PROPOSED REMEDIAL ACTION PLAN

Whitesboro Dry Cleaners Site
State Superfund Project
Whitesboro, Oneida County
Site No. 633054
April 2025

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

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing 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 proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred 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 Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

Dunham Public Library
Attn: Dennis Kininger
76 Main Street
Whitesboro, NY 13492
Phone: 315-736-9734

A public comment period has been set from: April 23rd to May 21st

A public meeting is scheduled for the following date: May 7th at 5:30 PM

Public meeting location: Whitesboro Fire Station

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through to:

Elyse DuBois
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
elyse.dubois@dec.ny.gov

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

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 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 Whitesboro Dry Cleaners Site is located at 130 Oriskany Blvd, in the Village of Whitesboro, Oneida County. The site is bounded by Oriskany Blvd to the west, Owens Place (a village street) to the east, a bank to the north and commercial property to the south.

Site Features: The site consists of a small, one-story commercial building and a separate single-family residence. The commercial building includes two spaces; one currently occupied by a dog groomer and the other a thrift store. The detached residential building is in the rear/east of the commercial building.

Current Zoning and Land Use: The site is zoned commercial. However, the parcel contains a detached residence at the rear of the lot. The surrounding properties are zoned for a mix of commercial and residential use.

Disadvantaged Communities (DACs) are defined by the Climate Leadership and Community Protection Act (CLCPA) as communities that are 1) Burdened by environmental pollution or other environmental hazards which bear negative health effects, 2) Containing high concentrations of people with low socioeconomic status including but not limited to low income, high unemployment, low levels of educational attainment, and/or members of groups, ethnicities, and populations that have experienced historical discrimination based on race or ethnicity, and 3) Vulnerable to impacts of climate change including floods, storm surges, and/or urban heat island effects. The Disadvantaged Communities Criteria, created by the Climate Justice Working Group, identifies communities of focus for remediation and environmental cleanup efforts.

There are no census tracks identified as DACs within a 0.5-mile radius of the Whitesboro Dry Cleaners (Site) located at 130-134 Oriskany Boulevard. The nearest identified DAC is approximately one mile east of the Site (census tract 36065021402), as shown on **Figure 10**.

Potential Environmental Justice Areas (PEJAs) are United States (US) Census block groups of 250 to 500 households that have populations meeting, or exceeding, at least one of the following thresholds:

1) At least 52.42% of the population in an urban area reported themselves to be members of minority groups; or
2) At least 26.28% of the population in a rural area reported themselves to be members of minority groups; or
3) At least 22.82% of the population in an urban or rural area had household incomes below the federal poverty level.

There are three census tracts located within a 0.5-mile radius of the Site identified as a PEJAs, as shown on **Figure 10**:

- Census Tract 360650232002
- Census Tract 360650234003
- Census Tract 360650214021

These three tracts have the potential to be impacted by exposure to site-related pollutants that may be produced during remediation operations. Environmental Burden and Population Vulnerability statistics for PEJAs are currently unavailable, however the protection of PEJA communities will be considered in the evaluation of remedial alternatives.

Past Use of the Site: From 1966 to 1994 the commercial structure on site operated as a dry cleaner. Substantial renovations have been made to the building since that time and a portion of the property is currently occupied by tenants. The central portion of the building is where dry cleaning operations are believed to have taken place. Previous uses of the northern section of the building also included a real estate office and a restaurant. On-site there is a 1,100 square foot (sq ft). residential structure that is currently tenant occupied.

During the construction of the bank on the parcel north of the subject property, Spill No. 86-02108, the former Ferrell's Chevron site was reported. This spill report identified chlorinated solvents in soil and groundwater. A limited Site Characterization was conducted by the NYSDEC and concluded in January 2010 identifying the former Whitesboro Dry Cleaner as the source of the chlorinated solvents. The results of this investigation led to listing the site in the Registry of Inactive Hazardous Waste Disposal sites as a Class 2 in February of 2010.

Site Geology and Hydrogeology: Shallow groundwater, 5 to 10 feet below ground surface (ft bgs) at the site fluctuates seasonally, but primarily flows to the northeast. The site is underlain by historic fill, glacial till and glaciofluvial/glaciolacustrine deposits over bedrock. The sedimentary rock beneath the site is Ordovician Frankfort shale, siltstone and/or Utica shale.

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) is being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation against unrestricted use standards, criteria and guidance values (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:

- V.J.K. Inc.
- Anthony Commisso
- Vikki A. Commisso
- Joseph Bravo
- Bonnie Bravo
- Robert A. Reeder, Jr.
- Gary A. Webb

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
- 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 In accordance with the Climate Leadership and Community Protection Act (CLCPA), disadvantaged communities (DAC) are identified based on a combination of environmental, economic, and health criteria. A site-specific evaluation will determine the proximity of the site to a DAC and whether the proposed remediation places a disproportionate burden on a DAC.

6.1.2: RI Results

The data have identified contaminants of concern, (COCs). 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 at this site is/are:

Tetrachloroethene (PCE)
Trichloroethene (TCE)
Cis-1,2- Dichloroethylene (DCE)
Vinyl Chloride
Lead

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.

Soil vapor intrusion (SVI) was evaluated on-site and at six off-site properties as part of previous site investigations from 2010 to 2013. SVI sampling included sub-slab vapor, indoor air, and ambient outdoor air. Based on the SVI sampling results, mitigation was recommended for both on-site buildings and one off-site residence. Sub-slab depressurization systems (SSDSs) were installed as an IRM to mitigate inhalation exposure of site-related contaminants. Post-mitigation indoor air sampling demonstrated that the SSDSs were effective in reducing the level of volatile organic compounds (VOCs) in indoor air. Based on the sampling results no further action was necessary the remaining structures that were sampled.

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.

Soil and groundwater were analyzed for VOCs, semi-volatile (SVOCs), metals, polychlorinated biphenyls (PCBs), per- and polyfluoroalkyl substances (PFAS), and pesticides. Soil vapor was analyzed for VOCs. Based upon investigations conducted to date, the primary COCs include chlorinated volatile organic compounds (CVOCs) associated with the disposal of spent dry cleaning solvent as well as PFAS contaminants.

Soil: There were limited detections in soils for the analyzed contaminants, listed above. Trivalent chromium (detected at 43 parts per million [ppm]) and copper (at 66.4 ppm) were detected slightly above their unrestricted use soil cleanup objective (SCO) of 30 ppm and 50 ppm, respectively.

Pesticides, 4,4'-DDE and 4,4'-DDT, were identified slightly above their unrestricted use SCO of 0.0033 ppm at detections of 0.00918 ppm and 0.00789 ppm, respectively. Inorganic and Pesticides soil exceedances and locations are shown on **Figure 7**. The highest detections in soil were of CVOCs. PCE was detected at a maximum concentration of 1070 ppm. TCE was found at a max concentration of 336 ppm. Unrestricted use SCO for PCE and TCE are 1.3 ppm and 0.47 ppm respectively. Locations and concentrations of VOCs are shown on **Figure 6**. Off-site soil contamination was not found.

Groundwater: CVOCs and PFAS were detected in groundwater above applicable standards. PCE was detected across the site at a maximum concentration of 100 ppb located just to the west of the site boundary. TCE was detected up to 22 ppb at the southeastern corner of the site. The ambient water quality standard for both PCE and TCE is 5 ppb. Off-site contamination of CVOCs was not found above ambient water quality standards. PFOA and PFOS were also detected in two wells on site and one wells off-site, **Figure 2**. Maximum concentrations of PFOA were found on site at 58 parts per trillion (ppt) and PFOS were found on site at 66 ppt, both exceeding their ambient water quality standard of 6.7 ppt for PFOA and 2.7 ppt for PFOS. Contaminats in groundwater has been found to migrate off-site.

Soil Vapor & Indoor Air: SVI sampling was completed both on- and off-site. On-site PCE concentrations ranged from 120 to 200,000 micrograms per cubic meter ($\mu g/m^3$) in sub-slab soil vapor and from 70 to 1,300 $\mu g/m^3$ in indoor air. On-site TCE concentrations ranged from 12 to 1800 $\mu g/m^3$ in sub-slab soil vapor and from 3.1 to 7.6 $\mu g/m^3$ in indoor air. Based on these results, a mitigation system (SSDS) was installed in the on-site residence, and one was installed by the property owner at the on-site commercial building. Off-site properties were also evaluated for the potential of SVI and PCE concentrations ranged from 6.7 to 286 $\mu g/m^3$ in sub-slab soil vapor and from 1.7 to 29.8 $\mu g/m^3$ in indoor air. Off-site TCE concentrations ranged from 0 to 4.7 $\mu g/m^3$ in sub-slab soil vapor and from 0 to 3.8 $\mu g/m^3$ in indoor air. Of the six off-site Properties that were evaluated for SVI, one residence required mitigation and a partial SSDS was installed.

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.*

People will not come into contact with contaminants in soil unless they dig below the ground surface. Contaminated groundwater at the site is not used for drinking or other purposes, and the area is served by a public water supply that obtains water from a different source not affected by site-related contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into 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. Soil vapor intrusion sampling identified impacts to indoor air quality within the on-site building and its adjoining residence and at one off-site building. Sub-slab depressurization systems (systems that ventilate/remove air beneath the buildings) have been installed on these buildings and have been verified as effectively preventing indoor air quality from being affected by the contamination in soil vapor beneath the buildings. Sampling indicates soil vapor intrusion

is not a concern for six other off-site buildings, however soil vapor intrusion may be a potential concern for other off-site buildings where sampling was offered but not accepted.

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 (RAOs) 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.

RAOs for Environmental Protection

- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated 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 PROPOSED 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 proposed remedy is set forth at Exhibit D.

The proposed remedy is Alternative 4 referred to as Targeted Surface and Subsurface Soil Removal, In-situ Chemical Treatment and MNA.

The estimated present worth cost to implement the remedy is $2,580,000. The cost to construct the remedy is estimated to be $2,400,000 and the estimated average annual cost is $180,000.

The elements of the proposed remedy are as follows:

1. Remedial Design
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 and Sustainable Remediation (GSR) 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;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development including climate leadership and community protection act (CLCPA) within disadvantage communities (DAC) and/or Potential Environmental Justice Areas, where applicable; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

In addition to the GSR Best Management Practices identified above, the following additional exposure mitigation measures will be implemented as part of the remedy to reduce the potential exposures of the PEJAs located within 0.5-miles of the Site:

- Implementation of more extensive Community Air Monitoring Program (CAMP), including if total organic vapor levels exceed 5 ppm above background, work activities shall be halted and monitoring continued under the provisions of a Vapor Emission Response Plan, collection of background data prior to work commencing and frequent review and reporting of data collected, in order to assess whether mitigation is needed. If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities shall be halted, additional monitoring and abatement shall be required and, if unsuccessful, a Major Vapor Emission Response Plan shall be put into effect if organic vapor levels are greater than 10 ppm above background levels.
- Optimization of identification of injectants by conducting bench tests and ensuring proper injectant mixing.
- Minimization of excess soil generation by completing micro-sampling to identify areas for excavation;
- Reduce to the extent practicable VOC emissions, covering exposed soils and tarping haul vehicles and implementing dust suppression and a no visible fugitive dust policy.
- Minimizing electrical consumption through selection of most energy-efficient equipment and installation or purchase of green or renewable energy providers when possible.
- Minimization of dust emissions and production during excavation and intrusive operations.
- Selection of fuel-efficient and/or Ultra-Low Sulfur Diesel fuel vehicles for transportation.
- Sourcing of materials from shortest possible distance.

As part of the remedial design program, the remedy will be evaluated with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as the United States Environmental Protection Agency (USEPA) Spreadsheets for Environmental Footprint Analysis (SEFA), SiteWise(TM) (available in the Sustainable Remediation Forum [SURF] library) or similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

2. Excavation

   Excavation and off-site disposal of contaminant source areas, including:

   - Grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
   - Soil exceeding the 6 NYCRR Part 371 hazardous criteria for lead;
   - Soil with visual waste material or non-aqueous phase liquid; and
   - Soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

   Approximately 660 cubic yards (yd^3) of contaminated soil will be removed from the site. Collection and analysis of confirmation samples at the remedial excavation depth will be used to verify that commercial SCOs for the site have been achieved. If confirmation sampling indicates that SCOs were not achieved at the stated remedial depth, DEC will determine if further remedial excavation is necessary. Further excavation for development will proceed after confirmation samples demonstrate that SCOs for the site have been achieved.

3. Backfill

   Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site.

4. Cover System

   A partial site cover currently exists as asphalt parking in areas not occupied by buildings and will be maintained to allow for commercial use of the site. Any site redevelopment will maintain or establish site cover. The site cover may include paved surface parking areas, sidewalks or soil where the upper one foot of exposed surface soil meets the applicable SCOs for commercial use. However, soils proximate to the residential structure collocated on the commercial property will be excavated and replaced with clean fill to a depth of two feet. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6NYCRR part 375-6.7(d).

   A site cover will be required, in areas which are currently vegetated soils and not covered by asphalt or building, where the upper one feet (ft) of exposed surface soil will exceed the applicable SCOs, to allow for commercial use of the site. Where a soil cover is to be used adjacent to the residential structure it will be a minimum of two ft of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

5. In-Situ Chemical Oxidation or Reduction

   In-situ chemical oxidation (ISCO) or enhanced in-situ dechlorination (EISD) will be implemented to treat contaminants in groundwater. A chemical oxidant or reducing agent will be injected into the subsurface to destroy the contaminants in an approximately 2,780 ft^2 area located in the northeast portion of the site where CVOCs were elevated in the groundwater. The method, depth of injection and specific injectant will be determined during the remedial design.

Prior to the full implementation of this technology, bench-scale laboratory and on-site pilot scale studies will be conducted to inform design. The number of injection wells and duration will be evaluated during the remedial design.

Groundwater monitoring will be required upgradient, downgradient and within the treatment zone, Monitoring will be conducted for COCs upgradient and downgradient of the treatment zone following injection events.

6. Vapor Mitigation
   Any on-site buildings and off-site buildings impacted by the site will be required to have a sub-slab depressurization system, or other acceptable measures, to mitigate the migration of vapors into the building from soil and/or groundwater.

7. Monitored Natural Attenuation
   Groundwater contamination (remaining after active remediation) will be addressed with monitored natural attenuation (MNA) which relies on natural attenuation processes such as biodegradation, dispersion, dilution, sorption, volatilization, etc. to reduce the concentration of contaminants in groundwater. Groundwater will be monitored for site related contamination and also for MNA influencers and processes which will provide an understanding and quantification of the (biological activity) breaking down the contamination. Reports of the attenuation will be compiled after the first year of monitoring, and active remediation may be proposed if it appears that natural attenuation processes alone will not address the remaining contamination.

8. Institutional Control
   Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

   - Require the remedial party or site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
   - Allow the use and development of the controlled property for commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
   - Restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYS Department of Health or County Department of Health; and
   - Require compliance with the NYSDEC approved Site Management Plan (SMP).

9. Site Management Plan
   A SMP is required, which includes the following:
   1. 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 remedial party or site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);

- Allow the use and development of the controlled property for commercial use as defined by Part 375-1.8(g),
- Restrict 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; and
- Require compliance with the NYSDEC approved SMP.

Engineering Controls: require the maintained of existing cover system where applicable and soil cover as discussed in paragraph 3 require the ongoing operation of the SSDSs on site.

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 and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the NYSDEC. Based on the investigation results and the NYSDEC determination of the need for a remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment. This includes the entire site property;
- A provision for removal or treatment of the source area located under the onsite commercial building or residential building if and when the building is demolished or becomes vacant;
- Descriptions of the provisions of the environmental easement including any land use or groundwater restrictions;
- A provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 3 above will be placed in any areas where the upper one or two feet of exposed surface soil exceed the applicable SCOs
- Provisions for the management and inspection of the identified engineering controls;
- Maintaining site access controls and NYSDEC notification; and
- The steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

2. 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 NYSDEC;

- Monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above;
- Off-site SVI sampling plan to minimize potential exposures.

3. An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system(s). The plan includes, but is not limited to:

   - Procedures for operating and maintaining the system(s); and
   - Compliance inspection of the system(s) to ensure proper O&M as well as providing the data for any necessary reporting.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation (RI) 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 five categories: volatile organic compounds (VOCs, semi-volatile organic compounds (SVOCs, PFAS/PFOS, pesticides, and inorganics (metals and cyanide). 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/source materials were identified at the site and are impacting the groundwater, soil and soil vapor.

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. Wastes and Source areas identified at the site include soils beneath a drainage pipe on the east side of the commercial building.

These wastes are believed to be present as a result of previous use of the site. While non-aqueous phase liquid (NAPL), or free product, was not observed in any of the soil or groundwater samples on-site, the presence of contaminants above respective SCGs indicate a potentially persistent source. The existence of the on-site buildings and existing cover (parking lots and sidewalks) makes a full delineation of the potential source impracticable at this time.

An IRM was completed to address exposures of site contaminants due to SVI. In evaluating SVI as described in Section 3.6 of the RI report, the on-site buildings and six off-site residences were sampled and three required mitigations. SSDSs were installed in the on-site commercial building, including detached residence, and one off-site residence post-mitigation indoor air sampling has demonstrated that these systems are effective in addressing exposure.

The waste/source areas identified will be addressed in the remedy selection process.

Groundwater

Groundwater samples were collected from overburden monitoring wells both on and off the subject site to assess groundwater conditions. Multiple rounds of groundwater sampling were conducted to assess groundwater conditions. The results indicated presence of COCs. PCE, associated degradation products, and Chloroform was detected in the on and off-site Groundwater wells. Figure 2 shows detected constituents in Groundwater. Other VOCs associated with petroleum fuels

were detected in groundwater. The petroleum-related compounds are likely associated with a past petroleum release(s) (NYSDEC Spill #86-02108) from the previously mentioned station located on the southeast corner of Oriskany Boulevard and Clinton Street. The site and surrounding area is served by public water, there are no private wells within a half mile of the site. A full list of contaminates detected in groundwater is found below in table 1; however, not all of the detected constituents are COCs.

Table 1 – Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Benzene	0.47 – 8.3	1	7/58
Chloroform	0.42 – 31.1	7	2/58
Cis-1,2-Dichloroethylene	1.2 – 410	5	15/58
Ethylbenzene	110 – 150	5	3/58
Isopropylbenzene (Cumene)	35 – 72.6	5	3/58
O-Xylene (1,2-Dimethylbenzene)	2.3 – 5.2	5	1/40
Tert-Butyl Methyl Ether	1.1 – 27.2	10	5/58
Tetrachloroethylene(Pce)	0.42 – 1,.600	5	19/58
Trans-1,2-Dichloroethene	0.51 – 30.3	5	7/58
Trichloroethylene (Tce)	0.4 – 270	5	13/58
Vinyl Chloride	0.44 – 10.5	2	9/58
Xylenes (Total)	0 – 21	5	1/19
PFAS/ PFOS (PPT)			
PFOA	Non-detect – 58 ppt	6.7 ppt	1/3
PFOS	Non-detect – 66 ppt	2.7 ppt	1/3
Inorganics			
Iron	11.2 – 317	300	1/6
Manganese	9.28 – 751	300	2/6
Sodium	56,600 – 234,000	20,000	6/6

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).

The primary groundwater contaminants are PCE and associated decay products TCE, DCE and vinyl chloride), PFAS, and PFOS, associated with the operation of the former dry cleaner operation. As shown on Figures, 3, 4, and 5, the primary contamination is located on the southeast side of the commercial building most likely associated with the former dry cleaner's drainage pipe found on inspection of the commercial building. PCE and associated degradation products were not found off-site. Petroleum related contaminants as well as inorganic metals were found during the RI. Inorganics likely represent background conditions and are not associated with the site. The petroleum-related compounds, Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) are likely associated with a past petroleum release(s) (NYSDEC Spill #86-02108) from the former gas station on the southeast corner of Oriskany Boulevard and Clinton Street, north of the subject property.

Based on the findings of the RI, the presence of PCE 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 and its associated degradation products (TCE, DCE, and vinyl chloride).

Soil

Surface and subsurface soils samples were collected from various areas around the onsite residence and commercial building during the RI. Subsurface soil samples were collected from 0.17 ft up to 15 ft below ground surface (bgs) to assess soil contamination in the groundwater. Surface soil samples were collected from a depth of 0 to 0.17 ft bgs to assess potential direct human exposure to contamination. The results indicate that soils at the site exceed the unrestricted use SCG for volatile and semi-volatile organics and metals. A full list of exceedances are shown below in Table 2.

Table 2 – Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
1,2-Dichlorobenzene	0 - 1.2	1.1	1/44	100	0/44
Acetone	0.0218 – 0.11	0.05	2/44	100	0/44
Benzene	0 – 0.39	0.06	1/44	4.8	0/44
Cis-1,2-Dichloroethylene	0.0017 – 246.2	0.25	4/44	100	2/44
Tetrachloroethylene (PCE)	0.00098 - 1070	1.3	9/44	19	5/44
Trans-1,2-Dichloroethene	0.0027 – 16.1	0.19	3/44	100	0/44
Trichloroethylene (TCE)	0.0015 - 336.3	0.47	7/44	21	2/44
Vinyl Chloride	0 – 1.2	0.02	1/44	0.9	1/44
SVOCs					
Benzo[a] anthracene	0.35 – 5.2	1	4/15	1	4/15
Benzo[a]pyrene	0.19 – 4.9	1	4/15	1	4/15
Benzo[b] fluoranthene	0.25 – 6.7	1	4/15	1	4/15
Benzo[k] fluoranthene	0.20 – 2.1	0.8	1/15	3.9	0/15
Chrysene	0.20 – 5.7	1	4/15	3.9	1/15
Dibenzo[a,h] anthracene	0.19 – 0.66	0.33	1/15	0.33	1/15
Indeno[1,2,3-cd] pyrene	0.18 – 3.4	0.5	4/15	0.5	4/15

Inorganics					
Cadmium	1.53 - 2.78	2.5	1/11	4.3	0/11
Lead	17.9 - 1600	63	10/14	400	7/14
Silver	0.91 - 2.68	2	2/11	180	0/11
Zinc	93.8 - 408	109	6/11	10000	0/11
Mercury	0.078 - 0.647	0.18	3/11	0.81	0/11
Pesticides/PCBs					
4-4-DDE	0.013 – 0.015	0.0033	3/11	8.9	0/11
4-4-DDT	0.0038 – 0.061	0.0033	4/11	7.9	0/11

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 Commercial Use, unless otherwise noted.
D – SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.

The primary soil contaminates of concern are PCE and associated degradation products, correlates with the former dry-cleaning operation. As noted on Figure 6 the location of the major soil contaminates are around the parking lot behind the commercial building for VOCs. Lead surface soil contamination was found above the Protection for Public Health SCO for the site, Shown of Figure 7. The source of the lead is unknown but is considered a COC.

Metal soil contamination, with the exception of lead, was also found at the site but is unrelated to the site and most likely historical fill or background concentrations. Inorganic concentrations are consistent with those found in the area and are most likely representative of background concentrations. Therefore, inorganic contamination, excluding lead, is not considered a COC.

Based on the findings of the RI, the presence of PCE and related degradation products 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, PCE and related degradation products and lead.

Soil Vapor

The potential for soil vapor intrusion resulting from the presence of site related VOC contamination in soil and groundwater was evaluated by sampling sub-slab soil vapors underneath structures and the associated indoor air within the structures. Both on and off-site buildings were sampled to evaluate SVI.

SVI was evaluated on-site and at six off-site properties as part of a previous site investigation from 2010 to 2013, and it included sampling sub-slab vapors beneath the structure in addition to indoor air and ambient outdoor air. Based on the SVI sampling results, the on-site commercial building

including detached residence and one off-site residence were installed with a SSDS as an IRM to address exposure of site-related contaminants.

Based on the findings of the Remedial Investigation, the presence of PCE has resulted in the contamination of soil vapor. The site contaminants that are considered to be the primary COCs which will drive the remediation of soil vapor to be addressed by the remedy selection process are, PCE and associated degradation products.

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. The No Further Action Alternative is evaluated as a procedural requirement and as a basis for comparison with active soil and groundwater remediation technologies and in accordance with Section 4.2 of NYSDEC DER-10. If no remedial action is taken, contaminants already present in the soil and groundwater will remain in place and the RAOs will not be met. There will be no reduction in volume of contaminated soil or groundwater on site, and contaminants may continue to dissolve into groundwater, and migrate via groundwater. This alternative leaves the site in its present condition and does not provide any additional protection of the environment. The costs associated with this alternative would be the continued operation of the SSDSs.

Present Worth: *$130,000*

Capital Cost: *$0*

Annual Costs: *$130,000*

Alternative 2: 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 clean objectives listed in Part 375-6.8 (a). This alternative would include demolition of all existing buildings and existing cover on-site, site wide excavation, and off-site disposal of all waste and soils above the unrestricted use SCOs. Clean fill would be placed on the site for site restoration. The soil cover would consist of 1-foot minimum clean fill plus 6-inches of topsoil to support vegetation. Site management is included for the continued operation of SSDSs and maintenance of the cover system.

For contaminated surface and subsurface soils on the site, the proposed overall excavation area encompasses approximately 10,500 sq ft. The depth of excavation over most of this site is 15 ft bgs, although in a small portion, approximately 650 sq ft, the depth of excavation is 2 ft bgs. It is estimated 5,500 yd^3 of soil would be excavated and shipped off site for disposal. Post excavation confirmation sampling would be completed to ensure unrestricted use SCOs are met.

Remaining groundwater contamination would be addressed with MNA. Groundwater will be monitored for site related contamination and also for MNA indicators which will provide an understanding of natural attenuation processes at work. Reports of the natural attenuation would be provided at not greater than one year intervals, and active remediation would be proposed if it appears that natural processes alone would not address the contamination. Specific monitoring locations, parameters, and frequencies would be established during remedial design. The

monitoring program would comprise annual sampling of existing wells both on-Site and off-Site for VOCs and MNA parameters.

A pre-design investigation (PDI) and remedial design would be completed to define the limits of excavation, waste classifications, various geotechnical details, and MNA sampling. Clean fill material would be imported to restore the surface grade and allow for vegetative growth.

This alternative removes the greatest amount of contamination on site, requires the demolition of the commercial property and residential property on site, as well as destruction of the current cover system (Parking lot and sidewalks). This alternative would disrupt this area, through the demolition of the buildings, excavation related activities and trucks to and from the site.

This remedy is expected to take two construction seasons to fully implement. Long term O&M would continue for off-Site SSDSs as well as MNA sampling. Additionally, the Site would be periodically evaluated to determine the need for further remediation.

Present Worth: *$5,992,000*

Capital Cost: *$5,780,000*

Annual Costs: *$210,000*

Alternative 3: Targeted Surface Soil Excavation, Engineered Cover and MNA

This alternative would include targeted excavation of surface soil in the area of the on-site residence. This alternative also includes maintenance of existing Site covers (i.e., buildings, asphalt pavement, gravel) to prevent potential exposure. In addition, this alternative would include institutional controls, a SMP, periodic reviews, groundwater MNA, and continued operation and maintenance of the on- and off-Site mitigation systems (i.e., SSDSs).

The excavation would remove areas of surface soil to the east and west of the on-Site residential building exhibiting concentrations above residential SCOs. Soils would be excavated to a depth of up to 2 ft bgs. Approximately 100 yd^3s of soil would be removed from this area. Excavated soil would be transported to an off-Site disposal facility. Following excavation, clean fill would be brought in, and the area restored to the original surfaces (e.g., vegetation, gravel, asphalt).

The existing cover surfaces (i.e., building, asphalt pavement, gravel) would be maintained to provide a physical barrier to direct contact with surface soil. Proper maintenance of the existing cover surfaces would be detailed in the SMP, including provisions for routine maintenance and inspection to maintain function and integrity.

Administrative control(s) such as institutional controls (e.g., environmental easements, deed restrictions, and environmental notices) would be recorded for the Site to require the continued management of engineering controls to maintain protectiveness of public health and the environment. This administrative control would limit Site and groundwater use and require maintenance of remedial elements. Where necessary, preventative measures may be included in the design and construction of new buildings at the Site to mitigate the potential for exposure to constituents that may be present in soil vapor. Institutional controls would also include provisions

for additional vapor intrusion evaluation and mitigation, if requested by NYSDOH. Mitigation measures may include the use of a vapor barrier or the installation of a vapor intrusion mitigation system. institutional controls would include provision for maintenance of cover systems. The reasonably anticipated future land use for the Site is for both commercial and residential use.

A SMP would guide future activities at the Site by documenting institutional and engineering controls and by developing requirements for periodic site reviews, the implementation of required O&M activities for the selected remedy, and future development on the Site. In addition, consistent with 6 NYCRR Part 375-1.8(h)(3), annual certification of institutional and engineering controls would be required in the SMP.

Remaining groundwater contamination would be cleaned up by MNA. Groundwater will be monitored for site related contamination and for MNA indicators which will provide an understanding of natural attenuation processes at work. Reports of the natural attenuation would be provided at no greater than one-year intervals, and active remediation would be proposed if it appears that natural processes alone would not address the contamination. Specific monitoring locations, parameters, and frequencies would be established during remedial design. The monitoring program would comprise annual sampling of existing wells both on-Site and off-Site for VOCs and MNA parameters.

As part of this alternative, O&M of the on- and off-Site SSDSs would continue. O&M activities would include periodic inspection of SSDS components, with repair, modification, or replacement of system components as necessary. This alternative would address the Lead contaminated soils but would not address the groundwater contamination or the PCE impacted soils. This remedy is estimated to take one construction season to fully implement.

Present Worth:.....*$180,000*

Capital Cost:.....*$230,000*

Annual Costs:.....*$410,000*

Alternative 4: Targeted surface and subsurface soil excavation,

In-Situ amendment and MNA

This alternative would include a targeted excavation of soil exceeding commercial SCOs and an in-situ treatment, either ISCO or EISD, would be applied to address the contamination in the groundwater. A PDI would be performed to define the limits of excavation and determine the treatment. This alternative also includes site management provisions.

Soil in the source area with contamination above commercial SCOs would be excavated to a depth up to 15 ft bgs. Due to the depth of excavation temporary shoring and/or other stabilization mechanisms would be needed to support the excavation and the existing commercial building. The excavation would be backfilled and restored to match surrounding grade and surfaces (e.g., vegetation, gravel, asphalt). Approximately 560 yd^3 of unsaturated soil would be removed from this area at depths ranging from approximately 5 to 15-ft bgs. Excavated soil would be transported to an off-site disposal facility.

A PDI would be performed to refine the extent of soil excavation, complete a geotechnical evaluation for excavation support design, and determine the most effective injectant with a pilot scale study and the chosen injectant schedule.

An in-situ chemical amendment would treat groundwater using either an oxidizing agent or a reducing agent injected in the saturated zone. The amendment reacts chemically to convert constituents to nonhazardous or less toxic compounds that are more stable, less mobile, and/or inert. They would be applied via injection to the saturated zone in the source area and immediately downgradient, approximately 2,780 sq ft. During the remedial investigation, both ISCO and EISD were examined as a possible remedy for the site. Both treatment options showed that they are capable of reducing contamination in the groundwater, however a PDI is required to collect additional information to determine which application will be most efficient and cost effective for the site. Injection method will be chosen by the ability to effectively deliver amendments to the treatment zone.

A groundwater performance monitoring program would be implemented to establish baseline groundwater conditions (including MNA indicators), as well as to periodically monitor groundwater concentrations between the two injection events and one year following injection completion. Additional injections events may be implemented based on groundwater concentrations. Specific monitoring locations, parameters, and frequencies would be established during remedial design.

Following the confirmation of remedy effectiveness, an MNA monitoring program would be implemented consisting of the monitoring for site related contamination and also for MNA indicators, which will provide an understanding of natural attenuation processes. Specific monitoring locations, parameters, and frequencies would be established during remedial design. The MNA program would be comprised of not greater than annual sampling of existing wells, both on-Site and off-Site, for VOCs and MNA indicators. Reports of the natural attenuation would be provided at one-year intervals.

The covered surfaces (i.e., building, asphalt pavement, gravel) would be maintained to provide a physical barrier to direct contact with surface soil. Proper maintenance of the existing cover surfaces would be provided for in the SMP, including provisions for routine maintenance and inspection to maintain integrity and function.

Administrative control(s) such as institutional controls (e.g., an environmental easement) would be recorded for the Site to require the continued management of engineering controls to maintain protectiveness of public health and the environment. This administrative control would limit Site and groundwater use and require maintenance of remedial elements. Where necessary, preventative measures may be included in the design and construction of new buildings at the Site to mitigate the potential for exposure to constituents that may be present in soil vapor. Institutional controls would also include provisions for additional vapor intrusion evaluation and mitigation, if requested by NYSDOH. Mitigation measures may include the use of a vapor barrier or the installation of a vapor intrusion mitigation system, and institutional controls would include

provision for maintenance of cover systems. The reasonably anticipated future land use for the Site is for both commercial and residential use.

A SMP would guide future activities at the Site by documenting institutional and engineering controls and by developing requirements for periodic site reviews, the implementation of required O&M activities for the selected remedy, and future development on the Site. In addition, consistent with 6 NYCRR Part 375-1.8(h)(3), annual certification of institutional and engineering controls would be required in the SMP.

As part of this alternative, O&M of the on- and off-Site SSDSs would continue. O&M activities would include periodic inspection of SSDS components, with repair, modification, or replacement of system components as necessary.

This remedy is estimated to take one construction season to implement, additional time may be needed if groundwater contamination remains after treatment. This alternative addresses the grossly contaminated soils on site, as well as the lead surface soils around the residential building. This alternative appropriately addresses the groundwater contamination as well.

Present Worth: *$2,580,000*

Capital Cost: *$2,400,000*

Annual Costs: *$180,000*

Exhibit C

Remedial Alternative Costs

Remedial Alternatives	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Alternative 1 No Further Action	$0	$130,000	$130,000
Alternative 2 Site-Wide Excavation with Off-Site Disposal	$5,780,000	$210,000	$5,990,000
Alternative 3 Targeted Surface Soil Excavation, Engineered Cover and MNA	$230,000	$180,000	$410,000
Alternative 4 Targeted Surface and Subsurface Soil Removal, In-situ Chemical treatment and MNA	$2,400,000	$180,000	$2,580,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 4, Targeted Surface and Subsurface Soil Removal, In-situ Chemical treatment and MNA as the remedy for this site. Alternative 4 would achieve the remediation goals for the site by removing contaminated soil, treating groundwater and limiting potential exposure of any residual contamination. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figures 8 and 9.

Basis for Selection

The proposed 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 FS report.

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

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

The proposed remedy, Alternative 4, would satisfy this criterion by removing the contaminated soils from the surface and subsurface, and maintain the cover where contamination cannot be reached due to existing site conditions. Alternative 4 addresses the source of the groundwater contamination, which is the most significant threat to public health and the environment. Alternative 4 also includes protection from soil vapor through the installation and continued monitoring of SSDS system and the imposition of a institutional control. Alternative 1 (No Further Action) is protective of potential public health exposures to indoor air through the continued operation of the SSDS, however it does not address the RAOs for soil contamination or groundwater and will not be evaluated further. Alternative 2 meets all the threshold criteria by removing all soil contaminated above the commercial use SCOs. Alternative 3 complies with indoor air RAOs but does not address constituents in groundwater or address the source of contamination to groundwater. Alternative 1 will not be evaluated further.

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 to the extent practicable. It addresses source areas of contamination and complies with the residential use soil cleanup objectives in the area immediately surrounding the residential structure while identifying commercial SCOs, consistent with parcel zoning, for the remainder of the site through the removal of contaminated on-site soils, through excavation, and construction of a cover system. This alternative creates the conditions necessary to restore groundwater quality to the extent practicable.

Alternative 2 (Site-wide excavation) would address the SCGs through removal of impacted soil exceeding commercial use SCOs. For location specific SCGs Alternatives 2 and 4 would be conducted in a manner consistent with Federal and State requirements for cultural, archeological, and historical resources.

Alternatives 2 and 4 provide a means of reducing on-Site and off-Site groundwater concentrations through groundwater treatment, and/or excavation of source area soils. For Alternatives 2 and 4, it is anticipated that treatment of the source zone and/or removal of impacted soils would shorten the timeframe needed for attainment of groundwater RAOs following execution and limiting off-Site migration of groundwater in excess of ambient water quality standards as compared to Alternatives 1 and 3. Groundwater monitoring included in Alternatives 2 through 4 would provide a means of evaluating attainment of groundwater SCGs and remedy effectiveness.

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.

The remaining alternatives would provide long-term effectiveness and permanence through continued maintenance of adequate and reliable controls of exposures to soil and groundwater through institutional and engineering controls.

In Alternatives 2 and 4, residual impacts following excavation would be adequately managed through an SMP, institutional controls, engineering controls, periodic reviews and O&M of remedy components. In Alternatives 2 and 4, residual risks due to groundwater would be addressed by institutional controls and the provision of water through the existing public water supply, while groundwater monitoring would provide a means of evaluating attainment of groundwater SCGs and remedy effectiveness. Alternative 4 provides added long-term effectiveness and permanence through the treatment of saturated soils and groundwater within the Site boundaries while Alternative 2 removes the greatest quantity of impact soils.

For Alternatives 2 and 4, it is anticipated that the treatment and/or removal of impacted soils would better support attainment of groundwater RAOs following execution as compared to natural attenuation alone as contemplated in Alternative 3. Alternatives 2 and 4 would provide long-term effectiveness with minimal residual contaminants through continued operation, maintenance and monitoring of existing IRM components; institutional controls for groundwater and soil; in-situ treatment of groundwater in areas of elevated VOCs (Alternative 4); soil excavation and off-site disposal; and engineered covers. There is some degree of added permanence for Alternatives 2 and 4 due to the greater volume of soil removed and source treatment.

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.

Alternative 4 is the only alternative that results in reduction in toxicity, mobility and volume through active treatment of both soil and groundwater. Alternatives 2, 3, and 4 would provide a reduction in volume of impacted soil present at the Site through excavation of soils. Alternative 2 would result in the largest reduction in volume of impacted soil through Site-wide removal of soil exceeding commercial use SCOs however does not address groundwater thereafter. Alternative 3 will not be evaluated further.

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 2 and 4 have short-term impacts associated with excavation, which can be managed through construction best management practices.. Alternative 2 is estimated to take the longest amount of time and have the largest immediate impacts due to the injection of an amendment into the identified groundwater treatment zone. The environmental footprint was analyzed for the remaining alternatives to determine short term impacts. There is an environmental footprint inherent in implementation of each alternative as it relates to construction and operation. The greenhouse gas emissions and other environmental footprint metrics associated with the implementation/construction of each alternative was estimated using the SiteWise Environmental Footprint Tool (SiteWise™, 2019). Of the remaining alternatives, Alternative 4 has the smallest associated environmental footprint while Alternative 2 has the largest associated environmental footprint. Additionally Alternative 2 utilizes the highest amount of landfill space, a significant contributor to its high sustainability impact.

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 4 is favorable in that it is readily implementable. The equipment, specialists and materials necessary for the implementation is readily available. This alternative would have short-term disruption to the on-Site commercial structure and residence during the implementation of the surface soil excavation (residential area), source area excavation and in-situ treatment on the northeast portion of the Site.

Alternative 2 would have the greatest impacts and be the most challenging to implement due to the need to demolish the on-Site commercial building and residence. Additional excavation challenges would be present under Alternative 2, including limited space for staging materials, and conducting excavation dewatering operations. Truck traffic in and out of the Site would require traffic control and possible lane closures on roads surrounding the Site for the approximately 6-month-long duration of the construction. In addition to the potentially significant effects on local air quality and community traffic patterns. Additionally, this alternative would present require relocation of residents and businesses prior to demolition of the on-site buildings. For Alternatives

2 and 4 the presence of underground utilities could pose a challenge during implementation and would need to be considered.

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 2 (excavation and off-site disposal) would have the highest present work cost. In-situ treatment, excavation and cover system (Alternative 4) would be much less expensive than Alternative 2, is anticipated to provide faster cleanup of the groundwater resource.

The present worth of the remaining alternatives is lowest in Alternative 4 and highest with Alternative 2. The long-term maintenance cost of Alternative 4 are lower than Alternative 2.

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 area around the site is zoned a mix of commercial and residential. It is reasonably anticipated that the future use of the site remains commercial, Alternative 4 is desirable because it removes most of the accessible contaminated materials. For the potential contamination left on site, this alternative would control potential exposure with a SMP and institutional control. Alternative 2 would remove the contaminated soil permanently, however the site would require redevelopment following the remedy.

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. 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.

Alternative 4 is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.