AMERICAN CLEANERS

Binghamton (C), Broome County, New York
Site No. 7-04-030

PROPOSED REMEDIAL ACTION PLAN

July 2002

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

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Site No. 7-04-030
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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) is proposing a remedy to address the significant threat to human health and the environment created by the presence of hazardous waste at American Cleaners, a Class 2 inactive hazardous waste disposal site. As more fully described in Sections 3 and 4 of this document, the operation of a dry cleaning business resulted in the disposal of perchloroethylene (PCE) at the site. These disposal activities have resulted in the following significant threats to the public health and the environment:

- A significant threat to human health associated with the potential for contaminated groundwater or vapors entering the basements of nearby residences.

  A significant environmental threat associated with the impacts of contaminants to groundwater and the Clinton Street-Ballpark Valley sole source aquifer.

In order to eliminate or mitigate the significant threats to the public health and the environment that the hazardous waste disposed at the American Cleaners site has caused, the following remedy is proposed:

- The American Cleaners building will be demolished and the PCE contaminated soil located beneath the basement slab will be excavated and disposed of offsite.

The proposed remedy, discussed in detail in Section 7 of this document, is intended to attain the remediation goals selected for this site in Section 6 of this Proposed Remedial Action Plan (PRAP), in conformity with applicable standards, criteria, and guidance (SCGs).

This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for this preference. The NYSDEC will select a final remedy for the site only after careful consideration of all comments received during the public comment period.

The NYSDEC has issued this PRAP as a component of the citizen participation plan developed pursuant to the New York State

Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in greater detail in the Remedial Investigation (RI), Feasibility Study (FS) and other relevant reports and documents, available at the document repositories.

To better understand the site and the investigations conducted, the public is encouraged to review the project documents at the following repositories:

Broome County Public Library
185 Court Street
Binghamton, NY 13901
Attn: Reference Department
(607) 778-6400
Mon. - Thurs. 9:00am to 9:00pm
Fri. - Sat. 9:00am to 5:00pm

NYSDEC Kirkwood
1679 NY Route 11
Kirkwood, NY 13795-9772
(607) 775-2545
Attn: Tom Suozzo
(By appointment only)
Mon. - Fri. 9:00am to 4:00pm

NYSDEC Central Office
625 Broadway, 11th Floor
Albany, NY 12233-7017
(518)402-9670
Attn: James Candiloro
(By appointment only)
Mon. - Fri. 8:00am to 4:00pm

The NYSDEC seeks input from the community on all PRAPs. A public comment period has been set from August 19, 2002 to September 17, 2002 in order to provide an opportunity for public participation in the remedy selection process for this site. A public meeting is scheduled for August 29, 2002 at the Methodist Tabernacle Church beginning at 7:30 pm.

At the meeting, the results of the RI/FS will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which you can submit verbal or written comments on the PRAP.

The NYSDEC may modify the preferred alternative or select another of the alternatives presented in this PRAP, based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

Comments will be summarized and responses provided in the Responsiveness Summary section of the Record of Decision. The Record of Decision is the NYSDEC's final selection of the remedy for this site. Written comments may be sent to Mr. James Candiloro at the above address through September 17, 2002.

SECTION 2: SITE LOCATION AND DESCRIPTION

The American Cleaners site is located in a residential area on the west side of the City of Binghamton, Broome County, New York. The property is located on the northeast corner of Walnut Street and Seminary Avenue at the address of 48-50 Walnut Street (Figure 1). The property, which extends approximately 79 feet along Seminary Avenue and 50 feet along Walnut Street, is occupied by a dilapidated one story masonry block structure attached to a two story wood frame structure. A smaller, separate masonry block building occupies the

north corner of the property. The total area of the property is approximately 0.1 acre.

The 93 Main Street inactive hazardous waste disposal site, Registry ID No. 7-04-027, is located less than 1/4 mile northwest of the American Cleaners site.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The American Cleaners site is a former dry cleaner, which closed in 1991. Following closure of the business, the property was abandoned. In January 1998, the NYSDEC completed a records search which revealed that PCE, a listed hazardous waste, was disposed of onsite. PCE is a common solvent used in dry cleaning. The PCE was stored in a 275 gallon tank in the basement. Other dry cleaning equipment and solvents were stored in a small cinder block building on the northeast corner of the property. Due to poor housekeeping practices, substantial amounts of dry cleaning solvents were spilled. The solvents permeated the concrete basement floor, contaminating underlying soil and groundwater. Several sump structures are located in the basement which were also apparently used for disposal of wastes.

The site was originally brought to the attention of the NYSDEC from a nuisance complaint. A NYSDEC spill inspector investigated the site in 1995 and confirmed that an unknown amount of PCE had spilled.

3.2: Remedial History

Four investigations have been conducted at the site. The following discussion summarizes these investigations.

April 1995: As part of an environmental assessment one composite soil sample, from twelve onsite locations, was analyzed for the presence of dry cleaning solvents and degradation byproducts. PCE was detected at a concentration reported as greater than 200 parts per million (ppm) in this sample. The recommended cleanup objective for PCE is 1.4 ppm. The presence of trichloroethene was also reported, but it was below the laboratory certified detection levels.

May 1995: Five discrete soil samples were collected and analyzed for PCE only. The results ranged from 1.4 ppm to 410 ppm. The analytical report also indicated that the samples showed light to heavy petroleum patterns, however, no other analysis was performed.

July 1995: A subsurface environmental investigation was performed by a prospective buyer under the supervision of the NYSDEC. Since previous site investigations confirmed the presence of PCE in the site soils, the objective of this investigation was to obtain groundwater data.

Four Geoprobe holes were advanced, one on each side of the site. The four sampling locations were designated GP-1 through GP-4 and ranged in depth from four to six feet below the ground surface. Though PCE and toluene were detected in soil gas samples from all four borings, no groundwater samples were obtained from this investigation. Due to local geologic conditions, the Geoprobe was unable to penetrate farther than six feet below ground surface (bgs). Groundwater is typically encountered at twelve feet bgs at the site.

February 1998: The NYSDEC conducted an Immediate Investigation Work Assignment (IIWA). Field investigation activities were conducted in February and March of 1998. These activities included:

- Installation of three monitoring wells;
- Collection and analysis of four subsurface soil boring samples and three groundwater samples;
- Collection of five subsurface soil samples from beneath the main building basement slab and one surface soil sample from the masonry block storage building floor;
- Collection of one sediment sample and two sump water samples from two of the three pits identified in the basement of the main building;
- Installation of four piezometers to establish regional groundwater flow.

PCE was detected at levels up to 4,400 ppm in the soil below the concrete basement slab. PCE was also detected up to 24,000 parts per billion (ppb) in the groundwater. SCGs for PCE in soil and groundwater are 1.4 ppm and 5 ppb, respectively.

January 1999: The site was listed, as a Class 2, on the registry of inactive hazardous waste disposal sites.

SECTION 4: SITE CONTAMINATION

To evaluate the contamination present at the site and to evaluate alternatives to address the significant threat to human health and the environment posed by the presence of hazardous waste, the NYSDEC has recently conducted a Remedial Investigation/Feasibility Study (RI/FS).

4.1: Summary of the Remedial Investigation

The purpose of the Remedial Investigation (RI) was to define the nature and extent of any contamination resulting from previous activities at the site.

The RI was conducted in 2 phases. The first phase was conducted during November of 2000, the second phase was conducted between January and February of 2001. A report entitled Remedial Investigation Report, July 2001 has been prepared which describes the field activities and findings, of the two RI phases, in detail.

The RI included the following activities:

- Subsurface soil sampling to determine the vertical and horizontal extent of contamination in soil;
- Installation of piezometers and monitoring wells to define local groundwater flow and the extent of local groundwater contamination; and
- Indoor air sampling of the American Cleaners building to determine the impact, if any, to indoor air quality.

To determine which media (soil, groundwater, etc.) are contaminated at levels of concern, the RI analytical data was compared to environmental SCGs. Groundwater, drinking water and surface water SCGs identified for the American Cleaners site are based on NYSDEC Ambient Water Quality Standards

and Guidance Values and Part 5 of Chapter One of the New York State Sanitary Code. For soils, NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 provides soil cleanup guidelines for the protection of groundwater, background conditions, and health-based exposure scenarios. In addition, for soils, site specific background concentration levels can be considered for certain classes of contaminants. The indoor air sample data was evaluated against the NYSDOH PCE guidance value of 100 micrograms per cubic meter ($\mu g/m^3$).

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm). For comparison purposes, where applicable, SCGs are provided for each medium.

4.1.1: Site Geology and Hydrogeology

The stratigraphic sequence in the vicinity of the site includes from the surface down: fill; stratified silts; sands and gravel; clayey silt/silty clay with boulders and gravel; and bedrock. The overburden is estimated to be approximately 50 to 75 feet thick based upon drilling information from municipal water wells nearby (USGS - Randall 1977). Bedrock was not penetrated as part of the remedial investigation drilling program. A thin veneer of fill was encountered at a few drilling locations which was described as clayey silt to silty sand containing some gravel and trace amounts of blacktop and cinders. A 2 to 5 foot thick layer of silty sand/silt and sand lies beneath the fill. A wedge of medium dense, permeable sand and gravel was identified north and east of the site. The wedge thickens toward the north and east. The sand and gravel layer grades into the thin layer of silty sand. The very dense silt layer lies immediately beneath the silty sand and underlies the basement of the building. The dense silt layer was determined to be approximately six feet thick at monitoring well 2 (MW-2) and approximately nine feet thick at piezometer 4 (P-4). A very dense clayey silt with shale fragments underlies the inter-stratified mixture of sand, gravel, and silt. The clayey silt unit is interpreted as glacial till. The upper surface of the clayey silt is highly variable in the site vicinity. The glacial till and dense silt layers form a mound beneath the site near MW-2.

The site is located above the southeastern edge of the Clinton Street-Ballpark Valley Aquifer, a federally designated sole source aquifer, which is the primary source of drinking water for Johnson City, NY. The Clinton Street-Ballpark Valley Aquifer is an unconsolidated glacial aquifer that underlies three square miles of urban land in the Susquehanna River valley, extending from the western part of Binghamton to Johnson City.

The unconfined water-table aquifer present in the overburden was characterized as part of the RI. Groundwater was encountered at depths approximately twelve to twenty two feet bgs.

The horizontal hydraulic gradient between MW-2 and P-3 is 0.0246 ft/ft and between MW-2 and MW-3 is 0.053 ft/ft. Figure 2 illustrates groundwater flow.

4.1.2: Nature of Contamination

As described in the RI report, soil, groundwater, and indoor air samples were collected at the site to characterize the nature and extent of contamination. The main categories of contaminants which exceed their SCGs are volatile organic compounds (VOCs).

The VOC contaminants of concern are PCE, trichloroethene (TCE), and 1,2-dichloroethene (1,2-DCE).

4.1.3: Extent of Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in subsurface soil and groundwater and compares the data with the SCGs for the site. All PCE data is reported as tetrachloroethene, another name for perchloroethylene. The following are the media which were investigated and a summary of the findings of the investigation.

Subsurface Soil

Twenty soil samples were collected as part of the RI. All samples were analyzed for target compound list (TCL) VOCs. Nineteen samples were selected from locations beneath the concrete slab inside the building and one sample was selected from soil boring location SB-14, located outside the building. Detected compounds included acetone, PCE, TCE, 4-methyl-2-pentanone, and toluene. PCE was detected most frequently and at the highest concentrations. Detected concentrations of PCE ranged from 0.01 ppm in SB-23 to 37 ppm in SB-10. The highest reported concentrations of PCE were reported beneath the basement floor in the central portion of the building along Seminary Avenue. Sample locations are shown on figure 3. The recommended cleanup objective for PCE is 1.4 ppm. The other reported VOCs were detected sporadically and typically at low concentrations.

Volatile organic gases were screened using a photoionization detector (PID) at each of the thirty-three jackhammer boring locations inside the building and at each of the four soil borings outside the building. Measurements inside the building were taken immediately below the concrete slab. PID concentrations ranged from non-detect to 460 ppm. The highest soil gas readings were reported beneath the slab in the central section of the main building along Seminary Avenue. No PID readings above background were detected in the four soil borings outside the building.

Figure 3 shows the approximate limits of subsurface soil contamination.

Groundwater

Several wells and piezometers were installed in the City right of way surrounding the site. A total of two new wells were installed during the remedial investigation. The investigation revealed that groundwater is mounded in the vicinity of MW-2 and flows radially away from this well. Groundwater generally flows northerly around the mound. Figure 2 illustrates groundwater flow.

Two rounds of groundwater sampling were conducted as part of the RI. The first round was conducted in November 2000 when three existing monitoring wells were sampled. Samples were analyzed for TCL VOCs. In addition to the three monitoring wells, two sump pits inside the building were sampled

and analyzed for TCL VOCs. Based upon the analytical data from the first round sampling, a second phase of field work was conducted in February 2001. This involved installation of two additional monitoring wells and sampling of all the monitoring wells. PCE was detected in groundwater, at MW-1, up to 550 ppb. The groundwater quality standard for PCE in groundwater is 5 ppb.

Two sump water samples were collected as part of the RI. Samples were analyzed for TCL VOCs. Detected compounds included 1,2-DCE at 46 ppb, TCE, at 140 ppb, and PCE at 1800 ppb.

Despite the high concentrations of PCE detected in the soil beneath the basement slab, groundwater has remained only locally impacted. This is believed due to fluctuations in the groundwater table which cause the groundwater to only come in contact with the contaminated soil periodically.

The area is served by public water. Investigations to date have not identified any groundwater receptors down gradient of the site.

Indoor Air

Four indoor air samples were collected in the American Cleaners building for the analysis of volatile organics. Samples were collected using organic vapor monitor badges. Two badges were placed in the main basement area, where the highest levels of PCE were detected. One badge was placed in the small room located to the west of the main basement. One badge was also placed in the boiler room. The badges were exposed for approximately sixty-eight hours. The samples were analyzed by the NYSDOH Wadsworth Center laboratory. PCE was detected at concentrations ranging from 18 to 70 $\mu g/m^3$. The NYSDOH guidance value for PCE is 100 $\mu g/m^3$ for residential settings.

- **4.2: Summary of Human Exposure Pathways**

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 6.0 of the RI report.

An exposure pathway is the manner by which an individual may come in contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Pathways which are known to or may exist at the site include:

- The potential exists for contaminated groundwater to impact nearby residences through basement flooding which could result in direct contact with contaminated water or inhalation of vapors from the contaminated water.

  An exposure pathway exists for indoor air in the American Cleaners building if it were to be used now or in the future.

The potential exists for offsite impacts to nearby residences, by VOC soil vapors.

- The potential exists for the federally designated sole source aquifer to be impacted by contaminated groundwater originating from the American Cleaners. This aquifer is the primary source of drinking water for Johnson City.

4.3: Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures and ecological risks which may be presented by the site. During the RI it was determined that a Fish and Wildlife Impact Assessment was not necessary, due to its urban location and lack of any migration pathways to sensitive environmental areas. The following potential pathway for environmental exposure has been identified:

- A threat to the federally designated sole source aquifer.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

An Administrative Order on Consent, Order No. A7-0408-0001, has been executed by the Executor of the Estate of the former owner/operator of American Cleaners.

The Order requires the Estate to pay a lump sum towards the investigation and remediation of the American Cleaners site.

If additional PRPs are identified in the future they will be subject to legal actions by the State for recovery of all response costs the State has incurred.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all SCGs and be protective of human health and the environment. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- Reduce, control, or eliminate to the extent practicable the contamination present within the soils on site.

- Eliminate, to the extent practicable, offsite migration of groundwater that does not attain NYSDEC Class GA Ambient Water Quality Criteria.

- Eliminate the threat to the sole source aquifer by removing or treating the source of contamination.

- Eliminate the potential for direct human contact with the contaminated soils or groundwater at the site.

- Eliminate the potential for indoor air impacts.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the American Cleaners site were identified, screened and evaluated in the report entitled Feasibility Study, May 2002.

A summary of the detailed analysis follows. As presented below, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

7.1: Description of Remedial Alternatives

The potential remedies are intended to address the contaminated subsurface soil and groundwater at the site.

Alternative 1 - No Action

The No Action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2 - Building Demolition and Soil Excavation

Present Worth:	$ 170,000
Capital Cost:	$ 164,800
Annual O&M:	$ 5,200
Time to Implement:	4 to 6 months

Above and below ground structures on site would be demolished and transported offsite for disposal as construction and demolition debris (C&D). Any contaminated C&D materials would be disposed as hazardous waste.

Following building demolition, soil exhibiting contamination in excess of SCGs (see Table 1) would be excavated and hauled offsite for treatment and/or disposal. Soil contaminated with chlorinated solvents would be excavated to the limits identified on Figure 3. Confirmatory samples would be collected from the floor and walls of the excavation to determine whether remedial goals have been achieved, or if further removal and sampling is necessary. Excavation would continue vertically and horizontally until confirmatory samples demonstrate complete removal of contaminated soil. If contaminated soils remain, due to impediments encountered during construction, alternatives to address the residual contamination, including institutional controls, would be evaluated.

Water collected during excavation dewatering would be treated as necessary with either an onsite water treatment system or at an offsite treatment facility. Active dewatering of the excavation would take place to recover as much contaminated groundwater as possible. Efforts beyond excavation dewatering (e.g. an active groundwater recovery and treatment effort such as a dedicated recovery well) do

not appear warranted. The groundwater impacted by the PCE is limited to one monitoring well (MW-1) located immediately adjacent to the area of concern. Monitoring wells immediately downgradient of MW-1 show PCE concentrations at or below the NYSDEC water quality standard of 5 ppb. Removal of the PCE source area should allow for attenuation of any residual groundwater contamination to below standards in a short period of time.

The site would be backfilled with clean fill. Six inches of top soil would be spread over the site. The site would then be seeded to promote vegetative cover to control erosion. An annual groundwater monitoring program would be implemented for an estimated period of 2 years to verify that any residual levels of contamination in groundwater are attenuating. Installation of new monitoring wells may be necessary following completion of the excavation.

A Community Air Monitoring Plan would be implemented to monitor VOCs and dust. Dust suppression equipment (e.g. water sprinklers) would remain on hand to prevent airborne migration of contaminated soil. Other techniques would be used as necessary to prevent contaminants or nuisance odors from leaving the site. Temporary fencing and warning signs would be placed around the site during the remediation to keep trespassers out.

Alternative 3 - Soil Excavation without Building Demolition

Present Worth:	$ 160,000
Capital Cost:	$ 154,800
Annual O&M:	$ 5,200
Time to Implement:	6 to 8 months

This alternative would leave the American Cleaners building in place during excavation of the contaminated soil beneath the building. Prior to commencement of excavation activities, the building would be evaluated for structural integrity and any necessary structural enhancements would be implemented to ensure worker safety during excavation. Since contaminated soil has been identified both within the building footprint and outside the building foundation, appropriate structural controls (e.g. shoring) would be required. The contaminated soil would be excavated to the extent practicable with the building in place. If contaminated soils remain, due to impediments encountered during construction, alternatives to address the residual contamination, including institutional controls, would be evaluated. Active de-watering of the excavation would take place to recover as much contaminated groundwater as possible.

The excavation would be backfilled with clean fill and the building would be restored to the extent necessary to provide for re-use. A groundwater monitoring program would be implemented. Groundwater would be monitored to ensure that degradation of chlorinated solvents was taking place.

Health and safety measures similar to Alternative 2 would be implemented. Deed restrictions would also be necessary to limit future intrusive activities.

Alternative 4 - In-Situ SVE Dual Phase Extraction

Present Worth:	$ 170,000
Capital Cost:	$ 110,000
Annual O&M:	$ 60,000
Time to Implement:	**6 to 12 months**

A dual phase soil vapor extraction (SVE) system would be installed in the basement of the American Cleaners building to remediate the contaminated subsurface soil and impacted groundwater. The dual phase system would consist of one pump to extract liquids from an extraction well(s) and a surface blower to extract contaminated soil vapor. A treatment system capable of handling both the contaminated vapor and groundwater collected would be necessary. Treated groundwater would be discharged to the publicly owned treatment works (POTW). Groundwater monitoring would take place to monitor the effectiveness of the SVE system.

Health and safety measures similar to Alternative 2 would be implemented.

Alternative 5 - In-Situ Chemical Oxidation

Present Worth:	$ 180,000
Capital Cost:	$ 170,000
Annual O&M:	$ 10,000
Time to Implement:	**6 to 12 months**

The contaminated subsurface soil would be flushed with a strong oxidizing agent, such as potassium permanganate, which would chemically breakdown the organic contaminants in the soil and groundwater. During the oxidation process carbon bonds within the contaminant are broken. Ultimately the contaminant would be degraded to carbon dioxide and water along with some halides (i.e. salts). A groundwater extraction and treatment system would be used to collect the impacted groundwater and the leachate generated during the oxidation treatment. The water would then be treated with continued oxidation and/or carbon treatment and either discharged or re-injected. Groundwater would be subject to periodic monitoring to ensure that the extraction and treatment system was operating effectively. Health and safety measures during treatment would be similar to Alternative 2 but would require special provisions/precautions for handling of the oxidizing agent.

7.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each of the criteria, a brief description is provided, followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is included in the Feasibility Study.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

Alternative 1 would not achieve compliance with SCGs, because high levels of PCE would be left onsite.

Alternatives 2 and 3 would meet applicable SCGs for contaminated soil since it would be removed from the site and disposed of at a permitted facility. It is anticipated that following removal of the source area groundwater would attenuate to meet SCGs.

Alternative 4 and 5 would meet applicable SCGs for contaminated soil since it would be treated to below remedial goals, eliminating likely exposure pathways.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

The no action alternative would not be protective of human health and the environment since high concentrations of PCE would be left onsite. The remaining alternatives, excavation with offsite disposal; dual phase soil vapor extraction; and chemical oxidation would all be protective of human health and the environment since contaminated soil would be removed from the site and/or the PCE contamination would be treated.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

The no action alternative would cause little or no increased short-term impacts since no intrusive work would take place. Alternatives 3, 4 and 5 would all result in relatively minor short-term impacts since the building would remain in place and work would be completed within it. Alternative 2 - Building Demolition with Excavation, would result in the highest short term impacts due to the demolition and earth moving activities, however, engineering controls would minimize and/or eliminate any possible impact. The controls would include air monitoring, personal protective equipment for workers, and dust suppression.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

The no action alternative would not be effective in the long-term since high levels of PCE would remain onsite and continue to migrate/impact local groundwater. Given the tight nature of the soils it is uncertain if the SVE system would be able to remediate the entire source area.

The offsite disposal and chemical oxidation alternatives would be effective in the long-term since all likely exposure pathways would be eliminated. This would be achieved by removing and/or treating the contaminated soil.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

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The no action alternative would not reduce the toxicity, mobility, or volume of contamination. Each of the remaining alternatives, 2 through 5, would effectively reduce the toxicity, mobility, and volume of material contaminated with PCE by removing or treating them in place.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.

The no action alternative would be the easiest of the alternatives to implement since no construction would be necessary. Excavation with building demolition would be relatively easy to implement since no specialized equipment or techniques would be necessary. Standard demolition and excavation techniques would be employed. The dual phase SVE system would be more complicated, though treatment systems are readily available. Chemical oxidation would be more difficult to implement as special handling and storage of the oxidizing agent are required. Also, both chemical oxidation and dual phase SVE would require installation of treatment wells through the basement slab of the building. Due to the presence of glacial till approximately two feet below the basement slab, and the limited area in which to work, installation of the treatment wells would be difficult. The RI demonstrated the tight nature of these soils. Equipment would have to be a sufficient size/power to penetrate the till. Building modifications would be necessary to permit these alternatives. Excavation of the contaminated soil while leaving the building in place would be the most difficult effort. As with the SVE and chemical oxidation systems, because of the limited area in which to work, interior building modifications would be required to permit this alternative. This would include removal of a large portion of the first floor and removal of one or more of the exterior walls. Further, engineering controls and/or specialized excavation equipment would be required to support the building and maintain structural integrity during the excavation work.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

The potential exists for the operating time frame of the SVE and chemical oxidation systems to extend beyond the estimated operating time of 2 years. Any increase in operating time will result in an increased cost for the associated remedial alternative.

This final criterion is considered a modifying criterion and is taken into account after

evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance. Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan are evaluated. A "Responsiveness Summary" will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is proposing Alternative 2, Building Demolition and Soil Excavation, as the remedy for this site. The American Cleaners building would be demolished and the perchloroethylene contaminated soil located beneath the basement slab would be excavated and disposed of offsite at a permitted facility.

This selection is based on the evaluation of the of the five alternatives developed for this site. With the exception of the No Action alternative, each of the alternatives would comply with the threshold criteria. Alternative 3 would be difficult to implement due to the precautions necessary to secure the building and maintain its structural integrity. Also the size and type of excavation equipment able to be used inside the American Cleaners building would be limited (e.g. bobcat) and could pose difficulty excavating the glacial till. Also, with the building in place it may not be possible to remove the entire source area and the difference in capital costs between alternatives 2 and 3 is small.

Alternative 4 would be difficult to implement because modifications to the American Cleaners building would be necessary to allow a drill rig to access the basement. Previous portable methods employed in the basement to gather soil samples encountered significant difficulty penetrating depths beyond two to three feet below the basement slab due to the presence of glacial till. In order to install the wells necessary for the SVE system, a drill rig would be necessary, thus building modifications would be required. Also, the effectiveness of the SVE system is questionable in light of the tight nature of the soil present.

Alternative 5 would also be difficult to implement because injection wells would be needed and the only feasible method of penetrating the till layer below the basement slab, for treatment well installation, is to use a drill rig.

Despite the high concentrations of PCE detected in the soil beneath the basement slab groundwater has remained only locally impacted. This is due to fluctuations in the groundwater table which cause the groundwater to only come in contact with the contaminated soil periodically. It is anticipated that any residual levels of contamination in groundwater would attenuate once the source has been removed. To be sure this occurs, groundwater would be monitored for VOCs.

Alternative 2, would allow for the complete removal of the source area by eliminating obstacles associated with excavating with the

building in place. Likewise, the selection of Alternative 2 avoids the uncertainties associated with soil vapor extraction and chemical oxidation technologies in this setting.

The site would be periodically evaluated to determine whether a change in classification (i.e. delisting) on the registry of inactive hazardous waste sites was warranted. Once the site is delisted it is anticipated that the remedy would allow unrestricted use of the property.

The estimated present worth cost to implement the remedy is $170,000. The cost to construct the remedy is estimated to be $164,800 and the estimated average annual operation and maintenance cost for one year is $5,200.

The elements of the proposed remedy are as follows:

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

2. Demolition of all above ground and below ground structures on the American Cleaners property.

3. Excavation and offsite disposal of all contaminated soil containing PCE above 1.4 ppm.

4. Restoration of the site including backfilling of open excavations and foundation areas. The site would also be covered with six inches of topsoil, to promote vegetative cover, graded and seeded to minimize erosion.

5. Since residual levels of contamination may remain at the site, a groundwater monitoring program would be instituted. Reduction of PCE levels in impacted groundwater wells would confirm removal of the source area and demonstrate that any residual levels of contamination are attenuating.

Table 1
Nature and Extent of Contamination

Statistical Summary Soil - November 2000							
Parameter	Units	SCG*	Num. Of Samples	Num. Of Detections	Range of Detections		Num. Exceed
					Min (ppm)	Max (ppm)	
Volatiles							
Acetone	PPM	0.2	20	6	0.003	0.03	NA
Trichloroethene	PPM	0.7	20	1	0.003	0.003	NA
4-Methyl-2-Pentanone	PPM	1	20	1	0.19	0.19	NA
Tetrachloroethene (PCE)	PPM	1.4	20	20	0.01	37	7
Toluene	PPM	1.5	20	1	0.001	0.001	NA

Statistical Summary Groundwater - November 2000/February 2001							
Parameter	Units	SCG**	Num. Of Samples	Num. Of Detections	Range of Detections		Num. Exceed
					Min (ppb)	Max (ppb)	
Volatiles							
Vinyl Chloride	PPB	2	8	1	1	1	NA
1,2-Dichloroethene (Total)	PPB	5	8	2	1	2	NA
Tetrachloroethene PCE	PPB	5	8	5	4	550	4
2-Hexanone	PPB	50	8	1	2	2	NA

Statistical Summary Sump Water - November 2000							
Parameter	Units	SCG**	Num. Of Samples	Num. Of Detections	Range of Detections		Num. Exceed
					Min (ppb)	Max (ppb)	
Volatiles							
1,2-Dichloroethene (Total)	PPB	5	2	1	ND	46	1
Trichloroethene	PPB	5	2	1	ND	140	1
Tetrachloroethene PCE	PPB	5	2	2	4	1800	1

*Criteria - NYSDEC TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels; HWR-94-4046
**Criteria - NYSDEC TOGS(1.1.1), Ambient Water Quality and Guidance Values and Groundwater Effluent Limitations. June 1998
Note: Tetrachloroethene is also known as Perchloroethylene (PCE).

Table 1 (continued)
Nature and Extent of Contamination

Statistical Summary Indoor Air - June 2002							
Parameter	Units	SCG**	Num. Of Samples	Num. Of Detections	Range of Detections		Num. Exceed
					Min ($\mu g/m^3$)	Max ($\mu g/m^3$)	
Volatiles							
Tetrachloroethene PCE	$\mu g/m^3$	100	4	4	18	70	0

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
No Action	$0	$0	$0
Building Demolition & Excavation	$ 164,800	$ 5,200	$ 170,000
Excavation w/o Building Demolition	$ 154,800	$ 5,200	$ 160,000
In-Situ Dual Phase SVE Extraction	$ 110,000	$ 60,000	$ 170,000
In-Situ Chemical Oxidation	$ 170,000	$ 10,000	$ 180,000