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To: Ms. Heidi-Marie Dudek
New York State Department of Environmental Conservation
Division of Environmental Remediation, Bureau A
625 Broadway
Albany, NY 12233-7015

Date: November 9, 2007

File: 10653/36951 Doc

Re: Jimmy's Dry Cleaners
Feasibility Study Report
Final, November 2007

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Remarks:

cc: Ms. Sharon McLelland (2 Hardcopies)

Very truly yours,

O'Brien & Gere Engineers, Inc.

Amy Lawrence

Amy Lawrence, EIT
Design Engineer

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FINAL REPORT

Feasibility Study Report
Jimmy's Dry Cleaners
Operable Unit 2 #1-30-080
Roosevelt, New York

New York State Department of Environmental Conservation

November 2007

O'BRIEN & GERE

Job No. 10653/36951

FINAL REPORT

Feasibility Study Report
Jimmy's Dry Cleaners
Operable Unit 2 #1-30-080
Roosevelt, New York

New York State Department of Environmental Conservation

Douglas M. Crawford, Vice President
O'Brien & Gere Engineers, Inc.

November 2007

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1. Introduction

1.1. Purpose

The purpose of this report is to present the Feasibility Study (FS) for Jimmy's Dry Cleaners Site, Operable Unit 2 (OU2), New York State Superfund Site #1-30-080, located in the Village of Freeport, Town of Hempstead, Nassau County, New York.

1.2. Site Background

The Jimmy's Dry Cleaners Site is the location of a former dry cleaning business located at 61 Nassau Road in Roosevelt, New York (Figure 1, Site Location Map). The Jimmy's Dry Cleaners Site includes a commercial building, which formerly housed Jimmy's Dry Cleaners. The dry cleaner was shut down in November 1998. A delicatessen (deli) formerly occupied a small portion of the building. Breen Capital Investment Corporation currently owns the property.

In 1988, an inspection by the New York State Department of Health (NYSDOH) concluded that the dry cleaning operations and hazardous material storage at the Site presented a risk to public health and the environment. In 1994, soil and ground water samples were collected from the Site. The results confirmed the presence of chlorinated volatile organic compounds (VOCs) in ground water at the site. Additional investigations confirmed the presence of VOCs in soil gas and indoor air (NYSDEC 2004).

In 1994, the New York State Department of Environmental Conservation (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 that requires action because hazardous waste presents a significant threat to the public health or environment (NYSDEC 2004).

In 2002, NYSDEC contracted Shaw Environmental & Infrastructure Engineering of New York, P.C. (Shaw) to complete a Remedial Investigation (RI) and Feasibility Study (FS) for the Jimmy's Dry Cleaners Site. The RI identified the primary contaminant as tetrachloroethene (PCE) in the soil, soil gas, indoor air, and ground water. PCE concentrations in the soil ranged from below detection to greater than 330 ppm. Ground water concentrations ranged from below detection to 38,000 μg/L. Indoor air concentrations originally ranged from below detection to 1,400 $\mu g/m^3$, while soil gas concentrations ranged from below detection to 26,000 $\mu g/m^3$ (NYSDEC 2004).

During the RI, PCE was detected at concentrations above the NYSDOH Ambient Air Guideline for PCE (100 $\mu g/m^3$) and the NYSDOH Background Levels for PCE (100 $\mu g/m^3$) within the Site building and a nearby basement. Due to these findings, an Interim Remedial Measure (IRM) was implemented in July 2002 to reduce VOC soil vapor concentrations in the area including the former deli and neighboring residences. The IRM consisted of a limited soil vapor extraction (SVE) system with 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 piping system. This SVE system has been successful in reducing indoor air concentrations of PCE (NYSDEC 2004).

Due to the extent of the contamination, the site was subdivided into two operable units: OU1 and OU2 (refer to Figure 2). OU1 is rectangular in shape and approximately 2.5 acre in size and encompasses the Jimmy's Dry Cleaners property and the immediately surrounding residential and commercial neighborhoods. OU1 is bounded by Maple Avenue to the north, Nassau Road to the east, Davis Street to the south, and Dutchess Street to the west.

OU2 encompasses the residential and commercial area where the off site ground water plume is located and extends from Davis Street to about West Milton Avenue. The OU2 plume is approximately 4,000 ft in length with an average width of about 650 ft, spanning nearly 60 acres. The average depth of the plume is 120 ft, with a maximum depth of about 200 ft. PCE in the ground water is the primary contaminant of concern in OU2. The current ground water laboratory analytical data (from the February 2007 sampling event) indicates that PCE concentrations off site range from below detection to 3,800 μg/L (O'Brien & Gere 2007).

The Shaw FS (Shaw 2004b), and the subsequent Record of Decision (ROD) (NYSDEC 2004), addressed OU1. The ROD for OU1 was approved by NYSDEC in March 2004. The selected remedy documented in the ROD consisted of the installation of a more extensive SVE system (enhancing the SVE system constructed as an IRM) to treat the on-site soil contamination and the treatment of on-site ground water contamination via *in situ* chemical oxidation (NYSDEC 2004).

1.3. Summary of Previous Investigations

Work completed to date at OU1 and OU2 is summarized in the following documents:

- Remedial Investigation (RI) Report (OU1 and OU2), prepared by Shaw, dated August 2003
- Feasibility Study (FS) Report (OU1), prepared by Shaw, dated January 2004
- Record of Decision (ROD) (OU1), prepared by the NYSDEC, dated March 2004
- Potassium Permanganate Treatability Study Results (OU1), prepared by Shaw, dated September 2004
- Operation and Maintenance Description for IRM (OU1), prepared by Shaw, dated May 2005
- Soil Investigation and Treatability Study Report (OU1), prepared by Shaw, dated June 2005
- Supplemental Feasibility Study Sampling Report (OU1 and OU2), prepared by O'Brien & Gere, dated October 2007.

1.4. Summary of OU2 Ground Water and Soil Vapor Data

1.4.1. Geology

As described in the RI Report prepared by Shaw (August 2003), the Site is located in western Long Island, over approximately 1,000 to 1,500 feet of clastic, glacial sediments described as glacial kame deposits, fluvial sands or variably sorted till moraine deposits. These sediments were deposited during the last glacial retreat (D. Cadwell, Surficial Geologic Map of New York, Lower Hudson Sheet, 1989). The glacial sediments are described as (in descending order) Upper Pleistocene Glacial Deposits, Lower Pleistocene Glacial Deposits, Magothy Formation, and the Raritan Formation with the Lloyd Sand Member. Precambrian Bedrock underlies the glacial sediments.

According to the information presented by Cadwell, the Pleistocene deposits, which extend from grade to a depth of approximately 200 feet, consist of poorly sorted sand and gravel with local lenses of fine sand, silt and/or clay. The RI field investigation was used to define the local characteristics of this formation and evaluate the presence of the chemical constituents of concern at various depths. The underlying

Magothy formation consists predominantly of silty sands with isolated lenses of clay and organic material. Although the Pleistocene and Magothy sediments represent local water bearing units, reportedly the ground water supply for the area of Roosevelt, New York is obtained from deep production wells completed in the Magothy formation. The Pleistocene glacial deposits and the Magothy formation lie above the Raritan Formation and the Precambrian bedrock which were not investigated during the RI field investigation.

As documented in the RI, soil classifications were conducted exclusively in the upper and lower Pleistocene Glacial Deposits. Soil classifications performed for OU2 were consistent with the regional and local geology reported for Nassau County, New York. Soil observed in OU2 was collected as grab samples from the auger cuttings. The soil consisted of brown and gray medium grain sands, varying amounts of gravel, and trace amounts of silt. To better define the deep geology and changes in lithology in OU2, Shaw completed gamma logs at the ITDGW-27, 28, and 30 locations. The gamma logs taken at depth indicate that horizons of less permeable, more dense, strata are present. The gamma log completed closest to the Site (ITDGW-28) indicates that less permeable horizons are present at depths of approximately 115 ft, 155 ft, 170 ft, and 200 ft bgs. ITDGW-27, completed further downgradient, exhibits a less permeable horizon at 75 ft bgs. Furthermore, the gamma log completed the furthest downgradient, ITDGW-30, indicate that less permeable horizons are present at depths of 50 ft, 95 ft, 125 ft, and 190 ft bgs at 100 ft bgs. Based on the vertical distribution of chemical constituents to approximately 120 ft bgs, it appears that the less permeable strata are not fully preventing vertical ground water flow and vertical contaminant migration has occurred. However, based on the ground water analytical profile, and the gamma log data, a more highly impermeable stratigraphic layer may exist at 120 ft bgs, inhibiting vertical contaminant migration (Shaw 2003).

1.4.2. Soil Vapor

As documented in the RI, a soil gas survey identified elevated concentrations of VOCs in the soil in OU1. The soil gas data confirmed that inappropriate disposal of dry cleaning chemicals to soils occurred in OU1, resulting in soil and ground water contamination. Indoor air monitoring identified PCE in air above the Guidance Value and Background Levels at the site and neighboring area as a result of former dry cleaning operations at OU1. An IRM was designed and installed. In May and June 2006, O'Brien & Gere conducted soil vapor sampling at 56 locations in OU1 and OU2. Based on the analytical results from this sampling event, PCE was detected above 1000 ug/m^3 in soil gas at four locations (see Figure 3). Residences in some of these areas have been evaluated for potential vapor intrusion. (O'Brien & Gere 2007). A data summary of 2006 soil vapor sampling results is included in Appendix B.

1.4.3. Ground Water

As described in the RI Report, ground water monitoring and survey data collected as part of the RI were used to conclude that the uppermost aquifer beneath the Site is located at approximately 15 to 20 feet below ground surface and ground water flows to the south at an average hydraulic gradient of 0.08 with a horizontal ground water flow velocity of approximately 2.58 feet/day. In addition, the RI found extensive impacts to the ground water system in OU1 and OU2. The ground water impacts observed during the RI are primarily a result of PCE that was identified to depths of approximately 120 feet below grade, extending approximately 3,400 feet (OU2) to the south of OU1 (see Appendix A for figure illustrating the horizontal distribution of PCE in ground water). Concentrations of PCE increase in the shallower depths with closer proximity to OU1 (see Appendix A for figure illustrating the vertical distribution of PCE in ground water). A monitoring location to the north and upgradient of OU1 did not identify the presence of VOCs in ground water, indicating that OU1 is the source of the PCE (Shaw 2003).

Ground water samples collected subsequent to the RI in June 2006 and February 2007 also indicated that VOCs, primarily PCE, continue to be present above NYSDEC Class GA ground water standards in ground water in OU2 (see Figure 2 for sample locations). Concentrations of PCE in the ground water plume ranged from non-detect to 3,800 µg/L, with two main "hotspots" (*i.e.* areas with ground water concentrations of PCE in excess of 1,000 µg/L) near PZ-1/ITMW-1S and ITMW-2D (see Figure 4). The hotspot areas are generally consistent with ground water data from the RI. Samples collected from wells installed downgradient of OU2 in May and June 2007 indicated that PCE is present above NYSDEC Class GA ground water standards (see Figure 4). Additional figures and data tables for the post-RI ground water analytical results are included in Appendix B.

1.5. Qualitative Exposure Assessment

A qualitative exposure assessment (EA) was conducted for OU1 and OU2 as part of the RI Report for the site (Shaw 2003). The purpose of the EA was to evaluate the current and potential future exposure pathways associated with baseline site conditions at OU1 and OU2.

Analytical results for indoor air, soil gas, soil, and ground water collected as part of the 2003 RI Report were evaluated in the EA. Since that time, additional indoor air, soil gas and ground water samples have been collected. In general, analytical results were of similar magnitude, therefore, an update of the EA was not performed for OU2. For purposes of this FS, the relevant OU2 information is summarized below.

Media of concern for OU2 are soil gas and ground water. Soil gas was not directly evaluated in the EA because no assessment criteria were available. Ground water was assessed in the EA. Chlorinated VOCs were identified as the contaminants of potential concern (COPCs).

As documented in the EA, the human health exposure assessment evaluated local residents and utility or construction workers in OU2. Though current unacceptable exposures related to local residents were not identified, it was noted that indoor air conditions could develop due to soil vapor intrusion in the future that could lead to unacceptable exposures. Potential future use of ground water as a household and drinking water source was identified as potentially resulting in unacceptable exposures through consumption of VOCs in drinking water, inhalation of VOCs (particularly while showering), and dermal contact with VOCs in water if wells were established in the vicinity of the VOC plume.

As documented in the EA, the ecological exposure assessment concluded that based on the detection of PCE in soil gas, there is a potential for exposures to PCE. However, due to the developed nature of the Site, exposures would be minimal at most. For this reason no ecological impacts were expected associated with the Site and no further evaluation was deemed necessary.

Analytical results obtained following the 2003 EA do not change the pathway analysis performed in the 2003 EA.

1.6. Assumptions

The FS for OU2 is based on two underlying assumptions:

- The source of the off site ground water plume is being remediated and, upon completion in a timeframe of approximately 3 years, OU1 will no longer be considered an ongoing source to OU2. This assumption is based on conversations with the NYSDEC and reported remedial plans for OU1.

- The ground water VOC plume is in equilibrium, essentially being limited in downgradient and lateral expansion by natural attenuation mechanisms. A review of OU2 ground water data collected between 2001 and 2007 suggests that the plume is stable and the overall distribution of plume concentrations has not significantly changed since 2001. Given the ground water flow velocity of 942 ft/year (RI), expansion of the plume would be expected between 2001 and 2007 if the plume were not stable.

2. Development of Remedial Alternatives

The objective of this phase of the FS was to develop a range of remedial alternatives for the Site. The process for the development of alternatives consisted of six steps:

- identification of potential standards, criteria and guidance (SCGs)
- development of remedial action objectives (RAOs)
- identification of general response actions (GRAs)
- identification of areas or volumes of media
- identification, screening, and evaluation of remedial technologies and process options
- assembly of remedial alternatives.

2.1. Identification of Potential Standards, Criteria, and Guidance (SCGs)

NYSDEC evaluates compliance with Standards, Criteria, and Guidance (SCGs), as such, SCGs will be evaluated for this Site. There are three types of SCGs: chemical-, location-, and action-specific SCGs. Chemical-specific SCGs are health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. These values establish the acceptable amount or concentration of a chemical that may be found in, or discharged to the ambient environment. Location-specific SCGs set restrictions on activities based on the characteristics of the site or immediate environs. Action-specific SCGs set controls or restrictions on particular types of remedial actions once the remedial actions have been identified as part of a remedial alternative. The identification of potential SCGs is documented in Table 1.

2.2. Development of Remedial Action Objectives

Remedial action objectives (RAOs) are goals set for environmental media, such as soil, ground water, sediment, surface water, and soil vapor/indoor air, that are intended to provide protection for human health and the environment. RAOs form the basis for the FS by providing overall goals for site remediation. The RAOs are considered during the identification of appropriate remedial technologies and formulation of alternatives for the Site, and later during the evaluation of remedial alternatives.

RAOs are based on engineering judgement, risk-based information established in the risk assessment, and potentially applicable or relevant and appropriate SCGs. Documentation of the rationale employed in the development of the RAOs for the Site is presented in the following sections.

2.2.1 Remedial Action Objectives for Soil Vapor/Indoor Air

As described in Section 1.4.2., soil vapor samples collected in OU1 and OU2 indicated elevated PCE concentrations. In addition, indoor air monitoring identified PCE in air above the Guidance Value and Background Levels at some locations. An IRM was implemented and addresses residences where PCE was detected in indoor air above guidance levels.

Accordingly, the following RAOs were developed for soil vapor/indoor air:

- Achieve, to the extent practicable, conformance with the NYSDOH vapor intrusion guidance for properties within OU2.

- Minimize, to the extent practicable, inhalation exposures related to soil vapor intrusion from the OU2 ground water plume that would result in unacceptable health risks.

2.2.2 Remedial Action Objectives for Ground Water

As described in Section 1.4.3, ground water samples collected during and subsequent to the RI show that VOCs, primarily PCE, are present above NYSDEC Class GA ground water standards (NYSDEC 1998) in ground water in OU2.

Accordingly, the RAOs identified for ground water consists of:

- Minimize, to the extent practicable, further migration of ground water in exceedance of NYSDEC Class GA ground water standards (NYSDEC 1998) or guidance values.
- Minimize, to the extent practicable, unacceptable human health risks associated with dermal contact with, inhalation of, or incidental ingestion of VOCs in off site ground water.

2.3. Identification of Areas and Volumes of Media

Site conditions, the nature and extent of contamination, and the RAOs were taken into consideration to estimate the volumes and areas of media to be addressed by the general response actions.

The OU2 plume is approximately 4,000 ft in length with an average width of about 650 ft, spanning nearly 60 acres. The average depth of the plume is about 120 ft, with a maximum depth of about 200 ft. Assuming a porosity of 25%, the estimated total volume of ground water exceeding Class GA Standards is 583,440,000 gallons. The ground water quality data suggest that the ground water VOC plume is currently in equilibrium, essentially being limited in downgradient expansion by natural attenuation mechanisms. As indicated on Figure 4, the plume contains two "hotspots" with ground water concentrations of PCE in excess of 1,000 μg/L.

Soil vapor concentrations of PCE were detected above 1,000 $\mu g/m^3$ in 4 out of 56 samples collected for the May and June 2006 sampling event. Indoor air concentrations were sampled at eight locations within OU1 and OU2. Based on the indoor air sampling results, monitoring currently consists of quarterly sampling and laboratory analysis of indoor air at three locations in OU1. Based on the existing indoor air sampling results, indoor air mitigation systems are not currently warranted.

2.4. Physical Limitations to Remediation

Site conditions present challenges to implementation of ground water remediation at the Site. Specifically, the following physical characteristics exist at the Site:

- The large ground water VOC plume extends under several blocks of residential areas. This presents challenges to the siting of injection or extraction wells, associating piping, and treatment systems.
- Due to the soil conditions and rate of ground water flow within the aquifer, the ground water model simulations identified a pumping rate of approximately 1350 gallons per minute (gpm) from three extraction wells (see Appendix C). This would generate approximately 710 million gallons of water annually. Discharge of these quantities of water presents a challenge in the absence of a nearby receiving body of water.

2.5. Identification of General Response Actions

GRAs are remedial actions for environmental media such as soil, ground water, sediment, surface water, and soil vapor/indoor air that may be combined into alternatives to satisfy the RAOs. Based on the RAOs documented in Section 2.2, soil vapor/indoor air and ground water are the media of concern. The GRAs that address the RAOs for soil vapor/indoor air are institutional controls, collection, and *ex situ* treatment. The GRAs that address the RAOs for ground water are institutional controls, containment, collection, *in situ* treatment, *ex situ* treatment, and discharge actions. These GRAs are identified in Table 2.

2.6. Identification and Screening of Remedial Technologies and Process Options

Potentially applicable remedial technology types and process options for each GRA were identified during this step. Process options were screened on the basis of technical implementability. The technical implementability of each identified process option was evaluated with respect to site contaminant information, site physical characteristics, and areas and volumes of affected media.

Table 2 presents descriptions and screening comments for the technologies and process options that were identified for OU2. Process options that were viewed as not implementable were not considered further in the FS. The following sections describe the technologies that were considered potentially implementable.

2.6.1. Soil Vapor/Indoor Air

No action. The no action GRA must be considered in the FS, as specified in the NYSDEC Draft DER-10, *Technical Guidance for Site Investigation and Remediation* (2002).

Institutional controls. Monitoring and an environmental easement were identified as the potentially implementable remedial technologies associated with the institutional GRA for soil vapor/indoor air.

- **Monitoring.** Monitoring of sub-slab soil vapor, basement air, lowest occupied living space air, and outdoor (ambient) air would be conducted to evaluate VOC concentrations in indoor air and sub-slab soil vapor. Air monitoring would also provide a means of detecting changes in VOC concentrations to evaluate if mitigation systems are functioning as desired.

- **Environmental Easement.** With respect to indoor air, building/property use restrictions would be placed on the Jimmy's Dry Cleaners property that would require compliance with the approved OU2 site management plan. The site management plan could mandate the ongoing monitoring of indoor air and/or the operation and maintenance of engineered mitigation systems.

Removal. Vapor control was identified as the potentially implementable remedial technology associated with the removal GRA for soil vapor/indoor air. The process option considered potentially implementable for vapor control was ventilation (sub-slab depressurization).

- **Ventilation (sub-slab depressurization).** Ventilation of the sub-slab of a building would involve the installation of piping through the slab and a fan to exert a vacuum to depressurize the sub-slab environment. In conjunction with sealing potential subsurface vapor entry points, an active sub-slab depressurization system is the preferred mitigation method for buildings with a basement slab or slab-on-grade foundation according to NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH 2006).

Ex Situ Treatment. Physical treatment was identified as the potentially implementable remedial technology associated with the *ex situ* treatment GRA for soil vapor/indoor air. The process option considered potentially implementable for *ex situ* treatment was carbon adsorption.

- **Carbon Adsorption.** Activated carbon can readily adsorb organic contaminants from vapor phase onto its surfaces during contact. The carbon must be periodically replaced, regenerated, treated, and/or disposed. Regeneration is accomplished off site at a permitted commercial hazardous waste carbon regeneration facility. Spent carbon would be disposed of off site at a permitted commercial hazardous waste facility.

2.6.2. Ground Water

No action. The no action GRA must be considered in the FS, as specified in the NYSDEC Draft DER-10, *Technical Guidance for Site Investigation and Remediation* (2002).

Institutional controls. Monitoring and an environmental easement were identified as the potentially implementable remedial technologies associated with the institutional GRA for ground water.

- **Monitoring.** Ground water monitoring would involve periodic sampling and analysis of ground water. Ground water monitoring would provide a means of detecting changes in constituent concentrations in the ground water.

- **Environmental Easement.** Currently, ground water is not used as a potable water source in OU2. Ground water use restrictions would be placed on the Jimmy's Dry Cleaners property that would require compliance with the approved OU2 site management plan. The site management plan could prohibit the use of ground water. In addition, a site management plan could preclude excavation and construction activities that would expose workers without proper protective equipment to affected ground water.

Removal. Ground water extraction was identified as the potentially implementable remedial technology associated with the removal GRA for ground water. The process option considered potentially implementable for ground water extraction was extraction wells.

- **Extraction Wells.** Contaminated ground water would be collected by pumping from extraction wells. An aquifer performance test would be required to identify locations for extraction wells and evaluate appropriate pumping rates to remove the contaminated ground water plume.

In situ treatment. Physical, chemical, and biological treatment and monitored natural attenuation were identified as the potentially implementable remedial technologies associated with the *in situ* treatment GRA for ground water. The potentially implementable process options are described below.

- **In-well Air Stripping**. In-well air stripping involves the injection of air into the water column to volatilize constituents. Air injected into the bottom of the well casing establishes a ground water circulation cell within the well, with ground water entering the well at one screen and being discharged through a second screen. The recirculation cell continuously draws ground water into the well such that contaminants can be stripped from the aqueous to gaseous phase. Treated ground water is discharged back to the aquifer. Depending on the resulting characteristics of the effluent air stream, air pollution controls may be required.

- **Natural Degradation**. Natural attenuation relies of the naturally occurring *in situ* biotic and abiotic processes to degrade organic constituents in the saturated zone. Baseline and ongoing monitoring is required to evaluate the effectiveness of this process option.

- **Bioremediation.** Natural *in situ* microbial degradation of organic contaminants can be enhanced through injection of microbial populations, nutrient sources, and electron donors into ground water through injection wells. A treatability study would be necessary to field verify the applicability of biological treatment.

- **Chemical Oxidation**. *In situ* chemical oxidation involves the addition of oxidation agents, such as hydrogen peroxide, ozone, or permanganate, into ground water through injection wells to oxidize/destroy organic contaminants. Given Site access limitation and operational issues, permanganate is recommended for further evaluation. Treatability study information derived for OU1 could be used to evaluate the effectiveness of chemical oxidation.

Ex situ treatment. Physical, chemical and biological treatment were identified as the potentially implementable remedial technologies associated with the *ex situ* treatment GRA for ground water. The potentially implementable process options are described below.

- **Air Stripping**. Air stripping involves the contact of ground water with air in a countercurrent packed column, tray, or bulk reactor to transfer volatile organic contaminants from the ground water to the air. Depending on the resulting characteristics of the effluent air stream, air pollution controls may be required.

- **Carbon Adsorption**. Activated carbon can readily adsorb organic contaminants from ground water onto its surfaces during contact. The carbon must be periodically replaced, regenerated, treated, and/or disposed. Spent carbon would be regenerated or disposed of off site at a permitted commercial hazardous waste facility.

- **Adsorptive Resin**. Commercial resins are available which can adsorb organic contaminants from the ground water during contact. Such resins are typically regenerated on site on a periodic basis.

- **Chemical/Ultraviolet (UV) Oxidation**. Chemical oxidation involves the addition of an oxidation agent, such as hydrogen peroxide, permanganate, or ozone, to the ground water to oxidize organic contaminants to non-toxic byproducts. UV light is often used in conjunction with oxidants to promote faster and more complete destruction of organic compounds. Chemical oxidation is typically performed in a closed reactor system.

- **Biological Reactor**. A biological reactor could be used to enhance conditions for co-metabolic degradation of chlorinated organics. Nutrients, cometabolities, and aeration would be provided as necessary to optimize degradation. Sludge management would be required.

Discharge. Discharge of treated ground water was identified as the potentially implementable remedial technology associated with the discharge GRA for ground water. The potentially implementable process options are described below.

- **Discharge to Ground Water.** Extracted and treated ground water would be reinjected to the aquifer pursuant to a reinjection permit.

- **Discharge to POTW.** Extracted and treated ground water would be released to municipal sanitary sewers and discharged to a municipal treatment plant.

2.7. Evaluation of Remedial Technologies

Table 3 further evaluates the potentially implementable process options according to the criteria of effectiveness, implementability, and cost.

The effectiveness criterion evaluates: (1) the potential effectiveness of the process options in meeting the RAOs and handling the estimated volumes or areas of media; (2) the potential impacts to human health and the environment during construction and implementation; and (3) how proven and reliable the process option is with respect to site contaminants and conditions.

The implementability criterion evaluates the technical and administrative/institutional feasibility of implementing a process option.

The cost criterion evaluates the capital and operation and maintenance (O&M) costs of each process option on the basis of whether they are high, medium, or low relative to other process options in the same remedial technology group.

Based on this detailed evaluation, a representative process option is selected for each remedial technology. Selection of representative process options simplifies the assembly and evaluation of alternatives, but does not eliminate process options from consideration in the remedial design phase. The process options marked with an asterisk in Table 3 were selected as representative process options.

2.8. Assembly of Remedial Alternatives

Remedial alternatives were developed by assembling general response actions and representative process options into combinations that address the Site. Five alternatives were developed for the Site. A summary of the alternatives and their components is presented in Table 4. A description of each alternative is included in the following subsections.

2.8.1. Common Components of Alternatives

An environmental easement and a Site Management Plan are common elements to the alternatives being evaluated for the Site. A description of these elements is included below.

Environmental Easement. Building/property use restrictions and ground water use restrictions would be placed on the Jimmy's Dry Cleaners property that would require compliance with the approved OU2 site management plan. The site management plan could mandate the ongoing monitoring of indoor air and/or the operation and maintenance of engineered mitigation systems, as well prohibit the use of ground water. In addition, a site management plan could preclude excavation and construction activities that would expose workers without proper protective equipment to affected ground water. At the recommendation of the NYSDEC, costs for an environmental easement were not included in the cost estimates.

Site Management Plan. A Site Management Plan would guide future activities at OU2 by addressing property and ground water use restrictions and by developing requirements for periodic site management reviews. The periodic site management reviews would focus on evaluating the site with regard to the continuing protection of human health and the environment as provided by information such as indoor air and ground water monitoring results and documentation of field inspections.

Vapor Intrusion Investigation/Indoor Air Mitigation. A vapor intrusion investigation would be conducted to better characterize potential vapor intrusion conditions in OU2. For cost purposes, the vapor intrusion investigation was assumed to include indoor air and sub-slab air sampling at forty structures. Also for cost purposes, contingent indoor air mitigation was assumed to include indoor air mitigation at ten structures.

Indoor Air Monitoring. Vapor intrusion conditions present at properties within OU2 would be addressed in a manner consistent with NYSDOH guidance. In the event that air sampling data indicates concentrations of VOCs exceeding the NYSDOH guidance, indoor air mitigation systems would be installed. For cost estimate purposes, five structures are assumed to require monitoring.

2.8.2. Alternative 1

Alternative 1 is the no further action alternative. The no further action alternative is required by NYSDEC Draft DER-10, *Technical Guidance for Site Investigation and Remediation* (2002) and serves as a benchmark for the evaluation of action alternatives. This alternative provides for an assessment of the environmental conditions if no active remedial actions are implemented. The no further action alternative consists of an environmental easement and a Site Management Plan, as described in Section 2.8.1.

2.8.3. Alternative 2

Alternative 2 consists of monitored natural attenuation (MNA), in addition to an environmental easement, Site Management Plan, a vapor intrusion investigation/indoor air mitigation system, and indoor air monitoring, as described in Section 2.8.1.

Monitored Natural Attenuation. The premise of an MNA alternative is to demonstrate with periodic ground water monitoring that natural conditions are affecting a decrease in VOCs via physical, chemical, and biological processes. These processes include intrinsic biodegradation, advection and hydrodynamic dispersion, and other chemical reactions (*e.g.*, abiotic transformation of VOCs). The effectiveness of MNA as a remediation process depends on the type and concentration of compounds present, and the physical, chemical, and biological characteristics of the soil and ground water at the site. To this end, the rate of VOC mass reduction via natural process is a primary discriminator in determining the appropriateness of an MNA remedy.

Favorable scenarios for MNA include sites where VOC degradation is occurring in addition to advection and dispersion, affecting an overall decrease in the mass flux of VOCs at a site, and sites that have an overall low potential for VOC migration. Additionally, source control or remediation (natural or engineered) is an important component of MNA.

MNA application at OU2 would initially comprise a quarterly ground water monitoring program to collect spatial and temporal VOC and MNA data from approximately fifteen existing monitoring wells. Ground water samples would be analyzed for redox field parameters (oxidation-reduction potential, dissolved oxygen, and ferrous iron); VOCs and associated daughter products; dissolved hydrocarbon gases (methane, ethane, and ethene); standard anion redox indicators (*e.g.*, nitrate, nitrite, sulfate, and sulfide); dissolved hydrogen; alkalinity; pH, temperature, and conductivity; chloride; and, potentially, quantitative polymerase chain reaction (qPCR). Quarterly monitoring for these parameters would proceed for a minimum of one year to establish ground water quality data and to estimate a VOC attenuation rate. Semiannual sampling would be implemented after the requisite baseline data was attained.

A simple flow and transport ground water model was developed to assist in the evaluation of the potential response of the plume to the remedial options. Specifically, a ground water model was used to evaluate the time frame to reduce PCE concentrations to below 1,000 μg/L and to NYSDEC Class GA ground water standards (5 μg/L) (NYSDEC 1998). The basic model components and input parameters are described in Appendix C. For MNA, the estimated remedial timeframe for PCE concentrations to decline below 1,000 μg/L across the plume is approximately 7 to 8 years and approximately 10 to 11 years for

PCE concentrations to decline below 5 µg/L across the plume. Both these ranges of timeframes assume that the source of contamination from OU1 continues for the first three years modeled.

It is assumed that the monitoring program would continue for 13 years, which is 2 years beyond the anticipated timeframe for MNA to reduce ground water concentrations to below 5 µg/L.

2.8.4. Alternative 3

Alternative 3 consists of enhanced *in situ* biodegradation (EISB) and ground water monitoring, in addition to an environmental easement, Site Management Plan, and indoor air monitoring/contingent indoor air mitigation, as described in Section 2.8.1.

Enhanced In Situ Biodegradation. EISB involves optimizing ground water geochemical conditions to sustain microorganisms that mediate the breakdown of compounds in ground water. For chlorinated VOCs, the most common approach involves supporting halorespiring microorganisms. Halorespiring microorganisms transfer electrons from an electron donor to the chlorinated compound molecule affecting a sequential replacement of chlorine atoms with hydrogen atoms termed reductive dechlorination.

EISB via reductive dechlorination is an anaerobic process, achieved through the subsurface injection of carbon-based electron donor amendments and nutrients (termed biostimulation), and may also involve the delivery of an exogenous bacterial consortia to seed the ground water with functional halorespiring organisms (termed bioaugmentation). The delivery mode for electron donors varies widely with donor type, physical setting and hydraulics, but for most soluble and semi-soluble electron donors, in most settings, this can be achieved through direct injection via injection wells, Geoprobe™ borings, or cone penetrometer (CPT) borings. Injection wells are usually favorable as they allow for periodic reapplication of amendments which is required for sustaining EISB over time in response to increased biological demand. For cost estimation purposes, a pilot test was assumed to be necessary to field verify the applicability of EISB for the site.

The OU2 EISB approach would involve amendment of ground water with an electron donor, such as emulsified soybean oil, sodium lactate, or ethanol, in an effort to enhance the reductive dechlorination of PCE to ethene via transformational daughter products trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride. Pending favorable results from a pilot test to field verify applicability of EISB, the EISB remedy would be designed to reduce VOC concentrations through the development of enhanced, biologically active zones (EISB zones). By applying EISB treatment at the hotspots (areas with PCE concentrations greater than 1,000 ug/L), the resulting "segmented" plume would be more readily attenuated by the ongoing biological degradation sustained through the EISB zones, and further by the natural degradation, dispersion, and adsorption processes active in the aquifer.

EISB zones would be created by injecting the electron donor in "batch" mode approach through a linear transect of injection wells located across the hotspots and oriented perpendicular to ground water flow. The subsurface mass of electron donor would create a biologically active zone, through which PCE would be dechlorinated to ethene. Residual electron donor would then be distributed throughout the aquifer under the natural ground water flow gradient, expanding reducing conditions downgradient of the VOC source. The EISB alternative would consist of an estimated forty wells (twenty wells per hotspot) to treat the OU2 plume hotspots to depths up to 150 feet below grade. Half of the wells would be screened for injections into the shallower portion of the treatment zone and the other half would be screened for injections into the deeper portion of the treatment zone. Batches of electron donor would be injected quarterly until plume concentrations decline to below NYSDEC Class GA ground water standards.

A flow and transport ground water model was developed to assist in the evaluation of the potential response of the plume to the remedial options. Specifically, a ground water model was used to evaluate the time frame to reduce PCE concentrations to below 1,000 μg/L and to NYSDEC Class GA ground water standards (5 μg/L) (NYSDEC 1998). The basic model components and input parameters are described in Appendix C. For EISB, the estimated remedial timeframe for PCE concentrations to decline below 1,000 μg/L across the plume is approximately 4 to 6 years and approximately 10 to 11 years for PCE concentrations to decline below 5 μg/L across the plume. Both these ranges of timeframes assume that the source of contamination from OU1 continues for the first three years modeled.

Prior to implementation of the EISB, a ground water investigation would be implemented to better define the OU2 ground water hotspots. For cost estimation purposes, it is anticipated that this would consist of six sets of nested wells. Ground water monitoring would be implemented to track VOC concentrations in ground water and evaluate the effectiveness of the selected remedy. Ground water monitoring would consist of quarterly sampling of approximately fifteen existing monitoring wells with analysis of VOCs. It is assumed that the monitoring program for EISB would continue for 13 years, which is 2 years beyond the anticipated timeframe for EISB to reduce ground water concentrations to below 5 μg/L.

2.8.5. Alternative 4

Alternative 4 consists of *in situ* chemical oxidation and ground water monitoring, in addition to an environmental easement, Site Management Plan, and indoor air monitoring/contingent indoor air mitigation, as described in Section 2.8.1.

In situ Chemical Oxidation. In situ chemical oxidation is a process of changing the oxidation-state of a contaminant through the introduction of liquid, slurry, or gaseous oxidants in the subsurface. Fenton's agent, ozone injection, and potassium/sodium permanganate are commonly used chemical oxidants. The oxidants gain electrons that are lost by VOCs or other readily oxidized material. Subsequent to losing electrons, VOCs are reduced to benign products (*i.e.*, carbon dioxide and water). Oxidation reactions require contact between VOCs and the oxidant. Chlorinated ethenes, such as PCE, are oxidized because of their electrophilically favorable chemical structures. Electron pairs in the double carbon bond (pi bonds) of chlorinated VOCs are broken in the oxidation reactions, directly destroying the chlorinated molecule. Because most oxidants can be directly injected into the ground water aquifer, the approach is suited for *in situ* applications, without the expense of elaborate aboveground infrastructure or O&M for *ex situ* treatment.

Generally, the efficacy of *in situ* chemical oxidation is limited to the ability to maximize contact between the oxidant, the VOCs, and the naturally occurring mass of carbon in the subsurface. Given the scale of the OU2 aquifer, a chemical oxidation approach would most appropriately be used as a destruction technology for hotspot areas where PCE concentrations are greater than 1,000 ug/L. By applying chemical oxidants at the hotspots, the resulting "segmented" plume would be more readily attenuated by the ongoing chemical oxidation sustained at the chemical oxidation zones and further by the natural degradation, dispersion, and adsorption processes active in the aquifer.

Permanganate injection technology is a natural extension of the use of (primarily) potassium permanganate in water purification. Both potassium permanganate and sodium permanganate supply the permanganate ion to initiate the dechlorination reaction with VOCs. Permanganate has been increasingly utilized as an *in situ* oxidant and possesses a specific gravity similar to that of PCE or TCE. Permanganate oxidation occurs by breaking the double carbon bond in a chlorinated ethene molecule. Potassium permanganate is produced as solid at 4% to 6% oxidant strength, and typically requires on site mixing. Sodium permanganate is a liquid that is produced at 40% strength and typically requires only on site dilution. The major difference between the two products (in addition to their respective cations) is that $NaMnO_4$ can be delivered to the subsurface at a higher strength (typically 10 to 15%) than $KMnO_4$, which can rarely exceed 3% strength in normal field conditions.

Given that the primary site compound is PCE, permanganate is well suited for Site application. For cost estimation purposes, potassium permanganate was selected for the *in situ* chemical oxidation approach. The remedy would be designed to reduce VOC concentrations in areas with PCE concentrations greater than 1,000 ug/L. Treatment zones would be created by injecting potassium permanganate into the hotspots in a "batch" mode approach through a linear transect of injection wells located across the hotspots and oriented perpendicular to ground water flow. Residual oxidant would then flow throughout the aquifer under the natural ground water flow gradient, following the natural ground water flow path. The chemical oxidation alternative would consist of an estimated eighty wells (twenty wells per transect, two transects per hotspot) to treat the OU2 plume hotspots to depths up to 150 feet below grade. Half of the wells would be screened for injections into the shallower portion of the treatment zone and the other half would be screened for injections into the deeper portion of the treatment zone. Batches of permanganate would be injected quarterly until plume concentrations decline to below NYSDEC Class GA ground water standards. Appropriate pilot testing information collected as part of OU1 would be used to design full scale implementation of this alternative.

A simple flow and transport ground water model was developed to assist in the evaluation of the potential response of the plume to the remedial options. Specifically, a ground water model was used to evaluate the time frame to reduce PCE concentrations to below 1,000 μg/L and to NYSDEC Class GA ground water standards (5 μg/L) (NYSDEC 1998). The basic model components and input parameters are described in Appendix C. For *in situ* chemical oxidation, the estimated remedial timeframe for PCE concentrations to decline below 1,000 μg/L across the plume is approximately 3 years and approximately 4 to 5 years for PCE concentrations to decline below 5 μg/L across the plume. These timeframes assume that the source of contamination from OU1 continues for the first three years modeled.

Prior to implementation of the *in situ* chemical oxidation, a ground water investigation would be implemented to better define the OU2 ground water hotspots. For cost estimation purposes, it is anticipated that this would consist of six sets of nested wells. Ground water monitoring would be implemented to track VOC concentrations in ground water and evaluate the effectiveness of the selected remedy. Ground water monitoring would consist of quarterly sampling of approximately fifteen existing monitoring wells with analysis of VOCs. It is assumed that the monitoring program for *in situ* chemical oxidation would continue for 7 years, which is 2 years beyond the anticipated timeframe for *in situ* chemical oxidation to reduce ground water concentrations to below 5 μg/L.

2.8.6. Alternative 5

Alternative 5 consists of ground water extraction/treatment/reinjection and ground water monitoring, in addition to an environmental easement, Site Management Plan, and indoor air monitoring/contingent indoor air mitigation, as described in Section 2.8.1.

Ground Water Extraction/Treatment/Reinjection. Hydraulic control with *ex situ* treatment and reinjection of treated ground water involves pumping impacted ground water to the surface from a system of ground water extraction wells for treatment and subsequent reinjection of the treated ground water into the original aquifer. Hydraulic control would effectively remove dissolved PCE from the subsurface and form a hydraulic barrier to minimize further off site migration of PCE.

Preliminary estimates indicated that a total of three extraction wells, with a combined pumping rate of approximately 1,350 gallons per minute (gpm) (*i.e.,* 450 gpm per well), would be required to treat the nearly 60-acre OU2 plume (see Appendix C). The ground water extraction wells would be aligned with the apparent centerline of the plume and spaced approximately 1200 ft apart, with the last well located at the downgradient edge of the plume. This extraction well distribution was selected to provide adequate capture of the plume, with ground water travel time to the wells of approximately one year.

Pre-design field studies would be necessary to identify the specific number and locations of extraction wells and their discharge rates. The criteria for extraction well design, the extraction system, treatment, and the reinjection system are dependent on the physical site characteristics, contaminant concentrations and the geochemistry of the ground water at the site, which can affect the ground water treatment "train" (*i.e.*, treatment system) utilized to treat the extracted ground water. Ground water treatment would include the design of a "train" of processes, such as gravity segregation (*i.e.*, settling or equalization tank), metals pretreatment if necessary, filtration, air strippers, and carbon adsorption. Treated ground water would be discharged to ground water through approximately six to ten reinjection wells. The reinjection wells would be located beyond the downgradient edge of the plume, so as to minimize disruptions to the natural flow of ground water through OU2 and prevent increasing the aquifer thickness within OU2. The ground water extraction/treatment/reinjection system would be operated until plume concentrations decline to below 5 μg/L.

A simple flow and transport ground water model was developed to assist in the evaluation of the potential response of the plume to the remedial options. Specifically, a ground water model was used to evaluate the time frame to reduce PCE concentrations to below 1,000 μg/L and to NYSDEC Class GA ground water standards (5 μg/L) (NYSDEC 1998). The basic model components and input parameters are described in Appendix C. For ground water extraction/treatment/reinjection, the estimated remedial timeframe for PCE concentrations to decline below 1,000 μg/L across the plume is approximately 4 to 5 years and approximately 7 to 8 years for PCE concentrations to decline below 5 μg/L across the plume. Both these ranges of timeframes assume that the source of contamination from OU1 continues for the first three years modeled.

Ground water monitoring would be implemented to track VOC concentrations in ground water and evaluate the effectiveness of the selected remedy. Ground water monitoring would consist of quarterly sampling of approximately fifteen existing monitoring wells with analysis of VOCs. It is assumed that the monitoring program for ground water extraction/treatment/reinjection would continue for approximately 10 years, which is 2 years beyond the anticipated timeframe for ground water extraction/treatment/reinjection to reduce ground water concentrations to below 5 μg/L.

3. Detailed Analysis of Alternatives

The following section documents the detailed analysis of the alternatives developed for the site. The objective of the detailed analysis of alternatives was to analyze and present sufficient information to allow the alternatives to be compared and a remedy selected. The analysis consisted of an individual assessment of each alternative with respect to nine evaluation criteria that encompass statutory requirements and overall feasibility and acceptability. The detailed analysis of alternatives also included a comparative evaluation designed to consider the relative performance of the alternatives and identify major trade-offs among them. The nine evaluation criteria are:

- Overall protectiveness of human health and the environment
- Compliance with SCGs
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume through treatment
- Short-term effectiveness
- Implementability
- Cost
- Support agency acceptance
- Community acceptance.

The preamble to the NCP (Federal Register 1990) indicates that, during remedy selection, these nine criteria should be categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. The two threshold criteria, overall protection of human health and the environment, and compliance with SCGs, must be satisfied in order for an alternative to be eligible for selection. Long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implemetability; and cost are primary balancing criteria that are used to balance the trade-offs between alternatives. The modifying criteria are state and community acceptance, which are formally considered after public comment is received on the Proposed Remedial Action Plan (PRAP). The New York State TAGM entitled *Selection of Remedial Actions at Inactive Hazardous Waste Sites*, (NYSDEC 1990) and NYSDEC's Department of Environmental Restoration (DER)-10 draft guidance entitled *Technical Guidance or Site Investigation and Remediation* were also considered during this evaluation (NYSDEC 2002).

3.1. Individual Analysis of Alternatives

In the individual analysis of alternatives, each of the remedial alternatives was evaluated with respect to the above-listed evaluation criteria. A summary of this analysis is presented in Table 5.

3.1.1. Overall Protection of Human Health and the Environment

The analysis of each alternative with respect to this criterion provides an evaluation of whether the alternative would achieve and maintain adequate protection and a description of how site risks would be eliminated, reduced, or controlled through treatment, engineering, or institutional controls.

3.1.2. Compliance with SCGs

Potential SCGs for the Site are presented in Table 1.

3.1.3. Long-Term Effectiveness and Permanence

This criterion assesses the magnitude of residual risk remaining from untreated material or treatment residuals at the site. The adequacy and reliability of controls used to manage untreated material or treatment residuals are also evaluated.

3.1.4. Reduction of Toxicity, Mobility, or Volume though Treatment

The evaluation of this criterion addresses the expected performance of treatment technologies in each alternative.

3.1.5. Short-Term Effectiveness

The evaluation of short-term effectiveness addresses the protection of workers and the community during construction and implementation of each alternative and potential environmental effects that would result from implementation of each alternative. The time required to achieve remedial objectives was also evaluated under this criterion.

3.1.6. Implementability

The analysis of implementability involves an assessment of the ability to construct and operate the technologies, the reliability of the technologies, the ease of undertaking additional remedial action, the ability to monitor the effectiveness of each remedy, and the ability to obtain necessary approvals from other agencies. Additionally, the availability of services, capacities, equipment, materials, and specialists necessary for implementation of the alternative is also assessed.

3.1.7. Cost

For the cost analysis, cost estimates were prepared for each alternative based on vendor information and quotations, cost estimating guides, and experience. Cost estimates were prepared for the purpose of alternative comparison and were based on information currently known about the study area. The cost estimates include capital costs, annual operation and maintenance costs, and present worth cost. The present worth cost for these alternatives was calculated for the expected duration of the remedy at a 7% discount rate.

The individual cost estimates for the remedial alternatives are included in Tables 6 through 10.

3.1.8. Support Agency Acceptance

Support agency acceptance will be addressed during development of the PRAP.

3.1.9. Community Acceptance

Community acceptance will be addressed during the public comment period prior to the ROD.

3.2. Comparative Analysis of Alternatives

In the comparative analysis of alternatives, the performance of each alternative relative to the others was evaluated for each criterion. As discussed in the following subsections, with the exception of Alternative 1, each alternative would satisfy the threshold criteria by providing protection to human health and the environment and by complying with the identified SCGs; therefore, each active alternative would be eligible for selection as the final remedy. The primary balancing criteria (long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implemetability; and cost) were used in the comparative evaluation of alternatives.

3.2.1. Overall Protection of Human Health and the Environment

With respect to protection of human health, each alternative would provide equal protectiveness for ground water and indoor air potential impacts through institutional controls. Each alternative would also be equally protective of human health and the environment by addressing potential future exposures to VOCs in ground water through natural attenuation or active treatment of ground water. Ground water monitoring included in Alternatives 2, 3, 4, and 5 would provide a means of evaluating the protectiveness of the alternatives. Alternatives 2, 3, 4 and 5 would be more protective to human health than Alternative 1 for impacts due to soil vapor through indoor air monitoring and installation of vapor mitigation systems, if necessary, for affected properties.

3.2.2. Compliance with SCGs

As summarized in Table 1, chemical-specific SCGs were identified for ground water and indoor air. Each alternative would provide a means of attaining ground water SCGs, assuming that the source of ground water contamination in OU1 is removed. Ground water monitoring included in Alternatives 2, 3, 4, and 5 would provide a means of evaluating the attainment of ground water SCGs. Alternative 1 would not address indoor air SCGs, while the remaining alternatives would attain indoor air SCGs (as described in Table 3.1 of the *NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York*) through monitoring and contingent vapor control.

No location-specific SCGs were identified for the site. Action-specific SCGs related to OSHA requirements during construction activities were identified for Alternatives 3, 4, and 5 and would be met during construction. Action-specific SCGs related to air emissions, waste management, and subsurface injection of treated ground were identified for Alternatives 5 and would be met during remedy implementation.

3.2.3. Long-Term Effectiveness and Permanence

Each alternative would provide for long-term effectiveness and permanence through adequate and reliable controls of impacts from ground water and indoor air, though Alternative 1 provides the least level of protection with regards to indoor air. It should be noted that adequacy and reliability of controls related to ground water are contingent on removal of the OU1 source of ground water contamination. Given the institutional controls included in each alternative, there would be minimal residual risk from ground water and indoor air. Ground water monitoring included in Alternatives 2, 3, 4, and 5 would provide a means of evaluating the reliability of controls.

3.2.4. Reduction of Toxicity, Mobility, or Volume though Treatment

Each alternative, through natural attenuation or active treatment would attain reduction in VOC contamination of the ground water plume. Assuming the source of contamination in OU1 is removed in its entirety, each alternative would achieve the ground water SCGs, thus each alternative would achieve a similar degree of reduction of toxicity, mobility or volume of contamination through treatment. Natural attenuation and active treatment are irreversible processes. Minimal residual contamination is anticipated from implementation of these alternatives.

3.2.5. Short-Term Effectiveness

Alternatives 1 and 2 could be implemented immediately. Alternative 5 would have the longest construction duration, however, Alternatives 3, 4, and 5 would require one construction season to construct. Based on preliminary modeling, assuming the source of ground water contamination in OU1 is removed in its entirety, Alternative 5 would achieve the ground water SCGs in the least amount of time. It is estimated that Alternative 5 would attain ground water SCGs in approximately 3 years, while Alternative 4 would attain ground water SCGs in approximately 7 years, and Alternatives 1, 2, and 3 would attain ground water SCGs in approximately 8 years.

Engineering controls would be implemented during construction of the alternatives that would be adequately protective of the community and the environment.

3.2.6. Implementability

Each alternative would be implementable, however, Alternative 5 presents significant challenges to construct due to the size of the plume and quantity of treated ground water that would require discharge. Specifically, the 60- acre size of the plume would require thousands of feet of piping to be installed through a very congested neighborhood to convey contaminated ground water to the treatment system and treated ground water to a discharge location. Alternative 5 includes reinjection of treated ground water at a downgradient location, due to the large volume of ground water assumed to be treated (approximately 540 gpm). Ground water reinjection may require significant permitting requirements to implement.

The technologies being used in each alternative are reliable technologies. Each alternative would allow for additional remedial actions to be implemented, if necessary, and would be readily monitored for effectiveness of the remedy.

3.2.7. Cost

Detailed cost estimates for Alternatives 1 through 5 are included as Tables 6 through 10.

Alternative 1, the no further action alternative, is the least cost alternative with an estimated present worth value of approximately $ 120,000.

Alternative 2, the monitored natural attenuation alternative, is the second least cost alternative with an estimated present worth of approximately $2,170,000.

Alternative 3, the *in situ* biological treatment alternative, is the next least cost alternative with an estimated present worth of approximately $6,340,000.

Alternative 4, the *in situ* chemical oxidation treatment alternative, is the next least cost alternative with an estimated present worth of approximately $4,840,000.

Alternative 5, the ground water collection/treatment/reinjection alternative, is the most expensive alternative with an estimated present worth of approximately $13,690,000.

3.2.8. Support Agency Acceptance

Support agency acceptance will be addressed during development of the preferred alternative.

3.2.9. Community Acceptance

Community acceptance will be addressed during the preferred alternative public comment period prior to the ROD.

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Table 1. *Evaluation of Potential SCGs*

Medium/Location/ Action	Citation	Requirements	Comments	Potential SCG	Alternative
		Potential chemical-specific SCGs			
Ground water	6 NYCRR 703 - Class GA ground water quality standards	Promulgated state regulation that requires that fresh ground waters of the state must attain Class GA standards.	Potentially applicable to site ground water.	Yes	1, 2, 3, 4, 5
Indoor Air	NYSDOH - Guidance for Evaluating Soil Vapor Intrusion.	Guidance that provides action levels for mitigation of indoor air influences	Potentially applicable to all occupied structures affected by the OU2 ground water plume.	Yes	1, 2, 3, 4, 5
Soil	NYSDEC 6 NYCRR Part 375-2 Inactive Hazardous Waste Disposal Site Remedial Program	Regulation that provides guidance for soil cleanup objectives for various property uses.	Not applicable or relevant and appropriate because soil is not a medium of concern for the Site.	No	None
	NYSDEC TAGM HWR-94-4046 - Recommended soil cleanup objectives	Guidance that provides recommended soil cleanup objectives.	Not applicable or relevant and appropriate because soil is not a medium of concern for the Site.	No	None
		Potential location-specific SCGs			
Wetlands	6 NYCRR 663 - Freshwater wetland permit requirements	Actions occurring in a designated freshwater wetland (within 100 ft) must be approved by NYSDEC or its designee. Activities occurring adjacent to freshwater wetlands must: be compatible with preservation, protection, and conservation of wetlands and benefits; result in no more than insubstantial degradation to or loss of any part of the wetland; and be compatible with public health and welfare.	Not applicable or relevant and appropriate. No wetlands within 100 feet of the Site.	No	None
	Executive Order 11990 - Protection of Wetlands	Activities occurring in wetlands must avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands. The procedures also require USEPA to avoid direct or indirect support of new construction in wetlands wherever there are practicable alternatives or minimize potential harm to wetlands when there are no practicable alternatives.	Not applicable or relevant and appropriate. No wetlands within 100 feet of the Site.	No	None
100-year flood plain	6 NYCRR 373-2.2 - Location standards for hazardous waste treatment, storage, and disposal facilities -100-yr floodplain	Hazardous waste treatment, storage, or disposal facilities located in a 100-yr floodplain must be designed, constructed, operated and maintained to prevent washout of hazardous waste during a 100-yr flood.	Not applicable or relevant and appropriate. Site is not located in the 100-year floodplain.	No	None
	Executive Order 11988 - Floodplain Management	EPA is required to conduct activities to avoid, to the extent possible, the long- and short- term adverse impacts associated with the occupation or modification of floodplains. The procedures also require EPA to avoid direct or indirect support of floodplain development wherever there are practicable alternatives and minimize potential harm to floodplains when there are no practicable alternatives.	Not applicable or relevant and appropriate. Site is not located in the 100-year floodplain.	No	None
Within 61 meters (200 ft) of a fault displaced in Holocene time	40 CFR Part 264.18	New treatment, storage, or disposal of hazardous waste is not allowed.	Not applicable or relevant and appropriate. Site is not located within 200 ft of a fault displaced in Holocene time, as listed in 40 CFR 264 Appendix VI.	No	None
River or stream	16 USC 661 - Fish and Wildlife Coordination Act	Requires protection of fish and wildlife in a stream when performing activities that modify a stream or river.	Not applicable or relevant and appropriate. No rivers or streams located at Site.	No	None
Habitat of an endangered or threatened species	6 NYCRR 182	Provides requirements to minimize damage to habitat of an endangered species.	Not applicable or relevant and appropriate. No habitat of endangered species identified at the Site.	No	None

Table 1. *Evaluation of Potential SCGs*

Medium/Location/ Action	Citation	Requirements	Comments	Potential SCG	Alternative
Potential location-specific SCGs (cont.)					
Habitat of an endangered or threatened species	Endangered Species Act	Provides a means for conserving various species of fish, wildlife, and plants that are threatened with extinction.	Not applicable or relevant and appropriate. No endangered species identified at the Site.	No	None
Historical property or district	National Historic Preservation Act	Remedial actions are required to account for the effects of remedial activities on any historic properties included on or eligible for inclusion on the National Register of Historic Places.	Not applicable or relevant and appropriate. Site not identified as a historic property	No	None
Potential action-specific SCGs					
Treatment actions	6 NYCRR 373 - Hazardous waste management facilities	Provides requirements for managing hazardous wastes.	Not applicable. No hazardous waste anticipated to be produced.	No	None
Construction	29 CFR Part 1910 - Occupational Safety and Health Standards - Hazardous Waste Operations and Emergency Response	Remedial activities must be in accordance with applicable OSHA requirements.	Applicable for construction and monitoring phase of remediation.	Yes	2, 3, 4, 5
	29 CFR Part 1926 - Safety and Health Regulations for Construction	Remedial construction activities must be in accordance with applicable OSHA requirements.	Applicable for construction phase of remediation.	Yes	2, 3, 4, 5
Transportation	6 NYCRR 364 - Waste Transporter Permits	Hazardous waste transport must be conducted by a hauler permitted under 6 NYCRR 364.	Potentially applicable for treatment residuals.	Yes	5
	6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities	Substantive hazardous waste generator and transportation requirements must be met when hazardous waste is generated for disposal. Generator requirements include obtaining an EPA Identification Number and manifesting hazardous waste for disposal.	Potentially applicable for treatment residuals.	Yes	5
	49 CFR 172-174 and 177-179 - Department of Transportation Regulations	Hazardous waste transport to offsite disposal facilities must be conducted in accordance with applicable DOT requirements	Potentially applicable for treatment residuals.	Yes	5
Generation of air emissions	NYS Air Guide 1	Provides annual guideline concentrations (AGLs) and short-term guideline concentrations (SGCs) for specific chemicals. These are property boundary limitations that would result in no adverse health effects.	Potentially applicable for treatment residuals.	Yes	5
	NYS TAGM 4031 - Dust Suppressing and Particle Monitoring at Inactive Hazardous Waste Disposal Sites	Provides limitations on dust emissions.	Not applicable. No dust emissions anticipated during construction or operation.	No	None
Construction storm water management	NYSDEC General permit for storm water discharges associated with construction activities. Pursuant to Article 17 Titles 7 and 8 and Article 70 of the Environmental Conservation Law.	The regulation prohibits discharge of materials other than storm water and all discharges that contain a hazardous substance in excess of reportable quantities established by 40 CFR 117.3 or 40 CFR 302.4, unless a separate NPDES permit has been issued to regulate those discharges. A permit must be acquired if activities involve the disturbance of 5 acres or more. If the project is covered under the general permit, the following are required: development and implementation of a storm water pollution prevention plan; development and implementation of a monitoring program; all records must be retained for a period of at least 3 years after construction is complete.	Not applicable. Construction disturbances will not exceed the limits.	No	None

Table 1. *Evaluation of Potential SCGs*

Medium/Location/ Action	Citation	Requirements	Comments	Potential SCG	Alternative
Potential action-specific SCGs (cont.)					
Underground injection	40 CFR 144 and 146 USEPA Underground Injection Control Regulations	This regulation sets forth minimum requirements for the UIC program promulgated under Part C of the Safe Drinking Water Act and describes the technical standards to follow when implementing the UIC program.	Applicable for the installation of reinjection wells.	Yes	5

Table 2. *Screening of Remedial Technologies and Process Options*

General Response Action	Remedial Technology	Process Option	Description	Screening Comments
Soil Vapor / Indoor Air				
No Action	None	No action	No action.	Required for consideration by NYSDEC Draft DER-10, Technical Guidance for Site Investigation and Remediation.
Institutional Controls	Monitoring	Soil vapor / indoor air monitoring	Periodic sampling and analysis of indoor air and sub-slab soil vapor.	Potentially applicable.
	Environmental easement	Building / property use restrictions	Restrictions on property / building uses and activities that could potentially result in unprotected and unacceptable exposures to contaminated vapors. May also include requirements that mitigation systems be operated and monitored to maintain protectiveness from unacceptable exposures to contaminated vapors.	Potentially applicable.
Removal	Vapor control	Ventilation (sub-slab depressurization)	Removal of subsurface soil vapors beneath the building slab to prevent intrusion of vapors to the building.	Potentially applicable.
Ex Situ Treatment	Physical	Carbon adsorption	Adsorption of organic constituents from vapor phase to activated carbon.	Potentially applicable.
	Thermal	Thermal oxidation	Destruction of organic constituents in a vapor phase by heating.	Not likely required for small vapor control systems.
		Catalytic oxidation	Destruction of organic constituents in a vapor phase by a combination of heating and oxidation by solid media.	Not likely required for small vapor control systems.
Ground Water				
No Action	None	No action	No action.	Required for consideration by NYSDEC Draft DER-10, Technical Guidance for Site Investigation and Remediation.

Table 2. *Screening of Remedial Technologies and Process Options*

General Response Action	Remedial Technology	Process Option	Description	Screening Comments
Institutional Controls	Monitoring	Ground water monitoring	Periodic sampling and analysis of ground water.	Potentially applicable.
	Environmental easement	Ground water use restrictions	Restriction of ground water use.	Potentially applicable.
Containment	Vertical barrier	Slurry wall	Soil- or cement-bentonite slurry wall placed around the area of contamination to contain ground water.	Not feasible due to depth of contamination and absence of a lower confining layer.
		Sheet piles	Sheet piles installed around the area of contamination to contain ground water.	Not feasible due to depth of contamination and absence of a lower confining layer.
Removal	Ground water extraction	Extraction wells	Removal of ground water by pumping from recovery wells for hydraulic containment or mass removal.	Potentially applicable.
		Recovery trench	Removal of ground water by pumping from recovery trenches for hydraulic containment or mass removal.	Not feasible due to depth of contamination.
In Situ Treatment	Physical	Air sparging	Injection of air into the saturated zone to volatilize constituents, which are collected in the unsaturated zone by an SVE system.	Not feasible due to depth of contamination.
		In-well air stripping	Injection of air into the water column within the well to volatilize constituents. Ground water circulation is performed *in situ*, with ground water entering the well at one screen and being discharged through a second screen. Air is collected and treated if necessary.	Potentially applicable.

Table 2. *Screening of Remedial Technologies and Process Options*

General Response Action	Remedial Technology	Process Option	Description	Screening Comments
In Situ Treatment (continued)	Monitored natural attenuation	Natural degradation	Long-term monitoring of the natural biotic and abiotic degradation of organic constituents.	Potentially applicable.
	Biological	Bioremediation	Injection of microbial populations, nutrient sources, and electron donors into ground water to enhance biological degradation of organic constituents.	Potentially applicable.
	Chemical	Chemical oxidation	Injection of oxidation agents such as hydrogen peroxide, ozone, or permanganate into ground water to oxidize/destroy organic contaminants.	Potentially applicable using permanganate.
	Permeable reactive barrier	Treatment wall	Construction of an iron wall, biobarrier, or carbon wall to treat ground water as it flows through the treatment zone.	Not feasible due to depth of contamination.
Ex Situ Treatment	Physical	Air stripping	Contact of air with ground water in countercurrent column or bulk reactor to transfer VOCs from ground water to air.	Potentially applicable.
		Carbon adsorption	Adsorption of organic constituents from water to activated carbon.	Potentially applicable.
		Adsorptive resin	Adsorption of organic constituents from water to commercial adsorptive resin.	Potentially applicable.
		Settling	Retention of aqueous stream in tank to settle/separate light or heavy components.	Not applicable for dissolved VOC constituents.
		Filtration	Separation of solids from water phase using semi-permeable filter medium.	Not applicable for dissolved VOC constituents.

Table 2. *Screening of Remedial Technologies and Process Options*

General Response Action	Remedial Technology	Process Option	Description	Screening Comments
Ex Situ Treatment (continued)	Chemical	Chemical/Ultraviolet (UV) oxidation	Addition of oxidation agents such as hydrogen peroxide and ultraviolet light to water to oxidize/destroy organic contaminants.	Potentially applicable.
		Precipitation	pH adjustment of ground water to separate out dissolved metal contaminants.	Not applicable for dissolved VOC constituents.
		Ion exchange	Chemical alteration of a hazardous to a non-hazardous constituent.	Not applicable for dissolved VOC constituents.
	Biological	Biological reactor	Addition of oxygen, nutrients, and cometabolites to ground water in reactor to enhance co-metabolic degradation of organic constituents.	Potentially applicable. Limited applications using a biological reactor for treatment of chlorinated VOCs in groundwater.
Discharge	Treated water discharge	Discharge to ground water	Re-injection of extracted and treated ground water back into the subsurface.	Potentially applicable.
		Discharge to surface water	Discharge of extracted ground water to surface water features such as streams, ponds, and culverts.	Not applicable as surface water features are not located within a suitable distance.
		Discharge to POTW	Discharge of extracted ground water to sanitary or storm sewers.	Potentially applicable. May not be feasible due to anticipated high flow rates (approximately 500 gpm).

Table 3. *Evaluation of Process Options*

General Response Action	Remedial Technology	Process Option	Effectiveness	Implementability	Costs
			Soil Vapor / Indoor Air		
No Action	None	No action*	Effectiveness is uncertain.	Readily implementable.	No capital No O&M
Institutional Controls	Monitoring	Soil vapor / indoor air monitoring*	Effective method for monitoring changes in VOC concentrations in air over time. Useful for evaluating remedy effectiveness.	Readily implementable.	Low capital Low O&M
	Environmental easement	Building / property use restrictions *	Effectively controls exposure to VOCs in indoor air by restricting use of affected buildings and requiring that mitigation systems be operated and maintained as necessary.	Readily implementable.	Low capital No O&M
Removal	Vapor control	Ventilation (sub-slab depressurization)*	Effective for control of vapor intrusion to indoor air.	Readily implementable.	Low capital Low O&M
Ex Situ Treatment	Physical	Carbon adsorption	Effectively removes VOCs from vapor stream prior to discharge to atmosphere.	Readily implementable.	Low capital Medium O&M
			Ground Water		
No Action	None	No action*	Relies on natural processes to attenuate the plume.	Readily implementable.	No capital No O&M
Institutional Controls	Monitoring	Ground water monitoring*	Effective method for monitoring changes in VOC concentrations in ground water over time. Useful for evaluating remedy effectiveness.	Readily implementable.	Low capital Low O&M
	Environmental easement	Ground water use restrictions*	Effectively controls exposure to VOCs in ground water by restricting ground water use.	Readily implementable.	Low capital No O&M

* Indicates process option was selected as a representative process option and included in at least one of the remedial alternatives.

Table 3. *Evaluation of Process Options*

General Response Action	Remedial Technology	Process Option	Effectiveness	Implementability	Costs
Removal	Ground water extraction	Extraction wells*	Effectively removes contaminated ground water.	May be difficult to implement due to limited accessibility for siting piping, pumps, and appurtenances.	Medium capital High O&M
In Situ Treatment	Physical	In-well air stripping	Effective for removal of chlorinated VOCs. May encounter problems with inorganic fouling of the well screens.	May be difficult to implement due to limited accessibility for siting piping, pumps, and appurtenances.	Medium capital Medium O&M
	Monitored natural attenuation	Natural degradation*	Long-term ground water monitoring would be used to evaluate the effectiveness of natural biotic and abiotic degradation of organic constituents. RI results have shown that the breakdown products of PCE exist in the off-site plume, suggesting that natural attenuation is occurring.	Readily implementable.	Low capital Low O&M
	Biological	Bioremediation*	Likely effective for destruction of chlorinated VOCs in saturated zone. Treatability study would be necessary. Multiple applications may be necessary.	Readily implementable.	Medium capital Low O&M
	Chemical	Chemical oxidation*	Likely effective for destruction of chlorinated VOCs in saturated zone. Treatability study would be necessary. Multiple applications may be necessary.	Readily implementable.	Medium capital Low O&M
Ex Situ Treatment	Physical	Air stripping	Effective for removal of chlorinated VOCs.	May be difficult to implement due to limited accessibility for siting treatment equipment, piping, pumps, and appurtenances.	Medium capital Medium O&M

* Indicates process option was selected as a representative process option and included in at least one of the remedial alternatives.

Table 3. *Evaluation of Process Options*

General Response Action	Remedial Technology	Process Option	Effectiveness	Implementability	Costs
Ex Situ Treatment (continued)	Physical (continued)	Carbon adsorption*	Effective for removal of chlorinated VOCs.	May be difficult to implement due to limited accessibility for siting treatment equipment, piping, pumps, and appurtenances.	Low capital High O&M
		Adsorptive resin	Effective for removal of chlorinated VOCs.	May be difficult to implement due to limited accessibility for siting treatment equipment, piping, pumps, and appurtenances.	Medium capital Medium O&M
	Chemical	Chemical/Ultraviolet (UV) oxidation	Effective for removal of chlorinated VOCs.	May be difficult to implement due to limited accessibility for siting treatment equipment, piping, pumps, and appurtenances.	Medium capital Medium O&M
	Biological	Biological reactor	Limited applications using a biological reactor for treatment of chlorinated VOCs in groundwater.	May be difficult to implement due to limited accessibility for siting treatment equipment, piping, pumps, and appurtenances.	Medium capital Medium O&M
Discharge	Treated water discharge	Discharge to ground water*	Effective for disposal of extracted water.	May be difficult to implement due to limited accessibility for siting piping, pumps, injection wells, and appurtenances.	High capital High O&M
		Discharge to POTW	Effective for disposal of extracted water.	May be difficult to implement due to limited accessibility for siting piping, pumps, and appurtenances. May not be implementable due to high flow rates (approximately 1350 gpm). Approval from POTW needed for discharge.	Low capital Low O&M

* Indicates process option was selected as a representative process option and included in at least one of the remedial alternatives.

Table 4. *Components of Remedial Alternatives*

General Response Actions	Remedial Technology - Process Option	Alternatives				
		1	2	3	4	5
Institutional Actions	Monitoring - Indoor Air Monitoring		X	X	X	X
	Environmental Easement - Building / Property Use Restrictions	X	X	X	X	X
	Monitoring - Ground Water Monitoring		X	X	X	X
	Environmental Easement - Ground Water Use Restrictions	X	X	X	X	X
Removal Actions	Vapor Control - Ventilation (sub-slab depressurization)		X	X	X	X
	Groundwater Extraction - Recovery Wells					X
In Situ Treatment Actions	Monitored Natural Attenuation - Natural Degradation		X			
	Biological - Bioremediation			X		
	Chemical - Chemical Oxidation				X	
Ex Situ Treatment Actions	Physical - Carbon Adsorption					X
Disposal Actions	Treated Ground Water Discharge - Discharge to Ground Water					X

Alternative 1: No further action
Alternative 2: Monitored Natural Attenuation
Alternative 3: *In Situ* Bioremediation
Alternative 4: *In Situ* Chemical Oxidation
Alternative 5: Ground Water Extraction/Treatment/Reinjection

Table 5. *Detailed Analysis of Alternatives*

Criterion	Alternative 1: No further action	Alternative 2: Monitored Natural Attenuation	Alternative 3: *In situ* Bioremediation	Alternative 4: *In situ* Chemical Oxidation	Alternative 5 Ground water Extraction/Treatment/Reinjection
	• Environmental easement	• Environmental easement • Ground water monitoring • Indoor air monitoring • Vapor control	• Environmental easement • Ground water monitoring • Indoor air monitoring • Vapor control • *In situ* biological treatment	• Environmental easement • Ground water monitoring • Indoor air monitoring • Vapor control • *In situ* chemical oxidation	• Environmental easement • Ground water monitoring • Indoor air monitoring • Vapor control • Ground water extraction • Ground water treatment • Treated ground water reinjection
Overall protection of human health and the environment					
Overall protection of human health	Protection of human health is provided through institutional controls precluding ground water use and restricting building use. Relies on natural attenuation to address potential risks associated with future ground water use.	Protection of human health is provided through institutional controls precluding ground water use and restricting building use. Relies on natural attenuation to address potential risks associated with future ground water use. Vapor control would provide protection to human health from effects related to indoor air.	Protection of human health is provided through institutional controls precluding ground water use and restricting building use. Active ground water remediation would address potential risks associated with future ground water use. Vapor control would provide protection to human health from effects related to indoor air.	Protection of human health is provided through institutional controls precluding ground water use and restricting building use. Active ground water remediation would address potential risks associated with future ground water use. Vapor control would provide protection to human health from effects related to indoor air.	Protection of human health is provided through institutional controls precluding ground water use and restricting building use. Active ground water remediation would address potential risks associated with future ground water use. Vapor control would provide protection to human health from effects related to indoor air.
Overall protection of the environment	Relies on natural attenuation to protect ground water.	Relies on natural attenuation to protect ground water.	Protection of the environment is provided through active remediation of ground water.	Protection of the environment is provided through active remediation of ground water.	Protection of the environment is provided through active remediation of ground water
Compliance with standards, criteria, and guidance (SCGs)					
Compliance with chemical-specific SCGs	Relies on natural attenuation to achieve ground water SCGs. Likelihood of attainment of ground water SCGs highly dependent on control of OU1 source. Relies on institutional controls to achieve indoor air SCGs.	Relies on natural attenuation to achieve ground water SCGs. Likelihood of attainment of ground water SCGs highly dependent on control of OU1 source. Achieves compliance with indoor air SCGs through institutional controls and active vapor control.	Achieves compliance with ground water SCGs through active ground water treatment. Likelihood of attainment of ground water SCGs highly dependent on control of OU1 source. Achieves compliance with indoor air SCGs through institutional controls and active vapor control.	Achieves compliance with ground water SCGs through active ground water treatment. Likelihood of attainment of ground water SCGs highly dependent on control of OU1 source. Achieves compliance with indoor air SCGs through institutional controls and active vapor control.	Achieves compliance with ground water SCGs through active ground water treatment. Likelihood of attainment of ground water SCGs highly dependent on control of OU1 source. Achieves compliance with indoor air SCGs through institutional controls and active vapor control.
Compliance with location-specific SCGs	No potential location specific SCGs were identified.	No potential location specific SCGs were identified.	No potential location specific SCGs were identified.	No potential location specific SCGs were identified.	No potential location specific SCGs were identified.
Compliance with action-specific SCGs	No actions are part of this alternative.	Construction activities would be conducted consistent with OSHA safety requirements.	Construction activities would be conducted consistent with OSHA safety requirements.	Construction activities would be conducted consistent with OSHA safety requirements.	Construction activities would be conducted consistent with air quality standards and in accordance with OSHA safety requirements. Treatment systems would be operated consistent with applicable state and federal requirements. Wastes generated by the treatment process would be managed, transported and disposed of in accordance with applicable state and federal requirements.
Long-term effectiveness and permanence					

Table 5. *Detailed Analysis of Alternatives*

Criterion	Alternative 1: No further action	Alternative 2: Monitored Natural Attenuation	Alternative 3: *In situ* Bioremediation	Alternative 4: *In situ* Chemical Oxidation	Alternative 5 Ground water Extraction/Treatment/Reinjection
	• **Environmental easement**	• **Environmental easement** • **Ground water monitoring** • **Indoor air monitoring** • **Vapor control**	• **Environmental easement** • **Ground water monitoring** • **Indoor air monitoring** • **Vapor control** • ***In situ* biological treatment**	• **Environmental easement** • **Ground water monitoring** • **Indoor air monitoring** • **Vapor control** • ***In situ* chemical oxidation**	• **Environmental easement** • **Ground water monitoring** • **Indoor air monitoring** • **Vapor control** • **Ground water extraction** • **Ground water treatment** • **Treated ground water reinjection**
Magnitude of residual risk	Minimal residual risk of exposure to ground water by natural attenuation and use controls. Minimal residual risk of exposure to indoor air through use controls.	Minimal residual risk of exposure to ground water by natural attenuation and use controls. Minimal residual risk of exposure to indoor air through vapor control and use controls.	Minimal residual risk of exposure to ground water by treatment and use controls. Minimal residual risk of exposure to indoor air through vapor control and use controls.	Minimal residual risk of exposure to ground water by treatment and use controls. Minimal residual risk of exposure to indoor air through vapor control and use controls.	Minimal residual risk of exposure to ground water by treatment and use controls. Minimal residual risk of exposure to indoor air through vapor control and use controls.
Adequacy and reliability of controls	Institutional controls are reliable means of managing risks due to ground water and indoor air.	Institutional controls are reliable means of managing risks due to ground water and indoor air. Vapor control provides added control of risks to exposure to indoor air. Monitoring of ground water and air provides effective means of evaluating potential risks.	Institutional controls are reliable means of managing risks due to ground water and indoor air. Active treatment of ground water provides added control of risks to exposure to ground water. Vapor control provides added control of risks to exposure to indoor air. Monitoring of ground water and air provides effective means of evaluating potential risks.	Institutional controls are reliable means of managing risks due to ground water and indoor air. Active treatment of ground water provides added control of risks to exposure to ground water. Vapor control provides added control of risks to exposure to indoor air. Monitoring of ground water and air provides effective means of evaluating potential risks	Institutional controls are reliable means of managing risks due to ground water and indoor air. Active treatment of ground water provides added control of risks to exposure to ground water. Vapor control provides added control of risks to exposure to indoor air. Monitoring of ground water and air provides effective means of evaluating potential risks
Reduction of toxicity, mobility, or volume through treatment					
Treatment process used and materials treated	Natural attenuation will be used for ground water.	Natural attenuation will be used for ground water.	*In situ* biological treatment would be used to treat VOCs in ground water.	*In situ* chemical oxidation would be used to treat VOCs in ground water.	*Ex situ* air stripping and activated carbon should be used to treat VOCs in extracted ground water.
Amount of hazardous material destroyed or treated	An approximately 60-acre ground water plume would be treated by natural attenuation.	An approximately 60-acre ground water plume would be treated by natural attenuation.	An approximately 60-acre ground water plume would be treated by *in situ* biological treatment and natural attenuation.	An approximately 60-acre ground water plume would be treated by *in situ* chemical oxidation and natural attenuation.	An approximately 60-acre ground water plume would be treated by ground water extraction/treatment/reinjection. Approximately 1350 gpm is anticipated to be extracted and treated (approximately 710 million gallons per year).
Degree of expected reduction in toxicity, mobility, or volume	Natural attenuation is anticipated to reduce PCE concentrations to 5 ug/L in approximately 11 years. Attainment of 5 ug/L PCE is highly dependent on control of the source of PCE to ground water in OU1.	Natural attenuation is anticipated to reduce PCE concentrations to 5 ug/L in approximately 11 years. Attainment of 5 ug/L PCE is highly dependent on control of the source of PCE to ground water in OU1.	*In situ* biological treatment is anticipated to reduce PCE concentrations to 5 ug/L in approximately 11 years. Attainment of 5 ug/L PCE is highly dependent on control of the source of PCE to ground water in OU1.	*In situ* chemical oxidation is anticipated to reduce PCE concentrations to 5 ug/L in approximately 5 years. Attainment of 5 ug/L PCE is highly dependent on control of the source of PCE to ground water in OU1.	Ground water extraction/treatment/reinjection is anticipated to reduce PCE concentrations to 5 ug/L in approximately 8 years. Attainment of 5 ug/L PCE is highly dependent on control of the source of PCE to ground water in OU1.
Degree to which treatment is irreversible	Natural attenuation of ground water is irreversible.	Natural attenuation of ground water is irreversible.	*In situ* biological treatment of ground water is irreversible.	*In situ* chemical oxidation of ground water is irreversible.	Treatment of extracted ground water is irreversible.
Type and quantity of residuals remaining after treatment	No treatment processes or removal are used in this alternative.	No treatment processes or removal are used in this alternative.	Following treatment completion, PCE concentrations are anticipated to decline to below 5 ug/L within the plume.	Following treatment completion, PCE concentrations are anticipated to decline to below 5 ug/L within the plume.	Upon treatment completion, PCE concentrations are anticipated to be below 5 ug/L within the plume.
Short-term effectiveness					
Protection of community during remedial actions	No remedial actions are considered under this alternative.	No remedial actions are considered under this alternative.	Proper health and safety measures will be established and implemented during remedial activities.	Proper health and safety measures will be established and implemented during remedial activities.	Dust, if any, will be controlled during installation of system piping. Air stripper emissions will be monitored and controlled if necessary.
Protection of workers during remedial actions	No remedial actions are considered under this alternative.	No remedial actions are considered under this alternative.	Proper health and safety measures will be established and implemented during remedial activities.	Proper health and safety measures will be established and implemented during remedial activities.	Proper health and safety measures will be established and implemented during remedial activities.

Table 5. *Detailed Analysis of Alternatives*

Criterion	Alternative 1: No further action	Alternative 2: Monitored Natural Attenuation	Alternative 3: *In situ* Bioremediation	Alternative 4: *In situ* Chemical Oxidation	Alternative 5 Ground water Extraction/Treatment/Reinjection
	• **Environmental easement**	• **Environmental easement** • **Ground water monitoring** • **Indoor air monitoring** • **Vapor control**	• **Environmental easement** • **Ground water monitoring** • **Indoor air monitoring** • **Vapor control** • ***In situ* biological treatment**	• **Environmental easement** • **Ground water monitoring** • **Indoor air monitoring** • **Vapor control** • ***In situ* chemical oxidation**	• **Environmental easement** • **Ground water monitoring** • **Indoor air monitoring** • **Vapor control** • **Ground water extraction** • **Ground water treatment** • **Treated ground water reinjection**
Environmental impacts	There are no environmental impacts expected as a result of implementation of this alternative.	There are no environmental impacts expected as a result of implementation of this alternative.	There are no environmental impacts expected as a result of implementation of this alternative.	There are no environmental impacts expected as a result of implementation of this alternative.	Dust, volatile emissions, and surface runoff controls will be instituted to minimize impacts to the environment during implementation of this alternative.
Time until remedial action objectives are achieved	Assuming the source of ground water contamination in OU1 is removed in its entirety, ground water concentrations are anticipated to decline to ground water SCGs in approximately 11 years through natural attenuation.	Assuming the source of ground water contamination in OU1 is removed in its entirety, ground water concentrations are anticipated to decline to ground water SCGs in approximately 11 years through natural attenuation.	Assuming the source of ground water contamination in OU1 is removed in its entirety, ground water concentrations are anticipated to decline to ground water SCGs in approximately 11 years through *in situ* biological treatment.	Assuming the source of ground water contamination in OU1 is removed in its entirety, ground water concentrations are anticipated to decline to ground water SCGs in approximately 5 years through *in situ* chemical oxidation treatment.	Assuming the source of ground water contamination in OU1 is removed in its entirety, ground water concentrations are anticipated to decline to ground water SCGs in approximately 8 years through ground water extraction.
Implementability					
Ability to construct and operate the technology	There are no technologies to be constructed in this alternative.	Installation of vapor control systems is readily constructable.	Installation of injection wells for *in situ* biological treatment is readily constructable. Installation of vapor control systems is readily constructable.	Installation of injection wells for *in situ* chemical oxidation treatment is readily constructable. Installation of vapor control systems is readily constructable.	Siting of a facility capable of treating 1350 gpm would be difficult in the congested vicinity of the site. Installation of a treatment system or *ex situ* treatment of ground water is readily constructable. Construction of extraction wells to collect ground water is readily constructable. Installation of piping necessary to convey water related to this alternative is difficult due to the large size of the plume and the highly congested nature of the area. Installation of vapor control systems is readily constructable.
Reliability of technology	In the absence of a continuing source, natural attenuation is a reliable means of reducing VOC concentrations in ground water.	In the absence of a continuing source, natural attenuation is a reliable means of reducing VOC concentrations in ground water. Ground water sampling and analysis is a reliable means to monitor the effectiveness of natural attenuation. Vapor control is a reliable technology for controlling risks due to indoor air.	*In situ* biological treatment is a reliable means of reducing VOC concentrations in ground water. Ground water sampling and analysis is a reliable means to monitor the effectiveness of ground water treatment. Vapor control is a reliable technology for controlling risks due to indoor air.	*In situ* chemical oxidation treatment is a reliable means of reducing VOC concentrations in ground water. Ground water sampling and analysis is a reliable means to monitor the effectiveness of ground water treatment. Vapor control is a reliable technology for controlling risks due to indoor air.	Ground water extraction is a reliable means of reducing VOC concentrations in ground water. Ground water sampling and analysis is a reliable means to monitor the effectiveness of ground water extraction. Vapor control is a reliable technology for controlling risks due to indoor air.
Ease of undertaking additional remedial actions, if necessary	Additional remedial actions, if necessary, would be readily implementable.	Additional remedial actions, if necessary, would be readily implementable.	Additional remedial actions, if necessary, would be readily implementable.	Additional remedial actions, if necessary, would be readily implementable.	Additional remedial actions, if necessary, would be readily implementable.
Ability to monitor effectiveness of remedy	Not applicable.	Effectiveness of remedy could be monitored through sampling of indoor air and ground water.	Effectiveness of remedy could be monitored through sampling of indoor air and ground water.	Effectiveness of remedy could be monitored through sampling of indoor air and ground water.	Effectiveness of remedy could be monitored through sampling of indoor air and ground water.
Coordination with other agencies and property owners	Coordination with local authorities would be necessary to implement use and access restrictions.	Coordination with local authorities would be necessary to implement use and access restrictions. Coordination with property owners would be necessary to implement indoor air investiations, monitoring and indoor air mitigation systems.	Coordination with local authorities would be necessary to implement use and access restrictions. Coordination with property owners would be necessary to implement indoor air investiations, monitoring and indoor air mitigation systems.	Coordination with local authorities would be necessary to implement use and access restrictions. Coordination with property owners would be necessary to implement indoor air investiations, monitoring and indoor air mitigation systems.	Coordination with local authorities would be necessary to implement use and access restrictions. Coordination with state, federal, and local authorities would be necessary to implement injection of treated ground water. Coordination with property owners would be necessary to implement indoor air investiations, monitoring and indoor air mitigation systems.

Table 5. *Detailed Analysis of Alternatives*

Criterion	Alternative 1: No further action	Alternative 2: Monitored Natural Attenuation	Alternative 3: *In situ* Bioremediation	Alternative 4: *In situ* Chemical Oxidation	Alternative 5 Ground water Extraction/Treatment/Reinjection
	• Environmental easement	• Environmental easement • Ground water monitoring • Indoor air monitoring • Vapor control	• Environmental easement • Ground water monitoring • Indoor air monitoring • Vapor control • *In situ* biological treatment	• Environmental easement • Ground water monitoring • Indoor air monitoring • Vapor control • *In situ* chemical oxidation	• Environmental easement • Ground water monitoring • Indoor air monitoring • Vapor control • Ground water extraction • Ground water treatment • Treated ground water reinjection
Availability of off-site treatment storage and disposal services and capacities	None required.	None required.	None required.	None required.	Disposal services would be readily available for management of treatment residuals.
Availability of necessary equipment, specialists, and materials	None required.	None required.	Readily available.	Readily available.	Readily available.
Costs					
Capital cost	$100,000	$570,000	$1,730,000	$2,000,000	$9,290,000
Present worth of operation and maintenance cost	$20,000	$1,600,000	$4,610,000	$2,840,000	$4,400,000
Approximate total net present worth cost	$120,000	$2,170,000	$6,340,000	$4,840,000	$13,690,000

Table 6
REMEDIAL ALTERNATIVE COST SUMMARY

Alternative #1 - No Further Action

O'BRIEN & GERE

COST ESTIMATE SUMMARY

Site: Jimmy's Dry Cleaners
Location: 61 Nassau Road, Roosevelt, New York
Phase: Feasibility Study (-30% to +50%)
Base Year: 2007

Description: Alternative #1 consists of ground water use and building/property use restrictions via the implementation of environmental easements.

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Direct Capital Costs						
1) Site management plan	LS	1	$20,000	$20,000		
				SUBTOTAL:	**$20,000**	
				TOTAL DIRECT CAPITAL COST:	**$20,000**	
Indirect Capital Costs						
1) Contingency (25% of Direct Capital Costs)		1	$5,000	$5,000		
				SUBTOTAL:	**$5,000**	
2) Engineering (15% of Direct Capital Costs)		1	$3,000	$3,000		
				SUBTOTAL:	**$3,000**	
3) Legal Fees (5% of Direct Capital Costs)		1	$1,000	$1,000		
				SUBTOTAL:	**$1,000**	
				TOTAL INDIRECT CAPITAL COSTS (rounded):	**$9,000**	
				TOTAL CAPITAL COSTS (rounded):	**$30,000**	
Operation & Maintenance Costs						
1) Periodic Review	LS	1	$10,000	$10,000		Assumes reviews are conducted every 5 years.
				PRESENT WORTH OF O&M COSTS (rounded):	**$20,000**	Assumes 15 years of O&M and a discount rate of 3%.
				APPROXIMATE TOTAL PRESENT WORTH COST (rounded):	**$50,000**	

Table 7
REMEDIAL ALTERNATIVE COST SUMMARY

Alternative #2 - Monitored Natural Attenuation

OBRIEN & GERE — **COST ESTIMATE SUMMARY**

Site: Jimmy's Dry Cleaners
Location: 61 Nassau Road, Roosevelt, New York
Phase: Feasibility Study (-30% to +50%)
Base Year: 2007

Description: Alternative #2 consists of treating the entire OU2 VOC plume by natural attenuation. This is intended to address contamination in excess of 5 ug/L.

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Direct Capital Costs						
1) Site management plan	LS	1	$20,000	$20,000		
				SUBTOTAL:	**$20,000**	
2) Vapor intrusion investigation	LS	1	$100,000	$100,000		Assumes 40 residences and 3 samples per residence.
				SUBTOTAL:	**$100,000**	
3) Vapor intrusion mitigation system installation	EACH	10	$10,000	$100,000		Assumes 10 residences require mitigation systems.
				SUBTOTAL:	**$100,000**	
4) Ground water monitoring - MNA baseline sampling	LS	1	$120,000	$120,000		Assumes quarterly sampling at 15 existing wells.
				SUBTOTAL:	**$120,000**	
			TOTAL DIRECT CAPITAL COST:		**$340,000**	
Indirect Capital Costs						
1) Contingency (25% of Direct Capital Costs)	LS	1	$85,000	$85,000		
				SUBTOTAL:	**$85,000**	
2) Engineering (15% of Direct Capital Costs)	LS	1	$51,000	$51,000		
				SUBTOTAL:	**$51,000**	
3) Legal Fees (5% of Direct Capital Costs)	LS	1	$17,000	$17,000		
				SUBTOTAL:	**$17,000**	
4) Construction Performance Bond (1.25% Direct Capital Construction Costs)	LS	1	$1,250	$1,250		
				SUBTOTAL:	**$1,250**	
			TOTAL INDIRECT CAPITAL COSTS:		**$154,250**	
			TOTAL CAPITAL COSTS (rounded):		**$490,000**	

Table 7
REMEDIAL ALTERNATIVE COST SUMMARY

Alternative #2 - Monitored Natural Attenuation

O'BRIEN & GERE

COST ESTIMATE SUMMARY

Site: Jimmy's Dry Cleaners
Location: 61 Nassau Road, Roosevelt, New York
Phase: Feasibility Study (-30% to +50%)
Base Year: 2007

Description: Alternative #2 consists of treating the entire OU2 VOC plume by natural attenuation. This is intended to address contamination in excess of 5 ug/L.

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Operation & Maintenance Costs						
1) Periodic Review	LS	1	$10,000	$10,000		Assumes reviews are conducted every 5 years.
2) Ground Water Monitoring, Years 1 to 11 - VOCs and MNA parameters	Each	2	$30,000	$60,000		Assumes semi-annual sampling event of 15 existing wells.
3) Ground Water Monitoring, Years 12 to 13 - VOCs Only	Each	4	$15,000	$60,000		Assumes quarterly sampling event of 15 existing wells.
4) Vapor Intrusion Monitoring, Years 1 to 13	Each	4	$16,000	$64,000		Assumes 5 residences per quarterly monitoring event.
5) Vapor Intrusion Mitigation System Operation and Maintenance, Years 1 to 13	Each	10	$1,500	$15,000		Assumes 10 residences require mitigation systems.
6) Insurance (1% Direct Capital Cost)	LS	1	$3,400	$3,400		
7) Reserve Fund (1% Direct Capital Cost)	LS	1	$3,400	$3,400		
		PRESENT WORTH OF O&M COSTS (rounded):			**$1,590,000**	Assumes 13 years of O&M and a discount rate of 3%
		APPROXIMATE TOTAL PRESENT WORTH COST (rounded):			**$2,080,000**	

Table 8
REMEDIAL ALTERNATIVE COST SUMMARY

Alternative #3 - *In Situ* Bioremediation

O'BRIEN & GERE

COST ESTIMATE SUMMARY

Site: Jimmy's Dry Cleaners
Location: 61 Nassau Road, Roosevelt, New York
Phase: Feasibility Study (-30% to +50%)
Base Year: 2007

Description: Alternative #3 consists of treating a portion of the OU2 VOC plume by in situ bioremediation. This is intended to address hotspot contamination in excess of 1,000 ug/L. The balance of the plume will be remediated by natural attenuation.

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Direct Capital Costs						
1) Site management plan	LS	1	$20,000	$20,000		
				SUBTOTAL:	**$20,000**	
2) Vapor intrusion investigation	LS	1	$100,000	$100,000		Assumes 40 residences are included in the investigation.
				SUBTOTAL:	**$100,000**	
3) Vapor intrusion mitigation system installation	Each	10	$10,000	$100,000		Assumes 10 residences require mitigation systems.
				SUBTOTAL:	**$100,000**	
4) Pre-Design Field Studies						
Ground Water Investigation	LS	1	$275,000	$275,000		Assumes installation of 6 nested monitoring wells.
Pilot Study	LS	1	$100,000	$100,000		
				SUBTOTAL:	**$375,000**	
5) Enhanced *In Situ* Biodegradation System Installation						
Permitting	LS	1	$10,000	$10,000		
Shallow Well Installation	LS	1	$70,000	$70,000		Installation of 20 75-ft deep wells.
Deep Well Installation	LS	1	$111,000	$111,000		Installation of 20 150-ft deep wells.
Disposal	LS	1	$30,000	$30,000		Transport and off-site disposal of drill cuttings.
Surveying	LS	1	$10,000	$10,000		
				SUBTOTAL:	**$231,000**	
6) Enhanced *In Situ* Biodegradation System Injections	LS	1	$312,000	$312,000		Assumes quarterly injections at 40 wells. Includes materials and labor.
				SUBTOTAL:	**$312,000**	
				TOTAL DIRECT CAPITAL COST:	**$1,138,000**	

Table 8
REMEDIAL ALTERNATIVE COST SUMMARY

Alternative #3 - *In Situ* Bioremediation

O'BRIEN & GERE

COST ESTIMATE SUMMARY

Site: Jimmy's Dry Cleaners
Location: 61 Nassau Road, Roosevelt, New York
Phase: Feasibility Study (-30% to +50%)
Base Year: 2007

Description: Alternative #3 consists of treating a portion of the OU2 VOC plume by in situ bioremediation. This is intended to address hotspot contamination in excess of 1,000 ug/L. The balance of the plume will be remediated by natural attenuation.

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Indirect Capital Costs						
1) Contingency (25% of Direct Capital Costs)	LS	1	$284,500	$284,500		
				SUBTOTAL:	**$284,500**	
2) Engineering (15% of Direct Capital Costs)	LS	1	$170,700	$170,700		
				SUBTOTAL:	**$170,700**	
3) Legal Fees (5% of Direct Capital Costs)	LS	1	$56,900	$56,900		
				SUBTOTAL:	**$56,900**	
4) Construction Performance Bond (1.25% Direct Capital Construction Costs)	LS	1	$4,138	$4,138		
				SUBTOTAL:	**$4,138**	
			TOTAL INDIRECT CAPITAL COSTS:		**$516,238**	
			TOTAL CAPITAL COSTS (rounded):		**$1,650,000**	
Operation & Maintenance Costs						
1) Periodic Review	LS	1	$10,000	$10,000		Assumes reviews are conducted every 5 years.
2) Ground Water Monitoring, Years 1 to 11 - VOCs and MNA parameters	Each	2	$30,000	$60,000		Assumes semi-annual sampling event of 15 existing wells.
3) Ground Water Monitoring, Years 12 to 13 - VOCs Only	Each	4	$15,000	$60,000		Assumes quarterly sampling event of 15 existing wells.
4) Vapor Intrusion Monitoring, Years 1 to 13	Each	4	$16,000	$64,000		Assumes 5 residences per quarterly monitoring event.
5) Vapor Intrusion Mitigation System Operation and Maintenance, Years 1 to 13	Each	10	$1,500	$15,000		Assumes 10 residences require mitigation systems.
6) Enhanced *In Situ* Biodegradation System Injections	Each	4	$78,000	$312,000		Assumes quarterly injections event for 40 wells. Includes materials and labor.
7) Insurance (1% Direct Capital Cost)	LS	1	$11,380	$11,380		
8) Reserve Fund (1% Direct Capital Cost)	LS	1	$11,380	$11,380		
		PRESENT WORTH OF O&M COSTS (rounded):			**$4,600,000**	Assumes 13 years of O&M and a discount rate of 3%
		APPROXIMATE TOTAL PRESENT WORTH COST (rounded):			**$6,250,000**	

Table 9
REMEDIAL ALTERNATIVE COST SUMMARY

Alternative #4 - *In Situ* Chemical Oxidation

O'BRIEN & GERE

COST ESTIMATE SUMMARY

Site: Jimmy's Dry Cleaners
Location: 61 Nassau Road, Roosevelt, New York
Phase: Feasibility Study (-30% to +50%)
Base Year: 2007

Description: Alternative #4 consists of treating a portion of the OU2 VOC plume by in situ oxidation. This is intended to address hotspot contamination in excess of 1,000 ug/L. The balance of the plume will be remediated by natural attenuation.

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Direct Capital Costs						
1) Site Management Plan	LS	1	$20,000	$20,000		
				SUBTOTAL:	$20,000	
2) Vapor Intrusion Investigation	LS	1	$100,000	$100,000		Assumes 40 residences are included in the investigation.
				SUBTOTAL:	$100,000	
3) Vapor Intrusion Mitigation System Installation	Each	10	$10,000	$100,000		Assumes 10 residences require mitigation systems.
				SUBTOTAL:	$100,000	
4) Pre-Design Ground Water Investigation	LS	1	$275,000	$275,000		Assumes installation of 6 nested monitoring wells.
				SUBTOTAL:	$275,000	
5) *In Situ* Chemical Oxidation System Installation						
Permitting	LS	1	$10,000	$10,000		
Shallow well installation	LS	1	$140,000	$140,000		Installation of 40 75-ft deep wells.
Deep well installation	LS	1	$222,000	$222,000		Installation of 40 150-ft deep wells.
Disposal	LS	1	$50,000	$50,000		Transport and off-site disposal of drill cuttings.
Surveying	LS	1	$10,000	$10,000		
				SUBTOTAL:	$432,000	
6) *In Situ* Chemical Oxidation Injections Using Permanganate	LS	1	$400,000	$400,000		Assumes quarterly injections at 80 wells. Includes materials and labor.
				SUBTOTAL:	$400,000	
			TOTAL DIRECT CAPITAL COST:		$1,327,000	
Indirect Capital Costs						
1) Contingency (25% of Direct Capital Costs)	LS	1	$331,750	$331,750		
				SUBTOTAL:	$331,750	
2) Engineering (15% of Direct Capital Costs)	LS	1	$199,050.00	$199,050		
				SUBTOTAL:	$199,050	
3) Legal Fees (5% of Direct Capital Costs)	LS	1	$66,350.00	$66,350		
				SUBTOTAL:	$66,350	
4) Construction Performance Bond (1.25% Direct Capital Construction Costs)	LS	1	$6,650.00	$6,650		
				SUBTOTAL:	$6,650	
			TOTAL INDIRECT CAPITAL COSTS:		$603,800	
			TOTAL CAPITAL COSTS (rounded):		$1,930,000	

Table 9
REMEDIAL ALTERNATIVE COST SUMMARY

Alternative #4 - *In Situ* Chemical Oxidation

O'BRIEN & GERE

COST ESTIMATE SUMMARY

Site: Jimmy's Dry Cleaners
Location: 61 Nassau Road, Roosevelt, New York
Phase: Feasibility Study (-30% to +50%)
Base Year: 2007

Description: Alternative #4 consists of treating a portion of the OU2 VOC plume by in situ oxidation. This is intended to address hotspot contamination in excess of 1,000 ug/L. The balance of the plume will be remediated by natural attenuation.

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Operation & Maintenance Costs						
1) Periodic Review	LS	1	$10,000	$10,000		Assumes reviews are conducted every 5 years.
2) Ground Water Monitoring, Years 1 to 5 - VOCs and MNA parameters	Each	2	$30,000	$60,000		Assumes semi-annual sampling event of 15 existing wells.
3) Ground Water Monitoring, Years 6 to 7 - VOCs Only	Each	4	$15,000	$60,000		Assumes quarterly sampling event of 15 existing wells.
4) Vapor Intrusion Monitoring, Years 1 to 7	Each	4	$16,000	$64,000		Assumes 5 residences per quarterly monitoring event.
5) Vapor Intrusion Mitigation System Operation and Maintenance, Years 1 to 7	Each	10	$1,500	$15,000		Assumes 10 residences require mitigation systems.
6) *In Situ* Chemical Oxidation Injections Using Permanganate, Years 1 to 5	Each	4	$100,000	$400,000		Assumes quarterly injection events for 80 wells. Includes materials and labor.
7) Insurance (1% Direct Capital Cost)	LS	1	$13,270	$13,270		
8) Reserve Fund (1% Direct Capital Cost)	LS	1	$13,270	$13,270		
		PRESENT WORTH OF O&M COSTS (rounded):			$2,840,000	Assumes 7 years of O&M and a discount rate of 3%
		APPROXIMATE TOTAL PRESENT WORTH COST (rounded):			**$4,770,000**	

Table 10
REMEDIAL ALTERNATIVE COST SUMMARY

Alternative #5 - Vapor Control and Ground Water Collection/Treatment/Discharge

O'BRIEN & GERE

COST ESTIMATE SUMMARY

Site: Jimmy's Dry Cleaners
Location: 61 Nassau Road, Roosevelt, New York
Phase: Feasibility Study (-30% to +50%)
Base Year: 2007

Description: Alternative #5 consists of treating the entire OU2 plume. This is intended to address the entire VOC contamination in excess of 5 ug/L.

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Direct Capital Costs						
1) Site management plan	LS	1	$20,000	$20,000		
				SUBTOTAL:	**$20,000**	
2) Vapor intrusion investigation	LS	1	$100,000	$100,000		
				SUBTOTAL:	**$100,000**	Assumes 40 residences are included in the investigation.
3) Vapor intrusion mitigation system installation	Each	10	$10,000	$100,000		
				SUBTOTAL:	**$100,000**	Assumes 10 residences require mitigation systems.
4) Ground Water Collection/Treatment/Discharge Systems						
Pre-design field studies	LS	1	$100,000	$100,000		
Permitting (Air, NPDES, etc.)	LS	1	$50,000	$50,000		
Mobilization	LS	1	$65,000	$65,000		
Extraction wells	LS	1	$75,000	$75,000		Installation of 3 extraction wells.
Pumps	LS	1	$50,000	$50,000		
Piping/trenching	LS	1	$1,200,000	$1,200,000		Assumes treatment system is located in OU1.
Building	LS	1	$2,700,000	$2,700,000		
Treatment system	LS	1	$1,500,000	$1,500,000		
Electrical	LS	1	$250,000	$250,000		
Restoration	LS	1	$150,000	$150,000		
Re-injection wells	LS	1	$100,000	$100,000		Installation of 3 injection wells.
Surveying	LS	1	$25,000	$25,000		
				SUBTOTAL:	**$6,265,000**	
			TOTAL DIRECT CAPITAL COST:		**$6,485,000**	

Table 10
REMEDIAL ALTERNATIVE COST SUMMARY

Alternative #5 - Vapor Control and Ground Water Collection/Treatment/Discharge

O'BRIEN & GERE

COST ESTIMATE SUMMARY

Site: Jimmy's Dry Cleaners
Location: 61 Nassau Road, Roosevelt, New York
Phase: Feasibility Study (-30% to +50%)
Base Year: 2007

Description: Alternative #5 consists of treating the entire OU2 plume. This is intended to address the entire VOC contamination in excess of 5 ug/L.

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Indirect Capital Costs						
1) Contingency (25% of Direct Capital Costs)	LS	1	$1,621,250	$1,621,250		
				SUBTOTAL:	**$1,621,250**	
2) Engineering (15% of Direct Capital Costs)	LS	1	$972,750	$972,750		
				SUBTOTAL:	**$972,750**	
3) Legal Fees (5% of Direct Capital Costs)	LS	1	$324,250	$324,250		
				SUBTOTAL:	**$324,250**	
4) Construction Performance Bond (1.25% Direct Capital Construction Costs)	LS	1	$79,563	$79,563		
				SUBTOTAL:	**$79,563**	
			TOTAL INDIRECT CAPITAL COSTS:		**$2,997,813**	
			TOTAL CAPITAL COSTS (rounded):		**$9,260,000**	
Operation & Maintenance Costs						
1) Periodic Review	LS	1	$10,000	$10,000		Assumes reviews are conducted every 5 years.
2) Ground Water Monitoring, Years 1 to 10 - VOCs Only	Each	4	$15,000	$60,000		Assumes quarterly sampling event at 15 existing wells.
3) Vapor Intrusion Monitoring, Years 1 to 10	LS	4	$16,000	$64,000		Assumes 5 residences per quarterly monitoring event.
4) Vapor Intrusion Mitigation System Operation and Maintenance, Years 1 to 10	Each	10	$1,500	$15,000		Assumes 10 residences require mitigation systems.
5) Discharge Sampling and Analytical, Years 1 to 8	LS	1	$75,000	$75,000		
6) Ground Water Treatment System Operation and Maintenance, Years 1 to 8	LS	1	$250,000	$250,000		Includes electricity, oversight, and disposal.
7) Insurance (1% Direct Capital Cost)	LS	1	$64,850	$64,850		
8) Reserve Fund (1% Direct Capital Cost)	LS	1	$64,850	$64,850		
		PRESENT WORTH OF O&M COSTS (rounded):			**$4,390,000**	Assumes 10 years of O&M and a discount rate of 3%
		APPROXIMATE TOTAL PRESENT WORTH COST (rounded):			**$13,650,000**	

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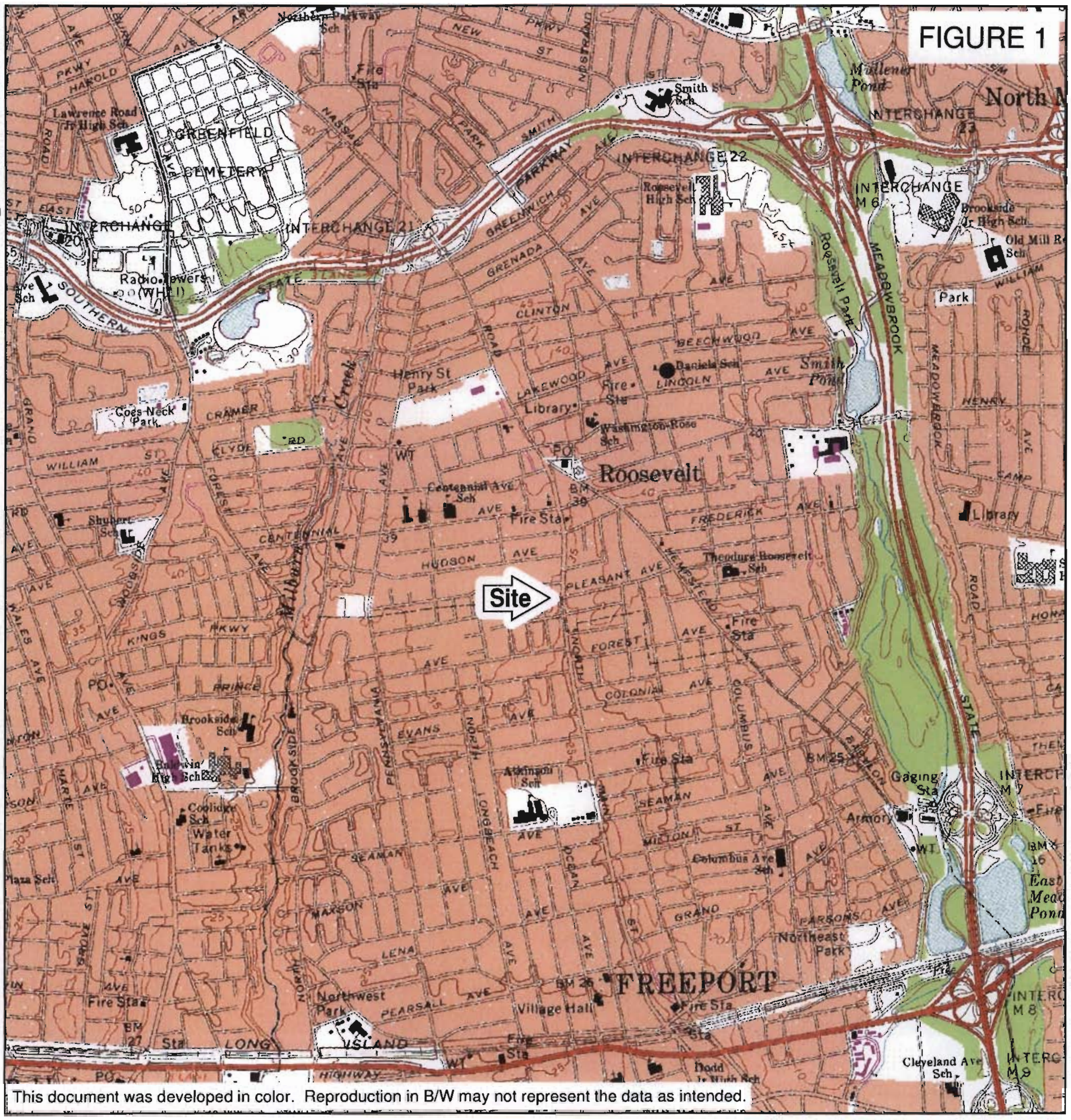
PLOT DATE: 8/23/07 DIV 71 LSR



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ADAPTED FROM: FREEPORT, NEW YORK USGS QUADRANGLE

QUADRANGLE LOCATION

JIMMY'S DRY CLEANERS
ROOSEVELT, NY
NYSDEC SITE #1-30-080

SITE LOCATION

0 1,000 2,000 4,000 6,000 8,000

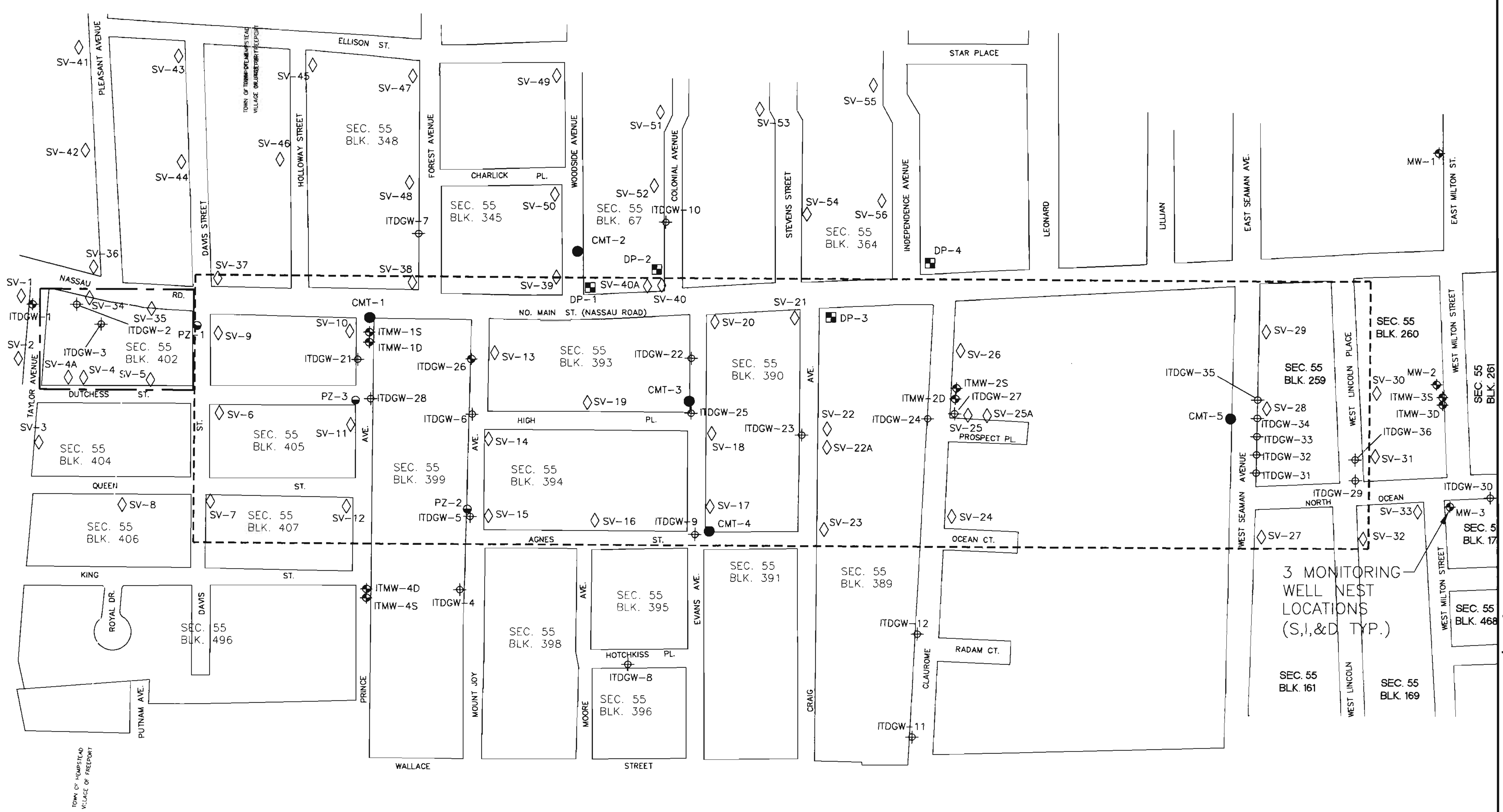
Feet

FILE NO. 10653/36951
AUGUST 2007

1:24,000

O'BRIEN & GERE

FIGURE 2



LEGEND:

MW-3	MONITORING WELL
DP-4	DIRECT PUSH GROUNDWATER SAMPLING LOCATION
CMT-5	CMT MONITORING WELL
SV-30	SOIL VAPOR PROBE
ITDGW-11	FORMER GROUNDWATER SAMPLING LOCATION (GENERALLY NOT EXISTING)
PZ-3	EXISTING PIEZOMETER
ITMW-3	EXISTING MONITORING WELL
	TAX MAP PROPERTY LINES
	OU1 BOUNDARY
	OU2 BOUNDARY

JIMMY'S DRY CLEANERS
ROOSEVELT, NEW YORK
NYSDEC SITE #1-30-080

MONITORING WELLS AND SAMPLE LOCATIONS

0 300 600
SCALE IN FEET

FILE NO. 10653.36951.015
OCTOBER 2007

O'BRIEN & GERE ENGINEERS INC.

NOTES:

1. ONLY FORMER GROUNDWATER SAMPLE LOCATIONS ITDGW-1 AND ITDGW-26, PIEZOMETERS PZ-1 THRU 3, AND MONITORING WELLS ITMW-1S, 1D, 2S, 2D, 3S, 3D, 4S, AND 4D ARE STILL PRESENT.

REFERENCE:

BASE MAP SOURCE: CHAZEN ENGINEERING & LAND SURVEYING CO., P.C. AND SHAW E&I ENGINEERING OF NY

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October 23, 2007 - 8:17AM

FIGURE 3

Legend

- SOIL VAPOR PROBE AND PCE VALUE IN ug/m^3 (example: SV-26 119)
- EXISTING PIEZOMETER
- EXISTING MONITORING WELL
- EXISTING CMT MONITORING WELL
- TOWN BOUNDARY
- TAX MAP PROPERTY LINES

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JIMMY'S DRY CLEANERS
ROOSEVELT, NEW YORK
NYSDEC SITE #1-30-080

SOIL VAPOR RESULTS - TETRACHLOROETHYLENE (PCE)

0 150 300 600
Feet

OCTOBER 2007
10653.36951

O'BRIEN & GERE

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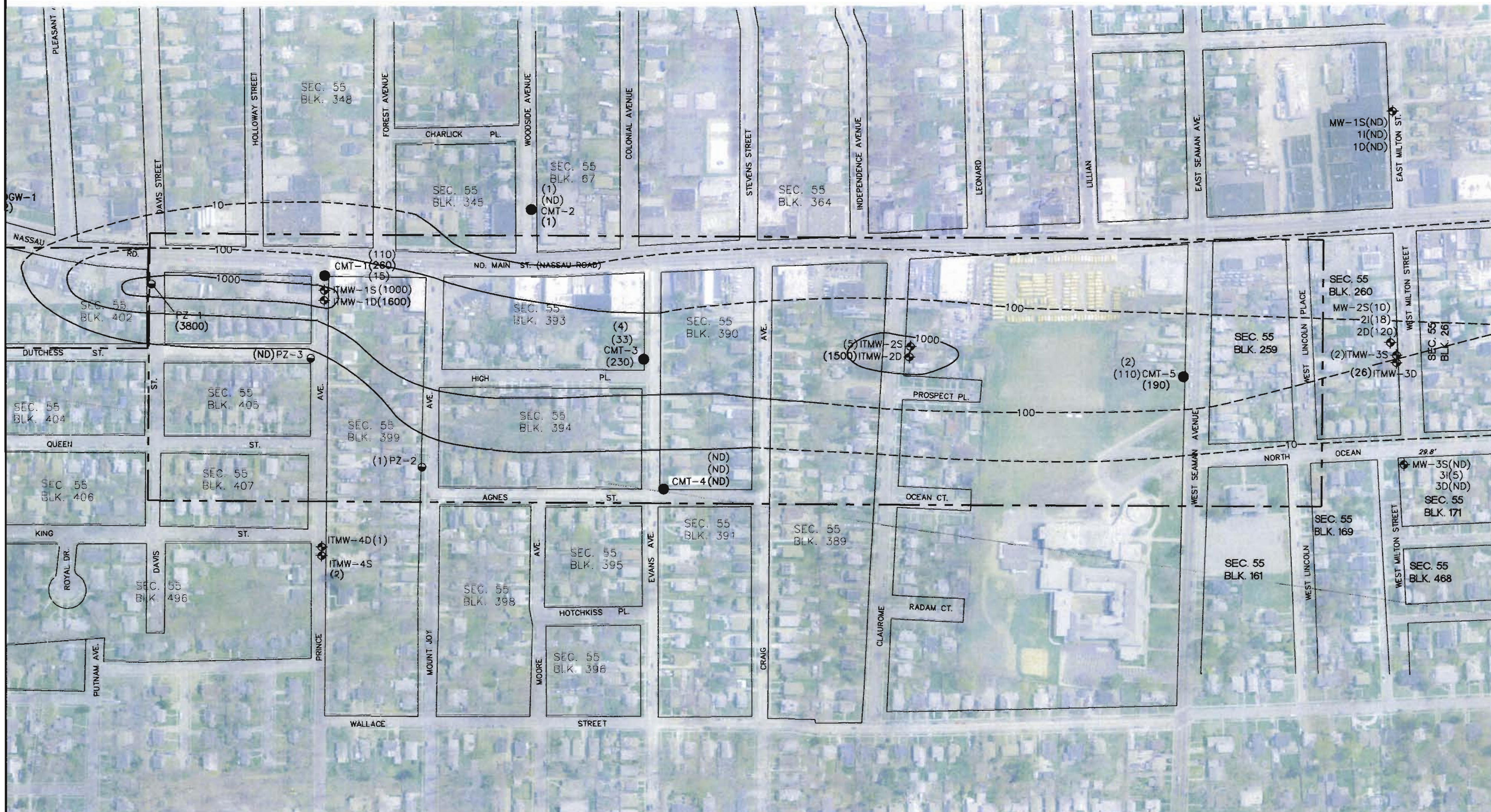
PLOT DATE: 10/18/07 DIV 70 AKL

FIGURE 4



LEGEND:

CMT-7 ●	PROPOSED CMT MONITORING WELL
	TAX MAP PROPERTY LINES
PZ-3 ◓	EXISTING PIEZOMETER
⯐	EXISTING MONITORING WELL
— - —	OU1 BOUNDARY
- - -	OU2 BOUNDARY
(26)	CONCENTRATION OF PCE IN GROUNDWATER (ug/L)
10	PCE ISOCONCENTRATION CONTOUR LINE (UG/L) (DASHED WHERE INFERRED)

JIMMY'S DRY CLEANERS
NYSDEC WA#D004090-25
ROOSEVELT, NEW YORK

PCE CONCENTRATIONS IN GROUND WATER

0 300 600
SCALE IN FEET

FILE NO. 10653.36951.004
OCTOBER 2007

O'BRIEN & GERE ENGINEERS INC.

NOTE:

ONLY FORMER GROUNDWATER SAMPLE LOCATIONS ITDGW-1 AND ITDGW-26, PIEZOMETERS PZ-1 THRU 3, AND MONITORING WELLS 1S, 1D, 2S, 2D, 3S, 3D, 4S, AND 4D ARE STILL PRESENT. MW1, MW2, MW3 WELL NESTS SAMPLED IN JUNE 2007, OTHER DATA IS FROM FEB. 2007 SAMPLING EVENT.

REFERENCE:

BASE MAP SOURCE: CHAZEN ENGINEERING & LAND SURVEYING CO., P.C. AND SHAW E&I ENGINEERING OF NY (FIGURE 1-3)

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Appendix A

Selected Data Tables and Figures from the Remedial Investigation Report (Shaw 2003)

Table 1
Groundwater Analytical Data
NYSDEC - Jimmy's Dry Cleaner

Sample ID:		ITMW-1S	ITMW-1S*D100	ITMW-1D	ITMW-1D*D2	ITMW-2S	ITMW-2S*D100	ITMW-2D	ITMW-2D*D10
Screen Interval (ft.bgs):		55-65	55-65	95-105	95-105	40.5-50.5	40.5-50.5	91.5-101.5	91.5-101.5
Sample Date:									
Units:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Volatile Organic Compounds	NYSDEC								
	GW Standard								
Dichlorodifluoromethane	5	<10	<1000	<10	<20	<10	<1000	<10	<100
Chloromethane	5	<10	<1000	<10	<20	<10	<1000	<10	<100
Vinyl Chloride	0.3	<10	<1000	<10	<20	<10	<1000	<10	<100
Bromomethane	5	<10	<1000	<10	<10	<10	<1000	<10	<100
Chloroethane	5	<10	<1000	<10	<20	<10	<1000	<10	<100
Trichlorofluoromethane	5	<10	<1000	<10	<20	<10	<1000	<10	<100
1,1-Dichloroethene	0.7	<10	<1000	<10	<20	<10	<1000	<10	<100
Carbon Disulfide	NR	<10	<1000	<10	<20	<10	<1000	<10	<100
Acetone	50	<10	<1000	<10	<20	<10	<1000	<10	<100
Methylene Chloride	5	<10	<1000	<10	<20	<10	<1000	<10	<100
methyl-tert butyl ether	10	<10	<1000	<10	<20	<10	<1000	<10	<100
trans 1, 2 Dichloroethene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
1,1-Dichloroethane	5	**6J**	<1000	**4J**	<20	<10	<1000	<10	<100
Vinyl Acetate	NR	<10	<1000	<10	<20	<10	<1000	<10	<100
cis 1, 2-Dichloroethene	5	<10	<1000	**3J**	<20	**15**	<1000	**17**	<100
2-Butanone	50	<10	<1000	<10	<20	<10	<1000	<10	<100
Chloroform	7	<10	<1000	<10	<20	<10	<1000	<10	<100
1,1,1-Trichloroethane	1	**4J**	<1000	**4J**	<20	<10	<1000	<10	<100
Carbon Tetrachloride	0.4	<10	<1000	<10	<20	<10	<1000	<10	<100
Benzene	1	<10	<1000	<10	<20	<10	<1000	<10	<100
1,2-Dichloroethane	0.6	<10	<1000	<10	<20	<10	<1000	<10	<100
Trichloroethene	1	**6J**	<1000	**3J**	<20	**15**	<1000	**7J**	<100
1,2-Dichloropropane	1	<10	<1000	<10	<20	<10	<1000	<10	<100
Bromodichloromethane	50	<10	<1000	<10	<20	<10	<1000	<10	<100
cis 1, 3-Dichloropropene	0.4	<10	<1000	<10	<20	<10	<1000	<10	<100
4-Methyl-2-pentanone	NR	<10	<1000	<10	<20	<10	<1000	<10	<100
Toluene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
trans-1, 3-Dichloropropene	NR	<10	<1000	<10	<20	<10	<1000	<10	<100
1,1,2-Trichloroethane	1	<10	<1000	<10	<20	<10	<1000	<10	<100
Tetrachloroethene	0.7	**6200E**	**23000ED**	**190E**	**200D**	**1300E**	**2600D**	**630E**	**980D**
2-Hexanone	50	<10	<1000	<10	<20	<10	<1000	<10	<100
Dibromochloromethane	5	<10	<1000	<10	<20	<10	<1000	<10	<100
Chlorobenzene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
Ethylbenzene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
m,p-Xylenes	5	<10	<1000	<10	<20	<10	<1000	<10	<100
o-Xylene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
Styrene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
Bromoform	50	<10	<1000	<10	<20	<10	<1000	<10	<100
1,1,2,2-Tetrachloroethane	5	<10	<1000	<10	<20	<10	<1000	<10	<100
2-Chlorotoluene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
4-Chlorotoluene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
1,3-Dichlorobenzene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
1,4-Dichlorobenzene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
1,2-Dichlorobenzene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
1,2,4-Trichlorobenzene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
1,2,3-Trichlorobenzene	5	<10	<1000	<10	<20	<10	<1000	<10	<100
Total VOCs		**6216 EJ**	**23000 ED**	**204 EJ**	**200 D**	**1330 E**	**2600 D**	**654 EJ**	**980 D**

Notes: All concentration in ug/L (ppb)
(1): Liquid collected from the dry well
(2): NYSDEC Division of Water Technical and Operation Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values, dated June 1998
(3): Based on information provided by NYSDEC
NS: analysis not performed
ND: not detected above method detection limit
Bold : concentrations above detection limit.
Shaded : Concentrations above guidance values.
J : Estimated Concentration

Table 1
Groundwater Analytical Data
NYSDEC - Jimmy's Dry Cleaner

Sample ID:		**ITMW-3S**	**ITMW-3D**	**ITMW-4S**	**ITMW-4D**
Screen Interval (ft.bgs):		55-65	80-90	55-65	95-105
Sample Date:					
Units:		ug/L	ug/L	ug/L	ug/L
Volatile Organic Compounds	**NYSDEC GW Standard**				
Dichlorodifluoromethane	5	<10	<10	<10	<10
Chloromethane	5	<10	<10	<10	<10
Vinyl Chloride	0.3	<10	<10	<10	<10
Bromomethane	5	<10	<10	<10	<10
Chloroethane	5	<10	<10	<10	<10
Trichlorofluoromethane	5	<10	<10	<10	<10
1,1-Dichloroethene	0.7	<10	<10	<10	<10
Carbon Disulfide	NR	<10	<10	<10	<10
Acetone	50	<10	<10	<10	<10
Methylene Chloride	5	<10	<10	<10	<10
methyl-tert butyl ether	10	<10	<10	<10	<10
trans 1, 2 Dichloroethene	5	<10	<10	<10	<10
1,1-Dichloroethane	5	<10	<10	<10	<10
Vinyl Acetate	NR	<10	<10	<10	<10
cis 1, 2-Dichloroethene	5	<10	<10	<10	<10
2-Butanone	50	<10	<10	<10	<10
Chloroform	7	<10	<10	<10	<10
1,1,1-Trichloroethane	5	<10	<10	<10	<10
Carbon Tetrachloride	0.7	<10	<10	<10	<10
Benzene	NR	<10	<10	<10	<10
1,2-Dichloroethane	50	<10	<10	<10	<10
Trichloroethene	5	<10	<10	<10	<10
1,2-Dichloropropane	10	<10	<10	<10	<10
Bromodichloromethane	5	<10	<10	<10	<10
cis 1, 3-Dichloropropene	5	<10	<10	<10	<10
4-Methyl-2-pentanone	NR	<10	<10	<10	<10
Toluene	5	<10	<10	<10	<10
trans-1, 3-Dichloropropene	50	<10	<10	<10	<10
1,1,2-Trichloroethane	1	<10	<10	<10	<10
Tetrachloroethene	0.7	<10	**10J**	<10	<10
2-Hexanone	50	<10	<10	<10	<10
Dibromochloromethane	5	<10	<10	<10	<10
Chlorobenzene	5	<10	<10	<10	<10
Ethylbenzene	5	<10	<10	<10	<10
m,p-Xylenes	5	<10	<10	<10	<10
o-Xylene	5	<10	<10	<10	<10
Styrene	5	<10	<10	<10	<10
Bromoform	50	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	5	<10	<10	<10	<10
2-Chlorotoluene	5	<10	<10	<10	<10
4-Chlorotoluene	5	<10	<10	<10	<10
1,3-Dichlorobenzene	5	<10	<10	<10	<10
1,4-Dichlorobenzene	5	<10	<10	<10	<10
1,2-Dichlorobenzene	5	<10	<10	<10	<10
1,2,4-Trichlorobenzene	5	<10	<10	<10	<10
1,2,3-Trichlorobenzene	5	<10	<10	<10	<10
Total VOCs		**BDL**	**10 J**	**BDL**	**BDL**

Notes: All concentration in ug/L (ppb)
(1): Liquid collected from the dry well
(2): NYSDEC Division of Water Technical and Operation Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values, dated June 1998
(3): Based on information provided by NYSDEC
NS: analysis not performed
ND: not detected above method detection limit
Bold : concentrations above detection limit.
Shaded : Concentrations above guidance values.
J : Estimated Concentration

Table 3
Soil Gas Analytical Data
NYSDEC, Jimmys Dry Cleaner, Roosevelt, NY

Sample ID:	**ITVP-21**	**ITVP-22**	**ITVP-23**	**ITVP-24**	**ITVP-25**	**ITVP-26**	**ITVP-27**	**ITVP-28**	**ITVP-29**
Sample Date:	3/7/02	3/7/02	3/7/02	3/7/02	3/7/02	3/7/02	3/7/02	3/7/02	3/7/02
Units:	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3
Volatile Organic Compounds									
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	NN	NN	NN	NN	NN	NN	NN	NN	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlororodifluromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	**1.0**	**2.0**	**2.0**	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	**77 E**	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	**1.0**	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	**1100 E**	**2100 E**	ND	**6.0**	**1.0**	**2.0**	**590 E**	**110 E**
Toluene	ND	ND	ND	ND	**180 E**	ND	ND	ND	**2.0**
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	**4.0**	ND	ND	ND	ND	ND	ND
Trichlorotrifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	ND	ND	ND	ND	**240 E**	ND	**1.0**	ND	ND
o-Xylene	ND	ND	ND	ND	**81 E**	ND	ND	ND	ND
Method Detection Limit	1.0	1000	1000	1000	1000	1000	1000	1000	1000
Total VOCs	**BDL**	**1100 E**	**2104 E**	**BDL**	**584 E**	**2**	**6**	**592 E**	**112 E**

Notes:
Bold = Values above the detection limit.
*D = Dilution Factor
ND = Not detected above the method detection limit.
J = Indicates that the analyte concentration exceeded the Calibration Range.

Table 3
Soil Gas Analytical Data
NYSDEC, Jimmys Dry Cleaner, Roosevelt, NY

Sample ID:	**ITVP-30**	**ITVP-31**	**ITVP-32**	**ITVP-33**
Sample Date:	3/7/02	3/7/02	3/7/02	3/7/02
Units:	mg/m^3	mg/m^3	mg/m^3	mg/m^3
Volatile Organic Compounds				
Benzene	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND
Dichlororodifluromethane	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND
Ethylbenzene	ND	**4.0**	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND
Styrene	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND
Tetrachloroethene	ND	**5.0**	**2.0**	**2.0**
Toluene	ND	**11.0**	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND
Trichlorotrifluoroethane	ND	ND	ND	ND
1,2,4-Trimethylbenzene	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND
m,p-Xylene	ND	**16.0**	ND	ND
o-Xylene	ND	**5.0**	ND	ND
Method Detection Limit	1000	1000	1000	1000
Total Vocs	**BDL**	**41**	**2**	**2**

Notes:
Bold = Values above the detection limit.
*D = Dilution Factor
ND = Not detected above the method detection limit.
J = Indicates that the analyte concentration exceeded the Calibration Range.

Table 4
Indoor Air Quality Data
NYSDEC - Jimmy's Dry Cleaner
61 Nassau Road, Roosevelt, New York

Sample Location	Units	NYSDOH Guidance Value	09/29/98	01/05/99	08/17/00	08/28/01	05/09/02
KFC - Kitchen	ug/m^3	100	NS	NS	NS	10	70
40 Dutchess (Bsmt. Living. Rm)	ug/m^3	100	NS	NS	NS	5 (PL)	NS
40 Dutchess (Bsmt. Bdrm/baby rm)	ug/m^3	100	NS	NS	NS	5 (PL)	**490**
40 Dutchess (Kitchen/First Floor)	ug/m^3	100	NS	NS	NS	5 (PL)	**280**
Deli - Front Room	ug/m^3	100	**1250/1400**	**400/400**	**510/480**	**108**	**900/870**
Deli - Storage Room (Back)	ug/m^3	100	**930/970**	**400/400**	**490/480**	NS	NS
Dupe 1 (Deli - Front Room)	ug/m^3	100	NS	NS	NS	NS	NS
Dupe 2 (40 Dutchess.Bsmt)	ug/m^3	100	NS	NS	NS	NS	NS
44 Dutchess (Jackson Bsmt./Family Rm)	ug/m^3	100	NS	NS	NS	NS	NS
44 Dutchess (First Floor/Kitchen)	ug/m^3	100	NS	NS	NS	NS	NS
34 Dutchess (Bsmt. Rec Room)	ug/m^3	100	NS	NS	NS	5 (PL)/5 (PL)	NS
34 Dutchess (Bsmt. Bdrm)	ug/m^3	100	NS	NS	NS	5 (PL)	NS
34 Dutchess (First Floor/Kitchen)	ug/m^3	100	NS	NS	NS	5 (PL)	NS
MSUP - Bld. 1 Basement, store room	ug/m^3	100	NS	NS	NS	ND	ND
MSUP - Bld. 1 First floor, southwest corner	ug/m^3	100	NS	NS	NS	ND/ND	5 (PL)
MSUP - Bld. First floor, northwest corner	ug/m^3	100	NS	NS	NS	ND	5 (PL)
MSUP - Bld. 2 First floor, front room	ug/m^3	100	NS	NS	NS	ND	5 (PL)
MSUP - Bld. 2 First floor, rear room	ug/m^3	100	NS	NS	NS	ND	ND
MSUP - Bld. 3 Basement, computer room	ug/m^3	100	NS	NS	NS	ND	5 (PL)/5 (PL)
MSUP - Bld. 3 First floor, office	ug/m^3	100	NS	NS	NS	ND	ND
MSUP - Play area southwest of Bld. 1	ug/m^3	100	NS	NS	NS	ND/ND	5 (PL)
Background	ug/m^3	100	NS	NS	NS	NA	NA

Notes:

Bold = Value exceeds NYSDOH guidance value.
MSUP = Miss Shelly's School - 66 Nassau Road.
KFC = 497 North Main Street.
All samples were sampled for Tetrachloroethene by NYSDOH Method 311-9.
NYSDOH Guidance Value references NYSDOH's "Tetrachloroethene in Indoor and in Indoor and Outdoor Air", October, 1997.

NS = Not sampled.
NA = Data not available.
ND = Non - Detect.
(PL) = value detected less thatn the reported value.
5 (PL)/5 (PL) = Indicates that the NCDOH collected a duplicate sample from this location

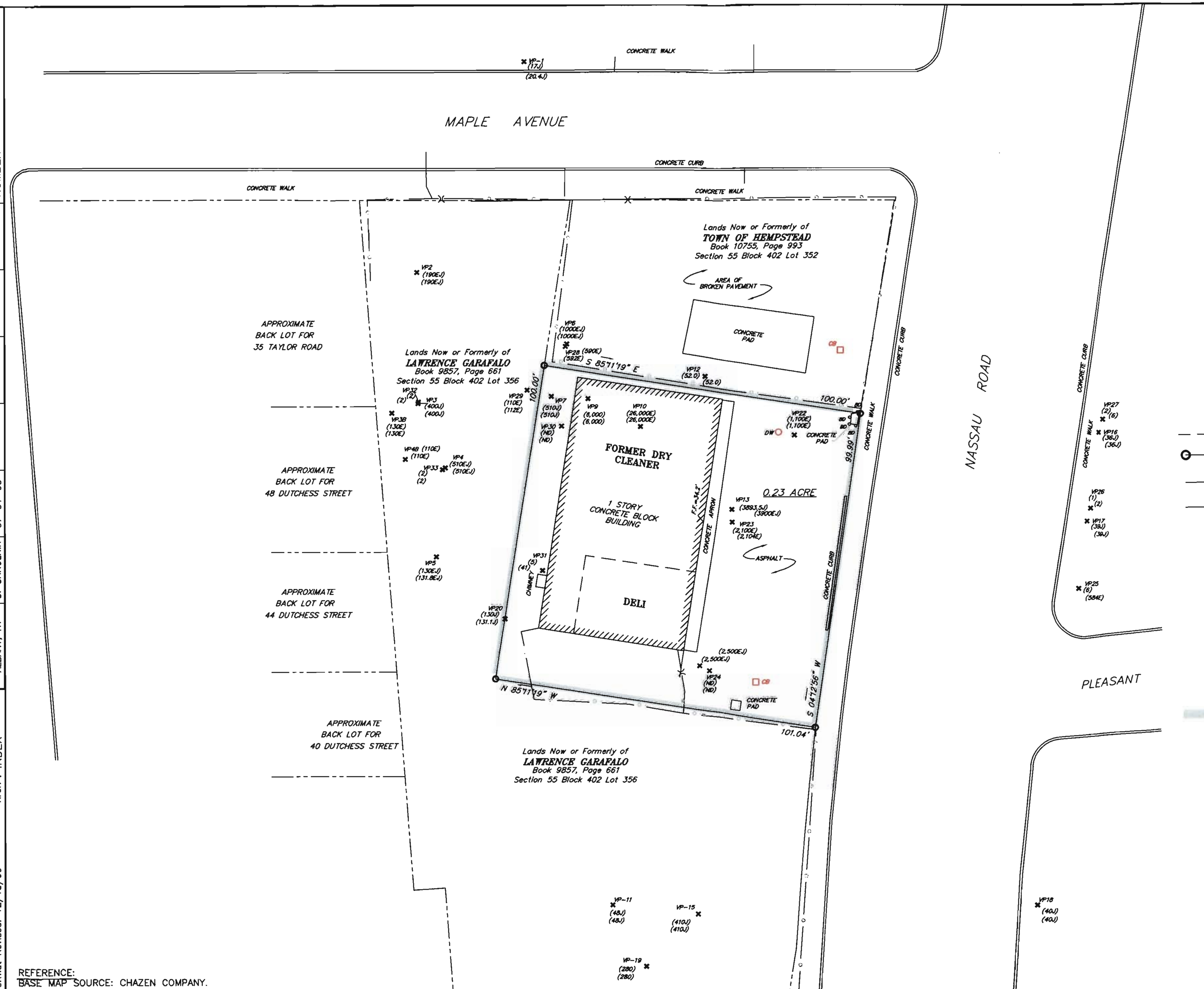
Table 4
Indoor Air Quality Data
NYSDEC - Jimmy's Dry Cleaner
61 Nassau Road, Roosevelt, New York

Sample Location	Units	NYSDOH Guidance Value	07/01/02	11/25/02	01/13/03	03/05/03
KFC - Kitchen	ug/m^3	100	NS	18	6.4	3.3
40 Dutchess (Bsmt. Living. Rm)	ug/m^3	100	5 (PL)	NS	NS	NS
40 Dutchess (Bsmt. Bdrm/baby rm)	ug/m^3	100	5	1.0	5.2	24
40 Dutchess (Kitchen/First Floor)	ug/m^3	100	NS	NS	NS	NS
Deli - Front Room	ug/m^3	100	**230**	67	48	**119**
Deli - Storage Room (Back)	ug/m^3	100	NS	NS	NS	NS
Dupe 1 (Deli - Front Room)	ug/m^3	100	NS	NS	49	NS
Dupe 2 (40 Dutchess.Bsmt)	ug/m^3	100	NS	NS	NS	20
44 Dutchess (Jackson Bsmt./Family Rm)	ug/m^3	100	14	7.4	NS	2.6
44 Dutchess (First Floor/Kitchen)	ug/m^3	100	5 (PL)	NS	NS	NS
34 Dutchess (Bsmt. Rec Room)	ug/m^3	100	NS	NS	NS	NS
34 Dutchess (Bsmt. Bdrm)	ug/m^3	100	NS	NS	NS	NS
34 Dutchess (First Floor/Kitchen)	ug/m^3	100	NS	NS	NS	NS
MSUP - Bld. 1 Basement, store room	ug/m^3	100	NS	NS	NS	NS
MSUP - Bld. 1 First floor, southwest corner	ug/m^3	100	NS	NS	NS	NS
MSUP - Bld. First floor, northwest corner	ug/m^3	100	NS	NS	NS	NS
MSUP - Bld. 2 First floor, front room	ug/m^3	100	NS	NS	NS	NS
MSUP - Bld. 2 First floor, rear room	ug/m^3	100	NS	NS	NS	NS
MSUP - Bld. 3 Basement, computer room	ug/m^3	100	NS	NS	NS	NS
MSUP - Bld. 3 First floor, office	ug/m^3	100	NS	NS	NS	NS
MSUP - Play area southwest of Bld. 1	ug/m^3	100	NS	NS	NS	NS
Background	ug/m^3	100	NS	1.7	2.4	4.0

Notes:

Bold = Value exceeds NYSDOH guidance value.
MSUP = Miss Shelly's School - 66 Nassau Road.
KFC = 497 North Main Street.
All samples were sampled for Tetrachloroethene by NYSDOH Method 311-9.
NYSDOH Guidance Value references NYSDOH's "Tetrachloroethene in Indoor and Outdoor Air", October, 1997.

NS = Not sampled.
NA = Data not available.
ND = Non - Detect.
(PL) = value detected less thatn the reported value.
5 (PL)/5 (PL) = Indicates that the NCDOH collected a duplicate sample from this location.



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
(1000EJ)	TOTAL PCE
(1000EJ)	TOTAL VOC
E	ESTIMATED VALUE
J	CONCENTRATION EXCEEDED THE CALIBRATION RANGE
	SITE PERIMETER

Shaw Environmental, Inc.

NYSDEC JIMMY'S DRY CLEANER

FIGURE 6B
SOIL GAS SURVEY RESULTS

ROOSEVELT, NEW YORK

REFERENCE:
BASE MAP SOURCE: CHAZEN COMPANY.

OFFICE	DRAWN BY		CHECKED BY	APPROVED BY	DRAWING NUMBER
ALBANY, NY	S. SHKOLNIK	07-31-03			824324B21

Image: 394
Xref: . INDEX

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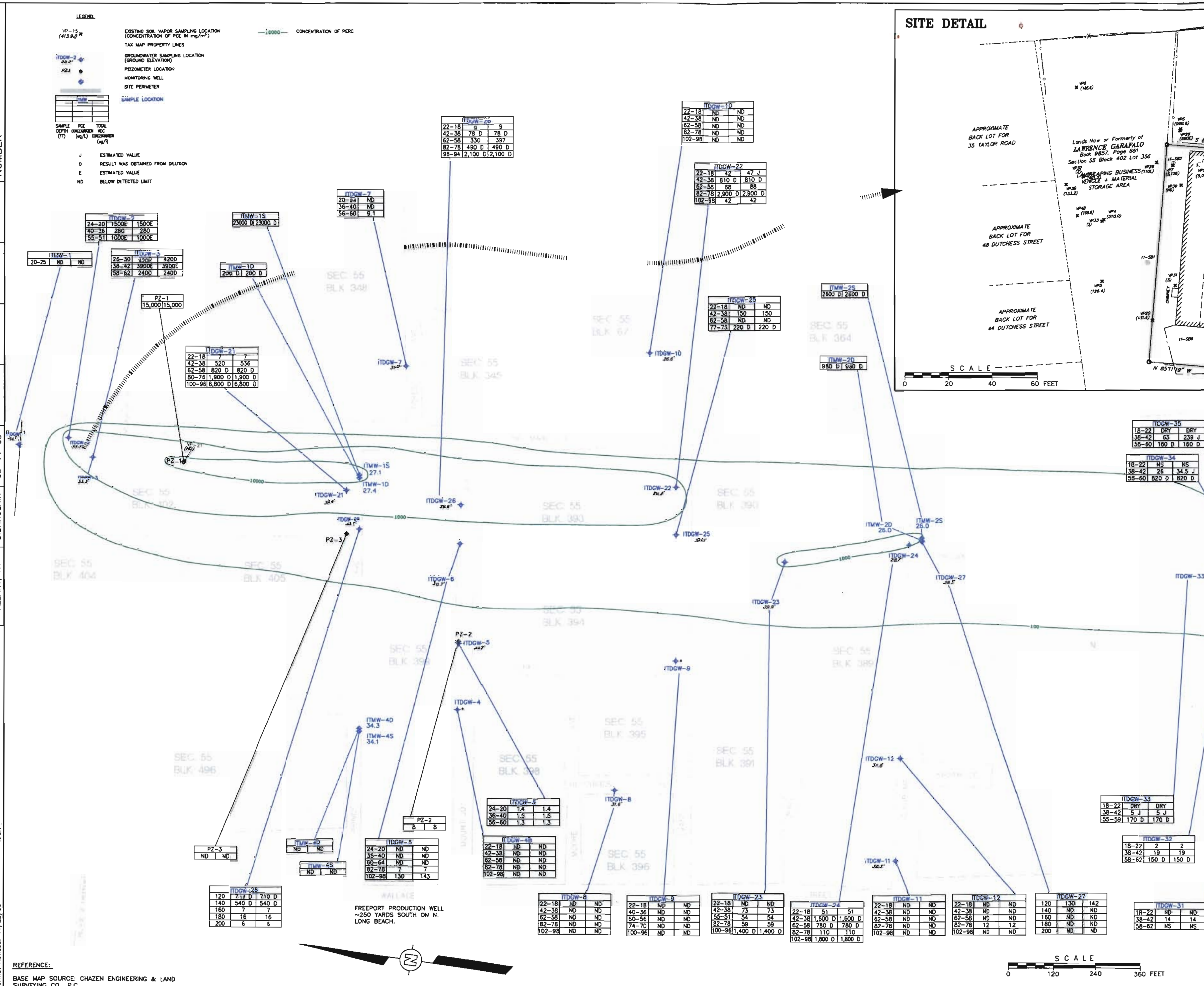
Plot Date/Time: 05/26/05 01:33pm
Format Revised: 12/15/99



Shaw Environmental, Inc.

NYSDEC
JIMMY'S DRY CLEANER

FIGURE 13A
DISTRIBUTION OF PCE IN GROUNDWATER

ROOSEVELT, NEW YORK

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
ALBANY, NY	S.SHKOLNIK 05-14-03			824324D33

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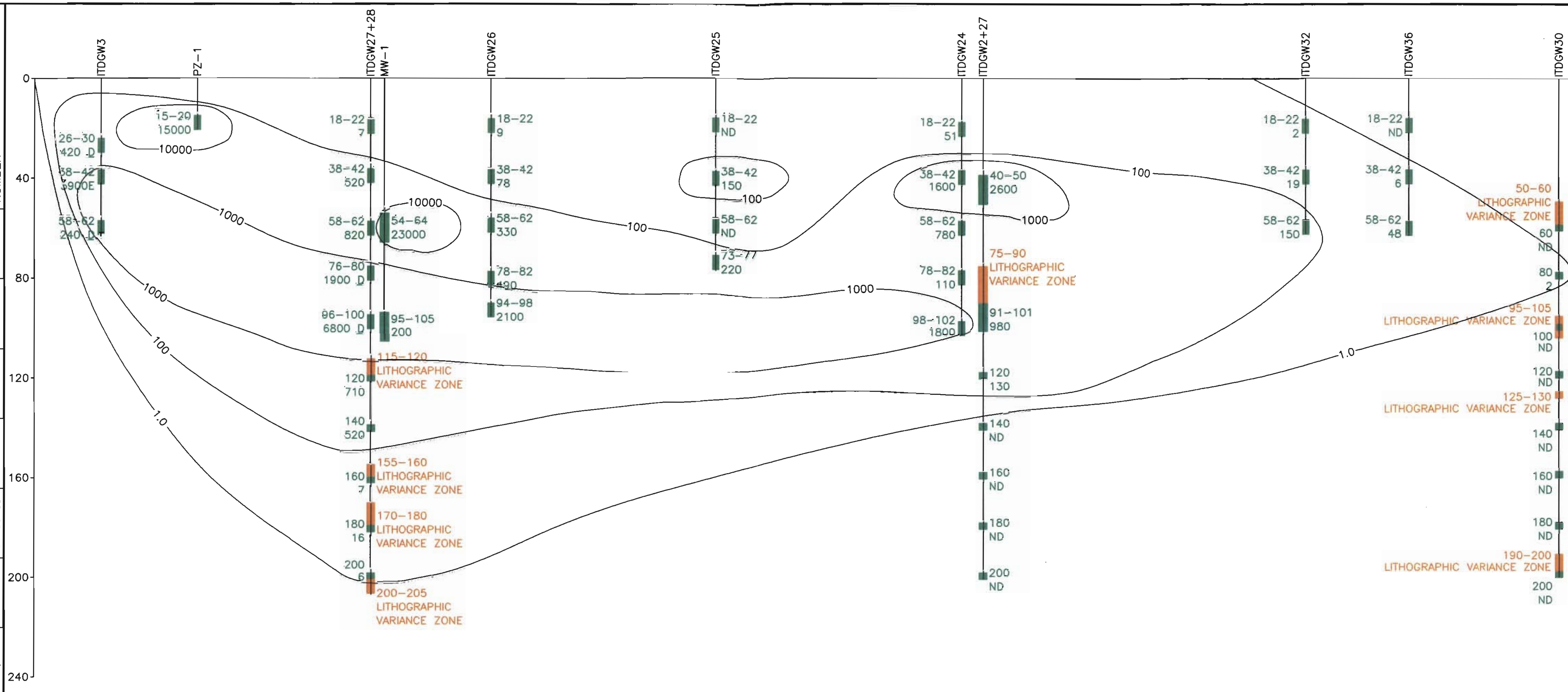
Plot Date/Time: 05/26/05 01:44pm
Format Revised: 11/23/99
Image:
Xref:



APPROXIMATE HORIZONTAL SCALE

0 250 500 FEET

APPROXIMATE VERTICAL SCALE

0 40 80 FEET

LEGEND

160 / 7	FEET BELOW GROUND SURFACE / CONCENTRATION OF TETRACHLOROETHENE (PERC) ug/l
50-60	GAMMA LOG DATA / FEET BELOW GROUND SURFACE
D	RESULT WAS OBTAINED FROM DILUTION
E	ESTIMATED VALUE
ND	BELOW DETECTED LIMIT

Shaw Environmental, Inc.

NYSDEC JIMMY'S DRY CLEANER

FIGURE 13B
DISTRIBUTION OF PCE IN GROUNDWATER, CROSS SECTION

ROOSEVELT, NEW YORK

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
ALBANY, NY	S. SHKOLNIK 04-30-03			824324B17

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Plot Date/Time: 05/26/05 01:45pm
Format Revised: 12/15/99

Image: 394
Xref: . INDEX

Appendix B

Selected Data Tables and Figures from the Supplemental Feasibility Study Sampling Report (O'Brien & Gere 2007)

Table 2

Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample ID	CMT-1 (1)	CMT1(1)	CMT-1 (2)	CMT1(2)	CMT-1 (3)
		Screen Interval or Well Depth	33.5'-34'	33.5'-34'	58.5'-59'	58.5'-59'	98.5'-99'
		Sample Date	6/21/2006	2/26/2007	6/21/2006	2/26/2007	6/21/2006
Chemical Name	**CAS**	**Max. Allowable Concentration[1]**					
Volatile Organic Compounds[2] (µg/L)							
1,1-Dichlorethane	75-34-3	5	ND	ND	ND	ND	ND
Acetone	67-64-1	50	ND	ND	ND	ND	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	1 J	ND
Dichloromethane	75-09-2	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	4 J	**110 J**	**190 J**	**180 DJ**	**10**
Trichloroethylene	79-01-6	5	ND	ND	ND	1 J	ND
m,p-Xylene		5[4]	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[4]	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	NA	ND	NA	ND	NA
Acetic acid	64-19-7	---	NA	ND	NA	0.1	NA
Hexanoic acid	142-62-1	---	NA	ND	NA	0.2	NA
i-Hexanoic acid	646-07-1	---	NA	ND	NA	ND	NA
i-Pentanoic acid	503-74-2	---	NA	ND	NA	ND	NA
Lactic acid and HIBA	50-21-5	---	NA	0.3	NA	0.58	NA
Pentanoic acid	109-52-4	---	NA	ND	NA	ND	NA
Propionic acid	79-09-4	---	NA	ND	NA	ND	NA
Pyruvic acid	127-17-3	---	NA	ND	NA	ND	NA
Dissolved Light Hydrocarbons (µg/L)							
Ethane	74-84-0	---	ND	ND	NA	ND	NA
Ethylene	74-85-1	---	ND	0.100	NA	0.110	NA
Methane	74-82-8	---	ND	1.300	NA	1.100	NA
Total organic carbon (mg/L)		---	NA	ND	NA	NA	NA
Inorganic Compounds[2]							
Manganese (µg/L)	7439-96-5	300	NA	257	NA	27.8 B	NA
Sodium (µg/L)	7440-23-5	20,000	NA	**127,000**	NA	**113,000**	NA
Chloride (mg/L)	16887-00-6	250	NA	160	NA	170	NA
Nitrate, as N (mg/L)	14797-55-8	10	NA	5.6	NA	6.2	NA
Sulfate (mg/L)	14808-79-8	250	NA	31	NA	29	NA
Sulfide (mg/L)	18496-25-8	0.05[5]	NA	ND	NA	ND	NA

O'BRIEN & GERE

Table 2

Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample ID Screen Interval or Well Depth Sample Date	CMT1(3) 98.5'-99' 2/26/2007	X2 (CMT-1(3)) 98.5'-99' 2/26/2007	X2DL (CMT-1(3)) 98.5'-99' 2/26/2007	CMT-2 (1) 34.5'-35' 6/20/2006
Chemical Name	**CAS**	**Max. Allowable Concentration(1)**				
Volatile Organic Compounds(2) (µg/L)						
1,1-Dichlorethane	75-34-3	5	ND	NA	ND	ND
Acetone	67-64-1	50	ND	NA	ND	ND
Benzene	71-43-2	1	ND	NA	ND	ND
Bromodichloromethane	75-27-4	50	ND	NA	ND	ND
Chlorobenzene	108-90-7	5	ND	NA	ND	ND
Chloroform	67-66-3	7	ND	NA	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	3 J	NA	ND	ND
Dichloromethane	75-09-2	5	ND	NA	ND	ND
Ethylbenzene	100-41-4	5	ND	NA	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	NA	ND	ND
Methyl tert-butyl ether	1634-04-4	10(3)	ND	NA	ND	ND
Toluene	108-88-3	5	ND	NA	ND	ND
Tetrachloroethene	127-18-4	5	**15 J**	NA	**190 DJ**	ND
Trichloroethylene	79-01-6	5	ND	NA	ND	ND
m,p-Xylene		5(4)	ND	NA	ND	ND
Xylene (Total)	1330-20-7	5(4)	ND	NA	ND	ND
Volatile Fatty Acids (mg/L)						
Butyric acid	107-92-6	---	ND	ND	NA	NA
Acetic acid	64-19-7	---	ND	ND	NA	NA
Hexanoic acid	142-62-1	---	ND	0.27	NA	NA
i-Hexanoic acid	646-07-1	---	ND	ND	NA	NA
i-Pentanoic acid	503-74-2	---	ND	ND	NA	NA
Lactic acid and HIBA	50-21-5	---	0.26	0.27	NA	NA
Pentanoic acid	109-52-4	---	ND	ND	NA	NA
Propionic acid	79-09-4	---	ND	ND	NA	NA
Pyruvic acid	127-17-3	---	ND	ND	NA	NA
Dissolved Light Hydrocarbons (µg/L)						
Ethane	74-84-0	---	0.061	ND	NA	NA
Ethylene	74-85-1	---	0.110	0.094	NA	NA
Methane	74-82-8	---	1.400	1.000	NA	NA
Total organic carbon (mg/L)		---	ND	ND	NA	NA
Inorganic Compounds(2)						
Manganese (µg/L)	7439-96-5	300	239	17.8 B	NA	NA
Sodium (µg/L)	7440-23-5	20,000	**49,600**	**114,000**	NA	NA
Chloride (mg/L)	16887-00-6	250	81	170	NA	NA
Nitrate, as N (mg/L)	14797-55-8	10	5.0	6.3	NA	NA
Sulfate (mg/L)	14808-79-8	250	36	29	NA	NA
Sulfide (mg/L)	18496-25-8	0.05(5)	ND	0.034	NA	NA

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Table 2

Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample ID Screen Interval or Well Depth Sample Date	CMT2(1) 34.5'-35' 2/23/2007	CMT-2 (2) 59.5'-60' 6/20/2006	CMT2(2) 59.5'-60' 2/23/2007	CMT-2 (3) 99.5'-100' 6/20/2006	CMT2(3) 99.5'-100' 2/26/2007
Chemical Name	**CAS**	**Max. Allowable Concentration[1]**					
Volatile Organic Compounds[2] (μg/L)							
1,1-Dichlorethane	75-34-3	5	ND	ND	ND	ND	ND
Acetone	67-64-1	50	ND	ND	ND	ND	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
Dichloromethane	75-09-2	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	1 J	ND	ND	ND	ND
Trichloroethylene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5[4]	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[4]	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	ND	NA	ND	NA	ND
Acetic acid	64-19-7	---	ND	NA	ND	NA	ND
Hexanoic acid	142-62-1	---	ND	NA	ND	NA	0.12
i-Hexanoic acid	646-07-1	---	ND	NA	ND	NA	ND
i-Pentanoic acid	503-74-2	---	ND	NA	ND	NA	ND
Lactic acid and HIBA	50-21-5	---	0.28	NA	0.15	NA	0.29
Pentanoic acid	109-52-4	---	ND	NA	ND	NA	ND
Propionic acid	79-09-4	---	ND	NA	ND	NA	ND
Pyruvic acid	127-17-3	---	ND	NA	ND	NA	ND
Dissolved Light Hydrocarbons (μg/L)							
Ethane	74-84-0	---	0.180	NA	0.150	NA	0.050
Ethylene	74-85-1	---	0.630	NA	0.640	NA	0.130
Methane	74-82-8	---	5.900	NA	17.000	NA	1.400
Total organic carbon (mg/L)		---	ND	NA	ND	ND	ND
Inorganic Compounds[2]							
Manganese (μg/L)	7439-96-5	300	86.7	NA	**1,600**	NA	27 B
Sodium (μg/L)	7440-23-5	20,000	**91,600**	NA	**74,100**	NA	**24,900**
Chloride (mg/L)	16887-00-6	250	130 J	NA	150 J	NA	39
Nitrate, as N (mg/L)	14797-55-8	10	2.7	NA	ND	NA	5.6
Sulfate (mg/L)	14808-79-8	250	14	NA	44	NA	37
Sulfide (mg/L)	18496-25-8	0.05[5]	ND	NA	ND	NA	ND

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Table 2

Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample ID	CMT-3 (1)	CMT3(1)	CMT-3 (2)	CMT3(2)	CMT-3 (3)
		Screen Interval or Well Depth	39.5'-40'	39.5'-40'	64.5'-65'	64.5'-65'	104.5'-105'
		Sample Date	6/20/2006	2/23/2007	6/20/2006	2/23/2007	6/20/2006
Chemical Name	**CAS**	**Max. Allowable Concentration[1]**					
Volatile Organic Compounds[2] (µg/L)							
1,1-Dichlorethane	75-34-3	5	ND	ND	ND	ND	ND
Acetone	67-64-1	50	ND	ND	6	ND	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	1 J	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	2 J	3 J	ND
Dichloromethane	75-09-2	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	**8**	4 J	**14**	**33**	ND
Trichloroethylene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5[4]	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[4]	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	NA	ND	NA	ND	NA
Acetic acid	64-19-7	---	NA	ND	NA	ND	NA
Hexanoic acid	142-62-1	---	NA	0.30	NA	ND	NA
i-Hexanoic acid	646-07-1	---	NA	ND	NA	ND	NA
i-Pentanoic acid	503-74-2	---	NA	ND	NA	ND	NA
Lactic acid and HIBA	50-21-5	---	NA	0.20	NA	0.18	NA
Pentanoic acid	109-52-4	---	NA	ND	NA	ND	NA
Propionic acid	79-09-4	---	NA	ND	NA	ND	NA
Pyruvic acid	127-17-3	---	NA	ND	NA	ND	NA
Dissolved Light Hydrocarbons (µg/L)							
Ethane	74-84-0	---	NA	0.320	NA	0.280	NA
Ethylene	74-85-1	---	NA	0.069	NA	0.060	NA
Methane	74-82-8	---	NA	5.500	NA	190.000	NA
Total organic carbon (mg/L)		---	NA	ND	NA	ND	NA
Inorganic Compounds[2]							
Manganese (µg/L)	7439-96-5	300	NA	**2,470**	NA	**2,410**	NA
Sodium (µg/L)	7440-23-5	20,000	NA	**74,100**	NA	**47,700**	NA
Chloride (mg/L)	16887-00-6	250	NA	120 J	NA	100 J	NA
Nitrate, as N (mg/L)	14797-55-8	10	NA	4.1	NA	ND	NA
Sulfate (mg/L)	14808-79-8	250	NA	21	NA	32	NA
Sulfide (mg/L)	18496-25-8	0.05[5]	NA	ND	NA	ND	NA

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Table 2

Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample ID	CMT3(3)	CMT-4 (1)	CMT4(1)	CMT-4 (2)	CMT4(2)
		Screen Interval or Well Depth	104.5'-105'	29.5'-30'	29.5'-30'	54.5'-55'	54.5'-55'
		Sample Date	2/23/2007	6/21/2006	2/26/2007	6/21/2006	2/26/2007
Chemical Name	CAS	Max. Allowable Concentration[1]					
Volatile Organic Compounds[2] (µg/L)							
1,1-Dichlorethane	75-34-3	5	ND	ND	ND	ND	ND
Acetone	67-64-1	50	ND	3 J	ND	41	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	**6 J**	ND	ND	ND	ND
Dichloromethane	75-09-2	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	5	ND
Methyl tert-butyl ether	1634-04-4	10[3]	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	**230**	ND	ND	ND	ND
Trichloroethylene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5[4]	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[4]	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	ND	NA	ND	NA	ND
Acetic acid	64-19-7	---	0.09	NA	ND	NA	0.46
Hexanoic acid	142-62-1	---	ND	NA	0.18	NA	ND
i-Hexanoic acid	646-07-1	---	ND	NA	ND	NA	ND
i-Pentanoic acid	503-74-2	---	ND	NA	ND	NA	ND
Lactic acid and HIBA	50-21-5	---	0.22	NA	0.16	NA	0.16
Pentanoic acid	109-52-4	---	ND	NA	ND	NA	ND
Propionic acid	79-09-4	---	ND	NA	ND	NA	ND
Pyruvic acid	127-17-3	---	ND	NA	ND	NA	ND
Dissolved Light Hydrocarbons (µg/L)							
Ethane	74-84-0	---	0.065	NA	0.330	NA	0.710
Ethylene	74-85-1	---	0.064	NA	0.220	NA	0.200
Methane	74-82-8	---	3.400	NA	4.400	NA	160.000
Total organic carbon (mg/L)		---	ND	NA	ND	NA	ND
Inorganic Compounds[2]							
Manganese (µg/L)	7439-96-5	300	3.2 B	NA	**3,340**	NA	**6,170**
Sodium (µg/L)	7440-23-5	20,000	**31,700**	NA	**48,800**	NA	**24,000**
Chloride (mg/L)	16887-00-6	250	43 J	NA	78	NA	14
Nitrate, as N (mg/L)	14797-55-8	10	5.5	NA	0.30	NA	ND
Sulfate (mg/L)	14808-79-8	250	35	NA	38	NA	13
Sulfide (mg/L)	18496-25-8	0.05[5]	ND	NA	ND	NA	ND

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Table 2

Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

Sample ID / Screen Interval or Well Depth / Sample Date			CMT-4 (3) 94.5'-95' 6/21/2006	CMT4(3) 94.5'-95' 2/26/2007	CMT-5 (1) 27.75'-28.25' 6/19/2006	CMT5(1) 27.75'-28.25' 2/23/2007	CMT-5 (2) 52.75'-53.25' 6/19/2006
Chemical Name	**CAS**	**Max. Allowable Concentration(1)**					
Volatile Organic Compounds(2) (µg/L)							
1,1-Dichlorethane	75-34-3	5	ND	ND	ND	ND	ND
Acetone	67-64-1	50	14	ND	ND	ND	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	6
Dichloromethane	75-09-2	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	6	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10(3)	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	ND	ND	ND	ND	110
Trichloroethylene	79-01-6	5	ND	ND	ND	ND	3 J
m,p-Xylene		5(4)	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5(4)	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	NA	ND	NA	ND	NA
Acetic acid	64-19-7	---	NA	ND	NA	ND	NA
Hexanoic acid	142-62-1	---	NA	ND	NA	ND	NA
i-Hexanoic acid	646-07-1	---	NA	ND	NA	ND	NA
i-Pentanoic acid	503-74-2	---	NA	ND	NA	ND	NA
Lactic acid and HIBA	50-21-5	---	NA	0.19	NA	0.27	NA
Pentanoic acid	109-52-4	---	NA	ND	NA	ND	NA
Propionic acid	79-09-4	---	NA	ND	NA	ND	NA
Pyruvic acid	127-17-3	---	NA	ND	NA	ND	NA
Dissolved Light Hydrocarbons (µg/L)							
Ethane	74-84-0	---	NA	1.400	NA	0.092	NA
Ethylene	74-85-1	---	NA	0.170	NA	0.140	NA
Methane	74-82-8	---	NA	250.000	NA	3.400	NA
Total organic carbon (mg/L)		---	NA	ND	NA	ND	NA
Inorganic Compounds(2)							
Manganese (µg/L)	7439-96-5	300	NA	**3,920**	NA	2.4 B	NA
Sodium (µg/L)	7440-23-5	20,000	NA	**28,500**	NA	**21,100**	NA
Chloride (mg/L)	16887-00-6	250	NA	29	NA	40 J	NA
Nitrate, as N (mg/L)	14797-55-8	10	NA	ND	NA	6.3	NA
Sulfate (mg/L)	14808-79-8	250	NA	31	NA	21	NA
Sulfide (mg/L)	18496-25-8	0.05(5)	NA	ND	NA	ND	NA

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Table 2

Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample ID	CMT5(2)	CMT-5 (3)	CMT5(3)	EQ-1	EQ1
		Screen Interval or Well Depth	52.75'-53.25'	82.75'-83.25'	82.75'-83.25'		
		Sample Date	2/23/2007	6/19/2006	2/23/2007	6/16/2006	2/26/2007
Chemical Name	CAS	Max. Allowable Concentration(1)					
Volatile Organic Compounds(2) (μg/L)							
1,1-Dichlorethane	75-34-3	5	ND	ND	ND	ND	ND
Acetone	67-64-1	50	ND	ND	ND	3 J	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	5	8	4 J	ND	ND
Dichloromethane	75-09-2	5	ND	ND	ND	**6 J**	**12**
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10(3)	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	**190**	**320 D**	**160**	ND	ND
Trichloroethylene	79-01-6	5	4 J	5	2 J	ND	ND
m,p-Xylene		5(4)	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5(4)	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	ND	NA	ND	NA	ND
Acetic acid	64-19-7	---	ND	NA	0.59	NA	ND
Hexanoic acid	142-62-1	---	0.15	NA	ND	NA	ND
i-Hexanoic acid	646-07-1	---	ND	NA	ND	NA	ND
i-Pentanoic acid	503-74-2	---	ND	NA	ND	NA	ND
Lactic acid and HIBA	50-21-5	---	0.26	NA	0.22	NA	0.16
Pentanoic acid	109-52-4	---	ND	NA	ND	NA	ND
Propionic acid	79-09-4	---	ND	NA	ND	NA	ND
Pyruvic acid	127-17-3	---	ND	NA	ND	NA	ND
Dissolved Light Hydrocarbons (μg/L)							
Ethane	74-84-0	---	0.071	NA	0.580	NA	ND
Ethylene	74-85-1	---	0.062	NA	0.230	NA	ND
Methane	74-82-8	---	1.400	NA	1.200	NA	0.160
Total organic carbon (mg/L)		---	ND	NA	ND	NA	ND
Inorganic Compounds(2)							
Manganese (μg/L)	7439-96-5	300	**785**	NA	215	NA	ND
Sodium (μg/L)	7440-23-5	20,000	**28,900**	NA	**39,400**	NA	ND
Chloride (mg/L)	16887-00-6	250	52 J	NA	68	NA	ND
Nitrate, as N (mg/L)	14797-55-8	10	4.1	NA	5.0	NA	ND
Sulfate (mg/L)	14808-79-8	250	27	NA	25	NA	ND
Sulfide (mg/L)	18496-25-8	0.05(5)	ND	NA	ND	NA	ND

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Table 2

Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

Sample ID / Screen Interval or Well Depth / Sample Date			ITDGW-1 WD=24.8' 6/19/2006	ITDGW1 WD=24.8' 2/26/2007	ITDGW-26 WD=19.4' 6/15/2006	ITDGW-26 WD=19.4' 2/22/2007	ITMW-1S 55.5'-65.5' 6/15/2006
Chemical Name	**CAS**	**Max. Allowable Concentration[1]**					
Volatile Organic Compounds[2] (µg/L)							
1,1-Dichlorethane	75-34-3	5	ND	ND	ND	ND	ND
Acetone	67-64-1	50	ND	ND	ND	ND	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	**20**
Dichloromethane	75-09-2	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	**8 B**	ND	ND	ND	**2,200 D**
Trichloroethylene	79-01-6	5	ND	ND	ND	ND	**8**
m,p-Xylene		5[4]	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[4]	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	NA	ND	NA	ND	NA
Acetic acid	64-19-7	---	NA	ND	NA	ND	NA
Hexanoic acid	142-62-1	---	NA	ND	NA	ND	NA
i-Hexanoic acid	646-07-1	---	NA	ND	NA	ND	NA
i-Pentanoic acid	503-74-2	---	NA	ND	NA	ND	NA
Lactic acid and HIBA	50-21-5	---	NA	0.24	NA	0.24	NA
Pentanoic acid	109-52-4	---	NA	ND	NA	ND	NA
Propionic acid	79-09-4	---	NA	ND	NA	ND	NA
Pyruvic acid	127-17-3	---	NA	0.09	NA	ND	NA
Dissolved Light Hydrocarbons (µg/L)							
Ethane	74-84-0	---	NA	0.130	NA	0.028	NA
Ethylene	74-85-1	---	NA	0.110	NA	0.120	NA
Methane	74-82-8	---	NA	3.700	NA	2.800	NA
Total organic carbon (mg/L)		---	NA	ND	NA	ND	NA
Inorganic Compounds[2]							
Manganese (µg/L)	7439-96-5	300	NA	**4,020**	NA	148	NA
Sodium (µg/L)	7440-23-5	20,000	NA	15,700	NA	15,400	NA
Chloride (mg/L)	16887-00-6	250	NA	12	NA	16 J	NA
Nitrate, as N (mg/L)	14797-55-8	10	NA	**12**	NA	3.6	NA
Sulfate (mg/L)	14808-79-8	250	NA	28	NA	16	NA
Sulfide (mg/L)	18496-25-8	0.05[5]	NA	0.043	NA	ND	NA

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Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample ID	ITMW1S	ITMW-1D	ITMW1D	ITMW-2S	ITMW2S
		Screen Interval or Well Depth	55.5'-65.5'	95.5'-105.5'	95.5'-105.5'	40.5'-50.5'	40.5'-50.5'
		Sample Date	2/22/2007	6/15/2006	2/22/2007	6/16/2006	2/21/2007
Chemical Name	**CAS**	**Max. Allowable Concentration[1]**					
Volatile Organic Compounds[2] (µg/L)							
1,1-Dichlorethane	75-34-3	5	2 J	ND	ND	ND	ND
Acetone	67-64-1	50	**170**	ND	ND	ND	ND
Benzene	71-43-2	1	1 J	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	**8**	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	1 J
cis-1,2-Dichloroethene	156-59-2	5	**30**	2 J	ND	ND	ND
Dichloromethane	75-09-2	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	**9**	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	ND	ND	ND	ND	ND
Toluene	108-88-3	5	3 J	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	**1,000 D**	**240 D**	**1,600**	**25**	5
Trichloroethylene	79-01-6	5	**7**	2 J	ND	ND	ND
m,p-Xylene		5[4]	4 J	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[4]	4 J	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	ND	NA	ND	NA	ND
Acetic acid	64-19-7	---	ND	NA	ND	NA	ND
Hexanoic acid	142-62-1	---	ND	NA	ND	NA	0.27
i-Hexanoic acid	646-07-1	---	ND	NA	ND	NA	ND
i-Pentanoic acid	503-74-2	---	ND	NA	ND	NA	ND
Lactic acid and HIBA	50-21-5	---	ND	NA	0.23	NA	0.23
Pentanoic acid	109-52-4	---	ND	NA	ND	NA	ND
Propionic acid	79-09-4	---	ND	NA	ND	NA	ND
Pyruvic acid	127-17-3	---	ND	NA	ND	NA	ND
Dissolved Light Hydrocarbons (µg/L)							
Ethane	74-84-0	---	0.250	NA	0.078	NA	0.045
Ethylene	74-85-1	---	1.700	NA	0.510	NA	0.450
Methane	74-82-8	---	40.000	NA	13.000	NA	5.800
Total organic carbon (mg/L)		---	ND	NA	ND	NA	ND
Inorganic Compounds[2]							
Manganese (µg/L)	7439-96-5	300	15.7 B	NA	142	NA	21.4 B
Sodium (µg/L)	7440-23-5	20,000	**43,400**	NA	**62,500**	NA	**64,100**
Chloride (mg/L)	16887-00-6	250	46 J	NA	93 J	NA	96 J
Nitrate, as N (mg/L)	14797-55-8	10	**11**	NA	9.1	NA	6.4
Sulfate (mg/L)	14808-79-8	250	31	NA	22	NA	26
Sulfide (mg/L)	18496-25-8	0.05[5]	ND	NA	ND	NA	ND

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Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

Chemical Name	CAS	Max. Allowable Concentration[1]	ITMW-2D	ITMW2D	ITMW-3S	ITMW3S	ITMW-3D
		Screen Interval or Well Depth	91.5'-101.5'	91.5'-101.5'	55'-65'	55'-65'	80'-90'
		Sample Date	6/16/2006	2/21/2007	6/14/2006	2/21/2007	6/14/2006
Volatile Organic Compounds[2] (μg/L)							
1,1-Dichlorethane	75-34-3	5	2 J	ND	ND	ND	ND
Acetone	67-64-1	50	ND	ND	ND	ND	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	**19**	**18 J**	ND	ND	ND
Dichloromethane	75-09-2	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	2 J	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	**1,000 D**	**1,500**	1 J	2 J	**8**
Trichloroethylene	79-01-6	5	**11**	**10 J**	ND	ND	ND
m,p-Xylene		5[4]	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[4]	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	NA	ND	NA	ND	NA
Acetic acid	64-19-7	---	NA	ND	NA	ND	NA
Hexanoic acid	142-62-1	---	NA	ND	NA	ND	NA
i-Hexanoic acid	646-07-1	---	NA	ND	NA	ND	NA
i-Pentanoic acid	503-74-2	---	NA	ND	NA	ND	NA
Lactic acid and HIBA	50-21-5	---	NA	0.17	NA	0.25	NA
Pentanoic acid	109-52-4	---	NA	ND	NA	ND	NA
Propionic acid	79-09-4	---	NA	ND	NA	ND	NA
Pyruvic acid	127-17-3	---	NA	ND	NA	ND	NA
Dissolved Light Hydrocarbons (μg/L)							
Ethane	74-84-0	---	NA	0.062	NA	0.034	NA
Ethylene	74-85-1	---	NA	0.350	NA	0.290	NA
Methane	74-82-8	---	NA	81.000	NA	3.900	NA
Total organic carbon (mg/L)		---	NA	ND	NA	ND	NA
Inorganic Compounds[2]							
Manganese (μg/L)	7439-96-5	300	NA	**422**	NA	5.6 B	NA
Sodium (μg/L)	7440-23-5	20,000	NA	**28,800**	NA	**22,400**	NA
Chloride (mg/L)	16887-00-6	250	NA	36 J	NA	35 J	NA
Nitrate, as N (mg/L)	14797-55-8	10	NA	0.24	NA	5.4	NA
Sulfate (mg/L)	14808-79-8	250	NA	48	NA	28	NA
Sulfide (mg/L)	18496-25-8	0.05[5]	NA	ND	NA	ND	NA

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Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample ID	ITMW3D	ITMW4S	ITMW4S	ITMW4D	ITMW4D
		Screen Interval or Well Depth	80'-90'	55'-65'	55'-65'	95'-105'	95'-105'
		Sample Date	2/21/2007	6/16/06	2/21/2007	6/16/06	2/21/2007
Chemical Name	**CAS**	**Max. Allowable Concentration(1)**					
Volatile Organic Compounds(2) (μg/L)							
1,1-Dichlorethane	75-34-3	5	ND	ND	ND	ND	ND
Acetone	67-64-1	50	ND	ND	ND	ND	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
Dichloromethane	75-09-2	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10(3)	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	**26**	ND	2 J	ND	1 J
Trichloroethylene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5(4)	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5(4)	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	ND	NA	ND	NA	ND
Acetic acid	64-19-7	---	ND	NA	ND	NA	ND
Hexanoic acid	142-62-1	---	ND	NA	ND	NA	ND
i-Hexanoic acid	646-07-1	---	ND	NA	ND	NA	ND
i-Pentanoic acid	503-74-2	---	ND	NA	ND	NA	ND
Lactic acid and HIBA	50-21-5	---	0.21	NA	0.24	NA	0.19
Pentanoic acid	109-52-4	---	ND	NA	ND	NA	ND
Propionic acid	79-09-4	---	ND	NA	ND	NA	0.08
Pyruvic acid	127-17-3	---	ND	NA	ND	NA	ND
Dissolved Light Hydrocarbons (μg/L)							
Ethane	74-84-0	---	0.030	NA	0.031	NA	0.026
Ethylene	74-85-1	---	0.250	NA	0.230	NA	0.220
Methane	74-82-8	---	3.300	NA	3.100	NA	2.900
Total organic carbon (mg/L)		---	ND	NA	ND	NA	ND
Inorganic Compounds(2)							
Manganese (μg/L)	7439-96-5	300	2.5 B	NA	30.6 B	NA	288
Sodium (μg/L)	7440-23-5	20,000	**30,300**	NA	**33,500**	NA	**26,500**
Chloride (mg/L)	16887-00-6	250	52 J	NA	61 J	NA	42 J
Nitrate, as N (mg/L)	14797-55-8	10	5.6	NA	7.5	NA	4.3
Sulfate (mg/L)	14808-79-8	250	23	NA	33	NA	30
Sulfide (mg/L)	18496-25-8	0.05(5)	ND	NA	ND	NA	ND

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Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

Chemical Name	CAS	Max. Allowable Concentration[1]	PZ-1 WD=19.55' 6/19/2006	PZ-1 WD=19.55' 2/23/2007	PZ2 WD=19.6' 6/15/2006	X1 (PZ-2) WD=19.6' 6/15/2006	PZ2 WD=19.6' 2/22/2007
Volatile Organic Compounds[2] (µg/L)							
1,1-Dichlorethane	75-34-3	5	ND	ND	ND	ND	ND
Acetone	67-64-1	50	ND	ND	ND	ND	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
Dichloromethane	75-09-2	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	**2,200 D**	**3,800**	ND	ND	1 J
Trichloroethylene	79-01-6	5	1 J	ND	ND	ND	ND
m,p-Xylene		5[4]	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[4]	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	NA	ND	NA	NA	ND
Acetic acid	64-19-7	---	NA	ND	NA	NA	ND
Hexanoic acid	142-62-1	---	NA	ND	NA	NA	ND
i-Hexanoic acid	646-07-1	---	NA	ND	NA	NA	ND
i-Pentanoic acid	503-74-2	---	NA	ND	NA	NA	ND
Lactic acid and HIBA	50-21-5	---	NA	0.21	NA	NA	0.24
Pentanoic acid	109-52-4	---	NA	ND	NA	NA	ND
Propionic acid	79-09-4	---	NA	ND	NA	NA	ND
Pyruvic acid	127-17-3	---	NA	ND	NA	NA	ND
Dissolved Light Hydrocarbons (µg/L)							
Ethane	74-84-0	---	NA	ND	NA	NA	0.043
Ethylene	74-85-1	---	NA	0.029	NA	NA	0.310
Methane	74-82-8	---	NA	0.720	NA	NA	7.600
Total organic carbon (mg/L)		---	NA	ND	NA	NA	16.0
Inorganic Compounds[2]							
Manganese (µg/L)	7439-96-5	300	NA	**901**	NA	NA	**8,510**
Sodium (µg/L)	7440-23-5	20,000	NA	17,000	NA	NA	**22,200**
Chloride (mg/L)	16887-00-6	250	NA	23 J	NA	NA	24 J
Nitrate, as N (mg/L)	14797-55-8	10	NA	5.6	NA	NA	2.8
Sulfate (mg/L)	14808-79-8	250	NA	26	NA	NA	26
Sulfide (mg/L)	18496-25-8	0.05[5]	NA	ND	NA	NA	ND

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Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample ID / Screen Interval or Well Depth / Sample Date	X1 (PZ-2) WD=19.6' 2/22/2007	PZ-3 WD=19.6' 6/15/2006	PZ3 WD=19.6' 2/22/2007	TB-1 6/15/2006	TB-1 2/23/2007
Chemical Name	**CAS**	**Max. Allowable Concentration(1)**					
Volatile Organic Compounds(2) (µg/L)							
1,1-Dichlorethane	75-34-3	5	ND	ND	ND	ND	ND
Acetone	67-64-1	50	ND	ND	ND	ND	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	ND
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	3 J	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
Dichloromethane	75-09-2	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10(3)	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	ND	ND	ND	ND	ND
Trichloroethylene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5(4)	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5(4)	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	ND	NA	ND	NA	NA
Acetic acid	64-19-7	---	ND	NA	ND	NA	NA
Hexanoic acid	142-62-1	---	0.11	NA	ND	NA	NA
i-Hexanoic acid	646-07-1	---	ND	NA	ND	NA	NA
i-Pentanoic acid	503-74-2	---	ND	NA	ND	NA	NA
Lactic acid and HIBA	50-21-5	---	0.22	NA	0.20	NA	NA
Pentanoic acid	109-52-4	---	ND	NA	ND	NA	NA
Propionic acid	79-09-4	---	ND	NA	ND	NA	NA
Pyruvic acid	127-17-3	---	ND	NA	ND	NA	NA
Dissolved Light Hydrocarbons (µg/L)							
Ethane	74-84-0	---	0.055	NA	0.031	NA	NA
Ethylene	74-85-1	---	0.150	NA	0.230	NA	NA
Methane	74-82-8	---	3.500	NA	5.800	NA	NA
Total organic carbon (mg/L)		---	ND	NA	ND	NA	NA
Inorganic Compounds(2)							
Manganese (µg/L)	7439-96-5	300	**7,740**	NA	**12,800**	NA	NA
Sodium (µg/L)	7440-23-5	20,000	**22,000**	NA	11,200	NA	NA
Chloride (mg/L)	16887-00-6	250	25 J	NA	9.5 J	NA	NA
Nitrate, as N (mg/L)	14797-55-8	10	3.0	NA	**13**	NA	NA
Sulfate (mg/L)	14808-79-8	250	26	NA	32	NA	NA
Sulfide (mg/L)	18496-25-8	0.05(5)	ND	NA	ND	NA	NA

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Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample ID	TB-2	TB-2	TB-3	TB-3	TB-4
		Screen Interval or Well Depth					
		Sample Date	6/16/2006	2/23/2007	6/19/2006	2/26/2007	6/20/2006
Chemical Name	**CAS**	**Max. Allowable Concentration(1)**					
Volatile Organic Compounds(2) (µg/L)							
1,1-Dichlorethane	75-34-3	5	ND	ND	ND	ND	ND
Acetone	67-64-1	50	ND	ND	ND	ND	ND
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Bromodichloromethane	75-27-4	50	ND	ND	ND	ND	1 J
Chlorobenzene	108-90-7	5	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	4 J	ND	5	ND	2 J
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
Dichloromethane	75-09-2	5	ND	4 J	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Methyl n-butyl ketone	591-78-6	50	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10(3)	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	ND	ND	ND	1 J	ND
Trichloroethylene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5(4)	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5(4)	ND	ND	ND	ND	ND
Volatile Fatty Acids (mg/L)							
Butyric acid	107-92-6	---	NA	NA	NA	NA	NA
Acetic acid	64-19-7	---	NA	NA	NA	NA	NA
Hexanoic acid	142-62-1	---	NA	NA	NA	NA	NA
i-Hexanoic acid	646-07-1	---	NA	NA	NA	NA	NA
i-Pentanoic acid	503-74-2	---	NA	NA	NA	NA	NA
Lactic acid and HIBA	50-21-5	---	NA	NA	NA	NA	NA
Pentanoic acid	109-52-4	---	NA	NA	NA	NA	NA
Propionic acid	79-09-4	---	NA	NA	NA	NA	NA
Pyruvic acid	127-17-3	---	NA	NA	NA	NA	NA
Dissolved Light Hydrocarbons (µg/L)							
Ethane	74-84-0	---	NA	NA	NA	NA	NA
Ethylene	74-85-1	---	NA	NA	NA	NA	NA
Methane	74-82-8	---	NA	NA	NA	NA	NA
Total organic carbon (mg/L)		---	NA	NA	NA	NA	NA
Inorganic Compounds(2)							
Manganese (µg/L)	7439-96-5	300	NA	ND	NA	ND	NA
Sodium (µg/L)	7440-23-5	20,000	NA	ND	NA	ND	NA
Chloride (mg/L)	16887-00-6	250	NA	NA	NA	NA	NA
Nitrate, as N (mg/L)	14797-55-8	10	NA	NA	NA	NA	NA
Sulfate (mg/L)	14808-79-8	250	NA	NA	NA	NA	NA
Sulfide (mg/L)	18496-25-8	0.05(5)	NA	NA	NA	NA	NA

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Table 2

Summary of 2006 and 2007 Ground Water Analytical Results for CMT and Monitoring Wells

Jimmy's Dry Cleaners
Roosevelt, NY

Notes

ND - Not detected
NA - Not analyzed
J - Estimated value
B - Analyte detected in the associated Method Blank
D - Analyte concentration obtained from a diluted analysis
WD - Well depth
(1) Standards or guidance values from Table 1 of NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*, June 1998.
(2) The analytical results for these compounds were validated.
(3) TOGS 1.1.1 April 2000 Addendum.
(4) The TOGS value for m,p-xylene or total xylene is assumed to be equal to the TOGS value for o-xylene, m-xylene, or p-xylene.
(5) Expressed as hydrogen sulfide.

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Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

Chemical Name	CAS	SV-1	SV-2	SV-3	SV-4	SV-4	SV-4A	4A -Amb.
Sample ID[(1)]		SV-1	SV-2	SV-3	SV-4	SV-4	SV-4A	4A -Amb.
Sample Location		Taylor/Nas	32 Taylor	59 Taylor	48 Dutchess	48 Dutchess	48 Dutchess	48 Dutchess
Sample Date		05/09/06	05/09/06	05/09/06	05/09/06	06/13/06	06/28/06	06/28/06
Volatile Organic Compounds[(2)] (μg/m³)								
Acetone	67-64-1	96.1 J	107 J	208 J	423 J	12440	573199 D	<25
Benzene	71-43-2	9.57	8.61	9.57	9204 EDJ	21216	3386	1.0
2-Butanone	78-93-3	17.4	15.3	23.6	31.5	<1180	9273	4.7
Bromomethane	74-83-9	<3.89	<3.89	<3.89	<3.89	<893	<893	<2.2
Carbon disulfide	75-15-0	22.7	21.1	17.7	<3.11	<996.52	<996.52	1.2
Carbon Tetrachloride	56-23-5	<6.30	<6.30	<6.30	<6.30	<944	1277	<2.4
Chlorobenzene	108-90-7	<4.62	<4.62	<4.62	<4.62	<461	<461	<1.2
Chloroethane	75-00-3	<2.66	<2.66	<2.66	<2.66	<290	348	<0.7
Chloroform	67-66-3	<4.87	<4.87	<4.87	<4.87	<488	620	<1.2
Chloromethane	74-87-3	<2.04	<2.04	<2.04	<2.04 J	<372	1276	0.9
Cyclohexane	110-82-7	10.1	<3.35	8.05	6339 EDJ	7087	361650 D	<2.3
Dichlorodifluoromethane	75-71-8	<4.95	<4.95	<4.95	<4.95	—	—	—
1,4-Dichlorobenzene	106-46-7	7.21	<6.01	<6.01	<6.01	<1202	<1202	<3.0
1,1-Dichloroethane	75-34-3	<4.05	<4.05	<4.05	<4.05	<526	<526	<1.3
1,2-Dichloroethane	107-06-2	<4.05	<4.05	<4.05	<4.05	<405	<405	<1.0
1,1-Dichloroethylene	75-35-4	<3.97	<3.97	<3.97	<3.97	<396	<396	<1.0
cis-1,2-Dichloroethylene	156-59-2	<3.97	<3.97	<3.97	<3.97	<436	<436	<1.1
trans-1,2-Dichoroethylene	156-60-5	<3.97	<3.97	<3.97	<3.97	<595	<595	<1.5
1,2-Dichloropropane	78-87-5	<4.62	<4.62	<4.62	<4.62	<462	<462	<1.2
cis-1,3-Dichloropropene	10061-01-5	<4.54	<4.54	<4.54	<4.54	<681	<681	<1.7
trans-1,3-Dichloropropene	10061-02-6	<4.54	<4.54	<4.54	<4.54	<726	<726	<1.8
Ethyl Acetate	141-78-6	28.4	22.3	<3.6	<3.6	<1081	<1081	<2.7
Ethyl Benzene	100-41-4	7.37	7.8	13.4	68.5	<434	4270	<1.1
4-Ethyltoluene	622-96-8	22.1 J	<4.91 J	23.6 J	31.9 J	<983	10024	<2.5
Heptane	142-82-5	17.2	17.2	18	4769 EDJ	6336	5918	<2.6
Hexane	110-54-3	<7.03	<7.03	<7.03	15047 EDJ	24614 J	7849	<2.6
Isopropyl Alcohol	67-63-0	51.5	29.7	28.2	<4.91	<983	93495	<2.5
Methyl butyl Ketone	591-78-6	<8.18	<8.18	<8.18	<8.18	<1229	<1229	<3.1
Methylene Chloride	75-09-2	14.9	11.8	11.8	<6.95	650	56915	<1.0
Methyl tert-butyl Ether	1634-04-4	<3.6	<3.6	<3.6	<3.6	<1082	<1082	<2.7
Propene	115-07-1	<1.72 J	16.8 J	11.3 J	<1.72 J	146944 D	301083 DR	<2.1 R
Styrene	100-42-5	<4.25	<4.25	<4.25	<4.25	<426	8660	<1.1
1,1,2,2-Tetrachloroethane	79-34-5	<6.87	<6.87	<6.87	<6.87	<687	<687	<1.7
Tetrachloroethylene	127-18-4	43.5	37.3	68.6	278	<678	1085	<1.7
Toluene	108-88-3	82	83.9	122	400	531	18469	2.5
1,1,1-Trichloroethane	71-55-6	<5.44	<5.44	<5.44	<5.44	<546	<546	<1.4
1,1,2-Trichloroethane	79-00-5	<5.44	<5.44	<5.44	<5.44	<546	<546	<1.4
Trichloroethylene	79-01-6	5.89	4.82 J	4.29 J	3.21 J	<247	446 J	<0.6
1,2,4-Trimethylbenzene	95-63-6	<4.91 J	<4.91 J	<4.91 J	28.5 J	<983	18947	<2.5
1,3,5-Trimethylbenzene	108-67-8	<4.91	<4.91	<4.91	13.3	<983	6932	<2.5
2,2,4-Trimethylpentane	540-84-1	3139 EJ	4788 EJ	4582 EJ	12581 EDJ	12265	<1028	<2.6
Vinyl Chloride	75-01-4	<2.56	<2.56	<2.56	<2.56	<256	<256	<0.6
m,p-Xylene		23	24.7	41.2	217 J	682	8631	0.7
o-Xylene	95-47-6	8.24	8.67	15.6	65.9	<434	6789	0.5

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Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

Sample ID[1]		SV-5	SV-6	SV-7	SV-8	SV-8	SV-9	SV-9
Sample Location		34 Dutchess	25 Davis	29 Queen	51 Queen	51 Queen	Davis / Nas.	Davis / Nas.
Sample Date		05/09/06	05/09/06	05/09/06	05/09/06	06/13/06	05/09/06	06/13/06
Chemical Name	**CAS**							
Volatile Organic Compounds[2] (µg/m³)								
Acetone	67-64-1	578 EJ	574 EJ	688 EJ	988 EJ	826	465 J	581
Benzene	71-43-2	16.3	12.1	12.8	10.2	18	3.83	14
2-Butanone	78-93-3	23.6	19.4	23.3	19.1	<29	<5.89	<29
Bromomethane	74-83-9	<3.89	<3.89	<3.89	<3.89	<22	<3.89	<22
Carbon disulfide	75-15-0	<3.11	<3.11	<3.11	<3.11	<25	<3.11	<25
Carbon Tetrachloride	56-23-5	<6.30	<6.30	<6.30	<6.30	<24	<6.30	<24
Chlorobenzene	108-90-7	<4.62	<4.62	<4.62	<4.62	<12	<4.62	<12
Chloroethane	75-00-3	<2.66	<2.66	<2.66	<2.66	<7.0	<2.66	<7.0
Chloroform	67-66-3	<4.87	<4.87	<4.87	<4.87	<12	<4.87	<12
Chloromethane	74-87-3	<2.04	<2.04	<2.04	<2.04	<9.0	<2.04	<9.0
Cyclohexane	110-82-7	<3.35	<3.35	<3.35	<3.35	52	<3.35	45
Dichlorodifluoromethane	75-71-8	<4.95	<4.95	<4.95	<4.95	—	<4.95	—
1,4-Dichlorobenzene	106-46-7	<6.01	<6.01	<6.01	<6.01	<30	<6.01	<30
1,1-Dichloroethane	75-34-3	<4.05	<4.05	<4.05	<4.05	<13	<4.05	<13
1,2-Dichloroethane	107-06-2	<4.05	<4.05	<4.05	<4.05	<10	<4.05	<10
1,1-Dichloroethylene	75-35-4	<3.97	<3.97	<3.97	<3.97	<10	<3.97	<10
cis-1,2-Dichloroethylene	156-59-2	<3.97	<3.97	<3.97	<3.97	<11	<3.97	<11
trans-1,2-Dichoroethylene	156-60-5	<3.97	<3.97	<3.97	<3.97	<15	<3.97	<15
1,2-Dichloropropane	78-87-5	<4.62	<4.62	<4.62	<4.62	<12	<4.62	<12
cis-1,3-Dichloropropene	10061-01-5	<4.54	<4.54	<4.54	<4.54	<17	<4.54	<17
trans-1,3-Dichloropropene	10061-02-6	<4.54	<4.54	<4.54	<4.54	<18	<4.54	<18
Ethyl Acetate	141-78-6	43.9	39.2	<3.60	34.9	<27	<3.6	<27
Ethyl Benzene	100-41-4	47.7	39	40.3	26.9	53	4.34	<11
4-Ethyltoluene	622-96-8	30.4 J	28 J	28.5 J	25 J	<25	<4.91 J	<25
Heptane	142-82-5	23.7	18	19.6	16	31	4.5	<26
Hexane	110-54-3	<7.03	<7.03	<7.03	<7.03	246 J	<7.03	661 J
Isopropyl Alcohol	67-63-0	<4.91	<5.6	<4.91	<4.91	<25	<4.91	<25
Methyl butyl Ketone	591-78-6	<8.18	<8.18	<8.18	<8.18	<31	<8.18	<31
Methylene Chloride	75-09-2	<6.95	<6.95	<6.95	<6.95	21	<6.95	28
Methyl tert-butyl Ether	1634-04-4	<3.6	<3.6	<3.6	<3.6	<27	<3.6	<27
Propene	115-07-1	50.8 J	14.8 J	40.2 J	23 J	<26	19.4 J	<26
Styrene	100-42-5	<4.25	<4.25	<4.25	<4.25	<11	<4.25	<11
1,1,2,2-Tetrachloroethane	79-34-5	<6.87	<6.87	<6.87	<6.87	<17	<6.87	<17
Tetrachloroethylene	127-18-4	203	181	185	125	183	28.5	793
Toluene	108-88-3	290	260	257	186	292	39.9	321
1,1,1-Trichloroethane	71-55-6	<5.44	<5.44	<5.44	<5.44	<14	<5.44	<14
1,1,2-Trichloroethane	79-00-5	<5.44	<5.44	<5.44	<5.44	<14	<5.44	<14
Trichloroethylene	79-01-6	<5.36	<5.36	<5.36	<5.36	<6.0	<5.36	<6.0
1,2,4-Trimethylbenzene	95-63-6	25 J	12.3 J	17.2 J	<4.91 J	27	<4.91 J	<25
1,3,5-Trimethylbenzene	108-67-8	11.3	8.34	9.82	5.4	<25	<4.91	<25
2,2,4-Trimethylpentane	540-84-1	6496 EJ	6004 EJ	6428 EJ	5547 EJ	19155 EJ	3042 EJ	13764 EJ
Vinyl Chloride	75-01-4	<2.56	<2.56	<2.56	<2.56	<6.0	<2.56	<6.0
m,p-Xylene		161	135	143	91.5	77	14.7	28
o-Xylene	95-47-6	50.7	42.1	44.7	27.7	53	4.77	24

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Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

	Sample ID[1]	SV-10	SV-11	SV-12	SV-13	SV-14	SV-14	SV-15
	Sample Location	Prince/Nas	9 Dutchess	48 Prince	Mt. Joy/Nas	27 Mt. Joy	27 Mt. Joy	68-Agnes
	Sample Date	05/09/06	05/09/06	05/09/06	05/09/06	05/10/06	06/13/06	05/09/06
Chemical Name	**CAS**							
Volatile Organic Compounds[2] (μg/m³)								
Acetone	67-64-1	1380 EJ	1257 EJ	641 EJ	998 EJ	524 EJ	912	277 J
Benzene	71-43-2	14	11.5	12.8	17.5	13.1	7.5	13.1
2-Butanone	78-93-3	28	24.7	19.4	34.5	22.1	<12	23.6
Bromomethane	74-83-9	<3.89	<3.89	<3.89	<3.89	<3.89	---	<3.89
Carbon disulfide	75-15-0	<3.11	<3.11	<3.11	<3.11	12.4	<10	13.7
Carbon Tetrachloride	56-23-5	<6.30	<6.30	<6.30	<6.30	<6.30	<9.0	<6.30
Chlorobenzene	108-90-7	<4.62	<4.62	<4.62	<4.62	<4.62	<5.0	<4.62
Chloroethane	75-00-3	<2.66	<2.66	<2.66	<2.66	<2.66	<3.0	<2.66
Chloroform	67-66-3	<4.87	<4.87	<4.87	<4.87	<4.87	<5.0	47.2
Chloromethane	74-87-3	<2.04	<2.04	<2.04	<2.04	<2.04	<4.0	<2.04
Cyclohexane	110-82-7	<3.35	<3.35	<3.35	<3.35	10.1	23	11.7
Dichlorodifluoromethane	75-71-8	<4.95	<4.95	<4.95	<4.95	<4.95	---	<4.95
1,4-Dichlorobenzene	106-46-7	<6.01	<6.01	<6.01	<6.01	<6.01	<12	9.62
1,1-Dichloroethane	75-34-3	<4.05	<4.05	<4.05	<4.05	<4.05	<5.0	<4.05
1,2-Dichloroethane	107-06-2	<4.05	<4.05	<4.05	<4.05	<4.05	<4.0	<4.05
1,1-Dichloroethylene	75-35-4	<3.97	<3.97	<3.97	<3.97	<3.97	<4.0	<3.97
cis-1,2-Dichloroethylene	156-59-2	<3.97	<3.97	<3.97	<3.97	<3.97	<4.0	<3.97
trans-1,2-Dichoroethylene	156-60-5	<3.97	<3.97	<3.97	<3.97	<3.97	<6.0	<3.97
1,2-Dichloropropane	78-87-5	<4.62	<4.62	<4.62	<4.62	<4.62	<5.0	<4.62
cis-1,3-Dichloropropene	10061-01-5	<4.54	<4.54	<4.54	<4.54	<4.54	<7.0	<4.54
trans-1,3-Dichloropropene	10061-02-6	<4.54	<4.54	<4.54	<4.54	<4.54	<7.0	<4.54
Ethyl Acetate	141-78-6	60.1	40	45.7	39.2	41.8	<11	33.5
Ethyl Benzene	100-41-4	52.5	39.5	41.2	52.5	13.9	40	10.4
4-Ethyltoluene	622-96-8	30.9 J	27.5 J	28.5 J	29 J	<4.91 J	44	23.1 J
Heptane	142-82-5	22.1	18	<4.09	<4.09	24.5	21	24.5
Hexane	110-54-3	<7.03	<7.03	69.6	35.2	39	88 J	44.3
Isopropyl Alcohol	67-63-0	<4.91	<4.91	<4.91	<4.91	<4.91	<10	50.8
Methyl butyl Ketone	591-78-6	<8.18	<8.18	<8.18	<8.18	<8.18	<12	<8.18
Methylene Chloride	75-09-2	<6.95	<6.95	<6.95	<6.95	7.3	13	9.39
Methyl tert-butyl Ether	1634-04-4	35.6	40.7	18.4	43.2	20.2	<11	18.4
Propene	115-07-1	<1.72 J	19.4 J	15.5 J	16.5 J	9.79 J	<10	<1.72 J
Styrene	100-42-5	<4.25	<4.25	<4.25	<4.25	<4.25	<4.0	<4.25
1,1,2,2-Tetrachloroethane	79-34-5	<6.87	<6.87	<6.87	<6.87	<6.87	<7.0	<6.87
Tetrachloroethylene	127-18-4	240	181	156	209	78.8	68	58.4
Toluene	108-88-3	312	239	286	320	173	279	132
1,1,1-Trichloroethane	71-55-6	<5.44	<5.44	<5.44	<5.44	<5.44	<5.0	<5.44
1,1,2-Trichloroethane	79-00-5	<5.44	<5.44	<5.44	<5.44	<5.44	<5.0	<5.44
Trichloroethylene	79-01-6	<5.36	<5.36	<5.36	<5.36	3.21 J	<2.0	4.82 J
1,2,4-Trimethylbenzene	95-63-6	23.6 J	9.33 J	<4.91 J	<4.91 J	<4.91 J	55	<4.91 J
1,3,5-Trimethylbenzene	108-67-8	11.3	7.85	5.4	5.89	<4.91	21	<4.91
2,2,4-Trimethylpentane	540-84-1	7248 EJ	5772 EJ	10846 EJ	12879 EJ	11055 EJ	18310 EJ	11472 EJ
Vinyl Chloride	75-01-4	<2.56	<2.56	<2.56	<2.56	<2.56	<3.0	<2.56
m,p-Xylene		179	137	137	166	39	66	31.6
o-Xylene	95-47-6	54.6	41.2	32.5	39.9	12.6	60	11.3

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Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

Sample ID[1]		SV-16	SV-17	SV-18	SV-19	SV-20	SV-21	SV-22
Sample Location		46 Agnes	22 Agnes	8 Evans	24 High	Evans/Nas	Craig/Nas	27 Craig
Sample Date		05/09/06	05/09/06	05/09/06	05/09/06	05/09/06	05/09/06	05/10/06
Chemical Name	**CAS**							
Volatile Organic Compounds[2] (µg/m³)								
Acetone	67-64-1	1237 DJ	846 DJ	1005 EJ	1224 EJ	708 DJ	751 EJ	597 EJ
Benzene	71-43-2	16.3	13.7	15	15	24.2	15.3 J	13.1 J
2-Butanone	78-93-3	768 D	104	102	23	118	107	98.1
Bromomethane	74-83-9	<3.89	<3.89	<3.89	<3.89	<3.89	<3.89	<3.89
Carbon disulfide	75-15-0	6.53	<3.11	<3.11	<3.11	<3.11	<3.11	7.77
Carbon Tetrachloride	56-23-5	<6.30	<6.30	<6.30	<6.30	<6.30	<6.30	<6.30
Chlorobenzene	108-90-7	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62
Chloroethane	75-00-3	<2.66	<2.66	<2.66	<2.66	<2.66	<2.66	<2.66
Chloroform	67-66-3	<4.87	<4.87	8.27	<4.87	<4.87	<4.87	<4.87
Chloromethane	74-87-3	<2.04	<2.04	<2.04	<2.04	<2.04	<2.04	<2.04
Cyclohexane	110-82-7	130	20.8	20.8	<3.35	35.2	26.2 J	20.1 J
Dichlorodifluoromethane	75-71-8	<4.95	<4.95	<4.95	<4.95	<4.95	<4.95	<4.95
1,4-Dichlorobenzene	106-46-7	1202 D	<6.01	<6.01	<6.01	420	<6.01	<6.01
1,1-Dichloroethane	75-34-3	<4.05	<4.05	<4.05	<4.05	<4.05	<4.05	<4.05
1,2-Dichloroethane	107-06-2	<4.05	<4.05	<4.05	<4.05	<4.05	<4.05	<4.05
1,1-Dichloroethylene	75-35-4	<3.97	<3.97	<3.97	<3.97	<3.97	<3.97	<3.97
cis-1,2-Dichloroethylene	156-59-2	<3.97	<3.97	<3.97	<3.97	<3.97	<3.97	<3.97
trans-1,2-Dichoroethylene	156-60-5	<3.97	<3.97	<3.97	<3.97	<3.97	<3.97	<3.97
1,2-Dichloropropane	78-87-5	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62
cis-1,3-Dichloropropene	10061-01-5	<4.54	<4.54	<4.54	<4.54	<4.54	<4.54	<4.54
trans-1,3-Dichloropropene	10061-02-6	<4.54	<4.54	<4.54	<4.54	<4.54	<4.54	<4.54
Ethyl Acetate	141-78-6	687	208	112	32	206	108 J	114 J
Ethyl Benzene	100-41-4	46	46	46.4	46.8	44.7	45.1	21.2
4-Ethyltoluene	622-96-8	26.5 J	27 J	27 J	28 J	29 J	28 J	23.6 J
Heptane	142-82-5	<4.09	<4.09	<4.09	<4.09	<4.09	<4.09	<4.09
Hexane	110-54-3	1202 D	411	188	<7.03	420	348 J	205 J
Isopropyl Alcohol	67-63-0	81.2	<4.91	<4.91	<4.91	<4.91	<4.91	<4.91
Methyl butyl Ketone	591-78-6	<8.18	<8.18	<8.18	<8.18	<8.18	<8.18	<8.18
Methylene Chloride	75-09-2	41.4	<6.95	<6.95	<6.95	<6.95	<6.95	8.0
Methyl tert-butyl Ether	1634-04-4	<3.6	21.2	32.4	<3.6	<3.6	<3.6	<3.6
Propene	115-07-1	<1.72 J	18.9 J	29.9 J	16.1 J	544 DJ	20.1 R	14.6 R
Styrene	100-42-5	14.9	<4.25	<4.25	<4.25	<4.25	<4.25	4.68
1,1,2,2-Tetrachloroethane	79-34-5	<6.87	<6.87 J	<6.87	<6.87	<6.87	<6.87	<6.87
Tetrachloroethylene	127-18-4	147	185	199	200	165	185	126
Toluene	108-88-3	1411 D	892 D	382	285	443	452	348
1,1,1-Trichloroethane	71-55-6	<5.44	<5.44	<5.44	<5.44	<5.44	<5.44	<5.44
1,1,2-Trichloroethane	79-00-5	<5.44	<5.44	<5.44	<5.44	<5.44	<5.44	<5.44
Trichloroethylene	79-01-6	35.4	5.89	24.1	<5.36	45.5	18.2	6.97
1,2,4-Trimethylbenzene	95-63-6	<4.91 J	<4.91 J	<4.91 J	<4.91 J	6.87 J	<4.91 J	<4.91 J
1,3,5-Trimethylbenzene	108-67-8	5.89	4.91	<4.91	5.4	6.87	5.89	<4.91
2,2,4-Trimethylpentane	540-84-1	18668 EDJ	14113 EDJ	11685 EJ	12022 EJ	16760 EDBJ	11626 EJ	10001 EJ
Vinyl Chloride	75-01-4	<2.56	<2.56	<2.56	<2.56	<2.56	<2.56	<2.56
m,p-Xylene		122	132	145	153	143	142	56.4
o-Xylene	95-47-6	32.9	33.4	34.7	36.9	36	36.4	16.9

O'BRIEN & GERE

Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

Chemical Name	CAS	Field Dup 1	SV-22	SV-22A	SV-23	SV-24	SV-25	SV-25
	Sample ID[(1)]	Field Dup 1	SV-22	SV-22A	SV-23	SV-24	SV-25	SV-25
	Sample Location	27 Craig	27 Craig	27 Craig	49 Craig	4 Ocean	4 Prospect	4 Prospect
	Sample Date	05/10/06	06/13/06	06/29/06	05/10/06	05/10/06	05/11/06	06/13/06
Volatile Organic Compounds[(2)] (µg/m³)								
Acetone	67-64-1	37.4 J	594	<4.3	445	133	15278 EJ	5326
Benzene	71-43-2	1.53	34	<0.8	11.5 J	4.47 J	1075 D	914
2-Butanone	78-93-3	28.9	<118	<2.9	38.6	<5.89	36.2	<1180
Bromomethane	74-83-9	<1.55	<89	<2.0	<3.89	<3.89	<3.89	<893
Carbon disulfide	75-15-0	<1.24	<100	<2.5	<3.11	<3.11	<3.11	<997
Carbon Tetrachloride	56-23-5	<2.52	<94	<2.4	<6.30	<6.30	<6.30	<944
Chlorobenzene	108-90-7	<1.85	<46	<1.2	<4.62	<4.62	<4.62	<461
Chloroethane	75-00-3	<1.06	<29	<0.7	<2.66	<2.66	<2.66	<290
Chloroform	67-66-3	<1.95	<49	<1.2	<4.87	<4.87	<4.87	<488
Chloromethane	74-87-3	<0.82	<37	<0.9	<2.04	<2.04	<2.04	<372
Cyclohexane	110-82-7	<1.34	<103	<2.6	25.5 J	12.4 J	2811 D	4292
Dichlorodifluoromethane	75-71-8	2.77	—	—	<4.95 J	<4.95 J	<4.95 J	—
1,4-Dichlorobenzene	106-46-7	<2.4	<120	<3.0	<6.01	<6.01	<6.01	<1202
1,1-Dichloroethane	75-34-3	<1.62	<53	<1.3	<4.05	<4.05	<4.05	<526
1,2-Dichloroethane	107-06-2	<1.62	<40	<1.0	<4.05	<4.05	<4.05	<405
1,1-Dichloroethylene	75-35-4	<1.59	<40	<1.0	<3.97	<3.97	<3.97	<396
cis-1,2-Dichloroethylene	156-59-2	<3.97	<44	<1.1	<3.97	<3.97	<3.97	<436
trans-1,2-Dichoroethylene	156-60-5	<3.97	<59	<1.5	<3.97	<3.97	<3.97	<595
1,2-Dichloropropane	78-87-5	<1.85	<46	<1.2	<4.62	<4.62	<4.62	<462
cis-1,3-Dichloropropene	10061-01-5	<1.82	<68	<1.7	<4.54	<4.54	<4.54	<681
trans-1,3-Dichloropropene	10061-02-6	<1.82 J	<73	<1.8	<4.54	<4.54 J	<4.54	<726
Ethyl Acetate	141-78-6	<1.44	<108	<2.7	94.7 J	<3.6	<3.6	<1081
Ethyl Benzene	100-41-4	2.6	<43	<1.1	40.8	8.24	64.2	<434
4-Ethyltoluene	622-96-8	<1.96 J	<98	<2.5	27.5 J	<4.91 J	31.4 J	<983
Heptane	142-82-5	9.49 J	<102	<2.6	<4.09	<4.09	402	<1025
Hexane	110-54-3	161	183 J	<2.6	207 J	109 J	2173 D	2964 J
Isopropyl Alcohol	67-63-0	<1.96	<98	<2.5	<4.91	<4.91	<4.91	<983
Methyl butyl Ketone	591-78-6	<3.27	<123	<3.1	<8.18	<8.18	<8.18	<1229
Methylene Chloride	75-09-2	<4.59 B	69	<0.9	<6.95	<6.95	<6.95	<695
Methyl tert-butyl Ether	1634-04-4	<1.44	<108	<2.7	13	<3.6	<3.6	<1082
Propene	115-07-1	<0.69	<103	<2.6	13.2 R	<1.72	<1.72	69703 D
Styrene	100-42-5	<1.7	<43	<1.1	<4.25	<4.25	<4.25	<426
1,1,2,2-Tetrachloroethane	79-34-5	<2.75	<69	<1.7	<6.87	<6.87	<6.87	<687
Tetrachloroethylene	127-18-4	5.97	<68	<1.7	185	42.8	309	<678
Toluene	108-88-3	291	297	<0.9	404	152	506	904
1,1,1-Trichloroethane	71-55-6	<2.18	<55	<1.4	<5.44	<5.44	<5.44	<546
1,1,2-Trichloroethane	79-00-5	<2.18	<55	<1.4	<5.44	<5.44	<5.44	<546
Trichloroethylene	79-01-6	2.14 J	<25	<0.6	19.3	<5.36	<5.36	<247
1,2,4-Trimethylbenzene	95-63-6	<1.96 J	<98	<2.5	8.83 J	<4.91 J	20.1 J	<983
1,3,5-Trimethylbenzene	108-67-8	<1.96	<98	<2.5	7.36	<4.91	10.3	<983
2,2,4-Trimethylpentane	540-84-1	794 EBJ	26549 EJ	<2.6	4352 EJ	2353 EB	7667 EJ	12401
Vinyl Chloride	75-01-4	<1.02	<26	<0.6	<2.56	<2.56	<2.56	<256
m,p-Xylene		3.64	<43	<1.1	136	26.9	206	<434
o-Xylene	95-47-6	<1.73	<43	<1.1	40.3	7.8	59.4	<434

O'BRIEN & GERE

Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

Sample ID(1) / Sample Location / Sample Date		SV-25A 4 Prospect 06/29/06		25A-Amb 4 Prospect 06/29/06		25A-Amb S 4 Prospect 06/29/06		25A-Amb N 4 Prospect 06/29/06		SV-26 17 Claurome 05/10/06		SV-27 235 Seaman 05/10/06		SV-28 25 Seaman 05/11/06	
Chemical Name	**CAS**														
Volatile Organic Compounds(2) (µg/m³)															
Acetone	67-64-1	24182	D	<30		<41		<30		1088	EJ	938	EJ	783	EJ
Benzene	71-43-2	770		1.1		1.0		1.1		15.6	J	10.8	J	13.7	J
2-Butanone	78-93-3	<12		1.5		1.7		2.7		19.1		18.8		27.7	
Bromomethane	74-83-9	<9.0		<2.2		<2.2		<2.2		<3.89		<3.89		<3.89	
Carbon disulfide	75-15-0	<10		<2.5		<2.5		<2.5		<3.11		<3.11		<3.11	
Carbon Tetrachloride	56-23-5	<9.0		<2.4		<2.4		<2.4		<6.30		<6.30		<6.30	
Chlorobenzene	108-90-7	<5.0		<1.2		<1.2		<1.2		<4.62		<4.62		<4.62	
Chloroethane	75-00-3	<3.0		<0.7		<0.7		<0.7		<2.66		<2.66		<2.66	
Chloroform	67-66-3	<5.0		<1.2		<1.2		<1.2		<4.87		<4.87		<4.87	
Chloromethane	74-87-3	<4.0		1.2		1.1		1.1		<2.04		<2.04		<2.04	
Cyclohexane	110-82-7	26873	D	<2.5		<1.4		<1.5		<3.35	J	11.1	J	17.8	J
Dichlorodifluoromethane	75-71-8	—		—		—		—		<4.95	J	<4.95	J	<4.95	J
1,4-Dichlorobenzene	106-46-7	<12		<3.0		<3.0		<3.0		<6.01		<6.01		<6.01	
1,1-Dichloroethane	75-34-3	<5.0		<1.3		<1.3		<1.3		<4.05		<4.05		<4.05	
1,2-Dichloroethane	107-06-2	<4.0		<1.0		<1.0		<1.0		<4.05		<4.05		<4.05	
1,1-Dichloroethylene	75-35-4	<4.0		<1.0		<1.0		<1.0		<3.97		<3.97		<3.97	
cis-1,2-Dichloroethylene	156-59-2	<4.0		<1.1		<1.1		<1.1		<3.97		<3.97		<3.97	
trans-1,2-Dichoroethylene	156-60-5	<6.0		<1.5		<1.5		<1.5		<3.97		<3.97		<3.97	
1,2-Dichloropropane	78-87-5	<5.0		<1.2		<1.2		<1.2		<4.62		<4.62		<4.62	
cis-1,3-Dichloropropene	10061-01-5	<7.0		<1.7		<1.7		<1.7		<4.54		<4.54		<4.54	
trans-1,3-Dichloropropene	10061-02-6	<7.0		<1.8		<1.8		<1.8		<4.54		<4.54	J	<4.54	J
Ethyl Acetate	141-78-6	<11		<2.7		<2.7		<2.7		23.8	J	49.7	J	112	J
Ethyl Benzene	100-41-4	48		0.55		<1.1		0.5		12.6		32.9		39	
4-Ethyltoluene	622-96-8	<10		<2.5		<2.5		<2.5		<4.91	J	26.5	J	27.5	J
Heptane	142-82-5	412		<2.6		<2.6		<2.6		<4.09		18		24.1	
Hexane	110-54-3	2275		<2.6		<2.6		<2.6		<7.03	J	64.7	J	151	J
Isopropyl Alcohol	67-63-0	<10		<2.5		<2.5		<2.5		<4.91		<4.91		<4.91	
Methyl butyl Ketone	591-78-6	<12		<3.1		<3.1		<3.1		<8.18		<8.18		<8.18	
Methylene Chloride	75-09-2	39		<1.0		<1.0		1.0		<6.95		<6.95		<15.3	B
Methyl tert-butyl Ether	1634-04-4	<11		<2.7		<2.7		<2.7		29.2		<3.6		14.8	
Propene	115-07-1	198903	DR	<2.4	R	<1.9	R	<2.2	R	<1.72		<1.72		<1.72	
Styrene	100-42-5	<4.0		<1.1		<1.1		<1.1		<4.25		<4.25		<4.25	
1,1,2,2-Tetrachloroethane	79-34-5	<7.0		<1.7		<1.7		<1.7		<6.87		<6.87		<6.87	
Tetrachloroethylene	127-18-4	<7.0		<1.7		<1.7		<1.7		119		161		184	
Toluene	108-88-3	1408		3.7		1.9		2.9		156		283		355	
1,1,1-Trichloroethane	71-55-6	<5.0		<1.4		<1.4		<1.4		<5.44		<5.44		<5.44	
1,1,2-Trichloroethane	79-00-5	<5.0		<1.4		<1.4		<1.4		<5.44		<5.44		<5.44	
Trichloroethylene	79-01-6	<2.0		<0.6		<0.6		<0.6		<5.36		15		11.3	
1,2,4-Trimethylbenzene	95-63-6	235		<2.5		<2.5		<2.5		<4.91	J	<4.91	J	7.85	J
1,3,5-Trimethylbenzene	108-67-8	192		<2.5		<2.5		<2.5		<4.91		5.4		7.36	
2,2,4-Trimethylpentane	540-84-1	732		<1.1		<2.6		<2.6		4657	EJ	4897	EBJ	5887	EBJ
Vinyl Chloride	75-01-4	<3.0		<0.6		<0.6		<0.6		<2.56		<2.56		<2.56	
m,p-Xylene		179		0.65		<1.1		0.56		25.1		110		131	
o-Xylene	95-47-6	156		0.53		<1.1		0.43		5.64		32.5		40.3	

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Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

Sample ID[1]		SV-28		SV-29		SV-30		SV-30		SV-31		Field Dup 2		SV-32	
Sample Location		25 Seaman		11 Seaman		27 W.Lincoln		27 W.Lincoln		212 N Ocean		212 N.Ocean		215 N.Ocean	
Sample Date		06/13/06		05/10/06		05/11/06		06/13/06		05/10/06		05/10/06		05/10/06	
Chemical Name	**CAS**														
Volatile Organic Compounds[2] (µg/m³)															
Acetone	67-64-1	933		456		334		709		597	EJ	585	EJ	949	EJ
Benzene	71-43-2	6.5		12.8	J	12.4	B	10		8.93	J	7.66	J	12.1	J
2-Butanone	78-93-3	<12		15.6		15.6		<12		17.1		15.3		19.7	
Bromomethane	74-83-9	<9.0		<3.89		<3.89		<9.0		<3.89		<3.89		<3.89	
Carbon disulfide	75-15-0	<10		<3.11		<3.11		45		<3.11		<3.11		<3.11	
Carbon Tetrachloride	56-23-5	<9.0		<6.30		<6.30		<9.0		<6.30		<6.30		<6.30	
Chlorobenzene	108-90-7	<5.0		<4.62		<4.62		<5.0		<4.62		<4.62		<4.62	
Chloroethane	75-00-3	<3.0		<2.66		<2.66		<3.0		<2.66		<2.66		<2.66	
Chloroform	67-66-3	<5.0		<4.87		15.8		<5.0		<4.87		<4.87		<4.87	
Chloromethane	74-87-3	<4.0		<2.04		<2.04		<4.0		<2.04		<2.04		<2.04	
Cyclohexane	110-82-7	18		31.2	J	13.1	J	33		<3.35	J	<3.35	J	43.6	J
Dichlorodifluoromethane	75-71-8	—		<4.95	J	<4.95	J	—		<4.95	J	<4.95	J	<4.95	J
1,4-Dichlorobenzene	106-46-7	<12		<6.01		<6.01		<12		<6.01		<6.01		<6.01	
1,1-Dichloroethane	75-34-3	<5.0		<4.05		<4.05		<5.0		<4.05		<4.05		<4.05	
1,2-Dichloroethane	107-06-2	<4.0		<4.05		<4.05		<4.0		<4.05		<4.05		<4.05	
1,1-Dichloroethylene	75-35-4	<4.0		<3.97		<3.97		<4.0		<3.97		<3.97		<3.97	
cis-1,2-Dichloroethylene	156-59-2	<4.0		<3.97		<3.97		<4.0		<3.97		<3.97		<3.97	
trans-1,2-Dichoroethylene	156-60-5	<6.0		<3.97		<3.97		<6.0		<3.97		<3.97		<3.97	
1,2-Dichloropropane	78-87-5	<5.0		<4.62		<4.62		<5.0		<4.62		<4.62		<4.62	
cis-1,3-Dichloropropene	10061-01-5	<7.0		<4.54		<4.54		<7.0		<4.54		<4.54		<4.54	
trans-1,3-Dichloropropene	10061-02-6	<7.0		<4.54	J	<4.54	J	<7.0		<4.54	J	<4.54	J	<4.54	J
Ethyl Acetate	141-78-6	<11		<3.6		158		<11		88.2	J	96.1	J	260	J
Ethyl Benzene	100-41-4	16		42.9		39		85		32.9		29		38.2	
4-Ethyltoluene	622-96-8	13		29	J	28.5	J	34		25.5	J	25.5	J	27.5	J
Heptane	142-82-5	13		24.5		19.6		23		13.9		11.5		23.7	
Hexane	110-54-3	75	J	233	J	96	J	144	J	35.2	J	<7.03	J	539	J
Isopropyl Alcohol	67-63-0	<10		<4.91		<4.91		<10		<4.91		<4.91		<4.91	
Methyl butyl Ketone	591-78-6	<12		<8.18		<8.18		<12		<8.18		<8.18		<8.18	
Methylene Chloride	75-09-2	13		<7.65	B	<6.95		12		<6.95		<6.95		<6.95	
Methyl tert-butyl Ether	1634-04-4	<11		<3.6		19.8		<11		<3.6		<3.6		<3.6	
Propene	115-07-1	15		<1.72		<1.72		<10		<1.72		<1.72		<1.72	
Styrene	100-42-5	<4.0		<4.25		<4.25		<4.0		<4.25		<4.25		<4.25	
1,1,2,2-Tetrachloroethane	79-34-5	<7.0		<6.87		<6.87		<7.0		<6.87		<6.87		<6.87	
Tetrachloroethylene	127-18-4	50		295		185		143		155		136		189	
Toluene	108-88-3	277		413		276		337		238		194		314	
1,1,1-Trichloroethane	71-55-6	<5		<5.44		15.8		16		<5.44		<5.44		<5.44	
1,1,2-Trichloroethane	79-00-5	<5.0		<5.44		<5.44		<5.0		<5.44		<5.44		<5.44	
Trichloroethylene	79-01-6	<2.0		<5.36		53		<2.0		4.29	J	6.97		17.1	
1,2,4-Trimethylbenzene	95-63-6	23		14.2	J	13.3	J	33		<4.91	J	<4.91	J	5.89	J
1,3,5-Trimethylbenzene	108-67-8	<10		9.33		8.34		13		5.89		5.4		6.87	
2,2,4-Trimethylpentane	540-84-1	10277	EJ	5450	EBJ	4856	EBJ	11096	EJ	3593	EBJ	3524	EBJ	5206	EBJ
Vinyl Chloride	75-01-4	<3.0		<2.56		<2.56		<3.0		<2.56		<2.56		<2.56	
m,p-Xylene		25		142		135		122		114		101		130	
o-Xylene	95-47-6	23		43.8		40.8		75		32.9		30.3		37.7	

O'BRIEN & GERE

Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

	Sample ID[1]	SV-33	SV-34	SV-35	SV-36	SV-37	SV-38	SV-39
	Sample Location	205 N.Ocean	Jimmy's	Nassau	Pleasant/Nas	Davis/Nas	Forest/Nas	15 Woodside
	Sample Date	05/10/06	05/10/06	05/10/06	05/10/06	05/10/06	05/10/06	05/10/06
Chemical Name	**CAS**							
Volatile Organic Compounds[2] (µg/m³)								
Acetone	67-64-1	692 EJ	818 DJ	383 J	450 J	664 EJ	767 EJ	978 EJ
Benzene	71-43-2	13.1	13.7	11.2	12.8	15	14.4	15.3
2-Butanone	78-93-3	18.8	20	13	19.7	20	24.4	27.1
Bromomethane	74-83-9	<3.89	<3.89	<3.89	<3.89	<3.89	<3.89	<3.89
Carbon disulfide	75-15-0	<3.11	<3.11	<3.11	<3.11	<3.11	<3.11	<3.11
Carbon Tetrachloride	56-23-5	<6.30	<6.30	<6.30	<6.30	<6.30	<6.30	<6.30
Chlorobenzene	108-90-7	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62
Chloroethane	75-00-3	<2.66	<2.66	<2.66	<2.66	<2.66	<2.66	<2.66
Chloroform	67-66-3	<4.87	<4.87	8.76	<4.87	<4.87	<4.87	<4.87
Chloromethane	74-87-3	<2.04	<2.04	<2.04	<2.04	<2.04	<2.04	<2.04
Cyclohexane	110-82-7	29.5	14.1	13.1	<3.35	<3.35	<3.35	<3.35
Dichlorodifluoromethane	75-71-8	<4.95	<4.95	<4.95	<4.95	<4.95	<4.95	<4.95
1,4-Dichlorobenzene	106-46-7	<6.01	<6.01	<6.01	<6.01	<6.01	<6.01	<6.01
1,1-Dichloroethane	75-34-3	<4.05	<4.05	<4.05	<4.05	<4.05	<4.05	<4.05
1,2-Dichloroethane	107-06-2	<4.05	<4.05	<4.05	<4.05	<4.05	<4.05	<4.05
1,1-Dichloroethylene	75-35-4	<3.97	<3.97	<3.97	<3.97	<3.97	<3.97	<3.97
cis-1,2-Dichloroethylene	156-59-2	<3.97	182	<3.97	<3.97	<3.97	<3.97	<3.97
trans-1,2-Dichoroethylene	156-60-5	<3.97	7.14	<3.97	<3.97	<3.97	<3.97	<3.97
1,2-Dichloropropane	78-87-5	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62	<4.62
cis-1,3-Dichloropropene	10061-01-5	<4.54	<4.54	<4.54	<4.54	<4.54	<4.54	<4.54
trans-1,3-Dichloropropene	10061-02-6	<4.54 J	<4.54 J	<4.54 J	<4.54 J	<4.54 J	<4.54 J	<4.54 J
Ethyl Acetate	141-78-6	194	138	90	44.6	77	68	75.6
Ethyl Benzene	100-41-4	45.1	40.8	42.9	37.7	45.1	42.1	48.1
4-Ethyltoluene	622-96-8	28 J	26.5 J	28 J	26 J	27.5 J	26 J	27.5 J
Heptane	142-82-5	22.5	22.5	17.2	19.2	21.7	26.2	24.9
Hexane	110-54-3	309	130	96.7	<7.03	<7.03	75.6	<7.03
Isopropyl Alcohol	67-63-0	<4.91	<4.91	<4.91	<4.91	<4.91	<4.91	<4.91
Methyl butyl Ketone	591-78-6	<8.18	<8.18	<8.18	<8.18	<8.18	<8.18	<8.18
Methylene Chloride	75-09-2	<6.95	<6.95	<6.95	<9.63 B	<6.95	<6.95	<6.95
Methyl tert-butyl Ether	1634-04-4	<3.6	<3.6	<3.6	<3.6	12.2	10.1	<3.6
Propene	115-07-1	<1.72	<1.72	<1.72	<1.72	<1.72	<1.72	<1.72
Styrene	100-42-5	<4.25	<4.25	<4.25	<4.25	<4.25	<4.25	<4.25
1,1,2,2-Tetrachloroethane	79-34-5	<6.87	<6.87	<6.87	<6.87	<6.87	<6.87	<6.87
Tetrachloroethylene	127-18-4	209	1894 D	443	241	226	205	233
Toluene	108-88-3	405	294	279	247	281	286	306
1,1,1-Trichloroethane	71-55-6	<5.44	<5.44	<5.44	<5.44	<5.44	<5.44	<5.44
1,1,2-Trichloroethane	79-00-5	<5.44	<5.44	<5.44	<5.44	<5.44	<5.44	<5.44
Trichloroethylene	79-01-6	18.8	164	13.4	20.4	25.2	<5.36	<5.36
1,2,4-Trimethylbenzene	95-63-6	7.85 J	<4.91 J	7.36 J	<4.91 J	<4.91 J	<4.91 J	<4.91 J
1,3,5-Trimethylbenzene	108-67-8	7.36	5.4	7.36	<4.91	6.38	5.4	6.38
2,2,4-Trimethylpentane	540-84-1	4803 EBJ	6232 EDJ	3991 EBJ	5487 EBJ	5652 EBJ	6082 EBJ	6495 EBJ
Vinyl Chloride	75-01-4	<2.56	<2.56	<2.56	<2.56	<2.56	<2.56	<2.56
m,p-Xylene		150	133	147	126	148	131	156
o-Xylene	95-47-6	42.5	37.7	42.5	35.6	41.2	36.4	43.4

O'BRIEN & GERE

Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

Chemical Name	Sample ID[1] Sample Location Sample Date CAS	SV-40 Col. /Nas. 05/12/06	SV-40 Col. /Nas. 06/13/06	SV-40A Col. /Nas. 06/29/06	Trip Blank 06/29/06	SV-41 69 Pleasant 08/21/06	SV-42 39 Pleasant 08/21/06	SV-43 Davis/Ellison 08/21/06
Volatile Organic Compounds[2] (μg/m³)								
Acetone	67-64-1	908 EJ	954	3065	36	1050 D	631 D	563 D
Benzene	71-43-2	15.3	6.5	<32	<0.8	37 D	6.3 D	5.7 D
2-Butanone	78-93-3	32.1	<12	<118	<2.9	72 D	60 D	23 D
Bromomethane	74-83-9	<3.89	<9.0	<89	<2.2	7.5 D	<4.9	<5.7
Carbon disulfide	75-15-0	<3.11	<10	<100	<2.5	109 D	4.2 D	7.3 D
Carbon Tetrachloride	56-23-5	<6.30	<9.0	<94	<2.4	214 D	<8.0	<9.2
Chlorobenzene	108-90-7	<4.62	<5.0	<46	<1.2	7.1 D	<5.9	<6.7
Chloroethane	75-00-3	<2.66	<3.0	<29	<0.7	<33	<3.4	<3.8
Chloroform	67-66-3	<4.87	<5.0	<49	<1.2	205 D	<6.2	<7.1
Chloromethane	74-87-3	<2.04	<4.0	<37	<0.9	6.1 D	<2.6	<3.0
Cyclohexane	110-82-7	<3.35	<10	2516	16	<43	331 D	<5.0
Dichlorodifluoromethane	75-71-8	<4.95	---	---	---	---	---	---
1,4-Dichlorobenzene	106-46-7	<6.01	<12	<120	<3.0	<75	<7.6	<8.8
1,1-Dichloroethane	75-34-3	<4.05	<5.0	<53	<1.3	<51	<5.1	<5.9
1,2-Dichloroethane	107-06-2	<4.05	<4.0	<40	<1.0	81 D	<5.1	<5.9
1,1-Dichloroethylene	75-35-4	<3.97	<4.0	<40	<1.0	<50	<5.0	<5.8
cis-1,2-Dichloroethylene	156-59-2	<3.97	<4.0	<44	<1.1	72 D	<5.0	<5.8
trans-1,2-Dichoroethylene	156-60-5	<3.97	<6.0	<59	<1.5	120 D	<5.0	<5.8
1,2-Dichloropropane	78-87-5	<4.62	<5.0	<46	<1.2	231 D	<5.9	<6.7
cis-1,3-Dichloropropene	10061-01-5	<4.54	<7.0	<68	<1.7	175 D	<5.8	<6.6
trans-1,3-Dichloropropene	10061-02-6	<4.54 J	<7.0	<73	<1.8	157 D	<5.8	<6.6
Ethyl Acetate	141-78-6	62.3	<11	<108	<2.7	24 D	19 D	<5.2
Ethyl Benzene	100-41-4	50.7	16	<43	<1.1	48 D	<5.5	<6.3
4-Ethyltoluene	622-96-8	29.4 J	11	<98	<2.5	21 D	<6.2	<7.2
Heptane	142-82-5	30.7	19	<102	<2.6	26 D	<5.2	7.0 D
Hexane	110-54-3	<7.03	62 J	<106	<2.6	30 D	21 D	15 D
Isopropyl Alcohol	67-63-0	<4.91	<10	<98	<2.5	23 D	6.5 D	<3.6
Methyl butyl Ketone	591-78-6	<8.18	<12	<123	<3.1	<51	<5.2	<6.0
Methylene Chloride	75-09-2	<6.95	11	131	1.4	238 D	7.2 D	<5.1
Methyl tert-butyl Ether	1634-04-4	<3.6	<11	<108	<2.7	114 D	<4.6	<5.3
Propene	115-07-1	<1.72	<10	383 R	3.2 R	178 D	107 D	188 D
Styrene	100-42-5	<4.25	<4.0	<43	<1.1	13 D	<5.4	<6.2
1,1,2,2-Tetrachloroethane	79-34-5	<6.87	<7.0	<69	<1.7	6480 D	<8.7	<10
Tetrachloroethylene	127-18-4	1062	4217 EJ	13549	<1.7	34 D	109 D	21 D
Toluene	108-88-3	346	200	<38	<0.9	281 D	16 D	11 D
1,1,1-Trichloroethane	71-55-6	<5.44	<5	<55	<1.4	142 D	<6.9	<7.9
1,1,2-Trichloroethane	79-00-5	<5.44	<5.0	<55	<1.4	445 D	<6.9	<7.9
Trichloroethylene	79-01-6	20.4	<2.0	<25	<0.6	113 D	<6.8	<7.8
1,2,4-Trimethylbenzene	95-63-6	13.3 J	20	<98	<2.5	104 D	7.4 D	<7.2
1,3,5-Trimethylbenzene	108-67-8	8.83	<10	<98	<2.5	29 D	<6.2	<7.2
2,2,4-Trimethylpentane	540-84-1	6877 EBJ	11307 EJ	<103	1.3	8.9 D	<5.9	<6.8
Vinyl Chloride	75-01-4	<2.56	<3.0	<26	<0.6	44 D	<3.3	<3.7
m,p-Xylene		167	24	<43	<1.1	87 D	5.9 D	<6.3
o-Xylene	95-47-6	49	20	<43	<1.1	64 D	<5.5	<6.3

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Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

Sample ID[1] / Sample Location / Sample Date		SV-44 41 Davis 08/21/06		SV-45 Holloway/Ellison 08/21/06		SV-46 45 Holloway 08/22/06		SV-47 63 Woodside 08/22/06		SV-48 19 Forest 08/22/06		SV-49 63 Woodside 08/22/06	
Chemical Name	**CAS**												
Volatile Organic Compounds[2] (μg/m³)													
Acetone	67-64-1	1560	D	182	D	288	D	25100	D	257	D	120	D
Benzene	71-43-2	4.1	D	7.9	D	<3.5		2110	D	<4.5		<2.9	
2-Butanone	78-93-3	23	D	37	D	52	D	<147		14	D	6.4	D
Bromomethane	74-83-9	<4.9		<5.1		<4.2		<194		<5.5		<3.5	
Carbon disulfide	75-15-0	8.7	D	7.1	D	<3.4		<156		<4.4		3.0	D
Carbon Tetrachloride	56-23-5	<8.0		<8.3		<6.8		<315		<8.8		<5.7	
Chlorobenzene	108-90-7	<5.8		<6.1		<5.0		<230		<6.5		<4.1	
Chloroethane	75-00-3	<3.3		<3.5		<2.9		<132		<3.7		<2.4	
Chloroform	67-66-3	<6.2		<6.4		<5.3		<244		<6.9		4.9	D
Chloromethane	74-87-3	<2.6		<2.7		<2.2		<103		<2.9		<1.9	
Cyclohexane	110-82-7	<4.4		<4.5		42	D	7990	D	<4.8		5.4	D
Dichlorodifluoromethane	75-71-8	---		---		---		---		---		---	
1,4-Dichlorobenzene	106-46-7	<7.6		<7.9		<6.5		<301		<8.5		<5.4	
1,1-Dichloroethane	75-34-3	<5.1		<5.3		<4.4		<202		<5.7		<3.6	
1,2-Dichloroethane	107-06-2	<5.1		<5.3		<4.4		<202		<5.7		<3.6	
1,1-Dichloroethylene	75-35-4	<5.0		<5.2		<4.3		<198		<5.6		<3.6	
cis-1,2-Dichloroethylene	156-59-2	<5.0		<5.2		<4.3		<198		<5.6		<3.6	
trans-1,2-Dichoroethylene	156-60-5	<5.0		<5.2		<4.3		<198		<5.6		<3.6	
1,2-Dichloropropane	78-87-5	<5.9		<6.1		<5.0		<231		<6.5		<4.2	
cis-1,3-Dichloropropene	10061-01-5	<5.7		<6.0		<4.9		<227		<6.4		<4.1	
trans-1,3-Dichloropropene	10061-02-6	<5.7		<6.0		<4.9		<227		<6.4		<4.1	
Ethyl Acetate	141-78-6	5.4	D	8.3	D	6.7	D	<180		7.4	D	<3.2	
Ethyl Benzene	100-41-4	<5.5		<5.7		<4.7		<217		<6.1		<3.9	
4-Ethyltoluene	622-96-8	<6.2		<6.5		<5.3		<246		<6.9		<4.4	
Heptane	142-82-5	13	D	7.5	D	7.5	D	5700	D	14	D	<3.7	
Hexane	110-54-3	6.0	D	20	D	13	D	8110	D	<5.0		<3.2	
Isopropyl Alcohol	67-63-0	<3.1		9.2	D	4.9	D	<123		<3.5		<2.2	
Methyl butyl Ketone	591-78-6	<5.2		<5.4		<4.4		<205		<5.8		<3.7	
Methylene Chloride	75-09-2	<4.4		<4.6		<3.8		<174		<4.9		<3.1	
Methyl tert-butyl Ether	1634-04-4	<4.6		<4.7		<3.9		<180		<5.1		<3.2	
Propene	115-07-1	44	D	235	D	28	D	50800	D	<2.4		<1.6	
Styrene	100-42-5	<5.4		<5.6		<4.6		<213		<6.0		<3.8	
1,1,2,2-Tetrachloroethane	79-34-5	<8.7		<9.0		<7.5		<343		<9.7		<6.2	
Tetrachloroethylene	127-18-4	198	D	10	D	163	D	<339		<9.5		7.0	D
Toluene	108-88-3	7.9	D	83	D	5.9	D	<188		6.1	D	3.6	D
1,1,1-Trichloroethane	71-55-6	<6.9		<7.2		<5.9		<273		<7.7		<4.9	
1,1,2-Trichloroethane	79-00-5	<6.9		<7.2		<5.9		<273		<7.7		<4.9	
Trichloroethylene	79-01-6	<6.8		<7.1		<5.8		<269		<7.6		<4.8	
1,2,4-Trimethylbenzene	95-63-6	<6.2		<6.5		<5.3		<246		<6.9		<4.4	
1,3,5-Trimethylbenzene	108-67-8	<6.2		<6.5		<5.3		<246		<6.9		<4.4	
2,2,4-Trimethylpentane	540-84-1	<5.9		<6.1		<5.1		243	D	<6.6		<4.2	
Vinyl Chloride	75-01-4	<3.2		<3.4		<2.8		<128		<3.6		<2.3	
m,p-Xylene		<5.5		<5.7		<4.7		<217		<6.1		<3.9	
o-Xylene	95-47-6	<5.5		<5.7		<4.7		<217		<6.1		<3.9	

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Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

	Sample ID[1]	SV-50	SV-51	Field Dup 7	SV-52	SV-53	SV-54
	Sample Location	Woodside/Charlick	65 Colonial	65 Colonial	29 Colonial	55 Stevens	38 Stevens
	Sample Date	08/22/06	08/23/06	08/23/06	08/23/06	08/23/06	08/23/06
Chemical Name	**CAS**						
Volatile Organic Compounds[2] (µg/m³)							
Acetone	67-64-1	145 D	32 D	<3.0	62 D	36 D	239 D
Benzene	71-43-2	<3.8	<4.0	<4.0	<4.0	<4.0	<4.0
2-Butanone	78-93-3	10 D	<3.7	<3.7	<3.7	<3.7	<3.7
Bromomethane	74-83-9	<4.6	<4.9	<4.9	<4.9	<4.9	<4.9
Carbon disulfide	75-15-0	3.9 D	<3.9	<3.9	<3.9	<3.9	<3.9
Carbon Tetrachloride	56-23-5	<7.4	<7.9	<7.9	<7.9	<7.9	<7.9
Chlorobenzene	108-90-7	<5.4	<5.8	<5.8	<5.8	<5.8	<5.8
Chloroethane	75-00-3	<3.1	<3.3	<3.3	<3.3	<3.3	<3.3
Chloroform	67-66-3	<5.8	<6.1	<6.1	<6.1	<6.1	<6.1
Chloromethane	74-87-3	<2.4	<2.6	<2.6	<2.6	<2.6	<2.6
Cyclohexane	110-82-7	13 D	<4.3	<4.3	<4.3	<4.3	<4.3
Dichlorodifluoromethane	75-71-8	---	---	---	---	---	---
1,4-Dichlorobenzene	106-46-7	<7.1	<7.5	<7.5	<7.5	<7.5	<7.5
1,1-Dichloroethane	75-34-3	<4.8	<5.1	<5.1	<5.1	<5.1	<5.1
1,2-Dichloroethane	107-06-2	<4.8	<5.1	<5.1	<5.1	<5.1	<5.1
1,1-Dichloroethylene	75-35-4	<4.7	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethylene	156-59-2	<4.7	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichoroethylene	156-60-5	<4.7	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	78-87-5	<5.5	<5.8	<5.8	<5.8	<5.8	<5.8
cis-1,3-Dichloropropene	10061-01-5	<5.4	<5.7	<5.7	<5.7	<5.7	<5.7
trans-1,3-Dichloropropene	10061-02-6	<5.4	<5.7	<5.7	<5.7	<5.7	<5.7
Ethyl Acetate	141-78-6	7.1 D	<4.5	<4.5	<4.5	<4.5	<4.5
Ethyl Benzene	100-41-4	<5.1	<5.4	<5.4	<5.4	<5.4	<5.4
4-Ethyltoluene	622-96-8	<5.8	<6.2	<6.2	<6.2	<6.2	<6.2
Heptane	142-82-5	8.8 D	<5.1	<5.1	<5.1	<5.1	<5.1
Hexane	110-54-3	<4.2	<4.4	<4.4	<4.4	<4.4	<4.4
Isopropyl Alcohol	67-63-0	3.2 D	<3.1	<3.1	<3.1	<3.1	<3.1
Methyl butyl Ketone	591-78-6	<4.8	<5.1	<5.1	<5.1	<5.1	<5.1
Methylene Chloride	75-09-2	5.3 D	20 D	<4.3	4.7 D	5.0 D	<4.3
Methyl tert-butyl Ether	1634-04-4	<4.3	<4.5	<4.5	<4.5	<4.5	<4.5
Propene	115-07-1	7.7 D	<2.2	<2.2	<2.0	<2.2	<2.2
Styrene	100-42-5	<5.0	<5.3	<5.3	<5.3	<5.3	<5.3
1,1,2,2-Tetrachloroethane	79-34-5	<8.1	<8.6	<8.6	<8.6	<8.6	<8.6
Tetrachloroethylene	127-18-4	<8.0	<8.5	<8.5	<8.5	<8.5	<8.5
Toluene	108-88-3	6.0 D	<4.7	<4.7	<4.7	<4.7	<4.7
1,1,1-Trichloroethane	71-55-6	<6.4	<6.8	<6.8	<6.8	<6.8	<6.8
1,1,2-Trichloroethane	79-00-5	<6.4	<6.8	<6.8	<6.8	<6.8	<6.8
Trichloroethylene	79-01-6	<6.3	<6.7	<6.7	<6.7	<6.7	<6.7
1,2,4-Trimethylbenzene	95-63-6	<5.8	7.5 D	<6.2	<6.2	<6.2	<6.2
1,3,5-Trimethylbenzene	108-67-8	<5.8	<6.2	<6.2	<6.2	<6.2	<6.2
2,2,4-Trimethylpentane	540-84-1	<5.5	<5.8	<5.8	<5.8	<5.8	<5.8
Vinyl Chloride	75-01-4	<3.0	<3.2	<3.2	<3.2	<3.2	<3.2
m,p-Xylene		<5.1	<5.4	<5.4	<5.4	<5.4	<5.4
o-Xylene	95-47-6	<5.1	<5.4	<5.4	<5.4	<5.4	<5.4

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Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

	Sample ID[1]	SV-55	SV-56	Amb Up 1	Amb Dn 2	Amb Up 3	Amb Dn 4	Trip
	Sample Location	46 Indep.	32 Indep.	SV-42	SV-45	SV-46	SV-49	Blank 5
	Sample Date	08/23/06	08/23/06	08/21/06	08/21/06	08/22/06	08/22/06	08/22/06
Chemical Name	**CAS**							
Volatile Organic Compounds[2] (μg/m^3)								
Acetone	67-64-1	<3.0	69 D	<1.2	<1.2	<1.2	<1.2	11
Benzene	71-43-2	<4.0	<4.0	<1.6	<1.6	<1.6	<1.6	<1.6
2-Butanone	78-93-3	<3.7	<3.7	<1.5	5.1	2.0	1.9	<1.5
Bromomethane	74-83-9	<4.9	<4.9	<2.2	<2.2	<2.2	<2.2	<2.2
Carbon disulfide	75-15-0	<3.9	<3.9	<1.6	<1.6	<1.6	<1.6	<1.6
Carbon Tetrachloride	56-23-5	<7.9	<7.9	<3.2	<3.2	<3.2	<3.2	<3.2
Chlorobenzene	108-90-7	<5.8	<5.8	<2.3	<2.3	<2.3	<2.3	<2.3
Chloroethane	75-00-3	<3.3	<3.3	<1.3	<1.3	<1.3	<1.3	<1.3
Chloroform	67-66-3	<6.1	<6.1	<2.4	<2.4	<2.4	<2.4	<2.4
Chloromethane	74-87-3	<2.6	<2.6	<1.0	<1.0	<1.0	<1.0	<1.0
Cyclohexane	110-82-7	<4.3	<4.3	<1.7	<1.7	<1.7	<1.7	17
Dichlorodifluoromethane	75-71-8	---	---	---	---	---	---	---
1,4-Dichlorobenzene	106-46-7	<7.5	<7.5	<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane	75-34-3	<5.1	<5.1	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane	107-06-2	<5.1	<5.1	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethylene	75-35-4	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0
cis-1,2-Dichloroethylene	156-59-2	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0
trans-1,2-Dichoroethylene	156-60-5	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloropropane	78-87-5	<5.8	<5.8	<2.3	<2.3	<2.3	<2.3	<2.3
cis-1,3-Dichloropropene	10061-01-5	<5.7	<5.7	<2.3	<2.3	<2.3	<2.3	<2.3
trans-1,3-Dichloropropene	10061-02-6	<5.7	<5.7	<2.3	<2.3	<2.3	<2.3	<2.3
Ethyl Acetate	141-78-6	<4.5	<4.5	<1.8	<1.8	<1.8	<1.8	<1.8
Ethyl Benzene	100-41-4	<5.4	<5.4	<2.2	<2.2	<2.2	<2.2	<2.2
4-Ethyltoluene	622-96-8	<6.2	<6.2	<2.5	<2.5	<2.5	<2.5	<2.5
Heptane	142-82-5	<5.1	<5.1	<2.1	<2.1	<2.1	<2.1	<2.1
Hexane	110-54-3	<4.4	<4.4	<1.8	<1.8	<1.8	<1.8	<1.8
Isopropyl Alcohol	67-63-0	<3.1	<3.1	<1.2	<1.2	<1.2	<1.2	<1.2
Methyl butyl Ketone	591-78-6	<5.1	<5.1	<2.1	<2.1	<2.1	<2.1	<2.1
Methylene Chloride	75-09-2	5.1 D	222 D	<1.7	1.9	2.3	<1.7	<1.7
Methyl tert-butyl Ether	1634-04-4	<4.5	<4.5	<1.8	<1.8	<1.8	<1.8	<1.8
Propene	115-07-1	<2.2	<2.2	<0.86	<0.86	<0.86	<0.86	3.9
Styrene	100-42-5	<5.3	<5.3	<2.1	<2.1	<2.1	<2.1	<2.1
1,1,2,2-Tetrachloroethane	79-34-5	<8.6	<8.6	<3.4	<3.4	<3.4	<3.4	<3.4
Tetrachloroethylene	127-18-4	84 D	<8.5	<3.4	<3.4	<3.4	<3.4	<3.4
Toluene	108-88-3	<4.7	<4.7	2.8	4.4	3.7	3.5	<1.9
1,1,1-Trichloroethane	71-55-6	<6.8	<6.8	<2.7	<2.7	<2.7	<2.7	<2.7
1,1,2-Trichloroethane	79-00-5	<6.8	<6.8	<2.7	<2.7	<2.7	<2.7	<2.7
Trichloroethylene	79-01-6	<6.7	<6.7	<2.7	<2.7	<2.7	<2.7	<2.7
1,2,4-Trimethylbenzene	95-63-6	<6.2	<6.2	<2.5	<2.5	<2.5	<2.5	<2.5
1,3,5-Trimethylbenzene	108-67-8	<6.2	<6.2	<2.5	<2.5	<2.5	<2.5	<2.5
2,2,4-Trimethylpentane	540-84-1	<5.8	<5.8	<2.3	<2.3	<2.3	<2.3	<2.3
Vinyl Chloride	75-01-4	<3.2	<3.2	<1.3	<1.3	<1.3	<1.3	<1.3
m,p-Xylene		<5.4	<5.4	<2.2	<2.2	<2.2	<2.2	<2.2
o-Xylene	95-47-6	<5.4	<5.4	<2.2	<2.2	<2.2	<2.2	<2.2

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Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

Sample ID[1]		Amb Up 8	54-Amb	Amb Dn 10	Trip Blank 11
Sample Location		SV-52	SV-54	SV-55	
Sample Date		08/23/06	08/23/06	08/23/06	08/23/06
Chemical Name	**CAS**				
Volatile Organic Compounds[2] (µg/m^3)					
Acetone	67-64-1	25 J	23 J	23 J	<1.2 J
Benzene	71-43-2	2.0	2.1	2.3	<1.6
2-Butanone	78-93-3	2.0	2.2	2.4	<1.5
Bromomethane	74-83-9	<1.9	<1.9	<1.9	<1.9
Carbon disulfide	75-15-0	<1.6	<1.6	<1.6	<1.6
Carbon Tetrachloride	56-23-5	<3.2	<3.2	<3.2	<3.2
Chlorobenzene	108-90-7	<2.3	<2.3	<2.3	<2.3
Chloroethane	75-00-3	<1.3	<1.3	<1.3	<1.3
Chloroform	67-66-3	<2.4	<2.4	<2.4	<2.4
Chloromethane	74-87-3	<1.0	<1.0	<1.0	<1.0
Cyclohexane	110-82-7	<1.7	2.3	<1.7	<1.7
Dichlorodifluoromethane	75-71-8	---	---	---	---
1,4-Dichlorobenzene	106-46-7	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane	75-34-3	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane	107-06-2	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethylene	75-35-4	<2.0	<2.0	<2.0	<2.0
cis-1,2-Dichloroethylene	156-59-2	<2.0	<2.0	<2.0	<2.0
trans-1,2-Dichoroethylene	156-60-5	<2.0	<2.0	<2.0	<2.0
1,2-Dichloropropane	78-87-5	<2.3	<2.3	<2.3	<2.3
cis-1,3-Dichloropropene	10061-01-5	<2.3	<2.3	<2.3	<2.3
trans-1,3-Dichloropropene	10061-02-6	<2.3	<2.3	<2.3	<2.3
Ethyl Acetate	141-78-6	<1.8	<1.8	<1.8	<1.8
Ethyl Benzene	100-41-4	<2.2	<2.2	<2.2	<2.2
4-Ethyltoluene	622-96-8	<2.5	<2.5	<2.5	<2.5
Heptane	142-82-5	4.0	3.0	2.8	<2.1
Hexane	110-54-3	1.8	2.1	3.1	<1.8
Isopropyl Alcohol	67-63-0	<1.2	<1.2	<1.2	<1.2
Methyl butyl Ketone	591-78-6	<2.1	<2.1	<2.1	<2.1
Methylene Chloride	75-09-2	<1.7	1.8	<1.7	<1.7
Methyl tert-butyl Ether	1634-04-4	<1.8	<1.8	<1.8	<1.8
Propene	115-07-1	<0.86	<0.86	<0.86	<0.86
Styrene	100-42-5	<2.1	<2.1	<2.1	<2.1
1,1,2,2-Tetrachloroethane	79-34-5	<3.4	<3.4	<3.4	<3.4
Tetrachloroethylene	127-18-4	<3.4	<3.4	<3.4	<3.4
Toluene	108-88-3	14	11	11	<1.9
1,1,1-Trichloroethane	71-55-6	<2.7	<2.7	<2.7	<2.7
1,1,2-Trichloroethane	79-00-5	<2.7	<2.7	<2.7	<2.7
Trichloroethylene	79-01-6	<2.7	<2.7	<2.7	<2.7
1,2,4-Trimethylbenzene	95-63-6	<2.5	<2.5	<2.5	<2.5
1,3,5-Trimethylbenzene	108-67-8	<2.5	<2.5	<2.5	<2.5
2,2,4-Trimethylpentane	540-84-1	2.6	2.8	4.2	<2.3
Vinyl Chloride	75-01-4	<1.3	<1.3	<1.3	<1.3
m,p-Xylene		2.6	<2.2	2.9	<2.2
o-Xylene	95-47-6	<2.2	<2.2	<2.2	<2.2

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Table 3

Soil Vapor Sampling Comparative Results

Jimmy's Dry Cleaners
Roosevelt, NY

Notes

J - Estimated value
B - Analyte detected in the associated Method Blank
E - Value exceeds instrument calibration range
D - Analyte concentration obtained from a diluted analysis
R - Technically rejected
(1) Samples designated with an "A", were hand driven. Teflon tubing & glass beads were used instead of polyethlene tubing & sand.
(2) The analytical results for these compounds were validated.

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Table 4

Summary of Soil and Ground Water Analytical Results for DP-1, 2, 3, and 4

Jimmy's Dry Cleaners
Roosevelt, NY

Chemical Name	CAS	TAGM 4046 Soil Cleanup Objective(1)	Subpart 375-6 Soil Cleanup Objective(2)	Max. Allowable Concentration(3)	DP-1 Soil (µg/kg)			DP-2 Soil (µg/kg)			DP-1 Ground Water (µg/L)			
				Sample Depth (ft bgs)	3-5	8-10	13-15	8-10	13-15	17-19	16-20	36-40	56-60	76-80
				Sample Date	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07
Volatile Organic Compounds		(µg/kg)	(µg/kg)	(µg/L)										
Acetone	67-64-1	200	50	50	ND	ND	ND	ND	ND	12	ND	ND	ND	**76**
Benzene	71-43-2	60	60	1	ND	2 J	ND	2 J	2 J	ND	ND	ND	ND	ND
2-Butanone	78-93-3	300	120	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	20
Carbon disulfide	75-15-0	2,700	---	60(4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	67-66-3	300	370	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	75-09-2	100	50	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene (semi-VOC)	91-20-3	13,000	12,000	10	4 J	1 J	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	108-88-3	1,500	700	5	1 J	5 J	ND	4 J	5 J	3 J	ND	ND	ND	1J
Tetrachloroethene	127-18-4	1,400	1300	5	ND	ND	ND	ND	ND	ND	ND	1 J	2 J	2 J
Trichloroethylene	79-01-6	700	470	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4

Summary of Soil and Ground Water Analytical Results for DP-1, 2, 3, and 4

Jimmy's Dry Cleaners
Roosevelt, NY

				Sample Location	DP-2				DP-3				DP-4			
				Sample Type	Ground Water (µg/L)				Ground Water (µg/L)				Ground Water (µg/L)			
				Sample Depth (ft bgs)	16-20	36-40	56-60	76-80	16-20	36-40	56-60	76-80	16-20	36-40	56-60	76-80
				Sample Date	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07	5/21/07
Chemical Name	CAS	TAGM 4046 Soil Cleanup Objective(1)	Subpart 375-6 Soil Cleanup Objective(2)	Max. Allowable Concentration(3)												
Volatile Organic Compounds		(µg/kg)	(µg/kg)	(µg/L)												
Acetone	67-64-1	200	50	50	ND	ND	ND	ND	ND	10	26	35	ND	16	26	20
Benzene	71-43-2	60	60	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	78-93-3	300	120	50	ND	ND	ND	ND	ND	ND	ND	9	ND	ND	ND	ND
Carbon disulfide	75-15-0	2,700	---	60(4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1 J	ND	ND
Chloroform	67-66-3	300	370	7	ND	2 J	ND	ND	ND	ND	ND	ND	1 J	ND	ND	ND
Methylene Chloride	75-09-2	100	50	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene (semi-VOC)	91-20-3	13,000	12,000	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	108-88-3	1,500	700	5	ND	ND	ND	ND	ND	ND	ND	3 J	ND	ND	ND	1 J
Tetrachloroethene	127-18-4	1,400	1300	5	ND	ND	ND	ND	ND	15	22	2 J	ND	ND	ND	ND
Trichloroethylene	79-01-6	700	470	5	ND	ND	ND	ND	ND	ND	1 J	ND	ND	ND	ND	ND

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Table 4

Summary of Soil and Ground Water Analytical Results for DP-1, 2, 3, and 4

Jimmy's Dry Cleaners
Roosevelt, NY

Notes

bgs - Below ground surface
ND - Not detected
J - Estimated value
(1) Tables 1 and 2 of NYSDEC Division of Environmental Remediation Technical and Administrative Guidance Memorandum (TAGM) #4046, *Determination of Soil Cleanup Objectives and Cleanup Levels*, January 1994.
(2) Table 375-6.8(a): *Unrestricted Use Soil Cleanup* of 6NYCRR Subpart 375-6: *Remedial Program Soil Cleanup*, December 14, 2006.
(3) Standards or guidance values from Table 1 of NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*, June 1998.
(4) TOGS 1.1.1 April 2000 Addendum.

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Table 5

Summary of MW-1, 2, and 3 Ground Water Analytical Results for Screening

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-1	MW-1	MW-1	MW-1	MW-1
		Sample Depth (ft bgs)	20	30	40	50	60
		Sample Date	6/4/07	6/4/07	6/4/07	6/4/07	6/4/07
Chemical Name	**CAS**	**Max. Allowable Concentration[1]**					
Volatile Organic Compounds[2] (µg/L)							
Benzene	71-43-2	1	ND	**3 J**	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	1 J	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	75-34-3	5	**6**	**24**	ND	ND	ND
Ethylbenzene	100-41-4	5	**44**	**49**	ND	2 J	4 J
Isopropylbenzene	98-82-8	5	**19**	**16**	ND	ND	1 J
4-Isopropyltoluene	99-87-6	5	**10**	**7**	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	ND	ND	ND	ND	ND
Methylene Chloride	75-09-2	5	ND	2 J	ND	ND	ND
n-Butylbenzene	104-51-8	5	**18**	**12**	ND	ND	1 J
n-Propylbenzene	103-65-1	5	**29**	**22**	ND	ND	2 J
Naphthalene	91-20-3	10	**83 B**	**88 B**	ND	4 JB	7 B
sec-Butylbenzene	135-98-8	5	**13**	**9**	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10[4]	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	**180**	**140**	ND	5	**9**
1,3,5-Trimethylbenzene	108-67-8	5	**45**	**35**	ND	1 J	2 J
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	ND	ND	ND	ND	ND
Trichloroethene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5[5]	**63**	**74**	ND	3 J	**6**
o-Xylene	95-47-6	5	ND	1 J	ND	ND	ND
Xylene (Total)	1330-20-7	5[5]	**63**	**75**	ND	3 J	**6**

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Table 5

Summary of MW-1, 2, and 3 Ground Water Analytical Results for Screening

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-1	MW-1	MW-1	MW-1	MW-1
		Sample Depth (ft bgs)	70	80	90	100	110
		Sample Date	6/4/07	6/4/07	6/4/07	6/4/07	6/4/07
Chemical Name	**CAS**	**Max. Allowable Concentration(1)**					
Volatile Organic Compounds(2) (μg/L)							
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	75-34-3	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	1 J	ND	ND	2 J	3 J
Isopropylbenzene	98-82-8	5	ND	ND	ND	ND	1 J
4-Isopropyltoluene	99-87-6	5	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10(3)	ND	ND	ND	ND	ND
Methylene Chloride	75-09-2	5	ND	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	ND	ND	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	ND	ND	1 J
Naphthalene	91-20-3	10	3 JB	2 JB	2 JB	6 B	8 B
sec-Butylbenzene	135-98-8	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10(4)	ND	ND	ND	2 J	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	1 J	ND
1,2,4-Trimethylbenzene	95-63-6	5	3 J	1 J	2 J	4 J	**8**
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	ND	1 J	2 J
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	ND	ND	ND	ND	ND
Trichloroethene	79-01-6	5	ND	2 J	ND	ND	ND
m,p-Xylene		5(5)	2 J	ND	1 J	2 J	5
o-Xylene	95-47-6	5	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5(5)	2 J	ND	1 J	2 J	5

O'BRIEN & GERE

Table 5

Summary of MW-1, 2, and 3 Ground Water Analytical Results for Screening

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-1	MW-1	MW-1	MW-1	MW-2
		Sample Depth (ft bgs)	120	130	140	150	20
		Sample Date	6/4/07	6/1/07	6/1/07	6/1/07	5/22/07
Chemical Name	**CAS**	**Max. Allowable Concentration[1]**					
Volatile Organic Compounds[2] (µg/L)							
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	75-34-3	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	**7**	ND	ND	2 J	ND
Isopropylbenzene	98-82-8	5	2 J	ND	ND	1 J	ND
4-Isopropyltoluene	99-87-6	5	1 J	ND	ND	1 J	ND
Methyl tert-butyl ether	1634-04-4	10[3]	ND	ND	ND	ND	9
Methylene Chloride	75-09-2	5	ND	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	2 J	ND	ND	ND	ND
n-Propylbenzene	103-65-1	5	3 J	ND	ND	2 J	ND
Naphthalene	91-20-3	10	**20 B**	2 JB	2 JB	9 B	9 B
sec-Butylbenzene	135-98-8	5	2 J	ND	ND	2 J	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10[4]	2 J	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	**22**	2 J	2 J	**12**	3 J
1,3,5-Trimethylbenzene	108-67-8	5	**6**	ND	ND	3 J	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	ND	ND	ND	ND	**14**
Trichloroethene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5[5]	**14**	ND	ND	3 J	2 J
o-Xylene	95-47-6	5	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[5]	**14**	ND	ND	3 J	2 J

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Table 5

Summary of MW-1, 2, and 3 Ground Water Analytical Results for Screening

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-2	MW-2	MW-2	MW-2	MW-2
		Sample Depth (ft bgs)	30	40	50	60	70
		Sample Date	5/22/07	5/22/07	5/22/07	5/22/07	5/22/07
Chemical Name	**CAS**	**Max. Allowable Concentration(1)**					
Volatile Organic Compounds(2) (µg/L)							
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	75-34-3	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Isopropylbenzene	98-82-8	5	ND	ND	ND	ND	ND
4-Isopropyltoluene	99-87-6	5	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10(3)	10	2 J	ND	1 J	2 J
Methylene Chloride	75-09-2	5	ND	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	ND	ND	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	ND	ND	ND
Naphthalene	91-20-3	10	1 JB	ND	ND	ND	ND
sec-Butylbenzene	135-98-8	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10(4)	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	**6**	4 J	ND	3 J	**6**
Trichloroethene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5(5)	ND	ND	ND	ND	ND
o-Xylene	95-47-6	5	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5(5)	ND	ND	ND	ND	ND

O'BRIEN & GERE

Table 5

Summary of MW-1, 2, and 3 Ground Water Analytical Results for Screening

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-2	MW-2	MW-2	X-1 (MW-2)	MW-2
		Sample Depth (ft bgs)	80	90	100	100	110
		Sample Date	5/22/07	5/22/07	5/22/07	5/22/07	5/22/07
Chemical Name	**CAS**	**Max. Allowable Concentration**[1]					
Volatile Organic Compounds[2] (µg/L)							
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	75-34-3	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Isopropylbenzene	98-82-8	5	ND	ND	ND	ND	ND
4-Isopropyltoluene	99-87-6	5	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	**11**	10	**22**	**25**	**25**
Methylene Chloride	75-09-2	5	ND	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	ND	ND	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	ND	ND	ND
Naphthalene	91-20-3	10	ND	ND	ND	ND	ND
sec-Butylbenzene	135-98-8	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10[4]	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	ND	**15**	**14**	**13**	**20**
Trichloroethene	79-01-6	5	**11**	ND	ND	ND	ND
m,p-Xylene		5[5]	ND	ND	ND	ND	ND
o-Xylene	95-47-6	5	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[5]	ND	ND	ND	ND	ND

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Table 5

Summary of MW-1, 2, and 3 Ground Water Analytical Results for Screening

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-2	MW-2	MW-2	MW-2	MW-2
		Sample Depth (ft bgs)	120	130	140	150	160
		Sample Date	5/22/07	5/21/07	5/21/07	5/21/07	5/21/07
Chemical Name	CAS	Max. Allowable Concentration[1]					
Volatile Organic Compounds[2] (µg/L)							
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	1 J	1 J	ND	ND	ND
1,1-Dichloroethane	75-34-3	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Isopropylbenzene	98-82-8	5	ND	ND	ND	ND	ND
4-Isopropyltoluene	99-87-6	5	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	**48**	**41**	**61**	**98**	**52**
Methylene Chloride	75-09-2	5	ND	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	ND	ND	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	ND	ND	ND
Naphthalene	91-20-3	10	ND	1 J	ND	ND	ND
sec-Butylbenzene	135-98-8	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10[4]	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	**30**	**10**	**10**	4 J	ND
Trichloroethene	79-01-6	5	1 J	ND	ND	ND	ND
m,p-Xylene		5[5]	ND	ND	ND	ND	ND
o-Xylene	95-47-6	5	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[5]	ND	ND	ND	ND	ND

O'BRIEN & GERE

Table 5

Summary of MW-1, 2, and 3 Ground Water Analytical Results for Screening

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-2	MW-2	MW-2	MW-2	MW-3
		Sample Depth (ft bgs)	170	180	190	200	20
		Sample Date	5/21/07	5/21/07	5/21/07	5/21/07	5/30/07
Chemical Name	CAS	Max. Allowable Concentration(1)					
Volatile Organic Compounds(2) (µg/L)							
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND	4 J
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	75-34-3	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Isopropylbenzene	98-82-8	5	ND	ND	ND	ND	ND
4-Isopropyltoluene	99-87-6	5	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10(3)	**36**	**26**	**13**	1 J	ND
Methylene Chloride	75-09-2	5	ND	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	ND	ND	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	ND	ND	ND
Naphthalene	91-20-3	10	ND	ND	ND	ND	ND
sec-Butylbenzene	135-98-8	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10(4)	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	1 J	1 J	ND
Tetrachloroethene	127-18-4	5	4 J	2 J	2 J	ND	2 J
Trichloroethene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5(5)	ND	ND	ND	ND	ND
o-Xylene	95-47-6	5	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5(5)	ND	ND	ND	ND	ND

O'BRIEN & GERE

Table 5

Summary of MW-1, 2, and 3 Ground Water Analytical Results for Screening

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-3	MW-3	MW-3	MW-3	X-2 (MW-3)
		Sample Depth (ft bgs)	30	40	50	60	60
		Sample Date	5/30/07	5/30/07	5/30/07	5/30/07	5/30/07
Chemical Name	CAS	Max. Allowable Concentration[1]					
Volatile Organic Compounds[2] (µg/L)							
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
Chloromethane	74-87-3	5	3 J	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	75-34-3	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Isopropylbenzene	98-82-8	5	ND	ND	ND	ND	ND
4-Isopropyltoluene	99-87-6	5	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	ND	ND	ND	ND	ND
Methylene Chloride	75-09-2	5	ND	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	ND	ND	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	ND	ND	ND
Naphthalene	91-20-3	10	ND	ND	ND	ND	ND
sec-Butylbenzene	135-98-8	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10[4]	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	2 J	2 J	ND	ND	1 J
Trichloroethene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5[5]	ND	ND	ND	ND	ND
o-Xylene	95-47-6	5	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[5]	ND	ND	ND	ND	ND

O'BRIEN & GERE

Table 5

Summary of MW-1, 2, and 3 Ground Water Analytical Results for Screening

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-3	MW-3	MW-3	MW-3	MW-3
		Sample Depth (ft bgs)	70	80	90	100	110
		Sample Date	5/30/07	5/29/07	5/29/07	5/29/07	5/29/07
Chemical Name	CAS	Max. Allowable Concentration(1)					
Volatile Organic Compounds(2) (µg/L)							
Benzene	71-43-2	1	ND	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND	ND
1,1-Dichloroethane	75-34-3	5	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND	ND
Isopropylbenzene	98-82-8	5	ND	ND	ND	ND	ND
4-Isopropyltoluene	99-87-6	5	ND	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10(3)	ND	ND	1 J	1 J	1 J
Methylene Chloride	75-09-2	5	ND	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	ND	ND	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	ND	ND	ND
Naphthalene	91-20-3	10	ND	ND	ND	ND	ND
sec-Butylbenzene	135-98-8	5	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10(4)	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	1 J	ND	3 J	3 J	2 J
Trichloroethene	79-01-6	5	ND	ND	ND	ND	ND
m,p-Xylene		5(5)	ND	ND	ND	ND	ND
o-Xylene	95-47-6	5	ND	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5(5)	ND	ND	ND	ND	ND

O'BRIEN & GERE

Table 5

Summary of MW-1, 2, and 3 Ground Water Analytical Results for Screening

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-3	MW-3	MW-3	MW-3
		Sample Depth (ft bgs)	120	130	140	150
		Sample Date	5/29/07	5/29/07	5/29/07	5/29/07
Chemical Name	CAS	Max. Allowable Concentration[(1)]				
Volatile Organic Compounds[(2)] (µg/L)						
Benzene	71-43-2	1	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND
1,1-Dichloroethane	75-34-3	5	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND
Isopropylbenzene	98-82-8	5	ND	ND	ND	ND
4-Isopropyltoluene	99-87-6	5	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[(3)]	1 J	ND	1 J	1 J
Methylene Chloride	75-09-2	5	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	ND	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	ND	ND
Naphthalene	91-20-3	10	1 JB	2 JB	2 JB	2 JB
sec-Butylbenzene	135-98-8	5	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10[(4)]	ND	ND	1 JB	1 JB
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	2 J	ND	ND	ND
Trichloroethene	79-01-6	5	ND	ND	ND	ND
m,p-Xylene		5[(5)]	ND	ND	ND	ND
o-Xylene	95-47-6	5	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[(5)]	ND	ND	ND	ND

O'BRIEN & GERE

Table 5

Summary of MW-1, 2, and 3 Ground Water Analytical Results for Screening

Jimmy's Dry Cleaners
Roosevelt, NY

Notes

bgs - Below ground surface

ND - Not detected

J - Estimated value

B - Analyte detected in the associated Method Blank

(1) Standards or guidance values from Table 1 of NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*, June 1998.

(2) The analytical results for these compounds were for screening purposes and were not validated.

(3) TOGS 1.1.1 April 2000 Addendum.

(4) The TOGS value for m,p-xylene or total xylene is assumed to be equal to the TOGS value for o-xylene, m-xylene, or p-xylene.

(5) Expressed as hydrogen sulfide.

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Table 6

Summary of MW-1, 2, 3, ITMW-2, and CMT-5 Ground Water Analytical Results

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-1S	MW-1I	MW-1D	MW-2S
		Screen Interval (ft bgs)	20-30	80-90	110-120	15-25
		Sample Date	7/10/07	7/9/07	7/9/07	7/19/07
Chemical Name	CAS	Max. Allowable Concentration(1)				
Volatile Organic Compounds(2) (µg/L)						
Benzene	71-43-2	1	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	ND
1,1-Dichloroethane	75-34-3	5	3 J	ND	2 J	ND
Ethylbenzene	100-41-4	5	ND	ND	**6**	ND
Isopropylbenzene	98-82-8	5	ND	ND	2 J	ND
4-Isopropyltoluene	99-87-6	5	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10(3)	ND	ND	ND	9
Methylene Chloride	75-09-2	5	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	2 J	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	2 J	ND
Naphthalene	91-20-3	10	ND	ND	**15**	ND
sec-Butylbenzene	135-98-8	5	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10(4)	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	ND	ND	**18**	ND
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	5	ND
Toluene	108-88-3	5	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	ND	ND	ND	**10**
Trichloroethylene	79-01-6	5	ND	2 J	ND	ND
m,p-Xylene		5(5)	ND	ND	**12**	ND
o-Xylene	95-47-6	5	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5(5)	ND	ND	**12**	ND

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Table 6

Summary of MW-1, 2, 3, ITMW-2, and CMT-5 Ground Water Analytical Results

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-2I	MW-2D	MW-3S	MW-3I
		Screen Interval (ft bgs)	80-90	110-120	25-35	90-100
		Sample Date	7/12/07	7/12/07	7/11/07	7/11/07
Chemical Name	**CAS**	**Max. Allowable Concentration[(1)]**				
Volatile Organic Compounds[(2)] (µg/L)						
Benzene	71-43-2	1	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	5	ND	ND
1,1-Dichloroethane	75-34-3	5	ND	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND	ND
Isopropylbenzene	98-82-8	5	ND	ND	ND	ND
4-Isopropyltoluene	99-87-6	5	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[(3)]	ND	**18**	ND	1 J
Methylene Chloride	75-09-2	5	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	ND	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	ND	ND
Naphthalene	91-20-3	10	ND	ND	ND	ND
sec-Butylbenzene	135-98-8	5	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10[(4)]	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	**18**	**120**	ND	5
Trichloroethylene	79-01-6	5	ND	5	ND	ND
m,p-Xylene		5[(5)]	ND	ND	ND	ND
o-Xylene	95-47-6	5	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[(5)]	ND	ND	ND	ND

O'BRIEN & GERE

Table 6

Summary of MW-1, 2, 3, ITMW-2, and CMT-5 Ground Water Analytical Results

Jimmy's Dry Cleaners
Roosevelt, NY

		Sample Location	MW-3D	ITMW-2S	X-1 (ITMW-2S)	ITMW-2D
		Screen Interval (ft bgs)	110-120	40.5'-50.5'	40.5'-50.5'	91.5'-101.5'
		Sample Date	7/10/07	7/10/07	7/10/07	7/10/07
Chemical Name	CAS	Max. Allowable Concentration[(1)]				
Volatile Organic Compounds[(2)] (μg/L)						
Benzene	71-43-2	1	ND	ND	ND	ND
Chloroform	67-66-3	7	ND	2 J	2 J	ND
Chloromethane	74-87-3	5	ND	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	ND	ND	23
1,1-Dichloroethane	75-34-3	5	ND	ND	ND	3 J
Ethylbenzene	100-41-4	5	ND	ND	ND	ND
Isopropylbenzene	98-82-8	5	ND	ND	ND	ND
4-Isopropyltoluene	99-87-6	5	ND	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[(3)]	2 J	ND	ND	2 J
Methylene Chloride	75-09-2	5	ND	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	ND	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	ND	ND
Naphthalene	91-20-3	10	ND	ND	ND	ND
sec-Butylbenzene	135-98-8	5	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10[(4)]	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	ND	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND	ND
Tetrachloroethene	127-18-4	5	ND	4 J	3 J	2,000 D
Trichloroethylene	79-01-6	5	ND	ND	ND	14
m,p-Xylene		5[(5)]	ND	ND	ND	ND
o-Xylene	95-47-6	5	ND	ND	ND	ND
Xylene (Total)	1330-20-7	5[(5)]	ND	ND	ND	ND

O'BRIEN & GERE

Table 6

Summary of MW-1, 2, 3, ITMW-2, and CMT-5 Ground Water Analytical Results

Jimmy's Dry Cleaners
Roosevelt, NY

Chemical Name	CAS	Sample Location / Screen Interval (ft bgs) / Sample Date / Max. Allowable Concentration[1]	CMT-5(1) 27.75'-28.25' 7/9/07	CMT-5(2) 52.75'-53.25' 7/9/07	CMT-5(3) 82.75'-83.25' 7/9/07
Volatile Organic Compounds[2] (µg/L)					
Benzene	71-43-2	1	ND	ND	ND
Chloroform	67-66-3	7	ND	ND	ND
Chloromethane	74-87-3	5	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	5	ND	3 J	ND
1,1-Dichloroethane	75-34-3	5	ND	ND	ND
Ethylbenzene	100-41-4	5	ND	ND	ND
Isopropylbenzene	98-82-8	5	ND	ND	ND
4-Isopropyltoluene	99-87-6	5	ND	ND	ND
Methyl tert-butyl ether	1634-04-4	10[3]	ND	ND	ND
Methylene Chloride	75-09-2	5	ND	ND	ND
n-Butylbenzene	104-51-8	5	ND	ND	ND
n-Propylbenzene	103-65-1	5	ND	ND	ND
Naphthalene	91-20-3	10	ND	ND	ND
sec-Butylbenzene	135-98-8	5	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	5, 10[4]	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	5	ND	ND	ND
1,2,4-Trimethylbenzene	95-63-6	5	ND	ND	ND
1,3,5-Trimethylbenzene	108-67-8	5	ND	ND	ND
Toluene	108-88-3	5	ND	ND	ND
Tetrachloroethene	127-18-4	5	ND	**170**	**46**
Trichloroethylene	79-01-6	5	ND	3 J	ND
m,p-Xylene		5[5]	ND	ND	ND
o-Xylene	95-47-6	5	ND	ND	ND
Xylene (Total)	1330-20-7	5[5]	ND	ND	ND

O'BRIEN & GERE

Table 6

Summary of MW-1, 2, 3, ITMW-2, and CMT-5 Ground Water Analytical Results

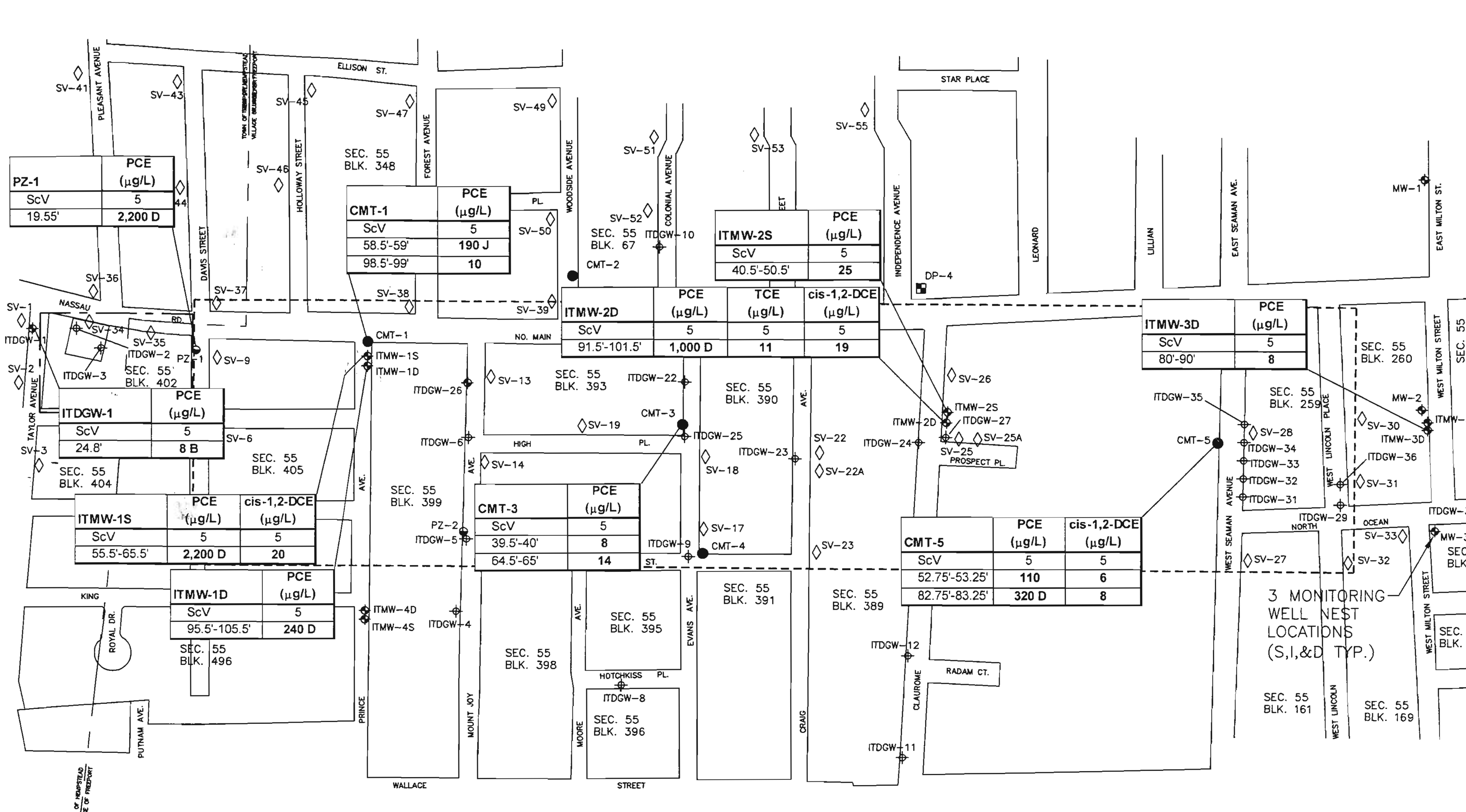
Jimmy's Dry Cleaners
Roosevelt, NY

Notes

bgs - Below ground surface
ND - Not detected
J - Estimated value
B - Analyte detected in the associated Method Blank
D - Analyte concentration obtained from a diluted analysis
(1) Standards or guidance values from Table 1 of NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*, June 1998.
(2) The analytical results for these compounds were validated.
(3) TOGS 1.1.1 April 2000 Addendum.
(4) The TOGS value for m,p-xylene or total xylene is assumed to be equal to the TOGS value for o-xylene, m-xylene, or p-xylene.
(5) Expressed as hydrogen sulfide.

O'BRIEN & GERE

FIGURE 4



LEGEND:

- MW-3 MONITORING WELL
- DP-4 DIRECT PUSH GROUNDWATER SAMPLING LOCATION
- CMT-5 CMT MONITORING WELL
- SV-30 SOIL VAPOR PROBE
- ITDGW-11 FORMER GROUNDWATER SAMPLING LOCATION (GENERALLY NOT EXISTING)
- PZ-3 EXISTING PIEZOMETER
- ITMW-3 EXISTING MONITORING WELL
- TAX MAP PROPERTY LINES
- OU1 BOUNDARY
- OU2 BOUNDARY

NOTES:

1. ONLY FORMER GROUNDWATER SAMPLE LOCATIONS ITDGW-1 AND ITDGW-26, PIEZOMETERS PZ-1 THRU 3, AND MONITORING WELLS ITMW-1S, 1D, 2S, 2D, 3S, 3D, 4S, AND 4D ARE STILL PRESENT.
2. ScV = SCREENING VALUE
   J = ANALYTE DETECTED BELOW REPORTING LIMIT
   D = ANALYTE CONCENTRATION OBTAINED FROM A DILUTED ANALYSIS
   B = ORGANIC ANALYTE DETECTED IN THE ASSOCIATED METHOD BLANK

REFERENCE:

BASE MAP SOURCE: CHAZEN ENGINEERING & LAND SURVEYING CO., P.C. AND SHAW E&I ENGINEERING OF NY

JIMMY'S DRY CLEANERS
ROOSEVELT, NEW YORK
NYSDEC SITE #1-30-080

CMT AND MONITORING WELLS GROUND WATER ANALYTICAL RESULTS ABOVE SCREENING VALUES – JUNE 2006

0 300 600
SCALE IN FEET

FILE NO. 10653.36951.016
AUGUST 2007

O'BRIEN & GERE ENGINEERS INC.

August 21, 2007 – 2:49PM

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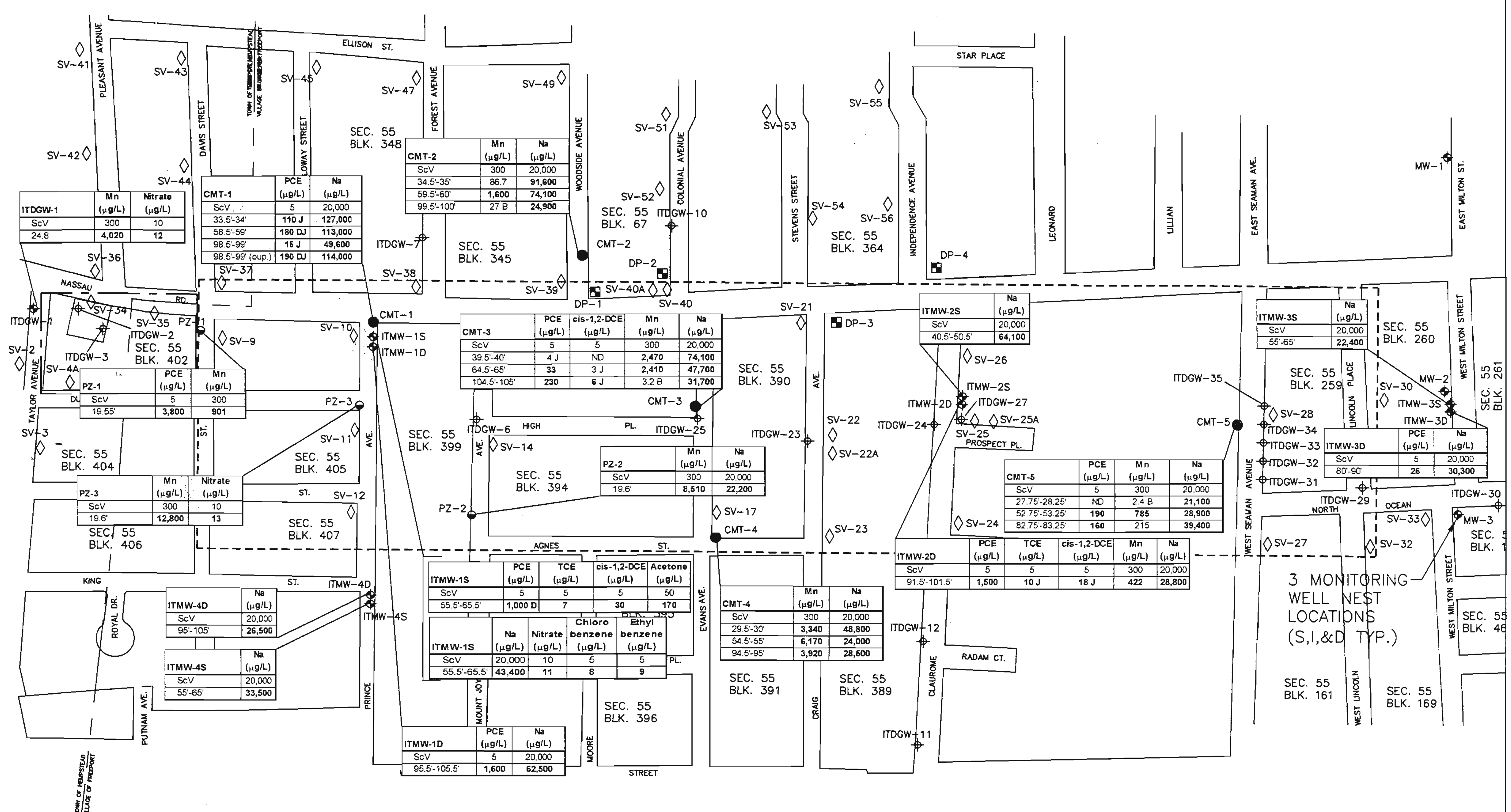
FIGURE 5



ITDGW-1	Mn (µg/L)	Nitrate (µg/L)
ScV	300	10
24.8	4,020	12

CMT-1	PCE (µg/L)	Na (µg/L)
ScV	5	20,000
33.5'-34'	110 J	127,000
58.5'-59'	180 DJ	113,000
98.5'-99'	15 J	49,600
98.5'-99' (dup.)	190 DJ	114,000

CMT-2	Mn (µg/L)	Na (µg/L)
ScV	300	20,000
34.5'-35'	86.7	91,600
59.5'-60'	1,600	74,100
99.5'-100'	27 B	24,900

PZ-1	PCE (µg/L)	Mn (µg/L)
ScV	5	300
19.55'	3,800	901

PZ-3	Mn (µg/L)	Nitrate (µg/L)
ScV	300	10
19.6'	12,800	13

CMT-3	PCE (µg/L)	cis-1,2-DCE (µg/L)	Mn (µg/L)	Na (µg/L)
ScV	5	5	300	20,000
39.5'-40'	4 J	ND	2,470	74,100
64.5'-65'	33	3 J	2,410	47,700
104.5'-105'	230	6 J	3.2 B	31,700

PZ-2	Mn (µg/L)	Na (µg/L)
ScV	300	20,000
19.6'	8,510	22,200

ITMW-1S	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	Acetone (µg/L)
ScV	5	5	5	50
55.5'-65.5'	1,000 D	7	30	170

ITMW-1S	Na (µg/L)	Nitrate (µg/L)	Chloro benzene (µg/L)	Ethyl benzene (µg/L)
ScV	20,000	10	5	5
55.5'-65.5'	43,400	11	8	9

ITMW-4D	Na (µg/L)
ScV	20,000
95'-105'	26,500

ITMW-4S	Na (µg/L)
ScV	20,000
55'-65'	33,500

ITMW-1D	PCE (µg/L)	Na (µg/L)
ScV	5	20,000
95.5'-105.5'	1,600	62,500

CMT-4	Mn (µg/L)	Na (µg/L)
ScV	300	20,000
29.5'-30'	3,340	48,800
54.5'-55'	6,170	24,000
94.5'-95'	3,920	28,600

ITMW-2S	Na (µg/L)
ScV	20,000
40.5'-50.5'	64,100

ITMW-2D	PCE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	Mn (µg/L)	Na (µg/L)
ScV	5	5	5	300	20,000
91.5'-101.5'	1,500	10 J	18 J	422	28,800

CMT-5	PCE (µg/L)	Mn (µg/L)	Na (µg/L)
ScV	5	300	20,000
27.75'-28.25'	ND	2.4 B	21,100
52.75'-53.25'	190	785	28,900
82.75'-83.25'	160	215	39,400

ITMW-3S	Na (µg/L)
ScV	20,000
55'-65'	22,400

ITMW-3D	PCE (µg/L)	Na (µg/L)
ScV	5	20,000
80'-90'	26	30,300

NOTES:

1. ONLY FORMER GROUNDWATER SAMPLE LOCATIONS ITDGW-1 AND ITDGW-26, PIEZOMETERS PZ-1 THRU 3, AND MONITORING WELLS ITMW-1S, 1D, 2S, 2D, 3S, 3D, 4S, AND 4D ARE STILL PRESENT.
2. ScV = SCREENING VALUE
   ND = NOT DETECTED
   J = ANALYTE DETECTED BELOW REPORTING LIMIT
   D = ANALYTE CONCENTRATION OBTAINED FROM A DILUTED ANALYSIS
   B = ORGANIC ANALYTE DETECTED IN THE ASSOCIATED METHOD BLANK

REFERENCE:

BASE MAP SOURCE: CHAZEN ENGINEERING & LAND SURVEYING CO., P.C. AND SHAW E&I ENGINEERING OF NY

LEGEND:

- MW-3 — MONITORING WELL
- DP-4 — DIRECT PUSH GROUNDWATER SAMPLING LOCATION
- CMT-5 — CMT MONITORING WELL
- SV-30 — SOIL VAPOR PROBE
- ITDGW-11 — FORMER GROUNDWATER SAMPLING LOCATION (GENERALLY NOT EXISTING)
- PZ-3 — EXISTING PIEZOMETER
- ITMW-3 — EXISTING MONITORING WELL
- TAX MAP PROPERTY LINES
- OU1 BOUNDARY
- OU2 BOUNDARY

JIMMY'S DRY CLEANERS
ROOSEVELT, NEW YORK
NYSDEC SITE #1-30-080

CMT AND MONITORING WELLS GROUND WATER ANALYTICAL RESULTS ABOVE SCREENING VALUES – FEBRUARY 2007

0 300 600
SCALE IN FEET

FILE NO. 10653.36951.017
AUGUST 2007

O'BRIEN & GERE ENGINEERS INC.

August 21, 2007 – 2:52PM

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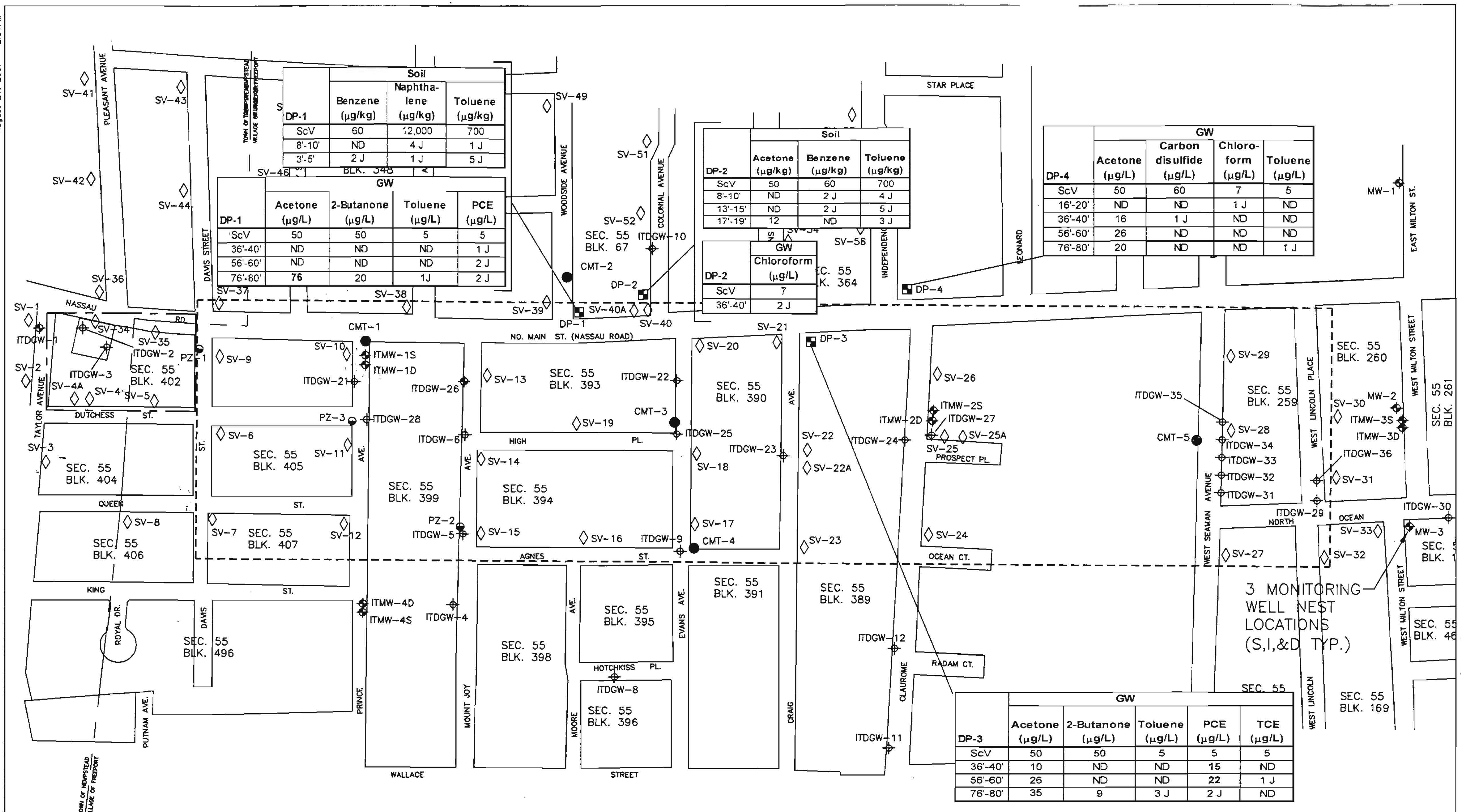
FIGURE 8



DP-1	Soil Benzene (µg/kg)	Soil Naphthalene (µg/kg)	Soil Toluene (µg/kg)
ScV	60	12,000	700
8'-10'	ND	4 J	1 J
3'-5'	2 J	1 J	5 J

DP-1	GW Acetone (µg/L)	GW 2-Butanone (µg/L)	GW Toluene (µg/L)	GW PCE (µg/L)
ScV	50	50	5	5
36'-40'	ND	ND	ND	1 J
56'-60'	ND	ND	ND	2 J
76'-80'	76	20	1J	2 J

DP-2	Soil Acetone (µg/kg)	Soil Benzene (µg/kg)	Soil Toluene (µg/kg)
ScV	50	60	700
8'-10'	ND	2 J	4 J
13'-15'	ND	2 J	5 J
17'-19'	12	ND	3 J

DP-2	GW Chloroform (µg/L)
ScV	7
36'-40'	2 J

DP-4	GW Acetone (µg/L)	GW Carbon disulfide (µg/L)	GW Chloroform (µg/L)	GW Toluene (µg/L)
ScV	50	60	7	5
16'-20'	ND	ND	1 J	ND
36'-40'	16	1 J	ND	ND
56'-60'	26	ND	ND	ND
76'-80'	20	ND	ND	1 J

DP-3	GW Acetone (µg/L)	GW 2-Butanone (µg/L)	GW Toluene (µg/L)	GW PCE (µg/L)	GW TCE (µg/L)
ScV	50	50	5	5	5
36'-40'	10	ND	ND	15	ND
56'-60'	26	ND	ND	22	1 J
76'-80'	35	9	3 J	2 J	ND

LEGEND:

- MW-3 — MONITORING WELL
- DP-4 — DIRECT PUSH GROUNDWATER SAMPLING LOCATION
- CMT-5 — CMT MONITORING WELL
- SV-30 — SOIL VAPOR PROBE
- ITDGW-11 — FORMER GROUNDWATER SAMPLING LOCATION (GENERALLY NOT EXISTING)
- PZ-3 — EXISTING PIEZOMETER
- ITMW-3 — EXISTING MONITORING WELL
- TAX MAP PROPERTY LINES
- OU1 BOUNDARY
- OU2 BOUNDARY

NOTES:

1. ONLY FORMER GROUNDWATER SAMPLE LOCATIONS ITDGW-1 AND ITDGW-26, PIEZOMETERS PZ-1 THRU 3, AND MONITORING WELLS ITMW-1S, 1D, 2S, 2D, 3S, 3D, 4S, AND 4D ARE STILL PRESENT.
2. ScV = SCREENING VALUE. FOR THE SOIL DATA, THE MORE RESTRICTIVE ScV FROM TAGM #4046 OR SUBPART 375-6 IS USED IN THIS FIGURE.

J = ANALYTE DETECTED BELOW REPORTING LIMIT
D = ANALYTE CONCENTRATION OBTAINED FROM A DILUTED ANALYSIS
B = ORGANIC ANALYTE DETECTED IN THE ASSOCIATED METHOD BLANK

REFERENCE:

BASE MAP SOURCE: CHAZEN ENGINEERING & LAND SURVEYING CO., P.C. AND SHAW E&I ENGINEERING OF NY

JIMMY'S DRY CLEANERS
ROOSEVELT, NEW YORK
NYSDEC SITE #1-30-080

DIRECT PUSH SAMPLING LOCATIONS AND DETECTED SOIL AND GROUND WATER ANALYTICAL RESULTS

0 300 600
SCALE IN FEET

FILE NO. 10653.36951.018
AUGUST 2007

O'BRIEN & GERE ENGINEERS INC.

August 21, 2007 - 2:51PM

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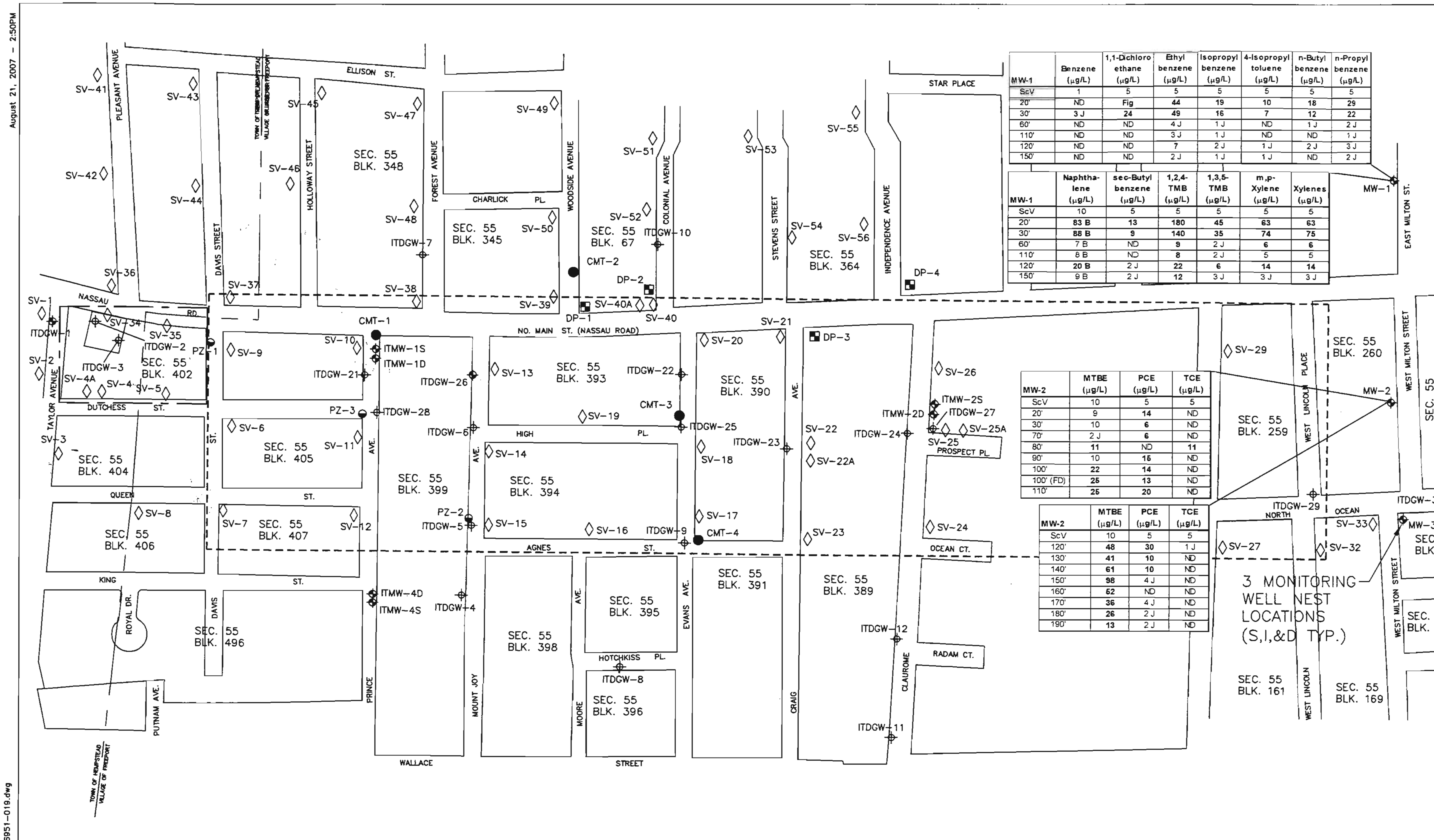
FIGURE 9



MW-1	Benzene (µg/L)	1,1-Dichloro ethane (µg/L)	Ethyl benzene (µg/L)	Isopropyl benzene (µg/L)	4-Isopropyl toluene (µg/L)	n-Butyl benzene (µg/L)	n-Propyl benzene (µg/L)
ScV	1	5	5	5	5	5	5
20'	ND	Fig	**44**	**19**	**10**	**18**	**29**
30'	**3 J**	**24**	**49**	**16**	**7**	**12**	**22**
60'	ND	ND	4 J	1 J	ND	1 J	2 J
110'	ND	ND	3 J	1 J	ND	ND	1 J
120'	ND	ND	**7**	2 J	1 J	2 J	3 J
150'	ND	ND	2 J	1 J	1 J	ND	2 J

MW-1	Naphtha-lene (µg/L)	sec-Butyl benzene (µg/L)	1,2,4-TMB (µg/L)	1,3,5-TMB (µg/L)	m,p-Xylene (µg/L)	Xylenes (µg/L)
ScV	10	5	5	5	5	5
20'	**83 B**	**13**	**180**	**45**	**63**	**63**
30'	**88 B**	**9**	**140**	**35**	**74**	**75**
60'	7 B	ND	**9**	2 J	**6**	**6**
110'	8 B	ND	**8**	2 J	5	5
120'	**20 B**	2 J	**22**	**6**	**14**	**14**
150'	9 B	2 J	**12**	3 J	3 J	3 J

MW-2	MTBE (µg/L)	PCE (µg/L)	TCE (µg/L)
ScV	10	5	5
20'	9	**14**	ND
30'	10	**6**	ND
70'	2 J	**6**	ND
80'	**11**	ND	**11**
90'	10	**15**	ND
100'	**22**	**14**	ND
100' (FD)	**25**	**13**	ND
110'	**25**	**20**	ND

MW-2	MTBE (µg/L)	PCE (µg/L)	TCE (µg/L)
ScV	10	5	5
120'	**48**	**30**	1 J
130'	**41**	**10**	ND
140'	**61**	**10**	ND
150'	**98**	4 J	ND
160'	**52**	ND	ND
170'	**36**	4 J	ND
180'	**26**	2 J	ND
190'	**13**	2 J	ND

LEGEND:

- MW-3 — MONITORING WELL
- DP-4 — DIRECT PUSH GROUNDWATER SAMPLING LOCATION
- CMT-5 — CMT MONITORING WELL
- SV-30 — SOIL VAPOR PROBE
- ITDGW-11 — FORMER GROUNDWATER SAMPLING LOCATION (GENERALLY NOT EXISTING)
- PZ-3 — EXISTING PIEZOMETER
- ITMW-3 — EXISTING MONITORING WELL
- TAX MAP PROPERTY LINES
- OU1 BOUNDARY
- OU2 BOUNDARY

NOTES:

1. ONLY FORMER GROUNDWATER SAMPLE LOCATIONS ITDGW-1 AND ITDGW-26, PIEZOMETERS PZ-1 THRU 3, AND MONITORING WELLS ITMW-1S, 1D, 2S, 2D, 3S, 3D, 4S, AND 4D ARE STILL PRESENT.
2. ScV = SCREENING VALUE
   FD = FIELD DUPLICATE
   J = ANALYTE DETECTED BELOW REPORTING LIMIT
   D = ANALYTE CONCENTRATION OBTAINED FROM A DILUTED ANALYSIS
   B = ORGANIC ANALYTE DETECTED IN THE ASSOCIATED METHOD BLANK

REFERENCE:

BASE MAP SOURCE: CHAZEN ENGINEERING & LAND SURVEYING CO., P.C. AND SHAW E&I ENGINEERING OF NY

JIMMY'S DRY CLEANERS
ROOSEVELT, NEW YORK
NYSDEC SITE #1-30-080

MW-1,2 AND 3 GROUND WATER ANALYTICAL RESULTS ABOVE SCREENING VALUES

0 300 600
SCALE IN FEET

FILE NO. 10653.36951.019
AUGUST 2007

O'BRIEN & GERE ENGINEERS INC.

August 21, 2007 - 2:50PM

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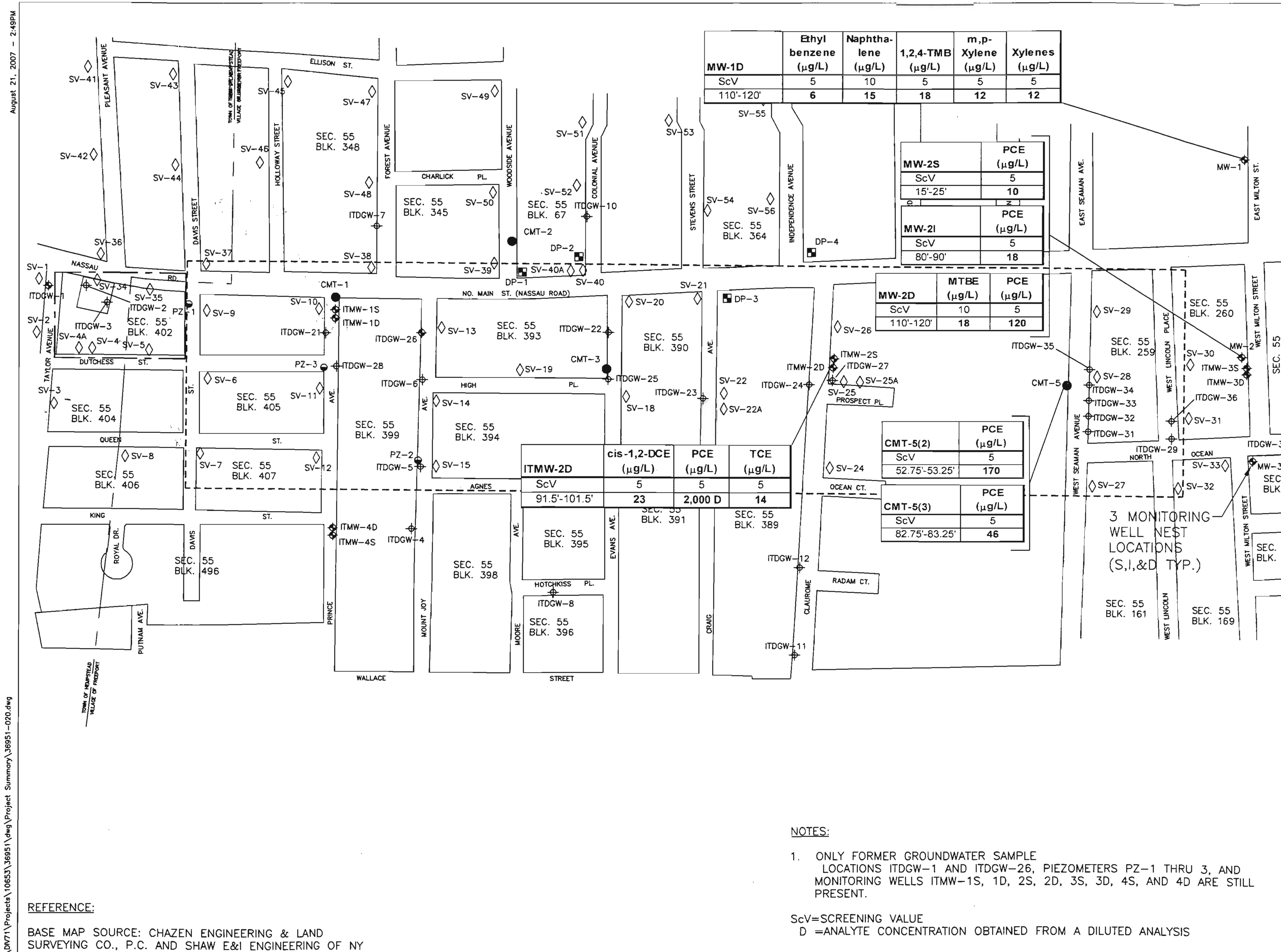
FIGURE 10



MW-1D	Ethyl benzene (µg/L)	Naphtha-lene (µg/L)	1,2,4-TMB (µg/L)	m,p-Xylene (µg/L)	Xylenes (µg/L)
ScV	5	10	5	5	5
110'-120'	**6**	**15**	**18**	**12**	**12**

MW-2S	PCE (µg/L)
ScV	5
15'-25'	**10**

MW-2I	PCE (µg/L)
ScV	5
80'-90'	**18**

MW-2D	MTBE (µg/L)	PCE (µg/L)
ScV	10	5
110'-120'	**18**	**120**

ITMW-2D	cis-1,2-DCE (µg/L)	PCE (µg/L)	TCE (µg/L)
ScV	5	5	5
91.5'-101.5'	**23**	**2,000 D**	**14**

CMT-5(2)	PCE (µg/L)
ScV	5
52.75'-53.25'	**170**

CMT-5(3)	PCE (µg/L)
ScV	5
82.75'-83.25'	**46**

LEGEND:

- MW-3 — MONITORING WELL
- DP-4 — DIRECT PUSH GROUNDWATER SAMPLING LOCATION
- CMT-5 — CMT MONITORING WELL
- SV-30 — SOIL VAPOR PROBE
- ITDGW-11 — FORMER GROUNDWATER SAMPLING LOCATION (GENERALLY NOT EXISTING)
- PZ-3 — EXISTING PIEZOMETER
- ITMW-3 — EXISTING MONITORING WELL
- TAX MAP PROPERTY LINES
- OU1 BOUNDARY
- OU2 BOUNDARY

NOTES:

1. ONLY FORMER GROUNDWATER SAMPLE LOCATIONS ITDGW-1 AND ITDGW-26, PIEZOMETERS PZ-1 THRU 3, AND MONITORING WELLS ITMW-1S, 1D, 2S, 2D, 3S, 3D, 4S, AND 4D ARE STILL PRESENT.

ScV=SCREENING VALUE
D =ANALYTE CONCENTRATION OBTAINED FROM A DILUTED ANALYSIS

REFERENCE:

BASE MAP SOURCE: CHAZEN ENGINEERING & LAND SURVEYING CO., P.C. AND SHAW E&I ENGINEERING OF NY

JIMMY'S DRY CLEANERS
ROOSEVELT, NEW YORK
NYSDEC SITE #1-30-080

MW-1,2 AND 3 NESTED WELLS, ITMW-2D AND CMT-5 WELLS GROUND WATER ANALYTICAL RESULTS ABOVE SCREENING VALUES

0 300 600
SCALE IN FEET

FILE NO. 10653.36951.020
AUGUST 2007

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August 21, 2007 - 2:49PM

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Appendix C

Ground Water Modeling Remedial Alternative Evaluation

APPENDIX C

JIMMY'S DRY CLEANERS

GROUND WATER MODELING REMEDIAL ALTERNATIVE EVALUATION

Prepared For:

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INTRODUCTION

Various remedial alternatives are proposed for the off-site ground water plume at the Jimmy's Dry Cleaners site in Roosevelt, New York (Jimmy's). The objective of the remediation is to reduce the off-site concentrations of volatile organic compounds (VOCs) to below Class GA Ground Water Standards. The potential performance of the proposed remedial alternatives was evaluated using a simple ground water model. This appendix describes the ground water modeling process and the results of the modeling.

Currently the off-site ground water plume at the Jimmy's site contains tetrachloroethene (PCE) with concentrations in some locations in excess of 1,000 ug/l. Five remedial alternatives have been developed to address this off-site plume. These alternatives include: no action, monitored natural attenuation, enhanced in-situ biodegradation, in-situ oxidation, and ground water extraction and treatment. Each of these alternatives assumes that the source of the off-site ground water plume has been remediated. The ground water model was used to provide a comparison of performance of the various alternatives.

Ground Water Model

A simple flow and transport ground water model was developed to assist in the evaluation of remedial alternatives. The model was developed to evaluate the potential response of the plume to the remedial options and to evaluate the conceptual design of certain alternatives. The model was not developed to provide a calibrated representation of site conditions for design purposes. The basic model components are as follows:

- A two-dimensional (2-D) representation of average ground water flow conditions. Average ground water flow conditions were simulated in the model.
- The flow was simulated as steady state conditions.
- The computer code MODFLOW (Harbaugh *et al.*, 2000) was used to simulate the off-site ground water flow.
- The transport was simulated as transient conditions.
- The computer code MT3D (Zheng, 1990) was used to simulate the transport of PCE in the off-site ground water.
- The model was designed to simulate the general off-site distribution of PCE concentrations in 2007. The simulations assumed sorption to provide a slower remedial time frame than would occur if sorption were not occurring.
- The remedial alternatives were incorporated in the model to evaluate the remedial performance for the off-site PCE plume. It was assumed that the source of the off-site plume was eliminated.
- The input parameters used in the model are presented below

Grid Dimensions

Horizontal extent = 7,000 ft by 10,000 ft (extends beyond plume area to avoid boundary interference)
Thickness = 200 ft (zone in aquifer with highest concentrations)
Layers = 1 layer

Hydraulic Conductivity

Hydraulic conductivity (K) = 250 ft/day (mean value from Remedial Investigation, page 30)

Porosity

Uniform value of 0.25 (value from Remedial Investigation, page 30)

Boundaries

Up and downgradient constant head boundaries with elevations of 100 ft and 75 ft respectively. These boundaries result in a hydraulic gradient of 0.0025, which is the gradient presented in the Remedial Investigation, page 30.

Recharge

No recharge was assumed.

Transport

$K_d = 1.47 \times 10^{-7}$ l/mg (This value was chosen to provide a retardation value of 3).

Dispersion d_x = 15 ft near source and 40 ft downgradient from source, d_y/d_x = 0.1 (selected to provide general plume shape).

Degradation = 0.00001 $^{-day}$ near source and 0.005 $^{-day}$ downgradient from source (selected to provide general plume shape).

The site ground water quality data suggest that the PCE plume is stable and the overall distribution of PCE concentrations have not significantly changed since 2001. The baseline model was designed such that the simulated downgradient PCE concentrations approximated the site data.

Remedial Alternatives Evaluation

The proposed ground water remedial alternatives were evaluated using the ground water model. The evaluation process is described in this section. The purpose of the modeling evaluation was to:

- Evaluate the remedial time frames, associated with each alternatives, to reduce plume concentrations below 1,000 ug/l;
- Evaluate the remedial time frames, associated with each alternatives, to reduce plume concentrations to meet the Class GA Ground Water Standards; and
- Estimate the expected rate of ground water collection by the ground water extraction system

The proposed ground water remedial alternatives include: no action, monitored natural attenuation, enhanced in-situ biodegradation, in-situ oxidation, and ground water extraction and treatment.

The model simulations of the remedial alternatives were performed under steady state ground water flow conditions, but transient transport conditions. The ground water extraction alternative simulations used the pumping well module in MODFLOW. The ground water extraction wells were spaced at the downgradient end of the portions of the plume that exceeded 1,000 ug/l and at the downgradient extent of the plume. The three extraction wells are aligned with the apparent centerline of the plume. The evaluation identified a pumping rate of 450 gpm for each well. Note that design pumping rates may be lower because of the limited thickness of the plume in some areas. The EISB treatment zones were simulated using zones of elevated biodegradation at the downgradient end of the plume areas with concentrations in excess of 1,000 ug/l. For the EISB simulation a biodegradation rate of 0.012 $^{-day}$, which represents a 60 day half life, was used. The oxidation treatment zones were simulated using zones of elevated biodegradation at the upgradient and downgradient ends of the plume areas with concentrations in excess of 1,000 ug/l. For the oxidation simulation a biodegradation rate of 0.69 $^{-day}$, which represents a 1 day half life, was used.

For the purpose of these evaluations it was assumed that the source of the plume was discontinued three years after the start of the remedial program.

Remedial Alternative Evaluation Results

The estimated remedial time frames for the various remedial alternatives are presented in the following table. Zero time is when the remedial program began with the plume source discontinued at year three.

Remedial Time Frames

Remedial Option	**Time for PCE Concentrations to Decline to below 1,000 ug/l**	**Time for PCE Concentrations to Decline to below 5 ug/l**
MNA	7 – 8 years	10 – 11 years
Ground Water Extraction	4 - 5 years	7 – 8 years
Enhanced Biodegradation	4 – 6 years	10 – 11 years
Oxidation	3 years	4 – 5 years

The simulations demonstrated that advection is governing transport component controlling the remedial time frames. Consequently there is only limited difference in the remedial time frames for MNA and EISB. Ground water extraction and treatment showed a shorter remedial time frame and in-situ oxidation had the shortest remedial time frame. Careful design of the remedy may reduce the time frames somewhat. The remedial time frames are expected to be shorter if there is less sorption than was assumed for the simulations.

Summary

The objective of the remediation is to reduce the off-site concentrations of VOCs to below Class GA Ground Water Standards. The potential performance of the proposed remedial alternatives was evaluated using a simple ground water model. Five remedial alternatives were evaluated. These alternatives include: no action, monitored natural attenuation, enhanced in-situ biodegradation, in-situ oxidation, and ground water extraction and treatment. The evaluations of these alternatives assumed that the source of the off-site ground water plume has been remediated. The evaluations demonstrated that there is only limited difference in the remedial time frames for MNA and EISB, while ground water extraction and in-situ oxidation provided a shorter remedial time frames.

References

Harbaugh, A.W., Banta, E.R., Hill, M.C., and McDonald, M.G., 2000, MODFLOW-2000, the U.S. Geological Survey modular ground-water model -- User guide to modularization concepts and the Ground-Water Flow Process: U.S. Geological Survey Open-File Report 00-92, 121 p.

Zheng, C., 1990, MT3D A Modular Three-Dimensional Transport Model for Simulation of Advection, Dispersion and Chemical Reactions of Contaminants in Groundwater Systems: US EPA, 163 p.