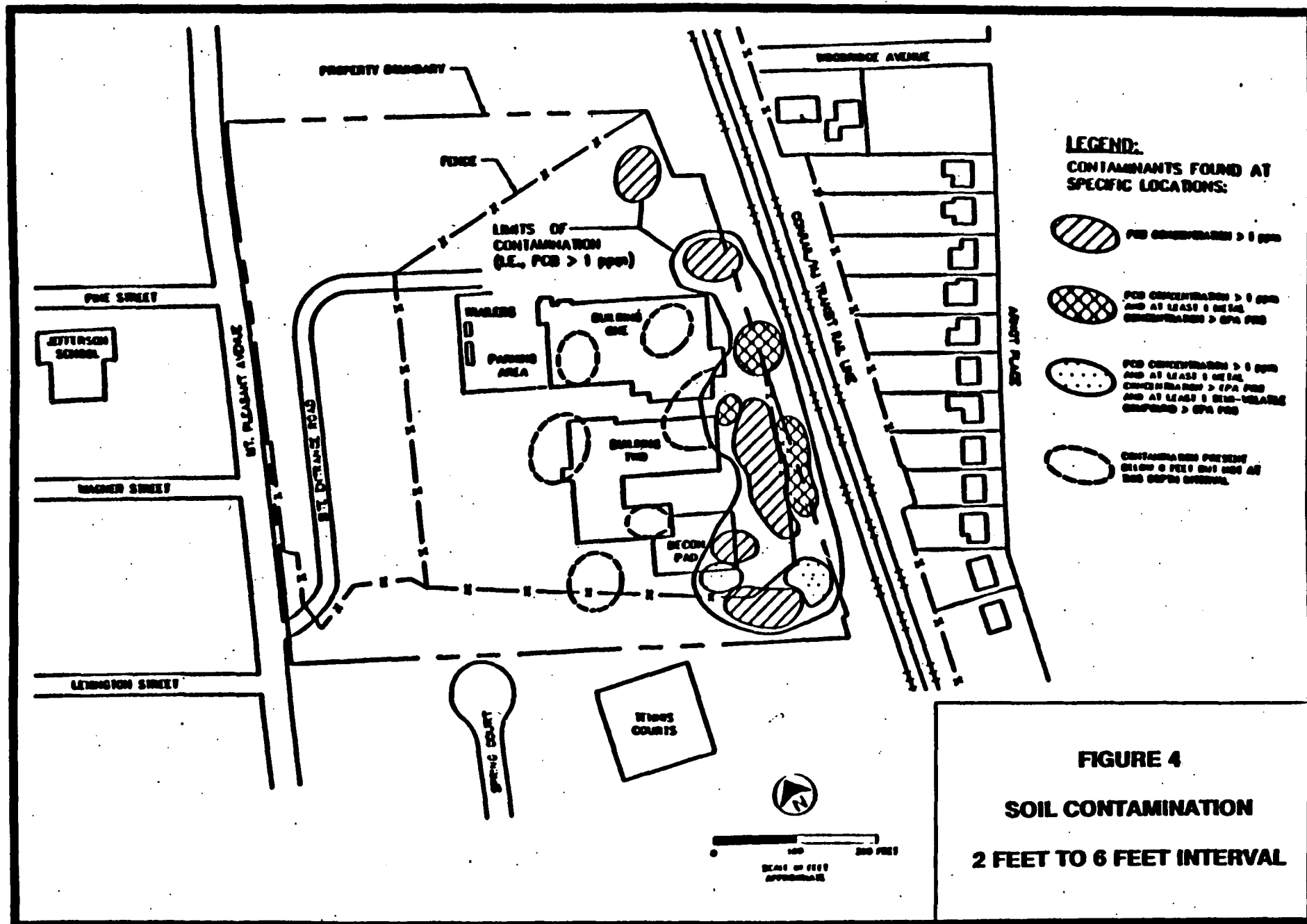
SOURCE: NJDEP.

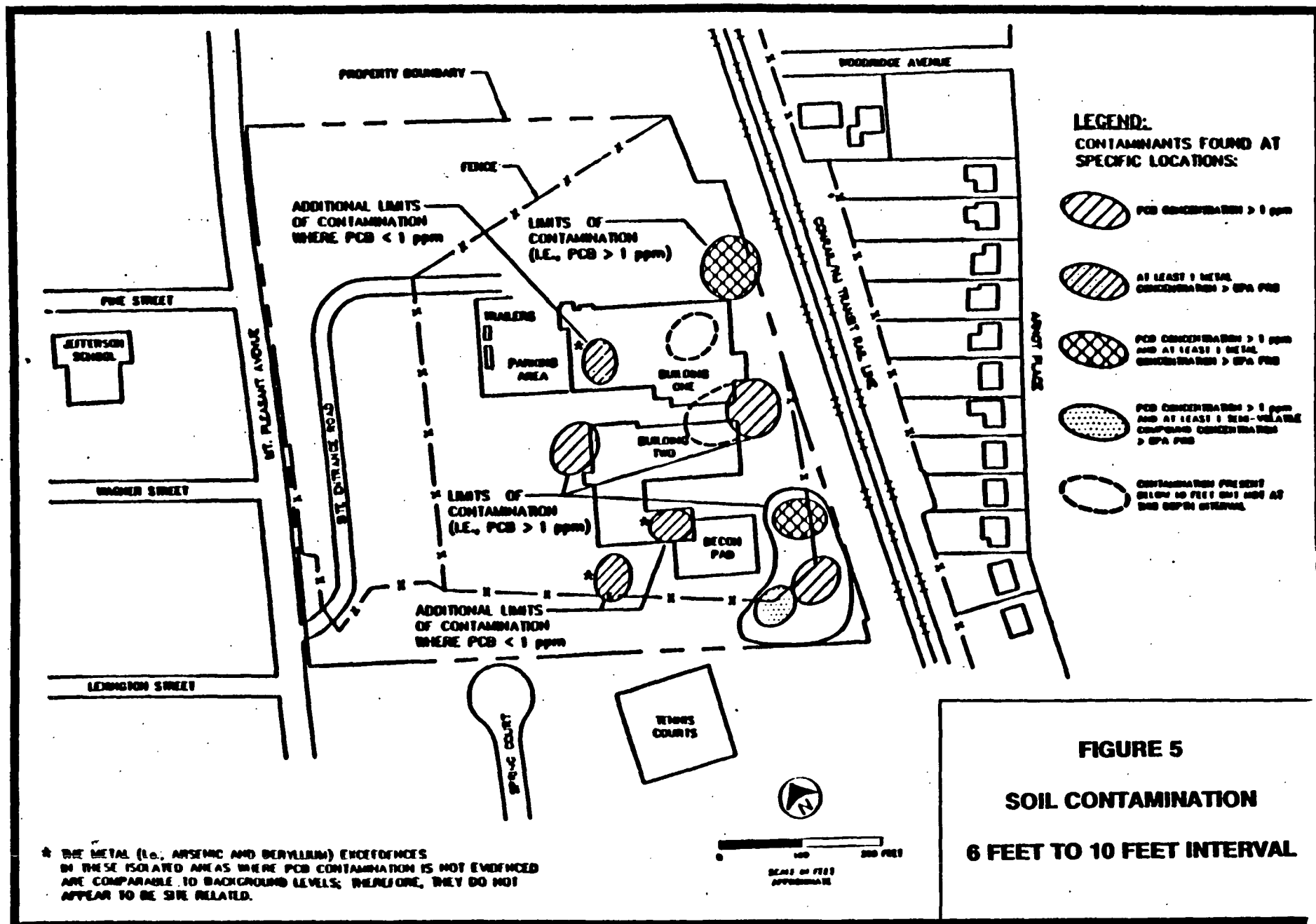


1200
SCALE IN FEET
APPROXIMATE

FIGURE 2
WALLINGTON MUNICIPAL
WELL LOCATION







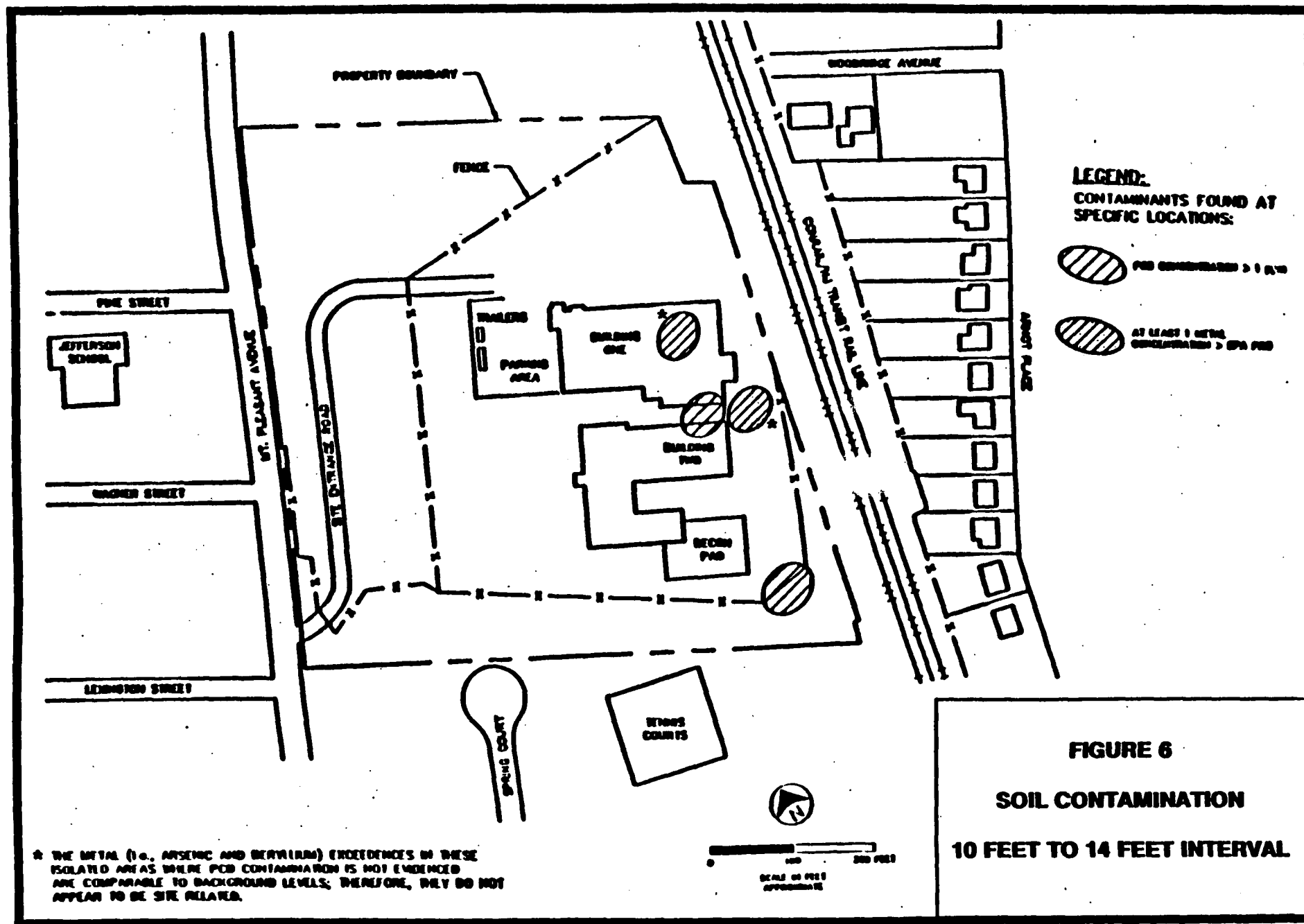


TABLE 1

**CHEMICALS DETECTED IN ON-SITE SURFACE SOIL SAMPLES (a)
HUMAN HEALTH ASSESSMENT
(Organics: ug/kg, Inorganics: mg/kg)**

Chemical	Frequency of Detection (b)	Range of Detected Concentrations	Site Specific Background Concentrations (c)	Regional Background Concentrations (d,e)
Organics:				
• Aroclor-1260	31 / 46	95 - 4,000,000	ND (<180 - <190)	---
• Benzoic acid	2 / 19	130 - 140	ND (<1,900 - <2,000)	---
• Bis(2-ethylhexyl)phthalate	30 / 38	102 - 170,000	ND (<375 - <400)	---
• Butylbenzylphthalate	1 / 38	400	ND	---
• gamma-Chlordane	1 / 20	110	ND	160 - 830
• 4,4'-DDE	1 / 19	1,280	8.8	40 - 1,830
• 4,4'-DDT	1 / 39	68	ND	20 - 1,170
• 3,3'-Dichlorobenzidine	1 / 19	6,000	ND	---
• 2,4-Dimethylphenol	1 / 19	50	ND (<375 - <400)	---
• Di-n-butylphthalate	6 / 38	78 - 310	ND (<375 - <400)	---
• Di-n-octylphthalate	7 / 19	270 - 980	ND (<375 - <400)	---
• Endrin ketone	1 / 19	56	ND	---
• Heptachlor epoxide	2 / 19	94 - 370	ND (<9 - <9.6)	70
• Hexachlorobenzene	1 / 17	160	ND	---
• 4-Methylphenol	1 / 19	50	ND (<375 - <400)	---
• N-Nitrosodiphenylamine	4 / 37	113 - 3,900	ND (<375 - <400)	---
• Pentachlorophenol	1 / 19	41	ND (<1,900 - <2,000)	---
PAHs				
• Acenaphthene	2 / 38	473 - 3,500	---	---
• Acenaphthylene	1 / 19	260	ND (<375 - <400)	---
• Anthracene	3 / 38	240 - 5,900	45 - 130	---
• Benzo(a)anthracene	8 / 39	44 - 7,500	193 - 410	169 - 59,000
• Benzo(a)pyrene	7 / 38	55 - 5,300	191 - 370	165 - 22,000
• Benzo(b)fluoranthene	11 / 38	36 - 12,000	198 - 410	15,000 - 62,000
• Benzo(k)fluoranthene	9 / 19	36 - 1,100	54 - 310	300 - 26,000
• Benzo(g,h,i)perylene	2 / 19	57 - 510	140 - 208	900 - 47,000
• Chrysene	11 / 38	39 - 7,300	209 - 450	251 - 64,000
• Dibenzo(f,h)anthracene	3 / 38	49 - 310	ND (<375 - <400)	---
• Dibenzo(a,h)anthracene	1 / 19	240	54 - 69	---
• Fluoranthene	15 / 39	40 - 19,000	343 - 1,000	200 - 166,000
• Fluorene	3 / 38	130 - 3,600	68	---
• Indeno(1,2,3-c,d)pyrene	3 / 38	56 - 580	223 - 280	8,000 - 61,000
• Phenanthrene	7 / 38	68 - 18,000	170 - 720	---
• Pyrene	14 / 39	39 - 15,000	295 - 750	145 - 147,000
PCDDs & PCDFs (g)				
• 2,3,7,8-TCDD	1 / 9	0.016	---	---
• non-2,3,7,8-TCDD	2 / 19	0.15 - 0.17	ND (f)	---
• 1,2,3,7,8-PeCDD	1 / 9	0.04	---	---
• non-x,x,2,3,7,8-HxCDD	1 / 19	0.63	ND (f)	---
• 1,2,3,4,6,7,8-HpCDD	5 / 19	1.6 - 3.6	ND (f)	---
• 1,2,3,4,6,7,9-HpCDD	11 / 19	0.07 - 4.6	0.11 - 0.13	---
• OCDD	15 / 19	0.15 - 68.7	2.94 - 3.27	---
• 2,3,7,8-TCDF	14 / 28	0.07 - 0.9	0.16 - 0.06	---
• non-2,3,7,8-TCDF	7 / 19	0.08 - 1.4	ND (f)	---
• x,x,2,3,7,8-PeCDF	6 / 19	0.09 - 0.47	ND (f)	---
• non-x,x,2,3,7,8-PeCDF	10 / 19	0.11 - 2	ND (f)	---
• x,x,2,3,7,8-HxCDF	11 / 19	0.02 - 1.7	ND (f)	---
• non-x,x,2,3,7,8-HxCDF	11 / 19	0.02 - 2.3	ND (f)	---
• x,x,x,2,3,7,8-HpCDF	7 / 19	0.09 - 1.7	ND (f)	---
• non-x,x,x,2,3,7,8-HpCDF	8 / 19	0.16 - 2.5	ND (f)	---
• OCDF	8 / 19	0.09 - 3.9	0.16 - 0.19	---

See footnotes on following page.

POOR QUALITY
ORIGINAL

TABLE 1 (continued)

**CHEMICALS DETECTED IN ON-SITE SURFACE SOIL SAMPLES (a)
HUMAN HEALTH ASSESSMENT
(Organics: ug/kg, inorganics: mg/kg)**

Chemical	Frequency of Detection (b)	Range of Detected Concentrations	Site Specific Background Concentrations (c)	Regional Background Concentrations (d,e)
Inorganics:				
Aluminum	39 / 39	1,100 - 11,700	7,760 - 8,770	50,000 - 100,000
Antimony	10 / 39	2.4 - 28.8	ND (R)	1
Arsenic	35 / 36	0.08 - 51.9	3.3 - 4.0	5.3 - 7.1
Barium	39 / 39	22 - 210	48.6 - 53.1	200 - 500
Beryllium	16 / 39	0.3 - 0.8	0.5	1.5
Cadmium	13 / 39	0.2 - 5.9	1.2	---
Calcium	38 / 39	359 - 5,940	1,210 - 1,450	800 - 1,500
Chromium	31 / 39	5.1 - 20.1	9.9 - 12	50
Cobalt	29 / 39	2.8 - 8.2	4.7 - 4.8	5 - 7
Copper	9 / 19	6.5 - 37.7	18.8 - 24.1	15 - 30
Cyanide	3 / 39	0.5 - 1.6	ND (R)	---
Iron	39 / 39	6,310 - 31,100	10,900 - 12,500	20,000 - 50,000
Lead	38 / 38	2.5 - 124	54.2 - 82.7	20 - 50
Magnesium	38 / 39	847 - 6,150	1,770 - 1,870	2,000 - 5,000
Manganese	39 / 39	87 - 411	275 - 308	70 - 500
Mercury	10 / 39	0.2 - 0.7	0.7 - 2.2	0.06 - 0.08
Nickel	37 / 39	6 - 22.2	9.7 - 11.1	5 - 15
Potassium	32 / 39	223 - 1,390	555 - 731	4,400 - 15,200
Selenium	5 / 35	0.2 - 1.1	ND (<0.47 - <0.48)	0.1 - 0.4
Sodium	14 / 28	57 - 494.4	ND (R)	5,000 - 7,000
Vanadium	39 / 39	6 - 44.3	15.4 - 17.8	70
Zinc	36 / 36	17 - 562	41.9 - 52.7	38 - 86

--- = No data available from study.

* = Selected as a chemical of potential concern. See text.

ND = Not detected in sample. Detection limits shown in parentheses.

R = Quality control indicates data are unusable.

(a) On-site surface soil samples SD-03 to SD-17, SD-24 to SD-27 and the duplicate of SD-14.

On-site soil boring samples at 0-2 foot interval: SB-02, SB-04, SB-06, SB-07, SB-10 to

SB-12, SB-14, SB-15, and SB-23 to SB-33. Additional samples were tested for PCBs:

SB-01, SB-03, SB-05, SB-09, SB-13, SB-34 and SB-37. Dioxins were tested in SB-02, .

SB-04, SB-06, SB-07, SB-10 to SB-12, SB-14 and SB-15 only.

(b) The number of samples in which the chemical was detected divided by the total number of samples analyzed, excluding those samples rejected by QA/QC.

(c) Background samples SD-01, SD-02 and the duplicate of SD-02.

(d) Source of urban pesticide background levels: Carey et al. (1979) (Mid-Atlantic Region).^a Sources of urban PAH background levels: IARC (1973, 1983), Blumer et al. (1977), White and Vanderslice (1980), Windsor and Rites (1979), Pucknat (1981), Edwards (1983), Butler et al. (1984), Vogt et al. (1987), and Jones et al. (1989).

(e) Inorganic regional background levels from Sussex County, NJ, and Sullivan and Ulster Counties, NY (Springen and Shacklette 1981).

(f) Detection limits were not provided by the laboratory for these chemicals.

(g) Only specific congeners of PCDDs & PCDFs were evaluated. Because subsurface soil data was reported as total congeners and insufficient information was provided from the laboratory, these total values were not incorporated into the data summary. This is not likely to influence the overall results because total congeners in subsurface soil were less than surface soil concentrations.

POOR QUALITY
ORIGINAL

TABLE 1 (continued)

**CHEMICALS DETECTED IN SURFACE SOIL SAMPLES
NEAR RAILROAD TRACKS (a)
HUMAN HEALTH ASSESSMENT
(Organics: ug/kg)**

Chemical	Frequency of Detection (b)	Range of Detected Concentrations	Site Specific Background Concentrations (c)	Regional Background Concentrations (d)
Organics:				
• Aldrin-1260	3 / 4	50 - 880	ND (<180 - <190)	---
Chlordane	3 / 4	19.5 - 68	ND (<90 - <96)	160 - 830

-- = No data available from study.

• = Selected as a chemical of potential concern. See text.

ND = Not detected in sample. Detection limits shown in parentheses.

(a) Samples SO-34 to SO-37, and the duplicate of SO-34 (Railroad Tracks), which were tested for PCBs and pesticides only.

(b) The number of samples in which the chemical was detected divided by the total number of samples analyzed excluding those samples rejected by QA/QC.

(c) Background samples SO-01, SO-02 and the duplicate of SO-02.

(d) Source of urban pesticide background levels: Carey et al. (1979) (Mid-Atlantic Region).

POOR QUALITY
COPY

TABLE 1 (continued)

**CHEMICALS DETECTED IN SURFACE SOIL SAMPLES
AT THE RECREATIONAL/PLAYGROUNDS AREA (a)
HUMAN HEALTH ASSESSMENT
(Organics: ug/kg, Inorganics: mg/kg)**

Chemical	Frequency of Detection (b)	Range of Detected Concentrations	Site Specific Background Concentrations (c)	Regional Background Concentrations (d,e)
Organics:				
• Bis(2-ethylhexyl)phthalate	4 / 4	120 - 1,600	ND (<375 - <400)	---
4,4'-DDT	1 / 4	27	10.5 - 16.0	20 - 1,170
Dieldrin	2 / 4	20 - 30	ND (<18 - <19)	40 - 240
• Di-n-octylphthalate	1 / 4	89	ND (<375 - <400)	---
Heptachlor epoxide	1 / 4	10	ND (<9 - <9.6)	70
PAHs				
Benzo(a)anthracene	4 / 4	42 - 140	193 - 410	169 - 89,000
Benzo(a)pyrene	2 / 4	78 - 180	191 - 370	165 - 22,000
Benzo(b)fluoranthene	4 / 4	70 - 460	198 - 410	15,000 - 62,000
Benzo(k)fluoranthene	4 / 4	47 - 460	54 - 310	300 - 26,000
Chrysene	4 / 4	77 - 220	209 - 450	251 - 64,000
Fluoranthene	4 / 4	74 - 240	345 - 1,000	200 - 166,000
Indeno(1,2,3-c,d)pyrene	1 / 4	66	223 - 280	8,000 - 61,000
Phenanthrene	3 / 4	47 - 100	170 - 720	---
Pyrene	4 / 4	65 - 210	295 - 750	145 - 147,000
PCDDs/ & PCDFs				
OCDD	2 / 4	0.14 - 0.41	2.94 - 3.27	---
2,3,7,8-TCDF	3 / 4	0.05 - 0.07	0.04 - 0.06	---
Inorganics:				
Aluminum	4 / 4	6,380 - 8,400	7,760 - 8,770	80,000 - 100,000
Arsenic	4 / 4	1 - 4.1	3.3 - 4.0	5.3 - 7.1
Barium	4 / 4	59.2 - 76.4	48.6 - 53.1	200 - 500
Beryllium	2 / 4	0.5 - 0.6	0.5	1.5
Calcium	4 / 4	1,400 - 2,360	1,210 - 1,450	800 - 5,100
Chromium	3 / 4	8.5 - 12.1	9.9 - 12	50
Iron	4 / 4	9360 - 16,100	10,900 - 12,500	20,000 - 50,000
Lead	4 / 4	43.3 - 56.2	54.2 - 82.7	20 - 50
Magnesium	4 / 4	1,270 - 1,540	1,770 - 1,870	2,000 - 5,000
Manganese	4 / 4	163 - 328	275 - 308	70 - 500
Mercury	4 / 4	0.5 - 1.3	0.7 - 2.2	0.06 - 0.08
Nickel	4 / 4	7.7 - 9.8	9.7 - 11.1	5 - 15
Vanadium	4 / 4	19.2 - 33.1	15.4 - 17.8	70
• Zinc	4 / 4	80 - 248	41.9 - 52.7	38 - 86

-- = No data available from study.

• = Selected as a chemical of potential concern. See text.

ND = Not detected in sample. Detection limits shown in parentheses.

(a) Samples SD-18 through SD-21.

(b) The number of samples in which the chemical was detected divided by the total number of samples analyzed, excluding those samples rejected by QA/QC.

(c) Background samples SD-01 and SD-02 and the duplicate of SD-02.

(d) Source of urban pesticide background levels: Corey et al. (1979) (Mid-Atlantic Region). Sources of urban PAH background levels: IARC 1973, 1983; Blumer et al. (1977); White and Vanderslice (1983); Windsor and Hites (1979); Pucknet (1981); Edwards (1983); Butler et al. (1984); Vogt et al. (1987); and Jones et al. (1989).

(e) Inorganic regional background levels from Sussex County, NJ, and Sullivan and Ulster Counties, NY (Boeringer and Shacklette 1981).

TABLE 1 (continued)

**CHEMICALS DETECTED IN ON-SITE SUBSURFACE SOIL SAMPLES
(>2-24 FEET) (a)
HUMAN HEALTH ASSESSMENT
(Organics: ug/kg, Inorganics: mg/kg)**

Chemical	Frequency of Detection (b)	Range of Detected Concentrations	Regional Background Concentrations (c,d)
Organics:			
• Aroclor-1260	56 / 121	5 - 280,000	---
• Benzene	1 / 26	4,700	---
• Bis(2-ethylhexyl)phthalate	12 / 26	300 - 51,000	---
• Chlorobenzene	1 / 26	1,500	---
• 4,4'-DDE	1 / 26	26	---
• Di-n-butylphthalate	2 / 26	44 - 17,000	---
• 3,3'-Dichlorobenzene	1 / 26	2,800	---
• Ethylbenzene	1 / 26	2,300	---
• Phenol	1 / 26	84	---
• Toluene	3 / 26	1 - 47,000	---
• Xylene (total)	3 / 26	2 - 11,000	---
PAHs			
• Benzo(a)anthracene	1 / 26	110	---
• Benzo(a)pyrene	2 / 26	90	---
• Benzo(b)fluoranthene	2 / 26	110 - 200	---
• Chrysene	1 / 26	120	---
• Fluoranthene	2 / 26	100 - 310	---
• Phenanthrene	1 / 26	250	---
• Pyrene	2 / 26	92 - 210	---
Inorganics:			
• Aluminum	26 / 26	2,450 - 8,380	50,000 - 100,000
• Arsenic	25 / 26	0.82 - 11.9	5.3 - 7.1
• Barium	26 / 26	13.8 - 85.5	200 - 500
• Beryllium	8 / 26	0.25 - 0.53	1.5
• Cadmium	3 / 26	0.23 - 0.42	---
• Calcium	23 / 24	188 - 14,600	800 - 5,100
• Chromium	26 / 26	3.3 - 21.2	90
• Cobalt	20 / 26	2.3 - 6.0	5 - 7
• Copper	26 / 26	5.3 - 26.8	15 - 30
• Iron	26 / 26	4,640 - 15,500	20,000 - 50,000
• Lead	23 / 23	2.2 - 17.7	20 - 50
• Magnesium	26 / 26	527 - 24,400	2,000 - 5,000
• Manganese	26 / 26	50.1 - 499	70 - 500
• Nickel	22 / 26	3.5 - 21.2	5 - 15
• Potassium	26 / 26	292 - 1,350	4,400 - 15,200
• Selenium	3 / 25	0.58 - 0.68	0.1 - 0.4
• Silver	2 / 26	0.26 - 0.27	---
• Sodium	15 / 17	43.9 - 209	5,000 - 7,000
• Thallium	1 / 21	0.29	---
• Vanadium	26 / 26	5.2 - 38.8	70
• Zinc	20 / 20	9.2 - 132	38 - 86

* = Selected as chemical of potential concern. See text.
 --- = No data available from study.

(a) Chemicals were tested at several depths in samples WD-58, WD-78, SS-02, SS-04, SS-06 to SS-08, SS-10 to SS-12, SS-14, SS-15, SS-23 to SS-34 and SS-37 and the duplicates of SS-04, SS-15, SS-34 and SS-37 at specific depth intervals. Additional samples SS-01, SS-03, SS-05, SS-09 and SS-13 were tested for PCBs.

(b) The number of samples in which the chemical was detected divided by the total number of samples analyzed, excluding those samples rejected by QA/QC.

(c) No site-specific soil boring background samples are available. Source of urban pesticide background levels: Carey et al. (1979) (Mid-Atlantic Region). Sources of urban PAH background levels: IARC (1973, 1983), Blumer et al. (1977), White and Vander-slice (1980), Windsor and Niles (1979), Pucknat (1981), Edwards (1983), Butler et al. (1984), Vogt et al. (1987) and Jones et al. (1989).

(d) No site-specific soil boring background samples are available. Inorganic regional background levels from Sussex County NJ and Sullivan and Ulster Counties, NY (Boerngen and Shacklette 1981).

TABLE 1 (continued)

**CHEMICALS DETECTED IN TEST PIT SAMPLES
HUMAN HEALTH ASSESSMENT
(Units: mg/kg)**

Chemical	Range of Detected Concentrations
Organics:	
Volatiles:	
Acetone	150
Benzene	0.050 - 16
2-Butanone	0.001 - 470
Ethylbenzene	0.003 - 360
Toluene	0.014 - 13,000
Xylene	0.003 - 1,800
Semi-Volatiles:	
Aroclor 1260	0.200 - 190
Bis(2-ethylhexyl)phthalate	0.110 - 280
Di-n-butylphthalate	0.240 - 43
Di-n-octylphthalate	60
Inorganics:	
Antimony	66
Arsenic	0.87 - 6.3
Cadmium	1.9 - 8.9
Chromium	5 - 17
Lead	4 - 44
Zinc	21 - 261

TABLE 1 (continued)

**CHEMICALS DETECTED IN SEDIMENT SAMPLES
(0-6 INCHES) (a)
HUMAN HEALTH ASSESSMENT
(Organics: ug/kg, Inorganics: mg/kg)**

Chemical	Frequency of Detection (b)	Range of Detected Concentrations (c)	Site Specific Background Concentrations (d)
Organics:			
• Aroclor-1260	11 / 13	1,000 - 250,000	ND (<200)
• beta-BHC	1 / 13	110	ND (<10)
• Benzoic acid	1 / 12	62	88
• Bis(2-ethylhexyl)phthalate	11 / 12	58 - 150,000	310
• Butylbenzylphthalate	2 / 12	230 - 960	63
• Di-n-butylphthalate	5 / 12	29 - 210	ND (<420)
• Di-n-octylphthalate	4 / 12	13 - 86	ND (<420)
• 1,2-Dichloroethene (total)	6 / 14	2 - 9	ND (<6)
• 2,6-Dinitrotoluene	1 / 12	84	ND (<420)
• N-nitrosodiphenylamine	1 / 12	1,100	ND (<420)
• Tetrachloroethene	6 / 13	5 - 15	ND (<6)
• Toluene	5 / 13	2 - 6	ND (<6)
• 1,1,1-Trichloroethane	2 / 13	2 - 7	ND (<6)
• Trichloroethene	7 / 14	2 - 25	ND (<6)
• Xylenes (Total)	5 / 12	1 - 5	ND (<6)
PCDDs & PCDFs			
• non-1,2,3,7,8-PeCDD	1 / 15	0.54	ND (e)
• x,x,2,3,7,8-HxCDD	2 / 15	0.22 - 0.52	ND (e)
• non-x,x,2,3,7,8-HxCDD	3 / 15	0.49 - 2.52	ND (e)
• 1,2,3,4,6,7,8-HpCDD	7 / 15	1.37 - 11.4	0.9
• 1,2,3,4,6,7,9-HpCDD	7 / 15	1.06 - 13.1	0.6
• OCDD	7 / 15	9.34 - 189	5.07
• 2,3,7,8-TCDF	2 / 15	0.31 - 0.33	ND (e)
• non-x,x,2,3,7,8-PeCDF	3 / 15	0.23 - 1.45	ND (e)
• x,x,2,3,7,8-HxCDF	2 / 15	0.37 - 0.48	ND (e)
• non-x,x,2,3,7,8-HxCDF	6 / 15	0.17 - 1.42	ND (e)
• x,x,x,2,3,7,8-HpCDF	5 / 15	0.55 - 1.25	ND (e)
• non-x,x,x,2,3,7,8-HpCDF	6 / 15	0.81 - 4.44	0.44
• OCDF	3 / 15	2.08 - 5.68	ND (e)
• non-2,3,7,8-TCDF	3 / 15	0.2 - 0.87	ND (e)
PAHs			
• Acenaphthene	2 / 12	150 - 560	63
• Acenaphthylene	6 / 9	84 - 5,400	340
• Anthracene	7 / 12	27 - 4,400	500
• Benzo(a)anthracene	9 / 13	350 - 13,000	1,800
• Benzo(a)pyrene	9 / 13	140 - 8,500	1,700
• Benzo(b)fluoranthene	10 / 13	280 - 13,000	2,200
• Benzo(g,h,i)perylene	7 / 13	19 - 5,100	550
• Benzo(k)fluoranthene	7 / 12	215 - 7,200	1,900
• Chrysene	10 / 13	240 - 21,000	2,200
• Dibenzo(a,h)anthracene	4 / 12	70 - 1,900	170
• Dibenzo(furan)	5 / 12	25 - 1,100	130
• Fluoranthene	12 / 13	45 - 24,000	4,300
• Fluorene	3 / 12	260 - 2,400	250
• Indeno(1,2,3-c,d)pyrene	6 / 12	16 - 5,900	580
• 2-Methylnaphthalene	6 / 12	82 - 460	120
• Naphthalene	5 / 12	73 - 500	91
• Phenanthrene	12 / 13	32 - 15,000	2,800
• Pyrene	12 / 13	310 - 6,400	3,800

See footnotes on following page.

TABLE 1 (continued)

**CHEMICALS DETECTED IN SEDIMENT SAMPLES
(0-6 INCHES) (a)
HUMAN HEALTH ASSESSMENT
(Organics: ug/kg, Inorganics: mg/kg)**

Chemical	Frequency of Detection (b)	Range of Detected Concentrations (c)	Site Specific Background Concentrations (d)
Inorganics:			
Aluminum	15 / 15	1,600 - 12,700	5,360
Antimony	7 / 15	8.6 - 347	ND (<5.9)
Arsenic	15 / 15	2.3 - 38.1	15.3
Barium	10 / 10	25.8 - 204	11.3
Beryllium	6 / 10	0.6 - 2.2	0.5
Cadmium	6 / 13	0.5 - 4.8	ND (<0.82)
Calcium	15 / 15	1,000 - 9,300	2,840
Chromium	2 / 2	19.3 - 32.1	12.3
Cobalt	10 / 10	3.5 - 10.4	5.2
Copper	15 / 15	20.6 - 124	48
Cyanide	1 / 15	0.8	ND (<1.3)
Iron	15 / 15	8,090 - 32,450	16,600
Lead	15 / 15	10.2 - 654	56
Magnesium	15 / 15	369 - 7,650	1,060
Manganese	15 / 15	69.7 - 2,840	230
Mercury	13 / 15	0.1 - 2.1	1.2
Nickel	9 / 10	8.2 - 31.2	1.2
Potassium	14 / 15	243 - 746	10.5
Selenium	6 / 15	0.8 - 1.2	ND (<0.77)
Sodium	13 / 13	85.5 - 1,315	ND (R)
Vanadium	10 / 10	15.4 - 55.6	26.5
Zinc	10 / 10	51.1 - 743	96

--- = No data available from study.

* = Selected as chemical of potential concern. See text.

ND = Not detected in sample.

R = Quality control indicates data are unusable.

(a) Sediment samples include SE-02 through SE-16 and duplicates of SE-06 and SE-15.

(b) The number of samples in which the chemical was detected divided by the total number of samples analyzed, excluding those samples rejected by QA/QC.

(c) Duplicate samples were averaged to calculate the range of detected concentrations.

(d) Sediment soil concentrations are compared to two times the site specific upgradient sample SE-01.

(e) Detection limits were not provided by the laboratory for these chemicals.

TABLE 1 (continued)

**CHEMICALS DETECTED IN SEDIMENT SAMPLES
(12-18 INCHES) (a)
HUMAN HEALTH ASSESSMENT
(Organics: ug/kg, Inorganics: mg/kg)**

Chemical	Frequency of Detection (b)	Range of Detected Concentrations (c)	Site-Specific Background Concentrations (d)
Organics:			
• Aroclor-1260	7 / 8	2,400 - 86,000	ND (<200)
• Butylbenzylphthalate	2 / 8	35 - 310	43
• Di-n-butylphthalate	3 / 8	26 - 200	ND (<420)
• Di-n-octylphthalate	3 / 8	42 - 69	ND (e)
• 1,2-Dichloroethene (total)	6 / 8	3 - 22	ND (e)
• 2,6-Dinitrotoluene	3 / 8	120 - 230	ND (e)
• Ethylbenzene	1 / 6	13	ND (e)
• bis(2-Ethylhexyl)phthalate	7 / 8	2,200 - 16,000	310
• 2-Methylnaphthalene	2 / 8	270 - 450	120
• Pentachlorophenol	1 / 8	160	ND (e)
• Tetrachloroethene	6 / 8	4 - 43	ND (e)
• Toluene	5 / 8	2 - 21	ND (e)
• Trichloroethene	6 / 8	6 - 47	ND (e)
• Xylenes (total)	4 / 7	1 - 2	ND (e)
PAHs			
• Anthracene	4 / 8	33 - 250	500
• Benzo(a)anthracene	4 / 8	170 - 1,100	1,800
• Benzo(a)pyrene	5 / 8	110 - 940	1,700
• Benzo(b)fluoranthene	4 / 8	190 - 2,200	2,200
• Benzo(b,h,i)perylene	4 / 8	160 - 550	550
• Benzo(k)fluoranthene	2 / 8	220 - 280	1,900
• Chrysene	5 / 8	250 - 1,600	2,200
• Dibenzo(a,h)anthracene	3 / 8	110 - 330	170
• Dibenzofuran	2 / 8	230 - 260	130
• Fluoranthene	6 / 8	360 - 2,100	4,300
• Fluorene	2 / 8	88 - 150	250
• Indeno(1,2,3-c,d)pyrene	4 / 8	160 - 540	580
• Naphthalene	2 / 8	290 - 400	91
• Phenanthrene	6 / 8	77 - 1,300	2,800
• Pyrene	4 / 8	470 - 1,800	3,800
Inorganics:			
• Aluminum	8 / 8	5,940 - 11,700	5,360
• Arsenic	8 / 8	1.8 - 38.2	15.3
• Barium	8 / 8	31.1 - 113	11.3
• Beryllium	4 / 8	1.3 - 2.1	0.5
• Calcium	8 / 8	809 - 6,850	2,840
• Cobalt	7 / 8	3.3 - 8	5.2
• Copper	8 / 8	17.8 - 181	48
• Iron	8 / 8	10,600 - 31,000	16,600
• Lead	8 / 8	8.2 - 228	56
• Magnesium	8 / 8	1,280 - 2,400	1,060
• Manganese	8 / 8	66 - 373	230
• Mercury	4 / 8	0.14 - 1.7	1.2
• Nickel	6 / 8	9.8 - 20	1.2
• Sodium	8 / 8	103 - 443	ND (<0.77)
• Vanadium	8 / 8	15.4 - 48	26.5
• Zinc	8 / 8	34.3 - 358	96

--- = No data available from study.

• = Chemical of potential concern.

ND = Not detected in sample.

R = Quality control indicates data are unusable.

(a) Samples SE-03 to SE-06, SE-09, SE-11, SE-13 and SE-15 at 12-18 inches.

(b) The number of samples in which the chemical was detected divided by the total number of samples analyzed, excluding those samples rejected by QA/QC.

(c) Duplicate samples were averaged to calculate the range of detected concentrations.

(d) Upgradient sample SE-01 (0-6 inches).

(e) Detection limits were not provided by the laboratory for these chemicals.

TABLE 2
ORAL TOXICITY CRITERIA FOR CHEMICALS OF
POTENTIAL CONCERN (a)
ORGANICS

Chemical	Chronic RfD (mg/kg-day)	Uncertainty Factor (b)	Target Organ/ Critical Effect (c)	Source	Slope Factor/ (mg/kg-day) ⁻¹	Weight-of- Evidence Class. (d)	Source
Organics:							
Aldrin	3.00E-05	1,000	liver	IRIS	1.70E+01	B2	IRIS
Benzoic acid	4.00E+00	1	malaise	IRIS	---	D	IRIS
Benzene	---	---	---	IRIS	2.90E-02	2	IRIS
Bis(2-ethylhexyl) phthalate	2.00E-02	1,000	liver	IRIS	1.40E-02	2	IRIS
Butylbenzyl phthalate	2.00E-01	1,000	liver/brain	IRIS	---	---	IRIS
Chloromethane	---	---	---	---	1.30E-02	C	NEAST
4,4'-DDE	---	---	---	IRIS	3.40E-01	B2	IRIS
Di-n-butyl phthalate	1.00E-01	1,000	mortality	IRIS	---	D	---
Di-n-octyl phthalate	2.00E-02	1,000	liver, kidney	NEAST	---	D	---
3,3'-Dichlorobenzidine	---	---	---	---	4.5E-01	B2	IRIS
1,1-Dichloroethane	1.00E-01	1,000	kidney	NEAST	---	C	IRIS
1,2-Dichloroethane	---	---	---	---	9.1E-02	B2	IRIS
1,2-c-Dichloroethene	1.00E-02	3,000	blood	NEAST	---	D	IRIS
trans-1,2-Dichloroethene	2.00E-02	1,000	liver	IRIS	---	D	---
1,2-Dichloropropanes	---	---	---	NEAST	6.80E-02	B2	NEAST
2,4-Dimethylphenol	2.00E-02	3,000	neuro/blood	IRIS	---	D	---
nitrotoluenes, 2,6-	---	---	---	NEAST	6.80E-01	B2	IRIS
...nyl benzene	1.00E-01	1,000	liver, kidney	IRIS	---	D	IRIS
Hexachlorobutadiene	2.0E-03	100	kidney	IRIS	7.8E-02	C	IRIS
Hexachloroethane	1.0E-03	1,000	kidney	IRIS	1.4E-02	C	IRIS
Methylene Chloride	6.0E-02	100	liver	IRIS	7.50E-03	B2	IRIS
4-Methylphenol	5.00E-02	1,000	nervous system	NEAST	---	C	IRIS
N-Nitrosodiphenylamine	---	---	---	IRIS	4.90E-03	B2	IRIS
PCBs (total)	1.00E-04 (e)	100	fetotoxicity	Clement	7.70E+00	B2	IRIS
Pentachlorophenol	3.00E-02	100	liver/kidney	IRIS	1.20E-01	B2	IRIS
2,3,7,8-TCDF	1.00E-09	1,000	---	NA 1987	1.56E+05	B2	NEAST
Tetrachloroethene	1.00E-02	1,000	liver	IRIS	5.10E-02	B2	NEAST
Toluene	2.00E-01	1,000	Liver, kidney	IRIS	---	D	IRIS
1,1,1-Trichloroethane	9.00E-02	1,000	liver	NEAST	---	D	IRIS
Trichloroethene	7.35E-03	1,000	liver	NA	1.10E-02	B2	NEAST
Trichlorofluoromethane	3.00E-01	1,000	mortality	IRIS	---	D	IRIS
Trimethylbenzenes (1,2,4 & 1,3,5)	---	---	---	NEAST	---	D	---
Xylenes (total)	2.00E+00	100	CNS, mortality	IRIS	---	D	IRIS

see footnotes on following page

TABLE 2 (continued)

**ORAL TOXICITY CRITERIA FOR CHEMICALS OF
POTENTIAL CONCERN (a)
INORGANICS**

Chemical	Chronic RfD (mg/kg-day)	Uncertainty Factor (b)	Target Organ/ Critical Effect (c)	Source	Slope Factor/ (mg/kg-day) ⁻¹	Weight of Evidence Class. (d)	Source
Inorganics:							
Antimony	4.00E-04	1,000	blood chemistry	IRIS		D	
Arsenic	3.00E-04	3	skin	IRIS	1.75E+00 (f)	A	IRIS
Barium	7.00E-02	3	cardiovascular	IRIS	---	D	
Beryllium	5.00E-03	100	total tumor	IRIS	4.30E+00	B2	IRIS
Cadmium	5.00E-04 (g)	10	kidney	IRIS	---	D	IRIS
Cadmium	1.00E-03 (h)	10	kidney	IRIS	---	D	
Chromium	5.00E-03 (i)	500	CNS	IRIS	---	D	
Copper	3.70E-02 (j)	1	GI irritation	NEAST	---	D	
Cyanide	2.00E-02	500	myelin degeneration	IRIS	---	D	
Lead	---		CNS	IRIS	---	B2	IRIS
Manganese	1.00E-01	1	CNS	IRIS	---	D	IRIS
Mercury	3.00E-04	1,000	kidney	NEAST	---	D	IRIS
Nickel	2.00E-02	300	body weight	IRIS	---	D	IRIS
Selenium and compounds	5.00E-03	3	sclerosis	IRIS	---	D	IRIS
Silver	5.00E-03	3	skin	IRIS	---	D	
Vanadium	7.00E-03	100	liver, kidney	NEAST	---	D	
Zinc	2.00E-01	10	anemia	NEAST	---	D	IRIS

- (a) The following chemicals are not presented because they lack toxicity criteria: benzene, tert-butylbenzene, chloroethane, cobalt, isopropylbenzene, p-isopropyltoluene and n-propylbenzene.
- (b) Uncertainty factors used to develop reference doses generally consist of multiples of 10, with each factor representing a specific area of uncertainty in the data available. The standard uncertainty factors include the following:
- A 10-fold factor to account for the variation in sensitivity among the members of the human population;
 - A 10-fold factor to account for the uncertainty in extrapolation animal data to the case of humans;
 - A 10-fold factor to account for uncertainty in extrapolating from less than chronic NOAELs to chronic NOAELs; and
 - A 10-fold factor to account for the uncertainty in extrapolating from LOAELs to NOAELs.
- (c) A target organ is the organ most sensitive to a chemical's toxic effect. RfD's are based on toxic effects in the target organ. If an RfD was based on a study in which a target organ was not identified, an organ or system known to be affected by the chemical is listed.
- (d) EPA Weight of Evidence for Carcinogenic Effects: [A] = Human carcinogen based on adequate evidence in human studies; [B2] = Probable human carcinogen based on inadequate evidence from human studies and adequate evidence from animal studies; [C] = Possible human carcinogen based on limited evidence from animal studies in the absence of human studies; [D] = Not classified as to human carcinogenicity; and
- (e) This value was derived by Clement using toxicity information available for Aroclor 1016 and received approval from ECAO in January 1990.
- (f) A unit risk of $5E-5$ (ug/L)⁻¹ has been proposed by the Risk Assessment Forum and this recommendation has been scheduled for SAB review. This value is equivalent to 1.75 (mg/kg/day)⁻¹ assuming a 70-kg individual ingests 2 liters of water per day.
- (g) This RfD for cadmium is used to assess drinking water exposures.
- (h) This RfD for cadmium is used to assess non-aqueous exposures.
- (i) The oral RfD for Chromium IV is conservatively used to assess chromium exposures.
- (j) EPA has reported a drinking water standard of 1.3 mg/L. This value was converted to a dose assuming a 70 kg individual ingests 2 liters of water per day.
- NOTE: IRIS = Integrated Risk Information System, January 1991.
 NEAST = Health Effects Assessment Summary Tables, Annual 1991.
 --- = No information available.
 MA = Health Advisory, Office of Drinking Water.

TABLE 3

CUMULATIVE RISKS TO CHILDREN AND TEENAGERS (6-16 YEARS)

Pathway	On-Site	Railroad Tracks	Recreational/ Playground Area	Ditches Along Railroad Tracks
Cancer Risk Due to All Chemicals				
Incidental Ingestion of Soil or Sediment	9E-04	2E-07	6E-08	6E-05
Dermal Contact with Soil or Sediment	1E-04	2E-08	1E-08	4E-06
Dermal Contact with Surface water	--	--	--	2E-07
TOTAL CANCER RISK	1E-03	2E-07	7E-08	6E-05
Noncancer Risk Due to All Chemicals				
Incidental Ingestion of Soil or Sediment	>1(7.8)	<1(2E-03)	<1(2E-03)	<1(6E-01)
Dermal Contact with Soil or Sediment	<1(9E-1)	<1(2E-04)	<1(6E-04)	<1(5E-02)
Dermal Contact with Surface water	--	--	--	<1(6E-03)
CUMULATIVE HAZARD INDEX FOR EACH TARGET ORGAN (a)	>1 (8.7 for fetotoxicity)	<1	<1	<1

(a) Hazard indices are summed by target organ.

TABLE 4

**CUMULATIVE RISKS ASSOCIATED WITH FUTURE
LAND-USE CONDITIONS**

Pathway	Workers	Residents
Cancer Risk Due to All Chemicals		
Incidental Ingestion of Soil	3E-03	2E-02
Dermal Contact with Soil	5E-04	5E-03
Ingestion of Groundwater (unconsolidated aquifer)	2E-04	1E-03
TOTAL CANCER RISK	4E-03	3E-02
Noncancer Risk Due to All Chemicals		
Incidental Ingestion of Soil	>1(9.5)	>1(48)
Dermal Contact with Soil	>1(1.6)	>1(14)
Ingestion of Groundwater (unconsolidated aquifer)	>1(2.3) (a)	>1(8.0)
CUMULATIVE HAZARD INDEX FOR EACH TARGET ORGAN (b)	----- > 1 (12 for fetotoxicity)	----- > 1 (64 for fetotoxicity, 1.8 for skin effects, 3.6 for CNS effects)

(a) Although the hazard index for all chemicals exceeded 1.0, the cumulative hazard indices for specific target organs/critical effects did not exceed 1.0.

(b) Hazard indices are summed by target organ.

TABLE 5

**EPA's RISK-BASED SOIL REMEDIATION LEVELS
FOR THE INDUSTRIAL LATEX SITE**

CONTAMINANT	REMEDIAL GOAL ^a in parts per million (ppm)	MAXIMUM CONTAMINANT LEVEL (ppm)
Polychlorinated Biphenyls		
PCBs	1 ^b	4,000
Pesticides		
Heptachlor Epoxide	0.1	0.22
Inorganics		
Arsenic	3.6 ^c	49.4
Beryllium	0.48 ^d	2.2
Lead	500	89.9
Semivolatiles		
Benzo(a)anthracene	0.4	13
Benzo(a)pyrene	0.1	11.0
Benzo(b)fluoranthene	0.5	13
Benzo(k) fluoranthene	0.8	11
Benzo(ghi)perylene	3	5.1
Bis(2-ethylhexyl) phthalate	46	280
Chrysene	13	21
3,3-Dichlorobenzidine	1.4	6
Indeno(1,2,3-cd)pyrene	0.2	6.4

^a EPA Region 2 Remediation Goals (RG) developed according to the methodology outlined in Risk Assessment Guidance for Superfund (RAGS) Part B. The RG applies to both surface and subsurface soils.

^b The New Jersey Department of Environment and Energy has proposed surface soil and subsurface soil cleanup standards for PCBs of 0.45 ppm and 100 ppm, respectively (Proposed Residential Standards - NJAC 7:26D). Proposed surface soil standards apply only to soils in the 0 to 2 foot depth interval.

^c The remediation level for arsenic is the background concentration. The corresponding RG is 0.4 ppm.

^d The remediation level for beryllium is the background concentration. The corresponding RG is 0.2 ppm.

TABLE 6
COST SUMMARY
FOR SOIL REMEDIATION ALTERNATIVES

ALTERNATIVE	COST		
S-1A: No Action	C	= \$	0
	O&M	= \$	80,000/5 years
	PW	= \$	83,100
S-1B: Minimal Action	C	= \$	167,000
	O&M	= \$	237,200/year
	PW	= \$	3,434,000
S-2: Capping	C	= \$	4,940,000
	O&M	= \$	240,000/year
	PW	= \$	7,090,000
S-3: In-situ Stabilization	C	= \$	9,100,000
	O&M	= \$	240,000/year
	PW	= \$	11,200,000
S-4: Low Temperature Thermal Desorption	C	= \$	10,480,000
	O&M	= \$	4,848,700/year
	PW	= \$	17,100,000
S-5: Dechlorination	C	= \$	6,760,000
	O&M	= \$	5,073,600/year
	PW	= \$	16,800,000
S-6: Solvent Extraction	C	= \$	16,200,000
	O&M	= \$	5,716,900/year
	PW	= \$	23,700,000
S-7: On-Site Incineration	C	= \$	7,190,000
	O&M	= \$	8,872,900/year
	PW	= \$	25,300,000
S-8: Off-site Landfilling	C	= \$	4,900,000
	O&M	= \$	6,886,600/year
	PW	= \$	13,600,000

C = Capital Costs.
O&M = Operation and Maintenance Costs.
PW = Present Worth at a 5 percent discount rate.

TABLE 7**COST SUMMARY OF REMEDIAL
ALTERNATIVES FOR HARDENED PRODUCT IN VATS**

ALTERNATIVE	COST		
V-1: Remove Vats and Dispose in Off-Site Landfill	C	= \$	140,200
	O&M	= \$	0/year
	PW	= \$	140,200
V-2: Remove Vats and Dispose in Off-Site Incinerator	C	= \$	646,500
	O&M	= \$	0/year
	PW	= \$	646,500
V-3: CO ₂ Blast Latex from Vats	C	= \$	286,000
	O&M	= \$	0/year
	PW	= \$	286,000

C = Capital Costs.
O&M = Operation and Maintenance Costs.
PW = Present Worth at a 5 percent discount rate.

TABLE 8**COST SUMMARY OF REMEDIAL
ALTERNATIVES FOR BUILDING SURFACES**

ALTERNATIVE		COST		
B-1:	Low Pressure Solvent/Detergent Washing Followed by Surface Sealing	C	= \$	450,700
		O&M	= \$	21,000/year
		PW	= \$	773,700
B-2:	CO ₂ Blasting of Building Surfaces	C	= \$	789,700
		O&M	= \$	0/year
		PW	= \$	789,700
B-3:	Scabbling of Building Surfaces	C	= \$	320,900
		O&M	= \$	0/year
		PW	= \$	320,900
B-4:	Building Demolition	C	= \$	643,400
		O&M	= \$	0/year
		PW	= \$	643,400

C = Capital Costs.
O&M = Operation and Maintenance Costs.
PW = Present Worth at a 5 percent discount rate.

TABLE 9**SUMMARY OF FEDERAL AND STATE APPLICABLE OR
RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)
FOR THE INDUSTRIAL LATEX SITE**

ARARS	CITATION
FEDERAL ARARS	
Chemical-Specific ARARS	
Resource Conservation and Recovery Act (RCRA) -- Identification and Listing of Hazardous Waste	40 CFR Part 261
Toxic Substances Control Act (TSCA)	40 CFR Part 761
National Ambient Air Quality Standards	40 CFR Part 50
Location-Specific ARARS	
Clean Water Act (CWA)	33 U.S.C. 1251 Section 404 40 CFR Parts 230 and 231
U.S. Army Corps of Engineers Nationwide Wetlands Permit Program	33 CFR Part 330
Protection of Wetlands	Executive Order No. 11990
Fish and Wildlife Coordination Act	16 U.S.C. 661 40 CFR Section 6:302(g)
National Ambient Air Quality Standards -- Non-attainment Zones	40 CFR Part 50
Action-Specific ARARS	
RCRA Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR Part 257
RCRA Hazardous Waste Management Systems General	40 CFR Part 260
RCRA Standards Applicable to Generators of Hazardous Waste	40 CFR Part 262
RCRA Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263
RCRA Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264 (Subpart X - Miscellaneous Units)
RCRA Land Disposal Restrictions	40 CFR Part 268.43
TSCA	40 CFR Part 761

TABLE 9 (continued)

**SUMMARY OF FEDERAL AND STATE APPLICABLE OR
RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)
FOR THE INDUSTRIAL LATEX SITE**

ARARS	CITATION
Occupational Safety and Health Act	29 U.S.C. Sections 651-678 29 CFR Parts 1910, 1926, and 1904
National Ambient Air Quality Standard	40 CFR Part 50 40 CFR Part 60 (New Source Performance standards, Subpart E)
Clean Air Act -- Listing Criteria	42 U.S.C. 7401, Section 112
STATE ARARS	
Location-Specific ARARS	
New Jersey Flood Hazard Area Control Act	NJSA 58:16A-50
New Jersey Wetland Act of 1970	NJSA 13:9A-1 et seq.
New Jersey Threatened Plant Species	Not Applicable
New Jersey Endangered Species	Not Applicable
Action-Specific ARARS	
New Jersey Prohibition of Air Pollution and Ambient Air Quality Standards	NJAC 7:27-5 and 13
New Jersey Air Pollution Control Permitting Requirements	NJAC 7:27-8
New Jersey Air Pollution Control Regulations	NJAC 7:27-11 and 17
New Jersey Worker and Community Right-to-Know Act	P.L. 1983c.315 P.L. 1985c.543 Executive Order #161
New Jersey Emergency Response Notice of Release of Hazardous Substance to Atmosphere	NJSA 26:2C-19
New Jersey Water Pollution Control Act -- Spill of Hazardous Substances	NJAC 7:21(E)
New Jersey Noise Control Act	NJSA 13:1G-1 et seq

TABLE 9 (continued)

**SUMMARY OF FEDERAL AND STATE APPLICABLE OR
RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)
FOR THE INDUSTRIAL LATEX SITE**

ARARS	CITATION
New Jersey Noise Pollution Regulations	NJAC 7:29-1
New Jersey General Requirements for Permitting Wells	NJAC 7:9-7
New Jersey Well Drillers and Pump Installers Act	NJSA 58:4A-5 et seq
New Jersey Requirements for Sealing Abandoned Wells	NJAC 7:9-9
New Jersey Solid Waste Management Act	NJSA 13:1E et seq