PROPOSED
AMENDED RECORD OF DECISION

Damshire Cleaners
Town of Colonie, Albany County
Site No. 401059

January 2021

Prepared by the:

Division of Environmental Remediation
New York State Department of Environmental Conservation

PROPOSED RECORD OF DECISION AMENDMENT
DAMSHIRE CLEANERS SITE

Town of Colonie | Albany County | Registry No. 401059 January 2021

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Division of Environmental Remediation

SECTION 1: PURPOSE AND SUMMARY OF THE PROPOSED RECORD OF DECISION AMENDMENT

The New York State Department of Environmental Conservation (Department), in consultation with the New York State Department of Health (NYSDOH), is proposing an amendment to the February 2018 Record of Decision (ROD) for the above referenced site. The disposal of hazardous wastes at this site, as more fully described in the original ROD document and Section 6 of this document, has caused the contamination of various environmental media. The proposed amendment is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This ROD Amendment identifies new information which has led to this proposed alternative to the previously selected remedy and discusses the reasons for the preferred remedy.

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 Environmental Remediation Programs. 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.

On February 12th, 2018, the Department, in consultation with the NYSDOH, signed a Record of Decision which selected a remedy to clean up the Damshire Cleaners Site. Implementation of the February 2018 selected remedy began in 2019 with a pre-design investigation (PDI). Additional monitoring wells were installed on the site and groundwater samples and groundwater elevations were collected. It was determined through this investigation that groundwater was too close to the ground surface to implement the selected remedy – Air Sparge and Soil Vapor Extraction (AS/SVE). Because of the high groundwater conditions found at the site, there is insufficient unsaturated soil depth to install the piping network necessary for a SVE system to work effectively. Without sufficient unsaturated soil depth to install the SVE piping which collects the vapors generated by the air sparge system, the SVE system will not capture the volatilized contaminants, resulting in the potential for fugitive emissions to impact air at and near the site. In addition to the limited thickness of soil above groundwater, the AS/SVE technology would be significantly hindered by the presence of the existing structure, underground utilities and newly documented large subsurface anomalies thought to be the former septic system and an underground storage tank. The originally selected AS/SVE remedy may have been effectively implemented if conditions as they were understood or anticipated at the time of the Remedial Investigation and Feasibility Study remained true. Unfortunately, the contents of the onsite structure have not been removed by the owner making installation of the AS/SVE system within the building footprint impractical. Likewise, prior to the discovery of additional subgrade

structures, which will negatively impact the effectiveness of the AS/SVE system, the selected remedy could have been engineered to work in the available unsaturated overburden. However, after evaluating the current and newly revealed site conditions, an alternative to the AS/SVE remedy is prudent.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on this proposed ROD Amendment. This is an opportunity for public participation in the remedy selection process. The information here is a summary of what can be found in greater detail in reports that have been placed in the Administrative Record for the site. The public is encouraged to review the reports and documents, which are available at the following repositories:

William K. Sanford Town Library
629 Albany-Shaker Road
Loudonville, NY 12211
Phone: (518) 458-9274

A public comment period has been set for **DATE** through **DATE** to provide an opportunity for you to comment on these proposed changes. Pursuant to Executive Order 202.15, a public meeting will not be held in an effort to limit the community spread of COVID-19.

Written comments may be sent to:

Benjamin Rung, Project Manager
NYS Dept. of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233-7017
benjamin.rung@dec.ny.gov

The Department may modify or reject the proposed changes based on new information or public comments. Therefore, the public is encouraged to review and comment on this proposal. Comments will be summarized and addressed in the responsiveness summary section of the final version of the ROD Amendment. This ROD Amendment is the Department's final selection of the remedy for the 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 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 https://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The 0.39-acre Former Damshire Cleaners site is located at 1205 Central Avenue in the Town of Colonie, Albany County (Tax Map No.: 53.06-06-35.1). The site is bordered by a church to the southeast, a commercial area to the northwest, a residential area to the northeast and Central Avenue and commercial and residential areas to the southwest. Patroon Creek is about 3,000 feet downgradient (southwest) of the site.

Site Features: The site is currently occupied by one vacant, approximately 3,600 square foot concrete-block building that is abutted by an asphalt parking lot to the northwest and southwest, a wooded area to the northeast and a grassy area and a dirt driveway to the southeast. An overhead door is present on the northeast side of the building where dry cleaning solvent was likely delivered during active operations.

Current Zoning and Land Use: The site is currently inactive and is located in a mixed residential and commercial area in the Town of Colonie. The site is zoned Neighborhood Commercial Office Residential.

Past Use of the Site: Damshire Cleaners conducted dry cleaning operations on-site until approximately 2001, however records do not identify when dry cleaning operations began. Several notices of violation pertaining to fugitive air emission exceedances were issued to the facility in 1999 and through 2000. Tetrachloroethene (PCE), a common dry cleaning chemical, is reported to have been leaking on the floor below dry cleaning equipment for as long as a year prior to the cleaner closing its doors in 2001.

A fuel oil spill (No. 0107674) at the site was reported to Department's Spill Response Program in November of 2001. Chlorinated solvent contamination was discovered in the soil during the response, which caused the spill project to remain open.

It is the Department's understanding and observation that the structure has remained vacant since 2001 except for the removal of the dry-cleaning equipment and the subsequent storage of copious miscellaneous belongings by the current owner. Ownership of the property was transferred to the current owner in September of 2007 who, at the request of the Department, conducted a preliminary soil vapor intrusion study at the site in 2010. The study detected elevated levels of chlorinated solvent contamination in both the sub-slab vapor and indoor air. The property owner was not willing to conduct further investigation of the on-site soil and groundwater, which resulted in the site being referred to the New York State Superfund Program as a potential site. Additional subsurface investigation, and a limited off-site area investigation, was conducted by the Department in 2011. The site was added to the Superfund Registry based on findings of this investigation and a Remedial Investigation and Feasibility Study were undertaken thereafter. Following issuance of the 2018 ROD, a pre-design investigation was performed during the summer of 2019 to gather the information necessary to design the prescribed air sparge and soil vapor extraction system remedy.

Site Geology and Hydrogeology: Overburden on the site and in the immediate area consists of silty-fine sand with clay lenses. Depth to groundwater on site is approximately four feet below ground surface (bgs) on average and flows to the southwest. The deepest well constructed

during the Remedial Investigation (RI) was 70 feet below grade into a reportedly thick clay layer at approximately 60 feet below grade. No bedrock was encountered at the limits of drilling during the RI or during the subsequent PDI. Borings advanced during the PDI did not encounter the clay layer observed at 60' bgs during the RI. Based on a PDI borings, the clay layer previously observed is likely intermittent, not forming a continuous aquitard as reported in the RI.

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, an alternative that restricts the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) was evaluated in addition to an alternative which would allow for unrestricted use of the site.

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:

- Ninamarie Crisafulli,
- Estate of Charles Yund

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

SECTION 6: SITE CONTAMINATION

6.1: 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 the site.

Nature and Extent of Contamination:

Soil

Soil was analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), pesticides and metals. Based upon investigations conducted to date, the primary contaminants of concern for the site include tetrachloroethene (PCE), trichloroethene (TCE) and cis-1,2-dichloroethene (DCE), though several polycyclic aromatic hydrocarbons (PAH) were also noted above applicable standards.

The soil samples collected show the presence of soil contamination, and groundwater data confirms the presence of an on-site source, although a specific source area has not been definitively located because it lies beneath the existing structure. Sub-slab soil sampling was limited within the footprint of the structure by a reinforced floor slab and debris and stored materials throughout the building. The highest on-site soil concentrations in samples collected from accessible locations during the RI was PCE at 12 parts per million (ppm) directly beneath the building slab. The highest on-site soil concentration observed during the PDI was 170 ppm from a boring location on the downgradient (southwest) side of the drycleaning structure near the sidewalk. Note that the respective unrestricted use/groundwater protection and commercial use soil cleanup objectives (SCOs) for PCE are 1.3 ppm and 150 ppm, respectively. Soil samples obtained immediately off-site and downgradient from the site during the site characterization investigation found PCE (830 ppm) in one soil sample from below the water table at 14 feet below grade. TCE was found at 11 feet below grade at 12 ppm compared to its respective unrestricted and commercial SCOs of 0.47 ppm and 200 ppm.

At three locations, SVOCs, particularly the PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene, were detected above their respective commercial use SCOs in shallow soil (0-6 inches) during the RI. While some of these compounds were observed during the PDI, none were present at concentrations greater than the commercial use SCO.

Groundwater

Groundwater was analyzed for VOCs, SVOCs, PCBs, pesticides, metals and cyanide. Results from on-site groundwater samples obtained upgradient of the building and septic system did not detect site-related contaminants.

During the RI, contaminants in on-site groundwater were present at concentrations ranging from non-detect to maximum concentrations of 970 parts per billion (ppb) of PCE, 190 ppb of TCE and 130 ppb of DCE. The higher concentrations were in the presumed area of an abandoned septic system to the east of the building. Groundwater samples collected during the PDI investigation contained maximum concentrations of 11,000 ppb PCE, 780 ppb TCE, and 160 ppb DCE. These concentrations were observed in monitoring well MW-04 on the downgradient side of the property adjacent to the sidewalk.

During the RI, standing water within a sump inside the site building had elevated concentrations of PCE (55,000 ppb), TCE (4,000 ppb) and DCE (69,000 ppb), indicating a possible source in the area of the sump. No standing water was present in the sump at the time of the PDI.

Groundwater directly downgradient (southwest) of the site exhibited significant site related

contamination; PCE concentrations ranged from 2 to 48,000 ppb, TCE concentrations ranged from 5 to 7,900 ppb and DCE concentrations ranged from 27 to 432 ppb. The groundwater standard for each of these compounds is 5 ppb. One groundwater sample was collected from off-site downgradient well MW-07 with a resultant PCE concentration of 100 ppb, up from the 52 ppb last observed during the RI.

Soil Vapor, Sub-slab Vapor and Indoor Air

Prior to evaluation as a potential State Superfund site, a soil vapor intrusion study was conducted in the on-site building on behalf of the property owner. The study detected elevated levels of chlorinated solvent contamination in the sub-slab vapor and indoor air of the vacant building. Concentrations of the PCE were as high as 130,000 micrograms per cubic meter (µg/m3) in the sub-slab vapor and 57 µg/m3 in the indoor air. TCE concentrations were as high as 220 µg/m3 in sub-slab vapor and non-detectable in indoor air.

Additional on-site soil vapor intrusion (SVI) and off-site downgradient soil vapor sampling was conducted in the spring of 2015. Sampling near and at one upgradient off-site building indicated that actions were not necessary to address exposures related to soil vapor intrusion at this location. Off-site downgradient soil vapor data showed PCE at concentrations of 130 and 1,300 µg/m3 in samples located immediately across Central Avenue (to the southwest) from the site. Based on this data the Department requested access from property owners to collect sub-slab vapor and indoor air samples from downgradient properties, but requests for access were denied at that time.

In April 2017, an SVI investigation was conducted in an off-site building east of the site at the request of a tenant. Investigation results near and at the building indicated no actions were needed to address exposures related to soil vapor intrusion at this location. Subsequent outreach initiatives resulted in the sampling of three additional structures and the installation of a sub slab depressurization system in two of the structures.

6.2: Interim Remedial Measures

An 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.

There were no IRMs performed at this site during the RI.

6.3: Summary of Human Exposure Pathways

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

Access to the site is unrestricted and people may contact contaminated soil or groundwater if they dig below the ground surface. People are not drinking the contaminated groundwater since the area is served by a public water supply system that is not contaminated by the site. 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. Because the site

is vacant, the inhalation of contaminants due to soil vapor intrusion does not represent a current concern for the on-site building. The potential exists for people to inhale contaminants in indoor air due to soil vapor intrusion in the event the site is re-occupied. Additional investigation is needed to evaluate soil vapor intrusion at off-site structures.

SECTION 7: SUMMARY OF ORIGINAL REMEDY AND PROPOSED AMENDMENT

7.1 Original Remedy

The elements of the selected 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 remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

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

2. Air Sparge with Soil Vapor Extraction (AS/SVE)

Air sparging will be implemented to address the groundwater plume contaminated by volatile organic compounds (VOCs). VOCs will be physically removed from the groundwater and soil below the water table (saturated soil) by injecting air into the subsurface. The injected air rising through the groundwater will volatilize and transfer the VOCs from the groundwater and/or soil into the injected air. The VOCs are carried with the injected air into the vadose zone (the area below the ground surface but above the water table) where a soil vapor extraction (SVE) system designed to remove the injected air will be installed. The SVE system will apply a vacuum to a network of perforated pipes installed into the vadose zone to remove the VOCs along with the air introduced by the sparging process. The air extracted from the SVE wells will be treated as necessary prior to being discharged to the atmosphere.

It is estimated 15 air injection wells will be installed in the area of the site to be treated. Installation will occur at a 30-foot spacing throughout the plume footprint, as depicted on Figure 12, to a depth of approximately 55 to 60 feet, which is 45 feet below the water table. To capture the volatilized contaminants, a network of perforated pipes will be installed in the vadose zone at a depth of approximately 5 to 10 feet below ground surface. The air containing VOCs

extracted from the SVE wells will be treated by passing the air stream through activated carbon which removes the VOCs from the air prior to it being discharged to the atmosphere.

3. Cover System

A site cover will be required to allow for commercial use of the site in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). The site cover may consist of paved surface parking areas, sidewalks, or a soil cover. Where a soil cover is to be used it will be a minimum of one foot 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 as set forth in 6 NYCRR Part 375-6.7(d). In areas where building foundations or building slabs preclude contact with the soil, the requirements for a site cover will be deferred until such time that they are removed.

4. Vapor Mitigation

Any on-site buildings 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. It is anticipated that the SVE system discussed in remedial element 2 will serve to mitigate vapor intrusion until such time that its operation is discontinued.

5. Institutional Controls

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 Department 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 NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

6. Site Management Plan

A Site Management Plan 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 Environmental Easement discussed above in paragraph 4.

   Engineering Controls: The Air Sparge with Soil Vapor Extraction system discussed above in paragraph 2.

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;
- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any new buildings developed on the site or for buildings in off-site areas of contamination, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision that should the owners of properties where sampling was previously declined request to have their properties sampled in the future, the NYSDEC, in consultation with the NYSDOH, shall assess the need for soil vapor intrusion sampling and take appropriate action.
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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 Department;
    - monitoring for vapor intrusion for any buildings, as may be required by the Institutional and Engineering Control Plan discussed above.

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

7.2 Elements of the Remedy Already Performed

Following issuance of the ROD, a pre-design investigation was performed to collect information necessary for the design of the air sparge and soil vapor extraction system. During this investigation four new groundwater monitoring wells were installed, a geophysical survey of the property was performed, and a comprehensive round of groundwater samples was collected from both new and existing on-site and off-site monitoring wells. No further implementation of the previously selected remedy was developed or carried out.

7.3 New Information

During the Pre-Design Investigation (PDI), the depth to groundwater beneath the surface was determined to be four feet on average across the site. Without an engineered plenum, or impervious cover system, four feet of unsaturated soils is insufficient for the effective implementation of an Air Sparge (AS) and Soil Vapor Extraction (SVE) system. The SVE portion of the system would experience short-circuiting (capturing ambient air from the surface rather than soil gas created by the air sparge system) because of the insufficient burial depth, necessitating an impermeable cover be constructed over the entire treatment area. The groundwater mounding that results from the application of AS would further reduce the available burial depth of the SVE components or potentially flood the extraction piping. AS/SVE is proven to be highly effective at addressing the documented site contaminants, however site conditions must be conducive for effective system operation. The effects of the limited unsaturated soil depth could have been mitigated through the use of a cover system, however there are other complicating factors which have led to the reevaluation the originally selected remedy. The presence and condition of the existing structure further reduces the potential effectiveness of the AS/SVE system. The existing structure is largely inaccessible due to its contents. The installation of the SVE components beneath the building slab and above the water table cannot be reasonably accomplished under conditions as they currently exist, and directional drilling of SVE piping is not feasible in four feet of unsaturated soil. Additionally, the comprehensive geophysical survey performed during the PDI revealed significant previously undocumented subgrade structures associated with the known septic system and anomalies believed to be underground storage tanks. The obstacles to implementation identified during the PDI have resulted in the need to select an alternative to the previously selected remedy. No significant departures from the RI, in contaminant concentration or location, were observed during the PDI. This ROD Amendment is driven by the implementability of the previously selected remedy.

7.4 Proposed Changes to the Original Remedy

A summary of the changes to the original ROD as proposed in this document are shown in the following Table:

SUMMARY OF PROPOSED REMEDY CHANGES

DAMSHIRE CLEANERS, Site No. 401059 | Record of Decision Amendment

Media:	February 2018 ROD	Amended 2020 ROD
Groundwater	(1) Air Sparge with Soil Vapor Intrusion; (2) Long term monitoring; (3) An Environmental Easement prohibiting the use of ground water.	(1) Evaluate groundwater and subsurface conditions to determine the most appropriate in-situ amendment injection technology. Examples may include - chemical oxidation, reductive dichlorination, augmented bioremediation; (2) Long term monitoring; (3) An Environmental Easement prohibiting the use of groundwater.

Media:	February 2018 ROD	Amended 2020 ROD
Soil	(1) A cover system for commercial use of the site in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). (2) An Environmental Easement to limit the property to commercial use; (3) Implementation of a Site Management Plan (SMP) to maintain IC/ECs at the site.	No change to the three previous Soil remedial elements. Additional element: (4) Tanks or subgrade structures documented or encountered will be removed. Limited excavation and off-site disposal of grossly contaminated soils, soils identified as potential source material or soils exhibiting elevated contaminant concentration which can be readily and discreetly addressed by removal.
Soil Vapor/Indoor Air	(1) Installation of a Sub Slab Depressurization System in the existing structure or any new structure built; (2) Monitoring of the SSDS system to evaluate effectiveness.	There are no changes to the remedy for soil vapor/indoor air via this amendment.

SECTION 8: EVALUATION OF PROPOSED CHANGES

8.1 Remedial Goals

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

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil
RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor
RAOs for Public Health Protection

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

8.2 Evaluation Criteria

The criteria used to compare the remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each criterion, a brief description is provided. A detailed discussion of the evaluation criteria and comparative analysis is contained in the original Feasibility Study.

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

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

The remedy selected in the February 2018 ROD (Alternative 4, Air Sparging and Soil Vapor Extraction) satisfies the criterion by directly reducing the concentrations of contaminants of concern (COCs) in soil, groundwater and soil vapor at the site and by preventing exposures to contamination through institutional and engineering controls, namely the environmental easement, cover system, Site Management Plan, and soil vapor extraction system. The proposed remedy of an injected amendment, along with the recording of an Environmental Easement, a cover system and the installation of a SSDS in any redeveloped or newly constructed building on-site also satisfies the criteria. The injection of an amendment will result in the reduction of contaminant mass though biotic or abiotic processes, thereby limiting the potential for human health exposures and reducing impacts to the environment.

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

The AS/SVE remedy selected in the 2018 ROD achieves compliance with SCGs. The implementation of an injected amendment technology will also meet the applicable SCGs.

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

3. 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.

The remedy selected in the 2018 ROD poses a potential for increased short-term adverse impacts to the public during the site activities associated with the construction of the remediation systems, most notably during excavation for system installation and backfill around pipes, through the production of dust and the presence of construction equipment in a high traffic area; however, earthwork would be short in duration. In addition, the permanent AS/SVE treatment systems would produce nuisance noise throughout operations. The proposed alternative remedy will require a short duration well drilling and injection program followed by a monitoring period. Additional injections events may be necessary but those would also be short in duration and less intrusive than the initial drilling activities. The short-term effectiveness of an injection technology will depend on the type selected. In-situ Chemical Oxidation can have rapid results while bio amendments typically take longer to realize results.

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

The remedy selected in the 2018 ROD would be a long-term treatment system that provides effective mass reduction with continued operation. The proposed remedial amendment injection technology will likely need to be implemented a number of times to achieve the desire reduction in contaminant mass and continue to mitigate the magnitude of the remaining risk. The engineering controls needed to implement this alternative technology are similar to that of AS/SVE. A firm understanding of the subsurface, hydrogeologic and biotic conditions which exist are necessary for the successful implementation of an injection remedy. The institutional control in the form of an Environmental Easement is the same as previously selected, as is the Cover System.

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

The remedy selected in the 2018 ROD does not guarantee source removal however it would significantly reduce mobility and volume in soil vapor with direct treatment. It would also directly reduce groundwater concentrations with little potential to mobilize COCs. The injection of an amendment to the subsurface must be done properly to prevent mobilization of a contaminant. Carefully implemented however, this technology can be very effective in the control and destruction of contaminant mass. When accurately applied, injected remedial amendments can quickly reduce the volume, mobility and toxicity of a contaminant source and plume. Site conditions and contaminant profiles observed during the RI and PDI indicate that biota may be present which is favorable to reductive dichlorination though the breakdown pathway from PCE to TCE, DCE, VC and Ethene. Alternatively, the in-situ injection of a chemical oxidant may result in the complete destruction of the contaminant. With both technology types, the injection results

in movement of amendment into hard-to-reach areas as well as movement downgradient with groundwater flow, resulting in reduced volume over time and remediation of the offsite plume.

6. Implementability. The technical feasibility 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.

As discussed above, the remedy selected in the 2018 ROD (AS/SVE) is not implementable at the site because of the groundwater elevation, subgrade obstructions and existing building. The alternative remedy proposed is readily implementable and leaves no infrastructure or permanent fixture on the property following the injection event(s). The existing or additional monitoring wells, completed at grade, will be the only identifiable feature of the injection technology. The site, although constricted has adequate space to implement the proposed remedy.

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 remedy selected in the 2018 ROD has an estimated Total Present Worth cost of $655,000. ROD Alternative 5 In-Situ Enhanced Reductive Dichlorination, an injection technology which may be implemented if conditions are favorable, has a Present Worth Cost of $1,440,000. Although this is more than twice the estimated cost of the previously selected remedy, the implementability and anticipated effectiveness justify the increased cost.

This final criterion is considered a modifying criterion and is considered after evaluating those above. It is focused upon after public comments on the proposed ROD amendment have been received.

8. Community Acceptance. Concerns of the community regarding the proposed changes 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 final remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 9: PROPOSED AMENDED REMEDY

The Department is proposing to amend the Record of Decision (ROD) for the Damshire Cleaners Site. The proposed changes to the selected remedy are summarized in Section 7.3 above.

The estimated present worth cost to carry out the amended remedy is $1,440,000. The estimated present worth to complete the original remedy was $655,000. The cost to construct the amended remedy is estimated to be $1,306,000 and the estimated average annual cost for 30 years is $8,100.

The elements of the proposed amended remedy listed below are identified as *unchanged,*

modified or new when compared to the February 2018 remedy:

Remedial Design (UNCHANGED)
A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy.

Amendment Injection Technology (NEW)
Based on the findings of the Pre-Design Investigation (PDI), a best fit in-situ amendment injection technology will be selected, similar to Alternative 2 (Enhanced Bioremediation) and Alternative 5 (In Situ Enhances Reductive Dichlorination) from the 2018 ROD. The PDI will be designed to identify the amendment technology which will achieve the best results given site-specific conditions, while also considering the cost of implementation, amendment persistence and need for reapplication of the selected product, and potential impacts to surrounding homes and businesses. The specific remedial amendment product will be selected to quickly eliminate, to the extent practicable, the contaminant source and downgradient plume, thereby mitigating the threat from Soil Vapor Intrusion.

Subgrade Structures Removal and Limited Excavation (NEW)
Tanks or subgrade structures documented or encountered will be removed and properly disposed of. Limited excavation and off-site disposal of grossly contaminated soils, soils identified as a potential source material or soils exhibiting elevated contaminant concentration which can be easily and discreetly addressed by removal will be carried out if found.

Site Cover (UNCHANGED)
A site cover consisting of pavement, buildings and/or one foot of soil meeting the commercial Soil Cleanup Objectives found in 6 NYCRR Part 375 will be placed site wide. This cover will preclude direct contact with contaminated soil.

Engineering and Institutional Controls (UNCHANGED)
Imposition of an institutional control in the form of an environmental easement and a site management plan, as described below, will be required. The remedy will achieve a commercial cleanup at a minimum and will include an environmental easement and site management.

The environmental easement for the controlled property which will:
- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering;
- allow the use and development of the controlled property for commercial use;
- restrict the use of groundwater as a source of potable or process water; and
- require compliance with the Department approved site management plan.

Site Management Plan (UNCHANGED)
A Site Management Plan is required, which includes 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 that the institutional and engineering controls remain in place and effective.

SECTION 10: NEXT STEPS

As described above, the Department is conducting a comment period on the proposed changes to the selected remedy. At the close of the comment period, the Department will evaluate the comments received and prepare a responsiveness summary which will be made available to the public. A notice describing the Department's final decision will be sent to all persons on the site mailing list.

If you have questions or need additional information you may contact any of the following:

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