City: NOYACK/SAG HARBOR

**ROWE INDUSTRIES GROUND WATER CONTAMINATION**

Site Information:

- **Site Name:** ROWE INDUSTRIES GROUND WATER CONTAMINATION
- **Address:** NOYACK/SAG HARBOR, NY
- **EPA ID:** NYD981486954
- **EPA Region:** 02

Site Alias Name(s):

- SAG HARBOR GROUNDWATER CONTAMINATION
- SAG HARBOR ID# NYD986869170
- ROWE INDUSTRIES GND WATER CONTAMINATION

Record of Decision (ROD):

- **ROD Date:** 09/30/1992
- **Operable Unit:** 01
- **ROD ID:** EPA/ROD/R02-92/179
- **Media:** Soil, Ground Water
- **Contaminant:** VOCs (Benzene, PCE, TCE, toluene, xylenes), metals (arsenic, Chromium, lead).

Abstract:

SITE HISTORY/DESCRIPTION: The 8.5-acre Rowe Industries Groundwater Contamination site is located in the Town of Sag Harbor, Suffolk County, New York. Land use in the surrounding area is mixed industrial, commercial, and residential. Approximately 6,000 people within a 3-mile radius of the site use ground water as their primary drinking water source. Site features include a building that covers 1 acre of the site, and two ponds located 300 and 700 feet to the northeast of the building. Additionally, there is a wetland area onsite. From the 1950's to the 1960's, Rowe Industries occupied the site and manufactured small electric motors and transformers. Chlorinated solvents were used to degrease oilcoated metals, and waste solvents were discharged from two tanks in the building into cesspools or to an open field 75 to 100 feet east of the building. A series of dry wells was used to dispose of organic solvents while Rowe Industries was in operation. From the late 1960's until 1974, the property was used by two othercompanies, Rowe
Industries-Aurora Plastics, Inc., and Nabisco, Inc. In 1980, the site was sold to Sag Harbor Industries, which currently uses the property as a facility to manufacture electronic devices. VOC-contaminated ground water was first discovered by the County in 1983, when several local private wells were sampled. In 1985, EPA undertook a removal action to provide an alternate water supply to residents in the vicinity of the ground water plume. This ROD addresses a final remedy for the contamination in soil and ground water attributable to the site. The primary contaminants of concern affecting the soil and ground water are VOCs, including benzene, PCE, TCE, toluene, and xylenes; and metals, including arsenic, chromium, and lead.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific soil excavation goals are established to ensure that soil contaminants do not contribute to ground water contamination, and include benzene 0.5 mg/kg; PCE 1.5 mg/kg; TCE 1 mg/kg; toluene 1.5 mg/kg; and xylenes 1.2 mg/kg. Additionally, excavated soil sent for offsite disposal will be treated, if necessary, according to RCRA LDR standards. Chemical-specific ground water clean-up goals are based on SDWA MCLs and MCLGs, including arsenic 25 ug/l; chloroform 7 ug/l; PCE 5 ug/l; TCE 5 ug/l; toluene 5 ug/l; and xylenes 5 ug/l. Treated ground water discharged to Sag Harbor Cove will meet state discharge requirements. INSTITUTIONAL CONTROLS: Not provided.

Remedy: SELECTED REMEDIAL ACTION: The selected remedial action for this site includes excavating 365 cubic yards of contaminated soil, treating the soil offsite using incineration or another equivalent technology to meet LDR disposal standards, then disposing the soil at an offsite RCRA landfill; conducting soil sampling to confirm that all soil contaminated above clean-up levels has been removed; pumping and onsite pretreatment of contaminated ground water to remove iron and manganese, followed by filtration to remove metals and air stripping to remove VOCs, with offsite discharge to surface water; treating air emissions, if necessary; and implementing a long-term ground water monitoring program. The estimated present worth cost for this remedial action is $6,187,000, which includes an annual O&M cost of $254,000 for 15 years.

Text: Full-text ROD document follows on next page.
EPA Superfund
Record of Decision:

ROWE INDUSTRIES GROUND WATER
CONTAMINATION
EPA ID: NYD981486954
OU 01
NOYACK/SAG HARBOR, NY
09/30/1992
EPA Superfund Record of Decision:
Rowe Industries Groundwater
Contamination, NY

ROD FACT SHEET

SITE

Site name: Rowe Industries
Site location: Sag Harbor, New York
HRS score: 31.94

ROD

Date Signed: September 30, 1992

Selected remedy: Soil excavation and Disposal at a Chemical Waste Landfill in conjunction with
Extraction/Air Stripping of Groundwater with Discharge to Sag Harbor Cove

Capital cost: $2,280,000
O & M cost: $254,000
Present-worth cost: $6,187,000

LEAD

Enforcement, PRP lead

Primary Contact: Linda Wood (212) 264-8585
Secondary Contact: Melvin Hauptman (212) 264-7681
Main PRPs: Nabisco Inc. and Sag Harbor Industries

WASTE

Waste type: Chlorinated solvents - VOCs
Waste origin: Waste solvents were discharged from the Rowe Industries facility to a series of cesspools and
onto the ground surface.

Estimated waste quantity: The groundwater plume is approximately 600 feet wide and 2700 feet long. In
addition, a total of approximately 365 cubic yards of soil is contaminated with volatile organic and
semi-volatile organic compounds.

Contaminated media: Groundwater and Soil
DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION
Rowe Industries Superfund Site
Town of Sag Harbor
Suffolk County, New York

STATEMENT OF BASIS AND PURPOSE
This decision document presents the selected remedial action for the Rowe Industries Site (the Site), which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and 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.

The New York State Department of Environmental Conservation (NYSDEC) concurs with the selected remedy. A letter of concurrence from NYSDEC is attached to this document (Appendix 4).

The information supporting this remedial action decision is contained in the administrative record file for this Site, an index of which is attached (Appendix 5).

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, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF SELECTED REMEDY
The remedy presented in this document addresses the treatment of soils and groundwater at the Rowe Industries Site.

The major components of the selected remedy include:

- Excavation and disposal of approximately 365 cubic yards of contaminated soil at a Resource Conservation and Recovery Act (RCRA) permitted landfill. In order to comply with RCRA Land Disposal Restriction (LDR) regulations, it is expected that the excavated soils will have to be treated off-site prior to disposal at the landfill. This will be verified during remedial design.

- Confirmatory sampling to ensure that soils with concentrations above the site specific soil cleanup objectives have been excavated;

- Remediation of the groundwater by the installation of seven extraction wells which will pump the contaminated groundwater to an air stripping treatment system with ultimate discharge of treated water to Sag Harbor Cove;

- Implementation of a system monitoring program that includes the collection and analysis of the influent and effluent from the treatment system and periodic collection of well-head samples; and

- Implementation of a long-term monitoring program to track the migration and concentrations of the contaminants of concern.

DECLARATION OF STATUTORY DETERMINATIONS
This selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost
This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site. Because treatment is being used to address the principal threats at the Site, this remedy satisfies the statutory preference for treatment as a principal element of the remedy.

As the remedy will result in hazardous substances remaining on site, in the aquifer, above health-based levels, a review will be conducted within five (5) years after commencement of the remedial action, and every five years thereafter, to ensure that the remedy continues to provide adequate protection of human health and the environment.
DECISION SUMMARY

ROWE INDUSTRIES SITE
TOWN OF SAG HARBOR, NEW YORK
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
NEW YORK

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I. SITE LOCATION AND DESCRIPTION

The Rowe Industries Site (the Site) is located on the east side of Sag Harbor-Bridgehampton Turnpike, Town of Sag Harbor, Suffolk County, New York (see Figure 1). The Site includes an industrial facility which is approximately 8.5 acres in size and is located 1,500 feet south of the village of Sag Harbor in the vicinity of Carrol Street, Noyack Road, Brick Kiln Road and Sag Harbor Turnpike. One acre of the facility is covered by a building (see Figure 2). There are two ponds located 300 and 700 feet to the northeast of the building. There is a small industrial area to the southwest and residential and commercial areas to the northwest, north and south. According to the Town Clerk, the town of Southampton consists of approximately 49,000 residents, 1,870 of which reside in the Village of Sag Harbor. The entire area, with the exception of the homes within the contaminated groundwater plume, is served by private wells. Approximately 6,000 people within a 3 mile radius of the site use groundwater as their primary drinking water source.

The site is underlain by the Upper Glacial aquifer which consists of clayey sand and gravel. The upper sediments above the water table consist of medium to fine sand with a trace amount of medium to fine gravel. The lower sediments below the water table consist of medium to very fine sand, alternating with intervals of silty clay, silt and clay. There are no major continuous beds or clay layers.

Sag Harbor Cove is about 3,000 feet to the northwest. Ligonee Brook, which flows into Sag Harbor Cove, is to the east and north of the Site. The area surrounding the Site is largely undeveloped to the east and west. Several designated wetlands in the vicinity of the Rowe site are considered to be significant habitats. The National Wetlands Inventory (NWI) classifies the area where Ligonee Brook enters Sag Harbor Cove as a mixture of palustrine forested, broad-leaf deciduous wetlands and intertidal emergent estuarine wetlands communities. The on-site pond is also classified as a palustrine, open water, intermittently exposed wetland community. One other significant habitat, a tern nesting area, is listed as occurring within two miles of the site along Noyack Bay. The tiger salamander is the only endangered animal known to live within two miles of the Site. It is listed as endangered in the NYSDEC's Natural Heritage Database.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Site History

The Rowe Industries Site is also known as the Sag Harbor Groundwater Contamination Site in reference to the current owners of the Site, Sag Harbor Industries, Inc. From the 1950's through the early 1960's, the Site was originally owned and operated by Rowe Industries, Inc. During that time, Rowe Industries manufactured small electric motors and transformers. During this process, chlorinated solvents were used to degrease oil-coated metals. Waste solvents were discharged from two tanks in the building into cesspools or through a connecting pipe to an open field located 75 to 100 feet east of the building (see Figure 2). The building was destroyed by fire in 1962 and reconstructed that same year.

Rowe Industries - Aurora Plastics, Inc. owned and operated the Site in the late 1960's. Nabisco, Inc. acquired the Site in the early 1970's. The Site ceased operation in 1974. In 1980, the Site was sold to Sag Harbor Industries (SHI) which currently uses the facility to manufacture electronic devices. The small electronic parts are currently cleaned with Freon 113.

A series of dry wells (designated DW-A through DW-F in Figure 2, with two wells at location DW-B) were used while Rowe Industries was in operation to dispose of organic solvents. Dry well DW-B was not installed until 1983 and has only been used for collecting roof runoff and coolant water. Currently, only wells DW-B, DW-E, and DW-F are still in use by SHI. DW-E and DW-F collect wastewater from lavatories. Groundwater contamination was first discovered in the Sag Harbor area in 1983. The Suffolk County Department of Health Services (SCDHS) sampled water from a private well on Noyack Road which revealed contamination by three solvents, 1,1,1-trichloroethane (TCA), 1,1,2-trichloroethylene (TCE), and tetrachloroethylene (PCE), and the metal iron. As a result of these findings, the SCDHS and EPA conducted further investigations to determine the extent and the cause of the groundwater contamination of the Sag Harbor area. Forty-three private wells and twenty-one monitoring wells were monitored from March 1984 until October 1984. The results of the study indicated a groundwater contamination plume that was approximately 600 feet wide and 1900 feet long extending to Ligonee Brook flowing northwest from the SHI facility and containing chlorinated hydrocarbons, primarily...
The study also determined that drinking water wells for twelve homes exceeded current New York State Department of Health (NYSDOH) standards for one or more solvents. Therefore, in January 1985, EPA undertook an removal action to provide an alternative water supply to twenty-five residences in the vicinity of the groundwater contamination plume. EPA contracted with the Suffolk County Water Authority to install a water main, and the Town of Southampton to install the hook-ups to the twenty-five homes affected by the contamination plume.

Based on the extent of groundwater contamination, the Rowe Industries Site was placed on the National Priorities List (NPL) on June 10, 1986. On September 30, 1988, EPA and Nabisco entered into an Administrative Order on Consent, Index NO. II-CERCLA-80213 (the Order). The Order required Nabisco to perform a Remedial Investigation/Feasibility Study (RI/FS) to determine the nature and extent of contamination at the Site and to develop and analyze remedial alternatives to address the contamination. The RI was performed in two separate phases; Phase I was conducted in 1989-90 and Phase II was conducted in 1991. The Phase I investigation was designed to determine if groundwater contamination was still present at the Site, and if so, how the concentrations compared to 1984 findings. In addition, several areas of the SHI facility, including suspected drum disposal areas, active and inactive dry wells, pond sediments, surface water, and surface and subsurface soils, were investigated in Phase I. The results of the Phase I groundwater investigation were consistent with the results of the SCDHS study. The three most prevalent compounds, TCE, TCA and PCE, were again detected at concentrations exceeding Federal and State water quality standards. In addition, the size of the plume remained at approximately 600 feet wide and 2700 feet long as defined in the SCDHS study (see Figure 3). However, despite the additional investigations of suspected disposal areas, the Phase I study did not pinpoint the source of the groundwater contamination. The Phase II investigation revealed that the sources of the groundwater contamination are the sludge and sediments in dry wells DW-C, DW-D, and DW-F and the soil in the former drum storage area. Therefore, in 1992, a Feasibility Study was performed to develop alternatives to clean up these sources of contamination as well as the contaminated groundwater itself.

B. Enforcement

EPA identified two potentially responsible parties (PRP's) as owners and/or operators. Special notice letters informing the PRPs of their potential liabilities were mailed on February 23, 1988 to Nabisco and Sag Harbor Industries. Several negotiations were held to discuss technical and legal issues relating to the Administrative Order on Consent (AO) for the conduct of the RI/FS. On September 30, 1988, EPA entered into an Administrative Order on Consent, Index NO. II-CERCLA-80213, with Nabisco. The Order required Nabisco to perform an RI/FS to determine the nature and extent of the contamination at the Site and to develop and analyze remedial alternatives to address the contamination.

Leggette Brashears and Graham (LBG) performed the RI/FS for Nabisco. The Phase I RI Report was submitted on May 23, 1990. In response to EPA’s comments, LBG submitted the Phase II RI work plan on December 10, 1990. The final RI Report, which incorporated the results of both phases, was approved by EPA on August 25, 1992. The FS Report was submitted to EPA in July 1992.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI/FS Reports and the Proposed Plan for the Site were released to the public for comment on August 26, 1992. These two documents were made available at information repositories maintained at the EPA Region II Office in New York City and at the Jeramin Library in Sag Harbor, New York. The notice of availability for these documents was published in Newsday on August 26, 1992. A public comment period on the documents was held from August 26, 1992 through September 24, 1992. In addition, a public meeting was held on September 9, 1992. At this meeting, representatives from EPA presented the Proposed Plan, and later answered questions concerning such plan and other details related to the RI/FS reports. Responses to comments and questions received during this period are included in the Responsiveness Summary, which is appended to this ROD.

IV. SCOPE AND ROLE OF RESPONSE ACTION
The objective of this remedy is to address the contamination in the soils and the groundwater attributable to the Site. The ultimate goal of the EPA Superfund Program's approach to groundwater remediation is to return usable groundwater to beneficial uses within a reasonable time frame. EPA's Groundwater Protection Strategy establishes different degrees of protection for groundwater based on their vulnerability, use, and value. For the aquifer beneath the Site, the final remediation goals will be drinking water standards. Therefore, EPA's goal in remediating groundwater at the Site is to reduce concentration levels in groundwater to meet the Maximum Contaminant Levels promulgated under the Safe Drinking Water Act. In order to achieve this goal any contaminated soil which is leaching contaminants into the groundwater must also be remediated. Therefore the selected remedy will excavate the soil in the drum storage area and in the three contaminated dry wells DW-C, DWD and DW-F. However, EPA recognizes that the final selected remedy may not achieve this goal because of potential difficulties associated with removing contaminants from groundwater to cleanup levels. The results of the selected remedy will be monitored carefully to determine the feasibility of achieving this final goal. The remedial action may require continuous pumping, pulsed pumping, and flexibility in placing pumping wells at strategic locations.

V. SUMMARY OF SITE CHARACTERISTICS

The RI was performed in two separate phases. Phase I was conducted in 1989-90 and Phase II was conducted in 1991. The Phase I investigation was designed to determine if groundwater contamination was still present at the Site, and if so, how the concentrations of contaminants in groundwater compared to the 1984 SCDS findings. In addition, several potential areas of the facility, including suspected drum disposal areas, active and inactive dry wells, pond sediments, surface water, and surface and subsurface soils, were investigated during the Phase I study. The Phase II investigation was a more comprehensive study of potential sources of groundwater contamination at the Site. In addition to further investigation of several of the areas mentioned above, it included investigation of the drum storage area. A. Nature and Extent of Contamination

1. Groundwater

During Phase I, 32 wells were sampled to evaluate groundwater conditions. The wells consisted of 18 previously installed SCDS monitoring wells, 8 private wells and two new well clusters (MW-42, MW-43) consisting of a shallow, intermediate and a deep well. The wells were completed to 30, 70 and 100 feet respectively. The locations of the wells can be seen in Figures 4 and 5.

The highest concentration of PCE was found in a sample from well N28 at 12,000 parts per billion (ppb). The compound found at the second highest concentration during Phase I was TCA, which was also found in well N-28 at 690 ppb. Finally, TCE was also detected at its highest concentration in well N-28 at 530 ppb. The three primary contaminants discovered in the SCDS study were TCA, TCE and PCE. Therefore, the results of the VOC analysis for Phase I are consistent with the results of the 1984 SCDS study. In addition, the groundwater sampling showed that the plume had not increased in area and remained approximately 600 feet wide and 2700 feet long. The summary of the groundwater results for volatile organics can be found in Table 1-A.

In addition, the groundwater was analyzed for metals using both filtered and unfiltered samples. All of the filtered samples were collected during round 2 of Phase I. The filtered samples represent dissolved concentrations and thus do not have the interference from fine material that is mobilized during sampling. Iron, manganese, lead, cadmium and chromium exceeded federal and state water quality standards in the unfiltered samples during both phases. Only iron showed significant differences between unfiltered and filtered samples. Iron concentrations ranged between nondetectable and 228,000 ppb in unfiltered samples. The concentrations of iron detected in the filtered samples ranged from 106 to 4670 ppb which still exceed the federal and state waterquality standards. The summary for groundwater results for metals can be found in Table 1-B.

During Phase I it was discovered that the parcel of land formerly utilized as the drum storage area was not owned by SHI or any previous owners of the Rowe Industries Site. The results of Phase I indicated that the area may be one of the sources of groundwater contamination. Permission to perform a subsurface investigation on the property was not obtained until the data from Phase I was analyzed. Therefore, this area was not investigated until Phase II. As a result, in Phase II, one well cluster and two shallow wells
were installed to monitor groundwater downgradient of the former drum storage area. The well cluster, consisting of a shallow well (MW-45a) and an intermediate well (MW-45b), was completed to 30 and 50 feet, respectively. Likewise the two shallow wells (MW-51A, MW-52A) were completed to 30 feet. PCE was the primary compound detected in the groundwater. The highest concentration was detected in MW-51A at 3100 ppb. The data from this investigation indicate that the plume emanating from the drum storage area is in the upper portion of the aquifer.

Overall, the results of both Phases indicate that the most prevalent VOCs in the groundwater were PCE, TCE, TCA, 1,1-dichloroethane (DCA), and 1,1-dichloroethylene (DCE). In addition to VOC contamination, heavy metals (chromium, iron, lead and manganese) were present in unfiltered samples at levels up to 7210 ppb, 108,000 ppb, 93.3 ppb and 4250 ppb, respectively. These levels exceed the federal Safe Drinking Water Act maximum contaminant level (MCL) for chromium (100 ppb) and the Action Level for lead (15 ppb). These levels also exceed the NYSDEC Water Quality Standards which are 50 ppb for chromium, 25 ppb for lead and 500 ppb for iron and manganese. However, all of the filtered samples, except for iron, indicated levels which were below the federal and state drinking water standards. The results indicate that the horizontal extent of the plume is the same as that observed in the SCDHS study (see Figure 5). The plume appears to intersect but not extend beyond Sag Harbor Cove, as shown by samples obtained from MW-50 on the other side of the Cove. However, the vertical extent of the plume increases with distance from the SHI facility. For example, on the SHI facility, the plume is confined to the upper 10–25 feet of the aquifer. However, as the plume migrates away from the SHI facility, the depth of the plume extends to the upper 50–60 feet of the Upper Glacial Aquifer. The groundwater plume ultimately discharges to Sag Harbor Cove via Ligonee Brook. VOC levels in Ligonee Brook did not exceed Federal Ambient Water Quality Criteria. The levels of VOCs in Sag Harbor Cove dissipate to nondetectable levels within several hundred feet of its confluence with Ligonee Brook.

2. Soils

The soil sampling program was designed to define the lateral and vertical extent of soil contamination. During Phase I, eight soil borings were drilled on the SHI property. The boring locations, which can be seen in Figure 6, were selected based on the results of a soil gas survey which measures the concentrations of VOCs in the space between soil particles.

The predominant plume constituents, TCE, TCA and PCE, were detected in three of the eight soil borings. These compounds were only detected in the paved area along the eastern border of the building in the upper six feet of the soil borings. PCE was detected in boring B-2 and boring B-5 at a concentration of 100 parts per million (ppm) and 9 ppm. TCE was detected in boring B-1 at a concentration of 130 ppm. Semivolatiles, pesticides and PCBs were not detected in these samples. Overall, the Phase I subsurface investigation indicated that soil contamination was limited to a depth of 6 feet. In addition, the concentrations in these soils from above the water table were not high enough to indicate that they were acting as a continuing source to groundwater. The results of Phase I indicated that the former drum storage area could be a possible source of groundwater contamination.

During Phase II, six additional soil borings were drilled in the former drum storage area. Two of the borings (B-9 and B-10) drilled in the drum storage area were chosen based on soil gas survey results. These two borings were completed to a depth of 45 feet. The remaining four were chosen to define the horizontal extent of contamination detected during the drilling of B-10. These four borings were completed above the water table to a depth of 14 feet in the area where most of the contamination was detected in B-10. The results showed that the drum storage area contains VOCs, primarily PCE and xylene, to a depth of approximately 12 feet below grade. The highest concentration of PCE was detected in this area at B-10 with a concentration of 67 ppm. Xylene was also detected at the same location at 66 ppm. The only metals which were detected above background levels were barium and copper. The complete results of subsurface sampling can be found in Table 6. The high levels of VOCs indicate that the former drum storage area is acting as a continuing source to groundwater contamination.

3. Dry Well Sediments

Seven dry wells are located on the Site (designated DW-A through DW-F with two wells located at DW-B – see Figure 2), some of which were used for disposal of organic solvents. Currently only wells DW-B, DW-E and
DW-F are used by SHI. The piping configuration can be seen in Figure 7. DW-A was used for the disposal of solvents. Floor drains on the first floor were directed to DW-A in the past but are no longer connected to the dry well. Therefore any continuing source to DW-A from inside the SHI building has been cut off. DW-B was installed in 1983 and is still used for the purpose of collecting roof runoff and coolant water. DW-C, DW-D, DW-E and DW-F were also all utilized for solvent disposal. Drywell DW-C was an overflow well for DW-D. Currently, DW-E and DW-F handle wastewater from lavatories.

Sediment samples were obtained from the soil or sludge in DW-A, DWC, DW-D, DW-E and DW-F during both Phases. The samples were obtained from depths of 6 inches and 2 feet. DW-B was not sampled since it was not used for solvent disposal. The sludge from DW-A showed concentrations of PCE and TCE at 2.1 ppm and 2.5 ppm, respectively. However, the sludge and sediment collected below the sludge (down to 2 feet) had no plume constituents present. PCE, the only organic compound detected in DW-C sludge and soil, was present at a maximum concentration of 6.9 ppm in the sludge and 1.1 ppm in a composite sample of upper sludge sediments and underlying soil. In addition DW-C had a high concentration of PCE at 1100 ppm detected at a depth of 2 feet. DW-D also had a high concentration of TCE at 820 ppm detected at a depth of 2 feet.

The results of both phases showed that DW-D contained sludge with TCE at concentrations up to 27 ppm. This dry well also contained elevated levels of VOCs including toluene, xylene and ethylbenzene. The concentrations of solvents in the soil which underlies the sludge were lower than concentrations in the sludge. For example, the concentration of PCE at 6 inches and 2 feet are 9100 ppm and 160 ppm respectively. This indicates that portions of the sludge are acting as the source to underlying soils and groundwater, although significant concentrations are not being retained by the soil. None of the primary plume constituents were detected in either the sludge or the underlying soil of DW-E. The only constituent detected in this dry well was 2.3 ppm of toluene in the upper 6 inches of the sludge. The presence of toluene is suspected to be related to current activities. Low levels of the primary (PCE, TCA and TCA) or secondary (1,1-DCE, 1,1-DCA and 1,2-DCE) plume constituents were detected in the sludge or soil of DW-F. However, elevated levels of Freon 113, toluene, methylene chloride, xylene, ethylbenzene and 2-butanone were detected in the sludge. Freon 113 was present at a maximum concentration of 230 ppm and toluene was found at 27 ppm. The underlying soil was generally clean. The studies show that the sludge in DW-D and DW-C are contributing the primary and secondary plume constituents to the groundwater and DW-F contains elevated concentrations of other compounds which are contributing to the groundwater contamination. Copper, lead, nickel and zinc were the only inorganics that exceeded background levels in the dry wells.

4. Surface Water and Sediment

The only stream in the area is Ligonee Brook, which is an intermittent stream, originates in Long Pond, located to the southeast of the Site. The brook and the groundwater flow in a north-westerly direction and discharge into an inlet of Sag Harbor Cove. Very little overland flow occurs; however that which does occur discharges into Sag Harbor Cove, Ligonee Brook, Lily Pond and the on-site pond which can be seen in Figure 2. Ligonee Brook is a freshwater stream that is sometimes intermittent. Sag Harbor Cove is a salt water body connected to Peconic Bay.

On Carrol Street, there is a catch basin/dry well which collects storm-water run-off. This catch basin is located directly across from well cluster MW-43 and adds to the recharge rate in the nearby vicinity during periods of intense storms. Storm-water runoff collected on the roof of the SHI building is diverted through gutters and storm drains to DW-B located along the southeast side of the building.

Sediment and surface water samples were collected from 5 locations along Ligonee Brook and Sag Harbor Cove as shown in Figure 5. In addition, sediment samples were collected from 3 locations from the on-site pond as shown in Figure 6. All sediment samples were collected in the top 6 inches of the sample location.

The sediment results for the Brook and the Cove exhibited contamination at locations where VOC contaminated groundwater discharges at sediment sampling locations SD-3 and SD-4. The volatile organic contamination included 1,1-DCA, 1,2-DCE, 1,1,1-TCA, TCE and PCE. The concentration of PCE was the highest at 87 ppb at location SD-4. Organic contaminants were not present in sediments from upstream locations. All detected inorganics were present at concentrations indicative of naturally-occurring background levels. The surface water sampling results reflected the results of the sediment samples in that the most significant VOC
contamination was where the plume discharges to the Cove at locations SW-4 and SW-3. Concentrations of PCE, TCE and 1,1,1-TCA reach 30 ppb at SW-4 and diminish to levels less than 4 ppb at SW-5. However, none of these levels exceed ambient water quality criteria. All the concentrations of inorganic compounds in the Brook and Cove were within Federal freshwater and saltwater aquatic guidelines. A summary of the complete results of the sediment and surface water sampling for the Brook and the Cove can be found in Table 3 and Table 4.

The only organic compound detected in the on-site pond sediments occurred at sample location 3 where ethylbenzene was detected at 2 ppb which is below its MCL. All of the detected inorganics, except antimony, were identified at concentrations comparable to those of background samples. Antimony was detected at a concentration of 1300 ppb.

VI. SUMMARY OF SITE RISKS

Human Health Assessment

EPA conducted a baseline Risk Assessment of the potential risks to human health and the environment associated with the Rowe Industries Site in its current state. The Risk Assessment focused on contaminants in the groundwater, soil, and surface water and sediments which are likely to pose a significant risks to human health and the environment. The summary of the contaminants of concern (COCs) in the sampled matrices is listed in Table 7.

EPA's Risk Assessment addressed the potential risks to human health by identifying several pathways by which the public may be exposed to contaminant releases at the Site under current and future land use conditions. A summary of the exposure scenarios can be found in Table 8.

EPA’s Risk Assessment addressed the potential risks to human health by identifying several pathways by which the public may be exposed to contaminant releases at the Site under current and future land use conditions. A summary of the exposure scenarios can be found in Table 8.

Demographics and land use were evaluated in assessing present and potential future populations which live, work, or otherwise spend time at or in the area of the Site. The purpose of this analysis was to assess the likelihood of various groups, including sensitive populations, becoming exposed to Site contaminants.

An undetermined number of people work at the SHI facility. Surrounding properties are primarily residential. The immediate Site vicinity is rural, however, a dense population center is located approximately 0.75 miles north of the Site. General public access to the SHI facility is currently restricted by a chain link fence, but area youths may trespass on the facility itself. As a result, the possible exposure of facility employees, maintenance workers, and utility workers needed to be considered along with residents and their youth. Therefore the following exposure scenarios were developed:

- ingestion of groundwater by residents (future use);
- inhalation of contaminants volatilized from groundwater when residents shower (future use);
- ingestion of surface soils by onsite residents (future use);
- incidental ingestion of subsurface soils by excavation workers (future use);
- incidental ingestion of subsurface soils by utility workers (present and future uses);
- ingestion of sediments from Ligonee Brook by local residents (present and future uses); and
- incidental ingestion of dry well sediments by utility workers (present use).

Under current EPA guidelines, the likelihood of carcinogenic (cancer causing) and non-carcinogenic effects due to exposure to site chemicals are considered separately. It was assumed that the toxic effects of the site-related chemicals would be additive. Thus, carcinogenic and non-carcinogenic risks associated with exposures to individual compounds of concern were added to indicate the potential risks associated with mixtures of potential carcinogens and non-carcinogens, respectively.
Potential carcinogenic risks were evaluated using the cancer slope factors (SFs) developed by EPA for the chemicals of potential concern. SFs have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor (CRAVE) for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. SFs, which are expressed in units of (mg/kg-day)[−1], are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes the underestimation of the risk highly unlikely. The SF for each COC is presented in Table 9.

For known or suspected carcinogens, EPA considers excess upper bound individual lifetime cancer risks of between 10[−4] to 10[−6] to be acceptable. This level indicates that an individual has not greater than a one in ten thousand to one in a million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year period under specific exposure conditions at the site. The total cancer risks for each receptor at the Rowe Site are outlined in Table 10-A. Media specific cancer risk estimates are listed in Table 10-B. The total cancer risk for an on-site resident is 7 x10[−3], primarily based on ingesting untreated groundwater containing PCE from the Upper Glacial aquifer in the vicinity of the Site. This means that, as a plausible upper bound, as individual has an additional 7 in 1000 chance of developing cancer as a result of Site-related exposures under the specific exposure conditions presented at the Site. In addition, MCLs are currently exceeded for several hazardous substances in groundwater.

Non-carcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and safe levels of intake, or Reference Doses (RfDs). RfDs have been developed by EPA for indicating the potential for adverse health effects. RfDs, which are expressed in units of mg/kg-day, are estimates of daily exposure levels for humans which are thought to be safe over a lifetime (including sensitive individuals). The RfDs for the chemicals of potential concern at the Rowe site are presented in Table 9. Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) are compared with the RfD to derive the hazard quotient for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds across all media that impact a common receptor.

An HI greater than 1 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

A receptor-specific summary of the non-carcinogenic risks associated with the chemicals of potential concern across various exposure pathways is found in Table 11-A. It can be seen from Tables 11-A and 11-B that the greatest non-carcinogenic risk from the Site is associated with ingestion of Upper Glacial aquifer water by residents. The hazard index associated with ingestion of groundwater was estimated to be 43. The non-carcinogenic effects exceed 1.0 due primarily to the presence of PCE, antimony, and iron. The hazard index for soil was calculated to be less than 1.0 except for ingestion of subsurface soils in the drum storage area and surface soils. The summary of surface soil sampling results which were used to determine the hazard index for ingestion of soils can be found in Table 5. Although the risks posed by ingestion of soils in the former drum storage area and the ingestion of sludge and underlying soils associated with the dry wells are within the range generally considered acceptable by EPA, contamination in these areas, if not addressed will likely continue to contribute to further contamination of groundwater at the Site.

Ecological Assessment

Information from the RI report, site visits and literature were used to characterize species present in the vicinity. Information on endangered, threatened, and special concern species was obtained from the New York Natural Heritage Program. The tiger salamander was the only identified, threatened, or rare animal that could potentially frequent the site vicinity. The species uses coastal plain ponds as breeding grounds. Exposure to arsenic, copper, chromium, lead, magnesium and zinc in soils can potentially cause sublethal effects in wildlife. Chromium is the only contaminant in Ligonee Brook surface water that may present a hazard to aquatic life. However, exposures will be limited since the streambed is frequently dry.

UNCERTAINTIES
The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include: environmental chemistry sampling and analysis - environmental parameter measurement - fate and transport modeling - exposure parameter estimation - toxicological data

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

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

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

A specific uncertainty inherent in the risk assessment process is that the methodology used to calculate the site risks are site-wide averages, which give a clear overall understanding of site risks.

Therefore, actual or threatened releases of hazardous substances from this site, if not addressed by the selected alternative or one of the other remedial measures considered, may present an imminent and substantial endangerment to the public health, welfare, and the environment. More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the Risk Assessment which can be found in the Administrative Record.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs) and risk-based levels established in the risk assessment.

Specific remedial action objectives for this Site include:

Groundwater - Restoration of groundwater quality to its intended use of potential drinking water by reducing contaminant levels to State and Federal drinking water standards (see Table 12).

Soil - Excavation of contaminated soil to the recommended soil cleanup objectives will be performed in order for the soil not to be a contributor to groundwater contamination by VOCs (see Table 13).

VII. DESCRIPTION OF REMEDIAL ALTERNATIVES

A feasibility study was conducted to develop and evaluate remedial alternatives at the Rowe Industries Site. Remedial alternatives were assembled from applicable remedial technology process options and were initially evaluated for effectiveness, implementability, and cost. The alternatives meeting these criteria were then evaluated and compared to nine criteria required by the NCP. Two media-specific remedial actions are required to protect human health and the environment because of the nature of the contamination at the Site. They are numbered to correspond with their presentation in the FS report. On-site soil in the former drum storage area and certain dry wells (DW-C, DW-D, and DW-F) have been determined to be a source of groundwater contamination. Contaminants were found to move from the unsaturated soil to the groundwater. Once in the groundwater, the contaminants, under the influence of the groundwater gradient, migrate from the facility to potential
CERCLA requires that each selected site remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions, alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

This Record of Decision evaluates, in detail, nine remedial alternatives for addressing the contamination associated with the Rowe Industries Site. The time to implement reflects only the time required to construct or implement the remedy and does not include the time required to negotiate with responsible parties, procure contracts for design and construction or design the remedy.

The alternatives identified for both soil and groundwater are presented below:

**Soil Remediation Alternatives:**

**Alternative 1: No Action**

EPA considered the "No Action" alternative for soils and dry well sludge to provide a baseline of comparison among soil alternatives. Under this alternative, the contaminated soil would be left in place without treatment. In accordance with Section 121 of CERCLA, remedial actions that leave hazardous substances at the Site are to be reviewed at least once every five years to assure that the remedial action is protective of human health and the environment. The No Action alternative must be reviewed by EPA at least every five years.

- **Capital cost:** $0
- **Annual Operation & Maintenance:** $0
- **30-year Present Worth:** $0
- **Time to Implement:** None

**Alternative 2- Deed Notation, Physical Restrictions and Monitoring**

This alternative involves obtaining deed notations in compliance with the appropriate regulatory agencies, fencing with warning signs around the former drum storage area and periodic soil sampling and analysis.

The deed notations would indicate that the land contains hazardous substances. A survey plot and record of the location and quantity of VOCs would be filed at the repositories.

The drum storage area would be secured by installing a 6 foot high industrial grade chain link fence and posting warning signs stating that the area contains hazardous substances. In addition, soil sampling and analysis for VOCs in the former drum storage area and dry wells DW-C, DW-D, DW-F would be conducted semiannually for ten years. After the first ten years, the need for further soil monitoring would be evaluated. EPA would review the Site every five years.

- **Capital cost:** $40,000
- **Annual Operation & Maintenance:** $16,000
- **30 year Present Worth:** $281,000
Alternative 3 – Capping, Excavation and Off-Site Disposal, Deed Restrictions, Physical Restrictions and Periodic Monitoring

This alternative consists of capping the 20 foot by 20 foot drum storage area according to federal specifications, excavation and off-site disposal of sludge and underlying soil from dry wells DW-C, DW-D, and DW-F, deed notations, physical restrictions, such as fencing with warning signs, and semiannual ground-water monitoring and analysis.

A cap is cover material placed over contaminated material designed to prevent infiltration of water. The cap itself would be designed to conform with federal Resource Conservation and Recovery Act (RCRA) requirements. It would occupy a 45-by-45-foot area, which would include a 2.5-foot wide perimeter infiltration trench. The cap would consist of the following layers above the compacted soil: a geocomposite membrane liner, a 40-mil high density polyethylene (HDPE) liner, 12 inches of masons sand, a geotextile membrane filter, 12 inches of sandy loam and 6-12 inches of loose topsoil. The liners would act as impermeable seals. The masons sand would allow water to seep into the infiltration trench. The geotextile membrane filter would separate the masons sand and sandy loam while allowing water to pass through. The sandy loam would provide a base for the topsoil and protect the liners.

The soil beneath the cap would be sloped to direct water away from the center of the cap and into the surrounding trench. The water would then travel from the trench into a 6-inch pipe to a nearby pond.

In addition, 135 cubic yards of contaminated sludge and underlying soils associated with dry wells DW-C, DW-D, and DW-F would be excavated and transported off-site to a RCRA permitted landfill. However, to comply with RCRA Land Disposal Restrictions (LDR) regulations, it is expected to be necessary to treat the soils before disposal. The LDR sets treatment standards which are based on the best demonstrated available technology (BDAT) for treatment of a given waste. In the case of VOCs in soil, the BDAT treatment method is generally incineration. During the remedial design phase of this project, EPA will determine whether incineration is necessary to meet the LDR regulations. Incineration would produce a dry ash material which may require further RCRA-permitted disposal to protect the environment. In addition, confirmatory monitoring would be performed to ensure that soils with concentrations above Site cleanup objectives have been excavated.

Semiannual inspections would be performed to inspect the cap, the fence and the drainage channels. In addition groundwater would be sampled semiannually from the three wells in the immediate vicinity of the cap. EPA would review the Site every five years.

A range of costs is presented for this alternative. The low end of the range assumes that treatment is not required to meet LDR restrictions. The high end of the range assumes incineration of all excavated soils is required to meet LDRs.

Capital cost: $277,000 - $452,000
Annual Operation & Maintenance: $7,000
30 year Present Worth: $441,000 - $616,000

Time to Implement: 6 Months
Remedial Action: 30 Years

Alternative 4 – Soil Vapor Extraction in the Drum Storage Area and Excavation and Off-Site Disposal at a RCRA-Permitted Landfill

Soil vapor extraction would involve the installation of vents in the contaminated unsaturated soil zone in the drum disposal area. A vacuum would be applied through these vents to volatilize and extract organic compounds from the soil. The organic vapors would be drawn into a collection system and subsequently treated...
with an activated carbon off-gas treatment system. Circulation of air through the soil also would enhance the biodegradation of semi-volatiles in the unsaturated zone.

A small amount of liquid condensate would be generated during the vapor extraction process. With an on-site groundwater treatment alternative operating in conjunction with groundwater remediation, the condensate could be treated on-site at minimal cost. Off-site disposal of condensate would be necessary if this alternative was implemented before a groundwater treatment system was constructed.

Under this alternative, approximately 230 cubic yards of contaminated soil would be treated until no more VOCs could be effectively removed from the unsaturated soil zone. Subsurface soil sampling would be required to monitor the progress of the soil vapor extraction process.

In addition, 135 cubic yards of contaminated sludge and underlying soils associated with dry wells DW-C, DW-D, and DW-F would be excavated and transported off-site to a RCRA permitted landfill. However, to comply with RCRA LDR regulations, it may be necessary to treat the soils before disposal as described under Alternative 3. The total cost of this remedy includes the cost of the excavation and off-site disposal of the dry wells shown under Alternative 3.

A range of costs is presented for this alternative. The low end of the range assumes that treatment is not required to meet LDR restrictions. The high end of the range assumes incineration of all excavated soils is required to meet LDRs.

In addition, confirmatory monitoring would be performed to ensure that soils with concentrations above Site cleanup objectives have been excavated.

**Capital cost:** $257,000 - $432,000
**Annual Operation & Maintenance:** $37,000
**30 year Present Worth:** $436,000 - $650,000
**Time to Implement:** 6 Months
**Remedial Action:** 30 Years

**Alternative 5 - Excavation and Off-site Disposal at a RCRA Permitted Landfill**

This alternative includes excavation of contaminated soils in the drum storage area and contaminated sludges and underlying soils associated with dry wells DW-C, DW-D, and DW-F. A total of 365 cubic yards of soil contaminated with volatile organic and semi-volatile organic compounds would be excavated, and the excavated soil would be disposed off-site at a RCRA-permitted landfill.

However, to comply with RCRA LDRs, it may be necessary to treat the soils before disposal as described under Alternative 3.

A range of costs is presented for this alternative. The low end of the range assumes that treatment is not required to meet LDR restrictions. The high end of the range assumes incineration of all excavated soils is required to meet LDRs.

In addition, confirmatory monitoring would be performed to ensure that soils with concentrations above Site cleanup objectives have been excavated.

**Capital cost:** $465,000 - $939,000
**Annual Operation & Maintenance:** $0
**Present Worth:** $465,000 - $939,000
Time to Implement: 1-2 months

Groundwater Treatment Alternatives:

All of the remedial groundwater alternatives, except the No Action alternative and Alternative 2, involve extraction, treatment and discharge of the treated water to the surface water. The contaminated groundwater is recovered using extraction wells within the contaminant plume. The extracted groundwater is treated and then discharged to a downgradient body of surface water.

The ultimate goal of the EPA Superfund Program’s approach to groundwater remediation as stated in the NCP (40 CFR Part 300) is to return usable groundwater to its beneficial use within a time frame that is reasonable. Therefore, for this aquifer, which is classified by New York State as IIB (drinking water aquifer), the final remediation goals will be federal and state drinking water standards. Recent studies have indicated that pumping and treatment technologies have inherent uncertainties in achieving the ppb concentrations required under ARARs for groundwater over a reasonable period of time. However, these studies also indicate significant decreases in contaminant concentrations early in the system implementation, followed by a leveling out. For these reasons, the selected groundwater treatment alternative stipulates contingency measures, whereby the groundwater extraction and treatment system’s performance will be monitored on a regular basis and adjusted as warranted by the performance data collected during operation. Modifications may include any or all of the following:

a) at individual wells where cleanup goals have been attained, discontinue pumping;
b) alternating pumping at wells to eliminate stagnation points;
c) pulse pumping to allow aquifer equilibration and to allow adsorbed contaminants to partition into groundwater; and
d) installation of additional extraction wells to facilitate or accelerate cleanup of the contaminant plume.

If it is determined, on the basis of the preceding criteria and the system performance data, that certain portions of the aquifer cannot be restored to their beneficial use in a reasonable time, all or some of the following measures involving long-term management may occur, for an indefinite period of time, as a modification of the existing system:

a) engineering controls such as physical barriers, source control measures, or long-term gradient control provided by low level pumping, as containment measures;
b) waiving chemical-specific ARARs for the cleanup of those portions of the aquifer based on the technical impracticability of achieving further contaminant reduction;
c) recommending institutional controls, in the form of local zoning ordinances, be implemented and maintained to restrict access to those portions of the aquifer which remain above remediation goals;
d) continued monitoring of specified wells; and
e) periodic reevaluation of remedial technologies for groundwater restoration.

The decision to invoke any or all of these measures may be made during a periodic review of the remedial action, which will occur at intervals of no less often than every five years.

Groundwater Remediation Alternatives

Alternative 1: No Action

EPA considers the "No Action" alternative for groundwater to provide a baseline of comparison among groundwater alternatives. Under this alternative, no groundwater remedial activity would take place at the
Site. Alternative 1 relies on natural processes in the groundwater to reduce VOC levels in the aquifer. In accordance with Section 121 of CERCLA, the No Action alternative would be reviewed by EPA at least every five years.

Capital cost: $0  
Annual Operation & Maintenance: $0  
30 year Present Worth: $0  
Time to Implement: None

Alternative 2- Deed Notations with Monitoring

This alternative involves obtaining deed notations to limit the land use activities at the Site as well as periodic groundwater monitoring to track the movement and concentrations of the VOCs. No active groundwater remediation (e.g., groundwater extraction and treatment) would be undertaken. Annual sampling of 19 monitoring wells would provide an assessment of the extent and mobility of the VOCs. Monitoring would be conducted at eight of the monitoring wells located on the SHI property, seven of the monitoring wells located within the extent of the VOC plume, and four additional monitoring wells to be located downgradient of the plume. Samples would be collected annually and analyzed to determine the compounds present and their concentrations. Two potential monitoring schemes were evaluated. Groundwater would be monitored for five years at which time EPA would re-evaluate the groundwater quality and determine the need for active groundwater extraction and treatment. Alternatively, groundwater could be monitored until contaminants are flushed out naturally through continued groundwater flow. Under this option, groundwater would be monitored for a minimum of 30 years. EPA would review the Site every five years. The following costs are for 30 years of monitoring.

Capital cost: $39,000  
Annual Operation & Maintenance: $26,000  
30 year Present Worth: $485,000  
Time to Implement: None  
Remedial Action: 30 Years

Alternative 3- Groundwater Extraction & Treatment with Discharge to Ligonee Brook

This alternative includes pumping and treating contaminated groundwater, discharging the treated water to Ligonee Brook, and groundwater monitoring. Based on groundwater modelling, this alternative was evaluated at two flow rates, each flow rate targeted to a different level of groundwater remediation. Alternative 3-I is evaluated assuming that 150 gallons per minute (gpm) is pumped from four recovery wells located on the SHI facility property. Based on this assumption, modelling shows that it would take approximately five years to remediate the plume located on the SHI property to meet cleanup goals. The remainder of the plume would disperse in approximately 20 years.

Alternative 3-II is evaluated assuming that a total of 600 gpm is pumped from seven recovery wells on and off the facility property throughout the groundwater plume. Based on this assumption, after 10 years a large portion of the plume would be remediated, and in 15 years the entire plume would be remediated to cleanup goals.

Under both Alternatives 3-I and 3-II, contaminated groundwater would be pumped from designated recovery wells and treated to remove iron, manganese, and VOCs. Sampling of the extraction wells would be performed to determine whether chromium and lead treatment should be included in the remedial action. After treatment to remove iron and manganese, the water would flow, under pressure, through a sediment filter and then to a packed tower for air stripping. The air stripper would remove the VOCs from the water through
volatilization. The treated water from the tower would be pumped and discharged to Ligonee Brook. The discharge would be sampled as necessary to comply with State Pollutant Discharge Elimination System (SPDES) permit requirements.

Vapors from the packed tower would be treated, if necessary, to comply with air emissions requirements and then released to the atmosphere.

EPA would review the Site every five years.

**Capital cost:**
- 3-I $874,000
- 3-II $1,298,000

**Annual Operation & Maintenance:**
- 3-I $180,000
- 3-II $254,000

**Present Worth:**
- 3-I $3,646,000
- 3-II $5,206,000

**Time to Implement:**
- Construction: 18 months
- Remedial Action: 3-I -20 years
  
- 3-II -15 years

Alternative 4 - Groundwater Extraction & Treatment with Discharge to Sag Harbor Cove

The only difference between Alternative 3 and Alternative 4 is the point of discharge for treated groundwater. The point of discharge for this alternative would be Sag Harbor Cove. EPA would review the Site every five years.

**Capital cost:**
- 4-I $941,000
- 4-II $1,341,000

**Annual Operation & Maintenance:**
- 4-I $180,000
- 4-II $254,000

**Present Worth:**
- 4-I $3,713,000
- 4-II $5,248,000

**Time to Implement:**
- Construction: 18 months
- Remedial Action: 4-I -20 years
- 4-II -15 years

VIII. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In accordance with the NCP, a detailed analysis of each alternative is performed. The purpose of the detailed analysis is to assess objectively the alternatives with respect to nine evaluation criteria that encompass statutory requirements and include other gauges of the overall feasibility and acceptability of remedial alternatives. This analysis is comprised of an individual assessment of the alternatives against each criterion and a comparative analysis designed to determine the relative performance of the alternatives and identify major trade-offs, that is, relative advantages and disadvantages, among them.

The nine evaluation criteria against which the alternatives are evaluated are as follows:

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

1. **Overall Protection of Human Health and the Environment:**
   This criterion addresses whether or not a remedy provides adequate protection and describes how risks are
eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with ARARs:
This criterion addresses whether or not a remedy will meet all the ARARs of other federal or State environmental statutes and/or provide grounds for invoking a waiver.

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

3. Long-term Effectiveness and Permanence:
This criterion refers to the ability of the remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

4. Reduction of Toxicity, Mobility, or Volume:
This criterion addresses the degree to which a remedy utilizes treatment technologies to reduce the toxicity, mobility, or volume of contaminants.

5. Short-term Effectiveness:
This criterion considers the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are met.

6. Implementability:
This criterion examines the technical and administrative feasibility of a remedy, including availability of materials and services needed to implement the remedy.

7. Cost:
This criterion includes capital and O&M costs and the present-worth costs.

Modifying Criteria - The final two criteria are regarded as "modifying criteria," and are to be taken into account after the previous criteria have been evaluated. They are generally to be focused upon after the public comment period.

8. State Acceptance:
This criterion indicates whether, based on its review of the FS and Proposed Plan, the State concurs with, opposes, or has no comment on the proposed alternative.

9. Community Acceptance:
This criterion indicates whether, based on its review of the FS and Proposed Plan, the public concurs with, opposes, or has no comment on the proposed alternative. Comments received during this public comment period, and the EPA's responses to those comments, are summarized in the Responsiveness Summary which is appended to this ROD.

The following is a summary of the comparison of each alternative's strengths and weaknesses with respect to the nine evaluation criteria.

1. Overall Protection of Human Health and the Environment

Soil Remediation Alternatives

Contaminated soils represent a continuing source of groundwater contamination. In addition, groundwater poses an unacceptable risk to human health in future use scenarios.

Alternatives 1 and 2 are not protective of human health or the environment because contaminants will continue to leach to groundwater. It has been estimated that leaching will result in groundwater concentrations that exceed ARARs for 30 years or more.
Alternative 3, which includes capping in the former drum storage area and excavation of the dry wells, provides for some protection of human health by minimizing infiltration and reducing leachate generation. Alternative 4 is more protective of human health and the environment because it removes the VOCs from the soil. In addition, the circulation of air from the soil vapor extraction system also enhances the biodegradation of semi-volatiles. Alternative 5 is the most protective because it ensures that all the contaminated soil and any residual contamination will be completely removed from the Site.

Groundwater Remediation Alternatives

All the groundwater alternatives, except Alternatives 1 and 2, are considered protective of human health. Deed restrictions rely heavily upon institutional controls for effectiveness. The time period for natural attenuation has been estimated to be 30 years, if a source control alternative is implemented. Alternatives 3-I and 4-I are less protective than Alternatives 3-II and 4-II since they actively treat only a portion of the plume and leave the rest of the plume, located downgradient of the SH1 property, subject to natural attenuation only.

2. Compliance With Applicable or Relevant and Appropriate Requirements (ARARs)

Soil Remediation Alternatives

No federal or state chemical-specific ARARs exist for soils. However, EPA and NYSDEC have generated soil cleanup objectives (see Table 13) to restrict the concentration of compounds in the soil to a level which would ensure that contaminants in soil do not further contaminate groundwater.

EPA has determined that, based on available information, certain actions taken with respect to the contaminated soil at the site must comply with applicable RCRA Land Disposal Restrictions (LDR) requirements. The LDRs place restrictions on the land disposal of any RCRA hazardous wastes. Because soil remediation alternatives 3, 4, and 5 involve the excavation and placement of contaminated soil and because EPA believes that such soil contains RCRA listed hazardous wastes, these alternatives must comply with RCRA LDR requirements. Soil remediation alternatives 3, 4, and 5 include the excavation and off-site disposal of 135 - 365 cubic yards of soil contaminated with spent solvents which were used in degreasing operations at the Site. EPA believes that these soils are contaminated with listed RCRA wastes, known as F001 wastes. The RCRA LDRs require that F001 wastes and soils which contain them comply with certain concentration requirements prior to being land disposed. These concentrations requirements are expressed in terms of the toxic characteristic leaching procedure (TCLP) analysis which measures concentration levels in the waste extract as a result of the TCLP test (see 40 CFR Part 268, Appendix I). The TCLP concentration requirements for F001 wastes include the following requirements for chemicals at the Rowe Site:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Concentration in TCLP Extract (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylbenzene</td>
<td>0.053</td>
</tr>
<tr>
<td>Methylene Chloride</td>
<td>0.96</td>
</tr>
<tr>
<td>PCE</td>
<td>0.05</td>
</tr>
<tr>
<td>Toluene</td>
<td>0.33</td>
</tr>
<tr>
<td>1,1,1 TCA</td>
<td>0.41</td>
</tr>
<tr>
<td>TCE</td>
<td>0.091</td>
</tr>
<tr>
<td>Xylene</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Therefore, in compliance with the LDR requirements, the soils to be excavated in soil remediation Alternatives 3, 4 and 5 would be analyzed using the TCLP analysis. If the extract concentrations for these soils are higher than those listed above, the soils would be treated (either by incineration or an alternative technology) to meet the TCLP concentrations above. Once the TCLP concentrations have been met, the soils would be disposed of in a RCRA-permitted landfill.

Groundwater Remediation Alternatives
Since the groundwater underlying the Site is a potential future water supply source, Federal MCLS and State Groundwater Quality Standards (whichever are more stringent) and non-zero MCL Goals are ARARs. Therefore, pumping of the groundwater would continue until levels in the aquifer are at or below ARARs. Alternatives 3 and 4 are designed to achieve these ARARs in a timeframe of 15-20 years. It is possible that Alternative 2 might potentially meet MCLs through the flushing processes associated with natural groundwater flow. However, all of these groundwater restoration timeframes are based on a computer model designed to predict environmental conditions, and the actual restoration timeframes may be longer or shorter than those predicted by this model. EPA believes that it would require a long period of time (greater than 20 years) to meet MCLs through natural attenuation. Therefore, EPA does not consider that Alternative 2 would meet MCLs in a timely manner.

Under Alternatives 3 and 4, treated groundwater would be directly discharged into surface water. Therefore, the requirements of the SPDES Program are ARARs and must be met. Any discharges made to Ligonie Brook or Sag Harbor Cove will be in compliance with SPDES requirements. Ligonie Brook is a fresh water intermittent stream and Sag Harbor Cove is a salt water body. Therefore discharging to the Cove will be more feasible for two reasons. One reason is the fact that periodically the Brook is dry and therefore the effluent discharge quality would have to be the fresh water, water quality criteria. The second reason is that since the Cove is a salt water body the SPDES requirements will be easier to achieve because salt water quality criteria are less stringent than fresh water quality. For the alternatives that include pumping and treating the groundwater, air emission treatment, if necessary, will be installed to meet 6NYCRR Parts 200,201, and 212 regulations and New York State Air Guide.

3. Long-term Effectiveness

Soil Remediation Alternatives

Alternative 1 results in groundwater contamination that exceeds MCLs for the groundwater contaminants of concern for over 30 years. Alternative 2 offers a lesser degree of long-term effectiveness since the likelihood of adequately enforcing deed notations and physical restrictions cannot be guaranteed.

Alternative 3 would offer a lesser degree of long-term effectiveness by eliminating the exposure pathway but diligent maintenance of the cap and long term monitoring would be required to be fully effective. Additionally, Alternative 3 does not fully eliminate the possibility of contaminated soil acting as a source of groundwater contamination if horizontal flow is present within some portion of the lower 12 feet of contaminated soil.

Alternatives 4 and 5 would offer the greatest degree of long-term effectiveness by reducing the contaminants to below the previously stated soil cleanup objectives.

Groundwater Remediation Alternatives

Alternatives 1 and 2 are effective as long as the groundwater is not used as a potable water supply, but do not actively address the degraded condition of the aquifer. Alternative 2 offers a lesser degree of long-term effectiveness since the likelihood of adequately enforcing deed notations and well permitting restrictions cannot be guaranteed. Alternatives 3 and 4 provide for active extraction systems which will remove the contaminated plume. The active treatment and extraction alternatives provide for more reliable protection by meeting groundwater clean-up goals. However, Alternatives 3-I and 4-I are less protective than Alternatives 3-II and 4-II since they only actively treat the portion of the plume located on the SHI property and leave the remainder of the plume subject to natural attenuation only.

4. Reduction of Toxicity, Mobility, or Volume

Soil Remediation Alternatives

Alternatives 1 and 2 do not utilize treatment to reduce the toxicity, mobility or volume of contaminants. Alternative 3 would not employ treatment of the drum storage area but could reduce the mobility of the contaminants by preventing vertical infiltration that may carry contaminants into the groundwater.
Alternatives 4 and 5 best meet this criterion because they would reduce the toxicity and volume of contaminants by removing the VOCs through the use of soil vapor extraction or excavation and treatment.

Groundwater Remediation Alternatives

Alternatives 1 and 2 would not reduce the toxicity, mobility, or volume of any contaminants through treatment.

Alternatives 3 and 4 best meet this criterion since they would reduce the toxicity, mobility, and volume of contaminants in Site groundwater through treatment to remove volatile organic compounds.

5. Short-term Effectiveness

Soil Remediation Alternatives

Alternatives 1 and 2 would not involve any change to the existing Site conditions. Therefore, no short term impacts to human health are anticipated for either alternative. However, both alternatives would not achieve soil cleanup goals in any reasonable period of time.

Alternatives 3 through 5 involve activities such as drilling and excavation, however, the major components would have minimal short-term effects on the community during implementation, since they require very limited excavation of dry wells. These alternatives would have minor short-term effects on the surrounding community, including a slight increase in noise level from construction equipment, and possible fugitive dust emissions which could be minimized by the proper engineering procedure.

Alternatives 5 involves transportation of a greater volume of contaminated soil from the Site, and increases the potential risks to workers associated with dust generated during excavation and/or transportation. Potential risks to workers can be managed easily by procedures outlined in site specific health and safety plans.

Groundwater Remediation Alternatives

Groundwater Alternatives 3-I and 4-I are not as protective of human health and the environment as 3-II and 4-II because 3-I and 4-I do not actively address the downgradient portion of the plume and therefore require a longer period of time to achieve protection. All the active groundwater treatment Alternatives, 3-I, 3-II, 4-I and 4-II, involve little disturbance to contaminated subsurface areas, therefore the potential risks to Site workers are minor and can be easily managed. The potential short-term risks to human health and the environment are anticipated to be low for these alternatives.

6. Implementability

Soil Remediation Alternatives

All the alternatives are technically and administratively feasible. Alternatives 1 and 2 would be the easiest to implement. Alternatives 3, 4 and 5 depend on a RCRA-permitted landfill agreeing to accept the soil before it can be implemented. In addition, since the area of soil to be remediated is small, it would be difficult to obtain a vendor to implement Alternative 4, soil vapor extraction.

Groundwater Remediation Alternatives

All the alternatives are technically and administratively feasible. The treatment components of Alternatives 3 and 4 are known to be proven effective for all contaminants of concern and should be relatively easy to implement because they rely on well understood and readily available commercial equipment. Air stripping is a proven technology widely used in the removal of VOCs from groundwater.

7. Cost
Soil Remediation Alternatives

The present worth cost of the alternatives that provide for treatment and disposal of the soils ranges from approximately $616,000 (for capping of drum storage area and excavation of DW-D, DW-C & DW-F) to $939,000 (for excavation of drum storage area and DW-D, DW-C and DW-F). These totals include the cost of incineration of all excavated soils to meet LDRs.

Groundwater Remediation Alternatives

The present worth cost of the alternatives that provide treatment for groundwater range from a present worth of $3,646,000 (for extraction using four recovery wells and treatment with discharge to Ligonee Brook) to $5,248,00 (for extraction using seven recovery wells and treatment with discharge to the Cove). The greater costs of the selected remedy increase with the greater degree of protectiveness. Alternative 4-II is more protective than Alternatives 3-I and 4-I since it cleans up the entire plume.

8. State Acceptance

The State of New York concurs with the selected remedy.

9. Community Acceptance

In general, the local residents agreed with the selection of the remedy. Their main concern is the effects that discharging the treated groundwater to the Sag Harbor Cove may have on its ecosystem. All comments are addressed in the Responsiveness Summary which is appended to this ROD in Appendix 4.

IX. SELECTED REMEDY

Based on the results of the RI/FS and after careful consideration of all alternatives presented above, EPA recommends the following alternatives for cleaning up the contaminated soils and groundwater at the Rowe Industries Superfund Site: Soil Remediation Alternative 5: Soil Excavation and Disposal at a Chemical Waste Landfill in conjunction with Groundwater Remediation Alternative 4-II: Extraction/Air Stripping with Discharge to Sag Harbor Cove.

Specifically, the selected remedy will involve the following:

1) excavating and disposing of 365 cubic yards of soil at a RCRA permitted facility (soil will be treated to meet LDRs, if necessary);

2) monitoring to confirm that soils with concentrations above Site cleanup objectives have been excavated;

3) extraction and treatment of groundwater to meet federal and State drinking water MCLs in the aquifer (groundwater will be treated with air stripping with subsequent discharge to Sag Harbor Cove);

4) long-term groundwater monitoring to track the migration and concentrations of the contaminants of concern; and

5) re-evaluation of the Site at least once every five years to determine if a modification to the selected alternative is necessary as long as contaminants remain on-site above health-based levels.

The selected remedy is believed to provide the best balance of trade-offs among the alternatives with respect to the evaluation criteria. Based on the information available at this time, EPA believes the selected alternative will be protective of human health and the environment, comply with ARARs, be cost effective, and utilize permanent technologies to the maximum extent practicable. The alternative also treats the source of contamination (i.e., soils), meeting the statutory preference for a remedy that involves treatment as a principal element.

X. STATUTORY DETERMINATIONS
Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that achieve adequate protection of human health and the environment. In addition, Section 121 of the CERCLA establishes several other statutory requirements and preferences. These specify that, when complete, the selected remedial action for a site must comply with applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is justified. The selected remedy also must be cost effective and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. Finally, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the toxicity, mobility and volume of hazardous substances as their principal element. The following sections discuss how the selected remedy meets these statutory requirements.

1. Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment. Soils with concentrations of contaminants exceeding the recommended soil cleanup objectives will be excavated and disposed of in an off-site RCRA permitted landfill. Therefore the selected remedy for soils is also fully protective of human health and the environment because it removes a continuing threat to groundwater posed by the on-site contaminated soils and protects the sole source aquifer drinking water supply.

Groundwater remediation with the goal of achieving ARARs is also protective of human health and the environment. Although there is no current exposure pathway for groundwater use on the site, the pumping and treatment alternative attempts to restore a future potential drinking water source to drinking water standards. Prior to the contamination, this sole source aquifer was used as a private drinking water supply. Additionally, the alternative prevents any contamination from migrating to Sag Harbor Cove, the surface water body to which the contaminated aquifer discharges.

2. Compliance with Applicable or Relevant and Appropriate Requirements

At the completion of response actions, the selected remedy will have complied with the following major ARARs and considerations:

Chemical-specific ARARs:

Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) (40 CFR 141.11-141.16) and non-zero MCLGs, 6 NYCRR Groundwater Quality Regulations (Parts 703.5, 703.6, 703.7) and the NYS Sanitary code (10 NYCRR part 5) provide standards for toxic compounds for public drinking water supply systems. The groundwater will be pumped until the above-referenced standards are achieved in the aquifer.

No federal or state chemical-specific ARARs exist for soils. However, EPA and NYSDEC have generated soil cleanup objectives (see Table 13) to restrict the concentration of compounds in the soil to a level which would ensure that contaminants in soil do not further contaminate groundwater.

Action-specific ARARs:

The selected remedy which involves the pumping and treating of groundwater may require air emissions treatment. This treatment will be required to meet 6NYCRR Parts 200, 201 and 212 regulations and the New York State Air Guide. In addition, the extracted groundwater will be treated and discharged to Sag Harbor Cove in compliance with SPDES requirements.

EPA has determined that, based on available information, certain actions taken with respect to the contaminated soil at the site must comply with applicable RCRA Land Disposal Restrictions (LDR) requirements. The LDRs place restrictions on the land disposal of any RCRA hazardous wastes. Because the selected remedy for soil remediation, Alternative 5, involves the excavation and placement of contaminated soil, and because EPA believes that such soil contains RCRA listed hazardous wastes, this alternative must comply with RCRA LDR requirements. Soil remediation Alternative 5 is the excavation and off-site disposal of 365 cubic yards of soil contaminated with spent solvents which were used in degreasing operations at the Site. EPA believes that these soils are contaminated with listed RCRA wastes, known as F001 wastes. The RCRA LDRs require that...
F001 wastes and soils which contain them comply with certain concentration requirements prior to being land disposed. These concentrations requirements are expressed in terms of the toxic characteristic leaching procedure (TCLP) analysis which measures concentration levels in the waste extract as a result of the TCLP test (see 40 CFR Part 268, Appendix I). The TCLP concentration requirements for F001 wastes include the following requirements for chemicals at the Rowe Site:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Concentration in TCLP Extract (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylbenzene</td>
<td>0.053</td>
</tr>
<tr>
<td>Methylene Chloride</td>
<td>0.96</td>
</tr>
<tr>
<td>PCE</td>
<td>0.05</td>
</tr>
<tr>
<td>Toluene</td>
<td>0.33</td>
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<tr>
<td>1,1,1 TCA</td>
<td>0.41</td>
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<tr>
<td>TCE</td>
<td>0.091</td>
</tr>
<tr>
<td>Xylene</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Therefore, in compliance with the LDR requirements, the soils to be excavated will be analyzed using the TCLP analysis. If the extract concentrations for these soils are higher than those listed above, the soils will be treated (either by incineration or an alternative technology) to meet the TCLP concentrations above. Once the TCLP concentrations have been met, EPA would dispose of the soils in a RCRA-permitted compliant landfill.

Location-specific ARARs

Executive Order 11990 - "Protection of Wetlands" is an ARAR for this Site. Therefore, a wetland delineation will be completed during the early stages of the Remedial Design (RD) Process. If it is determined that remedial actions may adversely impact wetlands, a wetland functional values assessment will be completed and used to develop a Wetland Impact Mitigation Plan if necessary.

Executive Order 11988 - "Floodplain Management" is an ARAR for this Site. A floodplain assessment (with delineation of the 100 and 500 year flood contours) will be completed in the early stages of RD. This will ensure that the 500 year contour are protected against, and that the 500 year contour will be evaluated so that appropriate protective measures will be taken if necessary to address the potential effects of a flood event.

The Endangered Species Act is an ARAR for this site. If it is determined that there Federal Endangered/Threatened species, or their critical habitats are on or in the vicinity of the Site, actions will be taken to ensure that they are not adversely impacted by the remedial action.

The National Historic Preservation Act is applicable to the site. Accordingly, a Stage IA Cultural Resources Survey will be completed for the project area during the early stages of the RD. If the results of the Stage IA Survey suggest that further investigation is necessary, a Stage IB Survey will be completed for sensitive areas. If Cultural Resources are found and will be impacted by site actions, further actions will be necessary consistent with the National Historic Preservation Act.

3. Cost Effectiveness

The selected soil remedy is the most expensive. However, it provides the greatest overall protectiveness. Excavation of the contaminated soil with off-site disposal and treatment has a present worth cost of $939,000 and is more expensive than soil vapor extraction which offers the next highest level of protectiveness. However, the difficulty of finding a vendor to implement the technology for such a small 20' by 20' area makes it infeasible. Therefore Alternative 5 is the most cost effective. The $5,248,000, 30-year present worth cost associated with the selected groundwater remedy, Alternative 4-II is the most costly of all the groundwater treatment alternatives. The $5,248,000 cost associated with groundwater treatment is cost effective in that the remedy provides the greatest overall protectiveness as compared with the $3,646,00 and $3,713,000 cost associated with Alternatives 3-I and 4-I, respectively, which pump and treat a portion rather
than the entire plume which is not as protective as alternative 4-II.

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

The selected remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be utilized in a cost effective manner for the Site. After excavation is complete, the soil will no longer be contributing contaminants to the underlying aquifer.

The groundwater treatment used in the selected remedy will reduce the contaminants of concern to levels protective of human health. In addition, of those alternatives which are protective of human health and the environment and comply with ARARs, EPA has determined that the selected remedy provides the best balance of trade-offs in terms of the five balancing criteria: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. The modifying considerations of State and community acceptance were also taken into account in this determination.

The long-term effectiveness and permanence of the selected soil remedy is very high in that the contaminated soils would be removed and the contaminated areas restored. Groundwater treatment also offers long-term effectiveness and permanence in that the remedial goal is to achieve ARARs as rapidly as possible.

Reduction of toxicity, mobility, or volume is also evident in the selected remedy. The excavation of soils will effectively reduce the mobility of contaminants by eliminating this pathway as a continuing source to groundwater. The toxicity and volume of contaminated soil is also reduced. Groundwater treatment has the goal of reducing contaminant concentrations in the aquifer to meet ARARs, effectively diminishing both toxicity and volume.

The short-term effectiveness and implementability of the selected soil remedy is high in that it would be conducted in a short time and have minimal effects on the surrounding community. The short-term effectiveness and implementability of the groundwater treatment alternative is high in that there is no exposure to contaminated groundwater during implementation and the remedy employs standard equipment and well developed technologies. As stated above, the cost associated with the selected remedy is the least costly of each alternative that is protective of human health and the environment and provides for treatment of the most hazardous substances.

5. Preference for Treatment as a Principal Element

The statutory preference for treatment as a principal element is satisfied in the selected remedy for each medium. The soil excavation alternative may require treatment prior to disposal to comply with LDR standards. The groundwater treatment alternative requires treatment prior to discharge to comply with SPDES requirements and to achieve ARARs in the aquifer.

XI. DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Rowe Industries Site was released to the public on August 26, 1992. The Proposed Plan identified soil remediation Alternative 5 and groundwater remediation Alternative 4-II as the preferred alternative. EPA reviewed all comments submitted. Upon review of the comments, it was determined that no significant changes to the preferred remedy, as it was originally identified in the Proposed Plan, were necessary.
### Soil Cleanup Objectives

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Cleanup Objective (in ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzene</td>
<td>0.05</td>
</tr>
<tr>
<td>Xylenes</td>
<td>1.2</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>5.5</td>
</tr>
<tr>
<td>Toluene</td>
<td>1.5</td>
</tr>
<tr>
<td>PCE</td>
<td>1.5</td>
</tr>
<tr>
<td>TCE</td>
<td>1.0</td>
</tr>
<tr>
<td>1,1-Dichloroethane</td>
<td>0.2</td>
</tr>
<tr>
<td>TCA</td>
<td>1.0</td>
</tr>
<tr>
<td>1,1-DCE</td>
<td>0.5</td>
</tr>
<tr>
<td>1,2-DCE</td>
<td>0.5</td>
</tr>
</tbody>
</table>
Ms. Kathleen Callahan
Director
Emergency & Remedial Response Division
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, NY 10278

Re: Rowe Industries Site ID No. 152106
Sag Harbor, Long Island
Draft Record of Decision

Dear Ms. Callahan:

The New York State Department of Environmental Conservation (NYSDEC) has reviewed and concurs with the September 16, 1992 draft Record of Decision (ROD) for the Rowe Industries site.

The remedy presented in the draft ROD includes excavation and disposal of approximately 365 cubic yards of contaminated soil and the remediation of groundwater via extraction and air stripping with discharge to Sag Harbor Cove.

Please contact Mr. James Bologna at (518) 457-3976 if there are any questions.

Sincerely,

Ann Hill DeBarbieri
Deputy Commissioner
Office of Environmental Remediation

cc: M. Hauptmann, USEPA-Region II
L. Wood, USEPA-Region II
Site Information:

Site Name: ROWE INDUSTRIES GROUND WATER CONTAMINATION  
Address: NOYACK/SAG HARBOR, NY  
EPA ID: NYD981486954  
EPA Region: 02

Site Alias Name(s):

SAG HARBOR GROUNDWATER CONTAMINATION  
SAG HARBOR ID# NYD986869170  
ROWE INDUSTRIES GND WATER CONTAMINATION

Record of Decision (ROD) - Explanation of Significant Differences (ESD):

ROD Date: 05/03/2001  
Operable Unit: 01  
ROD ID: EPA/ESD/R02-01/541

Text: Full-text ROD document follows on next page.
EPA Superfund
Explanation of Significant Differences:

ROWE INDUSTRIES GROUND WATER
CONTAMINATION
EPA ID: NYD981486954
OU 01
NOYACK/SAG HARBOR, NY
05/03/2001
Attached is an Explanation of Significant Differences (ESD) for the Rowe Industries Superfund site.

The 1992 Record of Decision for the site called for the extraction and treatment of contaminated ground water and discharge of the treated ground water to Ligonee Creek/Sag Harbor Cove. In response to public concern regarding a freshwater discharge into a saltwater environment, we have decided to reduce the amount of treated ground water discharged to Ligonee Creek and Sag Harbor Cove by splitting the discharge between two locations—Ligonee Brook (which discharges into Ligonee Creek) and a recharge basin. Pumping the contaminant plume will reduce the natural ground water flow to Ligonee Creek and Sag Harbor Cove. The treated ground water discharge to Ligonee Brook is intended to replace this flow. It will also facilitate the creation of a wetland called for in the Village of Sag Harbor's Local Waterfront Revitalization Program.

We intend to implement the ground water remedy in a phased approach. The first phase will involve the discharge of a portion of the treated ground water to the recharge basin. The second phase will involve the discharge of the remainder of the treated ground water to Ligonee Brook.

Please indicate your approval of the ESD by signing below.

If you have any questions related to the ESD, please call me at extension 4390.

Attachment
INTRODUCTION

In accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan, if after the selection of a remedial action plan, a component of the action differs in any significant respect from the original action, an explanation of the significant differences and the reasons such changes were made must be published.

The 1992 Record of Decision (ROD) for the Rowe Industries site called for the extraction and treatment of contaminated ground water and discharge of the treated ground water to Ligonee Creek/Inner Sag Harbor Cove. In response to public concern regarding a freshwater discharge into a saltwater environment, the U.S. Environmental Protection Agency (EPA) has decided to reduce the amount of treated ground water discharged to Ligonee Creek and Sag Harbor Cove by splitting the discharge between two locations—Ligonee Brook\(^1\) at its intersection with Bridgehampton-Sag Harbor Turnpike and a recharge basin that will be constructed on Sag Harbor Industries’ property. Pumping the contaminant plume will reduce the natural ground water flow to Ligonee Creek and Sag Harbor Cove. The treated

---

1. Ligonee Brook discharge into Ligonee Creek.
The site contains an eight-acre industrial facility. The most prominent feature of the site is a small factory covering one acre of the site with the remainder containing a lawn area, parking lot, woods and a small pond. Residences are located on two sides of the facility.

The site is underlain with mostly medium to fine sand with some gravel and clay. Sag Harbor Cove is about 3,000 feet northwest of the site. Ligonee Brook, which flows into Sag Harbor Cove, is to the east and north of the site.

The Rowe Industries facility was constructed in 1953 to manufacture small electric motors and transformers. Chlorinated solvents were used to degrease oil-coated metals during the manufacturing process. Waste solvents were discharged into on-site dry wells and/or stored behind the facility, where they leaked into the soils below. The original building was completely destroyed by a fire in 1962, and was rebuilt that same year to twice its original size.

In November 1965, Aurora Plastics purchased the plant and its equipment from Rowe Industries. The manufacture of the motors continued and Nabisco acquired Aurora Plastics in the early 1970's. The facility remained active until 1974, when Nabisco relocated its operations and the building was closed.

The building remained shuttered until it was sold to Sag Harbor Industries in 1980. The facility is currently used to manufacture electronic devices. Solvents are no longer used in the manufacturing process.

Ground water contamination was first discovered by the Suffolk County Department of Health in 1983. Water from a private well near the site revealed contamination by three solvents, 1,1,1-trichloroethane (TCA), 1,1,2-trichloroethylene (TCE), and tetra- chloroethylene (PCE). Further investigations determined that a ground water contaminant plume extended from the former Rowe Industries facility northwest to Ligonee Creek and Sag Harbor Cove. Based on the extent of ground water contamination, the Rowe Industries site was placed on the National Priorities List on July 7, 1987.

In September 1988, EPA and Nabisco entered into an Administrative Order on Consent, Index No. II-CERCLA-80213, for the performance of a remedial investigation and feasibility study (RI/FS) to determine the nature and extent of the contamination at and emanating from the site and to identify and evaluate remedial alternatives.

The results of the RI/FS indicated the presence of VOC-contaminated soils on the facility grounds, VOC-contaminated soils within three dry wells, VOC-contaminated ground water underlying the site, and a VOC-contaminant plume extending northwest from the on-site contaminated soil area to Ligonee Creek and Sag Harbor Cove. On September 30, 1992, a ROD was signed. The major components of the selected remedial action in the ROD are:

- Excavation and off-site disposal of approximately 230 cubic yards of volatile-organic-contaminated soils within the former drum storage area (a portion of the former drum disposal area is located on adjacent residential property).
- Excavation and off-site disposal of approximately 135 cubic yards of contaminated sludge and underlying soils associated with the dry wells.
- Confirmatory sampling to ensure that soils with concentrations above soil cleanup objectives have been excavated.
- Backfilling of the excavated areas with clean fill after excavation.
- Remediation of the ground water by the installation of seven extraction wells which will pump the contaminated ground water to an air stripping treatment system with ultimate discharge of treated water to Sag Harbor Cove.
- Implementation of a monitoring program that includes the collection and analysis of the influent and effluent from the treatment system, and long-term monitoring of the ground water to track the migration and concentrations of the contaminants of concern.

Nabisco, Inc. and Sag Harbor Industries agreed to design and implement the selected remedy. A Consent Decree formalizing this settlement was entered by the District Court for the Eastern District of New York in April 1994. Soon afterward, Nabisco’s consultant, Leggette, Brashears & Graham (LBG), commenced preparation of the remedial design work plan and related planning documents.

Based on soil sampling data obtained as part of the soil remedial design, the volume of contaminated soils from the former drum storage area requiring excavation increased significantly from the ROD estimate. It was also determined that approximately half of the excavated soils were more highly contaminated than originally believed which would necessitate on-site pretreatment prior to off-site disposal in order to comply with the requirements of Resource Conservation and Recovery Act Land Disposal Restrictions. Based on these new findings, in July 1997, EPA issued an ESD which modified the selected remedy for contaminated soils. The changes to the remedy included the treatment of the unsaturated soils (above the water table) in the former drum storage area using in-situ soil vapor extraction (SVE) instead of excavation, and treatment of the saturated soils (below the water table) using air sparging to enhance the effectiveness of the ground water extraction process.

SVE involves drawing air through a series of wells to volatilize the solvents contaminating the unsaturated soils. The extracted vapors are then treated in an activated carbon unit and monitored before being vented to the atmosphere. In-situ SVE leaves the soils in place while they are being remediated.
and treatment system \(^3\).

The contaminated soil (including the dry wells) was excavated in 1998 and the soil was completely treated by April 1999 using an on-site ex-situ SVE system. Off-site disposal of the dry well sludges and treated soils followed. The in-situ SVE system and air sparging systems were also installed in 1998. The in-situ SVE system operated from December 1998 through March 2000 and removed more than 500 pounds of VOCs. Confirmatory soil sampling revealed one small area within the former drum storage area which required additional treatment. The in-situ SVE system is currently being operated to treat the remaining contaminated portion of the former drum storage area.

EPA is also currently conducting focused pumping of a small area where water samples indicated elevated levels of VOCs. Soil and water samples collected as part of the installation of the in-situ SVE system revealed a layer of natural clay (clay lens) near the top of the water table within the former drum storage area. The ground water flowing above the clay lens was contaminated with levels of VOCs as high as 9,700 milligrams per liter (mg/l) (the ground water standard for individual VOCs in ground water is typically about 5 mg/l). To clean up this hot spot, four small ground water extraction wells were installed in this area in late 2000. The extracted ground water is being treated on-site and discharged to an on-site pond. Pumping of this area will continue until the decline in the level of contaminants has stabilized.

The installation of nine ground water recovery wells along the length of the ground water plume was completed in mid-2000. Figure 1 shows the locations of the nine recovery wells.

**DESCRIPTION OF SIGNIFICANT DIFFERENCES AND THE BASIS FOR THOSE DIFFERENCES**

The ROD called for the treated ground water to be discharged in Ligonee Creek/Inner Sag Harbor Cove. However, in response to public concern about potential impacts resulting from the discharge of fresh water into a saline environment and to address concern that Ligonee Brook between Brick Klin Road and Bridgehampton-Sag Harbor Turnpike\(^4\) might dry up as a result of the depression of the water table due to the extraction of contaminated ground water, EPA has decided to discharge the treated ground water at two locations, utilizing a phased implementation approach. The first phase will involve the discharge of a portion of the treated ground water to a recharge basin that will be constructed on Sag Harbor Industries’ property. The second phase will involve the discharge of the remainder of the treated ground water to Ligonee Brook at its intersection with Bridgehampton-Sag Harbor Turnpike.

As an access agreement related to discharging the treated ground water to Ligonee Brook has not yet been obtained, EPA will proceed with the construction of the recharge basin and its associated piping, the ground water treatment system, and the piping associated with the extraction wells. Initially, approximately 310 gallons per minute (gpm) of treated ground water will be discharged into the recharge basin.

Once access to the Ligonee Brook discharge location (an existing culvert beneath Sag Harbor-Bridgehampton Turnpike) has been obtained, the remainder of the discharge system will be constructed, which will allow approximately 400 gpm of treated ground water to be discharged to Ligonee Brook. This flow will replace the ground water from the contaminant plume that presently naturally percolates into Ligonee Creek and Sag Harbor Cove and will counter the effects of the potential drawdown in Ligonee Brook noted above. Discharging the treated ground water at Ligonee Brook at Sag Harbor-Bridgehampton Turnpike will also facilitate the creation of a wetland as called for in Village of Sag Harbor’s LWRP. A water level indicator will be placed in the streambed which will shut off the treated ground water discharge, should the brook approach flood levels during a storm event.

The treated ground water discharged into the recharge basin and at Ligonee Brook will meet all NYSDEC discharge requirements.

Based upon preliminary ground water modeling results, it is anticipated that the remediation of the majority of the contaminant plume will be completed within about five years. While it is difficult to quantify, it is estimated that 90% of the contamination from the ground water plume would be removed during this period. Because of the relatively short five-year time frame, EPA envisions the Ligonee Brook discharge to be temporary. At the end of this time frame, EPA will evaluate the need to continue to use the Ligonee Brook discharge or whether to rely solely on the recharge basin to complete the ground water remediation.

**SUPPORT AGENCY COMMENTS**

NYSDEC and the New York State Department of Health, after careful consideration of the modified remedy, support the modified remedy due to the environmental, public health, and technical advantages, and the fact that the modified remedy significantly changes but does not fundamentally alter the remedy selected in the ROD.

Also, the New York State Department of State concurs with

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\(^3\) Air sparging involves bubbling air below the water table to volatilize the solvents contaminating the ground water and soils. The volatilized solvents are drawn up through the unsaturated soils by a series of ISVE wells. The extracted vapors are then treated in an activated carbon unit and monitored before being vented to the atmosphere.

\(^4\) This portion of Ligonee Brook is an intermittent stream and is proposed as a wetlands creation area in the LWRP for the Village of Sag Harbor.
EPA's determination that the proposed action is consistent with the applicable policies of New York State's Coastal Management Program and the Village of Sag Harbor's LWRP.

**AFFIRMATION OF STATUTORY DETERMINATIONS**

Considering the new information that has been developed and the changes that have been made to the selected remedy, EPA and NYSDEC believe that the remedy remains protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the modified remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site.

**PUBLIC PARTICIPATION**

EPA and NYSDEC rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. Toward this end, a public meeting will be held at the Sag Harbor Town Hall, Main Street, Sag Harbor, New York on May 16, 2001 at 7:00 p.m. to discuss the ESD and the planned construction activities. Questions or comments related to the ESD or the planned construction activities can also be directed to:

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*Figure 1 - Ground Water Remediation System*