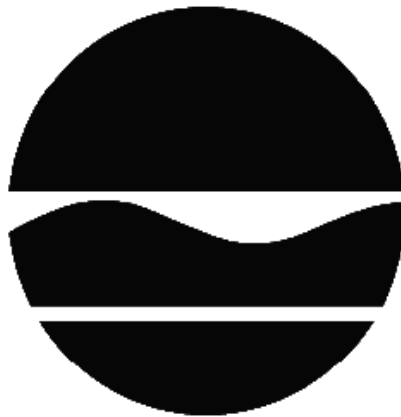


# RECORD OF DECISION

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Former C&B Dry Cleaners  
Environmental Restoration Project  
Jamestown, Chautauqua County  
Site No. E907028  
April 2013



Prepared by  
Division of Environmental Remediation  
New York State Department of Environmental Conservation

# **DECLARATION STATEMENT - RECORD OF DECISION**

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Former C&B Dry Cleaners  
Environmental Restoration Project  
Jamestown, Chautauqua County  
Site No. E907028  
April 2013

## **Statement of Purpose and Basis**

This document presents the remedy for the Former C&B Dry Cleaners site, an environmental restoration site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Former C&B Dry Cleaners site and the public's input to the proposed remedy presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

## **Description of Selected Remedy**

The elements of the selected remedy are as follows:

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

1. The remedial design program will include a Pre-Design Investigation to:
  - a. Verify arsenic soil contamination results and limits of in the northwest area of the site (SP-13 & SP 15).
  - b. Verify PCE soil contamination results in the vadose zone.
  - c. Determine the in-situ chemical oxidation parameters.
2. Excavation and off-site disposal of on-site soils located in the area of soils contaminated with arsenic which exceed SCGs for Protection of Groundwater of 16 ppm.
3. The removal and off-site disposal of VOC contaminated subsurface soil/fill down to the top of the groundwater table (unsaturated soil removal, 4-6 feet bgs), with the areal extent defined by the use of the protection of groundwater soil cleanup objectives to the extent practicable given any need to maintain structures in the excavation areas. The excavations will be backfilled in accordance with the requirements of 6NYCRR375-6.7(d).
4. Prior to backfilling the former UST area excavation, a chemical oxidant will be mixed in the groundwater in the bottom of the excavation to rapidly reduce the concentrations of PCE in this area. In-situ chemical oxidation is a technology used to treat chlorinated ethene compounds (a type of volatile organic compound) in saturated soils/groundwater. The process injects a chemical oxidant into the subsurface groundwater via injection wells, an infiltration gallery, or excavation. As the chemical oxidant comes into contact with the contaminant, an oxidation reaction occurs that breaks down the contaminant into relatively benign compounds such as carbon dioxide and water. Several chemical oxidants are commercially available such as: Fenton's Reagent, Permanganate (as either potassium and/or sodium permanganate), Persulfate (as either potassium and/or sodium persulfate), and ozone. These will be the chemical oxidants evaluated prior to the full implementation of this technology to determine the one best suited for this site. Laboratory and on-site pilot scale studies would be conducted to more clearly define design parameters.
5. Upon development, a sub-slab depressurization system (SSDS) will be installed in the Swanson Building. Upon obtaining all required permits/approvals, the existing sump in the building will be connected directly to the sanitary sewer.
6. The contaminated groundwater plume (on and off-site) will be treated in-situ with a Hydrogen Release Compound (HRC®), sodium lactate, molasses, vegetable oil and microbial colonies/stimulants to facilitate bioaugmentation for anaerobic enhanced reductive dechlorination (ERD). These chemical oxidants will be evaluated prior to the full implementation of this technology to determine the one best suited for this site. Laboratory and on-site pilot scale studies will be conducted to more clearly define design parameters. At this site, the material will be applied through injection wells screened in the saturated zone (approximately 6 to 9 feet bgs) to target the VOC contaminants of concern in groundwater. The method of injection and depth of injection will be determined by location of the contamination. It is estimated that the material will be

injected in three applications over several months.

7. Imposition of an institutional control in the form of an environmental easement for the controlled property that:
  - requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
  - allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
  - restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH;
  - requires compliance with the Department approved Site Management Plan.
  
8. A Site Management Plan is required, which includes the following:
  - a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in number 7 above.

Engineering Controls: The sub-slab depressurization system discussed in number 4 above.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- a provision for further investigation to refine the nature and extent of contamination in areas where access was previously hindered (i.e., under the Swanson Building) if and when the building is demolished;
- descriptions of the provisions of the environmental easement including any land use, groundwater and/or surface water use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

- b. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
- monitoring of groundwater to assess the performance and effectiveness of the remedy;
  - a schedule of monitoring and frequency of submittals to the Department;
  - monitoring for vapor intrusion for any buildings developed on and near the site, as may be required by the Institutional and Engineering Control Plan discussed above.
- c. An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
- compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
  - maintaining site access controls and Department notification; and
  - providing the Department access to the site and O&M records.

**New York State Department of Health Acceptance**

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

**Declaration**

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

April 15, 2013

Date



Robert W. Schick, P.E., Director  
Division of Environmental Remediation

# **RECORD OF DECISION**

Former C&B Dry Cleaners  
Jamestown, Chautauqua County  
Site No. E907028  
April 2013

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## **SECTION 1: SUMMARY AND PURPOSE**

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum. The remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This Record of Decision (ROD) identifies the selected remedy, summarizes the other alternatives considered, and discusses the reasons for selecting the remedy.

The 1996 Clean Water/ Clean Air Bond Act provides funding to municipalities for the investigation and cleanup of brownfields. Brownfields are abandoned, idled, or under-used properties where redevelopment is complicated by real or perceived environmental contamination. They typically are former industrial or commercial properties where operations may have resulted in environmental contamination. Brownfields often pose not only environmental, but legal and financial burdens on communities. Under the Environmental Restoration Program, the state provides grants to municipalities to reimburse up to 90 percent of eligible costs for site investigation and remediation activities. Once remediated, the property can then be reused.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

## **SECTION 2: CITIZEN PARTICIPATION**

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repository:

James Prendergast Library  
509 Cherry Street  
Jamestown, NY 14701  
Phone: 716-484-7135

A public meeting was also conducted. At the meeting, the findings of the remedial investigation (RI) and the alternatives analyses (AA) were presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period was held, during which verbal or written comments were accepted on the proposed remedy.

Comments on the remedy received during the comment period are summarized and addressed in the responsiveness summary section of the ROD.

### **Receive Site Citizen Participation Information By Email**

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at <http://www.dec.ny.gov/chemical/61092.html>

### **SECTION 3: SITE DESCRIPTION AND HISTORY**

**Location:** The former 0.22 acre C&B Dry Cleaners site is located in an urban area at 2241 Washington Street in the City of Jamestown, Chautauqua County. The site is 200 feet from the Pelican Manufacturing Site (Class C – Remediation complete), and 1,000 feet from the Former Jamestown City Landfill Site (Class 3 - contamination does not presently and is not reasonably foreseeable to constitute a significant threat to public health or the environment).

**Site Features:** The main site features include a gravel access road, parking areas, and the foundation remains of the former 2,170 sq ft building, demolished in 2003. The site is generally flat.

**Current Zoning and Land Use:** The site is currently inactive, and is zoned C-M, service and highway commercial. The surrounding parcels are currently used for a combination of commercial and utility right-of-ways. The nearest residential area is 0.3 miles east. A vacant commercial building, known as the Swanson Building, is located immediately adjacent to the site's southern property line.

**Past Use of the Site:** From 1931 to 1999, the site was used as a commercial dry cleaner. The County of Chautauqua obtained the property through foreclosure in 2001. In 2001, based on an Environmental Site Assessment (ESA) and site inspections, the County conducted an emergency removal action to remove various abandoned chemicals and solvents, including bleach, ethylene

based solvents, and tetrachlorethene (PCE). Two 500 gallon underground storage tanks (USTs), associated piping, UST contents (pea gravel and volatile liquid), and excavated soil/fill were also removed and disposed off-site during this 2001 emergency removal action. The building was demolished in 2003.

Site Geology and Hydrology: Overburden consists of 6-8 ft of sand/gravel/fill material underlain in some areas by a thin layer of peat, grading into a native gravelly sand and silt. Depth to groundwater is roughly 6 feet. Site groundwater flow is to the south.

A site location map is attached as Figure 1.

#### **SECTION 4: LAND USE AND PHYSICAL SETTING**

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the RI to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

#### **SECTION 5: ENFORCEMENT STATUS**

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

No PRPs have been documented to date.

Since no viable PRPs have been identified, there are currently no ongoing enforcement actions. However, legal action may be initiated at a future date by the state to recover state response costs should PRPs be identified.

#### **SECTION 6: SITE CONTAMINATION**

##### **6.1: Summary of the Remedial Investigation**

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,



- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor

### **6.1.1: Standards, Criteria, and Guidance (SCGs)**

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: <http://www.dec.ny.gov/regulations/61794.html>

### **6.1.2: RI Results**

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

Tetrachloroethylene (PCE)	Dichloroethylene (DCE)
Trichloroethylene (TCE)	Arsenic

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

### **6.2: Interim Remedial Measures**

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

### **IRM - Offsite Soil Vapor Mitigation**

A sub-slab vapor mitigation system was installed at an adjacent commercial building in September 2006 to address the high concentrations of PCE (190,000 ug/m<sup>3</sup>) found in soil vapor.

### **6.3: Summary of Environmental Assessment**

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary.

### **Nature and Extent of Contamination**

**Prior to Remediation:** Based on investigations to date, the primary contaminants of concern are chlorinated volatile organic compounds, including tetrachloroethylene [PCE], trichloroethylene [TCE], and cis-1, 2-dichloroethylene, and arsenic.

**Soil (on-site)** - Eleven different TCL VOCs were detected in on-site subsurface soils, but only PCE was detected at concentrations that exceeded the commercial SCGs in two locations. The PCE concentrations detected in soil were 8,000 parts per million (ppm) and 160 ppm exceeding the Protection of Groundwater Soil Cleanup Objectives (SCOs) of 1.3 ppm. The Protection of Groundwater SCO (1.3 ppm) is also exceeded at several other locations. Toxicity Characteristic Leaching Procedure (TCLP) analysis of subsurface soil from two areas indicate the concentration of PCE at 45 mg/l and 2.7 mg/l respectively, exceeding the regulatory threshold for characteristic hazardous waste of 0.7 mg/l. These samples were from near the former UST area and the former wash tubs.

Arsenic was detected at concentrations that exceeded the SCOs in the four on-site soil samples analyzed for TAL metals. Arsenic was detected at concentrations of 109 ppm and 85.7 ppm respectively, above the Protection of Groundwater and Commercial Use SCO of 16 ppm.

**Soil (off-site)** - VOCs detected in off-site subsurface soil were below the protection of groundwater SCO's.

**Groundwater (on-site)** - Seven different TCL VOCs were detected in all but one of seven on-site groundwater samples at concentrations that exceeded NYSDEC Class GA Groundwater Standard or Guidance Value. PCE concentrations ranged from 7 to 1,000,000 parts per billion (ppb), with the most significantly elevated concentrations detected in the groundwater sample in

the vicinity of the former USTs. The PCE concentrations in a majority of the remaining on-site locations were significantly above the SCG of 5.0 ppb, but none approached the levels near the former USTs. The other VOCs detected at concentrations above the SCGs include 1,1,2,2-tetrachloroethane; 1,1-dichloroethene (1,1-DCE); vinyl chloride; cis-1,2-dichloroethene; isopropylbenzene; and TCE.

**Groundwater (off-site)** - Five different TCL VOCs were detected in all but one of the 18 off-site groundwater samples at concentrations that exceeded SCGs. PCE was present in 15 of the 21 samples at concentrations above the SCG, with concentrations up to 9,200 ppb. These concentrations were highest near the project site and decreased significantly with distance from the project site. The other VOCs detected at concentrations above the SCGs included 1,1,1-trichloroethane, cis-1,2-DCE, vinyl chloride and TCE.

The results indicate that the groundwater contaminant plume has migrated off-site to the south of the project site, impacting the two adjacent properties. The contaminant plume also slightly extends beyond the northerly boundary of the site.

**Soil Vapor and Indoor Air** - Contaminants from the site have adversely impacted indoor air quality at an adjacent property north of the site which was addressed by an IRM. PCE was detected in the sub-slab soil vapor and in an ambient air sample collected from the basement and the results exceeded the NYSDOH indoor air guidance value for PCE. The concentration of PCE in the sub-slab sample was 190,000 ug/m<sup>3</sup>, and in the ambient air basement sample 2,200 ug/m<sup>3</sup>.

#### **6.4: Summary of Human Exposure Pathways**

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as exposure.

Access to the site is unrestricted. However, contact with contaminated soil or groundwater is unlikely unless people dig below the ground surface. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not contaminated by the site. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because there is no on-site building, inhalation of site contaminants in indoor air due to soil vapor intrusion does not represent a concern for the site in its current condition. However, the potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development. A sub-slab depressurization system (system that ventilates/removes the air beneath the building) has been installed in an off-site building to prevent the indoor air quality from being affected by the contamination in soil vapor beneath the building.

## **6.5: Summary of the Remediation Objectives**

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

### **Groundwater**

#### **RAOs for Public Health Protection**

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

### **Soil**

#### **RAOs for Public Health Protection**

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

#### **RAOs for Environmental Protection**

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

### **Soil Vapor**

#### **RAOs for Public Health Protection**

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

## **SECTION 7: SUMMARY OF THE SELECTED REMEDY**

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the alternatives analysis (AA) report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth

costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's remedy is set forth at Exhibit D.

The selected remedy is referred to as Alternative C: Vadose Soil Excavation and In-situ Soil/Groundwater Treatment.

The estimated present worth cost to implement the remedy is \$1,287,000. The cost to construct the remedy is estimated to be \$1,264,000 and the estimated average annual cost is \$5,300.

The elements of the selected remedy are as follows:

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

1. The remedial design program will include a Pre-Design Investigation to:
  - a. Verify arsenic soil contamination results and limits of in the northwest area of the site (SP-13 & SP 15).
  - b. Verify PCE soil contamination results in the vadose zone.
  - c. Determine the in-situ chemical oxidation parameters.
2. Excavation and off-site disposal of on-site soils located in the area of soils contaminated with arsenic which exceed SCGs for Protection of Groundwater of 16 ppm.
3. This alternative includes the removal and off-site disposal of the VOC contaminated subsurface soil/fill down to the top of the groundwater table (unsaturated soil removal, 4-6 feet bgs), with the areal extent defined by the use of the protection of groundwater soil

cleanup objectives to the extent practicable given any need to maintain structures in the excavation areas. The excavations will be backfilled in accordance with the requirements of 6NYCRR375-6.7(d).

4. Prior to backfilling the former UST area excavation, a chemical oxidant will be mixed in the groundwater in the bottom of the excavation to rapidly reduce the concentrations of PCE in this area. In-situ chemical oxidation is a technology used to treat chlorinated ethene compounds (a type of volatile organic compound) in saturated soils/groundwater. The process injects a chemical oxidant into the subsurface groundwater via injection wells, an infiltration gallery, or excavation. As the chemical oxidant comes into contact with the contaminant, an oxidation reaction occurs that breaks down the contaminant into relatively benign compounds such as carbon dioxide and water. Several chemical oxidants are commercially available such as: Fenton's Reagent, Permanganate (as either potassium and/or sodium permanganate), Persulfate (as either potassium and/or sodium persulfate), and ozone. These will be the chemical oxidants evaluated prior to the full implementation of this technology to determine the one best suited for this site. Laboratory and on-site pilot scale studies would be conducted to more clearly define design parameters.
5. Upon development, a sub-slab depressurization system (SSDS) will be installed in the Swanson Building. Upon obtaining all required permits/approvals, the existing sump in the building would be connected directly to the sanitary sewer.
6. The contaminated groundwater plume (on and off-site) will be treated in-situ with a Hydrogen Release Compound (HRC®), sodium lactate, molasses, vegetable oil and microbial colonies/stimulants to facilitate bioaugmentation for anaerobic reductive dechlorination (ERD). These chemical oxidants will be evaluated prior to the full implementation of this technology to determine the one best suited for this site. Laboratory and on-site pilot scale studies would be conducted to more clearly define design parameters.

At this site, the material would be applied through injection wells screened in the saturated zone (approximately 6 to 9 feet bgs) to target the VOC contaminants of concern in groundwater. The method of injection and depth of injection will be determined by location of the contamination. It is estimated that the material would be injected in three applications over several months.

7. Imposition of an institutional control in the form of an environmental easement for the controlled property that:
  - requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
  - allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH;
- requires compliance with the Department approved Site Management Plan.

8. A Site Management Plan is required, which includes the following:

- a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in number 7 above.

Engineering Controls: The sub-slab depressurization system discussed in number 4 above.

This plan includes, but may not be limited to:

- o an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
  - o a provision for further investigation to refine the nature and extent of contamination in areas where access was previously hindered (i.e., under the Swanson Building) if and when the building is demolished;
  - o descriptions of the provisions of the environmental easement including any land use, groundwater and/or surface water use restrictions;
  - o a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
  - o provisions for the management and inspection of the identified engineering controls;
  - o maintaining site access controls and Department notification; and
  - o the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
- b. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
- o monitoring of groundwater to assess the performance and effectiveness of the remedy;
  - o a schedule of monitoring and frequency of submittals to the Department;
  - o monitoring for vapor intrusion for any buildings developed on and near the site, as may be required by the Institutional and Engineering Control Plan discussed above.

- c. An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
  - o compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
  - o maintaining site access controls and Department notification; and
  - o providing the Department access to the site and O&M records.



## Exhibit A

### Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into two categories: volatile organic compounds (VOCs), and in-organics (metals). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 6.1.1 are also presented.

### Waste/Source Areas

As described in the RI report, waste and source materials were identified at the site and are impacting groundwater, soil, and soil vapor on and off-site.

Wastes are defined in 6 NYCRR Part 375-1.2(aw) and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375(au). Source areas are areas of concern at a site where substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium.

Existing wastes/source areas identified at the site include:

- Former UST Area – Elevated VOC concentrations were detected in soil samples collected in locations under and west of the former USTs.

Seven test pits were excavated from four to five feet deep across the site (Figure 3). Photoionization Detector (PID) measurements from soil collected from TP-3 ranged from 52 parts per million (ppm) at approximately two feet below grade to 4,000 ppm at approximately four feet below grade. The remaining four test pits revealed the presence of fill materials with significantly lower PID measurements. No sampling was conducted as a part of the test pit program.

Twenty soil probes, ten test borings and five monitoring well borings were completed across the project site, and 24 soil probes were advanced on adjoining properties during the first four sampling events (Figure 3). The visual and PID screening of the retrieved soil samples indicate the presence of contaminated soils beneath the central, eastern, south and south-central portions of the project site and on adjoining sites. The screening of the wet/saturated retrieved soil samples indicates the presence of contaminated groundwater in the above referenced areas. Based on PID measurements, the most significantly impacted soils are located in the eastern (SP-4) and south-central (MW-5) portions of the site. Additionally, the highest PID measurements in the wet/saturated soils are located in the central (SP-8) and the south-central (SP-18) portions of the site.

Although eleven (11) different TCL VOCs were detected in the on-site subsurface soil samples, only PCE was detected at concentrations that exceeded the SCOs. The highest PCE concentrations were detected at MW-5 and TB-5, 8,000 ppm and 160 ppm respectively (Figure 4), exceeding the SCO of 1.3 ppm for restricted use

protection of groundwater. MW-5 was placed in the area of the former USTs, and SP-4 was placed proximal to the former location of the wash tubs. Additionally, it should be noted the total concentrations of Tentatively Identified Compounds (TICs) is greater than 500 ppm in SP-9.

Based on elevated PID readings and visual/olfactory evidence of contamination, two samples were submitted for TCLP analysis at MW-5 and SP-4 (Table 6). PCE was detected in the sample collected from MW-5 at a concentration of 45 mg/L (TCLP), which is more than 64 times greater than the NYCRR Part 370 hazardous waste limit of 0.7 mg/L. The leachable concentration of PCE in the sample collected from SP-4 was 2.7 mg/L, nearly four times greater than the NYCRR Part 370 hazardous waste limit of 0.7 mg/L. These TCLP concentrations indicate that the impacted soils in these sample locations would be defined as a hazardous waste. The total PCE concentrations in the sample collected from SP-4 was similar to those detected in other samples collected at the project site, indicating that these other soils would likely also be defined as a hazardous waste. It is noted that all other RCRA characteristic analyses were within the regulatory values.

SVOCs, pesticides, herbicides, and metals were either not detected or were not detected at concentrations above the regulatory values in any of the soil/fill samples (Table 4).

Seven different TCL VOCs were detected in the off-site subsurface samples (Table 3). However, none of the compounds were detected at a concentration that exceeded its SCG. The results indicate that the soil contamination is limited to the project site.

Arsenic and iron were detected at concentrations that exceeded the SCGs in the four on-site soil samples analyzed for TAL metals Table 5. Similar levels of iron are also often encountered at similar concentrations in urban settings and/or in fill materials. However, arsenic was detected in SP-13 and SP-15 at concentrations of 109 ppm and 85.7 ppm, respectively, exceeding the protection of groundwater SCGs of 16 ppm and natural Eastern USA background values (3-12 ppm).

Certain waste/source areas identified at the site were addressed by the IRM(s) described in Section 6.2. The remaining waste/source area(s) identified during the RI will be addressed in the remedy selection process.

## Groundwater

### On-Site Groundwater

Seven different TCL VOCs were detected in all but one of seven on-site groundwater samples at concentrations that exceeded NYSDEC Class GA Groundwater Standard or Guidance Value (Tables 7 and 8). PCE concentrations ranged from 7 to 1,000,000 ppm, with the most significantly elevated concentrations detected in the groundwater sample from MW-5, in the vicinity of the former USTs (Figure 5). The PCE concentrations in the remaining on-site locations were also significantly above the NYSDEC Class GA Groundwater Standard or Guidance Value of 5 ppm, but none approached the levels in MW-5. The other VOCs detected at concentrations above the SCGs include: 1,1,2,2-tetrachloroethane; 1,1-dichloroethene (1,1-DCE); vinyl chloride; cis-1,2-dichloroethene; isopropylbenzene; and TCE.

The results indicate that the groundwater beneath the central and eastern portions of the project site has been significantly impacted by the VOC contamination present in the subsurface soil/fill at the project site. The results also indicate that the groundwater beneath the south-central portion of the site (MW-5 location) is the most severely impacted. This area is immediately down gradient of the former USTs and also adjacent to the southern property line of the project site. The southward groundwater flow direction and presence of high

concentrations of contaminants along the southern property boundary indicated the likelihood of down gradient impacts.

**Off-Site Groundwater**

Five different TCL VOCs were detected in at least one of the 21 off-site groundwater/surface water samples at concentrations that exceeded SCGs (Table 7).

PCE was present in 15 of the 21 samples at concentrations above the SCG, with concentrations ranging from 6 to 9,200 ppm. These concentrations were highest near the project site and decreased significantly with distance from the project site. The other VOCs detected at concentrations above the SCGs included 1,1,1-trichloroethane, cis-1,2-DCE, vinyl chloride and TCE.

The results indicate that the groundwater contaminant plume has migrated off-site to the south of the project site, impacting the Swanson and former Pelican properties (Figure 5). The SP-26 results indicate that the contaminant plume slightly extends beyond the northerly boundary of the site toward the adjacent Pal Joey’s restaurant, albeit at relatively low concentrations.

**Table #1 - Groundwater**

Detected Constituents	Concentration Range Detected (ppb) <sup>a</sup>	SCG <sup>b</sup> (ppb)	Frequency Exceeding SCG
<b>VOCs</b>			
1,1,2,2-Tetrachloroethane	ND - 7	5	1 of 10
Tetrachloroethene	ND – 1,000,000	5	26 of 33
Trichloroethene	ND – 4,800	5	21 of 33
1,1-Dichloroethene	ND - 27	5	1 of 33
cis-1,2-Dichloroethene	ND – 1,100	5	15 of 33
Vinyl chloride	ND - 120	2	4 of 33
	ND -	5	
<b>Inorganics</b>			
Iron	5,140 – 22,300	300	5 of 5
Lead	8.9 – 25.5	25	1 of 5
Manganese	453 – 5,690	300	5 of 5
Sodium	35,200 – 112,000	20,000	5 of 5
Thallium	ND – 3.2	0.5	1 of 5

a - ppb: parts per billion, which is equivalent to micrograms per liter, ppm, in water.

b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Based on the findings of the RI, the past disposal of hazardous waste has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: tetrachloroethene (PCE); trichloroethene (TCE); 1,1-dichloroethene (1,1-DCE); cis-1,2-dichloroethene; vinyl chloride.

### Soil

A total of 59 soil borings were installed on and off-site. Forty soil samples were collected from 32 of the soil borings. Sample depths ranged from ground surface to 15-feet below ground surface (bgs).

Of the 40 soil samples collected, four samples were analyzed for full Target Compound List (TCL)/Target Analyte List (TAL). Thirty-five samples were analyzed for TCL VOCs only; with the exception of one sample. This sample was analyzed for TCL VOCs as well as TCLP VOCs. Finally, one sample was analyzed for TCLP SVOCs, PCBs, pesticides, herbicides, and inorganics (metals), as well as reactivity, corrosivity, and ignitability.

Of the 40 soil samples collected on-site (Table 1), one or more of the SCGs were exceeded in seven samples. Three soil samples, MW-5, SP-4, and TB-5 exceeded the SCG for PCE (Table 3). Four soil samples, SP-3, SP-11, SP – 13, and SP-15 exceeded SCGs for one or more inorganic parameters (Table 5).

**Table #2 - Soil**

Detected Constituents	Concentration Range Detected (ppm) <sup>a</sup>	Unrestricted SCG <sup>b</sup> (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG <sup>c</sup> (ppm)	Frequency Exceeding Restricted SCG Protection of Groundwater
<b>VOCs</b>					
Tetrachloroethene	ND – 8,000,000	1,300	15 of 31	1,300	15 of 31
Trichloroethene	ND – 2,800	470	17 of 31	470	17 of 31
cis-1,2-Dichloroethene	ND – 5,600	250	9 of 19	250	9 of 19
Toluene	ND – 1,400	700	6 of 19	700	6 of 19
<b>Inorganics</b>					
Arsenic	85-109	13	2 of 4	16	2 of 2

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for protection of groundwater Use, unless otherwise noted.

d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.

Based on the findings of the Remedial Investigation, the past disposal of hazardous waste has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are tetrachloroethene (PCE), trichloroethene (TCE), and arsenic.

### **Surface Water**

No site-related surface water contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for surface water.

### **Sediments**

No site-related sediment contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for sediment.

### **Soil Vapor**

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of soil vapor, sub-slab soil vapor under structures, and indoor air inside structures. At this site, due to the presence of buildings in the impacted area, a full suite of samples were collected to evaluate whether soil vapor intrusion was occurring.

A passive soil gas survey was completed at the site to identify potential source areas of volatile organic compound contamination. Fourteen locations were included in the survey and the results indicate the presence of PCE and TCE at elevated concentrations.

Soil vapor samples were collected at an off-site adjacent building structure to the north of the site in order to determine potential impacts to indoor air quality from contaminants originating from the site (Table 9). Sub-slab, basement ambient, and outdoor ambient air samples were collected and analyzed for VOCs. Results of the indoor air quality sampling indicated an elevated concentration of PCE in the basement ambient air sample in excess of its respective SCG.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of soil vapor. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of soil vapor to be addressed by the remedy selection process are, tetrachloroethene (PCE) and trichloroethene (TCE).

## **Exhibit B**

### **Description of Remedial Alternatives**

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

#### **Alternative A: No Action**

The No Further Action Alternative recognizes the off-site vapor mitigation system completed by the IRM described in Section 6.2; and the 2001 County emergency removal action to remove various abandoned chemicals/solvents, two 500 gallon Underground Storage Tanks (UST's), and excavated soil/fill described in Section 3. This alternative is evaluated as a procedural requirement as a basis for comparison, leaves the site in its present condition, and does not provide any additional protection of the environment.

#### **Alternative B: Limited Excavation and In-Situ Soil/Ground Water Treatment**

This alternative includes the limited excavation and off-site disposal of the most contaminated subsurface soil/fill in the vicinity of MW-5 (to the top of groundwater table at a minimum) in addition to the arsenic contaminated area, and backfill with clean fill. The remaining VOC contaminated soil/fill would be treated in-situ using chemical oxidation.

In-situ chemical oxidation of the groundwater plume would consist of a series of injections throughout the contaminated groundwater plume.

Upon development, a sub-slab depressurization system (SSDS) will be installed in the Swanson Building and the existing sump in the building, upon obtaining all required permits/approvals, connected directly to the sanitary sewer.

This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment from any contamination identified at the site.

Present Worth: .....	\$1,653,000
Capital Cost:.....	\$1,612,000
Annual Costs:.....	\$5,300

#### **Alternative C: Vadose Soil Excavation, and In-Situ Groundwater Treatment**

This alternative includes the removal and off-site disposal of the VOC contaminated subsurface soil/fill down to the top of the groundwater table (unsaturated soil removal, 4-6 feet bgs), and backfill with clean fill. In addition, the arsenic contaminated soil area will be excavated to meet the SCO.

In-situ remediation of the contaminated groundwater plume would consist of both a chemical oxidant (MW-5 Area) and HRC elsewhere throughout the on-site and off-site VOC plume. In-situ chemical oxidation of the groundwater plume would consist of a series of injections throughout the contaminated groundwater plume.

Upon development, a sub-slab depressurization system (SSDS) will be installed in the Swanson Building. The existing sump in the building, upon obtaining all required permits/approvals, would be connected directly to the

sanitary sewer.

This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment from any contamination identified at the site.

Present Worth: ..... \$1,287,000  
Capital Cost:..... \$1,264,000  
Annual Costs:..... \$5,300

**Alternative D: Complete Excavation and Ex-Situ Ground Water Treatment By Air Stripping**

This alternative involves the complete excavation and disposal of the contaminated soil/fill down to native soil and/or clay (13 feet bgs) and backfilling with clean fill.

Treatment of the contaminated groundwater plume will consist of an ex-situ pump and treat system using an air stripper. This system includes additional groundwater collection trenches to intercept the groundwater flow, drain it by gravity to a sump chamber at the lowest point of the site, and pump to the treatment unit prior to direct discharge to the municipal sanitary sewer. Trenches placed along the Swanson Building to collect off-site contaminated groundwater underneath the building in also included.

A remedial design is required to determine the treatment unit and discharge requirements.

This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment from any contamination identified at the site.

Present Worth: ..... \$2,070,000  
Capital Cost:..... \$2,030,000  
Annual Costs:..... \$30,000

**Alternative E: Complete Excavation and In-Situ Ground Water Treatment**

This alternative involves the complete excavation and disposal of the contaminated soil/fill down to native soil and/or clay (13 fbg) and backfilling with clean fill. In-situ remediation of the contaminated groundwater plume would consist of both a chemical oxidant in the most significantly impacted area (MW-5 Area, 480 sq. ft.) and HRC elsewhere throughout the VOC plume which extends south through the Swanson site and onto the Pelican site (total plume estimated at 25,000 sq. ft.). In-situ remediation of the contaminated groundwater plume would consist of 500 HRC injections to be placed one per 50 sq. ft. over the contaminated groundwater plume.

This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment from any contamination identified at the site.

Present Worth: ..... \$2,241,100  
Capital Cost:..... \$2,200,200  
Annual Costs:..... \$5,300

A restoration to per-disposal or unrestricted conditions alternative was not provided in the RI/AAR. However, it is possible Alternative E could achieve all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meet the unrestricted soil clean objectives listed in Part 375-6.8(a).



**Exhibit C****Remedial Alternative Costs**

<b>Remedial Alternative</b>	<b>Capital Cost (\$)</b>	<b>Annual Costs (\$)</b>	<b>Total Present Worth (\$)</b>
Alternative A – No Further Action	0	0	0
Alternative B – Limited Excavation, In-situ Soil/Groundwater	\$1,612,000	\$5,300	\$1,653,000
Alternative C – Vadose Soil Excavation, In-situ Groundwater,	\$1,264,000	\$5,300	\$1,287,000
Alternative D – Complete Excavation, Ex-situ Groundwater	\$2,030,000	\$30,000	\$2,070,000
Alternative E – Complete Excavation, In-situ Groundwater	\$2,200,200	\$5,300	\$2,241,100

## **Exhibit D**

### **SUMMARY OF THE PROPOSED REMEDY**

The Department has selected Alternative C, Vadose Soil Excavation of Contaminated Soil/Fill, and In-Situ Soil/Groundwater Treatment as the remedy for this site. Alternative C will achieve the remediation goals for the site by the excavation and off-site disposal of hazardous soil/fill occurring in the vadose zone. The remaining contaminated soil/fill will be treated in-situ using chemical oxidation.

Upon development, a sub-slab depressurization system (SSDS) will be installed in the Swanson Building. The existing sump in the building, upon obtaining all required permits/approvals, will be connected directly to the sanitary sewer.

The entire contaminated groundwater plume on and off-site will be treated in-situ with injection of Hydrogen Releasing Compound (HRC) into the saturated zone. A chemical oxidant will be used in the most significantly impacted area near MW-5 to rapidly reduce the concentration of PCE. Annual groundwater monitoring/reporting for a period of 5 years will be conducted to measure the effectiveness of the treatment program. A review of the groundwater remedy will be conducted after 5 years of operation. The elements of this remedy are described in Section 7. The limits of the selected remedy are shown in Figure 5.

### **Basis for Selection**

The selected remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the AA report.

The selected remedy, Alternative C, is significantly different than Alternative D recommended by the FS. Alternative C recommends excavation of contaminated soil/fill in the vadose zone and utilizes in-situ rather than ex-situ soil/groundwater treatment.

When reviewing other alternatives, both Alternative D and E include complete excavation of soil fill down to native soil and/or the clay layer, adding stability issues associated with excavation to 13 feet bgs along the adjacent Swanson building. However, Alternative D proposes the installation of an ex-situ pump and treat groundwater system. Alternative E proposes treatment of the entire on and off-site contaminated groundwater plume with in-situ chemical oxidation. In contrast to conventional pump and treat techniques, in-situ chemical treatment of the groundwater is thought to provide a faster and more complete contaminate removal and/or destruction process. However, the costs evaluation in the AA Report associated with Alternative D (Complete Excavation, Pump and Treat, and in-situ chemical treatment) are less than Alternative E (Complete Excavation and in-situ chemical treatment).

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

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

The selected remedy, Alternative C, will satisfy this criterion by removing the contaminated soils in the vadose zone and properly disposing off-site, addressing the source of groundwater contamination, the most significant

threat to public health and the environment. The entire on and off-site contaminated groundwater plume will be remediated in-situ (i.e., Swanson and Pelican Sites to the south). Alternative C accomplishes this goal without the added risks/costs of additional soil excavation and disposal to native soil (13 feet bgs), backfilling with clean fill, site machinery and trucking, dealing with volumes of groundwater during excavation, and the engineering issues (stability) of excavation along the adjacent Swanson building.

Alternative A (No Action) does not provide sufficient protection to public health and the environment and will not be evaluated further.

Alternative B, would satisfy this criterion by only removing the most contaminated soils in the MW-5 area to the top of the groundwater table (unsaturated soils) and properly disposing off-site, addressing the main source of groundwater contamination, the most significant threat to public health and the environment. The remaining contaminated soils/fill will be treated in situ using chemical oxidation. The entire on and off-site contaminated groundwater plume will be remediated in-situ (i.e., Swanson parcel and Pelican Site to the south).

Alternative D, complete removal of contaminated soils and properly disposing off-site, would also satisfy this criterion but to a lesser degree and/or with lower certainty due to the questionable effectiveness and length of time required to meet remediation goals using a pump and treat groundwater treatment system. It's also not clear if Alternative D would treat the entire contaminant plume extending onto the Pelican site to the south.

Alternative E would satisfy this criterion by complete removal of the contaminated soils to native clay (approximately 13 feet) and properly disposing off-site, addressing the source of groundwater contamination, the most significant threat to public health and the environment. The entire on and off-site contaminated groundwater plume will be remediated in-situ (i.e., Swanson parcel and Pelican Site to the south).

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

Alternatives C complies with SCGs to the extent practicable by excavation of contaminated soils and treatment of the entire on and off-site contaminant plume. Alternative C thereby addresses source areas of contamination, and also creates the conditions necessary to restore groundwater quality to pre-disposal conditions and/or the extent practicable.

Alternatives B, D, and E also comply with this criterion.

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

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

Long-term effectiveness is best accomplished by all the Alternatives B,C, D, and E, involving varying degrees of excavation of the contaminated overburden soils and treatment of the entire contaminated groundwater plume.

Alternative C accomplishes this goal without the added risks/costs of additional soil excavation and disposal, backfilling with clean fill, site machinery and trucking, dealing with volumes of groundwater during excavation, and the engineering issues (stability) of excavation along the adjacent Swanson.

Alternative D proposes ex-situ pump and treat groundwater technology, which adds yearly operations and maintenance cost and additional remediation time depending on effectiveness of the collection system (i.e., extracting contaminants desorbed in soil and air stripping).

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

Alternatives B, C, D, and E, excavation and off-site disposal of contaminated soil, and groundwater treatment reduces the toxicity, mobility and volume of on-site waste by transferring the material to an approved off-site location.

Although free-phase product was not observed during the investigation, the elevated groundwater concentrations indicate that free-phase product may exist. If present, this product may rest on the clay layer observed in some of the deeper borings. Alternative D and E both include complete excavation of the contaminated soil to native soils and/or the clay layer, allowing removal of possible free phase product resting on the clay layer.

However, Alternative D relies on an ex-situ pump and treat system with questions regarding its effectiveness, the length of time needed to complete remediation goals, and limited treatment of the entire contaminated groundwater plume (i.e., Swanson parcel but not the Pelican Site).

Alternative E would permanently reduce the toxicity, mobility and volume of contaminants by complete excavation of on-site contaminated soil, coupled with in-situ chemical treatment of the entire contaminated groundwater plume.

Alternatives B and C rely on in-situ soil/groundwater remediation to accomplish these goals.

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

Alternatives B, D and E have short-term construction impacts, requiring engineering controls including handling the volumes of contaminated excavation groundwater, and stability issues of excavating along the adjacent Swanson building.

Alternative D, requiring a groundwater pump and treat system, would have short-term and yet to be determined long-term impacts to the environment due to the increase in green house emissions, noise, exhaust, and odor concerns to the neighborhood. These impacts are difficult to impossible to control by engineering means, and directly related to the duration of the activity, which in this case is in question. A pump and treat system could

extend 5, 10, 20, 30 years before achieving the remediation goals. These impacts must also be evaluated especially considering the close proximity of a commercial business on the adjoining property to the north (Pal Joey's,) and also numerous commercial businesses in close proximity to the west.

Alternative B relies on in situ chemical oxidation of the remaining soil/fill (outside MW-5) in the vadose zone, requiring added time and questionable results. Alternative C excavates contaminated soils as much as practically possible in the vadose zone, thus the length of time needed to achieve the remedial objectives will be minimized.

Alternatives B and C are less intrusive to the environment/neighborhood and are the simplest alternatives to implement.

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

Alternative C is the most technically and administrative feasible alternative to implement as contaminated soils are excavated to the extent practical and the entire groundwater plume is treated in-situ. Upon development, and after obtaining all required permits/approvals, the existing sump in the Swanson building would be connected directly to the sanitary sewer.

Contaminated soil excavation is limited to the vadose zone. This removes the soil stability issue of soil excavation along the northern length of the adjacent Swanson building to native soil (13 feet bgs).

Alternative D would require the design of an effective pump and treat system, and possible permits due to noise, odor concerns, and treated groundwater discharged to the sanitary sewer.

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

Alternative D proposes ex-situ pump and treat groundwater technology, adding yearly operations and maintenance costs, additional time depending its effectiveness (i.e., extracting contaminants desorbed in soil and air stripping). The capital investment for a typical ex-situ plant has been estimated to be between three and seven times higher than for the in-situ systems. Whereas the in-situ methods had virtually no operating costs, the ex-situ costs each year have been estimated to be nearly as high as the initial capital costs.

**8. Land Use.** When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

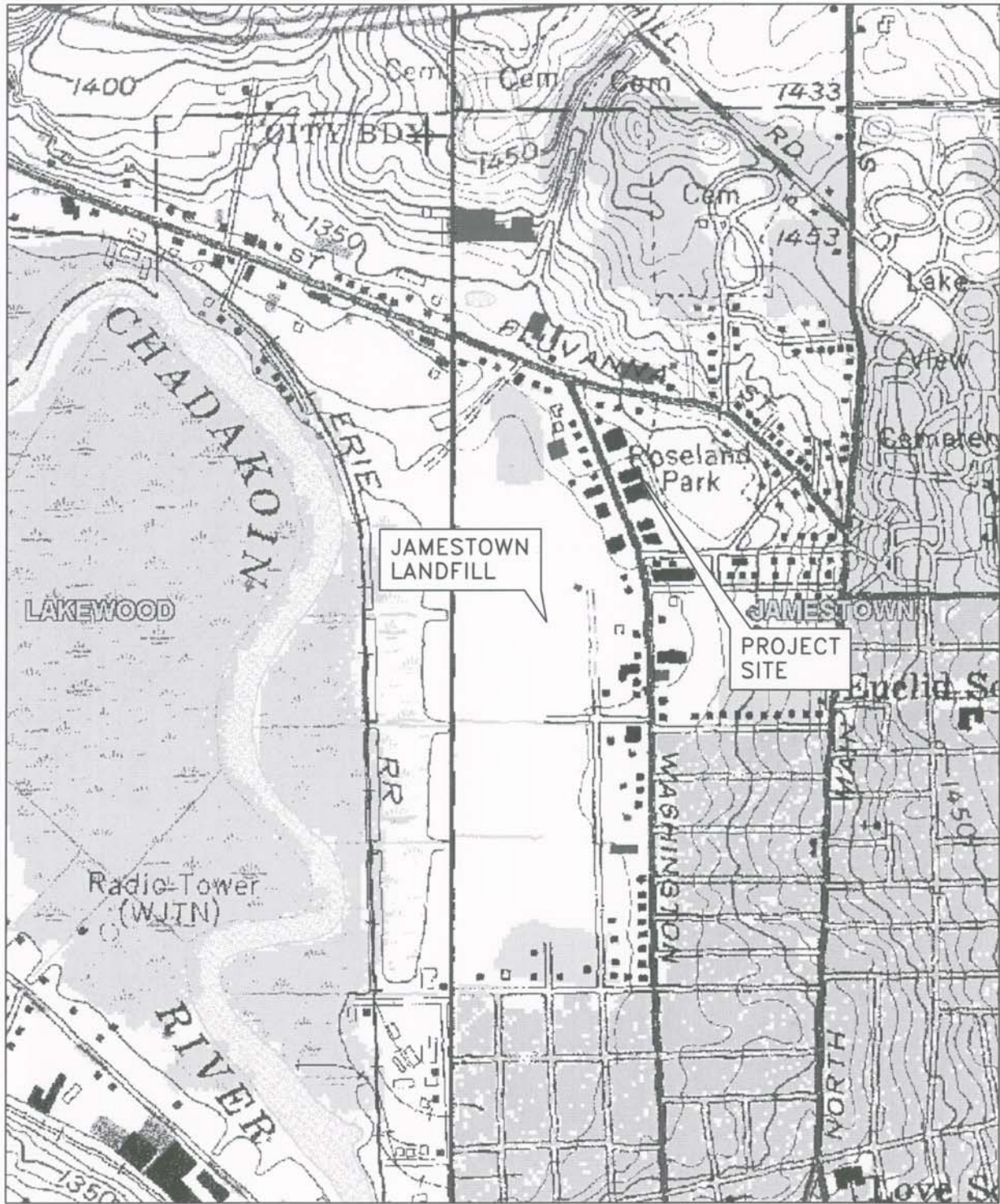
This current zoning and anticipated future use for this site is commercial. Alternatives B, C, D, and E, removal of contaminated soils and remediation of the entire contaminated groundwater plume (on and off-site), would allow this site to meet commercial use restrictions.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

**9. Community Acceptance.** Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. Since the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative C is being selected because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.

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U.S.G.S. JAMESTOWN QUADRANGLE

### SITE LOCATION MAP

**TVGA**  
CONSULTANTS

1000 MAPLE ROAD, P.O. BOX H  
ELMA, NEW YORK 14059-0264  
P. 716.655.8842  
F. 716.655.0937  
www.tvga.com

C & B CLEANERS  
2241 WASHINGTON STREET  
JAMESTOWN, NEW YORK 14701

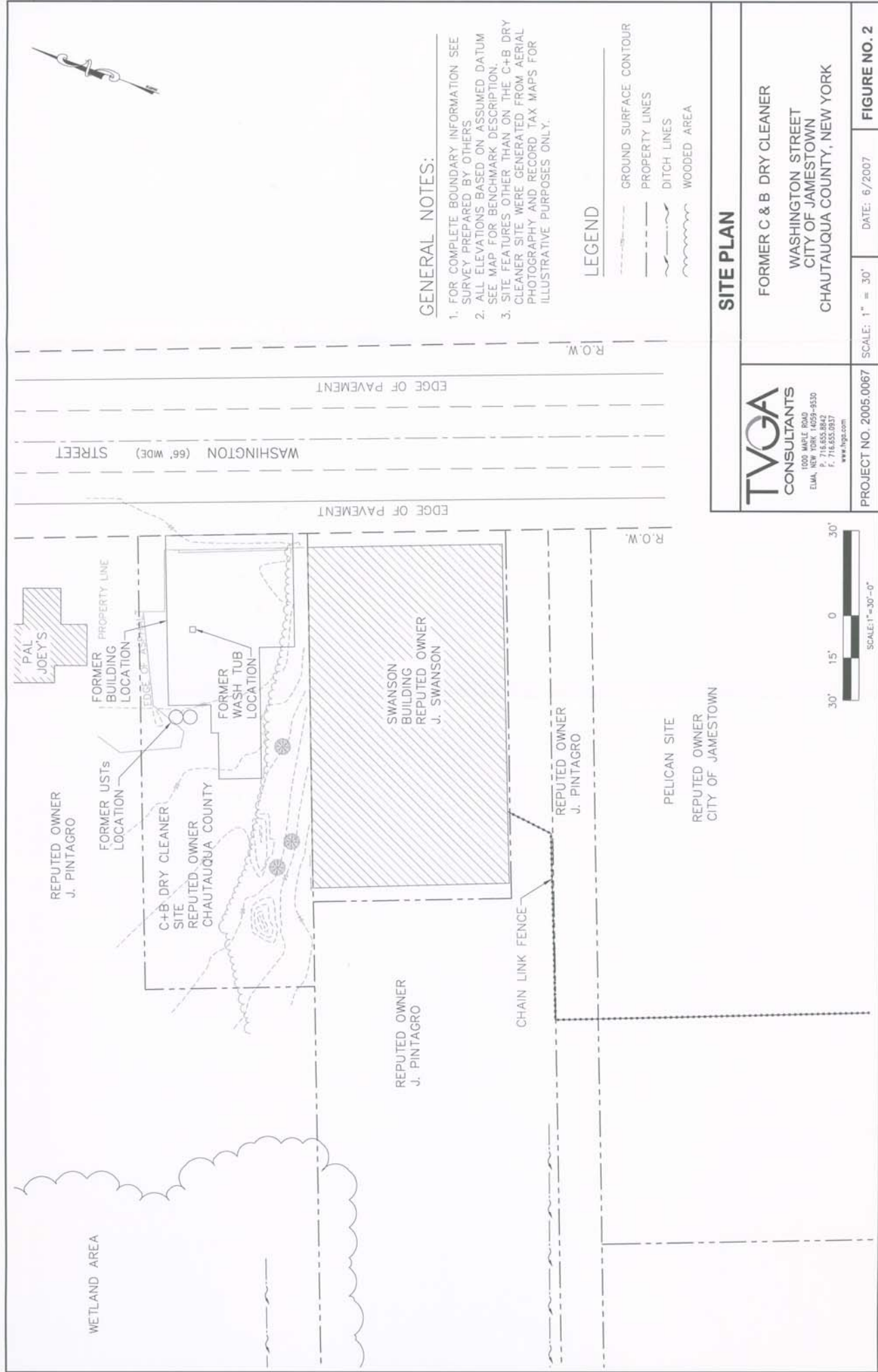
PROJECT NO. 0020031

SCALE 1" = 1000'

DATE: 07/08/03

FIGURE NO. 1





**GENERAL NOTES:**

1. FOR COMPLETE BOUNDARY INFORMATION SEE SURVEY PREPARED BY OTHERS
2. ALL ELEVATIONS BASED ON ASSUMED DATUM SEE MAP FOR BENCHMARK DESCRIPTION.
3. SITE FEATURES OTHER THAN ON THE C+B DRY CLEANER SITE WERE GENERATED FROM AERIAL PHOTOGRAPHY AND RECORD TAX MAPS FOR ILLUSTRATIVE PURPOSES ONLY.

**LEGEND**

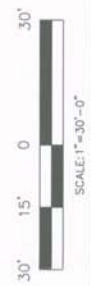
- GROUND SURFACE CONTOUR
- - - PROPERTY LINES
- - - DITCH LINES
- ~~~~~ WOODED AREA

**SITE PLAN**

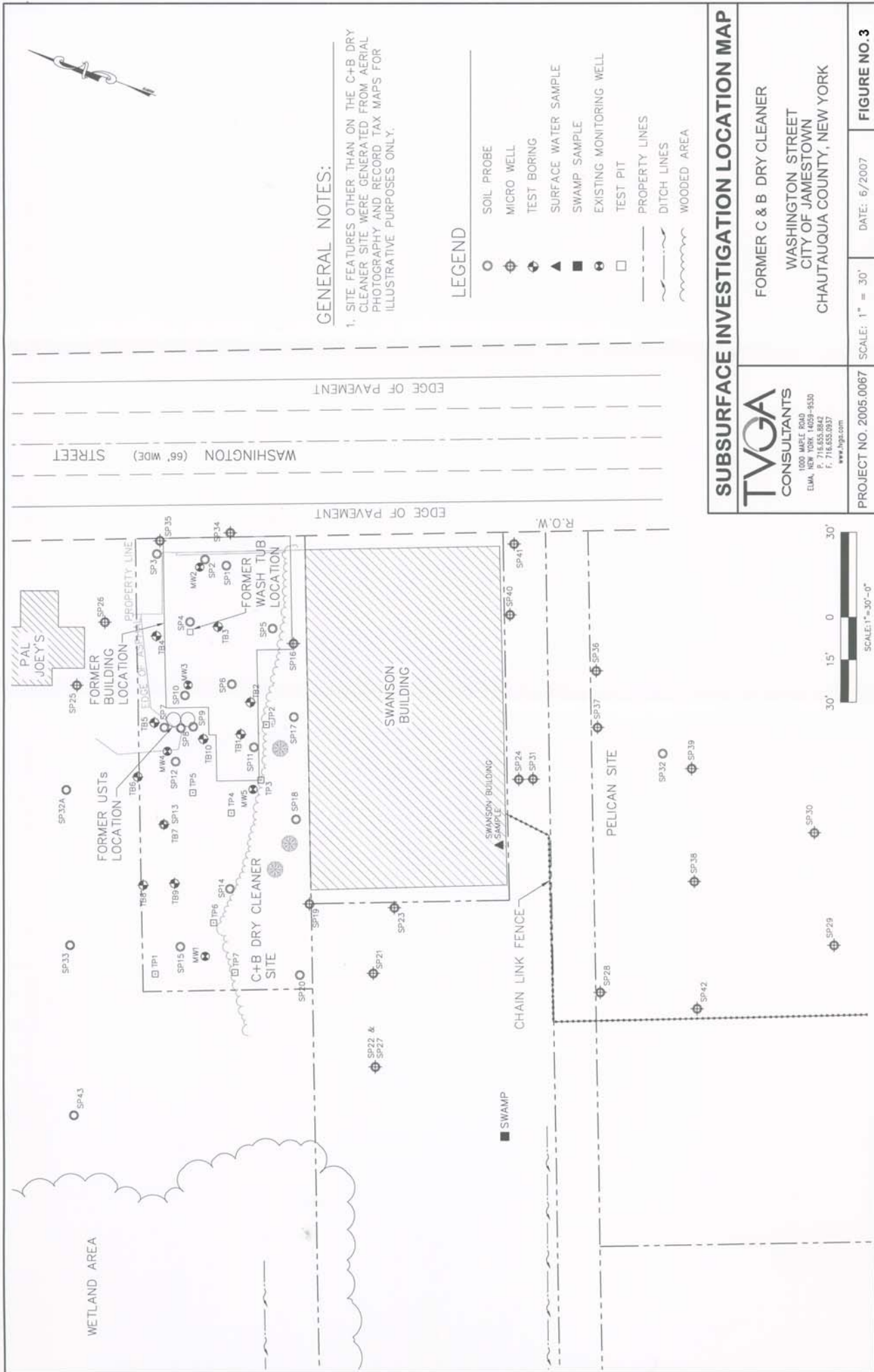
FORMER C & B DRY CLEANER  
 WASHINGTON STREET  
 CITY OF JAMESTOWN  
 CHAUTAQUA COUNTY, NEW YORK

**TVGA**  
 CONSULTANTS  
 1000 WARE ROAD  
 ELMA, NEW YORK 14059-9530  
 P. 716.655.8842  
 F. 716.655.0937  
 www.tvga.com

PROJECT NO. 2005.0067 SCALE: 1" = 30' DATE: 6/2007 **FIGURE NO. 2**







**GENERAL NOTES:**

1. SITE FEATURES OTHER THAN ON THE C+B DRY CLEANER SITE WERE GENERATED FROM AERIAL PHOTOGRAPHY AND RECORD TAX MAPS FOR ILLUSTRATIVE PURPOSES ONLY.

**LEGEND**

- SOIL PROBE
- ⊕ MICRO WELL
- ⊕ TEST BORING
- ▲ SURFACE WATER SAMPLE
- SWAMP SAMPLE
- ⊕ EXISTING MONITORING WELL
- TEST PIT
- PROPERTY LINES
- - - DITCH LINES
- ~ WOODED AREA

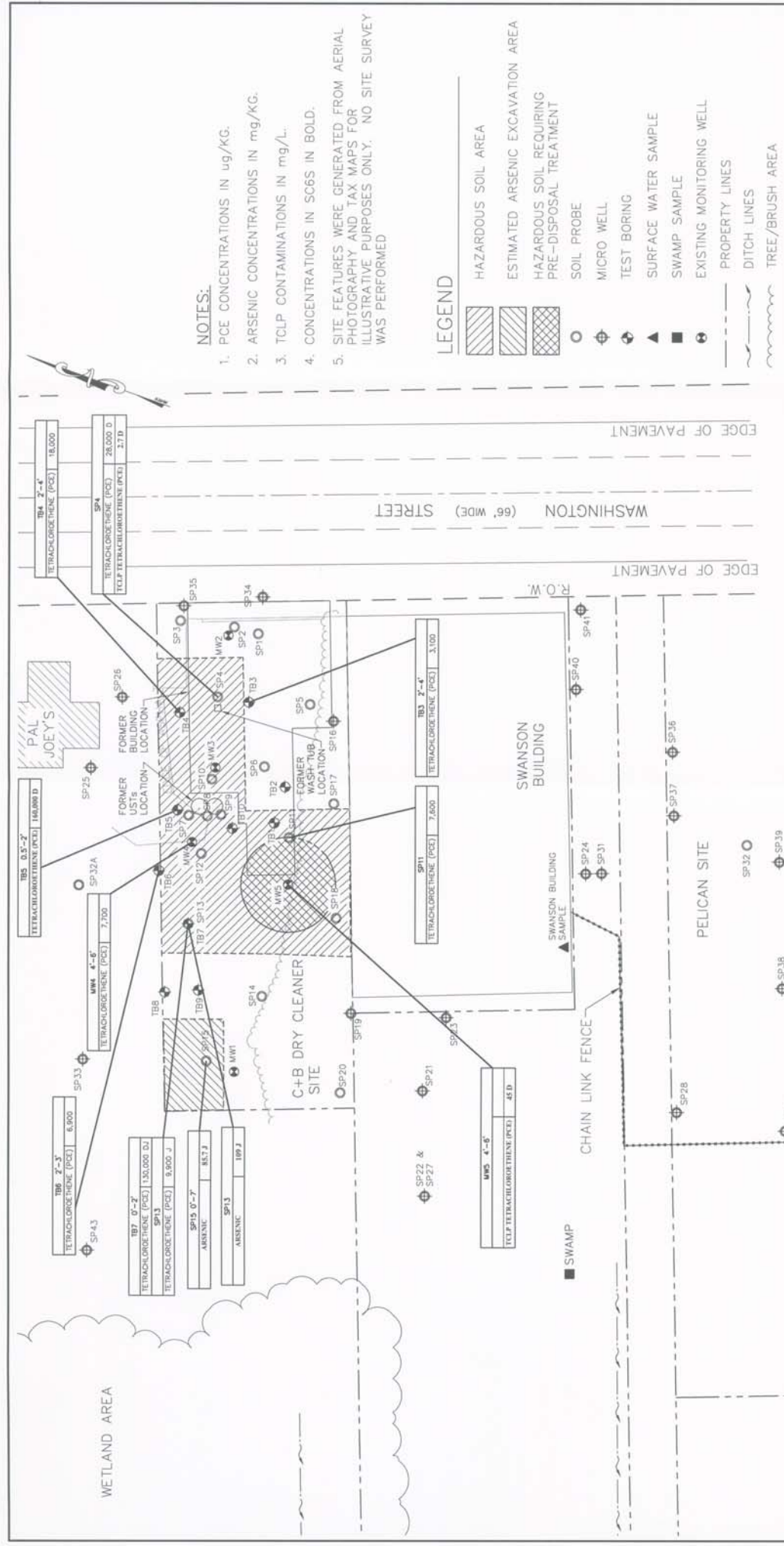
**SUBSURFACE INVESTIGATION LOCATION MAP**

**TVGA**  
 CONSULTANTS  
 1000 WALLE ROAD  
 ELMA, NY 14059-6530  
 P. 716.655.8842  
 F. 716.655.0937  
 www.tvga.com

FORMER C & B DRY CLEANER  
 WASHINGTON STREET  
 CITY OF JAMESTOWN  
 CHAUTAUKUA COUNTY, NEW YORK

PROJECT NO. 2005.0067 SCALE: 1" = 30' DATE: 6/2007 **FIGURE NO. 3**





- NOTES:**
- PCE CONCENTRATIONS IN ug/KG.
  - ARSENIC CONCENTRATIONS IN mg/KG.
  - TCLP CONTAMINATIONS IN mg/L.
  - CONCENTRATIONS IN SC6S IN BOLD.
  - SITE FEATURES WERE GENERATED FROM AERIAL PHOTOGRAPHY AND TAX MAPS FOR ILLUSTRATIVE PURPOSES ONLY. NO SITE SURVEY WAS PERFORMED.

- LEGEND**
- HAZARDOUS SOIL AREA
  - ESTIMATED ARSENIC EXCAVATION AREA
  - HAZARDOUS SOIL REQUIRING PRE-DISPOSAL TREATMENT
  - SOIL PROBE
  - MICRO WELL
  - TEST BORING
  - SURFACE WATER SAMPLE
  - SWAMP SAMPLE
  - EXISTING MONITORING WELL
  - PROPERTY LINES
  - DITCH/BRUSH AREA

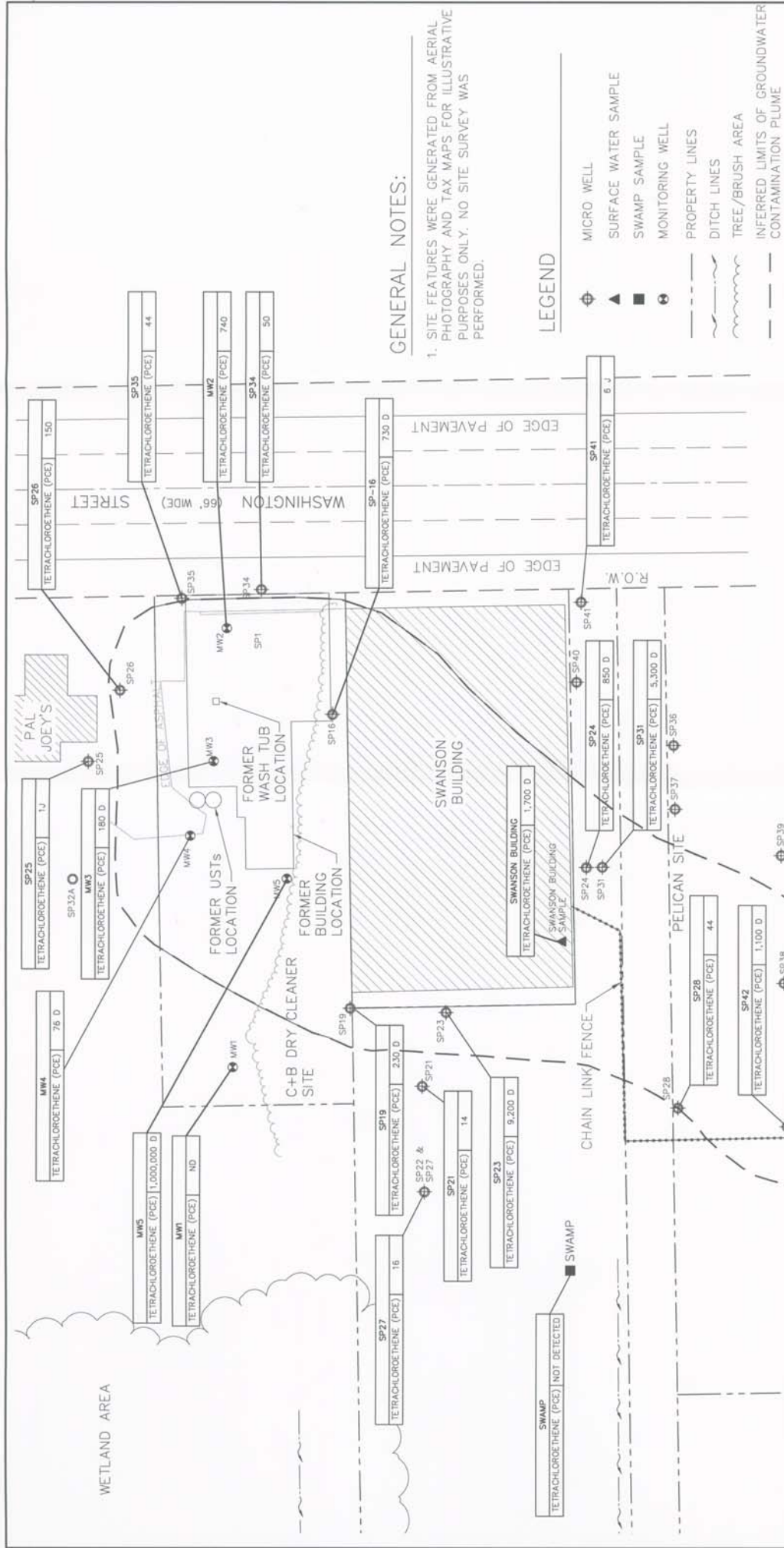
**CONTAMINANTS OF CONCERN IN SOIL**

**TVGA CONSULTANTS**  
 1000 MAPLE ROAD  
 ELMA, N.Y. 14059-9550  
 P. 716.655.8849  
 F. 716.655.0937  
 www.tvga.com

FORMER C & B DRY CLEANER  
 WASHINGTON STREET  
 CITY OF JAMESTOWN  
 CHAUTAUKUA COUNTY, NEW YORK

PROJECT NO. 2005.0067 SCALE: 1" = 30' DATE: 8/2007 **FIGURE NO. 4**





**GENERAL NOTES:**

1. SITE FEATURES WERE GENERATED FROM AERIAL PHOTOGRAPHY AND TAX MAPS FOR ILLUSTRATIVE PURPOSES ONLY. NO SITE SURVEY WAS PERFORMED.

**LEGEND**

- MICRO WELL
- SURFACE WATER SAMPLE
- SWAMP SAMPLE
- MONITORING WELL
- PROPERTY LINES
- DITCH LINES
- TREE/BUSH AREA
- INFERRERD LIMITS OF GROUNDWATER CONTAMINATION PLUME

**TETRACHLOROETHENE CONCENTRATIONS IN GROUNDWATER**

**TVGA CONSULTANTS**  
1000 MAPLE ROAD  
ELMA, NEW YORK 14609-4530  
TEL. 716.655.0957  
F. 716.655.0957  
www.tvga.com

**FORMER C & B DRY CLEANER**  
WASHINGTON STREET  
CITY OF JAMESTOWN  
CHAUTAUQUA COUNTY, NEW YORK

\\2005.0067\05-088\Site\Drawings\007-Map\01-Tetra-Monitoring-Site-Maps-06-2007.dwg (2/7/2007 10:13:31 AM) 10/2005.0067

# **APPENDIX A**

## **Responsiveness Summary**

# Responsiveness Summary

**Former C&B Dry Cleaners  
Environmental Restoration Project  
City of Jamestown, Chautauqua County, New York  
Site No. E907028**

The Proposed Remedial Action Plan (PRAP) for the Former C&B Dry Cleaners Site was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 2, 2013. The PRAP outlined the remedial measure proposed for the contaminated soil, surface water, and groundwater at the Former C&B Dry Cleaners site.

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

A public meeting was held on March 4, 2013, which included a presentation of the remedial investigation alternative analysis (RI/AA) for the Former C&B Dry Cleaners site, as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. A comment letter dated March 29, 2013 from Phillips Lytle LLP was received and is included in this responsiveness summary.

The public comment period for the PRAP ended on March 31, 2013.

The following are the comments received, with the Department's responses:

**COMMENT 1:** Approximately 205 dump trucks of contaminated soil will be removed from the site. How will it affect the adjacent restaurant business?

**RESPONSE 1:** During construction, measures will be taken to minimize possible short-term impacts on area businesses, the general public, and the environment. For example, the construction activities will be coordinated with the adjacent property owners in advance to allow for planning and alternate parking. The public will be kept informed throughout the process. Additionally, a Remedial Design will be prepared for the site which will include such details as the type(s) of monitoring required during construction (e.g., dust monitoring); site access and haul route(s); and requirements to keep area roads clear of debris due to site excavation.

**COMMENT 2:** Will there be fencing around the site to protect patrons of the adjacent restaurant and prevent materials or equipment used during remediation from being stored on adjoining properties?

**RESPONSE 2:** Once work begins, fencing will be placed around the work areas to secure any equipment and materials stored on-site and limit site access during construction. Storage of any

materials and/or equipment will be limited to the Former C&B Dry Cleaners site, unless otherwise agreed upon by the property owner.

**COMMENT 3:** Is the cost of the Swanson Building remediation included in the PRAP?

**RESPONSE 3:** Yes. The cost associated with addressing the contamination which has been identified beneath the Swanson building is included in the selected remedy.

**COMMENT 4:** If the roof were fixed on the Swanson Building there would be much less groundwater in the building.

**RESPONSE 4:** All costs associated with any improvements to the physical condition of the Swanson building are the responsibility of the owner.

**COMMENT 5:** Who's obligated to pay for and provide operations and maintenance on any Sub Slab Depressurization System (SSDS) required?

**RESPONSE 5:** The site is currently in the State's Environmental Restoration Program (ERP). Upon issuance of the Record of Decision, the Department will assess the best path forward in consultation with Chautauqua County and the ERP remedial party. Whether the site is remediated under the ERP or with funds from the State Superfund program, the Department will seek to recover costs from any identified responsible party to install any systems required because of contamination from this site.

**COMMENT 6:** If a SSDS was placed in the Swanson building, will it be similar to one previously installed by DEC?

**RESPONSE 6:** It would be similar to, but larger than a typical house installation, due to the larger basement area.

**COMMENT 7:** If the air monitoring system were put in the Swanson Building now, would it help?

**RESPONSE 7:** The Swanson building is currently unoccupied. A SSDS will only be required should the building become occupied in the future. The structural condition of the Swanson building would need to be evaluated prior to entry due to safety concerns.

**COMMENT 8:** Will the remediation cost be more cost effective if the Swanson Building were demolished? If so, would the county or State acquire and pay for the demolition?

**RESPONSE 8:** The remediation costs are not significantly affected by the existence or non-existence of the Swanson building. However, the location of the Swanson building along the site's southern property line limits the depth of excavation due to stability issues. Also, with the building in place, in-situ soil/groundwater remediation under the footprint of the Swanson building is limited. The presence of the building may have an effect on the length of time to achieve the remedial goals under and/or around the Swanson building due to these access limitations.



**A comment letter dated March 29, 2013 was received from Phillips Lytle LLP representing an adjacent property owner, which included the following comments:**

**COMMENT 9:** If access is required for off-site private property we request advance notice of at least 24 hours. We would also request a copy of all results for any future air, water or soil samples taken on the private property.

**RESPONSE 9:** A minimum twenty-four hour advance notice will be given to complete any required work or sampling on private property. This can be documented at the time access is granted. A copy of any results of air, water and soil samples taken on the private property will also be provided.

**COMMENT 10:** It is our understanding that NYSDEC has chosen Alternative C, which includes vadose soil excavation and in-situ groundwater treatment. To the extent that there are alternatives that would more aggressively treat off-site contamination, my client requests that consideration be given to the methods/alternatives that would address the off-site contamination as quickly as possible.

**RESPONSE 10:** Prior to remediation, additional pre-design investigation will be conducted to better define the limits of contamination and the most effective on and off-site treatment parameters.

**COMMENT 11:** My client also notes that while NYSDEC is considering the use of institutional and engineering controls for the remedial site, my client does not seek to restrict the future transfer or use of her property with institutional or engineering controls for contamination that originated off site.

**RESPONSE 11:** Any future construction on a property(s) that has off-site contamination emanating from the Former C&B Dry Cleaner Site will require sampling to determine if a SSDS or other actions will be needed. Access to install any such system from the property owner would also include continued access for the necessary operation, maintenance and monitoring of any SSDS installed due to off-site contamination from the Former C&B Dry Cleaner Site. Actions that may be recommended are not limited to the installation of a SSDS. No institutional controls on off-site property will be requested.

**COMMENT 12:** My client requests that following the remedial work, NYSDEC provide my client with a Notice of Completion for the work related to her property.

**RESPONSE 12:** Upon remediation of the Former C&B Dry Cleaners Site, a Fact Sheet will be issued to notify the public of the work performed. A Final Engineering Report will also be made available to the property owner and public.

# **APPENDIX B**

## **Administrative Record**



# **Administrative Record**

**Former C&B Dry Cleaners  
Environmental Restoration Project  
City of Jamestown, Chautauqua County, New York  
Site No. E907028**

1. Proposed Remedial Action Plan for the Former C&B Dry Cleaners Site, dated February 2013, prepared by the Department.
2. The Department and the City of Jamestown entered into a State Assistance Contract, Contract No. C302584, October 6, 2004.
3. A comment letter dated March 29, 2013 from Phillips Lytle LLP
4. Additional documents used as the basis of the Record of Decision:
  - a. “Work Plan for the Site Investigation at Former C&B Cleaners”, April 2005, prepared by TVGA Consultants.
  - b. “Remedial Investigation/Alternatives Analysis Report”, December 2007, prepared by TVGA Consultants.