Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision
Jimmy's Dry Cleaners Site
Operable Unit No. 1
Roosevelt, Nassau County, New York
Site Number 130080

March 2004

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* ERIN M. CROTTY, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Jimmy's Dry Cleaners Inactive Hazardous Waste Disposal Site
Operable Unit No. 1
Roosevelt, Nassau County, New York
Site No. 130080

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for: Operable Unit No. 1 of the Jimmy's Dry Cleaners site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for: Operable Unit No. 1 of the Jimmy's Dry Cleaners inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and/or the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the Jimmy's Dry Cleaners site and the criteria identified for evaluation of alternatives, the NYSDEC has selected expansion of the existing soil vapor extraction system and chemical oxidation of groundwater contamination. The components of the remedy are as follows:

- A more extensive soil vapor extraction (SVE) system (enhancing the SVE system constructed as an Interim Remedial Measure) will be installed. This will consist of three additional deep vapor extraction wells to address the source area soils, and seven existing shallow vapor extraction wells to address soil/soil gas/indoor air near the Deli and adjacent residences. The SVE system will include off-gas treatment to meet applicable discharge requirements.

- A pilot scale study will be conducted to confirm that conditions at the site are suitable for chemical oxidation of groundwater contamination.

- If the results of the pilot study are favorable a full scale application of chemical oxidant will be injected into the aquifer underlying the site.

- If the results of the pilot study indicate that an oxidation technology is not suitable for technical reasons, groundwater extraction and treatment will be implemented in place of chemical oxidation.

- Development of a site management plan to: (a) address residual contaminated soils that may be excavated from the site during future redevelopment; (b) evaluate the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified; and (c) identify any use restrictions.

- An annual certification will be prepared and submitted by a professional engineer or environmental professional acceptable to the Department, which will certify that the institutional controls and engineering controls put in place, are unchanged from the previous certification and nothing has occurred that would impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with any operation and maintenance or site management plan.

- Imposition of an institutional control in the form of an environmental easement that will: (a) require compliance with the approved site management plan, (b) limit the use and development of the property to commercial or industrial uses only; (c) restrict use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Nassau County Department of Health; and, (d) require the property owner to complete and submit to the NYSDEC an annual certification. Once soil and groundwater are treated to achieve unrestricted use levels, the institutional control could be modified.

- The operation of the components of the SVE remedy will continue until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable. Continued monitoring of groundwater, soil gas, and air will be done until remedial goals are met.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action

to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

MAR 3 1 2004
Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

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SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the Jimmy's Dry Cleaner's Operable Unit 1 (OU1) located in Nassau County at 61 Nassau Road in Roosevelt, New York (Figure 1, Site Location Map). OU 1, as described in Section 2 below, is rectangular in shape, and consists of approximately one acre of land including the former dry cleaner building (Figure 2, Site Map). The presence of hazardous waste has created significant threats to human health and the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, poor housekeeping practices and inappropriate hazardous material storage have resulted in the disposal of hazardous wastes, including the dry cleaning solvent tetrachloroethene or perchloroethene (PCE). These wastes have contaminated the soil, groundwater, soil gas, and indoor air at the site, and have resulted in:

- A significant threat to human health associated with current and potential future exposure to PCE-contaminated soil, groundwater, soil gas, and indoor air.

- A significant environmental threat associated with the impacts of contaminants to a groundwater resource. PCE contamination from the site affects groundwater beneath and hydraulically down-gradient of the site, impacting its value as a sole source aquifer.

To eliminate or mitigate these threats, the NYSDEC has selected the following remedy:

- A more extensive soil vapor extraction (SVE) system (enhancing the SVE system constructed as an Interim Remedial Measure) will be installed. This will consist of three additional deep vapor extraction wells to address the source area soils, and seven existing shallow vapor extraction wells to address soil/soil gas/indoor air near the Deli and adjacent residences. The SVE system will include off-gas treatment to meet applicable discharge requirements.

- A pilot scale study will be conducted to confirm that conditions at the site are suitable for chemical oxidation of groundwater contamination.

- If the results of the pilot study are favorable a full scale application of chemical oxidant will be injected into the aquifer underlying the site.

- If the results of the pilot study indicate that an oxidation technology is not suitable for technical reasons, groundwater extraction and treatment will be implemented in place of chemical oxidation.

- Development of a site management plan to: (a) address residual contaminated soils that may be excavated from the site during future redevelopment; (b) evaluate the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified; and (c) identify any use restrictions.

- An annual certification will be prepared and submitted by a professional engineer or environmental professional acceptable to the Department, which will certify that the institutional controls and engineering controls put in place, are unchanged from the previous certification and nothing has occurred that would impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with any operation and maintenance or site management plan.

- Imposition of an institutional control in the form of an environmental easement that will: (a) require compliance with the approved site management plan, (b) limit the use and development of the property to commercial or industrial uses only; (c) restrict use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Nassau County Department of Health; and, (d) require the property owner to complete and submit to the NYSDEC an annual certification. Once soil and groundwater are treated to achieve unrestricted use levels, the institutional control could be modified.

- The operation of the components of the SVE remedy will continue until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable. Continued monitoring of groundwater, soil gas, and air will be done until remedial goals are met.

The selected remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

SECTION 2: SITE LOCATION AND DESCRIPTION

Jimmy's Dry Cleaner's Operable Unit 1, located in Nassau County at 61 Nassau Road in Roosevelt, New York (Figure 1, Site Location Map), is rectangular in shape and consists of approximately one acre of land including the former dry cleaner building (Figure 2, Site Map). A small section of the building is currently under commercial use as a delicatessen (Deli). Most of the site is covered by the building and asphalt/ gravel parking areas. Major crossroads surrounding the site are: Taylor Road to the north, Davis Street to the south, and Dutchess Street and Nassau Road to the west and east, respectively. The area surrounding the site is a mixture of

residential and commercial properties. The commercial properties are located predominantly along Nassau Road.

OU1, which is the subject of this ROD, addresses on-site soil and groundwater contamination, and consists of approximately one acre of land. An operable unit represents a portion of the site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination. The remaining operable unit for this site is Operable Unit 2 (OU2), which will address the groundwater located downgradient of OU1. The OU2 Feasibility Study will be completed pending field activities to be implemented in 2004.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

In 1988, as a result of a site inspection by the Nassau County Department of Health (NCDOH), it was concluded that the dry cleaning operations and hazardous material storage at Jimmy's Dry Cleaners presented a risk to public health and the environment. This conclusion was based on the observation of poor housekeeping practices; specifically, leaking dry cleaning equipment and inappropriate hazardous waste storage practices. The NCDOH also noted the presence of an unregistered below-grade fuel oil tank and potential for discharge of hazardous materials to a dry well located near the dry cleaning facility. Subsequent investigations identified elevated levels of chlorinated VOCs in the soil, groundwater, soil gas, and indoor air near the dry cleaner and down-gradient of the site. The dry cleaner has been shut down since November 1998.

3.2: Remedial History

In 1988, it was concluded that the dry cleaning operations and hazardous material storage at the site presented a risk to public health and the environment as a result of a site inspection by the NCDOH. In the spring of 1994 soil and groundwater samples were collected from the site. The results confirmed the presence of chlorinated VOCs in groundwater at the site.

In 1994, the NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

The NCDOH collected additional soil and groundwater samples from the site in 1995. The December 1995 samples confirmed the presence of chlorinated VOCs above Technical and Administrative Guidance Memorandum (TAGM) 4046 concentrations in soil and above groundwater standards near the former dry cleaner.

SECTION 4: 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.

The PRP for the site, documented to date, is James Lawrence, the now deceased former owner, of the former Jimmy's Dry Cleaner business. The NYSDEC has been dealing with the executrix of his estate since then (who will be referred to as the PRP).

The PRP declined to implement the RI/FS at the site when requested by the NYSDEC. After the remedy is selected, the PRPs will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRP, the NYSDEC will evaluate the site for further action under the State Superfund. The PRP is subject to legal actions by the state for recovery of all response costs the state has incurred.

SECTION 5: SITE CONTAMINATION

An RI/FS has been conducted to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between August 2001 and December 2002. The field activities and findings of the investigation are described in the RI report.

The following activities were conducted during the RI within the boundaries of OU 1:

- Research of historical information;
- Geophysical survey to determine depth to underlying confining layers;
- Soil gas survey to locate VOC contaminated soils and possible vapor exposure pathways;
- Installation of eight soil borings with 48 samples collected for analysis of soils, as well as physical properties of soil;
- Two temporary piezometers were installed at ITGW1 and ITSB-5;
- 24 discrete groundwater samples were collected from 11 locations;
- A survey of public and private water supply wells in the area around the site;
- Collection of 37 indoor air samples from 6 structures from 4 sampling events; and
- Collection of 34 soil gas samples.

To determine whether the soil, groundwater, soil gas, and indoor air contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

- Soil SCGs are based on the NYSDEC "Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels".

- Air SCGs for tetrachloroethene are based on the NYSDOH fact sheet "Tetrachloroethene (PERC) in Indoor and Outdoor Air. NYSDOH recommends that actions be taken to reduce tetrachloroethene levels in air to as close to background levels as practical.

- Background soil, groundwater and soil gas samples were taken from an up-gradient location. This location was unaffected by historic or current site operations. The samples were analyzed for 15 VOCs. The results of the analysis were compared to data from the RI (Table 1) to determine appropriate site remediation goals.

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.

5.1.1: Site Geology and Hydrogeology

Soils collected at the site from the ground surface to depths of 20 feet below ground surface (bgs) consist of brown and light brown, medium to fine grain sands, with varying amounts of subrounded gravel, and trace amounts of silt consistent with Pleistocene deposits found in the Western Long Island area.

Review of the regional hydrogeology of Nassau County indicates that groundwater generally flows in a southerly direction. The soil-groundwater interface is typically encountered at approximately 20 feet bgs within the glacial deposits. There are three primary water bearing aquifers underlying Long Island. These aquifers (Glacial Deposits, Magothy, and Raritan) are considered to be hydraulically connected, with the Glacial and Magothy contributing recharge to the underlying Raritan aquifer. Groundwater samples were taken at depths ranging from the water table (20 feet bgs) down to 120 feet bgs.

5.1.2: Nature of Contamination

As described in the RI report, many soil, groundwater, soil gas, and indoor air samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the contaminants that exceed their SCGs are VOCs.

The primary contaminant of concern is tetrachloroethene or PCE. The improper waste disposal and housekeeping practices of the former dry cleaner caused the release of PCE into soil and groundwater at the site. The contamination contributed to impacts to soil gas and indoor air.

5.1.3: Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

Chemical concentrations are reported in parts per billion (ppb) for water, parts per million (ppm) for soil, milligrams per cubic meter (mg/m^3) for soil gas and micrograms per cubic meter (ug/m^3) for indoor air samples. For comparison purposes, where applicable, SCGs are provided for each medium.

Table 1 summarizes the degree of contamination for the contaminants of concern in soil, groundwater, soil gas, and indoor air and compares the data with the SCGs for the site. Figures 3, 4 and 5 also summarize the degree of contamination. The following are the media which were investigated and a summary of the findings of the investigation.

Soil

Soil sampling performed on site identified highly elevated concentrations of PCE in shallow (0-4 feet) and deep (18 - 20 feet) soils (33 ppm and 330 ppm respectively) near the dry cleaning equipment. The SCG for PCE in soil is 1.4 ppm. The distribution of the chemical constituents of concern in soil confirm that a loss of dry cleaning chemicals occurred within or near the building and migrated through the unsaturated soils to the water table. Figure 3 presents data defining the nature and extent of soil contamination.

Groundwater

Groundwater sampling identified extensive impacts to the groundwater down-gradient from the site. The groundwater impacts within OU1 are primarily a result of PCE (up to 15,000 ppb) that was identified at depths of approximately 120 feet below grade, approximately 300 feet downgradient of the site. The groundwater standard for PCE is 5 ppb. Groundwater impacts extending beyond the limits of OU1, approximately 3,400 feet to the south (down-gradient) of the site, will be addressed by OU2. Concentrations of PCE are highest in the shallower depths close to the site. A monitoring location to the north and up-gradient of the site did not identify the presence of PCE in groundwater, confirming the site as the source of the PCE. Figure 4 presents data showing the extent of the groundwater contamination within the boundaries of OU 1. Groundwater contamination which extends beyond OU 1 will be addressed under OU 2.

Soil Gas

A soil gas survey identified highly elevated concentrations of VOCs (over 26,000 mg/m^3) in the vadose zone (above the water table) on-site. The most elevated concentrations were identified in the northwest corner of the building near the dry cleaning equipment. Additional elevated areas of VOCs

in the soil gas were identified near the entrance/egress to the building and near the dry well located to the northeast of the building. The soil gas data confirmed that a loss of dry cleaning chemicals to soils occurred in each of these areas, resulting in soil and groundwater impacts. Figure 5 presents data defining the extent of soil gas contamination.

Indoor Air

Indoor air monitoring identified PCE in air above SCGs in the Deli and inside the building located at 40 Dutchess Street (see Figure 5 for locations) as a result of the loss of dry cleaning chemicals at the site. An Interim Remedial Measure (see Section 5.2) designed to inhibit the migration of chemical constituents in unsaturated soils was successful in reducing concentrations of PCE in air at both locations.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

During the Remedial Investigation of OU1, high levels of PCE vapor were found within the site building and a nearby basement which prompted the NYSDEC to require the implementation of an IRM. In July 2002, an IRM was implemented at the site to reduce concentrations of VOCs in the vadose zone of the area including the Deli and neighboring residences.

The IRM included a limited soil vapor extraction system (SVE) designed to reduce VOC soil vapor concentrations in the area including the Deli and neighboring residences (see Figure 5 for location of soil vapor extraction points). The limited SVE system is comprised of a 1.5 HP vacuum extraction blower, two vapor-phase carbon canisters and seven shallow vapor extraction wells connected by a 2-inch diameter schedule 80 PVC trunk line. The vapor extraction wells vary in total depth from five to ten feet below grade, each well includes three to five feet of well screen. The SVE system has been in continuous operation since August 7, 2002. This SVE system has been successful in reducing indoor air concentrations of PCE down to acceptable concentrations.

5.3: 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 human exposure pathways can be found in Appendix Q of the RI report.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.
The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route

of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

The only complete exposure pathway identified at OU 1 of the Jimmy's Dry Cleaners site has been the inhalation of contaminated vapors in indoor air. Before the SVE system was installed, contaminated soil gas from the site had migrated into homes and businesses at and near the site, where people were exposed by breathing the contaminated air. The SVE system is currently mitigating this exposure pathway, but inhalation of vapors could become a concern again if the SVE system were turned off before the source of the vapors has been remediated.

Other potential exposure pathways include various routes of exposure to contaminated soil and groundwater at the site. These pathways are currently incomplete because there is no exposure point at which people may come in contact with the contamination.

Contact with soil contamination is not likely because the contaminated soil is below ground surface, beneath pavement and the on-site building. However, activities requiring excavation could result in exposures until the soil contamination has been remediated.

Currently, groundwater at the site is not used, but it could be used in the future. Although possible, it is not likely that the contaminated water would be used for drinking because a public water supply serves the area. The public water supply is routinely monitored and treated, if necessary, to ensure that it complies with federal and state drinking water standards.

5.4: Summary of Environmental Impacts

This section summarizes the existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to natural resources such as aquifers.

Site contamination has impacted the groundwater resource in the Upper Glacial aquifer. While the Upper Glacial aquifer is not used as drinking water in the vicinity of the site, it is considered a resource with its best potential use as drinking water. Also, potential future impacts exist for the hydraulically connected Magothy aquifer.

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. 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 remediation goals for this site are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to PCE in subsurface soil, groundwater, soil gas, and indoor air;
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and
- the release of contaminants from soils and groundwater into indoor air through soil gas transport.

Further, the remediation goals for the site include attaining to the extent practicable:

- ambient groundwater quality standards
- TAGM 4046 soil objectives
- and the SCG for PCE in indoor air.

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 requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Jimmy's Dry Cleaner Site were identified, screened and evaluated in the FS report which is available at the document repositories identified in Section 1.

A summary of the remedial alternatives that were considered for this site are discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated groundwater and soil/soil gas/indoor air at the site.

All alternatives, except No Action, would include the development of a site management plan to restrict the use of the property and use of the groundwater beneath the property, imposition of an institutional control in the form of an environmental easement on the property, continued monitoring of groundwater, soil gas, and air, and annual certification that the institutional and engineering controls remain effective.

Groundwater Alternatives

Groundwater Alternative 1 (G-1): No Action

Present Worth: *$264,000*
Capital Cost: *$42,000*
Annual OM&M:
(Years 1-30): *$18,000*

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 generally provide minimal additional protection to human health or the environment.

Groundwater Alternative 2 (G-2): Extraction and Treatment

Present Worth : *$11,800,000*
Capital Cost : *$2,000,000*
Annual OM&M:
(Years 1-30): *$790,000*

Groundwater Alternative 2 would consist of the installation of two (2) groundwater extraction wells at OU1 and an extraction and treatment system to treat the contaminated groundwater.

Groundwater would be extracted using standard recovery wells and transferred to a treatment system. The treatment system would include an influent equalization tank, metals removal equipment, an air stripper, liquid and vapor-phase granular activated carbon (GAC) and an effluent equalization tank. The system would be designed to comply with the air and surface water discharge criteria.

Groundwater extracted from the on-site wells would be transferred via an underground force main (header) to the treatment system, which would be located at the south end of the property. Groundwater from the recovery system would be collected in an equalization tank to regulate flow and settle larger suspended solids. An air stripper and liquid-phase GAC unit would remove VOCs from the extracted groundwater. The VOCs in the air stripper off-gas would be removed in a vapor-phase GAC prior to discharge to the atmosphere. Treated water would be pumped to a discharge location using a transfer pump and buried discharge pipe and either discharged to a surface water body or reinjected to the aquifer.

The extraction and treatment system would include continued monitoring of groundwater and would operate for approximately 30 years to reduce the VOC concentrations to compliance levels.

Groundwater Alternative 3 (G-3): Chemical Oxidation

Present Worth : *$2,700,000*
Capital Cost : *$2,600,000*
Annual OM&M:
(Year 1): *$39,000*

(Year 2): *$54,000*

Chemical oxidation would include a pilot scale study to confirm that conditions at the site are suitable for chemical oxidation. It would consist of injections of a solution of potassium permanganate via an estimated nineteen wells (see Figure 6 for well locations) to treat the OU1 contaminant plume to depths up to 120 feet below grade. This alternative would limit further plume migration and would destroy dissolved VOC contaminants, reducing the concentrations of VOCs in groundwater to below groundwater standards. The estimated time to meet remediation goals is approximately two to three years.

Soil/Soil Gas/Indoor Air Alternatives

The following alternatives would remediate the contaminated soil, which is the primary source of soil gas contamination, which in turn is the transport medium causing indoor air impacts. The SVE IRM described in Section 5.2 has addressed the indoor air impacts for the short term. The following alternatives were evaluated to address indoor air impacts for the long term.

Soil/Soil Gas/Indoor Air Alternative 1 (S-1): No Further Action

Present Worth: *$780,000*
Capital Cost: *$0*
Annual OM&M
(Years 1-30): *$63,000*

The No Further Action alternative recognizes remediation of a portion of the site conducted under a previously implemented IRM. The No Further Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It involves monitoring and the continued operation of the limited SVE system for approximately 30 years. This alternative would leave the site in its present condition and would not provide any additional protection to human health and the environment.

Soil/Soil Gas/Indoor Air Alternative 2 (S-2): Soil Vapor Extraction

Present Worth : *$1,500,000*
Capital Cost : *$880,000*
Annual OM&M:
(Year 1-2): *$250,000*
(Year 3-5): *$50,000*

This remedial alternative would consist of the installation of a more extensive soil vapor extraction (SVE) system (enhancing the SVE system constructed as an Interim Remedial Measure). Approximately 3 additional deep soil vapor extraction wells (to approximately 20 ft bgs) would be installed to extract contamination in the OU1 vadose zone. The OU1 vadose zone extends to approximately 20 feet below grade.

The soil vapors would be extracted using standard extraction wells and transferred to a treatment system via subsurface pipe. The on-site treatment system would be designed to comply with the appropriate air discharge criteria. The system would be located on the southern portion of OU1.

The implementation of this alternative would include the design, construction, operation and maintenance of the soil vapor extraction and treatment system.

Soil/Soil Gas/Indoor Air Alternative 3 (S-3): Excavation and Disposal

Present Worth : *$8,000,000*
Capital Cost : *$8,000,000*
Annual OM&M *:* $0

This remedial option would include the excavation of soils where PCE concentrations exceed 1.4 ppm, the NYSDEC's generic soil cleanup objective from TAGM 4046. The depth of excavation would be approximately 20 feet below grade, or to the elevation of the groundwater table. The estimated volume of PCE-impacted soils that would be excavated and disposed off-site would be approximately 9,000 cubic yards.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York State. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

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

1. 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.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the NYSDEC has determined to be applicable on a case-specific basis.

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.

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 engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

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.

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

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

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 PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the NYSDEC addressed the concerns raised. In general, the public comments received were supportive of the selected remedy.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the NYSDEC has selected Alternative S-2, Soil Vapor Extraction (SVE), to address contaminated soil/soil gas/indoor air, and Alternative G-3, Chemical Oxidation, to address contaminated groundwater, as the remedy for this site. The elements of this remedy are described at the end of this section.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS.

These alternatives have been selected because, as described below, they satisfy the threshold criteria and provide the best balance of the primary balancing criteria described in Section 7.2. Alternative S-2 will achieve the remediation goals for the site by treating the soils that create the significant threat to public health and the environment, thereby reducing the source of contamination to groundwater and indoor air via transport through soil gas. Alternative G-3 will achieve remediation goals for groundwater by treatment with chemical oxidation to destroy the VOCs in groundwater.

Rationale for Soil/Soil Gas/Indoor Air Remedy:
Alternative S-1 (No Further Action) would not satisfy the threshold criteria. Alternatives S-2 (Soil Vapor Extraction) and Alternative S-3 (Excavation and Disposal) would each satisfy the threshold

criteria, thus the five balancing criteria are particularly important in selecting a final remedy to address soil/soil gas/indoor air at this site.

While Alternative S-2 requires a longer time for implementation, the relative short term impact to nearby communities, site workers and the environment would be significantly lower than Alternative S-3. Alternatives S-2 and S-3 are anticipated to provide comparable long-term effectiveness.

Alternative S-2 would provide a permanent remedy for the reduction of contamination toxicity, mobility and volume through treatment, relative to the site. Alternative S-3 would not reduce the overall contaminant volume, as it would rely entirely on the removal and placement of soils in an off-site permitted facility, but it would reduce the relative toxicity and mobility of the contamination.

While both Alternatives S-2 and S-3 would be readily implementable, Alternative S-2 would be slightly easier to implement. The costs associated with Alternative S-2 would be much less than those of Alternative S-3. Since Alternative S-2 would provide similar protections as Alternative S-3 with comparable long-term effectiveness for significantly less cost, Alternative S-2 is the selected remedy to address soil/soil gas/indoor air.

Rationale for Groundwater Remedy:
Alternative G-1 (No Action) would not satisfy the threshold criteria. Alternatives G-2 (Extraction and Treatment) and G-3 (Chemical oxidation) would each satisfy the threshold criteria, thus the five balancing criteria are particularly important in selecting a final groundwater remedy for this site. Alternatives G-2 and G-3 both would have short-term impacts that can be easily controlled. The time needed to achieve the remediation goals would be much longer for Alternative G-2. Alternative G-3 would have the greatest long-term effectiveness because it would permanently destroy VOCs in the groundwater.

Both alternatives G-2 and G-3 would reduce the overall volume of contaminants present in the aquifer and provide a permanent remedy for the reduction of contaminant toxicity, mobility and volume. Alternative G-3 is a destructive technology that would eliminate VOCs in groundwater, while Alternative G-2 would transfer the VOCs from the groundwater to activated carbon for disposal.

Both alternatives G-2 and G-3 would be readily implementable, however G-2 would require siting a treatment facility within a highly developed area and G-3 would require that a pilot test be completed to confirm suitable site conditions for chemical oxidation. Alternative G-3 would be significantly less expensive than Alternative G-2. Since Alternative G-3 would provide similar protections as Alternative G-2 with greater long-term effectiveness and permanence for significantly less cost, Alternative G-3 is the selected remedy to address groundwater.

The estimated present worth cost to implement both Alternatives S-2 and G-3 (the remedy) is $4,200,000. The cost to construct the remedy is estimated to be $3,500,000 and the estimated average annual operation, maintenance and monitoring costs for the first 2 years is $300,000, with annual costs of $50,000 for years 3 through 5.

The elements of the selected remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the chemical oxidation and SVE systems.

2. A more extensive soil vapor extraction (SVE) system (enhancing the SVE system constructed as an Interim Remedial Measure) will be installed. This will consist of three additional deep vapor extraction wells to address the source area soils, and seven existing shallow vapor extraction wells to address soil/soil gas/indoor air near the Deli and adjacent residences. The SVE system will include off-gas treatment to meet applicable discharge requirements.

3. A pilot scale study will be conducted to confirm that conditions at the site are suitable for chemical oxidation of groundwater contamination.

4. If the results of the pilot study are favorable a full scale application of chemical oxidant will be injected into the aquifer underlying the site. The full scale application will include the installation of approximately nineteen injection wells and eight monitoring wells. It is estimated that several applications followed by several months of monitoring will be required.

5. If the results of the pilot study indicate that an oxidation technology is not suitable for technical reasons, groundwater extraction and treatment will be implemented in place of chemical oxidation.

6. Development of a site management plan to: (a) address residual contaminated soils that may be excavated from the site during future redevelopment. The plan will require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations; (b) evaluate the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified; and (c) identify any use restrictions.

7. An annual certification will be prepared and submitted by a professional engineer or environmental professional acceptable to the Department, which will certify that the institutional controls and engineering controls put in place, are unchanged from the previous certification and nothing has occurred that would impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with any operation an maintenance or site management plan.

8. Imposition of an institutional control in the form of an environmental easement that will: (a) require compliance with the approved site management plan, (b) limit the use and development of the property to commercial or industrial uses only; (c) restrict use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Nassau County Department of Health; and, (d) require the property owner to complete and submit to the NYSDEC an annual certification. Once soil and groundwater are treated to achieve unrestricted use levels, the institutional control could be modified.

9. The operation of the components of the SVE remedy will continue until the remedial objectives have been achieved, or until the NYSDEC determines that continued operation is technically impracticable. Continued monitoring of groundwater, soil gas, and air will be done until remedial goals are met.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- Repositories for documents pertaining to the site were established.
- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.
- A public meeting at the Roosevelt Library was held on June 13, 2001 to discuss the draft work plan for the Remedial Investigation/Feasibility Study.
- A fact sheet summarizing the RI and FS (OU1) results and describing the Proposed Remedial Action Plan was mailed to those on the mailing list in February 2004.
- A second public meeting was held on March 1, 2004 at the Roosevelt High School to present the RI and FS OU1 results.
- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.

TABLE 1
Nature and Extent of Contamination

December 1995 - August 2001

SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Tetrachloroethene	ND[c] - 330	1.4	19 of 48

April 1994 - March 2002

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Tetrachloroethene	ND[c] - 38,000	5	18 of 24

August 2001 - March 2002

SOIL GAS	Contaminants of Concern	Concentration Range Detected (mg/m^3)[a]	SCG[b]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Tetrachloroethene	ND[c] - 26,000	N/A	31 of 34

September 1998 - March 2003

INDOOR AIR	Contaminants of Concern	Concentration Range Detected (ug/m^3)[a]	SCG[b] (ug/m^3)[a,d]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Tetrachloroethene	ND[c] - 1,400	100/back ground	5 of 37

[a]ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m^3 = micrograms per cubic meter
mg/m^3= milligrams per cubic meter
[b] SCG = standards, criteria, and guidance values
[c]ND = concentration not detected above method detection limit.
[d]The NYSDOH "Tetrachloroethene in Indoor and Outdoor Air" fact sheet states, "Reasonable and practical actions should be taken to reduce PERC exposure when indoor air levels are above background, even when they are below the guideline of 100 µg/m3... The goal of the recommended actions is to reduce PERC levels in indoor air to as close to background as practical."

TABLE 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
Groundwater Alternative 1: No Action	$42,000	$18,000	$264,000
Groundwater Alternative 2: Extraction and Treatment	$2,000,000	$790,000	$11,800,000
Groundwater Alternative 3: Chemical oxidation	$2,600,000	$39,000 (Yr 1) $54,000 (Yr 2)	$2,700,000
Soil/Soil Gas/Indoor Air Alternative 1: No Action	$0	$63,000	$780,000
Soil/Soil Gas/Indoor Air Alternative 2: Soil Vapor Extraction	$880,000	$250,000 (Yr 1-2) $50,000 (Yr 3-5)	$1,500,000
Soil Alternative 3: Excavation and Disposal	$8,000,000	$0	$8,000,000

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Jimmy's Dry Cleaners
Operable Unit No. 1
Roosevelt, Nassau County, New York
Site No. 130080

The Proposed Remedial Action Plan (PRAP) for the Jimmy's Dry Cleaners site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 12, 2004. The PRAP outlined the remedial measure proposed for the contaminated soil and groundwater at the Jimmy's Dry Cleaners site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on March 1, 2004, which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 15, 2004.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the NYSDEC's responses:

Comment 1: What symptoms do you experience when you have exposure to perc? What are the general health effects of exposure to these chemicals? What is the impacts of perc on human beings?

Response 1: The New York State Department of Health (NYSDOH) has a Fact Sheet which describes the health related symptoms of Perchloroethylene (PCE) human exposure. PCE is also know as "Perc" and Tetrachloroethylene. The following information regarding the effects of exposure to tetrachloroethene (also called perchloroetheylene, PCE, or Perc) is from the New York State Department of Health (NYSDOH) fact sheet *Tetrachloroethene (Perc) in Indoor and Outdoor Air (May 2003)*. Copies of the fact sheet are available from the NYSDOH (call 1-800-458-1158). The fact sheet is also posted on the NYSDOH web site at http://www.health.state.ny.us/nysdoh/environ/btsa/fs_perc.htm In humans and animals, the major effects of PCE exposure are on the central nervous system, kidney, liver, and possibly the reproductive system. These effects vary with the level and length of exposure.

In studies involving people who were exposed to PCE, not all humans exposed showed effects at the same levels. The difference in how people respond to the same or similar exposure levels is due, in part, to the individual differences among people. People, for example, differ in age, sex, diet, family traits, lifestyle, genetic background, the presence of other chemicals in their body (e.g., alcohol, prescription drugs), and state of health. These differences can affect how people will respond to a given exposure. One person may feel fine during and after an exposure while another person may become sick. This is known as sensitivity. Differences in sensitivity should be kept in mind when reading the following information on the human health effects of PCE.

Short-Term Exposure - Studies with volunteers show that exposures of 8-hours or less to 700,000 micrograms per cubic meter of air ($\mu g/m^3$) cause central nervous system symptoms such as dizziness, headache, sleepiness, lightheadedness, and poor balance. Exposures to 350,000 $\mu g/m^3$ for 4 hours affected the nerves of the visual system and reduced scores on certain behavioral tests (which, for example, measure the speed and accuracy of a person's response to something they see on a computer screen). These effects were mild and disappeared soon after exposure ended.

Long-Term Exposure – Numerous studies of dry-cleaning workers indicate that long-term exposure (9 to 20 years, for example) to workplace air levels averaging about 50,000 $\mu g/m^3$ to 80,000 $\mu g/m^3$ reduces scores on behavioral tests and causes biochemical changes in blood and urine. The effects were mild and hard to detect. How long these effects would last if exposure ended is not known.

One study reported reduced scores on behavioral tests in 14 healthy adults living (for 10.6 years, on average) in apartments near dry-cleaning shops. The effects were small; the average test scores of the residents were slightly lower than the average score of unexposed people. The range of measured air levels in 13 apartments was 7.6 $\mu g/m^3$ to 23,000 $\mu g/m^3$; one air level was below 100 mcg/m^3, five values were between 100 and 1,000 $\mu g/m^3$, and seven values were above 1,000 $\mu g/m^3$. The average air level in all apartments was 5,000 $\mu g/m^3$ and the median value was about 1,400 $\mu g/m^3$ (that is, half the measured air levels were above 1,400 $\mu g/m3$ and half were below it). As with the long-term occupational studies, how long these effects would last if exposure ended is not known. Confidence in the understanding of exposure in this study is less than that in the occupational studies.

Some studies show a slightly increased risk of some types of cancer and reproductive effects among workers, including dry-cleaning workers, exposed to PCE and other chemicals. Cancers associated with exposures include cancers of the esophagus, bladder, and non-Hodgkin's lymphoma. Cancers less clearly associated with exposures include cancers of the cervix, tongue, and lung. The reproductive effects associated with exposure included increased risks of spontaneous abortion, menstrual and sperm disorders, and reduced fertility. The data suggest, but do not prove, that the effects were caused by PCE and not by some other factor or factors. Data on the workplace air levels in these studies ranged from none (reproductive studies) to some (cancer studies); however, workplace air levels during the times these studies were conducted were considerably higher than those typically found in indoor or outdoor air.

Comment 2: What are the PCE concentrations levels in indoor air?

Response 2: The most recent indoor air monitoring data available is from September 2003, when PCE was detected at 26 $\mu g/m^3$ in the on-site deli and between 5.2 and 6.2 $\mu g/m^3$ in off-site buildings. The concentration of PCE in the Deli is below the NYSDOH air guideline, and in off-site locations levels are similar to typical background concentrations for PCE. A soil vapor extravtion (SVE) system was installed in the Summer of 2002. The highest concentration detected before the SVE system was installed was 1,400 $\mu g/m^3$ in the deli. Concentrations in other buildings near the site ranged from nondetectable to 490 $\mu g/m^3$.

Comment 3: How deep is the soil gas contamination?

Response 3: Soil gas sampling was performed 4 to 8 feet below the ground surface (bgs). PCE contamination in soil gas is likely to be found deeper than 8 feet bgs (as deep as 20 feet bgs), but the 4 to 8 foot depth was chosen to represent the typical depth to a building basement/foundation.

Comment 4: How long will the soil vapor extraction system be running?

Response 4: The NYSDEC plans to expand the current soil vapor extraction system so the entire source area can be remediated. This system is expected to operate until the cleanup is complete, approximately five years.

Comment 5: Has a faster remedy been considered such as the demolition of the building and the removal of contaminated soil? Wouldn't it make more sense to excavate the contaminated soil, especially if this could be done in one year? Wouldn't excavation ultimately be the most cost effective remedy?

Response 5: Currently, there is no exposure to soils via direct contact (contaminated soils are beneath the building and paved areas) and soil gas is being controlled by the existing SVE system. If we were to excavate PCE contaminated soil after the building was demolished, heavy construction equipment (excavation equipment, trucks, etc.) would be needed. It would be necessary to excavate down to approximately 20 feet below the surface of the ground. Excavation would take about 1 year, involve transporting contaminated material over long distances, and would create additional traffic, pollution, and noise through the neighborhood during transport.

The SVE system pulls vapors away from local residences with minimal risk of exposure. When selecting a remedy, we need to balance short term impacts with possible longer term threats, and for this site the short term impacts associated with excavation is greater than the slightly longer term threat of cleaning the soil with an SVE system. It would cost approximately $8 million to demolish the Jimmy's Dry Cleaners building and excavate all contaminated soils but only $1.5 million to expand the existing SVE system.

Comment 6: What caused the contamination to take place, storage or disposal?

Response 6: The causes for contamination include: poor housekeeping practices, storage of spent solvents in drums and other available containers in an inappropriate manner, and cracks and other openings in the floor where the spilled PCE entered the soil beneath the building. The dry cleaning machines also leaked.

Comment 7: How does perc react in the environment? How did it contaminate groundwater?

Response 7: PCE enters the soil as liquid and most of it gets tied up in the spaces between the soil particles. The PCE either slowly migrates down to the water table and then dissolves into the groundwater or it is dissolved by infiltrating precipitation which carries it down to the water table. The PCE groundwater contamination has spread approximately 3/4 of a mile to the south. The PCE contamination also sinks as it is carried along by the groundwater.

Comment 8: Could the Village of Freeport (VOF) water supply wells potentially be impacted by this contamination plume? PCE dissolves in water. Won't that ultimately impact other water supplies? Are drinking water supplies being impacted by this plume?

Response 8: The current VOF drinking water supply wells are to the south of the leading edge of the PCE contaminated groundwater plume from Jimmy's Dry Cleaners. The VOF water supply wells are also significantly deeper than the groundwater contamination and therefore are not likely to be impacted in the future. The drinking water supply wells are regularly tested to insure that all drinking water standards are met.

Comment 9: Are people going to be given devices that they can put into their homes to determine what impacts may be occurring in their homes? Is there equipment, similar to carbon monoxide detectors, available to test for perc and other chemicals in homes?

Response 9: Right now there are no monitoring devices (e.g. like smoke detectors) that residents can buy commercially. However, the NYSDEC, NYSDOH, and Nassau County Department of Health (NCDOH) have monitored those structures closest to the site and have implemented an IRM to mitigate any impacts on these structures. Structures farther from the source area are not expected to have indoor air impacts, but if the agencies believe there is a threat, due to new information, additional monitoring may be performed.

Comment 10: What can a homeowner do to protect themselves?

Response 10: The NYSDEC, NYSDOH, and NCDOH have tested those homes most likely at risk and either found no problem or took measures to reduce indoor air concentrations (i.e. implemented the IRM). If you are still concerned contact us and we will evaluate your situation.

Comment 11: When are gases more of a danger? Summer or Winter?

Response 11: The potential for PCE soil gas contamination to impact structures is greatest in the winter months when there is little ventilation in residents homes (windows are closed tight) and heating systems can cause a negative pressure which may tend to draw PCE soil gas into structures

Comment 12: What are the levels of perc at 44 Dutchess?

Response 12: The PCE concentration at 44 Dutchess in July 2002 was slightly above background concentrations. A soil vapor extraction (SVE) system and Interim Remedial Measure (IRM) was designed and built (in August 2002) to reduce PCE soil vapor concentrations (resulting in a reduction of indoor air concentrations) at this residence and nearby businesses. The SVE IRM has been in operation since August 2002 and has reduced indoor air PCE levels to below typical background concentrations.

Comment 13: Have any homes further down on Dutchess been tested? Why are some homes impacted while adjacent homes are not impacted?

Response 13: All accessible homes, commercial establishments, and schools in the immediate area have been tested, starting on-site and working outward, until no indoor air impacts were found. PCE levels may be different in adjacent homes because some foundations are in better shape than others (fewer cracks and piping penetrations). As the PCE contaminated groundwater plume moves in a southern direction, the contaminated groundwater plume becomes deeper, with cleaner water entering at the water table. This prevents soil gas from becoming a problem in homes further away from the site.

Comment 14: If PCE is diluting in water wouldn't that ultimately result in it sinking deeper into the aquifer?

Response 14: The PCE concentration slowly attenuates while moving through the soil via dispersion, adsorption, and dilution if no active remediation is undertaken. By implementing this remedy on-site, the majority of the source of groundwater contamination will be removed and the remaining groundwater plume should begin to attenuate sooner. There is also a clay layer (confining layer) beneath the contaminated groundwater plume which restricts its ability to impact the deeper aquifer.

Comment 15: How far is well 27 from the site?

Response 15: Well 27 is on Claurome Place which is approximately 2400 feet downgradient of the site.

Comment 16: How wide is the plume?

Response 16: The PCE contaminated plume is approximately 500 feet wide at its widest point, along the east/west axis. It extends from N. Main Street to about 2 blocks to the west of N. Main Street.

Comment 17: Has the plume traveled further than Claurome? How far has the contamination gone?

Response 17: The plume extends south of Claurome Place past West Seaman Avenue (about 3900 feet from the site). Down gradient monitoring wells are located as far south as West Milton Street. These wells are positioned ahead of the PCE contaminated groundwater plume.

Comment 18. How are people on Dutchess being impacted by air contamination from the site?

Response 18: Indoor air has been sampled at three homes on Dutchess Street near the site. Efforts to arrange indoor air sampling at other homes in the immediate vicinity have been unsuccessful. In August 2001, air samples were collected at two homes on Dutchess Street. PCE concentrations of less than 5 $\mu g/m^3$ were detected in both homes. When one of those homes was resampled in May 2002, 490 $\mu g/m^3$ of PCE was detected in a basement bedroom. Since the SVE system began operating in August 2002, concentrations in the monitored homes have been below the NYSDOH air guideline. Periodic indoor air monitoring will continue until the soil vapor contamination has been remediated.

Comment 19: Can someone (NCDOH, NYSDOH) come back and test my home?

Response 19: Individuals who would like to have their residences tested for PCE indoor air levels may contact NYSDOH or NCDOH.

Comment 20: Can the homeowners be supplied data relating to their individual homes?

Response 20: New York State has provided and will continue to provide the results of all air sampling to the owners of the homes and businesses where the samples are collected.

Comment 21: What impacts from perc are taking place at the Deli and Kentucky Fried Chicken (KFC)?

Response 21: Before the SVE system was installed in August 2002, indoor air was sampled six times at the deli (beginning in 1998) and twice at KFC (in 2001 and 2002). PCE concentrations in the deli ranged from 108 to 1,400 $\mu g/m^3$. PCE concentrations at KFC ranged from 10 to 70 $\mu g/m^3$. With the SVE system running, PCE concentrations at the deli have ranged from 26 to 119 $\mu g/m^3$. Concentrations at KFC have ranged from 3.3 to 42 $\mu g/m^3$. The most recent data available are from September 2003, when PCE concentrations were 26 $\mu g/m^3$ at the deli and 5.9 $\mu g/m^3$ at KFC.

Comment 22: Were people aware when they went to eat in the Deli about the perc issue? Were notices posted

in the Deli about the perc (air) contamination.

Response 22: It does not appear that notices were posted to inform patrons of the deli about the indoor air contamination. In the past, customers and employees at the deli were exposed to PCE at concentrations above the NYSDOH guideline for PCE in air. However, it is important to note that the guideline is not a line between concentrations that cause health effects and those that do not. It is much lower than concentrations that have been shown to cause either non-cancer or cancer effects. In addition, the guideline (100 $\mu g/m^3$) is based on the assumption that people are continuously exposed to PCE in air all day, every day for as long as a lifetime. This is not likely the case for employees or patrons of the deli, who are more likely to be exposed for a part of the day and a part of their lifetime.

Comment 23: Who would be at fault if I suffer health impacts from this site?

Response 23: This question is outside the scope of this decision document. However, the SVE IRM has reduced PCE indoor air concentrations at residences and business near the site to levels below the NYSDOH air guideline, and they should remain that way now and in the future.

Comment 24: Should I be concerned about putting in an in-ground pool? (Question was from a Dutchess Street resident who lived directly in back of the site.)

Response 24: Since the groundwater elevation is 20 feet below the ground surface, if you wanted to put in an in-ground pool, there would be no adverse effects from PCE contaminated groundwater.

Comment 25: When was the soil vapor extraction system put in?

Response 25: The SVE system was installed and began operation in August 2002. It has been operating continuously since then.

Comment 26: Before this, were all of the homes in the area contaminated by perc?

Response 26: Homes near the site were first tested in August 2001, and the SVE system began operating in August 2002. Between those dates, significant indoor air contamination was detected in one of the three Dutchess Avenue homes that were tested. It is possible that other homes were affected in the past, but there are no data to show what indoor air PCE concentrations might have been.

Comment 27: Are there private businesses that can come into my home and test my indoor air?

Response 27: Phone numbers for private environmental consultants can be found in your local phone book. All accessible homes, commercial establishments, and schools in the immediate area have been tested, starting on-site and working outward, until no indoor air impacts were found.

Comment 28: What precautionary measures might homeowners take to protect themselves from exposure to these chemicals?

Response 28: The SVE system at the Jimmy's Dry Cleaners site is addressing the indoor air contamination that has been identified in homes and businesses near the site. The SVE system draws in contaminated soil vapor, which keeps the vapors from migrating away from the source area and into overlying buildings.

Comment 29: How much contaminated soil is in this area?

Response 29: About twelve thousand tons of soil would have to be excavated and disposed of in a hazardous waste landfill.

Comment 30: Where is the nearest hazardous waste landfill?

Response 30: The nearest hazardous waste landfill is located in Buffalo.

Comment 31: Where is the money coming from to fund this cleanup?

Response 31: The New York State Superfund is paying for this clean up. The NYSDEC will continue to seek PRP participation in the clean up of this site at every step of the remedial process. In this case we will contact the attorney of James Lawrence's estate, the deceased owner of Jimmy's Dry Cleaners.

Comment 32: Where does the groundwater go and will it ultimately reach the bays towards the south?

Response 32: The groundwater is moving in a southernly direction toward the south shore of Long Island. If left untreated, the groundwater could eventually reach the ocean. In order to address this contamination sooner, and prevent the contamination from spreading further, the site is being split into OU1 and OU2, with OU1 being the source area. By focusing on OU1, the NYSDEC will remediate the source of the contaminated plume thereby reducing PCE groundwater concentrations as soon as possible. In OU2, the NYSDEC will evaluate additional remedies for the contaminated off-site groundwater.

Comment 33: Are there other sites in the area?

Response 33: There was another inactive hazardous waste disposal site near Jimmy's Dry Cleaners. It was called Ranco Wiping Cloth Site (site #130076- located at 409 N. Main St., Freeport), which was cleaned up and delisted in the year 2000. There are also other active dry cleaners, which are not inactive hazardous waste disposal sites, in the immediate area.

Comment 34: How long will it take to get this process going, especially given the fact that Jimmy's estate has no money?

Response 34: The PRP (James Lawrence's estate) will be contacted to determine if they have the resources for the next step. Assuming the PRP can't implement the remedy, the NYSDEC will begin the design process for the remedy (a pilot test will be necessary for the chemical oxidation) which will take about one year. The construction process will probably begin for OU1 in about two years. There are two components to the OU1 remedy; SVE enhancement and chemical oxidation. Since the enhanced SVE will not require an extensive pilot test, the NYSDEC may decide to bid these components separately in order to implement the enhanced SVE portion of the remedy sooner.

Comment 35: Why has the cleanup process taken so long?

Response 35: Nassau County first became aware of a problem at Jimmy's Dry Cleaners in 1988. The county performed some tests and determined the site presented a threat. The New York State Department of Environmental Conservation became involved in 1994. Jimmy's Dry Cleaners was listed in the Registry of Inactive Hazardous Waste Disposal sites in New York and negotiations began with the owner James Lawrence to investigate and clean up the site. The owner subsequently became ill and died. Negotiations continued with legal representatives of Lawrence's estate. The NYSDEC brought a consultant (Shaw E&I) on board and began investigation work in 1999.

Comment 36: How are dry cleaners tested now?

Response 36: Nassau County has a program called Article 11 (regulates hazardous materials and is administered by NCDOH)) whereby dry cleaners are now inspected on a regular basis. Dry cleaners are now required to hire licensed haulers to dispose of hazardous materials (e.g. PCE). Through these inspections some of the dry cleaners with problems are discovered. The NCDOH doesn't routinely collect samples but sometimes does when it sees sloppy house keeping (e.g. leaking drums, stained soils, appearance of spills). Nassau County has one of the best dry cleaning inspection programs in the state. The problem here is historical in nature when dry cleaners operated 20, 30, even 40 years ago, before NYSDEC existed and before the county had a program to inspect dry cleaners. We now have environmental staff able to evaluate these problems and hopefully correct them before they become significant problems. Today's operating dry cleaners are much better at handling hazardous materials, use better technology, are more closely regulated, and consequently much less likely to cause a problem like this.

Comment 37: How is the quality of drinking water? Will the new supply well being constructed by the VOF be impacted by this plume?

Response 37: The water quality of drinking water supplies is regulated by NYSDOH and must meet New York State and federal drinking water standards before it enters the public water supply system.

NYSDEC is aware of the VOF's development of new water supply wells and we have been sharing information with them. The NYSDEC has placed a monitoring well between the plume the VOF's proposed water supply well location on Prince Avenue (West of Jimmy's Dry Cleaners). No contamination was found in that monitoring well. The new supply well will draw water from the Magothy aquifer, which is much deeper than the groundwater contaminant plume emanating from the Jimmy's Dry Cleaners Site. There is also a clay layer below the contaminant plume and above the Magothy aquifer, which restricts the movement of contaminated groundwater in the vertical direction. While any threat to the new supply well posed by this groundwater plume is minimal, the NYSDEC's goal is to remediate the on-site source area as soon as possible.

Comment 38: What is the rate that the plume is moving at?

Response 38: The difference in the water table from Jimmy's Dry Cleaners to West Seaman Avenue is about 5 feet over a distance of 3400 feet. Therefore, the hydraulic gradient (which is the main driving force for groundwater movement) is very low. In addition, the soils in the aquifer tend to slow down (retard) the movement of contaminants. That is the reason the PCE contaminated groundwater plume has not moved too far (approximately 3400 feet) over approximately a 40 year period.

Comment 39: What is the soil like?

Response 39: The groundwater table is approximately 20 feet deep at Jimmy's Dry Cleaners. The geological composition is coarse sand at that point. As the plume drops through the geological formation, the sand particles decrease in size and become mixed with clay and silt particles. The clay and silt layer acts as an aquatard or aquaclude (confining layer), which limits or prevents the contaminated groundwater from moving down into the Magothy (lower) aquifer.

Comment 40: How does the plume affect drinking water supply wells?

Response 40: To date, no drinking water supply wells have been impacted by the plume. NYSDEC has monitoring wells situated down gradient of the plume. We have not detected contaminants in those wells. The VOF's drinking water supply wells are much further south of the down gradient monitoring wells. The NYSDEC will continue to monitor those down gradient wells to determine if there is any indicator that the plume is migrating further south. By implementing the OU1 remedy, a natural attenuation process will begin and PCE concentrations in the plume will start to decline. Additional remedial measures will also be evaluated for the off-site groundwater plume (OU2), to prevent contamination from reaching supply wells to the south or west.

Comment 41: An unsigned, undated written comment was received on March 11, 2004, which essentially said, "the Village is drilling supply wells about five short blocks (southwest) from your site".

Response 41: The supply well location referred to in this comment is the same location (Prince Avenue) discussed in comment #37. See Response #37.

APPENDIX B

Administrative Record

Administrative Record

Jimmy's Dry Cleaners
Operable Unit No. 1
Site No. 130080

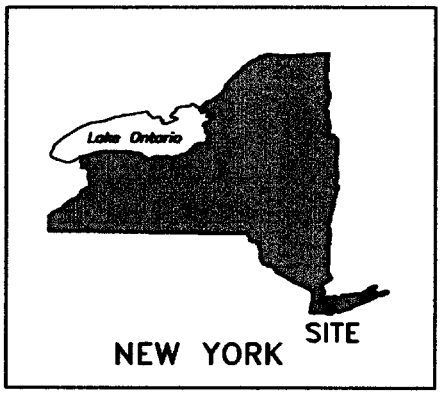
1. RI/FS Workplan for Jimmy's Dry Cleaners, dated July 20, 2001, by IT Corporation.

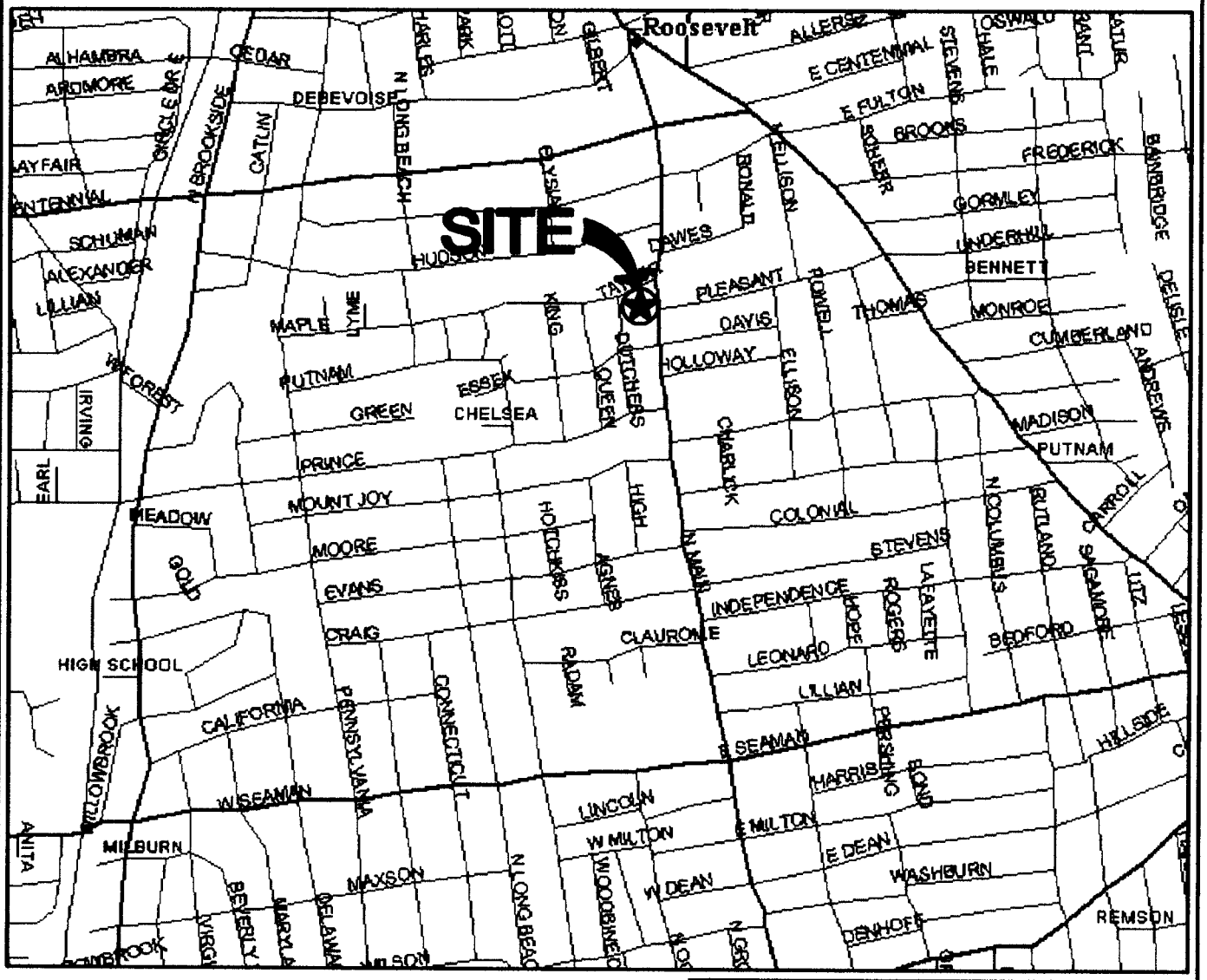
2. Remedial Investigation Report, August 2003, prepared by Shaw Environmental & Infrastructure Engineering of New York, P.C.

3. Feasibility Study Report Jimmy's Dry Cleaners Operable Unit 1, January 2004, prepared by Shaw Environmental & Infrastructure Engineering of New York, P.C.

4. Proposed Remedial Action Plan for the Jimmy's Dry Cleaners site, Operable Unit No. 1, dated February 2004, prepared by the NYSDEC.

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
ALBANY, NY	S. SHKOLNIK 11-13-03			824324A34





NOT TO SCALE

REFERENCE:
MAP FROM DELORME'S MAP EXPERT, FREEPORT, MAINE.

Shaw®
Shaw E&I Engineering of New York, P.C.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 1
SITE LOCATION MAP
OU1
JIMMY'S DRY CLEANER
ROOSEVELT, NEW YORK

N:\VOORIS\CAD\824324A34.dwg
Plot Date/Time: Jan 13, 2004 - 11:12am
Format Revised: 12/15/99
Image: L:\project\824324\ROOSEV_2.BMP
Xref:

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
ALBANY, NY	S.SHKOLNIK 02-05-04			824324062

REFERENCE:
BASE MAP SOURCE, CHAZEN ENGINEERING & LAND SURVEYING CO., P.C.

Shaw
Shaw E&I Engineering of New York, P.C.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 2
OU1 SITE MAP

JIMMY'S DRY CLEANER
ROOSEVELT, NEW YORK

DRAWING NUMBER	824324B30
APPROVED BY	
CHECKED BY	
DRAWN BY	S. SHKOLNIK 12-04-03
OFFICE	ALBANY, NY

CONCRETE CURB

CONCRETE WALK

CONCRETE WALK

Lands Now or Formerly of
TOWN OF HEMPSTEAD
Book 10755, Page 993
Section 55 Block 402 Lot 352

AREA OF BROKEN PAVEMENT

CONCRETE PAD

CB

APPROXIMATE BACK LOT FOR 35 TAYLOR ROAD

Lands Now or Formerly of
LAWRENCE GARAFALO
Book 9857, Page 661
Section 55 Block 402 Lot 356

S 85°11'19" E

ITSB3

SP-2

100.00'

100.00'

BD

ITSB2

ITSB4

ITSB5

SP-6

FORMER DRY CLEANER

SP-3

DW

CONCRETE PAD

ITSB7

99.99'

CONCRETE CURB

NASSAU ROAD

SP-4

F.F.=34.2'

1 STORY CONCRETE BLOCK BUILDING

CONCRETE APRON

ITSB1

ASPHALT

CHIMNEY

DELI

CONCRETE CURB

ITSB6

SP-5

ITSB8

CB

CONCRETE PAD

N 85°11'19" W

S 04°12'56" W

101.04'

APPROXIMATE BACK LOT FOR 48 DUTCHESS STREET

APPROXIMATE BACK LOT FOR 44 DUTCHESS STREET

APPROXIMATE BACK LOT FOR 40 DUTCHESS STREET

Lands Now or Formerly of
LAWRENCE GARAFALO
Book 9857, Page 661
Section 55 Block 402 Lot 356

REFERENCE:
BASE MAP SOURCE: CHAZEN COMPANY.

SCALE
0 20 40 FEET

N

LEGEND:

- APPROX. RESIDENT PROPERTY LINE
- NO PHYSICAL BOUNDS
- ADJACENT PROPERTY LINE
- EXISTING FENCE
- CB EXISTING CATCH BASIN
- DW EXISTING DRY WELL
- SB1 EXISTING SOIL BORING
- SP-1 HISTORIC SOIL BORING (APPROXIMATE LOCATION)
- SITE PERIMETER
- 20 PCE CONCENTRATION IN SOIL (ppm)

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 3
DISTRIBUTION OF PCE IN SOIL
SAMPLE DATES – 12/95 THROUGH 8/01
JIMMY'S DRY CLEANER
ROOSEVELT, NEW YORK

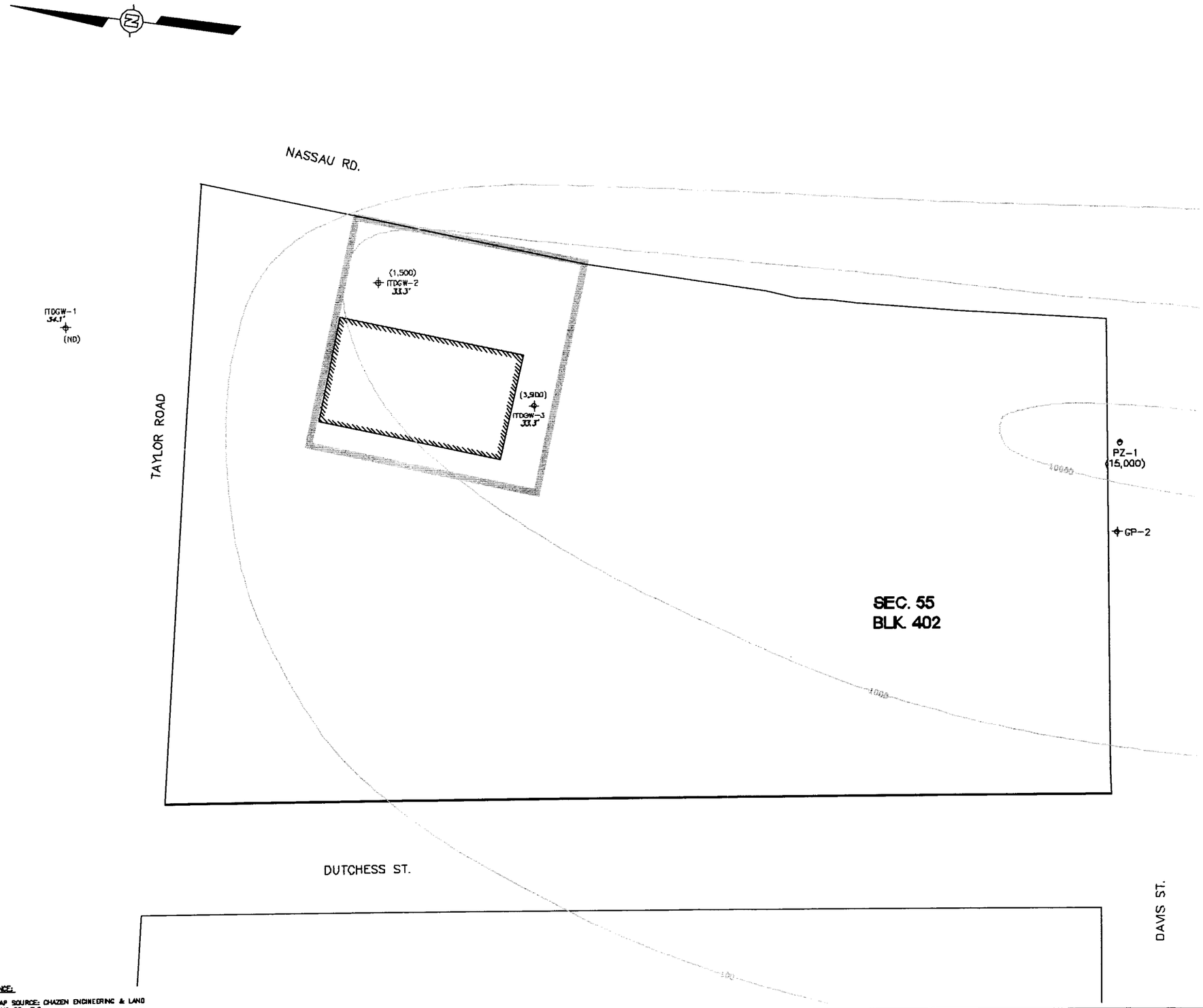
N:\VOORIS\CAD\824324B30.dwg
Plot Date/Time: Jan 22, 2004 - 4:17pm
Format Revised: 12/15/99

DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
S.SHKOLNIK 12-07-03			824324053

OFFICE
ALBANY, NY

LEGEND:

- TAX MAP PROPERTY LINES
- GP-1 — HISTORIC SAMPLING LOCATIONS
- ITDGW-2 333.3' (1,500) — GROUNDWATER SAMPLING LOCATION (GROUND ELEVATION) (PCE CONCENTRATION IN GROUNDWATER (ppb))
- PZ-1 — PIEZOMETER LOCATION
- MONITORING WELL
- 1000 — CONCENTRATION OF PCE (ppb)
- SITE PERIMETER
- BUILDING BOUNDARY



SCALE
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REFERENCE:
BASE MAP SOURCE: CHAZEN ENGINEERING & LAND SURVEYING CO., P.C.

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Format Revised: 11/15/99
Image Xref:

Shaw
Shaw E&I
Engineering of New York, P.C.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 4
DISTRIBUTION OF PCE IN GROUNDWATER
SAMPLE DATES – 8/6/01 THROUGH 8/29/01
JIMMY'S DRY CLEANER
ROOSEVELT, NEW YORK

DRAWING NUMBER 824324B29
APPROVED BY
CHECKED BY
DRAWN BY S. SHKOLNIK 12-02-03
OFFICE ALBANY, NY

CONCRETE CURB
CONCRETE WALK
CONCRETE WALK

Lands Now or Formerly of
TOWN OF HEMPSTEAD
Book 10755, Page 993
Section 55 Block 402 Lot 352

AREA OF BROKEN PAVEMENT
CONCRETE PAD
CB
CONCRETE CURB

APPROXIMATE BACK LOT FOR 35 TAYLOR ROAD

Lands Now or Formerly of
LAWRENCE GARAFALO
Book 9857, Page 661
Section 55 Block 402 Lot 356

VP2 (190EJ) (190EJ)
VP6 (1000EJ) (1000EJ)
VP28 (590E) (592E)
S 85°11'19" E
VP12 (52.0) (52.0)
100.00'
VP32 (2) (2)
VP3 (400J) (400J)
VP29 (110E) (112E)
VP38 (130E) (130E)
VP7 (510J) (510J)
VP9 (6,000) (6,000)
VP10 (26,000E) ~~(26,000E)~~
20,000
10,000
5,000
VP30 (ND) (ND)
VP22 (1,100E) (1,100E)
BD
DW
CONCRETE PAD
99.99'
CONCRETE WALK
CONCRETE CURB
VP4B (110E) (110E)
VP4 (510.0) (510.0EJ)
VP33 (2) (2)
FORMER DRY CLEANER
0.23 ACRE
1 STORY CONCRETE BLOCK BUILDING
F.F.=34.2'
CONCRETE APRON
VP13 (3893.5J) (3900EJ)
VP23 (2,100E) (2,104E)
ASPHALT
1,000
100
10
0.1
VP5 (130EJ) (131.8EJ)
VP31 (5) (41)
CHIMNEY
DELI
VP20 (130J) (131.1J)
(2,500EJ) (2,500EJ)
VP24 (ND) (ND)
CB
CONCRETE PAD
N 85°11'19" W
S 04°12'56" W
101.04'

APPROXIMATE BACK LOT FOR 48 DUTCHESS STREET

APPROXIMATE BACK LOT FOR 44 DUTCHESS STREET

APPROXIMATE BACK LOT FOR 40 DUTCHESS STREET

Lands Now or Formerly of
LAWRENCE GARAFALO
Book 9857, Page 661
Section 55 Block 402 Lot 356

NASSAU ROAD

SCALE
0 20 40 FEET

N

LEGEND:

- APPROX. RESIDENT PROPERTY LINE
- NO PHYSICAL BOUNDS
- ADJACENT PROPERTY LINE
- EXISTING FENCE
- CB EXISTING CATCH BASIN
- DW EXISTING DRY WELL
- VP6 EXISTING SOIL VAPOR SAMPLING LOCATION (PCE CONCENTRATION (mg/m^3)
- E ESTIMATED VALUE
- SITE PERIMETER
- 100 PCE CONCENTRATION IN SOIL GAS (mg/m^3)

REFERENCE:
BASE MAP SOURCE: CHAZEN COMPANY.

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Plot Date/Time: Jan 13, 2004 - 2:45pm
Format Revised: 12/15/99

Shaw E&I Engineering of New York, P.C.

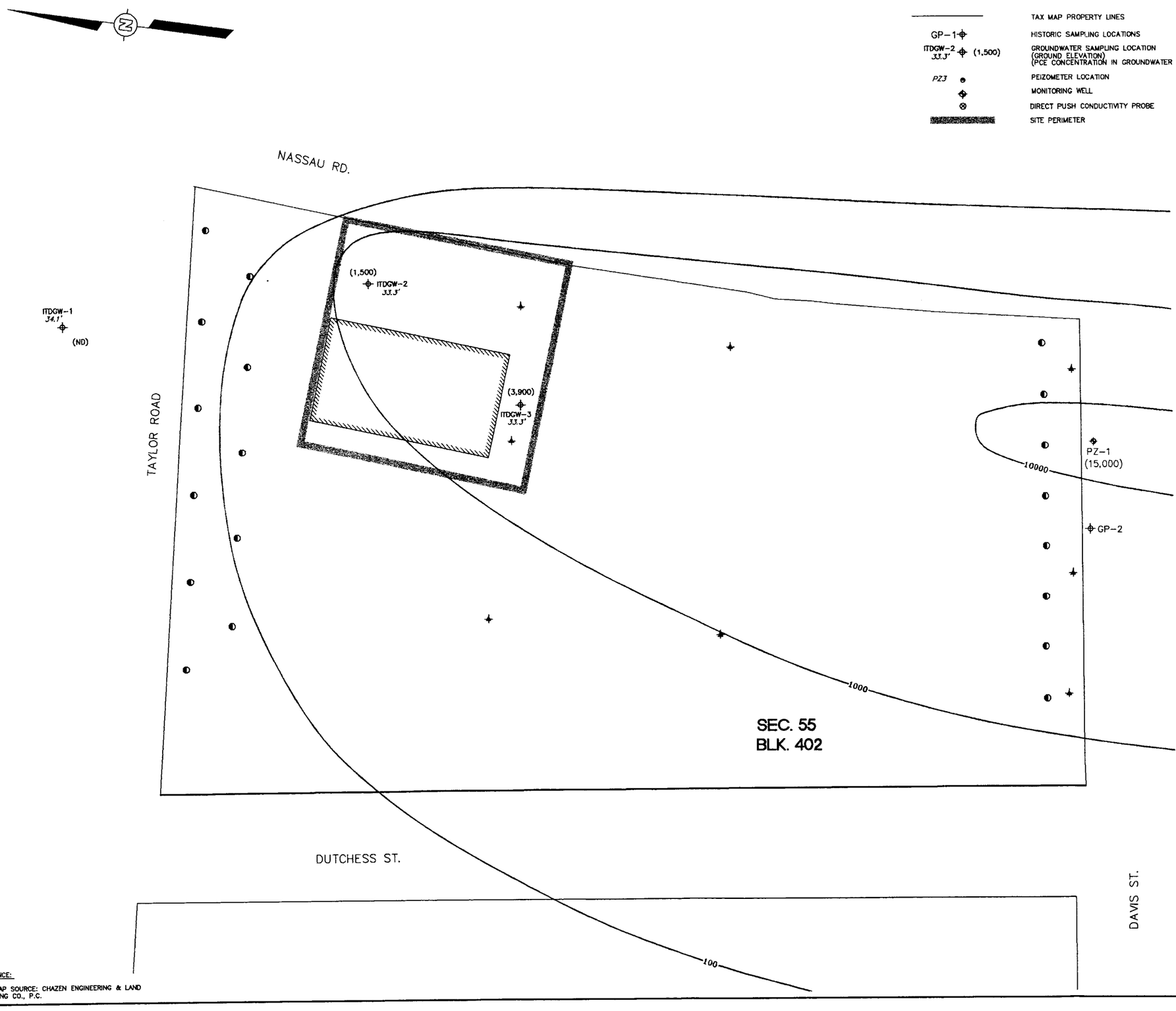
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 5
DISTRIBUTION OF PCE IN SOIL GAS
SAMPLE DATES – 8/01 THROUGH 3/02
JIMMY'S DRY CLEANER
ROOSEVELT, NEW YORK

DRAWING NUMBER	APPROVED BY	CHECKED BY	DRAWN BY	OFFICE
824324D54			S.SHKOLNIK 12-03-03	ALBANY, NY

LEGEND:

- TAX MAP PROPERTY LINES
- GP-1 — HISTORIC SAMPLING LOCATIONS
- ITDGW-2 33.3' (1,500) — GROUNDWATER SAMPLING LOCATION (GROUND ELEVATION) (PCE CONCENTRATION IN GROUNDWATER (ug/l))
- PZ3 — PEIZOMETER LOCATION
- MONITORING WELL
- DIRECT PUSH CONDUCTIVITY PROBE
- SITE PERIMETER
- —10000— CONCENTRATION OF PCE IN GROUNDWATER (ug/L)
- PROPOSED MONITORING WELL
- PERMANGANATE INJECTION WELL LOCATION



SCALE
0 20 40 60 FEET

REFERENCE:

BASE MAP SOURCE: CHAZEN ENGINEERING & LAND SURVEYING CO., P.C.

Shaw
Shaw E&I Engineering of New York, P.C.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 6
GROUNDWATER REMEDIAL ALTERNATIVE 3
SAMPLE DATES – 8/6/01 THROUGH 8/29/01
JIMMY'S DRY CLEANER
ROOSEVELT, NEW YORK

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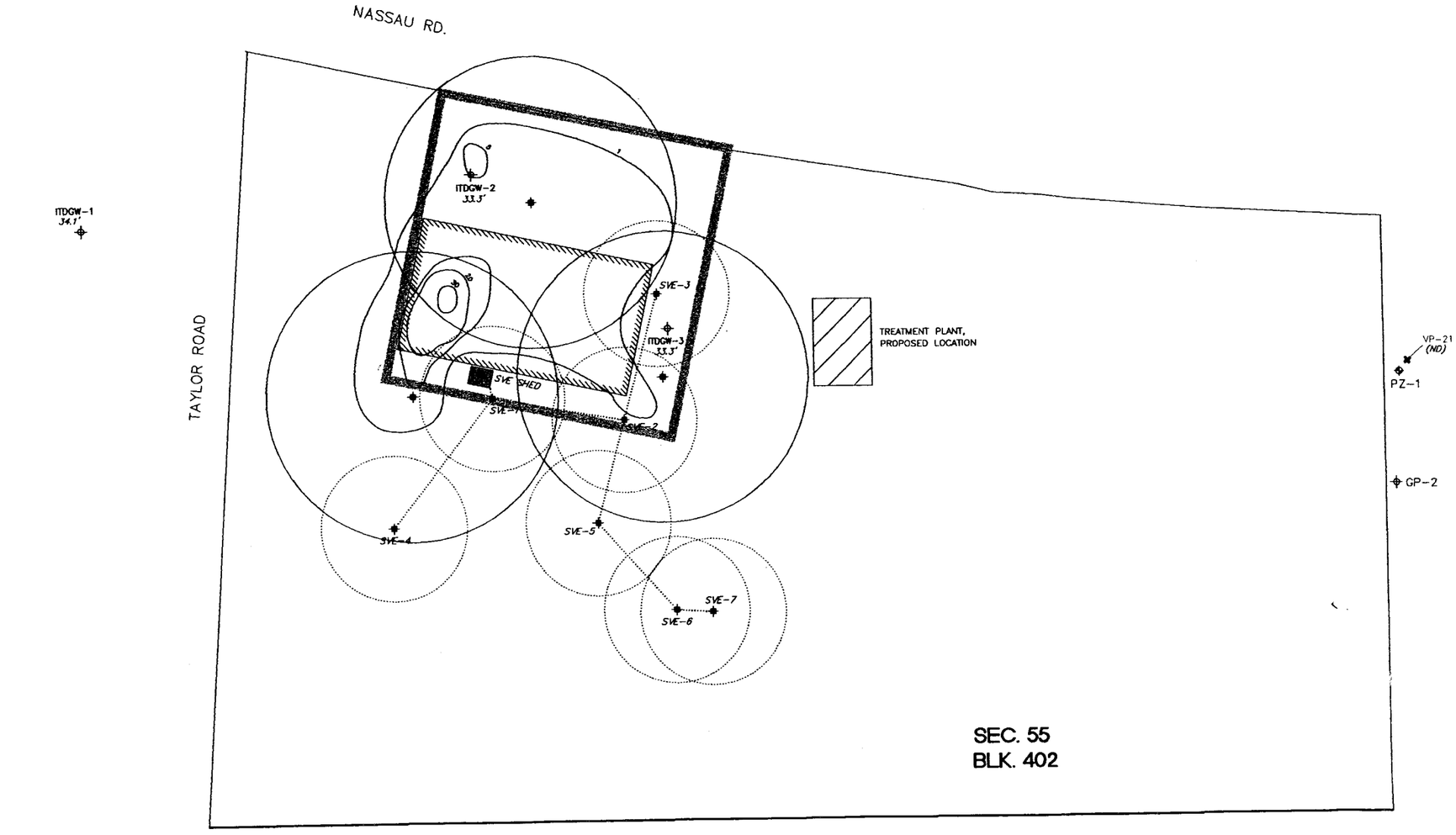
Plotted: Nov 13, 2004 - 2:45pm
Format: Revised: 12/15/98
Image: Xref:

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
ALBANY, NY	S.SHKOLNIK 01-12-04			824324D51

LEGEND:

VP-15 (413.9J)	EXISTING SOIL VAPOR SAMPLING LOCATION (CONCENTRATION OF PCE, mg/m³)
	TAX MAP PROPERTY LINES
GP-1	HISTORIC SAMPLING LOCATIONS
ITDGW-2 33.3'	GROUNDWATER SAMPLING LOCATION (GROUND ELEVATION)
PZ3	PEIZOMETER LOCATION
	MONITORING WELL
	DIRECT PUSH CONDUCTIVITY PROBE
	SITE PERIMETER
10	PCE CONCENTRATION IN SOIL (mg/m³)
	SOIL VAPOR EXTRACTION WELL, PROPOSED LOCATIONS
	TREATMENT PLANT, PROPOSED LOCATION
	IRM SOIL VAPOR EXTRACTION WELL
	IRM SVE PIPING
	EXPECTED RADIUS OF INFLUENCE OF SOIL VAPOR EXTRACTION WELLS



SCALE
0 20 40 60 FEET

REFERENCE:
BASE MAP SOURCE: CHAZEN ENGINEERING & LAND SURVEYING CO., P.C.

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Format Revised: 12/15/98
Image: Xref:

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FIGURE 7
SOIL/SOIL GAS/INDOOR AIR
ALTERNATIVE 2
JIMMY'S DRY CLEANER
ROOSEVELT, NEW YORK