Department of Environmental Conservation

Servall Laundry Site

Bay Shore, New York
Site Number 152077

New York State
Record of Decision

March 1992

PREPARED BY:

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

New York State Department of Environmental Conservation
MARIO M. CUOMO, *Governor* THOMAS C. JORLING, *Commissioner*

RECORD OF DECISION

SERVALL LAUNDRY SITE

SUFFOLK COUNTY, NEW YORK

ID NUMBER 152077

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MARCH 1992

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

ServAll Laundry Site
8 Drayton Avenue
Bay Shore (Town of Islip)
Suffolk County, New York
Site Code: 152077

Funding Source: 1986 Environmental Quality Bond Act

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the ServAll Laundry Site, Suffolk County, New York. The selection was made in accordance with the New York State Environmental Conservation Law (ECL), and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document summarizes the factual and legal basis for selecting the remedy for this site.

Exhibit A identifies the documents that comprise the Administrative Record for the site. The documents in the Administrative Record are the basis for the Record of Decision.

ASSESSMENT OF THE SITE

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 a significant threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy addresses the principle threats posed by the site by removing the source contaminants from the soils and groundwater.

The major elements of the proposed selected include:

- vacuum extraction
- hot air or steam injection
- groundwater extraction
- groundwater treatment
- discharge of treated water
- Discharge Study
- institutional controls
- environmental monitoring
- five-year reviews
- contingency plans

DECLARATION

The selected remedy is protective of human health and the environment, complies with State and Federal Requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable. However, because treatment of the entire plume from the site was not found to be practicable at this time, this remedy does not satisfy the statutory preference for complete treatment as a principal element. The Discharge Study will determine the ultimate fate of the untreated portion of the plume. Waivers of applicable or relevant and appropriate requirements may be needed in the future depending on the outcome of the Discharge Study.

Because this remedy will not allow for unlimited use and unrestricted exposure within five years after commencement of remedial action, a five year policy review will be conducted. This evaluation will be conducted within five years after the commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

3/31/92
Date

Edward O. Sullivan
Deputy Commissioner
Office of Environmental Remediation
New York State Department of Environmental Conservation

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RECORD OF DECISION
SERVALL LAUNDRY SITE #152077

I. SITE LOCATION AND DESCRIPTION

The ServAll Laundry Site (ServAll) is an inactive hazardous waste site located at 8 Drayton Avenue in a mixed-use industrial/residential area in Bay Shore, a village in the Township of Islip, New York. Drinking water is supplied to the site by the Suffolk County Water Authority. ServAll is not within a sewer district. ServAll, located at 40°45'16" north latitude and 73°15'43" west longitude, and the surrounding area are shown in Figure 1.

The two-story former ServAll building, now occupied by a lessee, K.C. Schoeps Metal Products, Inc., occupies approximately 8,000 square feet of a paved 22,000-square-foot lot on the south side of Drayton Avenue. ServAll abutters include a household moving company and a heavy equipment sales company to the west and east, respectively, and a private residence to the south. The ServAll property is bordered by a chain link fence topped with barbed wire on the south and west sides. The north side of the property fronts Drayton Avenue, where the building is separated from the street by a small parking lot. The site slope is from zero to 2 percent to the southeast. Two storm water runoff drywells, two sanitary system cesspools, and one underground fuel tank are located in the front yard parking area between the building and Drayton Avenue. A driveway, shared by the adjacent commercial property to the east, provides access to the backyard of both properties. A second underground fuel tank is located behind the ServAll building in the backyard. The site layout is shown in Figure 2.

The principal aquifers beneath the site include the Long Island Upper Glacial and Magothy Aquifers. The aquifers are separated by a continuous clay layer in this part of Long Island called the Gardiners Clay. The clay averages 80 feet in depth from the ground surface over the course of the plume. There are no public drinking water supply wells screened within the plume area or on site. There is one well field in the path of the plume, the Thomas Avenue well field belonging to the Suffolk County Water Authority, but it is screened in the Magothy Aquifer. There are some private wells screened in the Upper Glacial Aquifer in the area of the plume.

Surface water runoff in the vicinity of the site is collected and discharged to the groundwater since there is no public wastewater system in the area.

II. SITE HISTORY

ServAll Uniform Rental, Inc. (ServAll Uniform), operated as a commercial laundry from 1969 to 1972, and as a dry cleaner/laundry from 1972 to 1984. During this time, unknown quantities of wash water were pumped to, and occasionally overflowed from, three to 11 cesspools located outside and to the rear of the ServAll building. The approximate locations of the ServAll cesspools and the alleged drum storage areas are shown in Figure 2. Suffolk County Department of Health Services (SCDHS) performed several on-location inspections from 1978 to 1983, and cited ServAll Uniform for

violations including discharge of industrial waste without a State Pollution Discharge Elimination System (SPDES) permit, improper disposal and storage of drummed waste, and overflowing cesspools (NUS, 1989).

Tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride, chloroform, methylbenzenes and some Target Analyte List (TAL) metals were detected in some of the samples collected by SCDHS from the leach pits and cesspools. Until 1983, ServAll Uniform is believed to have continued illegal discharge and storage practices regardless of repeated notices from SCDHS. SCDHS alleged that discharges from ServAll Uniform resulted in groundwater contamination downgradient of the site. Although SCDHS personnel were denied access to the ServAll property for the purpose of installing monitoring wells to confirm the source of groundwater contamination, ServAll Uniform cleaned the on-site storm drains and an unknown number of cesspools, removing sludge and contaminated water in 1981. In 1984 the cesspools behind the building were backfilled and paved over.

Mr. Ralph Colantuoni owned and operated ServAll Uniform at 8 Drayton Avenue, Bay Shore, New York. Although Mr. Colantuoni apparently still owns the property, the site is currently leased by Mr. Kurt Schoeps for the operation of K.C. Schoeps Metal Products, Inc.

1983 Suffolk County Department of Health Services Investigation

In 1983, the SCDHS Office of Water Resources identified a contaminated groundwater plume containing PCE, TCE, cis-1,2-dichloroethene (DCE), and vinyl chloride in the Bay Shore area. Analysis of groundwater data from a series of test wells suggested the source was located at or just downgradient of ServAll, and that a plume of contaminated groundwater extended 0.6 miles southeast of the site, ending just south of the Southern State Parkway. At that time, the downgradient extent of the plume was 0.3 miles upgradient from a Suffolk County Water Authority (SCWA) well field located on Thomas Avenue in Bay Shore (see Figure 4).

SCDHS used profile wells to acquire groundwater data. Using this method, a poly vinyl chloride (PVC) well was temporarily installed in a borehole drilled to a depth ranging from 90 to 110 feet. The well was sampled, and then withdrawn (raised) in 10-foot increments and sampled at increasingly shallower intervals until the well screen intersected the water table and an analytical profile of the saturated zone soils was established. This method was repeated at each exploration location. Following the final sampling episode at each location, the PVC test wells were either left in place or completely removed from the boreholes.

The highest contaminant concentrations found in the groundwater samples were 110,000 micrograms per liter (µg/L) of PCE and 2,800 µg/L of vinyl chloride. The SCDHS report concluded that the contaminated groundwater plume appeared to be confined within the upper glacial aquifer above a silty clay unit, Gardiners Clay, but suggested that the aquifer below the clay be investigated. In the Bay Shore area near the site, Gardiners Clay separates the upper glacial aquifer from the Magothy Formation aquifer. The Magothy Formation aquifer is the water source for the Thomas Avenue SCWA well field, as well as more than 10 other SCWA well fields.

1987 U.S. Geological Survey/Suffolk County Department of Health Services Investigation

In 1987, a second series of temporary profile wells was drilled and sampled by the U.S. Geological Survey (USGS) in association with SCDHS. The 1987 data suggest that the plume had migrated slightly less than 0.3 miles further downgradient in four years. At that time, the distal end of the plume was approximately 100 feet south of the SCWA Thomas Avenue well field (see Figure 4). The plume velocity was estimated at approximately 1 foot per day.

1990 NYSDEC Remedial Investigation/Feasibility Study

A Remedial Investigation (RI)/Feasibility Study (FS) work plan was created to specify the steps needed to define the nature and extent of the contamination at the site and evaluate the feasible alternatives for remediating the site. Field work began in November 1990 and the final sampling was done in December 1991.

The results of the RI are summarized in Section VI (Summary of Site Characteristics) and the conclusions of the FS are described in Section VIII (Description of Remedial Alternatives) of this Record of Decision. Further details of the RI/FS can be obtained in the Draft Final Phase 1 RI/FS Report dated January 1992.

III. ENFORCEMENT STATUS

The site owners have been given the opportunity to participate in the RI/FS but refused due to financial hardship. The ServAll Laundry Corporation is no longer in business. The New York State Department of Environmental Conservation (NYSDEC) Remedial Investigation/Feasibility Study (RI/FS) was conducted using funds from the 1986 Environmental Quality Bond Act (EQBA).

IV. HIGHLIGHTS OF COMMUNITY PARTICIPATION

Concurrent with the investigations performed at the site, there has been significant community involvement and input into the project. A Citizen Participation (CP) Plan was developed in March 1990 and implemented to provide concerned citizens and organizations with many opportunities to learn about and comment upon the investigations and studies. All major reports were placed in document repositories in the vicinity of the site and made available for public review. A public contact list was developed and used to distribute fact sheets and meeting announcements. Prior to each of the public meetings regarding the RI/FS program, a news release, legal notice, and fact sheets were issued to announce the meeting and its subject. Additionally, notices were mailed to residents living in the vicinity of the site and over the contaminant plume.

Inquiries and comments (written and verbal) were received and responded to throughout the course of the project from citizens, state, county, and local officials, and special interest groups. Comments received regarding the Proposed Remedial Action Plan have been addressed and are documented in the Responsiveness Summary (Exhibit C).

A series of three public meetings were held to inform the public of NYSDEC's plans and to solicit their participation in this project.

April 17, 1990	Public meeting to discuss RI/FS work plan scope and schedule.
November 7, 1991	Public meeting to present the results of the RI and to discuss Phase 1 of the Feasibility Study.
February 12, 1992	Public hearing to present and receive comments on the Proposed Remedial Action Plan.

V. SCOPE AND ROLE OF RESPONSE ACTION

The remedial action selected in this decision document addresses the entire site and the plume emanating from the site. As discussed in greater detail in Section VI, the media contaminated include site soils and groundwater and the groundwater downgradient from this site. Contaminates in the soils on site leach into the groundwater which is migrating southeasterly toward the Great South Bay.

By directly removing contaminants from the soils and groundwater at the site, using vacuum extraction and groundwater pump and treat, the response action will remove the source of contaminants and prevent further impact to the indirectly contaminated media (i.e., groundwater). The actual remediation of the site will begin after the selected remedy has been designed, constructed, and activated.

VI. SUMMARY OF SITE CHARACTERISTICS

Summary of Field Investigations

The following paragraphs summarize the components and conclusions of the field investigations performed at the site. For more detailed information regarding the individual investigations or for additional regional information, refer to the RI/FS Report listed in the Administrative Record (Exhibit A).

Surface Soil Sampling. Surface soil samples were collected from shallow soils at on-site locations suspected to be former drum storage areas and in areas where ServAll Uniform cesspool/leach pit overflow may have occurred. Nine surface and near-surface composited samples were obtained at depths ranging from 1 to 7 feet bgs from five on-site locations.

Surface Soil Site Contaminants. Based on the criteria for selecting the potential site contaminants (i.e., concentrations greater than background or exceeding NYSDEC or U.S. Environmental Protection Agency Standards), the potential surface soil organic site contaminants identified are PCE, TCE, and the polynuclear aromatic hydrocarbons (PAHs): phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, and benzo(a)pyrene. No TAL inorganics were detected in concentrations exceeding the New York Department of Environmental Conservation (NYSDEC) Wildlife Resources Center or Eastern U.S. background data.

Final site surface soil contaminants are determined by evaluating the potential site contaminants against four criteria:

- history of use at the site
- presence in more than one media at the site
- presence at concentrations greater than trace levels
- comparison to background concentrations

Potential site contaminants satisfying one or more of these criteria are considered site contaminants.

PCE is related to the documented history of disposal of dry cleaning fluids during site operations of ServAll Uniform. PCE and TCE (a degradation product of PCE) have widespread distribution in the study area, are detected in other media, and are present at concentrations greater than trace levels. PCE and TCE are considered site contaminants for surface soils.

PAHs were detected in one surface soil sample from the site. These compounds suggest the presence of fuel products and may result from unrecorded spills or disposal of fuels at the site, contaminated fill used at the site, accumulation of tar compounds from the building's built-up roof, or general background conditions in an industrial area. For those reasons, the detected PAHs are not considered site contaminants.

Therefore, PCE and TCE are considered site-related contaminants in surface and near-surface soils at ServAll. An assessment of the associated risk is presented in Section VII.

Subsurface Soil Sampling. Subsurface soil samples were collected from one upgradient boring, eight on-site soil borings drilled in the former cesspool area behind and east of the ServAll building, and one downgradient boring.

Subsurface Soil Site Contaminants. Consistent with the criteria for evaluating site contaminants, the potential subsurface soil organic site contaminants are PCE, TCE, 1,2-DCE (total), toluene, and bis(2-ethylhexyl) phthalate. No TAL inorganics were present in concentrations above the NYSDEC Wildlife Resources Center or Eastern U.S. background ranges.

PCE, TCE, and 1,2-DCE (total) are directly related to the documented history of dry cleaning fluid disposal at ServAll. PCE is the dominant compound in dry cleaning fluids; TCE and 1,2-DCE are degradation products of PCE. PCE was detected in 13 of 29 subsurface soil samples analyzed for VOCs. TCE and 1,2-DCE were both detected in one sample out of 29 samples analyzed. All three compounds are considered site contaminants for subsurface soils.

Toluene was detected in five of 29 samples from three borings at the site. The presence of toluene in more than one sample from the same boring and the frequency of occurrence indicate that toluene is a site-related subsurface soil contaminant. Although there is no record of toluene disposal at the site, the observed concentrations of toluene may be the

result of undocumented disposal or unrecorded spills or of contaminated fill at the site.

The following compounds are considered site-related contaminants in subsurface soils at ServAll:

PCE
TCE
1,2-DCE
toluene
bis(2-ethylhexyl) phthalate

The fate and transport potential of these contaminants and risks associated with these compounds is addressed in Section VII.

Groundwater Sampling. Eighteen new monitoring wells were installed during the RI field program. Three wells are located upgradient of the site, one is located on-site, and 14 are located downgradient of the site.

Two rounds of groundwater samples were obtained from the 18 new wells in February and March of 1990, respectively. Rounds 1 and 2 are both composed of 20 groundwater samples (including two duplicate samples).

Groundwater. Final site groundwater contaminants are determined by evaluating the potential site contaminants against five criteria:

- history of use at the site
- presence in more than one round from a well
- presence in more than one media at the site
- presence at concentrations greater than trace levels
- not present in upgradient wells

Potential site contaminants satisfying one or more of these criteria are generally considered site contaminants.

PCE, TCE, 1,2-DCE (total), and vinyl chloride are related compounds made up of the primary dry cleaning solvent (i.e., PCE) and it's degradation products. Because of the widespread distribution of these compounds in more than one media at the site at concentrations well above background and the history of PCE disposal at the site, these four compounds are considered site contaminants. 1,1-DCE and 1,1-dichloroethane (DCA) were detected in low concentrations (less than 10 µg/L) in 10 and four groundwater samples, respectively. These compounds are common industrial chemicals found in gasoline and other petroleum distillates, degreasers, and metal cleaners. They are also found as impurities in industrial grade PCE. Their presence in groundwater may be related to dry cleaning activities, unrecorded chemicals used at the site, or background conditions in a highly industrialized area. 1,1-DCA was detected in four groundwater samples including both rounds in MW-9 with no distinct distribution pattern to the trace levels detected. 1,1-DCE was detected in both rounds from the on-site well, the on site well duplicates, and MW-9. Both 1,1, DCA and 1,1-DCE are considered site contaminants.

Toluene was detected in one groundwater sample, the second round sample from MW-15, at 56 µg/L. It was not present in either round in the duplicate sample from MW-15. Although toluene is present in five on-site soil samples, there are no reports of toluene use at ServAll. Lack of agreement between sampling rounds and the duplicate nondetect results suggests some uncertainty with the positive toluene result. Although toluene is a site contaminant for subsurface soils, its presence in one groundwater sample more than 4,000 feet from the site is not considered related to on-site soil contamination. Toluene is not considered a site contaminant for groundwater because of the uncertainty about its presence in groundwater and its single isolated occurrence away from the site.

Arsenic was detected in MW-7 during Round 1 at 1,750 µg/L but was not detected in the second round (contract required detection limit = 10 µg/L). Disagreement between sampling rounds indicates uncertainty about the arsenic results. Arsenic is not considered a site contaminant because there is no record of arsenic use at the site and arsenic was not detected in other media at the site. However, a resampling of MW-7 for arsenic has been done due to the relatively high concentration (1750 µg/L) compared to New York State Class GA groundwater quality standards (25 µg/L). This sampling showed no detection of arsenic. The Department has concluded that the original sample test was in error.

The following organic compounds have been identified as groundwater site contaminants:

PCE
TCE
1,2-DCE (total)
vinyl chloride
1,1-DCE
1,1-DCA

The fate and transport potential of site contaminants and assessment of the associated risks are discussed in Section VII.

VII. SUMMARY OF SITE RISKS

In accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP, 40 CFR Part 300), a baseline risk assessment has been completed as one component of characterizing the site. The results of the baseline risk assessment are used to help identify applicable remedial alternatives and select a remedy. The components of the baseline risk assessment for this site are as follows:

- a review of the site environmental setting;
- identification of site-related chemicals and media of concern;
- an evaluation of the toxicity of the contaminants of concern;
- identification of the possible exposure routes and pathways based upon the possible future uses of the site;

- estimation of contaminant intake rates and resulting incremental risks and hazard indices; and

- an evaluation of the impacts of the site upon the environment.

Exposure routes are the mechanisms by which contaminants enter the body (e.g., inhalation, ingestion, absorption). Exposure pathways are the environmental media (e.g., soil, groundwater, air, etc.) through which contaminants are carried.

To estimate exposure rates, representative compounds were proposed, conservative assumptions were made, and lifetime intake rates were calculated for the routes of inhalation, ingestion, and dermal absorption. Therefore, it was appropriate to evaluate residential and recreational exposure scenarios in the risk assessment. Contaminants were divided into two categories, those that are possible/probable carcinogens, and those that may cause non-cancer health effects (systemic toxicants). Toxicity data was obtained from the Integrated Risk Information System and the Superfund Public Health Evaluation Manual.

The following subsections summarize the major findings concerning the nature and distribution of site contaminants, contaminant fate and transport, and the risk assessment.

Nature and Distribution of Contamination

The predominant site contaminants are the dry cleaning solvent PCE and its degradation products, TCE, 1,2-DCE, and vinyl chloride. PCE and TCE were detected in surface soils, subsurface soils, and groundwater. Vinyl chloride and 1,2-DCE were detected in groundwater and 1,2-DCE in subsurface soils. The distribution of these compounds in the environment is a result of the disposal of dry cleaning fluids at ServAll and fate and transport mechanisms.

Other organic contaminants, including toluene, bis(2-ethylhexyl) phthalate, and 1,1-DCE, were detected at low concentrations or in single occurrences in site media. The source of these contaminants is not known and there is uncertainty associated with those compounds detected only once. These chemicals are common environmental contaminants in industrialized areas and may be the result of other industrial activities in the site vicinity, unreported practices at ServAll Uniform, present practices at the site, or contaminated fill used at the site.

Fate and Transport

The fate and transport analysis concentrated on groundwater transport of PCE, TCE, 1,2-DCE, and vinyl chloride. Contaminant migration via the atmosphere, surface water, and groundwater were evaluated for ServAll; groundwater transport is considered the most significant contaminant migration path. PCE, TCE, 1,2-DCE, and vinyl chloride are the major groundwater contaminants.

Based on their physico-chemical properties, PCE in its pure liquid form (and TCE and DCE) could possibly migrate downward through the aquifer until

it reached the clay layer underlying the site (see Figure 3). The distribution of volatile organic compounds (VOCs), predominantly PCE, indicates downward migration of contaminants to the top of the clay with horizontal migration along the clay surface in the direction of groundwater flow. This distribution pattern, and historical concentrations, suggest that PCE was present in the aquifer as a dense non-aqueous phase liquid at one time, but is currently moving as a dissolved phase with groundwater flow.

A chronology of events has been constructed from historical records of site operations and previous site investigations, beginning with the installation of dry cleaning equipment at the site in 1972. By 1974, Jordan estimates that a significant contaminant plume accumulated in the aquifer beneath the site. From 1974 to 1988, the plume moved 5,200 feet southeast from the site at a rate of approximately 443 to 484 feet per year. Since 1988, the plume has moved approximately 355 feet per year to a point 7,500 feet southeast of ServAll (see Figure 4).

The contaminant plume appears to contain two distinct areas of high PCE concentrations. The southernmost area is expected to represent PCE contamination entering the groundwater from the beginning of site operations to clean-up efforts begun in 1981 and completed in 1984. High PCE concentrations close to the site may indicate that a residual contaminant source persists in soils in the backyard of the site.

The presence of vinyl chloride in the groundwater indicates biodegradation of PCE and DCE. Jordan believes that anaerobic biodegradation of PCE to TCE to 1,2-DCE to vinyl chloride is occurring at moving reaction fronts within the southernmost area of the plume. Concentrations of the degradation products relative to PCE can be expected to increase over time.

Baseline Risk Assessment

The risk assessment uses information collected during the RI to assess public health risks posed by the contamination from ServAll in the absence of any remediation. The chemicals of concern used for the risk assessment are chosen from the site contaminants on the basis of frequency of detection, comparison to background concentrations, and general toxicity. The chemicals of concern identified at ServAll include:

PCE
TCE
vinyl chloride
toluene
1,1-DCA
1,1-DCE
1,2-DCE

The exposure doses or chemical intakes of these chemicals were estimated from five exposure scenarios developed for working and residential populations in the site vicinity:

- maintenance worker
- child trespasser

- tank excavation worker
- residential use of contaminated groundwater
- VOC migration into residential basements

Dosages resulting from these exposure scenarios were estimated using conservative assumptions about the concentrations to which workers and residents would be exposed.

The risk estimates associated with each exposure scenario were compared to USEPA target risk ranges and New York State Department of Health target risk guidelines. The risks were characterized as below, within, or above the target risk range, based on those comparisons.

Target risk levels were exceeded for:

- domestic use of contaminated groundwater (risk due to vinyl chloride, PCE, TCE, 1,2-DCE)

- maintenance worker at ServAll (risk due to PCE)

Health-based target clean-up levels for vinyl chloride, PCE, TCE, 1,1-DCE, and 1,2-DCE in groundwater were set equal to New York State groundwater standards. The groundwater target clean-up levels are 5 µg/L for the listed compounds except vinyl chloride; the target clean-up level for vinyl chloride is 2 µg/L. Soil target clean-up levels are risk-based and were developed to protect the on-site maintenance worker. The soil target clean-up level for PCE is 40 milligrams per kilogram (mg/kg).

Conclusions

The RI results indicate site-related contamination in site soils, and in groundwater both beneath the site and downgradient from the site. Two exposure scenarios exceeding target risk levels identified in the Risk Assessment involved exposure to either on-site (source area) soils or contaminated groundwater.

Historical information from previous investigations and the results of the current RI provide a good general understanding of the nature and distribution of soil contamination in the source area. This information is sufficient for estimating the volume of soils in the unsaturated zone requiring remediation under the source area.

Remediation of the source area will focus on the identification of response objectives and remedial alternatives for soils above the water table. Alternatives to be evaluated for the source area will include minimal action options, containment options, in situ treatment scenarios, and removal, treatment, and disposal options.

Excess risk calculated from exposure to contaminated groundwater occurred via domestic use of groundwater. The nature and distribution of the groundwater contaminant plume and the groundwater transport mechanisms are sufficiently well-characterized at ServAll to support evaluation of remedial alternatives.

Remediation of the groundwater will focus on alternatives ranging from a no-action or minimal-action alternative to alternatives achieving clean-up of groundwater to New York State and federal groundwater standards. Several groundwater extraction and treatment options will be evaluated during this process.

VIII. DESCRIPTION OF REMEDIAL ALTERNATIVES

To determine the most appropriate method for remediating the site, the feasibility study was completed in a process that can be described in three parts. The first step identified and "screened" a large number of technologies that could be employed at the site to treat, contain, or dispose of the contaminants. Technologies that passed the initial screening phase were then grouped into different combinations to form remedial alternatives for further evaluation. After an initial analysis to identify the most promising alternatives, a detailed analysis was performed to serve as the basis for selecting a preferred alternative. This process is described in more detail in the following subsections.

Compilation and Screening of the Technologies

The results of the remedial investigation indicate that soil and groundwater in and around the site have been contaminated as a result of the improper management of hazardous materials and wastes. It has been concluded that off site groundwater is being indirectly contaminated as a result of the direct contamination of the soil and groundwater at the site.

To generate alternatives capable of addressing the contamination of each media, the three progressively more specific categories of "general response actions," "remedial technologies," and "process options" were identified.

The initial screening process essentially consists of evaluating all of the identified process options against the single criteria of technical implementability. This also includes the evaluation of the "No Action" alternative which is carried through the entire process to demonstrate the need for remediation at the site and as a requirement of the NCP.

A detailed discussion and evaluation of the initial screening process can be found in the Draft Final Phase I RI/FS Report.

Evaluation of Remedial Alternatives

Initial Screening. The remedial technologies and process options that passed the screening process were then assembled into different combinations (i.e., remedial alternatives). Theoretically, an immense number of combinations are possible but the NCP provides guidance (40 CFR 300.430(e)(3)) for how to assemble suitable technologies into alternative remedial actions for evaluation.

Three sets of alternatives are described: (1) a range of alternatives that remove or destroy contaminants to the maximum extent feasible and eliminate or minimize to the degree possible, the need for long-term management; (2) "other alternatives which, at a minimum, treat the principal threats posed

by the site but vary in the degree of treatment employed and the quantities and characteristics of the treatment residuals and untreated waste that must be managed"; and (3) "one or more alternatives that involve little or no treatment, but provide protection of human health and the environment primarily by preventing or controlling exposure to...contaminants, through engineering controls" and other methods to "assure continued effectiveness of the response action."

Initial List of Remedial Alternatives. A matrix of applicable technologies was developed to further analyze the compatible alternatives. Table 1 is a summary of initially identified technologies.

The initial screening of these alternatives against the three balancing criteria mentioned above took the following factors into consideration.

The effectiveness evaluation considers:

a. the degree to which the alternative under consideration reduces the toxicity, mobility, or volume of the contaminants through treatment;

b. how residual risks are minimized;

c. how long-term protection is provided;

d. how Applicable, or Relevant and Appropriate Requirements (ARARs) and New York State Standards, Criteria, and Guidance (SCGs) are complied with;

e. how short-term risk are minimized; and

f. how quickly the alternative achieves protection.

The implementability evaluation considers:

a. technical feasibility (ability to design, construct, and operate the alternative) and

b. administrative feasibility (availability and capacity of services, equipment, and personnel along with the ability to obtain the necessary approvals from involved regulatory agencies).

The cost evaluation considers:

a. capital costs for designs and construction;

b. operation and maintenance costs; and

c. the present worth of all costs for comparison purposes.

The result of the initial screening process was to reject five of the thirteen alternatives. The reasons for rejecting these five are presented in Table 2.

Detailed Analysis. The goal of the detailed analysis, as defined by the NCP, is to evaluate each of the viable alternatives against seven criteria (see Section IX - Summary of the Comparative Analysis of the Alternatives). These criteria are: (1) overall protection of human health and the environment, (2) compliance with ARARs, (3) short-term impacts and effectiveness, (4) long-term effectiveness and permanence, (5) reduction of toxicity, mobility, and volume, (6) implementability, and (7) cost.

Each of the eight alternatives retained for the detailed analysis are presented and described in Table 3.

It should be noted that the implementation times and costs given in Tables 4 and 6, respectively, are initial estimates, and include the time needed to design the alternative. The present worth values estimate how much money is needed today to finance projects that will take place over several years. The present worth of each alternative has been calculated based on the time to implement that particular alternative and assuming an interest rate of 8.75 percent.

IX. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The comparative analysis evaluates the relative performance of each alternative using the same criteria on which the detailed analysis of each alternative was conducted. The purpose of the comparative analysis is to identify the advantages and disadvantages of the alternatives relative to one another to aid in selecting a remedy for the ServAll site.

The site specific goals for remediating this site can be summarized in general as follows:

1. Soil a. Reduce the concentrations of PCE and TCE so that the presence of these chemicals at the site do not present an added risk of cancer of more than one in one million under the most conservative exposure scenario.

   b. Reduce the concentrations of organic contaminants in soils so that, to the extent feasible, contaminants do not leach from soils and contaminant groundwater to levels above standards.

2. Groundwater - Reduce the concentrations of contaminants in groundwater to below NYS groundwater standards, to the extent technically feasible.

As previously discussed, the NCP requires that during evaluation of potential remedial alternatives, the threshold criteria of overall protectiveness of human health and the environment along with compliance with Applicable or Relevant and Appropriate Requirements (ARARs) must be met. The five primary balancing criteria are then used to weigh trade-offs between the alternatives. For each of the criteria, a brief description is given followed by an evaluation of the alternatives against that criterion.

Threshold Criteria - The first two criteria must be satisfied in order for an alternative to be eligible for selection.

1. **Protection of Human Health and the Environment**--This criterion is an overall and final evaluation of the health and environmental impacts to assess whether each alternative is protective. This evaluation is based upon a composite of factors assessed under other criteria, especially short/long-term impacts and effectiveness and compliance with ARARs (see below).

   Only Alternative 1 would not provide protection of human health and the environment. Alternative 1 includes no remedial actions, therefore, contaminants would remain in the soils that pose a risk to site workers exceeding the acceptable risk level determined by the USEPA. Alternative 1 also includes no actions to ensure that no consumption of contaminated groundwater is occurring downgradient of the site.

   Alternatives 2 and 6 provide protection for site workers by installing an asphalt cover over all contaminated soils at the site, eliminating exposure to contamination at the site. Alternatives 3, 5, and 7 include in situ treatment of source soils by vacuum extraction. Vacuum extraction would remove contaminants from the soils to levels that are protective of site workers. Alternatives 4 and 8 include the removal of all contaminated soils for off-site treatment, thereby eliminating risk to site workers.

   Alternatives 2 through 8 include institutional controls that would restrict the extraction and use of groundwater from the plume. These restrictions would protect the public from consuming contaminated groundwater that may pose a health risk. In addition, Alternatives 5 through 8 include extraction and treatment of groundwater. Groundwater would be treated to remove contamination to levels protective of human health and the environment. Alternatives 7 and 8 would effectively treat all contaminated groundwater to levels protective of human health and the environment.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARS) and New York State SCGs**--ARARs are divided into the categories of chemical-specific (e.g., groundwater standards), action-specific (e.g., design of a landfill), and location-specific (e.g., protection of wetlands). If the implementation of a remedy results in one or more ARARs not being met, a waiver of the ARAR must be justifiable based upon one of the six reasons specified in the NCP (40 CFR 300.430(f)(1)(ii)(C)).

   Only Alternatives 7 and 8 would be in compliance with all ARARs and SCGs. Alternatives 2 through 6 would include measures that would meet ARARs and SCGs for the source area; however, because the contaminated groundwater would not be remediated completely, federal and state ARARs and SCGs would not be met for these

alternatives. Alternative 1 would also not be in compliance with federal and state ARARs and SCGs for water, and contaminated soil left at the site, posing a risk to workers that exceeds acceptable risk guidelines.

Primary Balancing Criteria - The next five "primary balancing criteria" are used to weigh major trade-offs among the different hazardous waste management strategies.

3. Short-term Impacts and Effectiveness--The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment is evaluated. The length of time needed to achieve the remedial objectives is estimated and compared with other alternatives.

   Alternative 1 would have no short-term impacts because no actions would be taken. Alternatives 2 and 6 would involve construction of the asphalt cover, which could be accomplished by a sidewalk paving crew with little to no exposure to workers or the community except possibly some dust emissions and construction hazards. Measures would be taken to minimize these effects. Alternatives 3, 5, and 7 include vacuum extraction, which would require that operators be health and safety trained because invasive activities would be conducted. Vapors would be collected and treated and effects on the community would be minimal. Alternatives 4 and 8 pose the greatest potential effects on workers and the community. Workers would require health and safety training and the limited space could increase the chances of construction accidents. If excessive dust or emissions of VOCs occur, engineering controls would have to be implemented. Easements would restrict use of land by property owners and heavy equipment would cause noise and traffic disturbance to the community.

   Groundwater extraction and treatment facilities would all involve the same short-term effects. Construction of the treatment plants would not involve exposure to contaminated water or soils. Operation of the treatment plants would involve potential exposure to hazardous materials and would require health and safety training for plant operators. The times required to achieve the response objectives for each alternative are presented in Table 4.

4. Long-term Effectiveness and Permanence--If wastes or residuals will remain at the site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude and nature of the risk presented by the remaining wastes; 2) the adequacy of the controls intended to limit the risk to protective levels; and 3) the reliability of these controls.

   In addressing the source area there are a range of alternatives with a range of effectiveness. Alternative 1 would not be effective at reducing risk because no actions would be taken. Alternatives 2 and 6 include an asphalt cover over the source area. This would be effective at preventing exposure to contaminated soils by site workers. It would also reduce

rainwater infiltration through contaminated soils in the vadose zone; however, fluctuations in the water table and contamination of the saturated soils or the capillary fringe may continue to contaminate groundwater. The cover must also be properly maintained to prevent the infiltration of water through the unsaturated soils.

Alternatives 3, 5, and 7 include vacuum extraction. Vacuum extraction would effectively and permanently remove contaminants from unsaturated soils. It may be difficult to attain the target cleanup levels with vacuum extraction. Demonstration of vacuum extraction at achieving low concentrations of soil contamination as proposed for this site is very limited. There is little doubt that a significant portion of the contamination would be removed. Contamination of groundwater could continue following vacuum extraction if saturated soils or the capillary fringe are contaminated. Only Alternative 5 would address this possibility by extracting and treating groundwater from the source area.

Alternatives 4 and 8 would effectively remove and treat contaminated soils. Correct positioning of the sheet piling would be essential to ensure that all contaminated soils are removed. Incineration or thermal desorption would effectively destroy the contaminants. Contamination of groundwater could continue following excavation if saturated soils or the capillary fringe are contaminated.

All of the treatment options included in Alternatives 5 through 8 would be equally effective at treating the groundwater that is extracted. They would also be equally effective at meeting the stated objectives of their respective pumping strategies. Only Alternatives 7 and 8, however, would remove and treat all contaminated groundwater. With Alternatives 1 through 6, contaminated groundwater would remain that exceeds drinking water standards and that would be harmful to human health if consumed. Institutional controls would be effective at preventing consumption over the long-term, provided they are maintained and enforced.

5. **Reduction of Toxicity, Mobility, or Volume**--Preference is given to alternatives that permanently, and by treatment, significantly reduce the toxicity, mobility, or volume of the wastes at the site. This includes assessing the fate of the residues generated from treating the wastes at the site.

Alternatives 1 and 2 do not include any treatment of soils or groundwater; therefore, no reduction in the toxicity, mobility, and volume through treatment would be achieved. Some reduction in mobility of contaminants through limiting infiltration in Alternative 2 would be achieved. Alternatives 3 and 4 include reductions of toxicity, mobility, and volume of contaminants in the source area but no reduction in the groundwater. Alternatives 5 through 8 all involve treatment that would reduce the toxicity, mobility, and volume of contaminants in groundwater to different

degrees. Alternatives 5, 7, and 8 also include reductions in toxicity, mobility, and volume of contaminants in the source area. Alternative 6 does not include treatment of the source area. The estimated mass of contaminants removed by each of the alternatives is summarized in Table 5.

6. **Implementability**--The technical and administrative feasibility of implementing the alternatives is evaluated. Technically, this includes the difficulties associated with the construction and operation of the alternative, the reliability of the technology, and the ability to effectively monitor the effectiveness of the remedy. Administratively, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining special permits, rights-of-way for construction, etc.

   An asphalt cover, vacuum extraction, and institutional controls are not expected to pose any technical implementation difficulties. Therefore, Alternatives 1, 2, and 3 would also include few difficulties. Alternatives 4 and 8 may be difficult to implement based on the limited space available for excavation of soils. Easements from abutting property owners may be difficult to obtain and measures to control dust and VOC emissions from the excavation could restrict the excavation process substantially. Alternatives 5, 6, 7, and 8 include groundwater extraction and treatment. Difficulties may be encountered in obtaining space for treatment plants. Installation of piping to and from the treatment plants is also likely to be very difficult because of the existing heavy development and associated utilities in the roads. These implementation difficulties with groundwater extraction and treatment increase with the size of the treatment, therefore, they are likely to be more difficult to overcome for Alternatives 7 and 8 than for Alternative 5.

   In general, the larger and more aggressive the alternative, the greater the need for effective coordination among agencies to implement the alternative. State and local agencies would be involved in the implementation of each alternative and no major difficulties that would limit the implementation of the alternatives are anticipated.

   All the alternatives under consideration include services and materials that are available and adequate. For specialized services such as vacuum extraction and off-site treatment it may be difficult to find several vendors to bid on the project. Construction services should be readily available for all alternatives.

7. **Cost**--Capital and operation and maintenance costs are estimated for the alternatives and compared on a present worth basis. Although cost is the last criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for final selection.

A wide range of costs is represented by the eight alternatives included in the detailed analysis. The costs range from $574,000 for Alternative 1, No Action to $31,818,000 for Alternative 8, Off-site Source Treatment/Active Plume Remediation Strategy with UV/oxidation treatment. The range of costs is summarized in Table 6.

Modifying Criterion - **This final criterion is taken into account after evaluating those above. It is focused upon after public comments on the proposed remedial action plan have been received.**

8. Community Acceptance--Concerns of the community regarding the RI/FS Reports and the Proposed Remedial Action Plan are evaluated. The Responsiveness Summary (Exhibit C) for this project identifies those concerns and presents the Department's responses to those concerns.

X. SELECTED REMEDY

The remedy selected for the site by the NYSDEC was developed in accordance with the New York State Environmental Conservation Law (ECL) and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC Section 9601, et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

Based upon the results of the Remedial Investigation and Feasibility Study (RI/FS), and the criteria for selecting a remedy the NYSDEC has selected Alternative 5 (i.e., In-Situ Soil Vapor Extraction, Extraction of Groundwater, Air Stripping, and Monitoring) to remediate the site. In addition, a Discharge Study will be conducted to determine the fate of the portion of the plume that Alternative 5 does not address. The estimated present worth and capital costs for the entire remedy are, respectively $4,747,000 and $2,245,000. The cost to operate and maintain the remedy is approximately $1,711,000 (See Table 7).

The elements of the selected remedial program are as follows (see Figure 5):

1. A **remedial design program** to verify the components of the conceptual design and provide the details necessary for the construction, implementation, and monitoring of the remedial program.

2. Installation and operation of a **soil venting (vapor extraction)** system consisting of:

   a. installation of a cover system on the ground surface over the area to be vented to prevent short-circuiting of air into the venting system and reduce the infiltration of precipitation into site soils;

   b. installation of an adequate number of vacuum extraction wells to remove contaminants from the soils in accordance with the remedial goals;

c. piping, pumps, and other appurtenances to extract contaminated vapors from the treatment zone; and

d. **air pollution controls** to limit air emissions to levels acceptable to the NYSDEC.

3. Installation and operation of a **groundwater collection and treatment system** at the site and 3 blocks downgradient which will consist of:

a. collection wells to collect contaminated groundwater;

b. pipes, pumps, and other appurtenances to transport collected groundwater to a treatment area;

c. treatment of groundwater by air stripping (or equivalent process) to levels acceptable to the NYSDEC;

d. **air pollution controls** to limit air emissions to levels acceptable to the NYSDEC; and

e. reinjection, infiltration or other practical disposal options for the treated water.

4. A monitoring program will be designed to evaluate the performance of the remedial program while in operation and to evaluate its continued effectiveness after discontinuation. This will include review of routine sampling done at the Thomas Avenue Well Field and the sampling of existing monitoring wells to track the effect of the remedial action on the plume. The monitoring program will also include a well screened immediately below the Gardiners Clay and upgradient of the Thomas Avenue SCWA Well Field. This well will be monitored to provide early detection in the event that contamination migrates through the Gardiners Clay.

If monitoring indicates that continued operation of the remedy is not producing significant reductions in the concentrations of contaminants in soils and groundwater, the NYSDEC will evaluate whether discontinuance of the remedy is warranted. The criteria for the discontinuation will include an evaluation of the operating conditions and the parameters, as well as a statistical determination that the remedy has attained the feasible limit of contaminate reduction and that further reductions would be impracticable.

5. A **Discharge Study** will be designed and implemented concurrently with the design of the soil venting and groundwater extraction and treatment systems that will include:

a. groundwater modelling of plume attenuation after source area treatment has begun;

b. determination of plume discharge area based upon regional hydraulic analysis (literature search and possible peizometric testing);

c. determination of environmental effect to marine resources in the Great South Bay or aquatic resources in Penataquit Creek dependent upon a. and b. above; and

d. location of most downgradient and implementable containment screen to protect marine resources. This location should consider two other plumes in the Fifth Avenue area and the potential for additive discharge volumes from residual or detached plumes.

6. Institutional Controls.

a. property owner notification and private well survey for properties over the present and projected plume path has already begun and will continue. Any homes using private wells for drinking water that are contaminated (approaching or exceeding 10 NYCRR Part 5 Drinking Water Supplies Standards) by the Servall Laundry Site will be connected to a municipal water supply system;

b. new production wells in the plume area would be prohibited; and

c. funding for a treatment system for the Thomas Avenue Well Field is available from the Environmental Quality Bond Act (1986), if monitoring shows the necessity for such installation.

XI. STATUTORY DETERMINATIONS

The following discussion describes how the remedy complies with the decision criteria in the laws and regulations:

1. Protection of Human Health and the Environment

The selected remedy is protective in that it would substantially remove from the site the contaminants that are the source of the threat to human health and the environment. Contaminants in the unsaturated soils would be removed by in-situ vacuum extraction techniques and controlled to prevent adverse air emissions. Saturated soils would be treated by virtue of treating groundwater. Groundwater would be treated by extraction and air stripping. Treating these media materials will remove the source of contamination. No unacceptable short-term risks or cross-media impacts will be caused by implementation of the remedy.

2. Compliance with ARARs

Alternative 5, which will remediate the source will, within a reasonable degree of certainty, comply with all applicable or relevant and appropriate federal and state requirements. The actual efficiency of the treatment program and the exchange of contaminants between soils and groundwater contribute uncertainty to the ability of the remedy to attain compliance with all ARARs, primarily, New York State groundwater standards (6 NYCRR Part 703). However, the evaluation of the primary balancing criteria indicates that Alternative 5 provides the best method for achieving the remedial goals because it minimizes short-term risk, is highly implementable, and is cost effective.

The source remedy will continue to be operated and improved as necessary until such time that compliance with all ARARs has been obtained or conditions indicate that a waiver of the ARAR is justified based upon conditions given in the NCP.

Alternative 5 addresses source area remediation only. Therefore, the Department will be conducting a Discharge Study on the portion of the plume not being remediated in Alternative 5. The results of the Discharge Study will determine if remediation is necessary for this part of the plume. If it is determined that remediation is not warranted, a waiver of ARARs may be necessary, since the plume as it exists does not meet ARARs.

3. Cost-Effectiveness

Of the alternatives that can achieve the remedial goals and meet the threshold evaluation criteria, the selected remedy has the lowest cost.

4. Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

New York State has determined that the selected remedy provides the best balance of trade offs among the alternatives for remediating the site. Of the alternatives that met the threshold criteria of "overall protection of human health and the environment" and "compliance with ARARs," the balancing criteria of "short-term impacts and effectiveness," "implementability," and "cost" were the most critical criteria for selecting a remedy. The remaining alternatives were comparable in their ability to meet the remaining criteria ("long-term effectiveness and permanence", and "reduction of toxicity, mobility, and volume").

5. Preference for Treatment as Principal Elements

As discussed above, treatment rather than containment or disposal, is the principal element of the remedy. Furthermore, the selected treatment program is an in-situ method which will minimize disturbance of the site and the surrounding community.

GLOSSARY OF ACRONYMS

ARARs	Applicable, or Relevant and Appropriate Requirements
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DCA	dichloroethane
DCE	dichloroethene
DL	detection limit
ECL	Environmental Conservation Law
FS	Feasibility Study
mg/kg	milligram per kilogram
NCP	National Contingency Plan
NYSDEC	New York State Department of Environmental Conservation
PAH	polynuclear aromatic hydrocarbons
PCE	tetrachloroethene
PRAP	Proposed Remedial Action Plan
PVC	polyvinyl chloride
RI	Remedial Investigation
SARA	Superfund Amendments and Reauthorization Act
SCGs	Standards, Criteria, and Guidance
SCDHS	Suffolk County Department of Health Services
SCWA	Suffolk County Water Authority
SPDES	State Pollution Discharge Elimination System
TAL	Target Analyte List
TCE	trichloroethene
TCL	Target Compound List
µg/L	microgram per liter
USGS	U.S. Geological Survey
VOCs	volatile organic compounds

FIGURES

SOURCE: U.S.G.S. QUADRANGLE, BAY SHORE EAST, N.Y., 1967, BAY SHORE WEST, N.Y., 1969, CENTRAL ISLIP, N.Y., 1967, GREENLAWN, N.Y., 1967. ALL PHOTOREVISED 1969. 7.5-MINUTE SERIES.

SCALE IN FEET

0 3000 6000

FIGURE 1
SITE LOCATION MAP
SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

EC JORDAN CO

6205-07

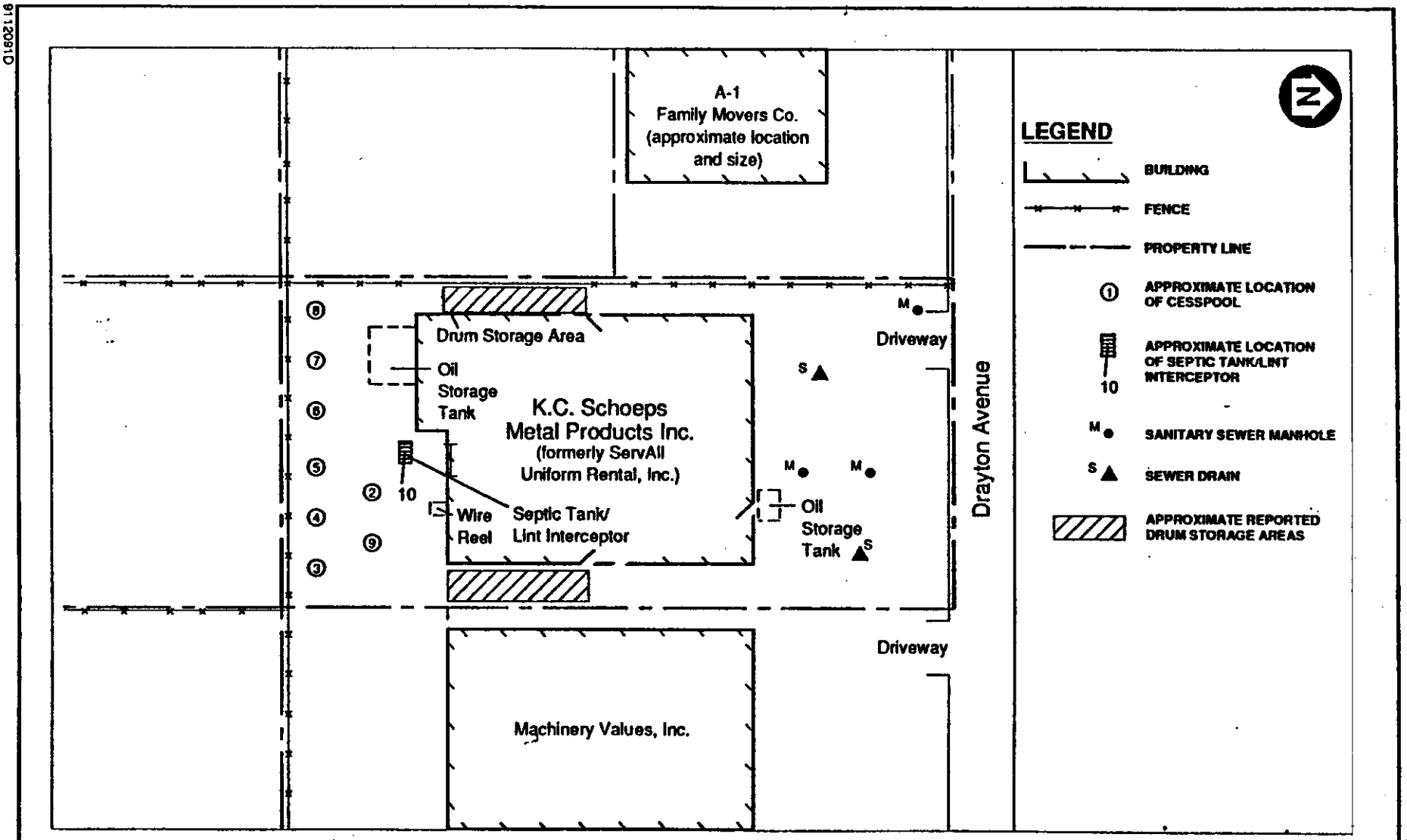
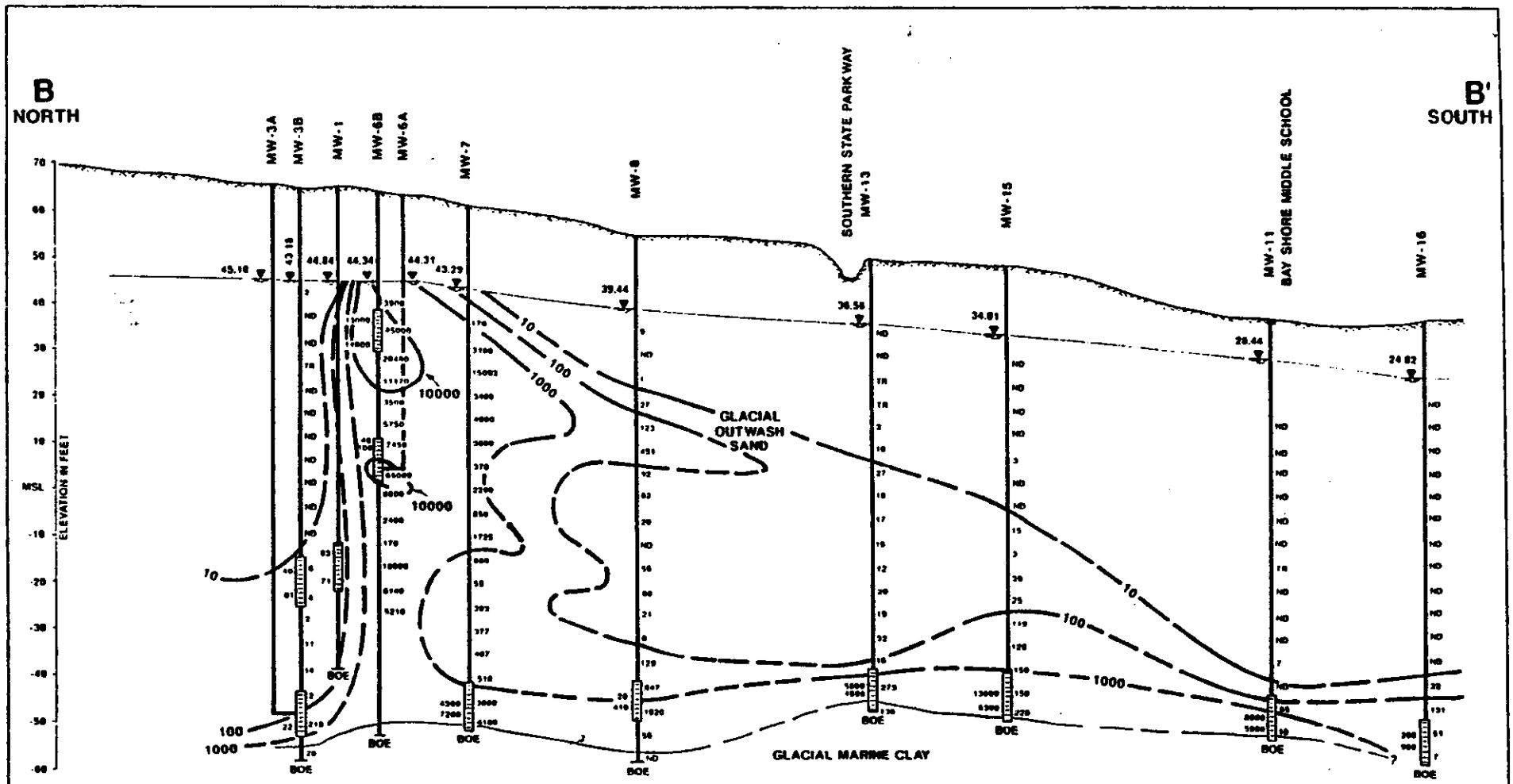


FIGURE 2
SITE LAYOUT MAP
SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

E.C.JORDAN CO.



6265-24

FIGURE 3
VERTICAL DISTRIBUTION OF CONTAMINANTS IN GROUNDWATER
SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

EC JORDAN CO

SOURCE: U.S.G.S. QUADRANGLE, BAY SHORE EAST, N.Y., 1967, BAY SHORE WEST, N.Y., 1969, CENTRAL ISLIP, N.Y., 1967, GREENLAWN, N.Y., 1967. ALL PHOTOREVISED, 1969. 7.5 MINUTE SERIES.

NOTES: 1. PLUME BOUNDARIES ARE THE 10 ug/L TOTAL VOCs ISOPLETH.

SCALE IN FEET

0 3000 6000

FIGURE 4
PAST AND PRESENT PLUME LOCATIONS
SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

ECJORDANCO

6205-07

9201025D

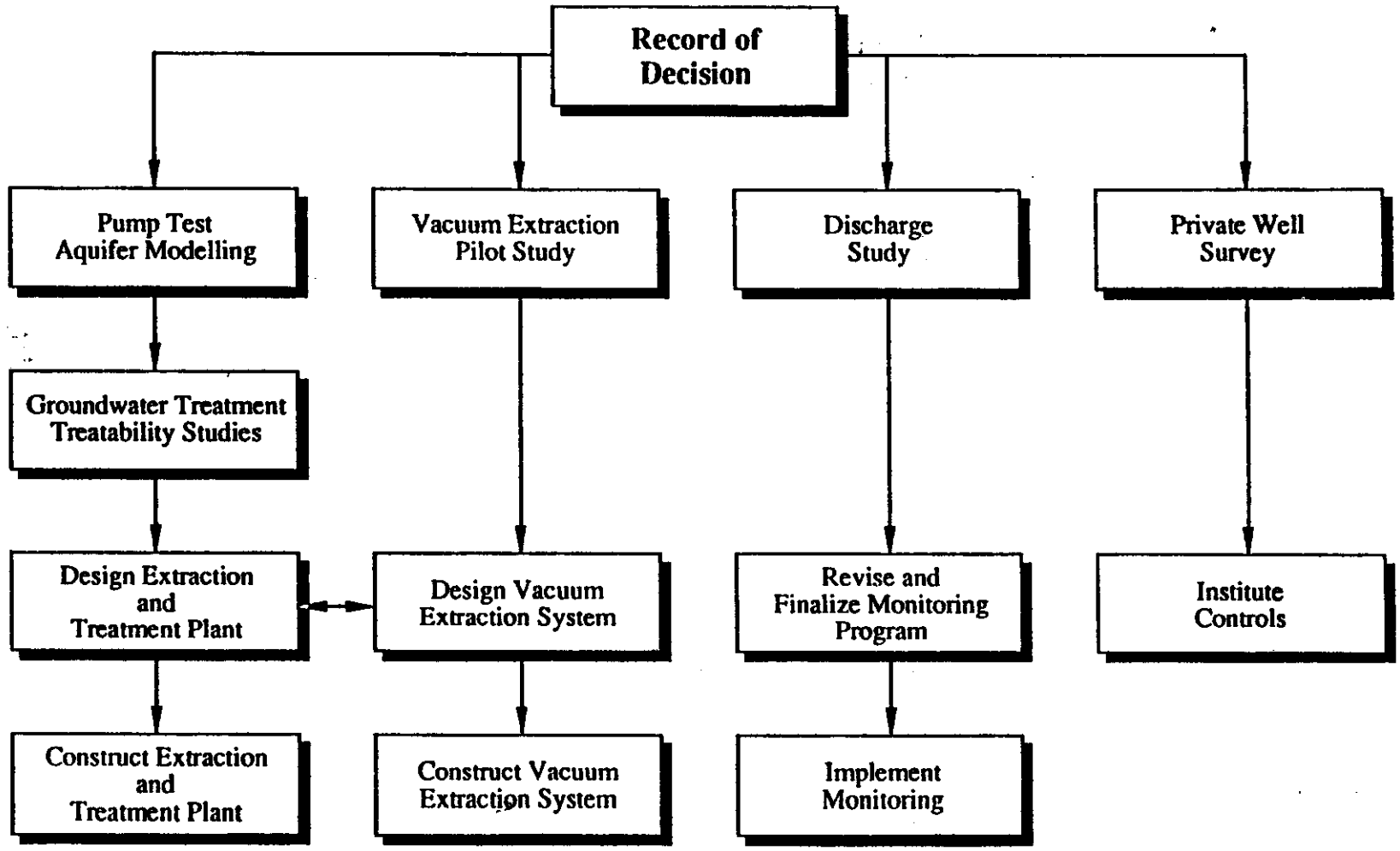


FIGURE 5
CONCEPTUAL PLAN IMPLEMENTATION FLOW CHART
SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK
E.C.JORDAN CO.

TABLES

TABLE 1
ALTERNATIVE DEVELOPMENT

SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

	RESPONSE ACTION	ALTERNATIVE DEVELOPMENT												
		A	B	C	D	E	F	G	H	I	J	K	L	M
SOURCE SOILS	No Action	X												
	Minimal Action Fencing Deed Restrictions		X				X				X			
	Containment Asphalt Cap			X				X				X		
	In Situ Treatment Vacuum Extraction				X				X				X	
	Off-site Treatment Incineration Thermal Desorption					X				X				X
	Disposal RCRA Landfill					X				X				X
GROUNDWATER	No Action	X												
	Minimal Action Deed Restrictions Environmental Monitoring		X	X	X	X								
	Containment Extraction Wells						X	X	X	X				
	Active Restoration Extraction Wells										X	X	X	X
	Groundwater Treatment Air Stripping UV/Oxidation Metals Precipitation						X	X	X	X	X	X	X	X
	Discharge POTW Groundwater Surface Water						X	X	X	X	X	X	X	X

ALTDEV WK1

TABLE 2
REMEDIAL ALTERNATIVES SCREENING

SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

ALTERNATIVE	EFFECTIVENESS	IMPLEMENTABILITY	CONCLUSION
A: Source - No Action Groundwater - No Action	• Does not meet response objectives • Does not protect human health and the environment	• Easiest to implement • Requires no construction activities	Retained as ALTERNATIVE 1 for baseline comparison with other alternatives
B: Source - Minimal Action Groundwater - Minimal Action	• Restricts access to site, which will reduce exposure to contaminated soils • Inhalation risks would continue • Contaminated soil may continue to act as a source for groundwater contamination • Restricts use of private wells that may extract contaminated water	• Easily implemented, although fencing may make continued use of the back part of the property difficult	This Alternative has been eliminated from further consideration because there are no significant differences between this alternative and Alternative C with regard to implementability and cost because the site is already covered with asphalt; Alternative C has the added benefit of reducing inhalation and direct exposure to soil contaminants
C: Source - Containment Groundwater - Minimal Action	• Reduces dermal contact and inhalation risks • Contaminated soils in the capillary fringe may continue to act as a source for groundwater contamination • Containment is not permanent, maintenance of cover system will be required • Reduces possibility of private wells from extracting contaminated groundwater	• Cover materials and construction services are readily available • Approximately 90 percent of the is already covered with asphalt • A periodic maintenance program for the cover system could be easily implemented	This alternative was retained as ALTERNATIVE 2 because it provides protection against dermal contact at the site and prevents further use and development of domestic wells in the contaminated groundwater plume

TABLE 2 (Page 2 of 5)
REMEDIAL ALTERNATIVES SCREENING

SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

ALTERNATIVE	EFFECTIVENESS	IMPLEMENTABILITY	CONCLUSION
D: Source - In Situ Treatment Groundwater - Minimal Action	• Contaminants would be removed from the soils, thus reducing the source of groundwater contamination and risk to the onsite maintenance worker • Reduces possibility of private wells from extracting contaminated groundwater	• Vacuum extraction is a demonstrated technology • Small site area may make implementation difficult	This alternative was retained as ALTERNATIVE 3 because it provides a cost effective method for treatment of source soils combined with a minimal action for groundwater
E: Source - Off-site Treatment Groundwater - Minimal Action	• Contaminated soils would be removed from the site eliminating the source of groundwater contamination and the risk to a maintenance worker • Reduces possibility of private wells from extracting contaminated groundwater	• Off-site treatment and disposal facilities are well developed and available • Excavation of soils will be difficult because of the close proximity of the building and the relatively small site area	This alternative was retained as ALTERNATIVE 4 because it provides a permanent treatment and disposal of contaminated site soils combined with a groundwater option that prevents further use and development of domestic wells in the area surrounding the contaminant plume
F: Source - Minimal Action Groundwater - Containment	• Reduces dermal contact risks • Inhalation risks would continue • Contaminated soils may continue to act as a source for groundwater contamination • Prevents groundwater contamination from migrating further downgradient	• May be difficult to locate groundwater treatment equipment • Groundwater extraction and treatment technologies are well developed and available • Easily implemented, although fencing may make continued use of the back part of the property difficult	This alternative does not meet response objectives for either the source soils or for the groundwater, and it is not considered a permanent remedy for the site; therefore, it was eliminated from further consideration

TABLE 2 (Page 3 of 5)
REMEDIAL ALTERNATIVES SCREENING

SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

ALTERNATIVE	EFFECTIVENESS	IMPLEMENTABILITY	CONCLUSION
G: Source - Containment Groundwater - Containment	• Reduces dermal contact and inhalation risks • Contaminated soils in the capillary fringe may continue to act as a source for groundwater contamination • Containment is not permanent • Prevents groundwater contamination from migrating further downgradient	• May be difficult to locate groundwater treatment equipment • Groundwater extraction and treatment technologies are well developed and available • Cover materials and construction services are readily available • Approximately 90 percent of the site is already covered with asphalt	This alternative does not meet response objectives for either the source soils or for groundwater, and it is not considered a permanent remedy for the site; therefore, it was eliminated from further consideration
H: Source - In Situ Treatment Groundwater - Source Control	• A significant portion of the soil contamination would be removed using vacuum extraction, thus the source of groundwater contamination and the risk to the onsite maintenance worker would be reduced • Vacuum extraction process will not completely remove all contamination in the source soils • Groundwater source control pump and treat system will provide cleanup of saturated soils beneath the site • Institutional controls will reduce possibility of extracting groundwater for domestic purposes in the detached contaminant plume	• Groundwater extraction and injection wells and treatment systems can be located on or in the vicinity of the site • Groundwater extraction and treatment technologies are well developed and available • Vapor extraction is a demonstrated technology, and availability of vendors to perform remedial activities is good • Small site area may make implementation of remedial actions difficult	This alternative was retained as ALTERNATIVE 9 because it provides an effective method for eliminating residual contaminant source in both the unsaturated and saturated soils beneath the site area; It also prevents further use and development of domestic wells in the area of the detached contaminant plume

TABLE 2 (Page 4 of 5)
REMEDIAL ALTERNATIVES SCREENING

SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

ALTERNATIVE	EFFECTIVENESS	IMPLEMENTABILITY	CONCLUSION
I: Source - Off-site Treatment Groundwater - Containment	• Contaminated soils would be removed from the site eliminating the source of groundwater contamination and the risk to a maintenance worker • Prevents groundwater contamination from migrating further downgradient	• May be difficult to locate groundwater treatment equipment • Groundwater extraction and treatment technologies are well developed and available • Off-site treatment facilities are well developed and available • Excavation of soils will be difficult because of the close proximity of the building and the relatively small site area	This alternative has been retained as ALTERNATIVE 6 because it provides a permanent remedy for the site soils, and provides a method to prevent continued migration of the groundwater contaminant plume
J: Source - Minimal Action Groundwater - Active Treatment	• Reduces dermal contact risks • Inhalation risks would continue • Contaminated soils may continue to act as a source for groundwater contamination • Actively treats groundwater contamination in an effort to meet New York State groundwater quality criteria	• May be difficult to locate groundwater treatment equipment • Groundwater extraction and treatment technologies are well developed and available • Easily implemented, although fencing may make continued use of the back part of the property difficult	This alternative was eliminated from further consideration because the potential that soils would continue to act as a source of groundwater contamination negates the advantage of an aggressive groundwater clean-up strategy
K: Source - Containment Groundwater - Active Treatment	• Reduces dermal contact and inhalation risks • Contaminated soils in the capillary fringe may continue to act as a source for groundwater contamination • Containment is not permanent • Actively treats groundwater contamination in an effort to meet New York State groundwater quality criteria	• May be difficult to locate groundwater treatment equipment • Groundwater extraction and treatment technologies are well developed and available • Cover materials and construction services are readily available	This alternative was eliminated from further consideration because the potential that soils would continue to act as a source of groundwater contamination negates the advantage of an aggressive groundwater clean-up strategy

TABLE 2 (Page 5 of 5)
REMEDIAL ALTERNATIVES SCREENING

SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

ALTERNATIVE	EFFECTIVENESS	IMPLEMENTABILITY	CONCLUSION
L: Source - In Situ Treatment Groundwater - Active Treatment	• A significant portion of the soil contamination would be removed using vacuum extraction, thus the source of groundwater contamination and the risk to the onsite maintenance worker would be reduced • Vacuum extraction process will not completely remove all contamination in the source soils • Actively treats groundwater contamination in an effort to meet New York State groundwater quality criteria	• May be difficult to locate groundwater treatment equipment • Groundwater extraction and treatment technologies are well developed and available • Vapor extraction is a demonstrated technology, and availability of vendors to perform remedial activities is good • Small site area may make implementation of remedial actions difficult	This alternative was retained as ALTERNATIVE 7 as a remedy that provides a cost effective approach for treatment of source area soils, and provides for an aggressive groundwater clean-up strategy
M: Source - Off-site Treatment Groundwater	• Contaminated soils would be removed from the site eliminating the source of groundwater contamination and the risk to a maintenance worker • Actively treats groundwater contamination in an effort to meet New York State groundwater quality criteria	• May be difficult to locate groundwater treatment equipment • Groundwater extraction and treatment technologies are well developed and available • Off-site treatment facilities are well developed and available • Excavation of soils will be difficult because of the close proximity of the building and the relatively small site area	This alternative was retained as ALTERNATIVE 8 as a remedy that provides a permanent approach for the treatment and disposal of source area soils, and provides for an aggressive groundwater clean-up strategy

TABLE 3
SUMMARY OF REMEDIAL ALTERNATIVES

SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

ALTERNATIVE	COMPONENTS
1: NO ACTION	• Environmental Monitoring • Five-year Reviews
2: MINIMAL ACTION	• Cover Construction • Institutional Controls • Environmental Monitoring • Five-year Reviews
3: IN SITU SOURCE SOIL TREATMENT/ MINIMAL ACTION ON GROUNDWATER	• Vacuum Extraction • Hot Air or Steam Injection • Institutional Controls • Environmental Monitoring • Five-year Reviews
4: OFF-SITE SOURCE SOIL TREATMENT/ MINIMAL ACTION ON GROUNDWATER	• Excavation of Source Soil • Off-site Incineration or Low Temperature Thermal Desorption • Institutional Controls • Environmental Monitoring • Five-year Reviews
5: IN SITU SOURCE SOIL TREATMENT/ SOURCE AREA GROUNDWATER EXTRACTION	• Vacuum Extraction • Hot Air or Steam Injection • Groundwater Extraction (Plume Source Control) • Air Stripping or Ultraviolet/Oxidation • Discharge of Treated Water • Institutional Controls • Environmental Monitoring • Five-year Reviews
6: MINIMAL ACTION SOURCE TREATMENT/ PLUME CONTAINMENT STRATEGY	• Cover Construction • Groundwater Extraction (Containment of Plume) • Air Stripping or UV/Oxidation • Discharge of Treated Water • Institutional Controls • Environmental Monitoring • Five-year Reviews
7: IN SITU SOURCE SOIL TREATMENT/ ACTIVE PLUME REMEDIATION STRATEGY	• Vacuum Extraction • Hot Air or Steam Injection • Groundwater Extraction (Active Restoration) • Air Stripping or UV/Oxidation • Discharge of Treated Water • Institutional Controls • Environmental Monitoring • Five-year Reviews
8: OFF-SITE SOURCE SOIL TREATMENT/ ACTIVE PLUME REMEDIATION STRATEGY	• Excavation of Source Soil • Off-site Incineration or Low Temperature Thermal Desorption • Groundwater Extraction (Active Restoration) • Air Stripping or UV/Oxidation • Discharge of Treated Water • Institutional Controls • Environmental Monitoring • Five-year Reviews

TABLE 4
RESPONSE OBJECTIVE TIMETABLE

SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

ALTERNATIVE	SOURCE		GROUNDWATER	
	Design & Construction	Treatment	Design & Construction	Treatment
Alternative 1	5 weeks	N/A	N/A	N/A
Alternative 2	2 months	N/A	N/A	N/A
Alternative 3	3 months	4 months	N/A	N/A
Alternative 4	6 months	N/A	N/A	N/A
Alternative 5	3 months	4 months	1 year	20 years
Alternative 6	2 months	N/A	1.5 years	30 years
Alternative 7	3 months	4 months	2 years	30 years
Alternative 8	6 months	N/A	2 years	30 years

NOTE:
N/A = Not Applicable

TABLE 5
CONTAMINANT MASS REMOVAL FOR EACH ALTERNATIVE

SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

ALTERNATIVE	MASS REMOVED FROM UNSATURATED SOILS	MASS REMOVED FROM SATURATED SOILS	MASS REMOVED FROM GROUNDWATER	TOTAL MASS REMOVED
Alternative 1	0 Pounds	0 Pounds	0 Pounds	0 Pounds
Alternative 2	0 Pounds	0 Pounds	0 Pounds	0 Pounds
Alternative 3	96 Pounds	0 Pounds	0 Pounds	96 Pounds
Alternative 4	96 Pounds	0 Pounds	0 Pounds	96 Pounds
Alternative 5	96 Pounds	5,768 Pounds	2,568 Pounds	8,400 Pounds
Alternative 6	0 Pounds	12,561 Pounds	5,972 Pounds	18,500 Pounds
Alternative 7	96 Pounds	12,561 Pounds	5,972 Pounds	18,600 Pounds
Alternative 8	96 Pounds	12,561 Pounds	5,972 Pounds	18,600 Pounds

NOTE: Removal rates are estimated for comparison purposes only. Estimates of contaminant mass treated in groundwater are based on treatment of one pore volume. Attainment of target clean-up levels may require the removal of additional pore volumes of groundwater in order to address contaminants. adsorbed onto soils within the water column. As much as two times the amount of contaminants in the groundwater, or approximately 12,700 lbs., may be adsorbed on to soil particles within the plume. Calculations are presented in Appendix J.

TABLE 6
COST COMPARISON OF ALTERNATIVES

SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

ALTERNATIVE	CAPITAL COST	INDIRECT COST	OPERATING COST	TOTAL COST(1)
Alternative 1	$10,000	$12,000	$456,000	$574,000
Alternative 2	$38,000	$32,000	$501,000	$685,000
Alternative 3	$200,000	$117,000	$456,000	$928,000
Alternative 4	$5,270,000	$1,084,000	$456,000	$8,172,000
Alternative 5				
Air Stripping	$1,591,000	$598,000	$1,525,000	$4,457,000
UV/oxidation	$1,791,000	$670,000	$1,636,000	$4,924,000
Alternative 6				
Air Stripping	$3,365,000	$698,000	$3,117,000	$8,616,000
UV/oxidation	$4,055,000	$837,000	$3,695,000	$10,304,000
Alternative 7				
Air Stripping	$8,461,000	$1,770,000	$6,612,000	$20,212,000
UV/oxidation	$10,670,000	$2,213,000	$7,547,000	$24,516,000
Alternative 8				
Air Stripping	$13,531,000	$2,787,000	$6,612,000	$27,516,000
UV/oxidation	$15,740,000	$3,228,000	$7,547,000	$31,818,000

NOTES:
All costs given are present worth using a discount rate of 8.75%
(1) Includes a 20% contingency factor
Conceptual design costs are assumed -30/+50% accurate and are not for remedial design.

TABLE 7
COST ESTIMATE SELECTED REMEDY
IN SITU SOURCE SOIL TREATMENT
SOURCE AREA GROUNDWATER EXTRACTION
AIR STRIPPING

SERVALL LAUNDRY SITE
BAY SHORE, NEW YORK

COST PARAMETER	COST	PRESENT WORTH COST(1)
CAPITAL COSTS		
Vacuum Extraction	$171,000	$171,000
Groundwater Extraction/Reinjection Wells	$95,000	$95,000
Treatment Plant with Air Stripping	$1,300,000	$1,300,000
Installation of Monitoring Wells	$58,000	$58,000
Institutional Controls	$19,000	$19,000
Total Capital Costs		$1,643,000
INDIRECT COSTS		
Health and Safety	$37,000	$37,000
Legal, Administrative, Permitting	$90,000	$90,000
Engineering	$317,000	$317,000
Construction Management	$158,000	$158,000
Total Indirect Costs		$602,000
OPERATING COSTS		
Groundwater Treatment (for 20 Years)	$115,000	$1,069,000
Environmental monitoring		
First 2 Years (4 Events Per Year)	$100,000	$177,000
Remaining 28 Years (1 Event Per Year)	$25,000	$219,000
Air Monitoring		
First Year	$32,000	$29,000
Remaining 19 Years (4 Events Per Year)	$16,000	$134,000
Effluent Monitoring		
First Year	$16,000	$15,000
Annual Cost after First Year	$6,000	$50,000
Five-year Reviews(2)	$10,000	$18,000
Total Operating Costs		$1,711,000
SUBTOTAL		$3,956,000
Contingency (20% of Subtotal)		$791,000
TOTAL		$4,747,000

NOTES:
(1) = Discount Rate is 8.75%
(2) = Present-worth cost based on reviews conducted every five years until year 30. Cost are conceptual only (-30/+50% accurate) and should not be considered an engineers estimate.

SELREM.WK1

EXHIBIT A

EXHIBIT A - ADMINISTRATIVE RECORD

Harris, D. and H.W. Davids, 1983. "Vinyl Chloride Contamination of Groundwater, North Bayshore, New York. Interim Report No. 2," Suffolk County Department of Health Services, Bureau of Water Resources.

Burton and Hand, 1980 (revised 1983). "Engineering Report for ServAll Uniform Rental, Inc.," ServAll Laundry Site, Bayshore, New York.

EA Science and Technology, 1987. "Phase I Investigation ServAll Laundry Site," Prepared for US Environmental Protection Agency, June 1987.

NUS Corporation, 1989. "Final Draft Site Inspection Report, ServAll Laundry, North Bay Shore, New York," Prepared for SCDHS and the US Environmental Protection Agency.

New York State Department of Environmental Conservation, May 1990. "Citizen Participation Plan for ServAll Laundry Inactive Hazardous Waste Site #152077."

E.C. Jordan Co., March 1990. "Phase I Final RI/FS Quality Assurance Project Plan, ServAll Laundry Site, Bay Shore, New York."

E.C. Jordan Co., May 1990. "Phase I Final RI/FS Work Plan, ServAll Laundry Site, Bay Shore, New York".

E.C. Jordan Co., November 1990. "Phase I Final RI/FS Health and Safety Plan, ServAll Laundry Site, Bay Shore, New York."

E.C. Jordan Co., May 1991. "Phase I Remedial Investigation Data Summary Report, Volume I & II, ServAll Laundry Site, Bay Shore, New York."

E.C. Jordan Co., September 1991. "Draft Phase I Feasibility Study Report, ServAll Laundry Site, Bay Shore, New York."

E.C. Jordan Co., October 1991. "Draft Final Phase I Remedial Investigation Report, ServAll Laundry Site, Bay Shore, New York."

E.C. Jordan Co., November 1991. "Draft Phase III Feasibility Study Report, ServAll Laundry Site, Bay Shore, New York."

E.C. Jordan Co., January 1992. "Draft Final Phase I Remedial Investigation/Feasibility Study Report, Volumes I & II, ServAll Laundry Site, Bay Shore, New York."

NYSDEC, January 1992. "Proposed Remedial Action Plan - ServAll Laundry Site #152077."

Fink & Carney, February 12, 1992. "NYSDEC Public Meeting Transcript in the Matter of ServAll Laundry Site."

Letter dated February 19, 1992 from Joseph Dugan (Brentwood, NY) to Mr. Edward Blackmer (NYSDEC), Re. to voice disapproval of choice No. 5 and urge selection of No. 13.

Letter dated February 21, 1992 from Elsa Ford (Brentwood, NY) to Mr. Ed Blackmer (NYSDEC), Re. community-wide clean up as opposed to site-by-site.

NYSDEC, March 1992. "Responsiveness Summary - Public Response for Proposed Remedial Action, ServAll Laundry Site #152077."

EXHIBIT B

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL ...

DIVISION OF HAZARDOUS WASTE REMEDIATION
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

EXHIBIT B

CLASSIFICATION CODE: 2 REGION: 1 SITE CODE: 152077
EPA ID:

NAME OF SITE : Serv-All Laundry
STREET ADDRESS: 8 Drayton Ave.
TOWN/CITY: COUNTY: ZIP:
Bay Shore Suffolk 11706

SITE TYPE: Open Dump-X Structure-X Lagoon- Landfill- Treatment Pond-
ESTIMATED SIZE: 0.20 Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME....: Serv-All Laundry
CURRENT OWNER ADDRESS.: 8 Drayton Ave., Bay Shore, NY
OWNER(S) DURING USE...: Unknown source
OPERATOR DURING USE...:
OPERATOR ADDRESS.....:
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From 1972 To 1984

SITE DESCRIPTION:
The Serv-All Laundry site was a laundry/dry-cleaning business located at 8 Drayton Ave. in the Town of Islip. Mr. Ralph Colantuoni owns and leases the 20,000 ft. property. Serv-All has operated as a laundry/dry-cleaner since 1972. Since the early 1970's, Serv-All was disposing of unknown quantities of washwater overflow without a SPDES permit. During 1978 and 1983, the Suffolk County Department of Health Services conducted an on-site sampling of leachpool, cesspools and storm drains. The sampling data revealed that wastewater and sludge were contaminated with tetrachloroethylene(160ppb) heavy metals, and vinyl chloride. In 1983, SCDHS Bureau of Water Resources located a vinyl chloride contaminated groundwater plume emanating southeast of the Serv-All Laundry site.

A plume of contamination has moved above a Suffolk County Water Authority Wellfield and is currently about two miles long. Analysis of the plume showed the presence of tetrachloroethylene.
A state funded RI-FS is completed and a Record of Decision will be signed in March, 1992. A state funded design and remediation is expected to follow. The ROD calls for soil vaccum extraction and groundwater pump and treat at the source area and a discharge study to be conducted on the front end of the plume.

HAZARDOUS WASTE DISPOSED: TYPE	Confirmed-X	Suspected- QUANTITY (units)
Vinyl Chloride		unknown
Tetrachloroethylene		160 ppb

SITE CODE: 152077

ANALYTICAL DATA AVAILABLE:
Air- Surface Water- Groundwater-X Soil-X Sediment-

CONTRAVENTION OF STANDARDS:
Groundwater-X Drinking Water-X Surface Water- Air-

LEGAL ACTION:

TYPE..: State- Federal-
STATUS: Negotiation in Progress- Order Signed-

REMEDIAL ACTION:

Proposed- Under design- In Progress- Completed-
NATURE OF ACTION: State Funded RI-FS and a State funded RD-RA Pro

GEOTECHNICAL INFORMATION:
SOIL TYPE: Sand
GROUNDWATER DEPTH: 35 feet

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Groundwater contamination

ASSESSMENT OF HEALTH PROBLEMS:

The area is entirely served by public water which is supplied from groundwater wells. The Thomas Ave Wellfield is located one mile south of the site and is routinely monitored by the SCWA. The Suffolk Co. Dept. Health Services is tracking the migration of the contaminant plume from the site and to date it has not reached the wellfield.

EXHIBIT C

EXHIBIT C
RESPONSIVENESS SUMMARY
PROPOSED REMEDIAL ACTION PLAN
SERVALL LAUNDRY SITE - ID NO. 152077

The issues addressed below were raised during a public hearing held on February 12, 1992 at the Oakpark Elementary School in Bayshore, New York and in letters received from commentors. The purpose of the meeting was to present the Proposed Remedial Action Plan (PRAP) for the site and receive comments on the PRAP for consideration during the final selection of a remedy. The transcript from the meeting and copies of the written comments are included in the Administrative Record for the site (Exhibit A) and is available for public review. The public comment period for the PRAP extended from January 24, 1992 to February 24, 1992.

The following written comments were received regarding the proposed remedy:

1. Letter dated February 19, 1992 from Joseph Dugan (Brentwood, NY) to Mr. Ed Blackmer (NYSDEC), Re. to voice disapproval of choice No. 5 and urge selection of No. 13.

2. Letter dated February 21, 1992 from Elsa Ford (Brentwood, NY) to Mr. Ed Blackmer (NYSDEC), Re. community-wide clean up as opposed to site-by-site.

Issue #1: Two people stated that they felt that the proposed Alternative 5 was inadequate and that they preferred Alternative 13.

Alternative 13 (actually call Alternative M) is listed in the Phase 1 FS screening and was evaluated as Alternative 8 in the Draft Final RI/FS Report. This alternative is the most costly of all the evaluated alternatives in many aspects. It was rejected because:

1. It is the most disruptive to the neighborhoods in terms of disturbance, dust, potentially hazardous transport of materials through residential areas and requires the most taking of property (to house treatment facilities) of the alternatives considered.

2. The logistics and technical feasibility of creating three separate groundwater treatment plants is questionable. The construction of extraction wells and small treatment facilities within the rights of way of the Southern State Parkway and Sunrise Highway would create a hazard to life for both on-site workers and motorists. Other locations for citing the treatment plants are very limited.

3. The duration of groundwater treatment plant operation for Alternative 8 is 30 years. Alternative 5 requires one third less time, 20 years.

4. Alternatives 5 and 8 both provide protection of human health. The difference between Alternatives 5 and 8 is that Alternative 8 actively remediates the plume before it discharges to the Great South Bay. Preliminary calculations show that discharge of the

plume to Great South Bay would not cause unacceptable contaminant levels. Therefore, there is no great difference between Alternatives 5 and 8 with respect to protection of human health and the environment, while there is a very large difference in cost. The proposed Alternative 5 does include additional evaluation of the discharge of the plume.

Issue #2: Cost should not be such an overriding factor as it seems to be in selecting Alternative 5.

While cost is a factor in the selection process, it was not the overriding factor in the selection process for this site. Impact on the neighborhoods (both long and short term), implementability, and protectiveness of human health and the environment were the determining factors for the selection of the proposed action.

Issue #3: Would the money to be spent for future testing and monitoring be better spent pumping and treating the water from the plume we have already identified?

Future testing and monitoring will be required no matter which alternative is chosen. It is done to ensure that the selected remedy is working properly. If the question was referring to the Discharge Study, which is a part of Alternative 5, the costs associated with that study would be a small fraction (less than 1%) of the added costs to implement Alternative 8.

Issue #4: Alternative 5 allows toxics to bioaccumulate in the Great South Bay. The standards do not protect marine life or people in the real world.

Surface water standards for perchlorethylene of 1 part per billion are designed to be protective of marine biota. Bioaccumulation was part of the assessment used in the setting of these standards to be protective of both human health and the environment. Preliminary indications are that standards will not be exceeded in the Great South Bay. A Discharge Study to define the location and quantity of discharge to surface waters will be conducted as part of Alternative 5 to confirm that standards will not be exceeded.

Issue #5: The Feasibility Study exposure scenarios are superficial. They don't address concerns to people in the plume path for utilizing backyard soil for gardening, living space in finished basements, and children's exposure.

The risk assessment and exposure scenarios used are valid for the conditions encountered from this site. Volatile organics (VOCs) are contained in a water plume well below the permanent water table and for the most part 60 feet below ground surface. The possibility of contaminants vaporizing and migrating into basements was evaluated as part of the risk assessment for this site and no unacceptable risks were found. Contamination of surface soils associated with this site only occur at the site itself.

Issue #6: Vegetation (trees) in contact with the plume extract contaminants

and then recirculate them back on the soil where our children can play in the leaves and contaminants.

Vegetation is not in contact with the plume except in the vicinity of the site. Roots do not extend below the permanent water table because the water will drown the root hairs. The plume is below the surface of the permanent water table. The only contaminants to be potentially removed in this manner are in the vadose (soils, air, and water vapor) zone. The site itself is essentially paved over and trees cannot access the vadose zone. The proposed alternative addresses the removal of contaminants in the vadose zone at the site itself.

Issue #7: How can ServAll be bankrupt and still be in business and collecting rents from the site?

The owners declared financial hardship and elected not to participate in the Remedial Investigation/Feasibility Study. This is not a declaration of bankruptcy nor does it protect them from future cost recovery action by the State of New York.

Issue #8: Doesn't the amount and concentration of vinyl chloride argue for Hooker as a possible source for the contamination that you have found at ServAll?

There is not hydraulic connection between the Hubbard-Wilson site (where Hooker allegedly dumped) and the ServAll Laundry site. Literature review of processes in the ServAll operation does indicate that the vinyl chloride we found is associated with ServAll and there is no indication that Hooker Chemical is the source.

Issue #9A: Concerns were raised about the air discharges from an electric cogeneration facility on Fifth Avenue, a new dry cleaner in the area, and Liberty Plating, as well as the general air quality in and around Brentwood.

The Regional Director of NYSDEC Region 1 recognizes the high level of public concern in the Brentwood area and held a meeting with a number of Brentwood community leaders on February 18, 1992. During that meeting, those leaders were briefed on the various sites of concern to residents in the Brentwood area. While the concerns are relevant to the area, they are not site specific and will not be addressed in this document.

Issue #9B: What effects could there be from the air stripping planned to be used to remediate the ServAll site?

The air stream will be treated and monitored to prevent <u>any</u> discharge of contaminants from the site. Since this part of Long Island is a "non-attainment" area, it is the Department's position that <u>no</u> contaminants will be discharged.

Issue #10: Does your proposal include a discharge study that will verify where the groundwater plume will ultimately go? And if it goes to the Penataquit Creek will the impact be evaluated?

The proposed action includes a means of verifying where the plume will discharge and an impact analysis will be undertaken, if warranted.

Issue #11: Concern was raised about water ponding on the streets in the Drayton Avenue area. Is this water used for drinking water?

The ServAll site is not contributing contamination to any surface waters since it is presently 95% paved and has no surface drainage outlet. The waters ponding in the street percolate into the Upper Glacial aquifer, which is not the source of your drinking water. The public water supply is taken from the Magothy Aquifer which is below the clay aquitard. The Magothy Aquifer is not contaminated in this area.

Issue #12: It was noted that the plume notification mailing did not have a return address on the envelope and, therefore, some people may have discarded it as "junk mail."

This mailing was done by NYSDEC consultant, E.C. Jordan, on plain paper envelopes. A supply of NYSDEC franked envelopes has been supplied to them so that all future mailings will have the NYSDEC return address.

Issue #13: A suggestion was made to have the reports for this site produced in Spanish.

While this is not feasible for the complete set of reports due to the large technical volumes and cost, this suggestion will be taken into consideration in the preparation of future summary reports and fact sheets.

Issue #14A: Will the expansion of the South Shore Mall and its associated expanded rate of pumping deflect the plume to the east?

We will review the design of the South Shore Mall groundwater pumping system to verify any effect on the plume as part of the analysis and evaluation of the final point of discharge. The planned expansion may deflect the plume slightly to the east. This is dependent upon the depth of production wells and the volumes to be pumped. If the production wells are deep (producing from the Magothy aquifer and recharging to the Magothy aquifer), then there will be no effect. The one monitoring well the Department installed on the northwest edge of the mall property was placed so that planned expansion should not disturb it.

Issue #14B: Do these groundwater pumping systems (South Shore Mall cooling system) pull contaminants from the water and evaporate it into the air?

No, these systems are "noncontact cooling systems" and the water seen on the outside of the piping systems is condensation of air borne water vapor. No consumptive use of the groundwater is allowed in these systems. Any consumptive use water must come from the municipal water supply.

Issue #15: What kind of long-term commitment is the Department ready to make?

The Department (NYSDEC) regularly commits to a 30 year program for monitoring and maintenance with this type of remedy and stipulates a review every five years as a minimum to evaluate the progress of the remedy.

Issue #16: How do you determine if a plume has reached a point of discharge other than by waiting for it to get there?

We are not going to wait for the plume to advance to a point of discharge. Technologies are available for studying and monitoring the movement of groundwater plumes. A study will be designed to find defensible answers to our question of where the plume will discharge and what its impact on receiving waters will be.

Issue #17: Is it possible for the contaminated water to move up toward the ground surface in the area of the Bayshore Middle School?

No, this is not possible. There is no upward vertical groundwater movement in the area of the school. Further south the saltwater and freshwater interface creates some unanswered questions, which we will be defining in the Discharge Study.

Issue #18: Should someone using the groundwater in this area have it tested?

Yes, this is recommended. The New York State Health Department will test any wells in the plume area at no cost to the landowner. Please contact William Lowden, NYSDOH, Bureau of Environmental Exposure at (518) 458-6310 to schedule this testing.

Issue #19: There was concern expressed that the Suffolk County Department of Health Services programs were being threatened by budgetary cuts. They helped identify this site and others in Suffolk County.

The Department recognizes these concerns and would agree that the Suffolk County Department of Health Services has provided much valuable assistance in our programs, but does not have knowledge of the local budget situations.

Issue #20: What about people that worked at ServAll?

The New York State Department of Health (NYSDOH) has asked that medical histories of such workers be given to the Bureau of Environmental Exposure so that a data base can be developed. Please send these to the attention of William Lowden, New York State Department of Health, Bureau of Environmental Exposure Investigation, 2 University Place, Albany, NY 12203. The NYSDOH is specifically interested in any history of medical problems.

Issue #21: What is the timetable for moving forward with the proposed remedy and actual remediation?

By New York State law, the Department is required to seek the participation of the responsible parties in the design and construction of the selected remedy. We have asked our attorneys to complete this

step in a two month time period starting on the date the Record of Decision (ROD) is executed. When this process is complete, we can initiate the design of the selected remedy contained in the ROD if the responsible parties decline to participate. Design may begin in the summer of 1992. It will take approximately six months to complete the design, at which time the construction and actual remediation can begin.

Issue #22: Who makes the final decision on whether or not the Department's program is accepted?

The final decision is made by Edward O. Sullivan, Deputy Commissioner, Office of Environmental Remediation, of the New York State Department of Environmental Conservation. His decision will be based upon this Responsiveness Summary and the Proposed Remedial Action Plan.