RECORD OF DECISION

Friedrichsohn Cooperage
Operable Unit Number 01: Remedial Program, On-site and Off-site Soil
State Superfund Project
Waterford, Saratoga County
Site No. 546045
December 2012

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

DECLARATION STATEMENT - RECORD OF DECISION

Friedrichsohn Cooperage
Operable Unit Number: 01
State Superfund Project
Waterford, Saratoga County
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Statement of Purpose and Basis

This document presents the remedy for Operable Unit Number: 01: Remedial Program, On-site and Off-site Soil of the Friedrichsohn Cooperage site, a Class 2 inactive hazardous waste disposal 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, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for Operable Unit Number: 01 of the Friedrichsohn Cooperage 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:

Based on the results of the investigations at the site, the Interim Remedial Measures (IRMs) that have been performed, and the evaluation presented here, the Department is selecting a Site Cover to achieve the restricted residential soil cleanup objectives (SCOs). In addition to the site cover system (an engineering control), this remedy also includes Institutional Controls (ICs). The Department believes that this remedy is protective of human health and the environment and satisfies the remediation objectives described in Exhibit B.

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Green remediation principals and techniques will be implemented to the extent feasible in the 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 gas 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.

2. A site cover will be required to allow for restricted residential use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks or a soil cover. Where the soil cover is required it will be a minimum of two feet of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. In areas where the SCOs for restricted residential use for the contaminants of concern identified in Section 6.1 are exceeded, and the intended final grade will not permit 2 feet of cover, the soil will be excavated to depth of 2 feet to achieve the SCOs for restricted residential use. Contamination below a depth of 2 feet will be left in place. Excavated soil will be disposed of at an approved facility. Approximately 285 cubic yards of soil will be removed. The final grade for the site should be consistent with the current grade or the future anticipated use. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

3. This decision document recognizes the work previously completed under the Interim Remedial Measures. Off-site soil was excavated to depth to achieve residential Soil Cleanup Objectives. Off-site soil which exceeded the residential use SCOs for cadmium, chromium, PCBs and several semi-volatile organic compounds was excavated and disposed of off-site. Clean fill which complies with 6 NYCRR Part 375-6.7(d) was then brought in to replace the excavated soil and re-establish the final grades at each location. This work was documented in the off-site IRM report. The soil removal action was not complete at one off-site location adjacent to the site, on the bank of the canal. PCB in the soil at this location still exceeds the soil cleanup objective of 1 ppm. This location is not accessible to the public and will be addressed in the near future during the implementation of remedial activity for OU-3.

Off-site IRM work also included installation of a sub-slab depressurization system (SSDS) at a commercial property which was part of the former Cooperage Barrel yard. The SSDS system will continue to be operated, evaluated, monitored and maintained.

4. For the on-site property, 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 restricted residential, 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;

- 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.
- Requires compliance with the Department approved Site Management Plan.

5. 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 Paragraph 4 above.

Engineering Controls: The site cover discussed in Paragraph 2, and the sub-slab depressurization system discussed in Paragraph 3 above.

This Site Management 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;

- descriptions of the provisions of the environmental easement including the land use and groundwater use restrictions;

- and 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.

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.

December 17,2012

Date

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

RECORD OF DECISION

Friedrichsohn Cooperage
Waterford, Saratoga County
Site No. 546045
December 2012

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 hazardous wastes 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 hazardous wastes at this site, as more fully described in this document, has contaminated various environmental media. 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 New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

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:

Town of Waterford, Town Clerks Office
Attn: Darlene Dziarcak
65 Broad Street
Waterford, NY 12188
Phone: 235-8282

A public meeting was also conducted. At the meeting, the findings of the remedial investigation

(RI) and the feasibility study (FS) 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 Friedrichsohn Cooperage site is located at 153-155 Saratoga Avenue in the Town of Waterford. The 0.45 acre property has approximately 315 feet of frontage on Saratoga Avenue (Route 32). The Old Champlain Canal borders the parcel on the side opposite the road. There are residential properties adjacent to the site along Saratoga Avenue. Residential properties and commercial properties are located across Saratoga Avenue from the site.

Site Features: The site is currently a vacant lot.

Current Zoning/Use: The site is zoned residential (R-75) and is served by public water supply system and public storm water and sanitary systems. The commercial parcel opposite the site is located on property formerly known as the Friedrichsohn Cooperage Lot and was used by the cooperage to store drums.

Historic Use: A cooperage operated at this location from 1817 to 1991. During its early operations, the cooperage made and refurbished wooden kegs and barrels. When the cooperage closed in 1991 the primary business had been cleaning and refurbishing metal drums. Industrial facilities in the area used materials shipped in drums in their industrial process. Drums would be sent to the cooperage to be cleaned, repainted and sold. Since a drum considered empty may contain up to an inch of residue, material likely remained in many drums sent to the cooperage. It is also possible that the cooperage received drums that were full of material. During the cooperage's cleaning and refurbishing operation some portion of the contents of the drums were spilled, lost or disposed of. The lost contents of these drums, and components of the cleaning and painting operation, comprise the contamination now found at the site.

During its most recent history, the cooperage operated out of five buildings at the site. Three of the five were constructed as slab on grade. Two of the buildings contained structures below

grade. One of the buildings had a basement area, below grade, where the sumps were located. It is believed a majority of the wastes disposed of at the site, the lost contents of the drums and components of the cleaning and painting operation, were disposed of at or through this building. Contamination from the building ended up in the environment by: (a) sinking out of the bottom of the sumps and into the ground, (b) flowing out the basement windows onto the ground and into the canal, or (c) out a drain pipe and onto the ground and/or into the canal. One of the buildings on the southwest end of the site is labeled as a garage on historical drawings and had a service trench associated with it. The service trench is below grade and provided access to the undercarriage of vehicles.

Inspection and examination of the abandoned business in 1994 found thousands of metal drums, some leaking, and the buildings themselves unstable and in poor condition. At the request of the Department, the USEPA began an emergency removal action in 1994. Activities completed by the EPA between 1994 and 1996 included removing for proper off-site disposal: 322.5 tons of contaminated sludge/soil, 9,000 gallons of liquid waste, and 3,767 drums. The cooperage buildings were torn down and clean fill was brought in to replace contaminated soil which had been removed from the sump area of Building 3. This emergency removal action properly addressed the exposed wastes present at the site.

In the spring of 2008 the Department collected samples of the soil, groundwater, and the surface water and sediments in the canal. The results of this sampling formed the basis for the listing of the site in December 2008 as a class 2 on the NYS Registry of Inactive Hazardous Waste Disposal sites.

Operable Units: The site was divided into three operable units. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination. Operable Unit 1 is comprised of the on-site and off-site soil at the former cooperage site (except for the soil in the on-site source area which is subject to the OU-3 remedy). Operable Unit 2 is comprised of the on-site and off-site groundwater. Operable Unit 3 is comprised of the sediments in the Old Champlain Canal between O'Conner Drive and Burton Avenue as well as the on-site source area.

Site Geology and Hydrogeology: Groundwater at the site has been found to be 4 to 6 feet below the ground surface at the site of the former cooperage. In general groundwater flows to the southeast toward the Mohawk River. Surface water from the former cooperage generally flows to the Old Champlain Canal. Surface water in the area can flow to the canal or to the Mohawk River.

Operable Unit (OU) Number 01 is the subject of this document.

A Record of Decision was issued previously for OU 03. A Record of Decision will be issued for OU 02 in the future.

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 restricted-residential use (which allows for commercial use and 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.

The PRPs for the site, documented to date, include:

Estate of Mary Sausville

Schenectaday International, Inc.

General Electric Company

GE Healthcare as successor in interest to Nycomed, Inc.

Agway, Inc.

Agway Energy Products, LLC, Successor to Agway Petroleum Co

Metalworking Lubricants Company

Mohawk Paper Mills, Inc.

Reliable Motor Pars Company

Monsey Products Co.

American Chemical and Equipment Co., Inc.

Jones Chemicals, Inc.

C.O. Jelliff Corp.

Eastman Kodak as successor in interest to Sterling Winthrop

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. PRPs are subject to legal actions by the state for recovery of all response costs the state incurs.

In accordance with New York State regulations, the Department will make all reasonable efforts to obtain a commitment by one or more PRPs to undertake the remedial program. If an agreement cannot be reached, the Department will evaluate the site for further action under the State Superfund.

Any PRP or other member of the public who has information regarding PRPs for the site is encouraged to forward the information to the Department.

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:

- air
- groundwater
- surface water
- soil
- sediment
- soil vapor
- indoor air
- sub-slab 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 hazardous waste 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 for this Operable Unit at this site is/are:

PCB-AROCLOR 1248	CHROMIUM
ARSENIC	CHLOROBENZENE
HEXACHLOROBENZENE	TETRACHLOROETHYLENE (PCE)
LEAD	TRICHLOROETHENE (TCE)
MERCURY	CADMIUM
DICHLOROETHYLENE	BARIUM
VINYL CHLORIDE	CRESOL(S)
DDT	PCB-AROCLOR 1242
PHENOL	

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

- groundwater
- soil
- sediment

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 Site Fencing

IRM, OU-1A. An eight foot tall, lockable, chain link fence has been installed around the former Friedrichsohn Cooperage property to prevent access. Warning signs have been installed on the fencing.

Off-site Soil Removal

IRM, OU-1B. The removal of surface soil was conducted at five adjacent residential properties in September and October of 2010 to address the off-site impacts resulting from the operations at the cooperage. Soil impacted by chromium and cadmium was removed at one property, soil impacted by semivolatile organic compounds was removed at two properties, and soil impacted by PCBs was removed from two properties. Approximately 370 cubic yards of contaminated soil were removed and replaced with clean fill and topsoil. Three underground storage tanks and associated contaminated soil were also removed from two locations. The tanks were determined to have contained fuel oil. A report documenting these activities was published in April of 2012.

Off-site Soil Vapor Intrusion Mitigation

IRM, OU-1C. Based on soil vapor sampling conducted during the remedial investigation, a sub slab depressurization system was installed in a commercial building located at 158 Saratoga Ave. The system includes multiple vacuum points and 3 phase 2.5 horsepower regenerative blower. The system is in place and has been operating successfully since January of 2010.

Off-site IRM Soil Removal

This IRM is a continuation of OU1B. Operations removed an additional 140 cubic yards of soil from an area contaminated with chromium and cadmium within a residential yard. The removed soil was disposed of at the Town of Colonie Landfill. Clean fill was used to replace the material removed, topsoil and grass seed was put in place over the clean fill.

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 for OU 01.

Wastes disposed of at the former Cooperage remain in the subsurface soil inside the fence, in the sediments in the canal, and in the groundwater. Contamination in the sediments, soil, and groundwater include volatile organic contaminants, heavy metals, PCBs, pesticides and semivolatile organic contaminants.

The contaminants considered to be the primary contaminants of concern are PCBs; chlorinated compounds (tetrachloroethene, trichloroethene, dichloroethene, vinyl chloride, and chlorobenzene); BTEX (benzene, toluene, ethylbenzene and xylene); phenol and dimethylphenol; hexachlorobenzene; and metals (arsenic, barium, chromium, and lead). Contamination is found in the highest concentrations in the sediment adjacent to the site and in the subsurface soils in the center of the site approximately in the location of the former cooperage Building number 3.

Soil contamination resulting from past operations at the cooperage is present in several locations in the subsurface soil at levels exceeding the soil cleanup objectives for restricted residential use and the protection of groundwater. Contamination is associated with the former automobile service trench on the south end of the site, beneath the 1400 sq ft concrete slab in the center of the site, near the current gate in the chain link fence, and in two locations below the broken slab at the north end of the site. The contamination in these locations includes metals, PCBs and BTEX compounds.

Subsurface contamination exists beneath the location of former Building 3 of the cooperage operations where the sumps were located. PCBs were found in the soil at levels above 50 ppm which characterize the contamination as hazardous waste. The groundwater in this location has been impacted by chlorobenzene, BTEX, chlorinated solvents, phenol, methyl phenol, and PCBs. The contaminated soil and hazardous waste at this on-site location is a source of the contamination in the sediments in the canal and the groundwater.

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.*

The site is completely fenced, which restricts public access. However, persons who enter the site could contact contaminants in the soil by walking on the site, digging or otherwise disturbing the soil. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. People may come in contact with contaminants present in the shallow canal sediments while entering or exiting the canal during recreational activities. 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. Since there are no on-site buildings, 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 for any future on-site development. In addition, sampling indicates soil vapor intrusion is not a concern for off-site residential buildings with the exception of one off-site commercial structure where the potential for soil vapor intrusion is being addressed through operation of a mitigation system.

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:

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.

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 feasibility study (FS) 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 the Site Cover remedy.

The estimated present worth cost to implement the remedy is $426,000. The cost to construct the remedy is estimated to be $271,000 and the estimated average annual cost is $10,100.

The elements of the selected remedy are as follows:

Based on the results of the investigations at the site, the Interim Remedial Measures(IRMs) that have been performed, and the evaluation presented here, the Department is selecting a Site Cover to achieve the restricted residential soil cleanup objectives (SCOs). In addition to the site cover system (an engineering control), this remedy also includes Institutional Controls (ICs). The Department believes that this remedy is protective of human health and the environment and satisfies the remediation objectives described in Exhibit B.

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Green remediation principals and techniques will be implemented to the extent feasible in the 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 gas 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.

2. A site cover will be required to allow for restricted residential use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks or a soil cover. Where the soil cover is required it will be a minimum of two feet of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. In areas where the SCOs for restricted residential use for the contaminants of concern identified in Section 6.1 are exceeded, and the intended final grade will not permit 2 feet of cover, the soil will be excavated to depth of 2 feet to achieve the SCOs for restricted residential use. Contamination below a depth of 2 feet will be left in place. Excavated soil will be disposed of at an approved facility. Approximately 285 cubic yards of soil will be removed. The final grade for the site should be consistent with the current grade or the future anticipated use. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

3. This decision document recognizes the work previously completed under the Interim Remedial Measures. Off-site soil was excavated to depth to achieve residential Soil Cleanup Objectives. Off-site soil which exceeded the residential use SCOs for cadmium, chromium, PCBs and several semi-volatile organic compounds was excavated and disposed of off-site. Clean fill which complies with 6 NYCRR Part 375-6.7(d) was then brought in to replace the excavated soil and re-establish the final grades at each location. This work was documented in the off-site IRM report. The soil removal action was not complete at one off-site location adjacent to the site, on the bank of the canal. PCB in the soil at this location still exceeds the soil

cleanup objective of 1 ppm. This location is not accessible to the public and will be addressed in the near future during the implementation of remedial activity for OU-3.

Off-site IRM work also included installation of a sub-slab depressurization system (SSDS) at a commercial property which was part of the former Cooperage Barrel yard. The SSDS system will continue to be operated, evaluated, monitored and maintained.

4. For the on-site property, 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 restricted residential, 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;
- 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.
- Requires compliance with the Department approved Site Management Plan.

5. 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 Paragraph 4 above.

Engineering Controls: The site cover discussed in Paragraph 2, and the sub-slab depressurization system discussed in Paragraph 3 above.

This Site Management 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;

- descriptions of the provisions of the environmental easement including the land use and groundwater use restrictions;

- and 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.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation (RI) for all environmental media that were evaluated in OU-1. 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 four categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/ polychlorinated biphenyls (PCBs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil the Restricted Use SCGs, for restricted residential use, identified in Section 6.1.1 are also presented.

Waste/Source Areas

As described in the March 2011 ROD for OU-3, waste/source materials identified at the Friedrichsohn Cooperage site will be addressed in the remedy for OU-3 which includes removal of the waste/soil down to bedrock in the source area to be transported off-site for disposal. The source area (shown on Figure 2) is located in the central portion of the site.

Groundwater

Groundwater samples were collected from overburden, interface and bedrock monitoring wells (Figure 3). The samples were collected to assess groundwater conditions on and off-site. The results indicate that contamination in shallow groundwater on-site and downgradient of the source area (OU-3), exceeds the SCGs for volatile organic compounds, semivolatile organic compounds, PCBs, pesticides, and inorganics. In the monitoring wells upgradient of the site, iron, sodium, manganese and magnesium exceeded the guidance values for inorganic compounds. The groundwater data is presented here for discussion in evaluation of the remedial actions proposed to address the OU-1 soil contamination.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b]	Frequency Exceeding SCG
VOCs			
ACETONE	0-1,800	50	2/17
BENZENE	0-190	1	6/18
CHLOROBENZENE	0-170	5	4/18
1,2-DICHLOROBENZENE	0-30	3	1/18
1,2-DICHLOROETHANE	0-4.2	0.6	1/18
1,4-DICHLOROBENZENE	0-34	3	1/18
CIS-1,2-DICHLOROETHENE	0-250	5	5/18
ETHYLBENZENE	0-650	5	2/16
ISOPROPYLBENZENE	0-170	5	2/18
METHYLENE CHLORIDE	0-99	5	2/18
O-XYLENE	0-550	5	3/16
STYRENE	0-120	5	3/18
TETRACHLOROETHENE(PCE)	0-86	5	1/18
TOLUENE	0-25,000	5	5/18
TRICHLOROETHENE (TCE)	0-240	5	1/18
VINYL CHLORIDE	0-31	2	4/18
SVOCs			
ACENAPHTHENE	0-21,000	20	2/18
ANTHRACENE	0-10,000	50	2/18
BIPHENYL (DIPHENYL)	0-5,000	5	2/18
BIS(2-ETHYLHEXYL) PHTHALATE	0-160	5	2/18
FLUORENE	0-41,000	50	1/17

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b]	Frequency Exceeding SCG
2,4-DICHLOROPHENOL	0-1.6	1	1/18
2,4-DIMETHYLPHENOL	0-240	1	1/15
PHENANTHRENE	0-79,000	50	1/17
PHENOL	0-80,000	1	5/18
PYRENE	0-4,600	50	2/18
Inorganics			
ANTIMONY	0-13.7	3	4/19
ARSENIC	0-168	25	3/19
BARIUM	6.08-1,860	1,000	1/19
BERYLLIUM	0-7.82	3	1/19
CHROMIUM, TOTAL	0-197	50	3/19
IRON	28.5-9,920	300	11/19
LEAD	0-321	25	3/19
MAGNESIUM	269-46,200	35,000	2/19
MANGANESE	5.24-5,080	300	11/19
MERCURY	0-1.03	0.7	1/19
NICKEL	0-626	100	3/19
SELENIUM	0-45.4	10	3/19
SODIUM	0-1,501,900	20,000	16/19
Pesticides/PCBs			
PCB-1242 (AROCLOR 1242)	0-53,000	0.09	5/19

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, 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: PCE, TCE, *cis*-1,2-dichlorothene, benzene, toluene, o-xylene, ethylbenzene, chlorobenzene, phenol, 2,4-dimethylphenol, PCB-1242, lead, and arsenic. Groundwater contamination identified within the fence around the property is located only within the source area. The source area soil (shown in Figure 2) will be addressed as described in the March 2011 OU-3 ROD. The groundwater will be addressed as part of the OU-2 operable unit.

Soil

Surface and subsurface soil samples were collected at the site during the RI. Additional sampling of the subsurface soil was conducted on-site. The surface and subsurface soil sample locations are shown on Figure 4. Surface soil samples were collected from a depth of 0-2 inches to assess direct human exposure. Subsurface soil samples were collected from a depth of 2 - 20 feet to assess the extent of the soil contamination and the potential impacts to groundwater. The results indicate that soils at the site exceed the unrestricted SCG for volatile and semi-volatile organics, PCBs, pesticides, and metals. The following tables present analytical results for samples collected on-site outside of the source area.

Table 2 - On-site Surface Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted
VOCs					
None					
SVOCs					
Benzo(a)anthracene	0.13 to 4.4	1	2/6	1	2/6
Benzo(a)pyrene	0.18 to 4.8	1	2/6	1	2/6
Benzo(b)fluoranthene	0.24 to 6.0	1	2/6	1	2/6
Chrysene	0.18 to 5.5	1	2/6	1	2/6
Dibenzo(a,h)Anthracene	0.08 to 0.96	0.33	3/6	0.33	3/6

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted
Indeno (1,2,3-cd)Pyrene	0.094 to 4.8	0.5	3/6	0.5	3/6
Phenol	0.43 to 9.4	0.33	4/6	100	0/6
Inorganics					
Cobalt	5.8 to 12.0	9.5[d]	1/ 6		
Chromium	14.9 to 621	30	3/6	180	1/6
Lead	15.9 to 3,000	63	5/6	400	1/6
Mercury	0.021 to 0.35	0.18	4/6	0.8	0/6
Pesticides/PCBs					
Total PCBs	0.013 to 0.88	0.100	3/6	1	0/6

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 Restricted Residential Use, unless otherwise noted.

d – SCG: Site Background

Table 3 - On-site Subsurface Soil Outside of Source Area

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted
VOCs					
Acetone	0 to 0.280	0.05	5/52	100	0/52
Xylenes	0 to 3.0	0.26	3/52	100	0/52
SVOCs					
2-Methyl Naphthalene	0 to 56	NA	NA	0.41[d]	3/52
Benzo(a)anthracene	0 to 11	1	3/52	1	3/52
Benzo(a)pyrene	0 to 9.7	1	3/52	1	3/52
Benzo(b)fluoranthene	0 to 8.5	1	3/52	1	3/52
Benzo(k)fluoranthene	0 to 3.4	0.8	1/52	1	0/52
Chrysene	0 to 13	1	2/52	3.9	2/52
Dibenzo(a,h)Anthracene	0 to 2.5	0.33	2/52	3.9	2/52
Hexachlorobenzene	0 to 9.3	NA	NA	0.41[d]	2/52
Indeno (1,2,3-cd)Pyrene	0 to 8.1	0.5	4/52	0.5	4/52
Naphthalene	0 to 41	12	1/52	100	0/52
Phenol	0 to 6.6	0.33	10/52	100	0/52

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted
Inorganics					
Arsenic	0 to 56.3	13	5/41	16	5/41
Barium	43.5 to 1,770	350	3/41	400	3/41
Chromium	10.6 to 214	30	3/41	180	1/41
Lead	7.8 to 1,920	63	12/41	400	5/41
Mercury	0.0085 to 2.7	0.18	11/41	0.81	3/41
Pesticides/PCBs					
Aldrin	0 to 0.034	0.005	1/22	0.097	0/22
beta-BHC	0 to 0.22	0.036	1/22	0.36	0/22
PCBs	0 to 12	0.1	50/124	1	27/124

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 Restricted Residential Use, unless otherwise noted.

d – SCG: CP-51 Residential Supplemental Soil Cleanup Objective

Off-site soil contamination identified during the RI was addressed during the IRM described in Section 6.2. On-site soil is contaminated with VOCs, SVOCs, PCBs, pesticides, and metals resulting from the cleaning of drums containing these compounds. The highest concentrations of these compounds in soil are present in the source area in the central portion of the site. The soil contamination in the source area will be addressed under the Operable Unit 3 ROD. The soil to be addressed in the remedy for OU-1 is on-site soil outside of the source area that contains concentrations greater than restricted residential use SCOs.

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 lead, mercury, phenol, and PCBs.

Surface Water

As described in the April 2010 focused Remedial Investigation Feasibility Study, the surface water in the Old Champlain Canal is not impacted by the Friedrichsohn Cooperage site.

Sediments

As described in the March 2011 ROD for OU-3, impacts from the Friedrichsohn Cooperage site to the sediment of the Old Champlain Canal will be addressed in the remedy for OU-3. The selected remedy for OU-3 includes removal of the waste/soil down to bedrock in the source area and removal of the contaminated sediments from the canal. The source area (shown on Figure 2) is located in the central portion of the site.

Soil Vapor

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 potentially impacted area a full suite of samples were collected to evaluate whether soil vapor intrusion was occurring.

Soil vapor samples were collected from locations on-site as well as from the off-site parking area of the former barrel yard located directly to the north of the Friedrichsohn site and adjacent residential properties. In addition, sub-slab and indoor air samples were collected from 14 nearby residential properties and one commercial structure to evaluate whether soil vapor intrusion was occurring. Results of the residential structure sampling indicates concentrations generally within background ranges typically found in residential homes and do not indicate a soil vapor intrusion concern. Sampling results for the commercial structure and associated parking lot located on the former barrel yard property contained levels of trichloroethylene and carbon tetrachloride which indicated a potential for exposure. Therefore, in order to prevent the potential for exposure to soil vapor, a sub slab depressurization system was installed in January of 2010 in the commercial structure.

In summary, the sample results indicate that soil vapor intrusion is not affecting off-site properties with the exception of the commercial structure located on the former barrel yard parcel, at which a mitigation system was installed and continues to operate effectively.

Due to the presence of contaminants beneath the Friedrichsohn Cooperage site (inside the fence), there is potential for on-site soil vapor contamination. The potential for on-site soil vapor intrusion will be addressed by the remedies selected for OU-1 and OU-3. The Soil Management Plan proposed in this remedy will address the potential for soil vapor intrusion related to any future site development.

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 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2. This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

Alternative 2: No Further Action with Site Management

The No Further Action with Site Management Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2 and Site Management and Institutional Controls and Engineering Controls are necessary to confirm the effectiveness of the IRM. This alternative maintains engineering controls which were part of the IRM and includes institutional controls, in the form of an environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at the site after the IRMs. An additional engineering control included in this Alternative is the paving of the site with asphalt.

Present Worth:.....$352,000

Capital Cost: ……..$115,000

Annual Costs:……..$15,400

Alternative 3: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil cleanup objectives listed in Part 375-6.8 (a). This alternative would include: excavation and off-site disposal of all soil contamination in OU-1 at concentrations greater than the unrestricted soil cleanup objectives. Approximately 4,864 cubic yards of soil within the site fence down to bedrock (approximately 16 feet below ground surface) to remove soil in OU-1 with concentrations of contaminants greater than the unrestricted soil cleanup objectives. The excavation would be backfilled with clean fill that meets the criteria for backfill as established in NYCRR Part 375. Removing soil in this manner would remove all soil contamination to pre-disposal levels. There are no Site Management activities, restrictions, institutional or engineering controls or periodic reviews included in this alternative.

Capital Cost:…….$3,849,000

Alternative 4: Site Cover

A site cover will be required to allow for restricted residential use of the site. The cover will consist either of structures such as buildings, pavement, sidewalks comprising the site development or a soil cover. Where the soil cover is required it will be a minimum of two feet of

soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d). The final grade for the site should be consistent with the current grade or the future anticipated use. In areas where the SCOs for restricted residential use for the contaminants of concern identified in Section 6.1 above are exceeded, and the intended final grade will not permit 2 feet of cover, the soil will be excavated to depth of 2 feet to achieve the SCOs for restricted residential use. Contamination below a depth of 2 feet will be left in place. Excavated soil will be disposed of at an approved facility. Depending on the final design and what type of cover is selected, a varied thickness of material will need to be removed to construct the cover layer. For costing purposes, it has been assumed that two feet of material will need to be removed and two feet of soil will replace the material removed. The estimated volume of soil to be removed is 285 cubic yards.

Site Management, Institutional and Engineering Controls are necessary to confirm the effectiveness of the SVE IRM (OU-1C) described in Section 6.2. This alternative maintains engineering controls which are included in the SVE IRM and are part of this alternative, and includes institutional controls, in the form of an environmental easement and site management plan, necessary to maintain the engineering controls, protect public health and the environment from contamination remaining at the site after the SVE IRM and implementation of Alternative 4.

Present Worth:……$426,000

Capital Cost: …….$271,000

Annual Costs: …….$10,100

Alternative 5: In-situ Solidification/Stabilization

In-situ solidification/stabilization is a process that uses a solidifying or stabilizing agent to bind the soil particles in place creating a low permeability mass. The contaminated soil would be augered and mixed in place with solidifying or stabilizing agents (typically portland cement) or other binding agents (e.g. cement kiln dust, fly ash, or blast furnace slag). The soil and binding agent are mixed by augers to produce a solidified mass resulting in a low permeable monolith. The solidified mass would then be covered with a cover consisting of either structures such as buildings or pavement or a soil cover to prevent direct exposure to the solidified mass. The resulting solid matrix reduces or eliminates mobility of contamination. Alternative 5 would treat the top five feet of soil within an approximately 3,900 square foot area (approximately 715 cubic yards of soil).

Site Management and Institutional and Engineering Controls are necessary to confirm the effectiveness of the IRMs described in Section 6.2. This alternative maintains engineering controls which were part of the SVE IRM (OU-1C) and are part of this alternative and includes institutional controls, in the form of an environmental easement and site management plan, necessary to maintain the engineering controls, protect public health and the environment from contamination remaining at the site after the IRM and implementation of Alternative 5.

Present Worth:……..$474,000

Capital Cost:……..$319,000

Annual Costs:……..$10,100

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
1 No Action	0	0	0
2 No Further Action with Site Management	$115,000	$15,400	$352,000
3 Restoration to Pre-Disposal or Unrestricted Conditions	$3,849,000	$0	$3,849,000
4 Site Cover	$271,000	$10,050	$426,000
5 In-situ Stabilization	$319,000	$10,050	$474,000

Exhibit D

SUMMARY OF THE SELECTED REMEDY

The Department has selected Alternative 4, Site Cover as the remedy for this site. Alternative 4 will achieve the remediation goals for the site by eliminating the potential for direct contact and exposure to the soil in areas outside of the source area. The Soil Cleanup Objectives for the protection of groundwater do not apply to the remedy for this operable unit because we do not have groundwater contamination associated with the soil in operable unit 1. Groundwater contamination is associated with the contaminated soil and hazardous waste in the source area and will be addressed as described in the March 2011 OU-3 ROD. The elements of this remedy are described in Section 7. The areas where soil contamination is located 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.

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 4) will satisfy this criterion through the provision of a site cover to prevent contact with contaminated soil which exceed the restricted residential SCGs. Alternative 4 addresses the potential for exposure to contaminated soil, which is the most significant threat to public health related to OU-1. Alternative 1 (No Action) does not provide any protection to public health and the environment and will not be evaluated further. Alternative 2 does not provide a sufficient level of certainty for protection of public health and the environment and will not be evaluated further. Alternative 3, by removing all soil contaminated above the unrestricted soil cleanup objective, meets the threshold criteria. Alternatives 4, and 5 also comply with this criterion.

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.

Alternative 4 complies with SCGs. It addresses shallow soil contamination and complies with the restricted residential use soil cleanup objectives at the surface through provision of a cover material. Alternative 3 removes all soil from the site that does not comply with SCGs. Alternative 5 also complies with this criterion but to a lesser degree or with lower certainty.

Because Alternatives 3, 4, and 5 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

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 those alternatives involving excavation of the contaminated overburden soils (Alternatives 3 and 4). Alternative 3 results in removal of all of the chemical contamination within OU-1 and removes the need for property use restrictions and long-term monitoring. Alternative 4 will result in the removal of some shallow contaminated soil, but it also require site cover and an environmental easement. Alternative 5 would be effective in the long-term, but would be less effective than Alternatives 3, or 4 because there is a slight potential for incomplete treatment and future exposure. Alternative 5 would also not be effective on mitigating the impact of the volatile organic compounds.

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 3, would include excavation and off-site disposal, reduce the toxicity, mobility and volume of on-site waste by transferring the material to an approved off-site location. Alternative 4 will include excavation of a lesser amount of shallow soil. Alternative 5 would reduce the toxicity, mobility of contaminants by use of in-situ physical and/or chemical treatment. As a result of the materials mixed into the soil, the volume of material in the targeted areas would increase under alternative 5.

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 3 through 5 all have short-term impacts which could easily be controlled. Alternatives 3 and 4 would require increased truck traffic to and from the site, which would result in short-term adverse impacts on the community. The amount of truck traffic would be greater for alternative 3 due to the larger volume of soil excavation and backfill. The time needed to achieve the remediation goals is the shortest for Alternative 4. Alternatives 3 and 5 take the longest to achieve the remediation goals.

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.

Alternatives 4 is favorable in that it is readily implementable. Alternative 5 is also implementable, but would be technically difficult to implement because of the lack of space on-site for staging of equipment. For Alternative 3, the small size of the site and the large volume of on-site soil to be excavated and restored, and the proximity to Saratoga Ave would make

implementing the remedy very difficult. Alternatives 3 and 4 involve the excavation and replacement of soil from the site and would necessitate increased truck traffic on local roads for weeks for alternative 4, or months for alternative 3. The amount of time necessary to complete alternative 4 would be dependent on the plans for the future use of property and the cover material selected, but in any scenario, it would be less time than alternative 3.

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.

The costs of the alternatives vary significantly. With its large volume of soil to be handled, Alternative 3 (excavation and off-site disposal to achieve pre-disposal conditions) would have the highest present worth cost. The capital costs for Alternative 4, are more than three million dollars less than for Alternative 3. The present worth costs of Alternatives 4 and 5 are similar to each other.

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.

The property is zoned as residential. However, based upon the size of the site and property setback requirements, it is unlikely that there will be residential construction at the site. Alternative 3 would be the most desirable because all of the on-site OU-1 contaminated soil would be removed from the site and restrictions on the site use would not be necessary. Contaminated soil would remain on the property at depth if Alternatives 4 or 5 were implemented. However, the remaining contamination associated with each of these alternatives would be controlled with implementation of a Site Management Plan. The areas of residual soil contamination deeper than 2 feet that will not be excavated under Alternative 4 are shown in Figure 6. The soil management plan will include an annotated Figure 6 to reflect any remaining contaminated soil deeper than 2 feet deep.

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 has been prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Final Summary

Alternative 4 has been selected because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.

APPENDIX A

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

Friedrichsohn Cooperage

Operable Unit No. 1

State Superfund Project

Waterford, New York

Site No. 546045

The Proposed Remedial Action Plan (PRAP) for the Friedrichsohn Cooperage 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 on October 2, 2012. The PRAP outlined the remedial measure proposed for the contaminated soil outside the source area on the Friedrichsohn Cooperage site.

The release of the PRAP was announced at the Waterford Town Board Meeting on October 2, 2012 and by sending a notice through List Serve to the public, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on November 7, 2012, which included a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on November 21, 2012.

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

COMMENT 1: This sounds like containment, will this remediation take all of the contamination away?

RESPONSE 1: The selected remedy will leave in place some soil that has low levels of contamination. Contaminated soils found between the ground surface and a depth of 2 feet will be removed and replaced with clean fill. The levels of contamination in soil which will be left at depths deeper than 2 feet are not impacting the groundwater and meet the requirements for restricted residential use. An institutional control, in the form of an environmental easement, will address the potential for exposure to the buried contamination and protect the integrity of the site after remediation is complete.

COMMENT 2: Who becomes the owner of the property after the remediation?

RESPONSE 2: Completion of the remediation will not change the ownership of the property.

COMMENT 3: I am concerned with the inhalation of dust from the digging. What time of year will this work take place?

RESPONSE 3: We do not yet have a planned start date for the remediation, however all remediation activities will be required to have a Community Air Monitoring Plan (CAMP). This CAMP will outline a monitoring program which will require continuous monitoring for volatile organic compounds (vapors) and particulates (dust) during intrusive activities (e.g., excavation). The CAMP is intended to ensure the work is performed within the established action levels so that activities at the site do not spread contamination off-site, and the work is executed in a manner protective of public health. The CAMP will include provisions to require mitigative measures based on real time measurements with action levels

established in order to prevent exceedances of standards. Mitigative measures could include shutting down operations if needed.

COMMENT 4: Will this be real time air monitoring?

RESPONSE 4: Yes, there will be real time air monitoring. It is expected that, dust monitors will be set up at designated locations and hand held equipment will be used to determine if there are volatile compounds in the air. The equipment will sound an alarm if the established action levels are exceeded. See also Response 3.

COMMENT 5: What happens if an alarm goes off?

RESPONSE 5: An alarm would trigger measures to be taken to mitigate the cause of the alarm such as modified work practices or dust suppression followed by a shutdown of work if these were not successful. See also Response 3.

COMMENT 6: What does restricted residential use mean?

RESPONSE 6: It is the land use category intended for apartments, condominium, co-operative or other multi-family/common property control residential development. A restricted residential use condition placed on the property does not allow single family residential use nor vegetable gardening without special provisions. A restricted residential condition does allow use of the site for all recreational purposes.

COMMENT 7: The Town Supervisor expressed a preference for the soil stabilization alternative. The costs are close and for the money the Town Supervisor believes this is the better option. There are many sensitive surface waters in Waterford. The Town Supervisor stated that stabilization would freeze the contamination in place and better protect the rivers.

RESPONSE 7: While the 'site cover' and the 'soil stabilization' alternatives are similar in cost, implementation of the two alternatives would have different constraints. The small size of the site would increase the difficulty in implementing the stabilization remedy. Because stabilization would add material to the site the grade of the site would be raised, and additional considerations would need to be implemented to compensate for the increase in elevation. The site size constraints also make soil stabilization less effective as there is a potential for incomplete mixture and treatment leading to future potential exposure. Providing a cover material and/or removing contaminated material provides a greater degree of separation from the contamination and is therefore more protective of the public health. Data gathered from the site indicates that the soil contamination located in operable unit 1 is not impacting the groundwater or the surface water. As such, the potential increase in protection to the groundwater and surface water offered by the soil stabilization alternative is offset by the increased protection to public health offered by site cover. The site cover alternative was selected over the soil stabilization alternative because it is more implementable and is more protective of the public health.

COMMENT 8: Is there money to complete the remediation?

RESPONSE 8: We have a tentative agreement with the responsible parties to undertake the proposed on-site remediation which we are discussing now for OU-1, as well as the groundwater (OU-2) and the canal sediments and on-site source area (OU-3). If the parties are not willing to implement the selected remedies, the site will be referred to the state superfund and will be implemented. The state would then pursue the Responsible Parties to recover costs.

COMMENT 9: What is the point of a public meeting and public comment if the DEC already has an agreement with the potentially responsible parties for the proposed remedy?

RESPONSE 9: Negotiations were ongoing for the OU-3 remedy (selected in early 2011 after public comment) and they were extended to include the proposed remedy for OU-1 and future work for OU-2 as well. If there is a compelling reason to select a different remedy for OU-1 the DEC could and would select a different remedy. The change could then lead to further negotiation for an agreement. DEC recognized this fact and was prepared to go this route if necessary. None of the comments received justify selecting a different remedy. See also Response 8.

COMMENT 10: The Town Supervisor indicated he would like to see a public benefit use as an outcome of the remediation. The Town Supervisor suggests that at the completion of the remedial project the site end up as a nicely landscaped parking lot with a foot bridge from the site to the other side of the canal to access the public walking path.

RESPONSE 10: The parking area portion of the proposal suggested by the Supervisor would be consistent with the land use restrictions for the selected remedy. A paved parking area could be incorporated as part of the site cover selected remedy, and this possibility is incorporated into the Record of Decision (ROD). However, landscaping and a foot bridge are considered site development and not part of the remedy and have not been included in the ROD. The planned development for future use of the site is a topic which could be pursued between the Town and the responsible party group which will be implementing the remedy.

COMMENT 11: Is there a formal response required by the Town Board?

RESPONSE 11: A formal response is not required.

COMMENT 12: Have the NYSDEC and the NYSDOH determined that this remedy will be protective of the public health?

RESPONSE 12: Yes, the NYSDEC and the NYSDOH have determined that the selected remedy is protective of the public health and the environment.

APPENDIX B

Administrative Record

Administrative Record

Friedrichsohn Cooperage

Operable Unit No. 3

State Superfund Project

Waterford, Saratoga County, New York

Site No. 546045

Proposed Remedial Action Plan for the Friedrichsohn Cooperage site, Operable Unit No. 1, dated October 2012, prepared by the Department.

Referral Memorandum dated January 2, 2009 for implementation of a State funded Remedial Program including a Remedial Investigation/Feasibility Study and if necessary, Interim Remedial Measures or Remedial Actions.

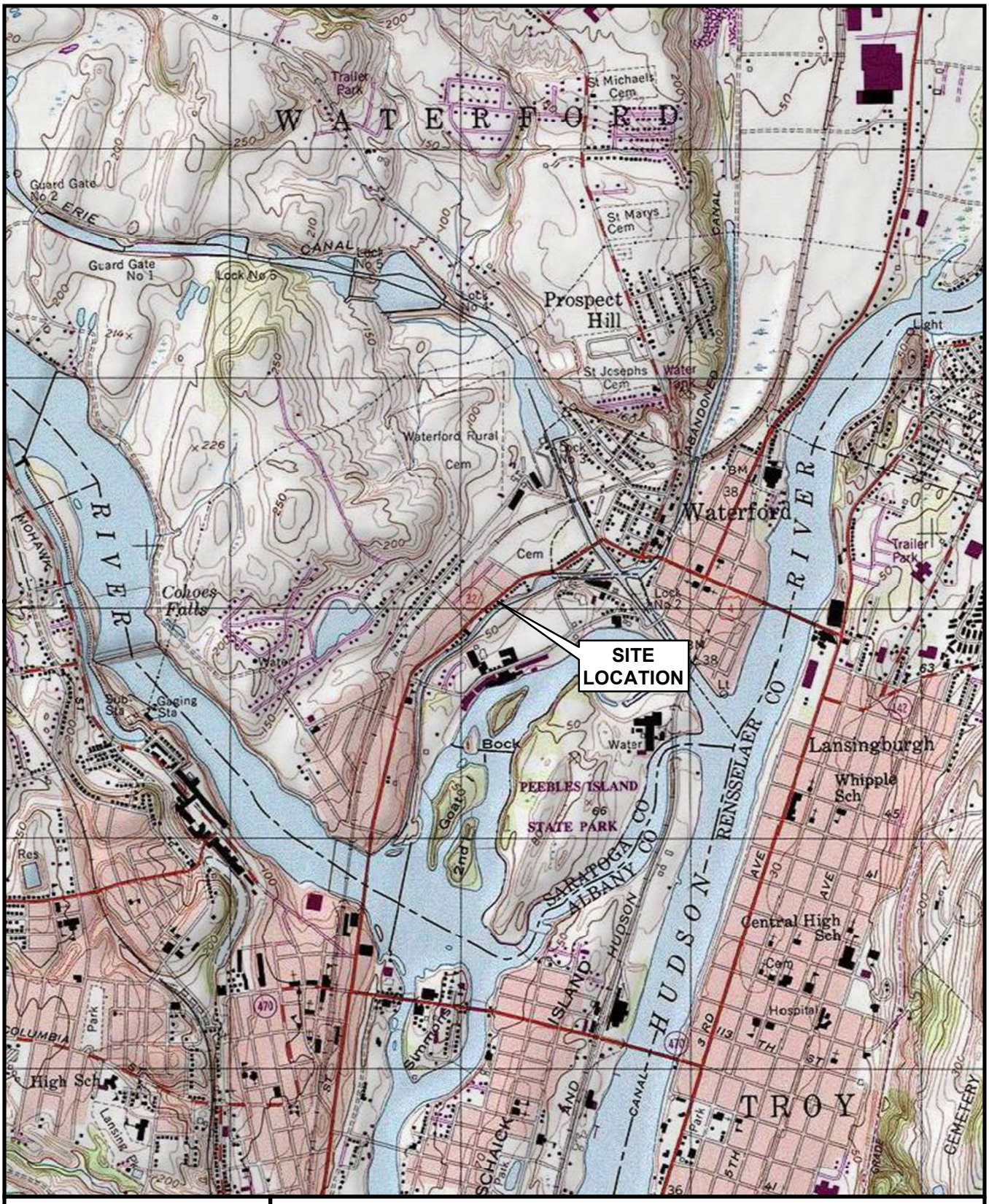
"Report.hw546045.2008-10-27. Preliminary Site Assessment Volume I" October 2008 prepared by EA Engineering PC

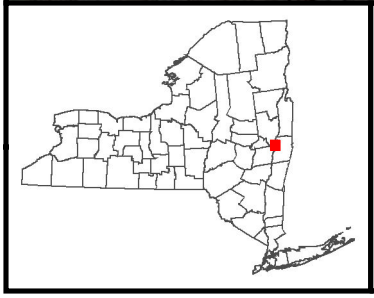
"Report.hw546045.2010-04-16. Focused Remedial Investigation Feasibility Study", April 2010 prepared by Malcolm Pirnie

"Report.hw546045.2011-02-22. February 2011 Sediment Data Submission" February 2011 prepared by Malcolm Pirnie

"Report.hw546045.2011-02-22. February 2011 Subsurface Soil Data Submission" February 2011 prepared by Malcolm Pirnie

"Report.hw546045.2012-02-13. Interim Remedial Measure – Residential Excavations" February 2012 prepared by Malcolm Pirnie





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0 1,000 2,000
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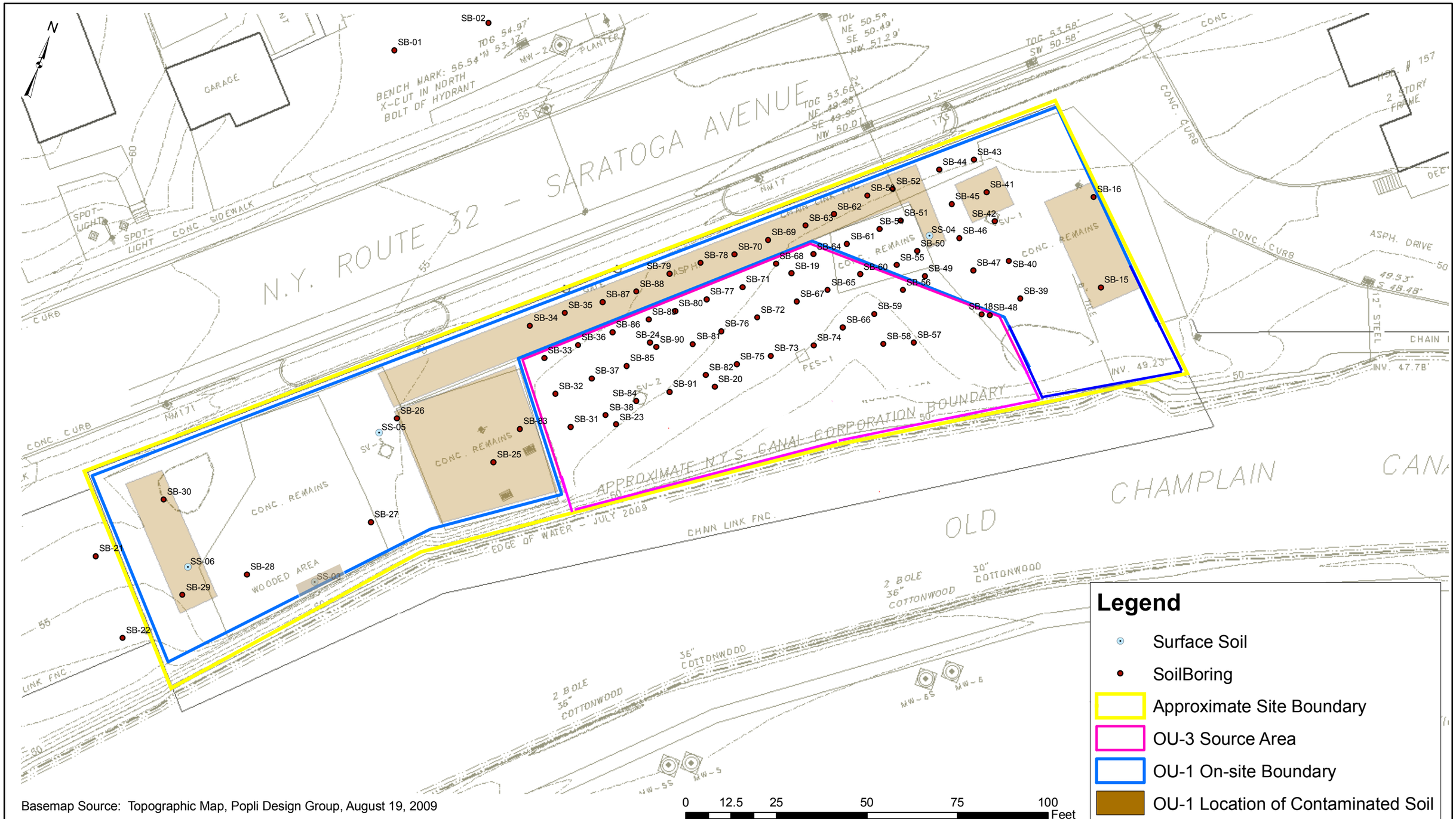
Figure 1

Site Location Map

Friedrichsohn Cooperage
Town of Waterford, Saratoga County
Site No. 546045

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NEW YORK STATE



Basemap Source: Topographic Map, Popli Design Group, August 19, 2009

MALCOLM PIRNIE

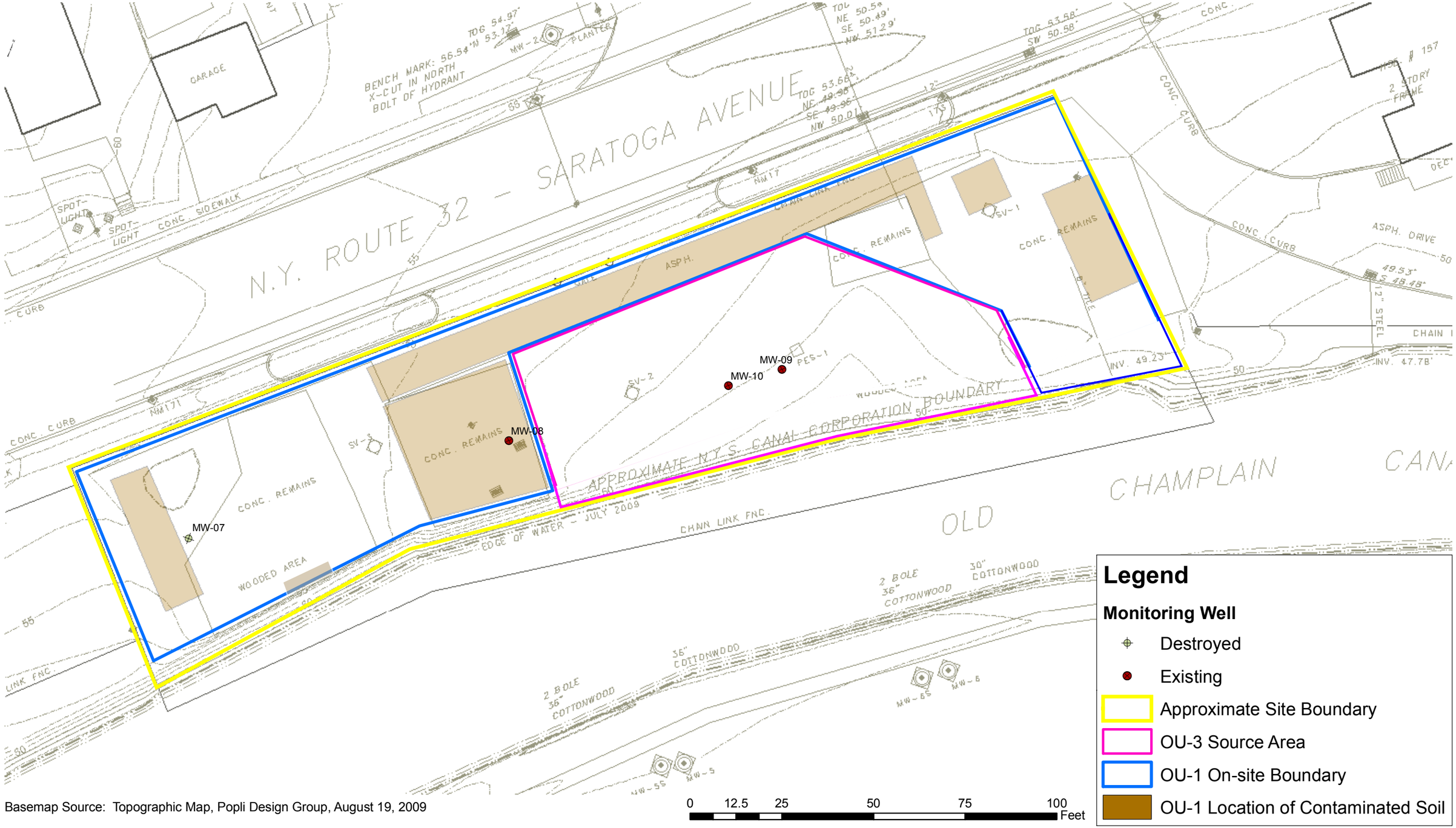
NYS Department of Environmental Conservation

FRIEDRICHSOHN COOPERAGE SITE #546045
TOWN OF WATERFORD, SARATOGA COUNTY, NEW YORK

OU-1 ON-SITE SOIL OUTSIDE OF SOURCE AREA

JUNE 2012

FIGURE 2



Basemap Source: Topographic Map, Popli Design Group, August 19, 2009

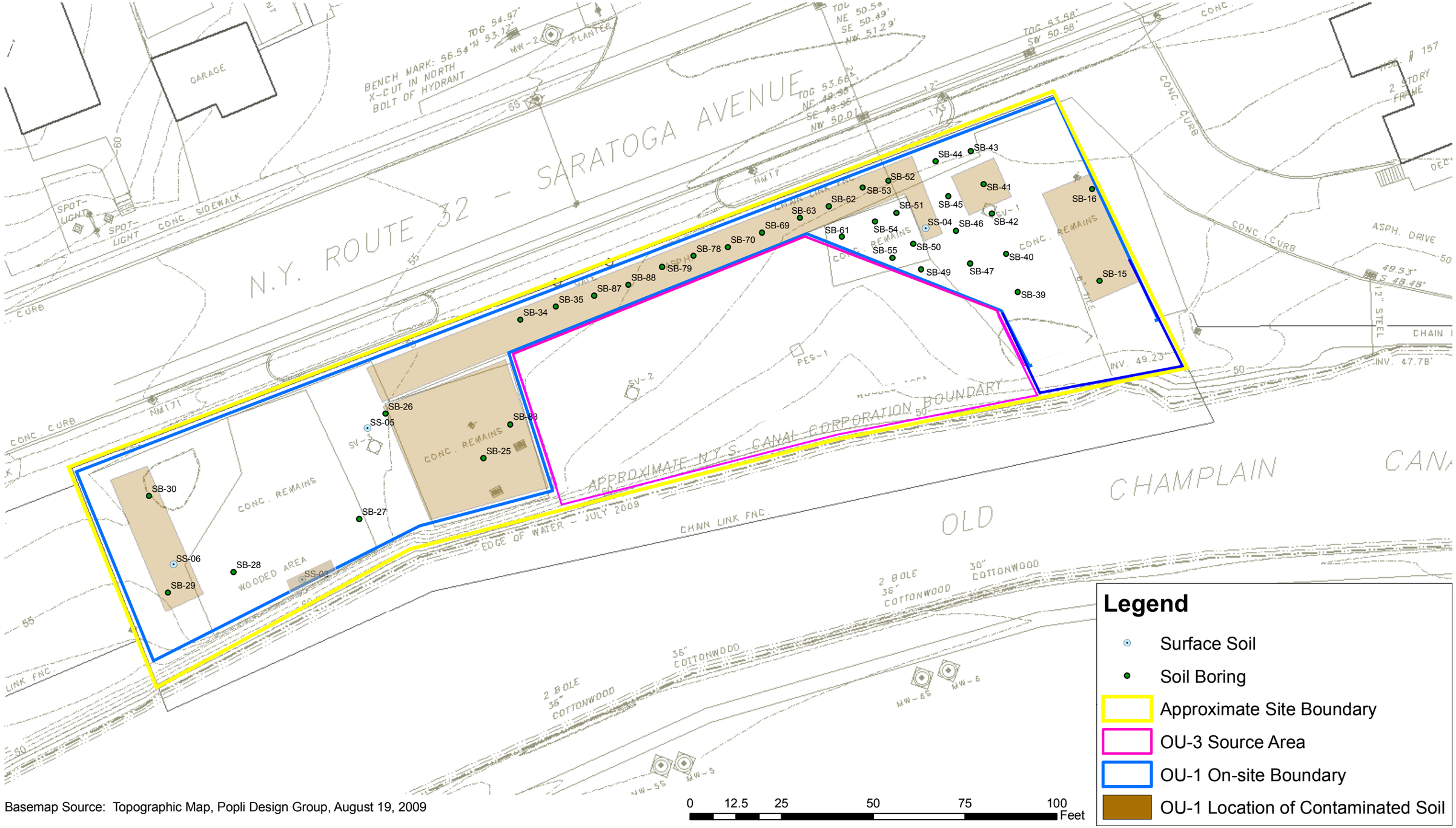
NYS Department of Environmental Conservation

FRIEDRICHSOHN COOPERAGE SITE #546045
TOWN OF WATERFORD, SARATOGA COUNTY, NEW YORK

ON-SITE MONITORING WELLS

JUNE 2012

FIGURE 3



Basemap Source: Topographic Map, Popli Design Group, August 19, 2009

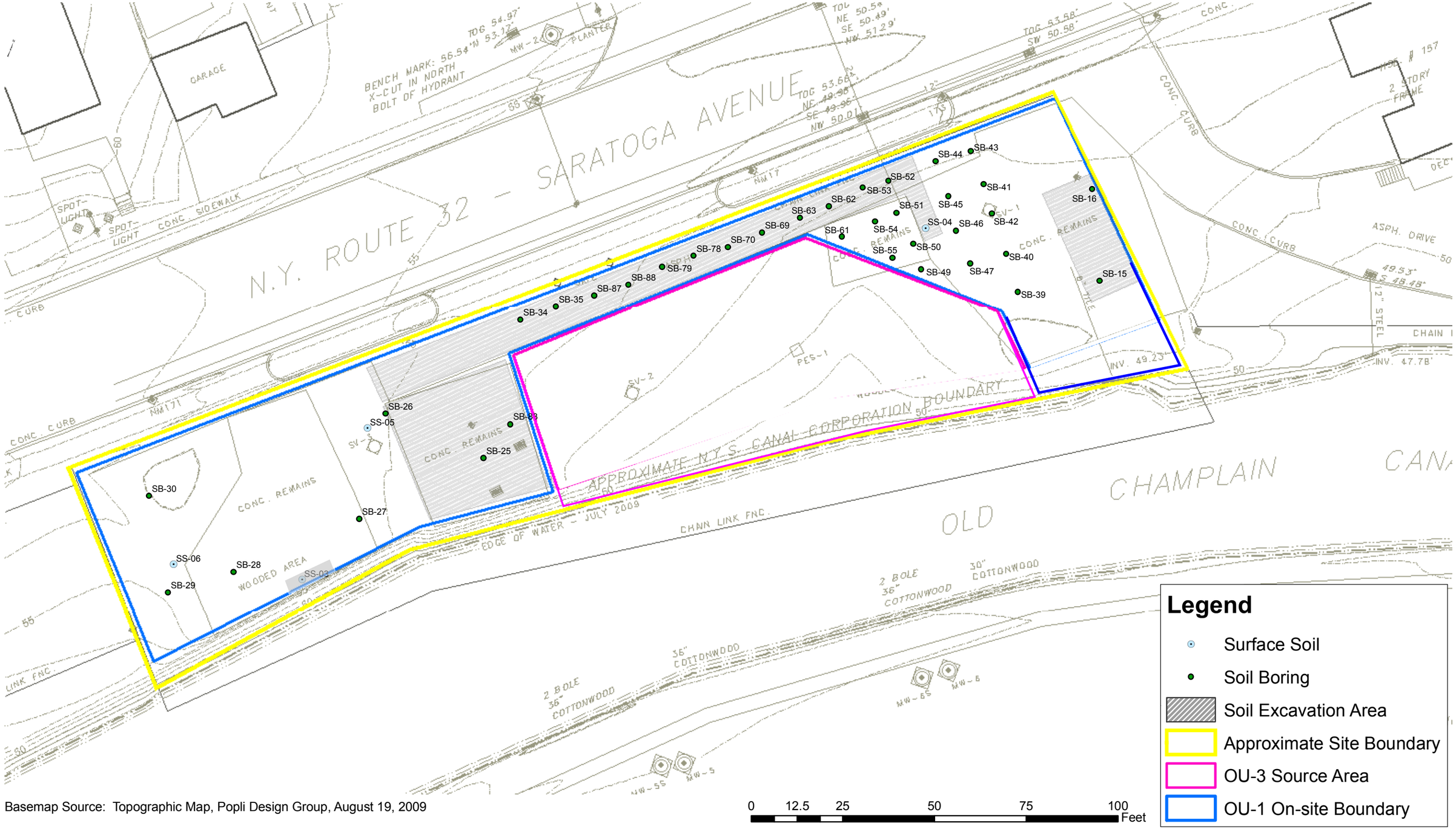
NYS Department of Environmental Conservation

FRIEDRICHSOHN COOPERAGE SITE #546045
TOWN OF WATERFORD, SARATOGA COUNTY, NEW YORK

SOIL SAMPLING LOCATIONS

JUNE 2012

FIGURE 4



Basemap Source: Topographic Map, Popli Design Group, August 19, 2009

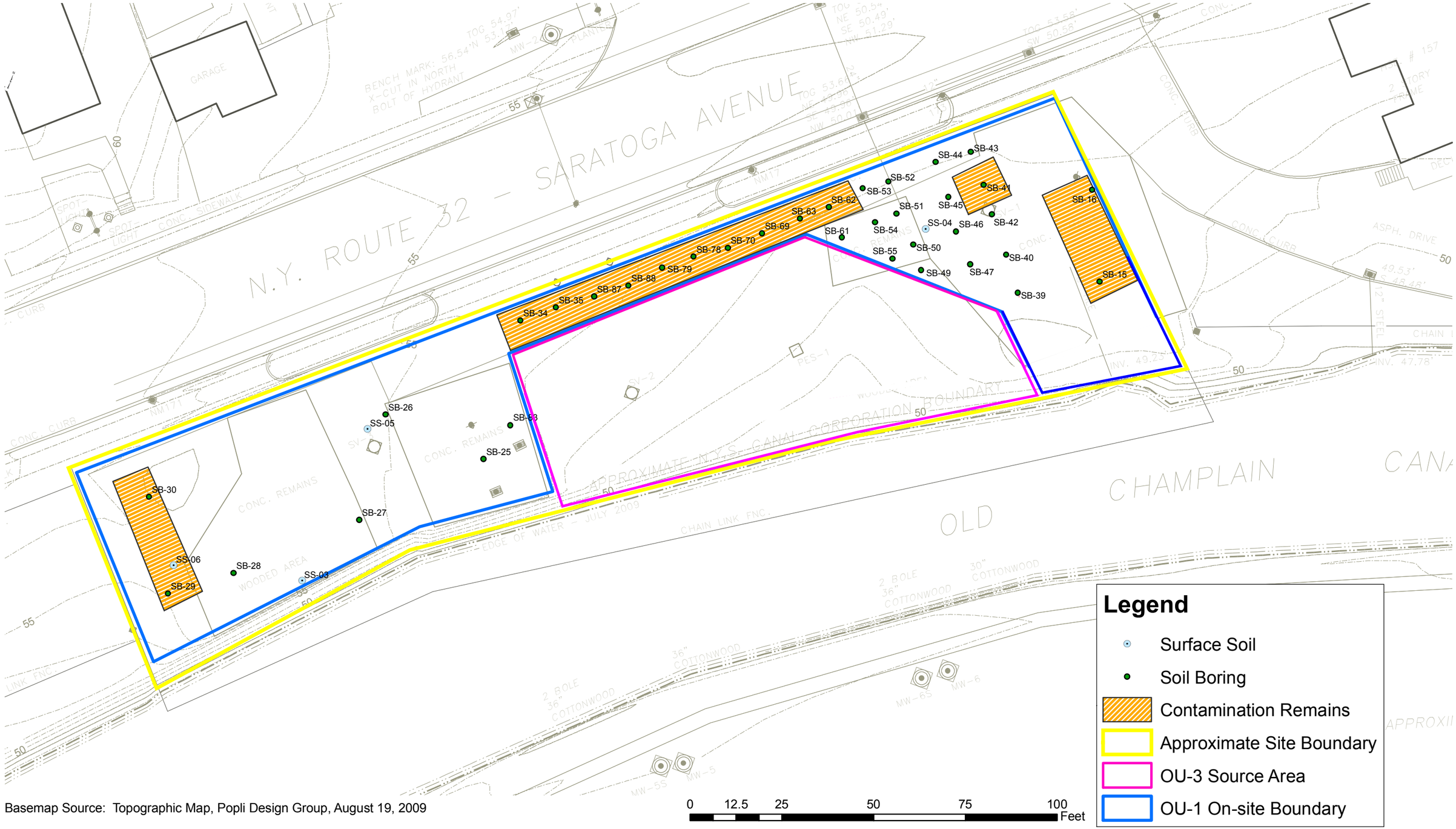
NYS Department of Environmental Conservation

FRIEDRICHSOHN COOPERAGE SITE #546045
TOWN OF WATERFORD, SARATOGA COUNTY, NEW YORK

SOIL EXCAVATION AREAS

JUNE 2012

FIGURE 5



Basemap Source: Topographic Map, Popli Design Group, August 19, 2009

NYS Department of Environmental Conservation

FRIEDRICHSOHN COOPERAGE SITE #546045
TOWN OF WATERFORD, SARATOGA COUNTY, NEW YORK

AREAS WITH SOIL CONTAMINATION LEFT IN PLACE

JUNE 2012

FIGURE 6