United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R03-91/123
September 1991

EPA

Superfund
Record of Decision:

Hellertown Manufacturing, PA

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R03-91/123	2.	3. Recipient's Accession No.

4. Title and Subtitle SUPERFUND RECORD OF DECISION Hellertown Manufacturing, PA First Remedial Action - Final	5. Report Date 09/30/91 6.
7. Author(s)	8. Performing Organization Rept. No.
9. Performing Orgainization Name and Address	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 14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 8.64-acre Hellertown Manufacturing site is an inactive spark plug manufacturing facility in Northampton County, Pennsylvania, approximately 1.5 miles south of Bethlehem. The site is bordered by commercial and residential areas, highway and railroad transportation corridors, Saucon Creek, and a wetlands area. Onsite features include a 124,000-square-foot building, and five lagoons totaling 500,000 cubic feet. From 1930 to 1975, chemical wastes including TCE, zinc plating waste, chrome dip waste, cleaners, and cutting oils generated during plating and degreasing processes were disposed of onsite in the unlined lagoons. Waste from these activities then seeped into the local soil and rock strata. In 1976, after the facility began discharging treated wastewater into the municipal sewer system, the lagoons were backfilled, closed in place, and covered with topsoil. The material used to backfill the lagoons included rejected spark plugs, demolition material from road-building activities, and soil excavated during construction of the nearby Bethlehem wastewater treatment plant. Studies conducted in 1990 identified contamination by VOCs, metals, and organic compounds in lagoon backfill, soil, and in onsite ground water. The primary contaminants of concern affecting the soil and ground water and VOCs including

(See Attached Page)

17. Document Analysis a. Descriptors

Record of Decision - Hellertown Manufacturing, PA
First Remedial Action - Final
Contaminated Media: soil, gw
Key Contaminants: VOCs (benzene, DCE, PCE, TCE, vinyl chloride, xylenes), other organics (PAHs), metals (chromium)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 57
	20. Security Class (This Page) None	22. Price

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

Abstract (Continued)

benzene, DCE, PCE, TCE, vinyl chloride, and xylenes; other organics including PAHs; and metals including chromium.

The selected remedial action for this site includes capping the former 3.5-acre lagoon area with an impermeable asphalt and clay cover; pumping and onsite treatment of ground water using air stripping; removing solids using a settling tank or clarifier followed by filtration; discharging the treated effluent onsite to Saucon Creek; long-term ground water monitoring; controlling surface water runoff; and implementing institutional controls including deed restrictions. The estimated present worth cost for this remedial action is $2,250,000.

<u>PERFORMANCE STANDARDS OR GOALS</u>: Ground water clean-up goals are based on SDWA MCLs or State background concentrations, whichever is the more stringent. Chemical-specific ground water clean-up levels include benzene 0.2 ug/l (State background), PCE 0.03 ug/l (State background), TCE 0.12 ug/l (State background), and vinyl chloride 0.18 ug/l (State background).

RECORD OF DECISION
HELLERTOWN MANUFACTURING COMPANY

DECLARATION

Site Name and Location

Hellertown Manufacturing Company
Hellertown Borough, Northampton County, Pennsylvania

Statement of Basis and Purpose

This decision document presents the final selected remedial action for the Hellertown Manufacturing Company site, Hellertown Borough, Northampton County, Pennsylvania, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the remedy for this site.

The Commonwealth of Pennsylvania concurs on the selected remedy. The information supporting this remedial action decision is contained in the Administrative Record for this site.

Assessment of the Site

Pursuant to duly delegated authority, I hereby determine, pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606, that actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of the Selected Remedy

This is the only planned response action for the site. This remedy addresses both source control of five former lagoons which are the source of the soil and groundwater contamination, and groundwater remediation. Groundwater contamination represents a primary threat; therefore, the extraction and treatment of groundwater will be required. Soils on-site represent a low-level threat and not a principal threat; therefore, a containment remedy for source control will be required.

The selected remedy includes the following major components:

- Placement of an impermeable cover over the entire former lagoon area;

- Surface water runoff controls;

- Extraction and treatment of groundwater (air stripping and solids removal), with discharge to Saucon Creek;

- Long-term groundwater monitoring; and

- Deed restrictions.

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 (or resource recovery) 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.

Because this remedy will result in hazardous substances above health-based levels remaining on-site, a review will be conducted within five years after commencement of remedial action and every five years thereafter, as required by Section 121(c) of CERCLA, 42 U.S.C. § 9621 (c), to ensure that the remedy continues to provide adequate protection of human health and the environment.

for Edwin B. Erickson
Regional Administrator
Region III

Date: 9-30-91

RECORD OF DECISION
HELLERTOWN MANUFACTURING COMPANY

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HELLERTOWN MANUFACTURING COMPANY

DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

The Hellertown Manufacturing Company site (the "Site"), is located on Main Street (Route 412) in Hellertown Borough, Northampton County, Pennsylvania. The Site occupies 8.64 acres and contains a 124,000 square foot building. The Site is located in a combined commercial and residential area approximately 1.5 miles south of Bethlehem, Pennsylvania (Figure 1).

The Site is bordered by commercial businesses and residences to the south, by the recently-completed Interstate Highway 78 to the north, by Main Street and undeveloped vacant land to the east, and a Conrail railroad and Saucon Creek to the west. Several residences are located between the Conrail railroad and Saucon Creek.

The Borough of Hellertown covers 1.4 square miles. It has a population of 6,025 and a density of 4,034 persons per square mile. The Borough maintains a public water supply which uses primarily surface water. Groundwater is used for backup municipal water supply. Residences within 0.5 miles of the Site are connected to the public water supply. The Remedial Investigation ("RI") Report identified seven wells within one mile of the Site, six of which are residential. Of the residential wells, three are used for drinking water, one is used for watering a lawn and washing cars, and two are inactive. The residential wells were sampled during the RI. None of the samples contained contaminants which exceeded Maximum Contaminant Levels ("MCLs") established by the Safe Drinking Water Act ("SDWA"). Eight additional wells were identified within approximately two miles of the Site. These wells are used for either backup municipal water supply, irrigation, or water level monitoring. The aquifer underlying the Site is classified as Class IIA, a current source of drinking water.

The nearest body of surface water is Saucon Creek, located approximately 600 feet west of the Site. It joins the Lehigh River about 1.5 miles to the north of the Site. Saucon Creek is used for recreational purposes and for fishing. Groundwater beneath the Site flows to the west-northwest in the direction of Saucon Creek. Groundwater in the vicinity of the Site discharges from the bedrock to Saucon Creek.

There are no known endangered species or critical habitats within the immediate vicinity of the Site. A wetlands area was delineated off-site near Saucon Creek.

II. SITE HISTORY AND ENFORCEMENT ACTIVITY

The Hellertown Manufacturing Company is an inactive spark plug manufacturing facility that ceased operation in October 1982. The Site was developed in 1918 as a spark plug manufacturing facility, and acquired by the Hellertown Manufacturing Company, a wholly-owned subsidiary of the Champion Spark Plug Company, in 1950. It was sold to Paikes Enterprises, Inc., in 1988. The building is currently used by a small laboratory and as warehouse space.

Spark plug manufacturing involved a plating process and a degreasing operation using trichloroethylene. These processes used various chemicals which resulted in the generation, storage, and disposal of various wastes. Between 1930 and 1976, wastes were disposed in five on-site lagoons with a total storage capacity of 500,000 cubic feet (referred to herein as the "former lagoon area"). The lagoons were unlined, and allowed waste to seep into the local soil and rock strata. According to a Preliminary Assessment conducted by the Pennsylvania Department of Environmental Resources, the waste disposed on-site included zinc plating waste, chrome dip waste, cleaners, and cutting oils.

In 1965 a wastewater treatment system with sludge drying beds was installed for treatment of plant wastewater. It was upgraded in 1972. By 1975 the treated wastewater was discharged to the municipal sewer system and disposal in the lagoons was no longer necessary. In 1976, the lagoons were backfilled, closed in place, and covered with topsoil.

The plant also previously used five underground tanks for storage of machine oil and fuel oil. In 1990 the contents of all tanks were removed and one of the tanks was removed. The other four tanks, which were in close proximity to the manufacturing building, have been closed in place.

The Site was listed on the National Priorities List ("NPL") in March 1989. In February 1988 Champion Spark Plug Company ("Champion") and EPA entered into an Administrative Order by consent which required Champion to conduct a Remedial Investigation/Feasibility Study ("RI/FS"). The purpose of the Remedial Investigation was to collect data necessary to characterize the Site; the purpose of the Feasibility Study was to develop and evaluate appropriate remedial alternatives. The work was conducted by Environmental Strategies Corporation. The final RI and FS Reports were submitted to EPA on August 20 and 21, 1991.

III. HIGHLIGHTS OF COMMUNITY INVOLVEMENT

A Community Relations Plan for the Hellertown Manufacturing Company site was finalized in June 1987. This document lists contacts and interested parties throughout government and the local community. It also establishes communication pathways to ensure timely dissemination of pertinent information. The draft RI/FS reports and the Proposed Plan were released to the public in July 1991. All of these documents were made available in both the Administrative Record and at the Hellertown Borough Municipal Center. A public comment period was held from July 26, 1991 to August 26, 1991. In addition, a public meeting was held on August 13, 1991, to discuss the results of the RI/FS and the preferred alternative as presented in the Proposed Plan for the Site. Notice of the Proposed Plan and public meeting was published in the Bethlehem Globe Times, the Allentown Morning Call, and the Hellertown Valley Voice. All comments which were received by EPA prior to the end of the public comment period, including those expressed verbally at the public meeting, are addressed in the Responsiveness Summary which is attached to this Record of Decision.

IV. SCOPE AND ROLE OF RESPONSE ACTION WITHIN SITE STRATEGY

The remedy selected in this ROD addresses pumping and treatment of the contaminated groundwater emanating from the Site and containment of the on-site contaminated subsurface soils. This is the only planned response action for this Site.

EPA has classified this aquifer as a Class IIA aquifer, a current source of drinking water, in accordance with the EPA document "Guidelines for Groundwater Classification" (Final Draft, December, 1986). One goal of this remedial action is to restore contaminated groundwater to its beneficial use as a drinking water source and to background concentrations, if practicable. The primary risk to human health and the environment is from ingestion of, and contact with, groundwater from wells that contain contaminants above the MCLs established under the Safe Drinking Water Act ("SDWA"), 42 U.S.C. §§ 300f to 300j-26. Pumping and treating groundwater is the most expeditious way to reduce the contaminant levels that have been detected.

Another goal of this remedial action is source control of contaminated soils. The purpose is to protect human health and the environment from exposure through direct contact, and to prevent transport of soil contaminants into the groundwater in order to protect groundwater for its beneficial uses and to meet groundwater ARARs. (ARARs are applicable or relevant and appropriate federal and state requirements that a selected remedy must attain).

The RI Report indicates that existing levels of contaminants in the soils are within EPA's acceptable incremental individual lifetime cancer risk range of 10^{-4} to 10^{-6}, based on direct dermal contact and ingestion. No principal threats such as areas of highly toxic or highly mobile wastes were found. Therefore, EPA has determined that contaminated soils are a low-level threat and not a principal threat. However, rainfall infiltration into the soils can cause contaminants in soil to continue to leach into the groundwater. Therefore, the selected remedial alternative requires an impermeable cover over the former lagoon area to minimize infiltration of rainwater and to reduce the time needed to achieve groundwater ARARs.

V. SUMMARY OF SITE CHARACTERISTICS AND EXTENT OF CONTAMINATION

A. Site Characteristics

The Site is underlain by Cambrian and Pre-Cambrian rocks that have been deeply weathered. The Tomstown Formation (also known as the Leithsville Formation) lies directly under the Site and is composed primarily of dolomitic limestones with varying amounts of lime-containing shales and phylitic schists. Some highly weathered sandstone lenses may be found in the formation as well. The geologic structure of the rocks is extremely complex, which is partly caused by extensive thrust faulting in the area. The Tomstown Formation extends to a depth of approximately 1,000 feet, with the upper few hundred feet reportedly containing all of the water-bearing fracture. The bedrock in the vicinity of the Site is overlain by saprolite and a mantle of undifferentiated alluvium and colluvium. The combined thickness of these units ranges from zero to 41 feet in the vicinity of the Site.

The bulk of the regional groundwater moves through carbonate-rock formations, including the Leithsville Formation, that are most likely interconnected hydraulically. Most of the water in the carbonate-rock aquifers occurs in bedding-plane openings, joints, fault zones, and fractures that have been enlarged by groundwater dissolving minerals from the rock. The flow pattern in the bedrock in the vicinity of the Site is complex; however, water level measurements in monitoring wells indicate that groundwater is discharging to Saucon Creek. There is generally a downward and horizontal (westerly) groundwater flow in the alluvium/colluvium mantle and an upward and horizontal (westerly) groundwater flow in the Leithsville Formation.

B. Nature and Extent of Contamination

The primary source of site contamination was the wastewater disposed in the five former lagoons. The lagoons were unlined, allowing stored liquids to seep through the bottoms. The lagoons and the underlying groundwater were sampled in the course of the field investigations conducted during the Remedial Investigation. Volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), and metals were found in the lagoon backfill and underlying lagoon sediments in concentrations that exceed background levels. VOCs and metals were found in groundwater at concentrations that exceed background levels and MCLs. The estimated volume of the contaminated groundwater plume both on-site and off-site is 49 million gallons. It covers an area of approximately 7.5 acres.

The former lagoon area covers approximately 3.5 acres. The total lagoon volume is 76,000 cubic yards. Lagoons vary in depth up to about 28 feet maximum. The material used to backfill the lagoons was obtained from different locations, and included rejected spark plugs, demolition material (including asphalt) from road-building activities, and soils excavated during construction of the nearby Bethlehem, Pennsylvania, wastewater treatment plant. The fill material probably contributed to the polynuclear aromatic hydrocarbon (PAH) contamination found in the soil in the former lagoon area. Disposal of wastes from the plating operation, degreasers, and oils from the manufacturing process, as described above, contributed to the elevated levels of VOCs and metals found in soil and groundwater at the Site. Asphalt now covers the area of lagoons 1 and 5, and a grass field covers the area where the other three lagoons were located.

The scope of the Remedial Investigation included sampling studies for all media that may be affected: surface and subsurface soils, groundwater, sediment, and surface water. Approximately 65 soil borings were taken on-site in the vicinity of the former lagoons. Additional soil samples were taken near the process building. The location of soil borings is shown in Figure 2. Samples were analyzed for contaminants including PAHs, VOCs, metals and inorganic compounds. A summary of VOC contamination in soils in the former lagoon area is presented in Table 1. Samples indicate that contamination is present throughout each lagoon soil profile at levels that exceed background concentrations. VOCs were not detected in surface soils, probably due to the fact that these compounds volatilize easily. The contaminants of concern for soil include: trichloroethylene (TCE); 1,2-dichloroethylene; tetrachloroethylene (PCE); 4-methyl-2-pentanone; carbon disulfide; ethylbenzene; total xylenes; PAHs; chromium; total cyanide; and cadmium.

TCE was the most frequently detected VOC in subsurface soils within the lagoon area, with a maximum TCE concentration of 560 micrograms/kilogram ("ug/kg") sampled from former lagoon 4. Subsurface soil samples from the former lagoon areas contained several base-neutral and acid extractable organic compounds, particularly PAHs. PAH concentrations collected from the fill materials and the residual lagoon sediments ranged from 830 ug/kg to 108,000 ug/kg. PAHs were detected in samples from beneath the base of each lagoon ranging in total concentration from 125 ug/kg to 23,969 ug/kg.

Approximately 23 groundwater monitoring wells, both on-site and off-site, were sampled on three occasions during the remedial investigation. The location of groundwater monitoring wells are shown in Figure 3. Water level measurements in the bedrock wells indicate that groundwater is moving west-northwest across the site and that groundwater is discharging to Saucon Creek.

Samples were analyzed for volatile and non-volatile organics, metals, and inorganic compounds. Contaminants were found in groundwater at concentrations that exceed background levels and MCLs under the Safe Drinking Water Act. MCLs were exceeded for benzene, cis-1,2 dichloroethylene, trans-1,2 dichloroethylene, trichloroethylene, vinyl chloride, and tetrachloroethylene. Additional contaminants of concern for groundwater include acetone; 1,1,1-trichloroethane; beryllium; chromium; total cyanide; mercury; nickel; selenium; and antimony.

Groundwater sampling results are summarized in Table 2. Maximum concentrations of the most frequently detected VOCs are: vinyl chloride, 83 ug/l; TCE, 1700 ug/l; tetrachloroethylene, 22 ug/l; total 1,2-dichloroethylene, 260 ug/l. A relationship between TCE in subsurface soils and groundwater was established during the RI/FS. Subsurface soils collected from former lagoon 4 contained levels of TCE up to 560 ug/kg, which were the highest levels detected in any lagoon; the corresponding groundwater in the wells downgradient of lagoon 4 contained the highest concentration of TCE.

Groundwater monitoring at the Site indicates that the VOCs have moved through groundwater off-site toward Saucon Creek at levels that exceed MCLs. The concentration of VOCs in wells decreased between the lagoons and the creek, indicating that dispersion and dilution is occurring. Stream and sediment samples were collected from five locations along Saucon Creek and analyzed for volatile and non-volatile organic compounds, PAHs, inorganic compounds, and indicator parameters of water quality. No volatile organic compounds were present in detectable concentrations. However, the presence of organic compounds in groundwater monitoring wells adjacent to Saucon Creek indicates that groundwater is a likely contaminant pathway to the creek.

Four additional wells were sampled in June, 1991. A cluster of two groundwater monitoring wells, CSP 20 and 21 (one shallow and one bedrock well) was installed off-site 450 feet west of Saucon Creek. TCE, toluene, ethylbenzene, and xylene were detected in these wells. A second cluster of two wells was installed offsite south of the site (wells CSP-22 and CSP-23). Well CSP-22 contained TCE at 6 ug/l.

VI. SUMMARY OF SITE RISKS

As part of the RI/FS, a baseline risk assessment was conducted to characterize the current and potential threats to human health and the environment posed by contaminants in the groundwater, soil and subsurface soil, the migration of contaminants to surface water, and the leaching of contaminants from soil to groundwater, in the absence of remedial action. Table 3 provides a discussion of the key terms used in the risk assessment described in the ROD. The risk assessment consisted of identification of contaminants of concern, toxicity assessment, exposure assessment, and risk characterization.

Current land use in the vicinity of the Site is residential and commercial. According to information received from the Hellertown Borough planning office, future land use is also expected to be residential and commercial.

Groundwater beneath the Site is classified as a Class IIA aquifer, a current source of drinking water. There are seven wells within one mile of the Site, six of which are residential. Of the residential wells, three are used for drinking water, one is used for watering a lawn and washing cars, and two are inactive. The residential wells were sampled during the RI/FS. None of the samples contained contaminants which exceeded MCLs. Eight additional wells were identified within approximately two miles of the Site. These wells are used for either backup municipal water supply, irrigation, or water level monitoring.

Populations at risk include:

(1) Persons who may use contaminated groundwater from the Site now and in the future. The primary routes of exposure would be ingestion, inhalation of volatile contaminants, and dermal adsorption by adults and children.

(2) Persons who may come in contact with contaminated on-site soils based on hypothetical residential use. The primary routes of exposure would be inadvertent ingestion and dermal absorption of contaminants by adults and children.

Use of an exposure scenario based on future residential use is consistent with Agency policy described in "EPA Risk Assessment Guidance for Superfund" (December, 1989) which requires consideration of hypothetical residential use. The NCP requires that groundwater which is suitable for use as a water supply be protected and restored to its beneficial use.

C. Contaminants of Concern

The Risk Assessment compiled a list of contaminants of concern from the results of the various sampling activities at the Site. These indicator contaminants of concern were selected based on concentrations at the site, toxicity, physical/chemical properties that affect transport/movement in air, soil and groundwater, and prevalence/persistence in these media. These contaminants of concern were used in the Risk Assessment to evaluate potential health risks at the site.

The specific contaminants of concern in the subsurface soil which were evaluated in Risk Assessment are trichloroethylene, 1,2-dichloroethylene, tetrachloroethylene, 4-methyl-2-pentanone, carbon disulfide, ethylbenzene, total xylenes, PAHs, chromium, total cyanide, and cadmium.

The specific contaminants of concern in groundwater which were evaluated in the Risk Assessment are acetone, benzene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, vinyl chloride, beryllium, chromium, total cyanide, mercury, nickel, selenium, and antimony.

D. Toxicity Assessment

The results of the Risk Assessment revealed that the concentrations of six contaminants in the groundwater exceed MCLs for those contaminants. Benzene and vinyl chloride are classified as human carcinogens based on epidemiological studies. Trichloroethylene and tetrachloroethylene are classified as probable human carcinogens based on toxicological studies performed on laboratory animals. Scientific data collected to date is not sufficient to classify cis and trans-1,2-dichloroethylene as carcinogens.

E. Exposure Assessment

The exposure assessment identified potential exposure pathways for residential soils and groundwater at the Site boundary. The potential for current exposure to surface and subsurface soils is limited. The former lagoon area is covered with asphalt or a grassy soil cover and the Site is fenced. There are no on-site drinking water wells. Therefore, two hypothetical exposure scenarios were developed, assuming the site was developed for future residential use: (1) exposure to surface soil by adults through dermal adsorption and by children via ingestion and dermal adsorption, and (2) domestic use of groundwater by adults and children through three routes: ingestion, dermal contact with water while bathing or showering, and inhalation of indoor air contaminants while bathing, showering, or cooking. For each potential exposure pathway, exposure assumptions were made for average and reasonable maximum exposure scenarios.

The contaminant intake equations and intake parameters were derived from standard literature equations and data from EPA guidance documents. Chronic daily intakes ("CDI") were estimated for contaminants of concern in the baseline risk assessment. The Reference Dose values ("RfD") for a substance represent a level of intake which is unlikely to result in adverse non-carcinogen health effects in individuals exposed for a chronic period of time. The slope factor represents the upper 95 percent confidence limit value on the probability of response per unit intake of a contaminant over a lifetime (70 years). (See Table 4 through 6 for values used in the exposure assessment).

F. Risk Characterization

The baseline risk assessment in the RI/FS quantified the potential carcinogenic and non-carcinogenic risks to human health posed by contaminants of concern in several exposure media. For the Hellertown Site, the carcinogenic and non-carcinogenic risks were determined for soil and groundwater. (See Tables 4 through 6 for values used in the exposure assessment).

Carcinogenic risk is presented as the incremental probability of an individual contracting some form of cancer over a lifetime as the result of exposure to the carcinogen. Risk standards for non-carcinogenic compounds are established at acceptable levels and criteria considered protective of human populations from the possible adverse effect from human exposure. The ratio of the CDI to the RfD, defined as the hazard quotient, provides an indication of the potential for systemic toxicity to occur. If the sum of the aggregate hazard quotients does not exceed one, there is not a concern for a non-carcinogenic public health threat.

1. Groundwater

Carcinogenic and non-carcinogenic risks for hypothetical residential use of groundwater based in a reasonable maximum exposure scenario are summarized in Table 7. The potential future risk associated with chronic daily ingestion of on-site groundwater is 10^{-3}. The potential future risk associated with showering with onsite groundwater is 3×10^{-4}. TCE is the carcinogen that was detected in groundwater at the highest concentration, and vinyl chloride is the most potent carcinogen among the contaminants of concern.

The aggregate non-carcinogenic hazard index for a future hypothetical residential scenario was calculated at 0.9. Since results do not exceed one, EPA believes there is no non-carcinogenic health risk.

Because the baseline carcinogenic risk exceeds the risk range of 10^{-4} to 10^{-6}, and because MCLs are exceeded, remedial action for groundwater will be taken at this Site.

2. Soil

Potential carcinogenic and non-carcinogenic risks for ingestion of, and dermal contact with, surface soil for a hypothetical residential use scenario is also summarized in Table 7. The lifetime excess cancer risk associated with exposure to total carcinogenic PAHs in surface soil is 7×10^{-5}. The non-carcinogenic hazard index is less than one. Because the exposure to surface soils represents a low-level threat and not a principal threat at the Site, source control through containment is the selected remedy.

G. Environmental Risks

There are no known endangered species or critical habitats within the immediate vicinity of the site. The Site is located in an industrial/commercial setting that does not provide habitat resources for wildlife.

Wetlands occupying 0.13 acres were identified adjacent to Saucon Creek in the vicinity of the Site. Saucon Creek and the delineated wetland are potentially affected by the migration of contaminants through groundwater discharge. Surface water in the wetlands area contained inorganic compounds and metals but no VOCs; sediments contained metals and PAH compounds. It is not clear from the sampling survey whether contaminants are present above background levels and whether the wetland receives contaminants from groundwater discharge or through storm drainage, or a combination of both. Therefore, additional wetland soil, stream, sediment, and surface water sampling will be required as part of the remedial design study.

H. Summary

For a residential use scenario, use of groundwater at the Site would result in a maximum excess cancer risk from exposure to groundwater of one person in one thousand (10^{-3}). The lifetime excess cancer risk associated with exposure to surface soil is seven persons in one hundred thousand (7×10^{-5}). Noncarcinogenic health effects are not expected from exposure at the present detected levels of contamination in either on-site soil or in groundwater.

Actual or threatened releases of hazardous substances from this 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.

VII. DESCRIPTION OF ALTERNATIVES

A feasibility study was conducted to identify and evaluate remedial alternatives for remediation of groundwater and contaminated soils in the former lagoon area. Applicable remediation technologies were initially screened in the feasibility study based on effectiveness, implementability, and cost. The alternatives meeting these criteria were then evaluated and compared to nine criteria required by the National Contingency Plan (NCP). The NCP requires that a no action alternative be evaluated as a point of comparison for other alternatives.

The six alternatives evaluated and their present worth costs are described below. The alternatives describe final remedial actions for source control and groundwater remediation.

Alternative 1: No Action
$223,000

Under this alternative, no further action would be taken to control the source of contamination. However, long-term monitoring of groundwater would be implemented using existing monitoring wells to monitor contaminant migration. Groundwater monitoring cost is based on quarterly monitoring for 2 years, semi-annual monitoring for an additional 3 years, and annual monitoring for the remaining life of the project. Ten wells would be sampled and analyzed. Under the no action alternative, the estimated time frame for groundwater to attenuate naturally and meet MCLs is 46 years, and to meet background concentrations, 68 years. Because this alternative will result in contaminants remaining on-site, CERCLA Section 121 (c) requires that a site review be conducted every 5 years.

The present worth cost for a 35-year period is $223,000. This alternative could be implemented immediately.

Alternative 2: Institutional Controls
$224,000

This alternative would not require implementation of remedial actions to address groundwater or soil contamination. Deed restrictions would be imposed to prevent excavation of contaminated soils on-site, and to prohibit on-site groundwater use for domestic purposes, including drinking water. A long-term groundwater monitoring program would also be implemented using previously installed wells. Because this alternative will result in contaminants remaining on-site, CERCLA Section 121 (c) requires that a site review be conducted every 5 years.

The present worth cost for a 35-year period is $224,000. This alternative could be implemented immediately.

Alternative 3: Impermeable Cover
$640,000

- Impermeable cover over former lagoon area
- Surface water run-off controls
- Groundwater monitoring
- Deed restrictions

This alternative would require that an impermeable two-foot clay cover or equivalent be installed over the soil-covered former lagoon area. The clay cover or equivalent would be covered with two additional feet of topsoil and seeded with grass. Routine monitoring and maintenance of the cover will be required. The former lagoon area now covered with asphalt would be sealed with another asphalt layer. Runoff from the graded cover and parking lot would be collected and conveyed to a stormwater collection system.

This alternative would not involve groundwater remediation. As in Alternative 2, deed restrictions and long-term groundwater monitoring will be required. Because this alternative will result in contaminants remaining on-site, CERCLA Section 121(c) requires that a site review be conducted every 5 years. The present worth cost is $640,000 (35 years). The impermeable cover could be installed in one year.

Alternative 4: Groundwater Pumping and Treatment (Solids Removal)
$1,806,700

- -Groundwater pump and treat
- -Groundwater monitoring
- -Deed restrictions

This alternative would not require implementation of remedial actions to address surface and subsurface soil contamination. Groundwater would be collected using a series of extraction wells and treated in an on-site treatment system for removal of suspended solids using a settling tank and filtration system. The treated groundwater would be discharged through a new outfall pipe that would be installed from the Site to Saucon Creek. Groundwater treatment for solids removal is expected to remove elevated levels of metals but will not significantly reduce the levels of volatile organic contaminants (VOCs) in the extracted groundwater. Treated groundwater discharged to Saucon Creek would not be expected to comply with all federal and state standards because of the level of VOCs in the discharge. Solids collected from the solids removal process would be sampled for compliance with RCRA requirements and disposed off-site.

Periodic groundwater monitoring would be required for the life of the project. Groundwater monitoring cost is based on quarterly groundwater sampling for the first two years and semi-annually for the remaining life of the project. Ten wells would be sampled. Because this alternative would result in contaminants remaining on-site, 5-year site reviews under Section 121(c) of CERCLA would be required.

The present worth cost of this alternative is $1,806,700 (35 years). The time to reduce the groundwater contaminants based on ARARs is estimated to be 30-40 years.

Alternative 5: Groundwater Pumping and Treatment (Solids Removal and Air Stripping)
$1,836,100

- -Groundwater pump and treat
- -Groundwater monitoring
- -Deed Restrictions

This alternative is similar to Alternative 4, except that groundwater would be treated using solids removal and air stripping. Air stripping would treat the VOCs in the groundwater. The air and VOCs exiting the air stripping column would be treated by a carbon adsorption unit, if necessary, to meet federal and State standards for air emissions. With the additional treatment with air stripping, the treated groundwater discharge would comply with NPDES effluent limitations for discharge to Saucon Creek. Monitoring requirements would be the same as Alternative 4.

The present worth cost of this alternative is $1,836,100 (35 years). The time it will take to reduce the groundwater contaminants to ARARs levels is estimated to be 30-40 years.

Alternative 6: Impermeable Cover, Groundwater Pumping and Treatment (Solids removal and air stripping) $2,250,000

- -Impermeable Cover
- -Surface Water Runoff Controls
- -Groundwater Pump and Treat
- -Groundwater Monitoring
- -Deed Restrictions

This alternative is a combination of Alternatives 2, 3, and 5. Alternative 6 provides containment of contaminated soils as described in Alternative 3, remediation of contaminated groundwater as described in Alternative 5, and deed restrictions on the property as described in Alternative 2.

The present worth cost of this alternative (35 years) is $2,250,000. The time to implement this alternative is estimated to be 30-40 years.

VIII. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The six remedial action alternatives described above were evaluated using nine evaluation criteria. The resulting strengths and weaknesses of the alternatives were then weighed to identify the alternative providing the best balance among the nine criteria. These nine criteria are:

Threshold Criteria

- -Overall protection of human health and the environment
- -Compliance with applicable or relevant and appropriate requirements

Primary Balancing Criteria

- -Reduction of toxicity, mobility, or volume
- -Implementability
- -Short-term effectiveness

-Long-term effectiveness
-Cost

Modifying Criteria

-Community acceptance
-State acceptance

A. Protection of Human Health and the Environment

A primary requirement of CERCLA is that the selected remedial action be protective of human health and the environment. A remedy is protective if it eliminates, reduces, or controls current and potential risks posed through each exposure pathway to acceptable levels through treatment, engineering controls, or institutional controls.

Alternative 1, the no action alternative, does not include treatment or controls, provides no reduction in risk, and is not protective. Alternative 1 will therefore no longer be discussed with regard to remediation of soils and groundwater.

Alternative 2, institutional controls (deed restrictions), would minimize further access to the Site and use of the groundwater but provides only minimal health protection and no environmental protection. No provisions would be made to treat groundwater, to reduce infiltration of rainwater into the lagoons, or to prevent migration of contaminants from the Site.

Alternative 3 proposed placing an impermeable cover over all contaminated areas where the former lagoons were located. This alternative would be protective and would prevent potentially adverse exposure risks associated with current and future site use by eliminating exposure routes such as dermal contact and ingestion of contaminated soils. Under alternative 3, no provisions would be made to treat groundwater or to prevent migration of contaminants in groundwater from the Site.

Alternatives 4 and 5 include extraction and treatment of groundwater with discharge to Saucon Creek. Alternatives 4 and 5 would be protective. Public and environmental risks from direct contact and ingestion of contaminated groundwater would be mitigated through treatment of the groundwater plume. The risk from direct contact with soils on-site would still pose a low level risk.

Alternative 6, which proposes a combination of an impermeable cover, surface water run-off controls, extraction and treatment of groundwater, long-term groundwater monitoring and deed restrictions, provides the greatest overall level of protection. Exposure to both soils and groundwater would be mitigated through containment of soils and treatment of groundwater to risk-based cleanup levels, therefore reducing potential risks to present and future residents in the area near the Site.

<u>B. Compliance with Applicable or Relevant and Appropriate Requirements</u>

Section 121(d) of CERCLA requires that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and State standards, requirements, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121 (d)(4). Applicable requirements are those substantive environmental protection requirements, criteria, or limitations promulgated under federal or State law that specifically address hazardous substances found at the site, the remedial action to be implemented at the site, the location of the site, or other circumstances present at the site. *Relevant and appropriate requirements are those* substantive environmental protection requirements, criteria, or limitations promulgated under federal or State law which, while not applicable to the hazardous materials found at the site, the remedial action itself, the site location or other circumstances at the site, nevertheless address problems or situations sufficiently similar to those encountered at the site that their use is well-suited to the site. ARARs may relate to the substances addressed by the remedial action (chemical-specific), to the location of the site (location-specific), or the manner in which the remedial action is implemented (action-specific).

Alternatives 4, 5, and 6 include groundwater remediation as a component of the remedy. The contaminant levels for VOCs currently in the groundwater plume exceed MCLs in the Safe Drinking Water Act and also exceed the Commonwealth of Pennsylvania's criteria for remediation to background concentrations. Once groundwater treatment is implemented, remediation to groundwater levels that meet federal and State ARARs will be required. Alternatives 5 and 6 (groundwater treatment with solids removal and air stripping) can be designed to comply with all ARARs. Alternative 4 (groundwater treatment with solids removal only) would not be expected to meet federal and State ARARs because of the level of VOCs in the treated groundwater discharged to Saucon Creek. Alternatives 4, 5, and 6 would also meet all action-specific ARARs relating to activities performed as part of the remedy, including NPDES discharge and design requirements, federal and State air emission requirements, and treatment, storage, and disposal requirements for any waste sludges generated during the groundwater treatment process.

Alternatives 3 and 6 require that the soil-covered former lagoon area be covered with an impermeable clay layer or equivalent and two feet of topsoil. The former lagoon area covered with asphalt would be covered with a reinforcement layer and another asphalt layer. (Contaminants that remain on-site in the former lagoon area are not RCRA wastes and EPA has determined that the contaminants do not pose a principal threat. Therefore, ARARs for RCRA closure are not applicable or relevant and appropriate for this Site.)

C. Reduction of Toxicity, Mobility, or Volume

This evaluation criteria addresses the degree to which a technology or remedial alternative reduces toxicity, mobility, or volume of hazardous substances.

Alternatives 2 and 3 are remedial actions that do not use treatment technologies. The toxicity, mobility, and volume of the contaminants would not be reduced, since the physical, chemical, or biological characteristics of the waste would not be altered through treatment.

Alternatives 4, 5, and 6 will result in the reduction of toxicity, mobility or volume of Site contaminants in groundwater through the treatment technologies of solids removal for metals treatment and air stripping for treatment of VOCs. Alternative 4 employs solids removal only for groundwater treatment. Alternatives 5 and 6, which use both solids removal and air stripping for VOC removal, will result in increased reduction of toxicity due to treatment of VOCs in groundwater. Contaminants released to the air during air stripping may need to be treated with carbon adsorption, depending on the concentration of contaminants released during air stripping. The treatment process for solids treatment will result in sludge which will require management as a solids residual. Neither Alternative 4 or 5 provides any reduction of toxicity, mobility, or volume of contaminated soils; Alternative 6, which employs an impermeable cover, provides reduction of mobility of the contaminants in soil but not toxicity or volume.

D. Implementability

Implementability refers to the technical and administrative feasibility of a remedy, from design through construction, operation, and maintenance. It also includes coordination of federal, State, and local governments to clean up the site.

All alternatives evaluated are considered implementable and use technologies that have been recommended at other Superfund sites. All alternatives require groundwater monitoring, and Alternatives 4, 5, and 6 will require monitoring of the treated groundwater discharge. Monitoring activities and discharge requirements will be developed in coordination with the Pennsylvania Department of Environmental Resources ("the Pennsylvania DER").

Alternative 3 would be the easiest technology to implement because the impermeable cover could be installed in approximately one year and would require minimum operation and maintenance. Excavation and grading would be required as part of implementation of this remedy. Alternatives 4, 5, and 6, involving groundwater remediation, present minimum technical difficulties in designing and constructing a treatment system, but may require pilot studies and additional groundwater investigations during the design stage. The reliability of groundwater treatment systems involving solids removal and air stripping is well established and has been demonstrated at other hazardous waste sites.

E. Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to achieve protection of human health and the environment and any adverse impacts that may be posed during the construction and operation period until remediation goals are achieved.

None of the alternatives evaluated involve extensive construction, excavation, or other remedial action measures that would pose any appreciable short-term risks to the community and to workers during construction and implementation. Workers will be required to wear Level C protective equipment (protective clothing and respirator), and Site perimeter air monitoring will be required during construction activities. Alternative 3, placement of the impermeable cover, can be completed in about one year and will not involve excavation of the former landfill area except at the surface where the new cover will be installed. No adverse effects to workers or the community are expected. Alternatives 5 and 6 will require that an evaluation of air releases from the air stripper be conducted during the design phase so that control of the release of contaminants to the air can be evaluated.

F. Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time. This criteria evaluation includes the consideration of residual risk and the adequacy and reliability of controls.

Alternatives 1, 2, and 3 will result in more than minimal residual risk from groundwater ingestion, dermal contact and inhalation under the future use reasonable maximum exposure scenario, since groundwater will not be treated or contained and ARARs will not be attained. Institutional controls will only mitigate residual risk at the Site by minimizing the use of groundwater at the Site. The impermeable cover in Alternative 3 will result in minimal risk from surface soils by preventing long-term direct contact and inadvertent ingestion.

Alternatives 4, 5, and 6 will provide the greatest degree of long-term effectiveness and permanence for groundwater remediation and will result in minimal residual risk by attaining ARARs for groundwater. Alternatives 4 and 5 will not prevent long-term direct contact of soils.

G. Cost

This criteria examines the estimated costs for each remedial alternative. For comparison, capital, annual O&M, and present worth costs are shown in Table 8.

H. State Acceptance

The Pennsylvania DER concurs on EPA's selected remedy, Alternative 6.

I. Community Acceptance

A public meeting on the Proposed Plan was held August 13, 1991 in Hellertown, Pennsylvania. Comments received orally at the public meeting and in writing during the public comment period are referenced in the Responsiveness Summary attached to this Record of Decision. Residents of the Borough of Hellertown have not objected to the selected remedy. Champion Spark Plug Company has recommended that EPA select Alternative 2, the institutional controls alternative.

IX. SELECTED REMEDY: DESCRIPTION AND PERFORMANCE STANDARD(S) FOR EACH COMPONENT OF THE REMEDY

EPA has selected Alternative 6 as the remedy for the Hellertown Manufacturing Company Site. The selected remedy consists of the following components:

- Placement of an impermeable cover over the entire former lagoon area;

- Surface water runoff controls;

- Extraction and treatment of groundwater (air stripping and solids removal) with discharge to Saucon Creek;

- Long-term groundwater monitoring; and

- Deed restrictions.

Each component of the remedy and its performance standard(s) will be described in turn.

A. Impermeable Cover

The former lagoon area encompasses 145,000 square feet or 3.5 acres. (See Figure 5). Former lagoons 1 and 5 are covered with an asphalt parking lot which has several noticeable cracks. Former lagoons 2, 3 and 4 are contiguous with the parking lot and are covered with soil.

As part of the selected remedy, an asphalt and clay impermeable cover shall be constructed over the entire former lagoon area. The portion which is now covered with asphalt shall be covered with a reinforcement layer and a new asphalt concrete cover. (The purpose of the reinforcement layer is to minimize cracking of the asphalt concrete cover.) The portion of the former lagoon area which is now covered with soil shall be covered with a two-foot compacted clay cover or the equivalent, topsoil and grass. Both portions of the cover shall be designed to achieve a permeability of no more than 1×10^{-7} cm/sec, which shall constitute the Performance Standard. (This impermeable cover is not a RCRA cap and there are no ARARs that are applicable, relevant or appropriate.)

As discussed above, the clay and soil portion of the cover shall be designed to achieve a permeability of no more than 1×10^{-7} cm/sec. Asphalt concrete is a hot-mixed and hot-laid mixture of asphalt and graded aggregates which produces a harder, denser, and more resistant surface than paving asphalt. Permeabilities ranging from 1×10^{-5} cm/sec to 10^{-9} cm/sec can be achieved ("Lining of Waste Containment and Other Impoundment Facilities," EPA Document 600/2-88/052, September 1988). Thus, both the asphalt concrete and clay portions of the cover will achieve equivalent permeability.

In order to maintain the Performance Standard of no more than 1×10^{-7} cm/sec, routine inspection and maintenance of the impermeable cover shall be required until such time as EPA and Pennsylvania DER determine that the Performance Standard for each contaminant in the groundwater has been achieved to the extent technically practicable throughout the entire area of groundwater contamination (an estimated 30 to 40 years). Maintenance shall include repairs to the asphalt portion of the cover as necessary to correct cracks and the effects of settling, subsidence, erosion, etc., and the cultivation of natural vegetation (grasses and weeds) on the clay and topsoil portion of the cover to prevent erosion. Because the selected remedy will result in contaminants remaining on-site, 5-year Site reviews under Section 121(c) of CERCLA will be required.

B. Surface Water Runoff Controls

A storm water collection system consisting of catch basins and drain pipes shall be constructed for the asphalt parking lot and the entire former lagoon area. The Performance Standard for this system shall be that it effectively collects storm water from the parking lot and former lagoon areas and conveys it to an existing storm drainage pipe on the northern boundary of the Site. (There are no ARARs that are applicable, relevant or appropriate to this system.) In order to maintain the integrity and effectiveness of this storm water collection system, routine inspection and maintenance of the system shall be required until such time as EPA and the Pennsylvania DER determine that the Performance Standard for each contaminant in the groundwater has been achieved to the extent technically practicable throughout the entire area of groundwater contamination (an estimated 30 to 40 years).

C. Extraction and Treatment of Groundwater

The selected remedy includes groundwater extraction, treatment and discharge, which shall be required until such time as EPA and the Pennsylvania DER determine that the Performance Standard for each contaminant in the groundwater has been achieved to the extent technically practicable throughout the entire area of groundwater contamination, both on-site and off-site (an estimated period of 30 to 40 years). (See Figure 4).

1. Groundwater Extraction and Treatment System

Groundwater shall be extracted using multiple extraction wells, the exact location and number of which shall be determined during the design of the groundwater recovery system. Recovered groundwater shall be treated using an on-site treatment system. Suspended solids shall be removed using solids settling in a settling tank or clarifier followed by an on-line filtration unit. The groundwater shall then be treated using a packed column airstripping unit. Final flow rates and air stripper dimensions will be determined during the remedial design. The treated effluent shall be discharged to Saucon Creek through a new outfall pipe that shall be constructed as part of the remedial action.

2. Performance Standards for Groundwater

The Performance Standard for each contaminant of concern in the groundwater shall be the MCL for that contaminant (the federal ARAR for public drinking water supplies under the Safe Drinking Water Act) or the background concentration of that contaminant (the Pennsylvania ARAR under 25 PA Code §§ 264.90 - 264.100), whichever is more stringent. The background concentration for each contaminant of concern shall be established in accordance with the procedures for groundwater monitoring outlined in 25 PA Code § 264.97 before groundwater treatment begins. In the event that a contaminant of concern is not detected in samples taken for the establishment of background concentrations, the detection limit for the method of analysis utilized with respect to that contaminant shall constitute the "background" concentration of the contaminant.

The MCLs for benzene, trichloroethylene, and vinyl chloride are set forth at 40 C.F.R. § 141.61. The MCLs for tetrachloroethylene, trans-1,2-dichloroethylene, and cis-1,2-dichloroethylene were published in the Federal Register at 56 Fed. Reg. 3593 on January 30, 1991. The MCLs, detection limits and appropriate analytical detection methods for these contaminants of concern are listed below:

Contaminant	MCL(ug/l)	Detection Limit (ug/l)	Method[1]
Benzene	5	0.20	601/602
Tetrachloroethylene	5	0.03	601/602
Trichloroethylene	5	0.12	601/602
Vinyl Chloride	2	0.18	601/602
Dichloroethylene (trans-1,2-)	100	0.10	601/602
Dichloroethylene (cis-1,2-)	70	0.12	524.2

[1]Method 601/602 is found at 40 C.F.R. Part 136
Method 524.2 is found at 40 C.F.R. Part 141

3. ARAR Requirements Which Shall Be Met for Groundwater

The following ARARs shall be met, in addition to the federal and state ARARs discussed under "Performance Standards," above, for each contaminant of concern in the groundwater.

Since the treated groundwater will be discharged to Saucon Creek, NPDES requirements and state water quality criteria under the Pennsylvania Clean Streams Law are applicable. During the design of the groundwater treatment system, specific discharge criteria will be established by Pennsylvania DER as set forth in 25 PA Code §§ 93.1 - 93.9.

Emissions from the air stripping tower, including benzene and vinyl chloride, shall be monitored and, if required, a vapor phase carbon adsorption or thermal destruction unit shall be installed to ensure compliance with Section 112 of the Clean Air Act, 42 U.S.C § 7412 National Emission Standard for Hazardous Air Pollutants (NESHAPs). The relevant and appropriate NESHAP for benzene is set forth at 40 C.F.R. Part 61, Subpart L, and the relevant and appropriate NESHAP for vinyl chloride is set forth at 40 C.F.R. Part 61, Subpart F. During design of the air stripping unit, the Pennsylvania DER will determine from actual design flow rates and VOC loading rates whether emission controls need to be installed.

The removal of suspended solids in a settling tank will result in the generation of small quantities of residual solids requiring disposal. The exact quantity will vary with treatment flow rates. These residual solids shall be tested to determine if they are a RCRA hazardous waste. If they are, the RCRA storage and transportation requirements for off-site disposal of these wastes (40 CFR Parts 262-264), and the Department of Transportation Rules for Hazardous Materials Transport (49 CFR Parts 107 and 171-179), shall be met.

During all site work, Occupational Safety and Health Administration (OSHA) standards set forth at 29 CFR Parts 1910, 1926 and 1904 governing worker safety during hazardous waste operations, shall be met.

4. Groundwater Remedy Implementation

During the conduct of the RI/FS, EPA identified several springs (or seeps) along Saucon Creek in the vicinity of the Site. It could not be determined if there is a hydraulic connection between groundwater on-site and the discharge of the springs. During the remedial design period additional field work shall be conducted to determine if these springs/seeps are a groundwater pathway for discharge of contaminants to Saucon Creek. The springs/seeps may discharge high levels of contaminants to Saucon Creek and may pose a risk either to users of the creek or to persons or animals who come into direct contact with the seeps. The design and construction of the groundwater pump and treatment system shall be coordinated with this investigation so that design and implementation schedules are compatible. If necessary, a program to remediate the discharge from the springs may be required. In that event, EPA will issue an Explanation of Significant Differences.

The wetland area adjacent to Saucon Creek is potentially affected by the migration of contaminants through groundwater discharge. Surface water in the wetlands area contained inorganic compounds and metals - in particular, elevated levels of zinc. Sediments contained metals and PAH compounds. The results of the sampling survey in the RI/FS were inconclusive in determining whether contaminants are present in the wetland area above background levels and whether the wetland area receives contaminants from groundwater discharge or through storm drainage, or a combination of both. Additional wetland soil, stream, sediment, and surface water sampling will be required as part of the remedial design study. If necessary, a program to remediate the wetland area may be required. In that event, EPA will issue an Explanation of Significant Differences.

An operation and maintenance plan for the groundwater extraction and treatment system shall be required. The performance of the groundwater extraction and treatment system shall be carefully monitored on a regular basis and the system may be modified, as warranted by the performance data collected during operation. These modifications may include, for example, alternate pumping of extraction wells or the addition or elimination of certain extraction wells.

It may become apparent during implementation or operation of the groundwater extraction system and its modifications, that contaminant levels have ceased to decline and are remaining constant at levels higher than the Performance Standards over some portion of the contaminated plume. If EPA and the Commonwealth of Pennsylvania determine that implementation of the selected remedy demonstrates, in corroboration with hydrogeological and chemical evidence, that it will be technically impracticable to achieve and maintain the Performance Standards throughout the entire area of groundwater contamination, EPA and the Pennsylvania DER may require that any or all of the following measures be taken, for an indefinite period of time, as further modification(s) of the existing system:

1) long-term gradient control may be provided by low level pumping, as a containment measure;

2) chemical-specific ARARs may be waived for those portions of the aquifer for which EPA and Pennsylvania DER determine that it is technically impracticable to achieve further contaminant reduction;

3) institutional controls may be provided/maintained to restrict access to those portions of the aquifer where contaminants remain above Performance Standards; and

4) remedial technologies for groundwater restoration may be re-evaluated.

The decision to invoke any or all of these measures may be made during the 5-year reviews of the remedial action. If such a decision is made, EPA will amend the ROD or issue an Explanation of Significant Differences.

D) Long-Term Groundwater Monitoring

A long-term groundwater monitoring program shall be implemented to evaluate the effectiveness of the groundwater pumping and treatment system. Monitoring wells shall be installed in the area of groundwater contamination and sampled for an estimated 30 to 40 years, until such time as EPA and the Pennsylvania DER determine that the Performance Standard for each contaminant of concern has been achieved to the extent technically practicable throughout the entire area of groundwater contamination. The number and location of these monitoring wells shall be specified in the design of the extraction system. Sampling shall be on a quarterly basis for the first two years and on a semi-annual basis thereafter.

An operation and maintenance plan for the groundwater monitoring system shall be required.

E) Deed Restrictions

As soon as practicable, restrictions shall be placed in the deed to the Site to prohibit (1) excavation of contaminated soils; and (2) the use of on-site groundwater for domestic purposes, including drinking water. The continuing need for these restrictions will be re-evaluated during the 5-year Site reviews under Section 121(c) of CERCLA.

X. STATUTORY DETERMINATIONS

EPA's primary responsibility at Superfund sites is to select remedial actions that are protective of human health and the environment. Section-121 of CERCLA also requires that the selected remedial action comply with ARARs, be cost-effective, and utilize permanent treatment technologies to the maximum extent practicable. The following sections discuss how the selected remedy meets these statutory requirements.

A. Protection of Human Health and Environment

Based on the baseline risk assessment for the Site, potential exposure to VOCs in drinking water through ingestion, inhalation, and dermal contact, was identified as the principal risk at the Site. Potential exposure to soils was not determined to be a principal threat based on the level of contaminants in soil and the baseline risk assessment.

The selected groundwater remedy protects human health and the environment by reducing levels of contaminants in the groundwater to ARARs through extraction and treatment. The risk level is reduced to the 10^{-6} level or less. The source control remedy will also protect human health and the environment by placing an impermeable cap over the contaminated soil, thereby preventing exposure through inhalation, ingestion, and dermal contact. A risk level of 7×10^{-5} for carcinogens will be attained. In addition, containment of contaminated soils will eliminate the source of continued contaminant loading to the aquifer by minimizing the infiltration of rainwater and the subsequent leaching of contaminants to the aquifer.

During the RI/FS investigation the Summers model for groundwater contamination transport was used to estimate the concentration of TCE in soils that would result in a concentration of TCE in groundwater of 5 ug/l, the MCL. TCE was used in the model because it represents the highest VOC contaminant concentration in both soil and groundwater. Depending on the assumptions used in the model, the calculated allowable TCE concentration in soil which would achieve a groundwater concentration of 5 ug/l ranged from 124 ug/kg to 1103 ug/kg. The 95 percent upper confidence level of TCE in soil samples collected from the lagoon area is 99 ug/kg, the mean value is 64 ug/kg, and the median value is 25 ug/kg. Since the measured TCE concentration of 99 ug/kg is less than the range of TCE values calculated with the Summers model, the model predicts that the contaminant concentration of TCE in soil will not degrade groundwater to levels that exceed MCLs based on assumed infiltration rates once the impermeable cover is in place.

Implementation of Alternative 6 will not pose any unacceptable short-term risks or cross-media impacts to the Site or the community.

B. Attainment of Applicable or Relevant and Appropriate Requirements of Environmental Laws

All ARARs will be met by the selected remedy.

1. Chemical Specific ARARs

The selected remedy shall be designed to achieve compliance with chemical specific ARARs related to groundwater, ambient air quality, and surface water at the Site. The Safe Drinking Water Act specifies MCLs for drinking water at public water supplies. Some contaminants of concern identified for the Site have MCLs which are relevant and appropriate for this remedial action. The MCLs shall be achieved for benzene, trichloroethylene, tetrachloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, and vinyl chloride throughout the entire contaminated groundwater plume. These MCLs are listed in Section IX.C.2 above.

The Commonwealth of Pennsylvania standards specify that all groundwater containing hazardous substances must be remediated to "background" quality pursuant to 25 PA Code §§ 264.90-264.100, and in particular, 25 PA Code §§ 264.97(i), (j), and 264.100(a)(9). The Commonwealth of Pennsylvania also maintains that the requirement to remediate to background is found in other legal authorities. The method(s) by which background levels will be determined are set forth under the description of the selected remedial alternative. These background levels shall be attained as part of this remedial action unless EPA and the Commonwealth determine that attaining such levels is technically impracticable, or they are waived under CERCLA Section 121(d).

The selected remedy will meet the NESHAP requirements of the federal Clean Air Act for vinyl chloride and benzene as specified in Section IX.C.3 above.

The requirements of Subpart AA (Air Emission Standards for Process Vents) and BB (Air Emission Standards for Equipment Leaks) of the federal RCRA regulations set forth at 40 C.F.R. Part 264 are relevant and appropriate (and, depending upon the levels of organics in the extracted groundwater and treatment residuals) may be applicable to the air stripping operations under the Selected Remedy. These regulations require that total organic emissions from the air stripping process vents must be less than 1.4 kg/hr (3 lb/hr) and 2.8 mg/yr (3.1 tons/yr).

2. Action-Specific ARARs

Section IX.C.3 above describes how the selected remedy will meet the requirements of the following ARARs: (1) the federal National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act; (2) the Pennsylvania Clean Streams Law; (3) OSHA standards governing worker safety during hazardous waste operations; and (4) RCRA storage and transportation requirements and the Department of Transportation Rules for Hazardous Materials Transport, if the latter become applicable, relevant or appropriate.

To the extent that new-point source air emissions result from the implementation of the remedial alternative, 25 Pa. Code § 27.12(a)(5) will apply, requiring that emissions be reduced to the minimum obtainable levels through the use of best available technology (BAT), as defined in 25 Pa. Code § 121.1.

Prior to the treatment of the groundwater, the groundwater will be tested to determine if it is a RCRA hazardous waste. If it is a RCRA waste, the air stripper will be designed in accordance with RCRA treatment standards 40 C.F.R. Part 264 and 25 Pa. Code Chapters 260 through 265 and Chapter 270.

3. Location Specific ARARS

No location specific ARARs have been identified relative to this Site.

C. Cost Effectiveness

The selected remedy is cost-effective in providing overall protection in proportion to cost, and meets all other requirements of CERCLA. The NCP, 40 C.F.R. Section 300.430(f)(ii)(D), requires EPA to evaluate cost-effectiveness by comparing all the alternatives which meet the threshold criteria - protection of human health and environment and compliance with ARARs - against three additional balancing criteria: long-term effectiveness and permanence; reduction of toxicity, mobility or volume through treatment; and short-term effectiveness. The selected remedy meets these criteria and provides for overall effectiveness in proportion to its cost. The estimated present worth cost for the selected remedy is $2,250,000. A detailed cost estimate is shown in Table 9.

D. 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 while providing the best balance among the other evaluation criteria. Of those alternatives evaluated that are protective of human health and the environment and meet ARARs, the selected remedy provides the best balance of tradeoffs in terms of long-term and short-term effectiveness and permanence, cost, implementability, reduction in toxicity, mobility, or volume through treatment, State and community acceptance, and preference for treatment as a principal element.

Under the selected remedy, treatment of groundwater using both suspended solids removal and air stripping will provide a greater degree of reduction of toxicity, mobility, or volume than the other alternatives evaluated. Alternative 6 will reduce contaminant levels in groundwater and reduce the risks associated with ingestion of the groundwater to the maximum extent practicable, as well as provide long-term effectiveness.

The selection of containment of contaminated soils using an impermeable cover is consistent with Superfund program policy of containment, rather than treatment, for wastes that do not represent a principal threat at the site and are not highly toxic or mobile in the environment. The impermeable cover reduces mobility, reduces risk to human health and the environment, and provides short-term effectiveness and long-term effectiveness, if the cover is properly maintained.

E. Preference for Treatment as a Principal Element

The selected remedy satisfies, in part, the statutory preference for treatment as a principal element. Alternative 6 addresses the primary threat of future direct contact and ingestion of contaminated groundwater through treatment using suspended solids removal and an air stripper. Since the contaminated soil does not constitute a principal threat, treatment is not required.

XI. DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Hellertown Manufacturing Site was released for public comment on July 26, 1991. The Proposed Plan identified Alternative 6 as the selected remedy. EPA reviewed all written and verbal comments submitted during the public comment period. No significant changes to the remedy, as it was originally identified in the Proposed Plan, were necessary. EPA has updated the cost estimates for alternatives 4, 5, and 6 set forth in the Proposed Plan based on the increased capital cost of installing a new outfall pipe to Saucon Creek and updated groundwater monitoring costs.

GLOSSARY

Administrative Record: An official compilation of documents, data, reports, and other information that is considered important to the status of and decisions made relative to a Superfund site. The public has access to this material.

Applicable or Relevant and Appropriate Requirements (ARARs): The federal and state requirements that a selected remedy must attain. These requirements may vary among sites and alternatives.

Aquifer: A zone below the surface of the earth capable of producing water, as from a well.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or Superfund: A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Act created a trust fund, known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites.

Fractured Bedrock: Breaks in underground rock formations caused by intense folding or faulting.

Ground water: Water found beneath the earth's surface in geologic formations that are fully saturated. When it occurs in sufficient quantity, ground water can be used as a water supply.

Hazard Index: A value used to evaluate the potential for noncarcinogenic effects that occur in humans.

National Priorities List (NPL): EPA's list of the nation's top priority hazardous waste sites that are eligible to receive federal money for response under Superfund.

Operable Unit (OU): A portion of a Superfund site that has been conceptually separated from the rest of the site to allow for easier management.

Present Worth: A term used to indicate the discounting of sums to be received in the future to their present value equivalent, or the amount which will accumulate to that sum if invested at prevailing interest rates.

Record of Decision (ROD): A legal document that describes the final remedial actions selected for a Superfund site, why the remedial actions were chosen and others not, how much they cost, and how the public responded.

Remedial Investigation/Feasibility Study (RI/FS): A two-part study of a hazardous waste site that supports the selection of a remedial action for a site. The first part, the RI, identifies the nature and extent of contamination at the site. The second part, the FS, identifies and evaluates alternatives for addressing the contamination.

Volatile Organic Compounds (VOCs): Organic liquids that readily evaporate under atmospheric conditions. Examples of VOCs include vinyl chloride and trichloroethylene (TCE).

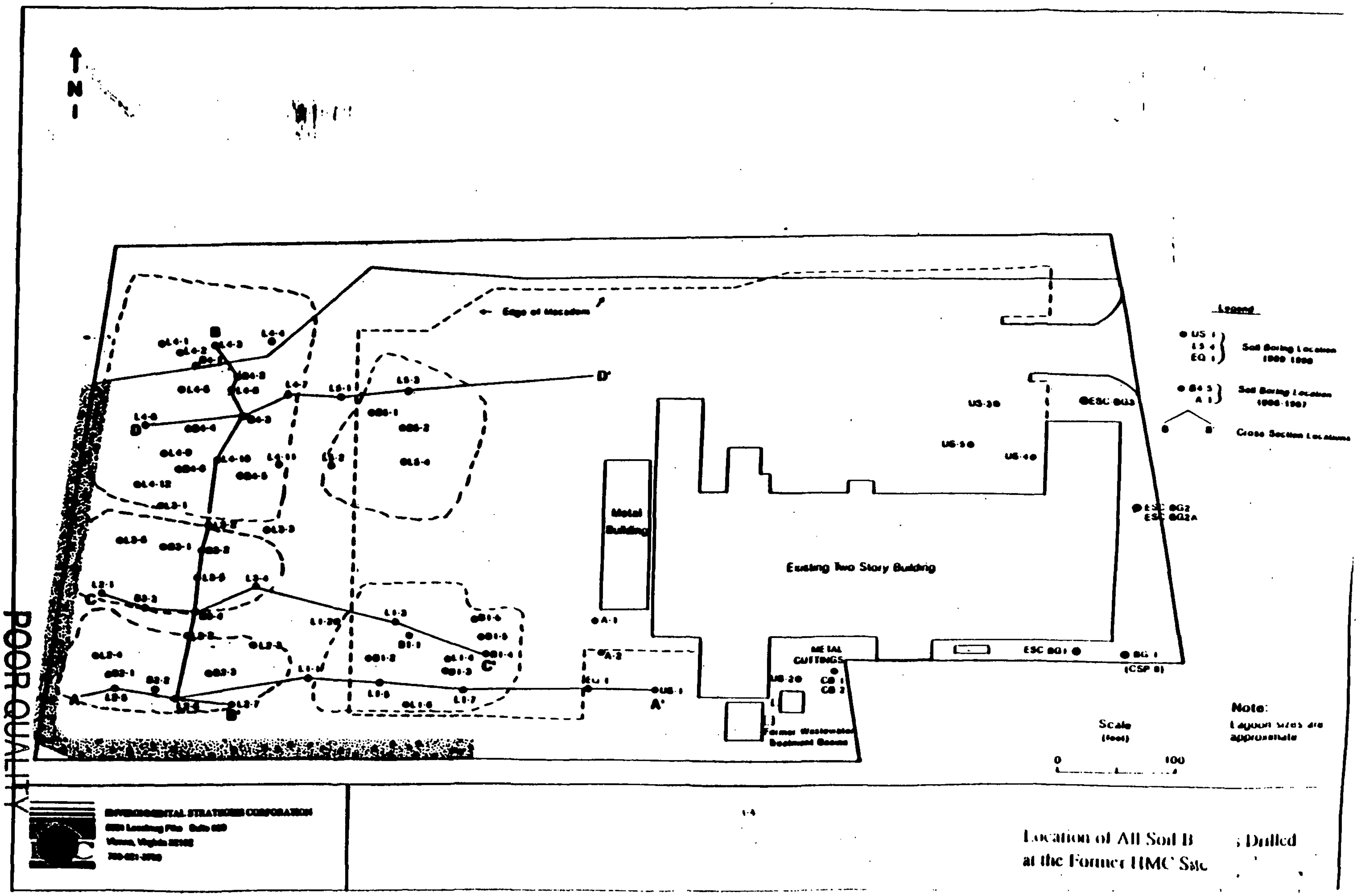
ENVIRONMENTAL STRATEGIES CORPORATION
8521 Leesburg Pike Suite 650
Vienna, Virginia 22182
703-821-3700

ESC

Figure 1
Site Location Map
Former HMC Site
Hellertown, Pennsylvania

POOR QUALITY
ORIGINAL

Figure 2



Location of All Soil B[illegible] Drilled at the Former HMC Site

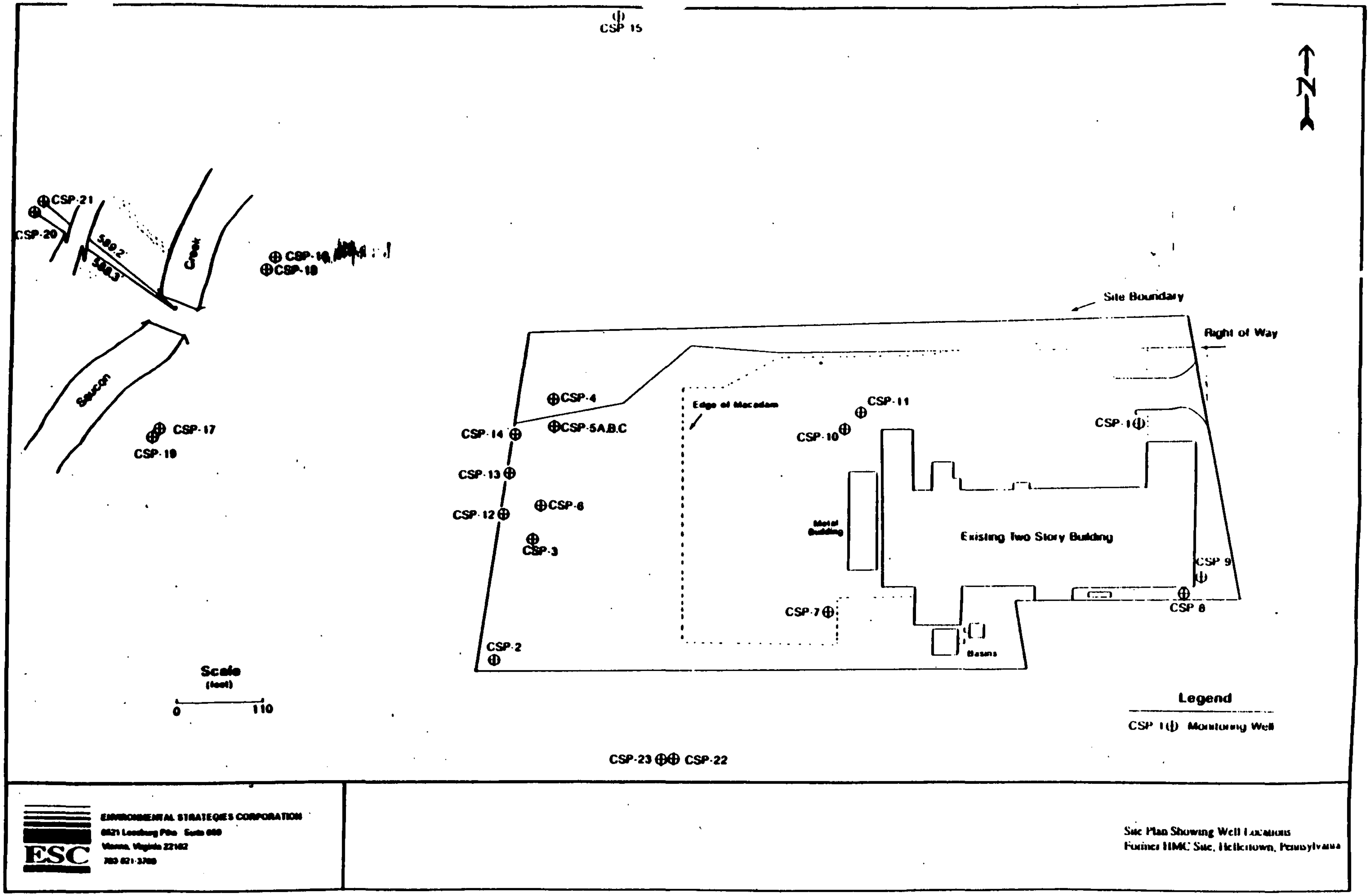
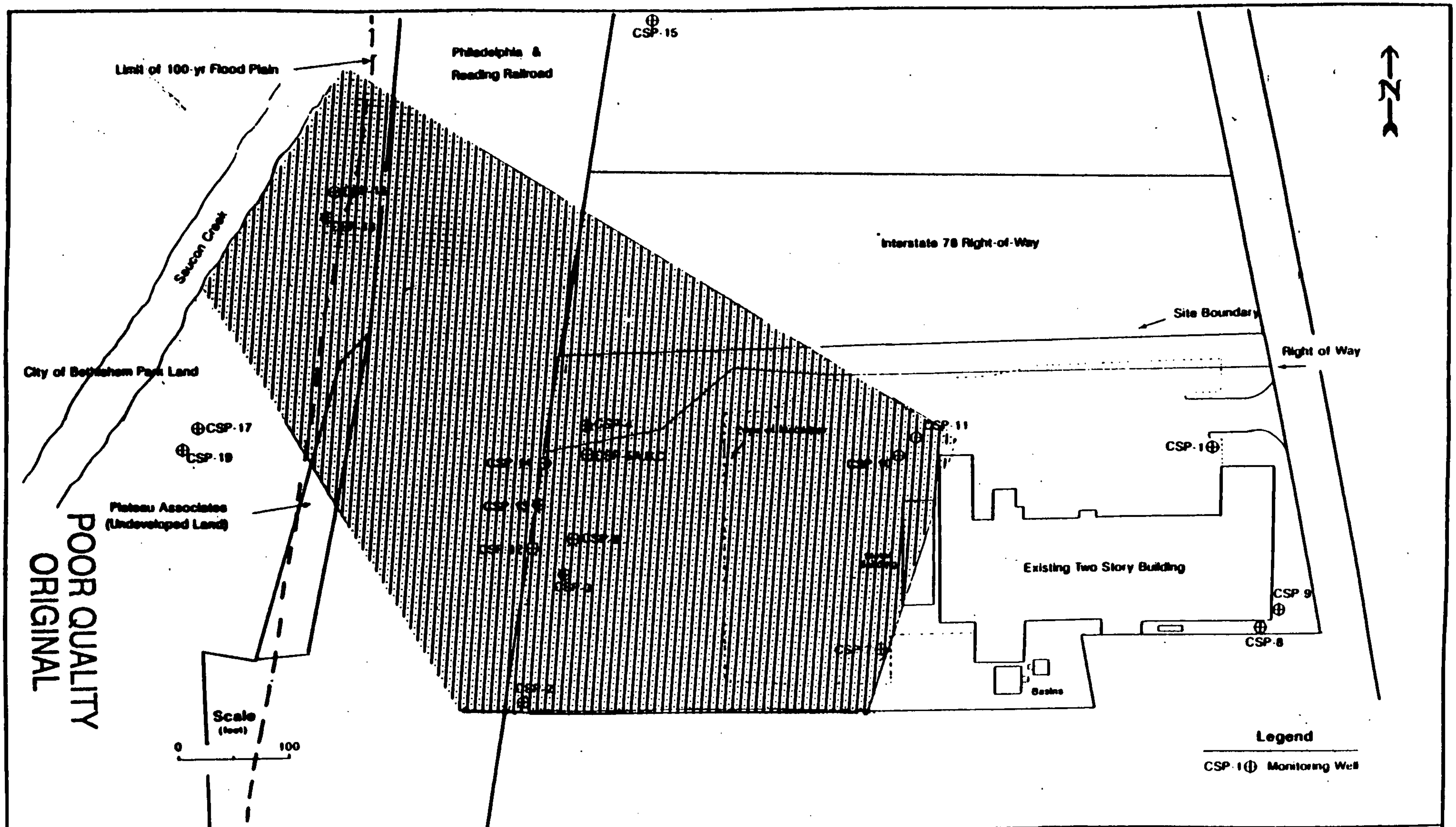

CSP 15
CSP-21
CSP-20
580.2
580.3
Creek
Saucon
CSP-16
CSP-18
CSP-17
CSP-19
Site Boundary
Right of Way
Edge of Macadam
CSP-4
CSP-5A,B,C
CSP-14
CSP-13
CSP-12
CSP-6
CSP-3
CSP-2
CSP-11
CSP-10
CSP-1
CSP-9
CSP-8
CSP-7
Metal Building
Existing Two Story Building
Basins
Scale
(feet)
0
110
Legend
CSP-1 Monitoring Well
CSP-23
CSP-22
ENVIRONMENTAL STRATEGIES CORPORATION
ESC
Site Plan Showing Well Locations

Figure 3

Figure 4



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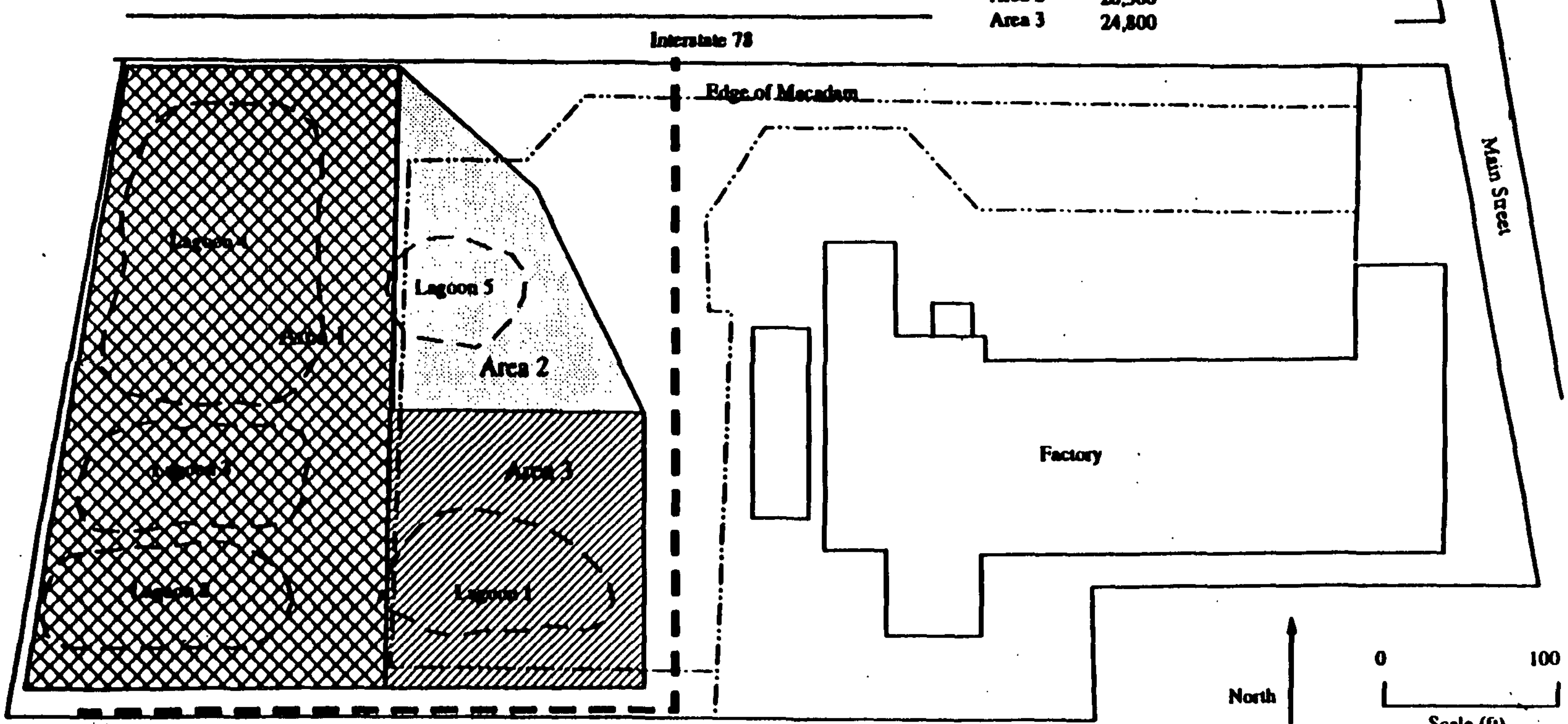
Virginia 22182
...1-3700
ESC

Approximate ... with Elevated Groundwater Contaminants
Former HM(... Hellertown, Pennsylvania

Figure 5

Areas & Volumes

Lagoon	Area (square feet)	Depth (feet)	Volume (cubic yards)
1	15,600	17	9,850
2	11,900	24	11,800
3	11,300	22	9,170
4	31,200	28	32,300
5	14,000	25	12,900
Area 1	93,800		
Area 2	26,300		
Area 3	24,800		



Lagoon Sizes Approximate

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8521 Leesburg Pike Suite 650
Vienna, Virginia 22182
703-821-3700

Areas and Volumes for Remediation Alternatives
Former HMC Site

Table 1

Volatile Organic Compounds (VOCs) in Lagoon Soils at the Former Hellertown Manufacturing Company Site

VOCs	Maximum Concentration Detected (ug/kg)	Frequency Detected
Trichloroethylene	560	66
Toluene	27	35
Tetrachloroethylene	77	19
Ethylbenzene	64	15
Xylenes (total)	620	14
1,2-Dichloroethylenes (total)	130	14
Carbon Disulfide	8	21
Chloroform	1	11
4-methyl-2-pentanone	21	4
Benzene	2	4
Vinyl acetate	2	1
Vinyl chloride	2	1

The total number of samples analyzed is 85.

Inorganic Compounds in Subsurface Soil Samples from Lagoon No. 4 at the Former Hellertown Manufacturing Company Facility January 1990 (mg/kg)

Compound	Frequency of Detection	Range of Detected Concentrations	Arithmetic Mean (a)	Background Level (b)
Cadmium	17/17	5 - 16	10	4
Calcium	17/17	641 - 146,000	34,954	14,780
Chromium	17/17	8 - 520	103	35
Magnesium	17/17	8,860 - 78,300	25,720	11,323
Sodium	17/17	91 - 1,420	322	55
Cyanide (total)	10/17	2 - 496	70	1
Fluoride	17/17	1 - 5	3	0.5
Sulfate	17/17	150 - 5,100	1,757	13

a/ Values reported as not detected were included by assuming the compound was present at half the detection limit.

b/ Background levels are the mean concentrations of compounds detected in soil sample BG-1 collected in February 1990 and soil samples BG-1-3-5, BG-2-3-5, and BG-3-3-5 collected in October 1990.

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Table 2

Inorganic Compounds from Onsite Groundwater Monitoring Well Samples at the Former Hellertown Manufacturing Company Facility March June, and September 1990 (ug/l)

Compound	Frequency of Detection	Range of Detected Concentrations	Arithmetic Mean (a)	Background Level (b)
Aluminum	21/36	34 - 50,200	5,891	1,955
Beryllium	4/36	1 - 4	1	ND (c)
Calcium	34/36	12,300 - 819,000	196,097	75,822
Chromium	15/36	10 - 86	21	7
Copper	12/36	5 - 243	26	ND
Iron	33/36	59 - 91,300	11,727	3,780
Magnesium	36/36	2,680 - 318,000	108,039	48,678
Manganese	33/36	4 - 2,970	510	52
Mercury	4/36	0.2 - 0.7	0.1	ND
Nickel	20/36	4 - 75	19	7
Selenium	10/33	2 - 110	13	2
Silver	7/30	3 - 40	6	ND
Sodium	36/36	10,800 - 93,400	29,053	8,293
Zinc	22/36	20 - 2,040	190	21
Cyanide (total)	13/36	12 - 1,080	87	4
Fluoride	27/36	60 - 1,600	378	127
Sulfate	36/36	65,000 - 580,000	473,336	110,333

a/ Values reported as not detected were included by assuming the compound was present at half the detection limit. Samples from CSP-2, CSP-4, CSP-5A, CSP-5B, CSP-6, CSP-7, CSP-10, CSP-11, CSP-12, CSP-13, and CSP-14 were included in the calculation of the mean.

b/ Background levels are the mean concentrations of compounds detected in groundwater samples CSP-1, CSP-8, and CSP-9 collected in March, June, and September 1990.

c/ ND = Not detected in background groundwater samples.

VOCs Found in Samples From Onsite Groundwater Monitoring Wells at the Former Hellertown Manufacturing Company Facility March, June, and September 1990 (ug/l)

Compound	Frequency of Detection	Range of Detected Concentrations	Arithmetic Mean (a)
Acetone	6/36	50 - 270	40
Benzene	5/36	2 - 93	15
1,2-Dichloroethylenes (total)	32/36	4 - 260	99
Tetrachloroethylene	16/36	1 - 22	15
1,1,1-Trichloroethane	3/36	7 - 25	13
Trichloroethylene	36/36	2 - 1,700	364
Vinyl chloride	6/36	20 - 83	30

Table 2

Inorganic Compounds from Offsite Groundwater Monitoring Well Samples at the Former Hellertown Manufacturing Company Facility March, June, and September 1990 (ug/l)

Compound	Frequency of Detection	Range of Detected Concentrations	Arithmetic Mean (a)	Background Level (b)
Aluminum	7/7	103 - 206,000	35,036	1,955
Beryllium	2/7	3 - 17	4	ND (c)
Calcium	7/7	44,700 - 510,000	175,286	75,822
Chromium	2/7	72 - 372	66	7
Copper	3/7	23 - 315	59	ND
Iron	6/7	198 - 280,000	50,176	3,780
Magnesium	7/7	20,900 - 427,000	127,757	48,678
Manganese	6/7	8 - 9,580	1,838	52
Mercury	1/7	1	0.3	ND
Nickel	2/7	45 - 297	53	7
Zinc	4/7	15 - 950	173	21
Fluoride	6/7	100 - 1,100	329	127

a/ Values reported as not detected were included by assuming the compound was present at half the detection limit.

b/ Background levels are the mean concentrations of compounds detected in groundwater samples CSP-1, CSP-8, and CSP-9 collected in March, June, and September 1990.

c/ ND = Not detected in background groundwater samples.

VOCs in Samples From Offsite Groundwater Monitoring Wells at the Former Hellertown Manufacturing Company Facility March, June, and September 1990 (ug/l)

Compound	Frequency of Detection	Range of Detected Concentrations	Arithmetic Mean (a)
1,2-Dichloroethylenes (total)	1/7	18	5
1,1,1-Trichloroethane	1/7	4	3
Trichloroethylene	2/7	19 - 51	12

a/ Values reported as not detected were included by assuming the compound was present at half the detection limit.

Table 3

Key Risk Terms

Carcinogen: A substance that increases the incidence of cancer.

Chronic Daily Intake (CDI): The average amount of a chemical in contact with an individual on a daily basis over a substantial portion of a lifetime.

Chronic Exposure: A persistent, recurring, or long-term exposure. Chronic exposure may result in health effects (such as cancer) that are delayed in onset, occurring long after exposure ceased.

Exposure: The opportunity to receive a dose through direct contact with a chemical or medium containing a chemical.

Exposure Assessment: The process of describing, for a population at risk, the amounts of chemicals to which individuals are exposed, or the distribution of exposures within a population, or the average exposure of an entire population.

Hazard Index: An EPA method used to assess the potential noncarcinogenic risk. The ratio of the CDI to the chronic RfD (or other suitable toxicity value for noncarcinogens) is calculated. If it is less than one, then the exposure represented by the CDI is judged unlikely to produce an adverse noncarcinogenic effect. A cumulative, endpoint-specific HI can also be calculated to evaluate the risks posed by exposure to more than one chemical by summing the CDI RfD ratios for all the chemicals of interest exert a similar effect on a particular organ. This approach assumes that multiple subthreshold exposures could result in an adverse effect on a particular organ and that the magnitude of the adverse effect will be proportional to the sum of the ratios of the subthreshold exposures. If the cumulative HI is greater, than one, then there may be concern for public health risk.

Reference Dose (RfD): The EPA's preferred toxicity value for evaluating noncarcinogenic effects.

Risk: The nature and probability of occurrence of an unwanted, adverse effect on human life or health, or on the environment.

Risk Assessment: The characterization of the potential adverse effect on human life or health, or on the environment. According to the National Research Council's Committee on the Institutional Means for Assessment of Health Risk, human health risk assessment includes: description on the potential adverse health effects based on an evaluation of results of epidemiologic, clinical, toxicologic, and environmental research; extrapolation from those results to predict the types and estimate the extent of health effects in humans under given conditions of exposure; judgements as to the number and characteristics of persons exposed at various intensities and durations; summary judgements on the existence and overall magnitude of the public-health program; and characterization of the uncertainties inherent in the process of inferring risk.

Slope Factor: The statistical 95% upper confidence limit on the slope of the dose response relationship at low doses for a carcinogen. Values can range from about 0.0001 to about 100,000, in units of lifetime risk per unit dose (mg/kg-day). The larger the value, the more potent is the carcinogen, i.e., a smaller dose is sufficient to increase the risk of cancer.

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Table 4

Reasonable Maximum Potential Risks Presented by the Compounds of Concern in Surface Soil

Compound	95% UCL Exposure Concentration (mg/kg) (a)	Resident Chronic Daily Intake (mg/kg/day) (b)	Cancer Slope Factor 1/(mg/kg/day)	Cancer Weight of Evidence	Excess Lifetime Risk (c)
Carcinogenic Effects					
PAHs	3.000 (d)	6.5E-06	11.5 (e)	B2 (e)	7E-05
			Reference Dose (mg/kg/day)		**Hazard Quotient (g)**
Noncarcinogenic Effects (f)					
Naphthalene	0.297	1.6E-06	0.0040	D	4E-04
Acenapthene	0.292	1.5E-06	0.0600	ND (h)	3E-05
Fluorene	0.516	2.7E-06	0.0400	D	7E-05
Phenanthrene	3.187	1.7E-05	0.0029	D	6E-03
Anthracene	1.431	7.7E-06	0.3000	D	3E-05
Fluoranthene	0.679	3.6E-06	0.0400	D	9E-05
Pyrene	0.349	1.8E-06	0.0300	D	6E-05
				Hazard Index	6E-03

a/ 95% upper confidence limit on the arithmetic mean.
b/ Sum of the exposures from inadvertent ingestion and dermal absorption of soil contaminants.
c/ Resident chronic daily intake (CDI) x cancer slope factor.
d/ Total carcinogenic PAHs expressed in benzo(a)pyrene equivalents. See Table 6-16.
e/ Value for benzo(a)pyrene.
f/ Only noncarcinogens with RfDs are considered.
g/ CDI divided by RfD.
h/ ND = not determined.

Table 5

Reasonable Maximum Potential Risks Presented by Showering with Onsite Groundwater

Compound	95% UCL Exposure Concentration (mg/l) (a)	Chronic Daily Intake (mg/kg/day) Dermal	Inhalation	Total (b)	Cancer Slope Factor (c) (1/mg/kg/day)	Cancer Weight of Evidence	Excess Risk (d) (upper bound)
Carcinogenic Effects							
Benzene	0.022	4.9E-07	3.4E-04	3.4E-04	0.0290	A	1E-05
Tetrachloroethylene	0.019	4.2E-07	2.3E-04	2.3E-04	0.0018	B2	4E-07
Trichloroethylene	0.503	1.1E-05	6.6E-03	6.6E-03	0.0170	B2	1E-04
Vinyl chloride	0.040	8.8E-07	6.8E-04	6.8E-04	0.2940	A	2E-04
							3E-04
					Reference Concentration (mg/kg/day)		Hazard Quotient (f)
Noncarcinogenic Effects (e)							
1,1,1-Trichloroethane	0.017	8.8E-07	5.2E-04	5.2E-04	0.3000	D	2E-03

a/ 95% upper confidence limit on the arithmetic mean.
b/ Sum of exposures from dermal absorption and inhalation of VOCs.
c/ Cancer slope factors for inhalation exposures.
d/ CDI x cancer slope factor.
e/ Only noncarcinogens with inhalation RfCs are evaluated.
f/ CDI divided by RfC.

Table 6

Reasonable Maximum Potential Risks Presented by Ingestion of Compounds of Concern in Onsite Groundwater

Compound	95% UCL Exposure Concentration (mg/l) (a)	Resident Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor 1/(mg/kg/day)	Cancer Weight of Evidence	Excess Risk (upper bound) (b)
Carcinogenic Effects					
Benzene	0.0220	2.7E-04	0.029	A	8E-06
Tetrachloroethylene	0.0190	2.3E-04	0.051	B2	1E-05
Trichloroethylene	0.5030	6.2E-03	0.011	B2	7E-05
Vinyl chloride	0.0396	4.8E-04	1.9	A	9E-04
Beryllium	0.0014	1.7E-05	4.3	B2	7E-05
					1E-03
			Reference Dose (mg/kg/day)		Hazard Quotient (c)
Noncarcinogenic Effects					
Acetone	0.0595	1.7E-03	0.1	D	2E-02
1,2-Dichloroethylenes (total)	0.1230	3.5E-03	0.02 (d)	ND	2E-01
Tetrachloroethylene	0.0190	5.4E-04	0.01	B2	5E-02
1,1,1-Trichloroethane	0.0170	4.9E-04	0.09	D	5E-03
Chromium	0.0288	8.2E-04	0.005 (e)	ND	2E-01
Mercury	0.000	5.7E-06	0.0003	D	2E-02
Nickel	0.026	7.5E-04	0.02	ND	4E-02
Selenium	0.023	6.6E-04	0.003 (f)	ND	2E-01
Cyanide	0.157	4.5E-03	0.02	D	2E-01
				Hazard Index	9E-01

a/ 95% upper confidence limit on the arithmetic mean.
b/ CDI x cancer slope factor.
c/ CDI divided by RfD.
e/ Chronic oral RfD for trans-1,2-dichloroethylene.
f/ Chronic oral RfD for chromium VI.
g/ Chronic oral RfD for selenious acid.

Table 7

Summary of Potential Risks Presented by Exposure to Compounds of Concern at the Former Hellertown Manufacturing Facility

Exposure Pathway	Total Pathway Risks Excess Risk (upperbound)	Total Pathway Risks Hazard Quotient
Reasonable maximum ingestion and dermal contact with soil	7E-05	6E-03
Reasonable maximum showering with groundwater	3E-04	2E-03
Reasonable maximum ingestion of groundwater	1E-03	9E-01

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Table 8
Cost Summary for Remedial Alternatives

Alternative	Capital Cost	Annual O&M Cost	Present Worth Cost
1-No Action	$0	$48,000 (Yrs 1&2) $16,600 (Yrs 3 to 5) $8,300 (Yrs 6 to 35)	$223,000
2-Institutional Controls	$1,000	Same as Alternative 1	$224,000
3-Impermeable Cover	$285,000	$37,000	$640,000
4-GW Pumping and Solids Removal	$685,000	$96,000 (Yrs 1 & 2) $65,000 (Yrs 3 to 35)	$1,806,700
5-GW Pumping, Solids Removal, Air Stripping	$698,000	$97,000 (Yrs 1 & 2) $66,000 (Yrs 3 to 35)	$1,836,100
6-Alt 3 + Alt 5	$983,000		$2,250,000

Table 9
Selected Remedy Cost

	Cost
<u>Capital Costs</u>	
<u>Impermeable Cover</u>	
Cover	$150,000
Storm Drainage	15,000
Design	20,000
Supervision	18,000
Management,Oversight	16,000
Subtotal, capital cost	219,000
Contingency	65,700
Subtotal Capital Cost	$285,000
<u>Groundwater Treatment</u>	
Pump Tests	$120,000
Recovery Wells	80,000
Well Pumps	8,000
Sedimentation Tank	2,000
Pump and Controls	6,000
Filter	1,000
Stripping Tower	10,000
Tower Appurtenances	40,000
Power Drop	5,000
Effluent Pipe	175,000
Subtotal, capital cost	447,000
Design and Supervision	51,000
Administration	40,000
Subtotal	$537,000
Contingency (30%)	161,000
Subtotal Capital Cost	698,000
Total Capital Cost	$983,000
<u>Annual Operation & Maintenance</u>	
<u>Impermeable Cover</u>	
Management and Maintenance	$8,000
<u>Groundwater Treatment</u>	
Well Sampling	12,000-24,000
Well Sample Analysis	5,000-24,000
Effluent Analysis	4,000
Maintenance	13,000
Power	2,000
Management	30,000
TOTAL PRESENT WORTH COST (5%, 35 years)	$2,250,000

RESPONSIVENESS SUMMARY
HELLERTOWN MANUFACTURING COMPANY SITE
HELLERTOWN, PENNSYLVANIA

This community relations responsiveness summary is divided into the following sections:

<u>Overview</u>: This section discusses EPA's preferred alternative for remedial action.

<u>Background</u>: This section provides a brief history of community interest and concerns raised during remedial planning at the Hellertown Manufacturing Company Site.

<u>Part I</u>: This section provides a summary of commentors' major issues and concerns, and expressly acknowledges and responds to those raised by the local community. "Local community" may include local homeowners, businesses, the municipality, and not infrequently, potentially responsible parties (PRPs).

<u>Part II</u>: This section provides a comprehensive response to all written comments received and is comprised primarily of the specific legal and technical questions raised during the public comment period. If necessary, this section will elaborate with technical detail on answers covered in Part I.

Any points of conflict or ambiguity between information provided in Parts I and II of this responsiveness summary will be resolved in favor of the detailed technical and legal presentation contained in Part II.

<u>OVERVIEW</u>

In August 1991, EPA announced the public comment period and published its preferred alternative for the Hellertown Manufacturing Company Site, located in Hellertown, Northampton County, Pennsylvania. EPA screened six possible alternatives to remediate site contamination, giving consideration to nine key evaluation criteria:

- Threshold criteria, including
  - -- Overall protection of human health and the environment
  - -- Compliance with Federal, State, and local environmental and health laws
- Balancing criteria, including
  - -- Long-term effectiveness
  - -- Short-term effectiveness
  - -- Reduction of mobility, toxicity, or volume
  - -- Ability to implement

-- Cost

- Modifying criteria, including

  -- State acceptance

  -- Community acceptance.

EPA carefully considered state and community acceptance of the remedy prior to reaching the final decision regarding the remedy.

The Agency's preferred remedy, Alternative 6, includes the following measures for remediation of contaminated groundwater and soil at the site:

Placement of an impermeable cover over the entire former lagoon area;

Surface water runoff controls;

Extraction and treatment of groundwater (air stripping and solids removal), with discharge to Saucon Creek;

Long-term groundwater monitoring; and

Deed restrictions.

In EPA's judgment, this alternative provides the best balance with respect to the nine standards EPA must consider when choosing a remedy.

BACKGROUND

To obtain public input on the Proposed Remedial Action Plan (Proposed Plan or PRAP), EPA held a public comment period from July 26, 1991 to August 26, 1991. EPA's community relations efforts included:

- Preparation of an updated Community Relations Plan in June 1991
- Preparation and distribution of a Proposed Plan Fact Sheet in July 1991
- A public meeting on the Proposed Plan on August 13, 1991.

Those in attendance at the meeting included local area residents, State and local officials, news media representatives, representatives from EPA, and representatives from companies interested in the site activities and clean-up decisions. EPA also preceded the public meeting with briefings for State and local officials.

Public notification of the August 13, 1991 meeting was issued to local media and to area residents and federal, State, and local officials on EPA's site mailing list, which was developed with the Community Relations Plan and periodically updated. EPA notified the public of the date and time of the meeting and announced the public comment period in newspaper display ads placed in the July 25, 1991 editions of *The Bethlehem Globe Times*, *The Allentown Morning Call*, and *The Valley Voice*.

In addition, EPA established a site information repository at the Hellertown Borough Municipal Building. The repository contains the Community Relations Plan, the Remedial Investigation/Feasibility Study (RI/FS) report, and other relevant documents. EPA's Administrative Record file for the site, which encompasses the key documents the Agency uses in selecting the site remedy, also is housed at the repository.

Finally, EPA prepared a Proposed Plan Fact Sheet and distributed it to individuals on the site mailing list and/or in attendance at the public meeting. This fact sheet outlined activity at the site and provided a summary of alternatives, including EPA's preferred alternative, for remediation of contaminated groundwater and soil at the site.

PART I: SUMMARY OF COMMENTORS' MAJOR ISSUES AND CONCERNS

This section provides a summary of commentors' major issues and concerns, and expressly acknowledges and responds to those raised by the local community. The major issues and concerns on the proposed remedy for the Hellertown Manufacturing Site received at the public meeting on August 13, 1991 and during the public comment period, can be grouped into five categories:

- **A. Implementation of the Remedy**
- **B. Superfund Process**
- **C. Soil Cleanup/Lagoon Area**
- **D. Groundwater Cleanup**
- **E. General Site Area Issues**

The questions, comments, and responses are summarized below.

A. Implementation of the Remedy

- A citizen asked how long it will take to begin the remediation process, and if monitoring will continue until then.

EPA Response: The actual starting date is not known at this time. After the ROD is signed, EPA will enter into a period of negotiation with the potentially responsible parties ("PRPs") for the design and implementation of the actual remedy. This process can take up to two years. Monitoring will continue on a quarterly basis until then, and at least semi-annually during remedy implementation.

- A citizen asked why the remedial alternatives did not include excavation and off-site disposal of contaminated materials.

EPA Response: Some of the contaminants found were at depths of 20 to 25 feet. To excavate that amount of soil and the primary contaminants of concern would require an extraordinary expense. The proposed impermeable cover over the area of concern would minimize any further migration of those contaminants to the groundwater and would meet the objective of protecting human health and the environment.

- A citizen asked if any innovative technologies like vapor extraction were considered to cut remediation time and overall costs.

EPA Response: Other alternatives were considered, but were not included in the final six alternatives because of either cost, effectiveness, or both factors combined.

- A citizen asked how far the deed restrictions will extend.

EPA Response: The deed restrictions will include the property and the lagoon area. The restrictions will prevent excavation of contaminated soil on-site and will prohibit groundwater use for domestic purposes.

- A citizen asked who will be paying for the cleanup. Will the citizens know the work is progressing toward the desired goals?

EPA Response: Basically, Superfund is divided into two separate phases. In the first phase, the Remedial Investigation and Feasibility Study (RI/FS) or study phase, EPA looks for PRPs who may have created or contributed to problems at the site. When EPA first entered the RI/FS phase for the Hellertown Manufacturing Site, a consent order was negotiated with Champion Spark Plug Company to perform that phase.

After the initial investigation is complete, EPA evaluates the data and makes a final decision on how the site will be cleaned up. This is documented in the Record of Decision (ROD). After the ROD is signed EPA will enter a second negotiation phase with the PRPs for the actual implementation of EPA's selected remedy. If negotiations in the second phase are successful, the PRPs will agree to implement the selected remedy. The PRPs' commitment to implement the ROD is memorialized in a Consent Decree signed by the PRPs and the United States Government and entered into by a judge in federal district court. Typically the PRPs hire a contractor to carry out the actual cleanup. EPA has oversight of the contractor, approves all work and design plans, and oversees construction and operation of the alternative.

If EPA cannot get a responsible party to negotiate and agree to implement the selected remedy, EPA may order it to do so. In addition, there is a trust account, the Superfund (monies appropriated both from Congress and from a tax levied on the petroleum and chemical industries), to clean toxic waste sites. EPA may use this money to carry out the cleanup if negotiations with the PRPs are unsuccessful. In that event, EPA may pursue the party later for cleanup costs.

- A citizen expressed concern about the sight and noise of the equipment used in the cleanup process and about the content of the ground water treated through the air stripping process.

EPA Response: The exact specifications of the equipment will be addressed during the design phase and will depend on many factors including ground water flow rates, the necessary pumping capacity, and the packing material needed for the air stripper. Typically this kind of equipment is housed in a structure that is slightly larger than a backyard lawn or utility shed, with an air discharge unit that might extend slightly above the structure for air dispersion purposes. Basically, these units have removal efficiencies of approximately 96 to 98 percent and any discharge would be in compliance with the state air requirements. Noise from the process should be minimal, since the equipment will be enclosed in the structure. EPA will hold further meetings to discuss the actual design concepts as the planning continues.

- A citizen asked if EPA will continue to pursue the outlined alternatives in spite of the sparse community turnout at the public meeting. Could there ever be a situation where someone could persuade EPA to pursue a less stringent alternative?

EPA Responded: EPA is mandated by Congress to protect human health and the environment by choosing the best alternative for cleaning up the site. Alternative 6 is the remedy EPA determined to be best suited for this site. State and community acceptance are two of the nine criteria considered in selecting a remedy. If EPA receives a significant number of comments that a community does not like the remedy that has been selected, the remedy may be re-evaluated and another may be selected.

B. Superfund Process

- A citizen asked if tests for maximum acceptable levels of contaminants were conducted in both soil and water. What standards were used to measure contaminant levels?

EPA Response: Yes, both soil and groundwater were tested at the site. Thirty-six soil borings were drilled and 101 samples were taken at various depths among the 36 borings. There are a total of 22 wells on-site from which groundwater contamination levels and the gradient and flow of the groundwater were determined.

A series of tests were run on the samples and the results identified what contaminants were found and at what concentrations. When contaminants are identified at levels that exceed Maximum Contaminant Levels for a certain contaminant, for example five parts-per-billion for trichloroethylene in groundwater, that indicates to EPA that there is a problem that warrants attention. Groundwater sampling indicated that maximum contaminant levels are exceeded at this site for vinyl chloride, benzene, dichloroethylenes(cis-1,2 and trans-1,2), trichloroethylene, and tetrachloroethylene.

A citizen asked if EPA and PADER allow hazardous wastes resulting from a leaking underground storage tank to go to a soil treatment facility by claiming the waste is not hazardous but only residual? Is it true that the TCLP limit is 100 times less stringent than the drinking water standards for identical contaminants?

EPA Response: The TCLP is a laboratory test procedure used to determine the level of contaminants that will leach from waste soil. The leachate is analyzed to determine if the contaminants in the leachate will result in the waste being classified as a hazardous waste. Analysis of drinking water is a direct analytical analysis and not a leaching test. Therefore, it is not possible to directly compare TCLP analysis with drinking water standards and to say that the TCLP limit is 100 times less stringent than drinking water standards. If wastes from an underground storage tank are determined to be a hazardous wastes, then the wastes are disposed of in accordance with federal and State hazardous waste regulations.

- A citizen expressed concern about the appearance of EPA personnel on-site in protective gear during the initial investigation at the site.

EPA Response: During the RI, the people conducting the on-site sampling were wearing protective clothing. This is a precautionary measure that EPA takes on all Superfund sites because hazardous materials may be present and the nature or location of the materials are unclear. To an outsider, the appearance of personnel in protective gear might suggest imminent danger, but at the time EPA cannot be sure how bad it may or may not be.

- A citizen asked if anyone has applied for or received a Technical Assistance Grant (TAG). If not, is it too late to apply for a TAG? Could a technical advisor participate in the ROD?

EPA Response: No one has applied for or received a TAG for the Hellertown Manufacturing Company Site. It is not too late to apply for a TAG, but in all likelihood it could not be issued in time for input on the upcoming ROD. However, a technical advisor could be helpful during the Remedial Design/Remedial Action (RD/RA) stage.

- A citizen asked if there was any possibility that the documents in the Administrative Record file could be made available for public view at some time other than normal business hours for people who are unable to view them during the day.

EPA Response: EPA will consider having that information made available at another location, possibly the public library.

C. Soil Cleanup/Lagoon Area

- A citizen expressed concern about soil contamination as a result of leaking Underground Storage Tanks (USTs) that were discovered at the site.

EPA Response: Five USTs, used to store fuel and machine oil, were located at the facility. The soil around the tanks was excavated and samples were taken from all sides to determine if anything leaked into the soil. No evidence of soil contamination was found. There was evidence of some residue left in the bottoms of the tanks, four of which were cleaned, filled with inert material, and, because of their location immediately adjacent to the building, left in place. One of the tanks was removed completely.

- A citizen asked about the soil composition in the site area, expressing concern about its infiltration rates.

EPA Response: While the general soil composition in the area is of the Washington Silt loam, the lagoon areas were backfilled with materials from off-site and most likely are no longer of the same composition. Regardless of the soil composition though, the purpose of the impermeable cover is to prevent any rainwater infiltration into the contaminated soil area.

- A citizen disputed information that the lagoons were drained and dredged and wanted to know the results of soil borings in the lagoon area.

EPA Response: According to the Remedial Investigation Report, the lagoons were drained, dredged, backfilled with construction debris and rejected spark plugs, and covered with a layer of soil. EPA did not find a significant concentration of contaminants in the topsoil covering the lagoons. Deeper samples did indicate a layer, of about a foot or two, that showed higher concentrations of contaminants. Below that layer the soil was clean, which allowed EPA to determine where the bottom of the lagoons had been.

D. Groundwater Cleanup

- A citizen asked what exactly are Maximum Contaminant Levels. Are the standards the same for drinking water and for soil?

EPA Response: Maximum Contaminant Levels (MCLs) are the maximum permissible levels of organic and inorganic contaminants allowed in public water supplies for drinking purposes. These levels are established by the EPA under the authority of the Safe Drinking Water Act. There are no MCLs for soil.

- A citizen asked if the groundwater recovery system will capture everything that is above Maximum Contaminant Levels.

EPA Response: Yes. In the design phase, EPA will develop a conceptual model to outline contamination boundaries and levels of contaminants, and identify appropriate locations for wells and necessary pumping rates. The ultimate goal of the cleanup process will be to return the entire aquifer to its beneficial use as a drinking water aquifer, which will require the attainment of MCLs.

- A citizen asked if any fractures, caverns, or solution channels were identified in the limestone under the site. If so, what would prevent a horizontal flow of contaminants through the limestone that would carry them to Saucon Creek?

EPA Response: EPA installed a number of wells on and off the property and encountered fractured bedrock underneath the site. Current information indicates that contaminants have already leached, and are continuing to leach, from the former lagoon area into the bedrock aquifer. The contaminants then migrate with the groundwater into Saucon Creek. Additional sampling of Saucon

Creek will be required during the remedial design.

- A citizen asked if there was a provision in any of the alternatives for a vertical physical barrier to prevent further migration of contaminants through the ground water.

EPA Response: No. Since there is a fractured bedrock aquifer, a physical barrier is not a viable engineering alternative.

- A citizen expressed concern about the contaminants reaching Saucon Creek. If the water table were to rise, could contaminants leach faster and reach levels that could pose a threat to wildlife?

EPA Response: Current information indicates that the groundwater is flowing in the direction of Saucon Creek. A change in the water table should not cause any significant changes in the level of contaminants.

- A citizen asked about the results of tests conducted on wells west of Saucon Creek.

EPA Response: Low levels of BTEX compounds (benzene, toluene, ethylene and xylene), which typically indicate some kind of petroleum or gasoline, were identified in the wells west of the creek.

- A citizen expressed concern about wells that the city of Bethlehem may have drilled in the Saucon Park area several years ago.

EPA Response: Municipal wells in the area are used only for emergency backup drinking water supply purposes, irrigation, and water level monitoring. The U.S. Geological Survey also has some wells in the area to monitor water levels for their own study purposes.

- A citizen asked if there has ever been an inventory of groundwater outlining the extent of pumping in the general area of the site. If pumping conditions were changed, could that alter the flow of the contaminated plume? Does EPA know if there will be future groundwater pumping in the area?

EPA Response: As part of the investigation, the entire Hellertown area was evaluated and well locations were identified. If pumping rates increased dramatically in close proximity to the site, it is possible that the direction of flow of the contaminated plume could change. However, EPA does not expect any new wells to be installed in the site vicinity and any existing wells are far enough away that they will not impact the site.

- A citizen asked if the groundwater in the site area is connected to the large cone of depression affected by the New Jersey Zinc mine.

EPA Response: According to U.S. Geological Survey reports, the site is outside the influence of the New Jersey Zinc mine.

E. General Site Area Issues

- A citizen asked what part of the site is still owned by Champion Spark Plug.

EPA Response: None. To EPA's knowledge, the entire complex, including all the previous lagoon sites, is now owned by Paikes Enterprises,Inc.

- A citizen asked if any part of the former factory is currently occupied. Is there any danger of exposure to contaminants at the facility or on its property?

EPA Response: The former factory building is currently occupied by two companies. Benchmark Analytics runs a laboratory in the front and Hill Imports used the back as a warehouse. As the site stands now, there is no exposure to contaminants. The building is clean, and as long as no one is drinking the groundwater or coming into contact with the contaminated soils twenty feet below the surface, there is no immediate risk involved with the site.

- A citizen expressed concern about the presence of drums left after past site work and about the overgrowth of vegetation around the site area.

EPA Response: EPA is aware of the drums and the vegetation overgrowth and will consider these issues during the design of the selected remedy.

- A citizen expressed concern about property values suffering as a result of proximity to the site.

EPA Response: EPA recognizes that this is a concern for homeowners in the Hellertown area. EPA's goal is to clean up the contamination associated with the site as quickly and efficiently as possible. The Remedial Action could begin within the next year and will be a major step in returning the area to a safer, cleaner state.

PART II: RESPONSE TO WRITTEN COMMENTS

This section provides technical detail in responding to written comments or questions on the Hellertown Manufacturing Company Site. These comments were received from the law firm of Gilberg and Kurent on behalf of Champion Spark Plug Company in correspondence dated August 26, 1991 and September 5, 1991.

- A review of various RODs for sites similar to the former Hellertown Manufacturing Company Site from fiscal year 1982 through the present revealed that at least three RODs selected a remedial alternative of no action and/or institutional controls. The remedy for the Hellertown Manufacturing Site is significantly more rigorous and costly than the remedy proposed for the Dorney Road Superfund Site (wellhead treatment using activated carbon filtration for current water users). Dorney Road is a nearby Site characterized by hydrogeologic conditions and contaminants of concern similar if not identical to those found at the Hellertown Site.

EPA Response: EPA must consider each site on a case-by-case basis when issuing a Superfund Record of Decision. EPA considers in detail the nine balancing criteria and other factors, such as site-specific risk factors, site conditions, the amount of waste to be treated, etc. The fact that the Hellertown Site is located in close proximity to the Dorney Road Site and has similar hydrogeological features and contaminants does not indicate that the same remedial alternative should be selected for both sites or that the cost of remediation will be the same for both sites. The fact that three other RODs (Western Sand and Gravel Site, Westline Site, and Oak Grave Sanitary Landfill Site) out of the hundreds of RODs signed by EPA select a different remedy for groundwater remediation is not conclusive in any way.

- Pumping and treatment has been proved by EPA and other scientific institutions to be ineffective in fractured bedrock systems.

EPA Response: No scientific information has been provided to EPA for this site which indicates that it is technically impracticable for groundwater pumping and treatment to reduce contaminants in the groundwater to MCLs and background concentrations. No site-specific information has been presented to demonstrate that a combination of natural attenuation and institutional controls is the only feasible remedial action alternative.

EPA has classified the aquifer underlying the site as a Class IIA aquifer, a current source of drinking water. For a Class IIA aquifer, the National Contingency Plan and Agency groundwater policy require active groundwater restoration using pumping and treatment. They also require periodic evaluation of the effectiveness of such systems, as discussed in the ROD under Section IX, "Selected Remedy."

- The use of pumping and treatment does not achieve the objectives and requirements of CERCLA, as amended by SARA.

EPA Response: EPA disagrees. As discussed in detail in the ROD, the pumping and treatment alternative meets all objectives and statutory requirements of CERCLA, as amended by SARA.

- Institutional Controls satisfy the nine criteria established under the NCP and, therefore, meet the intent of CERCLA as amended by SARA.

EPA Response: EPA disagrees. The two threshold requirements of CERCLA are that the selected remedial action be protective of human health and the environment and that it at least attain ARARs. The institutional controls discussed in Alternative 2 are proposed deed restrictions. Deed restrictions, would bar future excavation of contaminated soils in the lagoon area and the use of groundwater at the Site, but they are not a permanent treatment remedy, they will not provide sufficient health protection, and they will not attain the groundwater ARARs. Groundwater ARARs are identified in the ROD as MCLs and background concentrations for each contaminant in the groundwater.

- Long-term effectiveness and permanence of feasible remedial actions at the former Hellertown Manufacturing Company Site are achieved almost exclusively by existing institutional controls, existing land use patterns, and proposed deed restrictions.

EPA Response: Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time. This criteria evaluation includes the consideration of residual risk and the adequacy and reliability of controls. Alternative 2 does not effectively meet this evaluation criteria compared with groundwater pumping and treatment. Alternative 2 will result in more than minimal residual risk from groundwater ingestion, dermal contact and inhalation, since groundwater will not be treated or contained and ARARs will not be attained. Deed restrictions will only minimize the use of groundwater at the site and prevent excavation of contaminated soils in the lagoon area. Existing and future land use patterns include residential use in the immediate vicinity of the Site, further requiring mitigation of residual risk by groundwater pumping and treatment.

- The selection of institutional controls for the former Hellertown Manufacturing Company Site is consistent with other Superfund sites with similar risks.

EPA Response: EPA disagrees. As previously stated, EPA must consider each site on a case-by-case basis when issuing a Superfund Record of Decision. EPA must consider in detail all of the nine balancing criteria, statutory requirements, and other site related factors, which include, but are not limited to, site risk. To compare remedial actions at Superfund sites based only on similar site risks is not consistent with CERCLA program and statutory requirements.

- There is no risk of human exposure to potential contaminants in groundwater because local ordinances require residences to use public water supplies.

EPA Response: The aquifer underlying the Site is classified as Class IIA, a current source of drinking water. The Remedial Investigation Report identified seven wells within one mile of the Site, six of which are residential. Three of the wells are used for drinking water, one is used for watering a lawn and washing cars, and two are inactive. Eight additional wells were identified within two miles of the Site. Some of these wells are used for backup municipal water supply.

Local ordinances requiring residents to use public water supplies do not satisfy the requirements of the National Contingency Plan to return groundwater to its beneficial use as a drinking water source and to protect against current and future exposures to contaminants.

- The Site has not affected the surrounding natural environment.

EPA Response: The results of the Remedial Investigation are inconclusive regarding environmental risks and impact to the surrounding natural environment. EPA agrees that there are no known endangered species or critical habitats within the immediate vicinity of the Site. However, Saucon Creek and adjacent wetlands are potentially affected by the migration of groundwater and by several springs or seeps along Saucon Creek identified by EPA. EPA and the Department of Interior believe that the results of the sampling survey conducted during the RI/FS did not adequately characterize background concentrations of organic and inorganic contaminants, including metals, in the stream and wetlands area, and was inconclusive in determining whether contaminants from the Site adversely impact Saucon Creek, sediments, and adjacent wetlands. During the remedial design study additional studies in the area will be required.

- The selection of institutional controls is consistent with EPA guidance for sites that have hydrogeological constraints such as fractured bedrock.

EPA Response: EPA has classified the groundwater aquifer as a Class IIA aquifer, a current source of drinking water. The National Contingency Plan and Agency groundwater policy, as described in the document entitled "Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites," require rapid restoration of groundwater that is a current or potential source of drinking water, through pumping and treatment. They also require periodic evaluation of the effectiveness of such systems, as discussed in the ROD under Section IX, "Selected Remedy." Natural attentuation to health-based levels is used only as a baseline for comparison with active groundwater pump and treat alternatives. Champion estimates the time required for natural attentuation of groundwater to background concentrations to be 68 years, which is considerably longer than the EPA estimate of 30 to 40 years to restore groundwater to its beneficial use using a pumping and treatment alternative. Furthermore, the RI/FS does not present any scientific data or mathematical model to support the contention that natural attenuation will restore groundwater to background concentrations.