

DECISION DOCUMENT

Jamestown Brewery
Brownfield Cleanup Program
Jamestown, Chautauqua County
Site No. C907047
January 2022



**Department of
Environmental
Conservation**

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

DECLARATION STATEMENT - DECISION DOCUMENT

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Brownfield Cleanup Program
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Site No. C907047
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Statement of Purpose and Basis

This document presents the remedy for the Jamestown Brewery site a brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Jamestown Brewery site and the public's input to the proposed remedy presented by the Department.

Description of Selected 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;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; 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 will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Cover System:

A site cover currently exists in areas not occupied by buildings and will be maintained to allow for commercial use of the site. The minimal greenspace areas located at the site will be analyzed and evaluated as part of the remedial action, to ensure the cover soils meet Commercial Soil Cleanup Objectives CSCOs. If the cover material does not meet CSCO criteria, it will be excavated and properly disposed of off site, and the area backfilled with appropriate cover soils. Any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required, it will be a minimum of one foot, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

3. In-Situ Injection for Plume Reduction

Plume reduction will be accomplished by treating the groundwater for chlorinated volatile organic compounds (VOCs) via in-situ treatment methods, such that the groundwater leaving the site has been effectively treated to meet water quality criteria.

In-situ injections will be executed across five separate on-site areas (refer to Figure 3). Contaminated plume reduction will be accomplished by injecting in-situ treatment materials along a series of injection points which vary in depths from 10 to 35 feet below ground surface (fbgs). The in-situ treatment technologies to be implemented are in-situ chemical reduction (ISCR), enhanced anaerobic degradation, and bioaugmentation.

Following implementation of the in-situ injections, two rounds of performance groundwater monitoring will be completed. The monitoring events will be used to evaluate the remedy effectiveness and determine if it successfully achieved the remedial goals for the site. Monitoring locations will be located within the vicinity of a previously excavated and backfilled area and downgradient locations (PMW-1R, PMW-4, PMW-6, PMW-7, PMW-8, and MW-1)

4. Vapor Mitigation:

The site's existing active sub-slab depressurization system (SSDS) will be evaluated to ensure it is fully operational within the existing building and adequately mitigates the migration of vapors into the building from soil and/or groundwater. Any future on-site buildings will be evaluated to determine if a sub-slab depressurization system, or other acceptable measures, are necessary to mitigate the migration of vapors into the building from soil and/or groundwater.

5. Environmental Easement:

The remedy will achieve a Track 4 commercial cleanup at a minimum and will include an environmental easement and site management plan as described below.

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 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 or industrial 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 (SMP)

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

- 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:
 - o Institutional Controls: the environmental easement discussed in remedial element 5 above.
 - o Engineering Controls: the site cover discussed in remedial element 2 above, and the vapor mitigation system (SSDS) discussed in remedial element 4 above.

This plan includes, but may not be limited to:

- an excavation plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use or groundwater use restrictions;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described above will be placed in any areas where the upper one foot of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
- a provision for evaluation of the potential for soil vapor intrusion for any new buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification;
- the steps necessary for the periodic reviews and certification of the institutional and/or

engineering controls;

- a monitoring plan to assess the performance and effectiveness of the remedy. The plan includes but not be limited to:
 - o monitoring of groundwater to assess the performance and effectiveness of the remedy;
 - o monitoring of the site's engineering controls (i.e. SSDS);
 - o monitoring for vapor intrusion within any new buildings developed on the site, as many be required by the Institutional and Engineering Control Plan discussed above; and
 - o a schedule of monitoring and frequency of submittals to the Department.

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

The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration Department guidance, as appropriate. The remedy is protective of public health and the environment.

1/4/22

Date

Michael Cruden

Michael Cruden, Director
Remedial Bureau E

DECISION DOCUMENT

Jamestown Brewery
Jamestown, Chautauqua County
Site No. C907047
January 2022

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance, based on the reasonably anticipated use of the property.

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

SECTION 2: CITIZEN PARTICIPATION

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

DECInfo Locator - Web Application
<https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C907047>

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

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 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 Jamestown Brewery site is an approximately 0.59-acre site located in an urban area at 115-121 West Third Street in the City of Jamestown, Chautauqua County. It is south of West Third Street, east of Washington Street (New York State Route 60), and north of West Second Street.

Site Features:

The site consists of a three-story commercial building on the northwest portion of the site, asphalt-paved parking areas to the east and south of the building, and landscaped areas along the southern site boundary.

Current Zoning and Land Use:

The site is in a Central Business District (C-3). The site is currently vacant and improved with a three-story, 16,147 square foot commercial building on the north portion of the site and an asphalt parking lot on the south portion of the site. The surrounding parcels are used for various commercial purposes and road rights-of-ways. The intended future use of the property is for commercial purposes.

Past Use of the Site:

The site has been used for various commercial purposes since at least 1886. Commercial operations of note have included a photo facility, a dry cleaner, a taxi company, an automotive repair shop and a parking garage. In 2003, a 3,000-gallon #2 fuel oil underground storage tank was closed in place under NYSDEC direction within the Washington Street right-of-way proximate to the west exterior of the site building. Adjacent properties appear to have been developed since at least 1886 and have been utilized commercially since that time.

Site Geology and Hydrogeology:

According to the United States Department of Agriculture (USDA) Web Soil Survey, the site consists of Urban Land. Urban Land is characterized as areas highly developed for commercial, industrial, or residential use where the ground surface is covered by impervious features. Generally, the uppermost native soils have been removed, disturbed, or covered with fill material. Based on the results of the November 10, 2017 Phase II Environmental Site Assessment (ESA) report and the Supplementary Soil Investigation report dated February 9, 2018, crushed asphalt was encountered followed by a gravel sub-base mixed with brown clay silts from approximately one to two fbs. Groundwater has been measured at the site at depths between 12.7 and 14.5 fbs.

Groundwater is assumed to flow to the south towards Chadakoin River.

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.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

The Applicant under the Brownfield Cleanup Agreement is a Volunteer. The Volunteer does not have an obligation to address off-site contamination. The Department has determined that this site poses a significant threat to human health and the environment and that offsite investigations will be performed by the Department to determine if remedial actions are necessary to address any offsite migration of contaminants.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

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. For a full listing of all SCGs see: <http://www.dec.ny.gov/regulations/61794.html>

6.1.2: RI Results

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

- | | |
|-------------------------|--|
| cis-1,2-dichloroethene | ethylbenzene |
| tetrachloroethene (PCE) | toluene |
| trichloroethene (TCE) | vinyl chloride |
| 1,2,4-trimethylbenzene | naphthalene |
| xylene (mixed) | perfluorooctanoic acid (PFOA) |
| acetone | perfluorooctanoic sulfonic acid (PFOS) |

The contaminants of concern exceed the applicable SCGs for:

- soil
- groundwater
- soil vapor

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 Decision Document.

The following IRMs have been completed at this site based on conditions observed during the RI.

IRM - Source Excavation of Impacted Soil Materials

An IRM was implemented to remove impacted source materials and fill in which contaminant concentrations exceeded Commercial Soil Cleanup Objectives (CSCOs). The IRM excavation activities were performed between December 10, 2018 and December 18, 2018, to a maximum depth of 19.5 fbs. Approximately 2,014 tons of impacted soil/fill material was removed from the site as part of the IRM excavation process. All impacted material removed from the site was properly handled and disposed of off-site. Approximately 430 tons of hazardous soil/fill material was transported to Horizon Environment Inc. in Quebec, Canada; and 1,584 tons of non-hazardous soil/fill material was transported to the Chautauqua County Landfill in Jamestown, New York. Sampling details and results can be found in the site's Remedial Investigation (RI) report. The IRM excavation area was backfilled with a layer of virgin pea gravel and stone from 7.0 to 19.5 fbs, serving as a demarcation layer for the site. While the IRM excavation removed a substantial portion of the known source material, additional site characterization was deemed necessary to properly evaluate the site conditions.

IRM - Sub-Slab Depressurization System Installation

A sub-slab depressurization system (SSDS) was installed within the existing on-site building in December 2018 to mitigate the effects of vapor intrusion within the structure. The SSDS is equipped with a single fan system and multiple suction points to provide comprehensive coverage and address the effects of vapor intrusion within the building. The system was installed in 2018, in conformance with the October 2006 NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York. Post construction performance testing in 2019 was conducted at test points and indoor air sample locations surrounding the SSDS to verify the system's effectiveness. Results indicated that the system was operating appropriately and is effectively mitigating potential exposures from soil vapor intrusion. The system was evaluated to ensure it met the remedial goals of the IRM and with the understanding it would remain active and fully operational at the site.

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. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

Nature and Extent of Contamination:

The RI and IRMs for the site were initially performed in 2018 and included sampling of surface soil, subsurface soil/fill, groundwater, and soil vapor. Due to the 2018 RI not fully characterizing the site a supplemental investigation was performed in 2021. This supplemental investigation included sampling of subsurface soil/fill and groundwater.

The data collected during the RI efforts identified Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), metals, and emergent contaminants (PFAS) above CSCOs and/or their respective protection of groundwater standards (PGW) and NYS Groundwater Quality Standards (GWQS) for groundwater.

Surface Soils:

3 shallow soil samples, obtained from 0.25 to 0.5 fbs, were analyzed for SVOCs and metals. No SVOCs or metals exceeded applicable CSCOs and/or PGW SCOs.

Subsurface Soils:

26 subsurface samples, obtained from 2.0 to 37 fbs, were performed throughout the site limits. Samples were analyzed for VOCs, SVOCs, metals, herbicides/pesticides, and polychlorinated biphenyls (PCBs). No SVOCs, metals, herbicides/pesticides, or PCBs exceeded applicable CSCOs and/or PGW SCOs.

VOCs detected in subsurface soil included ethylbenzene at concentrations up to 1,300 parts per billion (ppb) (PGW 1,000 ppb), cis-1,2-dichloroethene up to 8.9 ppb (PGW 0.25 ppb), tetrachloroethene up to 100,000 ppb (PGW 1,300 ppb); trichloroethene up to 1,400 ppb (PGW 470 ppb), 1,2,4-trimethylbenzene up to 16,000 ppb (PGW 3,600 ppb), xylenes up to 13,000 ppb (PGW 1,600 ppb).

Groundwater:

18 groundwater samples were obtained throughout the site and analyzed for VOCs, SVOCs, metals, pesticides/herbicides, PCBs, and emergent contaminants. No herbicides/pesticides or PCBs exceeded GWQS.

VOCs detected in groundwater included methyl ethyl ketone 1,300 ppb (GWQS 50 ppb), acetone up to 600 ppb (GWQS 50 ppb), cis-1,2-dichloroethene up to 6,600 ppb (GWQS 5 ppb), ethylbenzene up to 48 ppb (GWQS 5 ppb), tetrachloroethene up to 8,000 ppb (GWQS 5 ppb), toluene up to 2,800 ppb (GWQS 5 ppb), trans-1,2-dichloroethene up to 61 ppb (GWQS 5 ppb), trichloroethene up to 4,300 ppb (GWQS 5 ppb), and vinyl chloride up to 970 ppb (GWQS 2 ppb).

SVOCs detected in groundwater included phenol up to 34 ppb (GWQS 1 ppb) and naphthalene up to 20 ppb (GWQS 10 ppb).

Metals detected in groundwater included aluminum up to 7,940 ppb (GWQS 2,000 ppb), arsenic up to 35.6 ppb (GWQS 25 ppb), barium up to 1,610 ppb (GWQS 1,000 ppb).

Emergent Contaminants:

Emergent contaminants (1,4-dioxane and total PFOA/PFOS) were analyzed within four of the groundwater monitoring wells. No 1,4-dioxane was detected in the groundwater samples. PFOA

was detected in groundwater monitoring wells PMW-1R (248 ng/L), PMW-3 (14.5 ng/L), and PMW-8 (68 ng/L). PFOS was detected in groundwater monitoring wells PMW-1R (33.4 ng/L), PMW-4 (44.9 ng/L), and PMW-8 (12.8 ng/L). The current NYSDEC threshold criteria for PFAS analytes is 10 ng/L.

Soil Vapor:

Initial soil vapor samples were collected from beneath the basement slab of the site building and identified chlorinated VOCs at concentrations exceeding NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006) Matrices. Results included elevated concentrations of cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene where guidance required mitigation measures be taken. The presence of elevated soil vapor concentrations prompted an IRM at the site which consisted of the installation of an active sub-slab depressurization system within the on-site building. Following the installation of the system, indoor air samples were collected from within the site building's basement. Based on the laboratory results, it was determined that the system successfully mitigated the impacts of soil vapor within the building and should remain fully operational in order to ensure indoor air remains at acceptable conditions.

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*.

Direct contact with contaminants in the soil is unlikely because the majority of the site is covered with buildings and pavement. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in the groundwater and soil may move into the soil vapor (air spaces within the soil), which in turn may move into nearby 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. The site is vacant so inhalation of site contaminants in indoor air via vapor intrusion is not a current concern. Additionally, measures are in place to minimize vapor intrusion at the affected building. Additional investigation is necessary to determine if the potential exists for the indoor air impacts due to soil vapor intrusion in offsite structures.

6.5: Summary of the Remediation Objectives

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

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

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.

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 4: Commercial use with generic soil cleanup objectives remedy.

The selected remedy is referred to as the In-Situ Injection for Plume Reduction remedy.

The elements of the selected remedy, as shown in Figure 3, are as follows:

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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;
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- 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; 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 will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Cover System:

A site cover currently exists in areas not occupied by buildings and will be maintained to allow for commercial use of the site. The minimal greenspace areas located at the site will be analyzed and evaluated as part of the remedial action, to ensure the cover soils meet Commercial Soil Cleanup Objectives CSCOs. If the cover material does not meet CSCO criteria, it will be excavated and properly disposed of off site, and the area backfilled with appropriate cover soils. Any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required, it will be a minimum of one foot, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

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In-situ injections will be executed across five separate on-site areas (refer to Figure 3). Contaminated plume reduction will be accomplished by injecting in-situ treatment materials along a series of injection points which vary in depths from 10 to 35 feet below ground surface (fbgs). The in-situ treatment technologies to be implemented are in-situ chemical reduction (ISCR),

enhanced anaerobic degradation, and bioaugmentation.

Following implementation of the in-situ injections, two rounds of performance groundwater monitoring will be completed. The monitoring events will be used to evaluate the remedy effectiveness and determine if it successfully achieved the remedial goals for the site. Monitoring locations will be located within the vicinity of a previously excavated and backfilled area and downgradient locations (PMW-1R, PMW-4, PMW-6, PMW-7, PMW-8, and MW-1)

5. Vapor Mitigation:

The site's existing active sub-slab depressurization system (SSDS) will be evaluated to ensure it is fully operational within the existing building and adequately mitigates the migration of vapors into the building from soil and/or groundwater

5. Environmental Easement:

The remedy will achieve a Track 4 commercial cleanup at a minimum and will include an environmental easement and site management plan as described below.

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 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 or industrial 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 (SMP)

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

- 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:
 - o Institutional Controls: The environmental easement discussed in remedial element 5 above.
 - o Engineering Controls: the site cover discussed in remedial element 2 above, and the SSDS discussed in remedial element 4 above.

This plan includes, but may not be limited to:

- an excavation plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use or groundwater use restrictions;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described above will be placed in any areas where the upper one foot of exposed surface soil exceed the applicable SCOs
- a provision for evaluation of the potential for soil vapor intrusion for any new buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and engineering controls.
- A monitoring plan to assess the performance and effectiveness of the remedy. The plan includes but not be limited to:
 - o monitoring of groundwater to assess the performance and effectiveness of the remedy;
 - o monitoring of the site's engineering controls (i.e. SSDS);
 - o monitoring for vapor intrusion within any new buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above; and
 - o a schedule of monitoring and frequency of submittals to the Department.
 - o an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
 - compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
 - maintaining site access controls and Department notification; and
 - providing the Department access to the site and O&M records.

The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.