RECORD OF DECISION

Maider Road Waterfront Site
Environmental Restoration Project
Clay, Onondaga County
Site No. B00015
March 2017

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

DECLARATION STATEMENT - RECORD OF DECISION

Maider Road Waterfront Site
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Statement of Purpose and Basis

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

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

Description of Selected Remedy

The elements of the selected remedy are as follows:

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. Removal of Facility Infrastructure

Test pits and/or a geophysical survey will be conducted during the design phase in order to identify any remaining pipelines and other infrastructure associated with the former major oil storage facility (MOSF). Excavation and off-site disposal will be conducted of all structures, foundations, and piping associated with the former MOSF which contain petroleum or are associated with areas of soil contamination. The subsurface pipeline which extends to the Oneida River will be video inspected to determine its present condition, and then will be cleaned, capped and plugged with grout or other flowable fill. Any off-site portions of the pipeline which are damaged, which show defects, or which otherwise appear to have leaked, will be excavated, unless they are too close to a residential structure to be safely removed without risking structural damage to the residence. Any other pipelines with petroleum impacts remaining on-site will be removed and properly disposed of or recycled off-site. Prior to off-site disposal or recycling, the pipes will be rendered inoperable by puncturing or breaking.

3. Excavation

Excavation of petroleum-contaminated soil will be conducted on-site and off-site, as needed to meet the off-site criteria. It is not anticipated that a cover system will be required for excavation areas described in paragraphs A or B. However, if restricted residential use SCOs cannot be achieved practicably in an on-site excavation of petroleum-contaminated soils, then a clean soil cover system will be installed over that area which meets the requirements for a cover system as described below in remedy element 5. The anticipated areas of excavation are shown on Figure 4.

A. On-Site Soil: On-site areas of petroleum contamination will be excavated to remove any grossly-contaminated soil, as defined in 6 NYCRR Part 375-1.2(u). Based on the RI results, it is expected those excavations will achieve restricted residential use SCOs. Endpoint samples will be collected from these excavation areas to document the level of any remaining contamination.

B. On-site Shallow Soil: Areas where contaminants in shallow soils (less than 24 inches) include gross petroleum impacts, or impacts by PAHs or other petroleum-related constituents at concentrations greater than restricted residential use SCOs, will be excavated and properly deposed of off-site. This includes the small excavation area located south of the former garage building as indicated on Figure 4 and the impacted portions of the low-lying areas. Endpoint samples will be collected from these shallow excavation areas to confirm restricted residential use SCOs have been achieved. On-site excavations will be backfilled as discussed below.

Additional sampling will be conducted during the design phase to determine the area of shallow impacts requiring excavation. Sampling will be conducted in the low-lying areas to a depth of at least 24 inches. The low-lying areas, where contaminants are to be delineated and excavated, are shown on Figure 4.

C. Off-site Soil: All soil from off-site areas impacted by site-related contaminants which meets one of the following criteria will be excavated and transported off-site for disposal:

- grossly contaminated, as defined in 6 NYCRR Part 375-1.2(u);
- contains elevated levels of tentatively identified compounds (TICs);
- creates a nuisance condition, as defined in Commissioner Policy CP-51 Section G; or
- contains site-related contaminants at concentrations exceeding residential soil cleanup objectives, as defined by 6 NYCRR Part 375-6.8;

Excavated soil from off-site areas which does not exceed the on-site excavation criteria or the protection of groundwater SCOs for volatile organic compounds or semi-volatile organic compounds may be used anywhere beneath the cover system described in remedy element 5, including below the water table, to backfill the excavation or re-grade the site.

Approximately 9,000 cubic yards of soil will be removed.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to establish the designed grades in the event that there is insufficient volume of excavated on-site soils suitable for establishment of designed grades as described above.

4. Consolidation

On-site soils within the top two feet of the ground's surface which exceed restricted-residential use soil cleanup objectives, but which do not require excavation per remedy element 3 above, will be excavated, consolidated on-site in the excavation areas described in remedy element 3.A., and covered with at least two feet of clean soil. It is anticipated the consolidation area will be located in the north-central portion of the site.

Additional sampling will be conducted during the design phase to determine the area of shallow soil requiring excavation and consolidation. Sampling will be conducted across an area measuring approximately 1.7 acres in the southern portion of the southern site parcel to an approximate depth of 6 inches, and from a small area of the northern site parcel to an approximate depth of 1 foot. The areas to be delineated and excavated are shown on Figure 4. Soil will be excavated until documentation sampling shows the excavation has removed all soil requiring consolidation as defined above. It is not anticipated it will be necessary to backfill the southern excavation area; however, if it becomes necessary, clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be imported to replace the excavated soil and establish the designed grades at the site. Alternatively, the perimeter of the excavation areas will be re-graded to create smooth grade transitions.

5. Cover System

A site cover will be required to allow for restricted-residential use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of two feet 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). If all excavations

achieve restricted residential SCOs, a cover system will only be a required element of the remedy for the consolidation area.

6. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property that:

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

7. Site Management Plan

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

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

Institutional Controls: The environmental easement discussed in paragraph 6 above.
Engineering Controls: The soil cover discussed in paragraph 5 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, groundwater and/or surface water use restrictions;
- 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;
- a provision that should an impervious area be removed in the future, a cover system consistent with that described in Paragraph 6 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
- a provision that should contamination remain off-site due to accessibility issues, the Department and NYSDOH will evaluate whether residual contamination requires follow-up under a different program;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and

- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department; and
- monitoring for soil vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

New York State Department of Health Acceptance

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

Declaration

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

March 31, 2017

Date

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

RECORD OF DECISION

Maider Road Waterfront Site
Clay, Onondaga County
Site No. B00015
March 2017

SECTION 1: SUMMARY AND PURPOSE

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

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

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

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comments 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 repositories:

NYSDEC Region 7 Headquarters
Attn: Joshua Cook
615 Erie Blvd West

Syracuse, NY 13204
Phone: 315-426-7411

Baldwinsville Public Library
Attn: Margaret Van Patten
33 East Genesee Street
Baldwinsville, NY 13027
Phone: 315-635-5631

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

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

Receive Site Citizen Participation Information By Email

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

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The Maider Road Waterfront Site is located in a mainly rural area in the Three Rivers area of the Town of Clay, Onondaga County. It is comprised of two parcels totaling approximately 10.7 acres; one parcel which covers approximately 10.4 acres located on the south side of Maider Road at 3414 Maider Road, and another parcel covering approximately 0.3 acres located opposite the first, on the north side of Maider Road. The northern parcel is a narrow strip of land situated between Maider Road and the Oneida River. The Oneida River flows east to west in this area and joins with the Seneca River approximately 800 feet west of the site to form the Oswego River, which flows north to Lake Ontario. The Oneida, Seneca and Oswego Rivers are part of the New York State Canal system, and are Class B waterways.

Site Features: The site is relatively flat and is vacant with the exception of a small, unoccupied structure which is present near the northeast corner of the southern site parcel. There is a paved driveway area located in the north-central portion of the site, and another paved driveway located in the northeastern portion of the site which is utilized by an adjacent industrial property. Foundation remains of former site buildings and ring foundation structures of former site bulk storage tanks are present across the site. In a few locations, structures associated with former bulk

storage tanks remain, including pipelines and valves.

A concrete retaining wall and earthen berms are present in certain locations, including along the northern and southern site boundaries. There is a buried pipeline present off the site, to the west of the northern site parcel, which extends from the riverbank to a dock. This pipeline is assumed to run underground, beneath an adjacent residential property or properties, to the southern site parcel. There is a rail spur running north and south located approximately 350 feet east of the site which formerly serviced the site major oil storage facility.

Large portions of the site are covered in shrubby vegetation. The western portion of the site and the extreme southeastern portion of the site are wooded and densely vegetated. Portions of the site are seasonably wet, including in the northwest and western portions of the site, as well as the area along two low-lying areas in the eastern portion of the site, which may be, or may have been, connected to each other. The low-lying areas are or were connected via culverts to a low-lying area off-site to the south, and a drainage ditch to the north. The drainage ditch is connected to the Oneida River via a culvert.

Current Zoning and Land Use: The site is currently vacant and lies in the Planned Development zoning district. Restricted residential use is consistent with uses allowed under the Planned Development zoning district. The future use of the site is undetermined. The southern site parcel is bordered to the north by several residential parcels. To the east and southeast of the site most of the land is undeveloped land, rural residential properties, or farmland. There is a railroad line along the southwest border of the site, and several suburban residential properties further to the southwest. There is a concrete manufacturing facility adjacent to the northeast corner of the southern site parcel and a former major oil storage facility located approximately 800 feet northeast of the site, on the north side of Maider Road at 3473 Maider Road.

Past Use of the Site: Industrial usage of the site began around 1940. The site was operated as a major oil storage facility (MOSF) for the storage of fuel oil and asphalt from about 1940 until 1996. The northern parcel included a dock or docks for unloading barges. Petroleum was transferred to and/or from the site, at least in part, via pipelines which ran from the Oneida River to the northern site parcel and then to the southern site parcel. One pipeline ran aboveground over the roadway. The other pipeline is mostly underground and was described above. Petroleum was also transferred from and/or to the site via a rail spur which is located to the east of the site. There was formerly an aboveground pipeline which ran from a pump house adjacent to the rail spur to the site. Soil and groundwater are contaminated by petroleum and petroleum constituents as a result of past operations at the site.

All of the known storage tanks have been removed from the site along with most of the aboveground piping and pipeline support structures. The remaining building is too small to be occupied. Several tanks were removed prior to the site entering the Environmental Restoration Program (ERP). Five of the tanks were located on the western half of the southern parcel and were used to store #2 fuel oil, #6 fuel oil, and kerosene. They had a combined total capacity of approximately 10,724,000 gallons and were removed around 1995. At least two other tanks were closed previously, including a tank used to store #2 fuel oil which was closed in place in 1986, and a gasoline tank which was removed in 1988. The rest of the known storage tanks were removed as

an interim remedial measure under the ERP.

All but one of the buildings on the southern site parcel were demolished and paving was removed by the Town of Clay between 2011 and 2013 independent from the ERP site remedial program. The former buildings included a garage, a boiler house, an office and scale house, and an oil dispensing canopy. Petroleum contamination was identified under the slab of the dispensing canopy during demolition. The area was then covered with approximately 12 to 18 inches of fill as an interim measure.

Site Geology and Hydrogeology: There were two primary geologic units encountered at the site. The top two to four feet of soil consists primarily of sand and gravel with some cobbles. That unit is underlain by silt, clay, and fine sand. Fill was encountered in certain locations as well. Bedrock was not encountered in any borings or test pits installed during the remedial investigation. Borings were installed to depths of up to 16 feet below grade. Groundwater was present at depths ranging from 1.23 feet below grade to 5.42 feet below grade and flows north towards the Oneida 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, alternatives (or an alternative) that restrict(s) the use of the site to restricted-residential use (which allows for commercial use and industrial use) as described in Part 375-1.8(g) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

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

SECTION 5: ENFORCEMENT STATUS

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

Past owners of the site are known to include:

Cibro Syracuse Property Corp
Commonwealth Oil Corporation

Legal action may be initiated at a future date by the state to recover state response costs should PRPs be identified. The Town of Clay will assist the state in its efforts by providing all information to the state which identifies PRPs. The Town of Clay will also not enter into any agreement regarding response costs without the approval of the Department.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- air
- groundwater
- soil
- sediment
- indoor air
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant

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

petroleum products
benzene
toluene
ethylbenzene
xylene (mixed)
isopropylbenzene
benzo(a)anthracene
benzo(a)pyrene
benzo(b)fluoranthene
chrysene
arsenic

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

- groundwater
- soil

6.2: Interim Remedial Measures

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

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

IRM Tank Demolition

Nine aboveground storage tanks (ASTs) and three underground storage tanks (USTs) were removed in 2006, along with most of the aboveground piping associated with the tanks. Prior to demolition, asbestos-containing materials were removed from the tanks and disposed of off-site. The tanks contained residual asphalt, fuel oil and/or sediment which was removed and disposed of off-site.

Six of the nine ASTs were formerly used to store asphalt and had a combined capacity of 4,242,000 gallons (Tanks 5 through 10). These tanks were located along the east side of the southern site parcel. It is unknown what was stored in the other three ASTs, which were located adjacent to the former boiler house in the center of the southern site parcel, and which had a combined capacity of approximately 16,000 gallons. There were also three USTs removed from the vicinity of the boiler house; one 3000 gallon, one 1000 gallon, and one 275 gallon. Each UST contained petroleum which appeared to be fuel oil.

Petroleum-contaminated soil was encountered in the vicinity of the USTs and 287.38 tons of soil were excavated and disposed of off-site. No contaminants of concern were detected in confirmatory samples collected from the limits of the excavation as compared to soil cleanup objectives defined in the former soil guidance document TAGM 4046. Petroleum-contaminated

groundwater was removed from the excavation as well. The excavation was backfilled to the original grade utilizing imported fill material. Fill placed on-site contemporaneously with this excavation was subsequently sampled, and does not exceed restricted residential soil cleanup objectives. A total of 1,572 gallons of liquid waste were generated, which included the liquid portion of the tank residuals and petroleum-contaminated groundwater from the UST excavation. Documentation regarding this IRM is included as an appendix to the report titled "Site Investigation/Remedial Alternatives Analysis Report" dated March 2014.

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 Fish and Wildlife Resources Impact Analysis (FWRIA), which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

Nature and Extent of Contamination: Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, cyanide, polychlorinated biphenyls (PCBs), and pesticides. Oneida River sediment samples were analyzed for VOCs, SVOCs, metals, PCBs and pesticides. Sub-slab vapor, outdoor air, and indoor air from several residences were sampled for VOCs. The primary contaminants of concern for the site for soil include petroleum and petroleum constituents and, to a lesser extent, arsenic. Other contaminants were not detected in soil, or if detected, were present at concentrations less than applicable SCOs.

Soil – Subsurface soil in several areas of the site is impacted by petroleum and by petroleum constituents at concentrations greater than applicable soil cleanup objectives (SCOs). Areas impacted by petroleum include: an area north of the former garage building; the area of the former dispensing canopy; an off-site area to the southeast of the site along a former petroleum pipeline and adjacent to a rail spur; an area along a former petroleum pipeline near the southern site boundary; and the northern portion of the site within and in the vicinity of the former 840,000-gallon #2 fuel oil tank, which also extends off-site to the north. Areas impacted by petroleum were identified by the presence of sheens, odors, stained soils and/or analytical results. Petroleum-related contaminants present on-site at levels that exceed restricted residential use SCOs include, but are not necessarily limited to: benzene (up to 84 parts per million [ppm]); toluene (up to 360 ppm); ethylbenzene (up to 230 ppm); xylenes (up to 1,200 ppm); isopropylbenzene (up to 26 ppm); 2-methylnaphthalene (up to 180 ppm); benzo(a)anthracene (up to 1.6 ppm); benzo(a)pyrene (up to 1.2 ppm); and chrysene (up to 5.4 ppm). Petroleum-related contaminants present off-site at levels that exceed residential use SCOs include, but are not necessarily limited to: xylenes (up to 15 ppm); isopropylbenzene (up to 9.9 ppm); 2-methylnaphthalene (up to 85 ppm); benzo(a)anthracene (up to 7.4 ppm); benzo(a)pyrene (up to 4.7 ppm); and chrysene (up to 17 ppm). Areas where these contaminants exceed SCOs are generally within areas of gross petroleum contamination. Several soil samples contained elevated levels of tentatively identified compounds (TICs), up to 2,748 parts per million (ppm) of total TICs. In two samples, two or more TICs were present at concentrations greater than 100 ppm. Although there are no SCOs corresponding to the

total concentration of TICs measured in soils, SCOs for individual organic compounds are capped at a maximum value of 100 ppm for residential and restricted residential use. Methyl-tert-butyl-ether (MTBE) was detected in two samples collected from the northern portion of the southern site parcel, a short distance north of the former garage building. It was detected at concentrations less than its unrestricted SCO; however, the presence of MTBE indicates a release of gasoline occurred.

Surface soils (0-2 inches) in the southeastern portion of the site are impacted by arsenic at levels greater than SCOs for restricted residential use. Arsenic was present at concentrations up to 46.4 parts per million (ppm), compared to its restricted residential use SCO of 16 ppm. Lead was present at concentrations greater than its unrestricted use SCO in several surface samples, and was present in one sample at 641 ppm, which is greater than its restricted residential use SCO of 400 ppm. This location was also impacted by arsenic. Surface soil impacts by arsenic are limited to the top six inches or less.

One surface soil sample in the vicinity of the former garage which was collected from a shallow drainage ditch contained several polycyclic aromatic hydrocarbons (PAHs), including benzo(a)anthracene, benzo(a)pyrene and benzo(b)fluoranthene at concentrations slightly greater than their restricted residential use SCOs. Surface soil impacts by PAHs in the drainage ditch were limited to the top six inches or less.

Several PAHs were detected at concentrations greater than applicable SCOs in one shallow sample (0 to 6 inches) collected just south of the culvert connecting the southern low-lying area to an off-site low-lying area (sample SED-11). This sample was collected near the southern site boundary indicating there is some potential for impacts from PAHs to extend beyond the southern site boundary. Several other shallow samples (0 to 6 inches) collected from the low-lying areas had elevated levels of SVOC TICs and elevated detection limits for SVOCs.

Groundwater – Groundwater impacts were identified by the presence of petroleum (non-aqueous phase liquid) which is present at or near the groundwater table. No dissolved phase site-related contaminants were detected in groundwater samples; however, the site's monitoring wells within or near the source areas were generally screened deeper than the gross petroleum impacts. Petroleum sheens were present in soil borings at depths below the water table in one off-site sampling location to the north of the site.

Sediments – Several PAHs were detected in Oneida River sediments adjacent to the site. PAHs were detected in four of the five Oneida River sediment samples at concentrations up to 3.65 ppm total PAHs, compared to a sediment guidance value of 4 ppm for total PAHs. PAHs were present at 1.55 ppm of total PAHs in a shallow sample (0 to 6 inches) collected in the low-lying area just south (upgradient) of the culvert which connects the low-lying area to the Oneida River (sample SED-6), indicating there is limited potential for on-site PAHs to impact the Oneida River. Other contaminants were not detected in Oneida River sediments or were not detected at concentrations of concern.

Sub-slab Vapor, Indoor Air, and Outdoor Air – There are no habitable structures at the site, so no soil vapor samples were collected on-site. Indoor air, outdoor air and sub-slab vapor samples were collected off-site at several of the adjacent residences. Petroleum-related VOCs were detected in

sub-slab vapor samples. VOCs were detected in indoor air at concentrations generally consistent with outdoor (ambient) air results and/or levels typically found in residences. Overall, based on the results of these samples and the results of soil and groundwater, no further action was recommended for these off-site buildings in regards to soil vapor intrusion.

Special Resources Impacted/Threatened: A Fish and Wildlife Resources Impact Analysis (FWRIA) was performed. Several areas were identified as wetlands by the FWRIRA, including areas within and adjacent to the site. Much of the site outside of the wetland areas was noted to be a successional system due to the past development. The area where Tank # 1 (840,000-gallon #2 fuel oil tank) was formerly located was identified as one of the on-site wetland areas in the FWRIA, though it is not a natural wetland. The FWRIA noted that the rivers and forested areas in the vicinity of the site provide high value habitat. Wildlife identified on-site includes: deer, leopard frogs, and many birds. Sediment samples collected from the Oneida River did not contain contaminants at concentrations greater than sediment criteria.

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*.

Persons who enter the site could contact contaminants in the soil by walking on the site, digging or otherwise disturbing the soil. The contaminated groundwater is not used for drinking or other purposes as the area is served by a public water supply not affected by site contamination. People may come in contact with contaminants present in soil located in the on-site low-lying areas and shallow drainage swales. Volatile organic compounds in the groundwater or 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. Because the site is currently vacant, the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern. However, the potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development. Sampling indicates that soil vapor intrusion is not a concern for off-site buildings.

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.
- Prevent the discharge of contaminants to surface water.
- 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.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

Soil Vapor

RAOs for Public Health Protection

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

SECTION 7: SUMMARY OF THE SELECTED REMEDY

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

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

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

The selected remedy is referred to as the Excavation and Off-site Disposal, with On-site Consolidation remedy.

The estimated present worth cost to implement the remedy is $2,960,000. The cost to construct the remedy is estimated to be $2,830,000 and the estimated average annual cost is $8,500.

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. Removal of Facility Infrastructure

Test pits and/or a geophysical survey will be conducted during the design phase in order to identify any remaining pipelines and other infrastructure associated with the former major oil storage facility (MOSF). Excavation and off-site disposal will be conducted of all structures, foundations, and piping associated with the former MOSF which contain petroleum or are associated with areas of soil contamination. The subsurface pipeline which extends to the Oneida River will be video inspected to determine its present condition, and then will be cleaned, capped and plugged with grout or other flowable fill. Any off-site portions of the pipeline which are damaged, which show defects, or which otherwise appear to have leaked, will be excavated, unless they are too close to a residential structure to be safely removed without risking structural damage to the residence. Any other pipelines with petroleum impacts remaining on-site will be removed and properly disposed of or recycled off-site. Prior to off-site disposal or recycling, the pipes will be rendered inoperable by puncturing or breaking.

3. Excavation

Excavation of petroleum-contaminated soil will be conducted on-site and off-site, as needed to meet the off-site criteria. It is not anticipated that a cover system will be required for excavation areas described in paragraphs A or B. However, if restricted residential use SCOs cannot be achieved practicably in an on-site excavation of petroleum-contaminated soils, then a clean soil cover system will be installed over that area which meets the requirements for a cover system as described below in remedy element 5. The anticipated areas of excavation are shown on Figure 4.

A. On-Site Soil: On-site areas of petroleum contamination will be excavated to remove any grossly-contaminated soil, as defined in 6 NYCRR Part 375-1.2(u). Based on the RI results, it is expected those excavations will achieve restricted residential use SCOs. Endpoint samples will be collected from these excavation areas to document the level of any remaining contamination.

B. On-site Shallow Soil: Areas where contaminants in shallow soils (less than 24 inches) include gross petroleum impacts, or impacts by PAHs or other petroleum-related constituents at concentrations greater than restricted residential use SCOs, will be excavated and properly deposed of off-site. This includes the small excavation area located south of the former garage building as indicated on Figure 4 and the impacted portions of the low-lying areas. Endpoint samples will be collected from these shallow excavation areas to confirm restricted residential use SCOs have been achieved. On-site excavations will be backfilled as discussed below.

Additional sampling will be conducted during the design phase to determine the area of shallow impacts requiring excavation. Sampling will be conducted in the low-lying areas to a depth of at least 24 inches. The low-lying areas, where contaminants are to be delineated and excavated, are shown on Figure 4.

C. Off-site Soil: All soil from off-site areas impacted by site-related contaminants which meets one of the following criteria will be excavated and transported off-site for disposal:

- grossly contaminated, as defined in 6 NYCRR Part 375-1.2(u);
- contains elevated levels of tentatively identified compounds (TICs);
- creates a nuisance condition, as defined in Commissioner Policy CP-51 Section G; or
- contains site-related contaminants at concentrations exceeding residential soil cleanup objectives, as defined by 6 NYCRR Part 375-6.8;

Excavated soil from off-site areas which does not exceed the on-site excavation criteria or the protection of groundwater SCOs for volatile organic compounds or semi-volatile organic compounds may be used anywhere beneath the cover system described in remedy element 5, including below the water table, to backfill the excavation or re-grade the site.

Approximately 9,000 cubic yards of soil will be removed.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to establish the designed grades in the event that there is insufficient volume of excavated on-site soils suitable for establishment of designed grades as described above.

4. Consolidation

On-site soils within the top two feet of the ground's surface which exceed restricted-residential use soil cleanup objectives, but which do not require excavation per remedy element 3 above, will be excavated, consolidated on-site in the excavation areas described in remedy element 3.A., and covered with at least two feet of clean soil. It is anticipated the consolidation area will be located in the north-central portion of the site.

Additional sampling will be conducted during the design phase to determine the area of shallow soil requiring excavation and consolidation. Sampling will be conducted across an area measuring approximately 1.7 acres in the southern portion of the southern site parcel to an approximate depth of 6 inches, and from a small area of the northern site parcel to an approximate depth of 1 foot. The areas to be delineated and excavated are shown on Figure 4. Soil will be excavated until documentation sampling shows the excavation has removed all soil requiring consolidation as defined above. It is not anticipated it will be necessary to backfill the southern excavation area; however, if it becomes necessary, clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be imported to replace the excavated soil and establish the designed grades at the site. Alternatively, the perimeter of the excavation areas will be re-graded to create smooth grade transitions.

5. Cover System

A site cover will be required to allow for restricted-residential use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of two feet 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). If all excavations achieve restricted residential SCOs, a cover system will only be a required element of the remedy for the consolidation area.

6. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property that:

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

7. Site Management Plan

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

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

Institutional Controls: The environmental easement discussed in paragraph 6 above.
Engineering Controls: The soil cover discussed in paragraph 5 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, groundwater and/or surface water use restrictions;
- 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;
- a provision that should an impervious area be removed in the future, a cover system consistent with that described in Paragraph 6 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
- a provision that should contamination remain off-site due to accessibility issues, the Department and NYSDOH will evaluate whether residual contamination requires follow-up under a different program;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department; and
- monitoring for soil vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

Exhibit A

Nature and Extent of Contamination

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

For each medium for which contamination was identified, 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 three categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganics (metals). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 4 and 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 soil and groundwater.

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 were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium. Wastes and source areas were identified at the site including several areas of gross petroleum contamination, including:

- an area north of the former garage building;
- the area of the former dispensing canopy;
- an area to the west of the former boiler house;
- an area along a former petroleum pipeline near the southern site boundary;
- an off-site area along a former petroleum pipeline near a rail spur to the east of the site; and
- the northern portion of the site within and in the vicinity of the former 840,000-gallon #2 fuel oil tank, which extends off-site to the north.

The contamination in the area within and around the #2 fuel oil fuel oil tank appeared consistent with #2 fuel oil. Based on results, it appears the concrete retaining wall along the northern site boundary may have prevented migration to the north.

The area of contamination north of the garage building appears to be gasoline and extends to the north. A 6,000-gallon gasoline petroleum bulk storage tank was formerly present at the site, which was removed in 1988, and was presumably the source of this area of contamination.

Several underground storage tanks (USTs) and aboveground storage tanks (ASTs) were identified near the boiler house, which were removed as part of an interim remedial measure (IRM). Each reportedly contained petroleum which appeared to be fuel oil. The contamination near the boiler house was consistent with fuel oil and was removed as part of the IRM.

Several other tanks were also removed from the site prior to the remedial investigation upon a finding that they had leaked or failed a tank tightness test.

Two areas of petroleum contamination were identified along a former pipeline that extended between the site and a rail spur to the east of the site. One area was located near the southern site boundary, and the other was located off-site adjacent to the rail spur.

The source areas were heavily impacted by petroleum, which was identified through the presence of non-aqueous phase liquids (NAPLs), heavy staining, strong odors, and/or elevated levels of VOCs as determined by a photoionization detector (PID). Several soil samples collected from the areas of obvious petroleum impacts contained elevated levels of petroleum-related VOCs and/or SVOCs.

The source areas generally coincide with the areas to be excavated due to petroleum contamination, as indicated on Figure 4.

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

Groundwater

No dissolved phase groundwater contamination was identified during the remedial investigation; however, the groundwater monitoring wells which were installed within or adjacent to the source areas were installed to monitor groundwater quality below the obvious petroleum impacts. The lack of dissolved phase contamination in the wells suggests the extent of groundwater contamination is generally limited to the area impacted by NAPL.

Based on the findings of the RI, the presence of petroleum (NAPL) has resulted in the contamination of groundwater. The site contaminant that is considered to be the primary contaminant of concern which will drive the remediation of groundwater to be addressed by the remedy selection process is the petroleum NAPL.

Soil

Surface and subsurface soil samples were collected during the RI. Surface soil samples were collected on-site from areas which were not covered by an impervious area (paving or concrete) and which were not already known to be heavily impacted by petroleum. Surface samples were collected from a depth of 0-2 inches to assess direct human exposure. Shallow subsurface soil samples were collected on-site from the same locations as the surface soil samples. They were collected from depths of 6-12 inches below grade and 18-24 inches below grade to assess soil quality in the top two feet. Samples were also collected from the low-lying areas from 0-6 inches below grade. Subsurface soil samples were collected on-site and off-site from depths ranging from 1.5 to 12 feet below grade to assess the nature and extent of soil contamination and the potential for impacts to groundwater.

Arsenic was present at concentrations greater than applicable soil cleanup objectives (SCOs) in a few on-site surface samples collected from the southeastern portion of the site outside of the footprint of the former asphalt storage tanks. Samples collected at the same locations at depths of 6-12 inches and 18-24 inches did not contain exceedances of SCOs. Lead was also present in a few of the surface soil samples which were impacted by arsenic at concentrations greater than its restricted residential use SCO (16 parts per million). In general, lead was present at concentrations less than applicable SCOs, but the presence of lead and arsenic, given the former agricultural use of the area, suggests the arsenic may be present in surface soil as a result of past pesticide usage. Several

PAHs were present at concentrations greater than applicable SCOs in one surface soil sample collected from a shallow, soil drainage ditch with discolored soil adjacent to the former garage. Samples collected at the same location at depths of 6-12 inches and 18-24 inches did not contain exceedances of SCOs. Several PAHs were present in one shallow sample (0 to 6 inches) collected from the low-lying area near the southern site border. Other samples collected from the on-site low-lying areas contained elevated levels of SVOC TICs and had elevated detection limits for SVOCs (greater than applicable SCOs).

Table 1 – On-site Surface Soil and On-site Shallow Soil in Low-lying Areas (0-2 inches for surface soil samples; 0-6 inches for samples from the low-lying areas)

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
SVOCs					
Benzo(a)anthracene	ND – 4.6	1	2 / 24	1	2 / 24
Benzo(a)pyrene	ND – 3.7	1	2 / 24	1	2 / 24
Benzo(b)fluoranthene	ND – 4.3	0.8	2 / 24	1	1 / 24
Benzo(k)fluoranthene	ND – 2.7	0.8	1 / 24	3.9	0 / 24
Chrysene	ND – 4.3	1	2 / 24	3.9	1 / 24
Indeno(1,2,3,-cd)pyrene	ND – 2.0	0.5	1 / 24	0.5	1 / 24
Inorganics					
Arsenic	2.1 – 40.5	13	3 / 24	16	3 / 24

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Restricted Residential Use, unless otherwise noted.
ND – not detected

The primary surface and shallow soil contaminants are arsenic and polycyclic aromatic hydrocarbons (PAHs). As noted on Figure 4, arsenic contamination is present in surface soil (0 to 2 inches) in the southeastern portion of the site. PAHs are present in surface soil (0 to 2 inches) adjacent to the former garage building. The PAH-impacted surface soil sample was collected from a shallow, soil drainage ditch with discolored soil. The extent of the PAH impacts do not extend deeper than 6 inches and are assumed to be limited to the discolored area in the shallow, soil drainage ditch. PAHs are also present at concentrations greater than SCOs in the low-lying area near the southern site boundary.

Subsurface soils in certain areas of the site exceed applicable SCOs for petroleum-related VOCs, petroleum-related SVOCs and, to a lesser extent, arsenic. Petroleum impacts are present off-site in three areas; one to the north, one along the southern site border, and another to the southeast of the site, adjacent to the rail spur. The analytical results for the impacted off-site boring to the north of the site did not exceed unrestricted SCOs; however, due to loss of soil during retrieval of the soil core the most heavily impacted interval of that location could not be sampled. It is noted that while a limited number of samples contained exceedances of SCOs, several soil samples collected from areas of gross impacts contained elevated levels of tentatively identified compounds (TICs); up to 2,748 parts per million (ppm) of total TICs. In two samples two or more TICs were present at

concentrations greater than 100 ppm. Although there are no SCOs corresponding to the total concentration of TICs measured in soils, SCOs for individual organic compounds are capped at a maximum value of 100 ppm for residential and restricted residential use. Methyl-tert-butyl-ether (MTBE) was present in samples collected from the area north of the former garage, and indicates a release of gasoline occurred.

For subsurface soil, arsenic exceeded its unrestricted use and restricted residential use SCOs with limited magnitude and with limited frequency (SS-17, 0.5-1.0 feet; and TP-RS-8, 2-2.5 feet). One of the two subsurface samples in which arsenic exceeded its unrestricted SCO (TP-RS-8, 2-2.5 feet) was located off-site (just south of the southern site boundary), and was also heavily impacted by petroleum.

Table 2 – On-site Subsurface 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					
Benzene	ND – 84	0.06	2 / 75	4.8	2 / 75
Toluene	ND – 360	0.7	2 / 75	100	1 / 75
Ethylbenzene	ND – 230	1	3 / 75	41	1 / 75
Xylenes	ND – 1,200	0.26	5 / 75	100	1 / 75
n-Butylbenzene	ND – 27	12	1 / 19	100	0 / 19
n-Propylbenzene	ND – 75	3.9	1 / 19	100	0 / 19
1,2,4-Trimethylbenzene	ND – 520	3.6	1 / 19	52	1 / 19
1,3,5-Trimethylbenzene	ND – 250	8.4	1 / 19	52	1 / 19
Methyl-tert-butyl-ether	ND – 4.5	0.93	1 / 75	100	0 / 75
Isopropylbenzene	ND – 26	2.3[d]	2 / 75	NA	NA
SVOCs					
2-Methylnaphthalene	ND – 180	0.41[d]	7 / 75	NA[e]	NA[e]
Naphthalene	ND – 93	12	1 / 75	100	0 / 75
Benzo(a)anthracene	ND – 1.6	1	7 / 75	1	7 / 75
Benzo(a)pyrene	ND – 1.2	1	1 / 75	1	1 / 75
Chrysene	ND – 5.4	1	2 / 75	3.9	2 / 75
Inorganics					
Arsenic	1.0 – 18.8	13	1 / 75	16	1 / 75

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Restricted Residential Use, unless otherwise noted.
d – SCG: CP-51 – Soil Cleanup Guidance, Lowest of all soil cleanup objectives included in CP-51 for this contaminant
e – SCOs for organic contaminants are capped at 100 ppm for residential and restricted residential uses. One sample contained 2-methylnaphthalene at a concentration greater than 100 ppm.
NA – not available
ND – not detected

Table 3 – Off-site Subsurface 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					
Xylenes	ND – 15	0.26	2 / 18	100	0 / 18
Isopropylbenzene	ND – 9.9	2.3[d]	2 / 18	100[e]	0 / 18
SVOCs					
2-Methylnaphthalene	ND – 85	0.41[d]	2 / 18	0.41	2 / 18
Benzo(a)anthracene	ND – 7.4	1	2 / 18	1	2 / 18
Benzo(a)pyrene	ND – 4.7	1	2 / 18	1	2 / 18
Benzo(b)fluoranthene	ND – 2.0	1	2 / 18	1	2 / 18
Chrysene	ND – 17	1	2 / 18	1	2 / 18
Inorganics					
Arsenic	1.4 – 22.6	13	1 / 7	16	1 / 7

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 Residential Use, unless otherwise noted.
d – SCG: CP-51 – Soil Cleanup Guidance, Lowest of all soil cleanup objectives included in CP-51 for this contaminant
e – SCG: CP-51 – Soil Cleanup Guidance per CP-51
NA – not available
ND – not detected

The primary subsurface soil contaminants of concern are petroleum, and petroleum-related VOCs and PAHs, and to a lesser extent, arsenic. As noted on Figure 4, petroleum contamination is present in subsurface soil in several areas.

Based on the findings of the Remedial Investigation, the presence of petroleum, petroleum-related VOCs and SVOCs, and arsenic have 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 the same.

Sediments

Sediment samples were collected from the Oneida River, adjacent to the former petroleum unloading docks and pipelines. The Oneida River sediment samples were collected to assess whether past operations at, or related to, the site have resulted in impacts to the river. In addition, shallow samples were collected from on-site low-lying areas to assess the potential for future impacts to the Oneida River.

Several polycyclic aromatic hydrocarbons (PAHs) were detected in Oneida River sediments adjacent to the site. PAHs were detected in four of the five Oneida River sediment samples at concentrations up to 3.65 ppm total PAHs, compared to a sediment guidance value of 4 ppm for total PAHs.

A surface sample was collected just south (upgradient) of the culvert which connects the on-site low-lying area to the Oneida River. PAHs were present at 1.55 ppm total PAHs in that sample, and other contaminants were not present at concentrations greater than screening levels, indicating the potential for future impacts to the Oneida River sediments from on-site surface materials is limited.

Table 3 – Oneida River Sediment

Detected Constituents	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)	Frequency Exceeding SCG
SVOCs			
Total PAHs	ND – 3.65	Class A Threshold – 4	0 / 5
		Class C Threshold – 35	0 / 5

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in sediment;
b - SCG: The Department's Screening and Assessment of Contaminated Sediment
Class A - If the concentration of a contaminant in sediment is below the sediment guidance values (SGVs) that defines this class, the contaminant can be considered to present little or no potential for risk to aquatic life.
Class C - If the concentration of a contaminant is above the SGVs that defines this class, there is a high potential for the sediments to be toxic to aquatic life.
Class B - If the concentration of a contaminant lies between the SGVs that define Class A and Class C, additional information is needed to determine the potential risk to aquatic life

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

Soil Vapor

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of sub-slab soil vapor under structures, indoor air inside structures, outdoor air, and water present within the sump in the basement of one of the structures. At this site, due to the presence of buildings adjacent to the impacted area, attempts were made to collect a full suite of samples to evaluate whether actions are needed to address exposures related to soil vapor intrusion.

Samples were collected from four of the five residential properties adjacent to the site. An outdoor ambient air sample was collected for each day of sampling. Access was not granted by the property owner of the fifth property for the purpose of soil vapor sampling.

For two of the buildings, indoor air samples were collected during the heating season from the basement, along with an outdoor ambient air sample; however, a sub-slab vapor sample was not able to be collected from those two properties due to the presence of groundwater immediately below the slabs of the buildings at the time of sampling, which was evidenced by groundwater seeping through the slabs.

For the third property, a sub-slab vapor sample, a basement indoor air sample and a first floor indoor air sample were collected during the heating season, along with an outdoor ambient air sample.

Two sampling events were conducted at a fourth property outside of the heating season. During the first sampling event, a basement indoor air sample and a first floor indoor air sample were collected, along with an outdoor ambient air sample; however, a sub-slab vapor sample was not able to be collected due to the presence of groundwater immediately below the slab, which was evidenced by groundwater seeping through the slab. During the second event, a sub-slab vapor sample, a basement indoor air sample, and a first floor indoor air sample were collected along with an outdoor ambient air sample, in addition to a water sample from the sump in the basement.

Based on the concentration detected, and in comparison with New York State's Soil Vapor Intrusion Guidance (NYSDOH 2006), it was determined no further action was necessary for each of the properties sampled.

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 IRMs described in Section 6.2. This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

Alternative 2: Institutional Controls

This alternative includes placing an institutional control, in the form of an environmental easement, on the site and developing a Site Management Plan, which will include, but not be limited to, an excavation work plan and 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, which may include mitigation and/or monitoring of indoor air. The excavation work plan will detail the provisions for management of future excavations at the site. Under this alternative the contamination will remain in place at the site, unless excavated under the provisions of the Site Management Plan due to other site work (*e.g.*, future development).

Present Worth: ..... *$ 181,000*
Capital Cost: ..... *$ 50,000*
Annual Costs: ..... *$ 8,500*

Alternative 3: Excavation and Off-site Disposal, with On-site Consolidation

This alternative includes the following tasks:

- conducting an investigation to locate any pipelines that may remain in the subsurface, which may include excavation of test pits and/or conducting a geophysical survey;
- removing on-site tank foundations, pipelines, valves, sumps, etc. which may be identified that contain petroleum or are associated with areas of petroleum-contamination;
- removing the slab for the former garage building where necessary for excavation, and removing the floor drains to their discharge point or points;
- removing, to the extent practicable, the subsurface pipeline which protrudes from the bank of the Oneida River, and cleaning, capping and plugging off-site portions of the pipeline. Off-site portions of this pipeline will be removed if they appear to have been damaged or otherwise to have leaked, unless the portions identified as damaged cannot be removed due to proximity to a residential structure;
- excavation and off-site disposal of grossly contaminated petroleum-contaminated soils;
- excavation and off-site disposal of surface soils impacted by petroleum and/or PAHs adjacent to the former garage and within the low-lying areas;
- excavation of surface soils impacted by arsenic and consolidation within the excavations of the petroleum-contaminated soil at depths greater than two feet below final grade;

- construction of a clean soil cover system at least two feet thick in areas where contaminated soil is consolidated, as well as other areas of the site if restricted residential soil cleanup objectives are not achieved by excavation; and
- backfilling the remainder of the petroleum excavations with clean soil which does not exceed the SCOs for backfill for restricted-residential use as set forth in 6 NYCRR Part 375-6.7(d).

Prior to removing the subsurface pipeline which extends to the Oneida River, the line will be video inspected to determine its present condition. It will be removed to the bank of the river, and any on-site segments associated with petroleum contamination will be removed. Off-site portions of the pipeline will be cleaned, capped and plugged with grout or other flowable fill, unless the pipe appears damaged or to have a defect, or otherwise appears to have leaked. Any portions of the subsurface pipeline that cannot be removed (*e.g.*, any portions that are too close to a residential structure to be safely removed without risking structural damage to the residence) will be cleaned, capped and plugged with grout or other flowable fill.

Other pipelines may exist on-site, as well. The locations of these will be determined and the lines will be removed if they contain petroleum or if they are associated with areas of petroleum-contamination. Tank foundations which remain and any other structures/devices that may remain associated with the former tanks and pipelines (*e.g.*, valves, sumps, etc.) will also be removed if they contain petroleum or if they are associated with areas of petroleum-contamination. Locations where pipelines are currently suspected to be present based on aerial photographs are indicated on Figure 4.

Excavation of petroleum-contaminated soil will be conducted on-site and will extend off-site. Figure 4 depicts the estimated areas of excavation.

Off-site excavations will be conducted to remove all grossly contaminated soils, soils which create a nuisance condition (as defined in Section G of the Department's policy, Commissioner Policy *CP-51: Soil Cleanup Guidance*), and to achieve applicable SCOs for site-related contaminants. The goal will be for the excavations to achieve unrestricted SCOs; however, the excavations must achieve residential use SCOs. Endpoint samples will be collected from off-site excavation areas to confirm that there is no contamination remaining at concentrations greater than the residential use SCOs. The off-site excavation will be backfilled with soil which meets the requirements of 6 NYCRR 375-6.7(d) for unrestricted use and restored to their pre-remedial condition (*e.g.*, lawn, paving, etc.), including repairing any active subsurface utilities/structures/facilities, such as septic system leach fields, if removed or damaged during the course of remediation.

On-site areas of petroleum contamination will be excavated to remove any grossly-contaminated soil. Based on the RI results, it is expected those excavations will achieve restricted residential use SCOs. As such, it is not anticipated that a cover system will be required, except for the consolidation area which is discussed further below. If restricted residential use SCOs cannot be achieved practicably in an on-site excavation of petroleum-contaminated soils, then a clean soil cover system will be installed over that area which meets the requirements for a cover system as described below. Endpoint samples will be collected from the petroleum excavation areas to document the level of any remaining contamination. On-site excavations will be backfilled as discussed below.

On-site soils within two feet of the surface which exceed the restricted-residential use SCOs for arsenic or other metals will be excavated and consolidated on-site at depths greater than two feet below final grade within the areas of excavation for the petroleum-contaminated soils. The extent of the excavation will be driven by arsenic since the area impacted by arsenic within the top two feet encompasses the area impacted by other contaminants, and in most areas is the only contaminant exceeding SCOs. Excavation will extend to approximately 6 inches over the area where arsenic exceeds 16 ppm. Following completion of the surface soil excavation, endpoint

samples will be collected to confirm that arsenic does not exceed applicable SCOs. Upon receipt of acceptable endpoint sampling results, the perimeter of the area will be re-graded to provide smooth transitions from the excavated areas to the non-excavated areas, but it is not anticipated that it will be necessary to backfill the shallow soil excavation area.

Prior to excavation of the shallow soil, further sampling will be conducted to delineate the area of the impacts. Figure 4 depicts the area which requires further delineation and excavation. The volume of surface soil impacted or potentially impacted by arsenic covers approximately 1.7 acres, which amounts to approximately 1,600 cubic yards. It is anticipated there will be sufficient space within the petroleum excavations to consolidate all of the arsenic-impacted soil. If the volume of arsenic-contaminated soil is too great to fit within the petroleum excavation areas at depths greater than two feet below final grade, then the excess arsenic-contaminated soil will be disposed of off-site.

Based on the RI results, certain areas of the low-lying areas will require remediation to remove any grossly impacted materials and to achieve restricted residential use SCOs within the top 24 inches. All material which is determined necessary to remove from the low-lying areas will be disposed of off-site. Following completion of the removal, the low-lying areas will be restored. Details of the restoration will be determined during the remedial design. Fill utilized for low-lying area restoration must be clean, imported material which meets the requirements of 6 NYCRR 375-6.7(d) for restricted residential use, and must meet any other requirements for the restoration which will be determined during the remedial design, including consideration of protection of Oneida River sediments. Figure 4 depicts the low-lying areas that require additional delineation and removal.

The remainder of the on-site excavations of the petroleum-impacted areas will be backfilled with clean, imported soil which meets the requirements of 6 NYCRR 375-6.7(d) for restricted residential use.

A soil cover is required for any areas where contaminants remain at depths less than 2 feet at concentrations greater than the restricted-residential use SCOs. The soil cover will be a minimum of two feet 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 and any fill material brought to the site will meet the SCOs for cover material for restricted-residential use as set forth in 6 NYCRR Part 375-6.7(d).

Since contamination will remain at the site, an institutional control will be placed on the site. The institutional control, in the form of an environmental easement (EE), 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)(03);
- allow the use and development of the controlled property for restricted residential, commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of site groundwater as a source of potable or process water without proper treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department-approved Site Management Plan.

The Site Management Plan (SMP) will identify and implement the required institutional and engineering controls, as well as any necessary monitoring and/or operation and maintenance of the remedy. It will include, but not be limited to:

- an Excavation Plan which will detail the provisions for management of future excavations at the site;
- provisions for the management and inspection of the identified engineering controls;

- the steps necessary for periodic review and certification of the institutional and engineering controls
- 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; and
- a monitoring plan, which will include a groundwater monitoring plan to assess the performance and effectiveness of the remedy, as well as a plan to monitor the effectiveness of restoration efforts in the low-lying areas following removal, and monitoring for soil vapor intrusion for any buildings on the site, as may be required by the soil vapor intrusion evaluation discussed above.

It is anticipated that the remedial design will take 15-24 months to complete, and the construction of the remedy will take approximately eight to twelve months, followed by approximately four months to complete the SMP and Final Engineering Report. It is anticipated that all construction activities will be able to be completed with standard construction equipment (*e.g.*, excavators, front-end loaders, bulldozers, roller, etc.) which is readily available and that soil and other materials will be transported to and from the site by truck.

The capital cost to implement this alternative include the costs to complete the remedial design, which will include performing a pre-design investigation and developing engineering specifications and drawings defining the remedial action. The pre-design investigation will include, but not necessarily be limited to, the following activities: installing test pits and/or conducting a geophysical survey; a video survey of the petroleum pipeline; additional surface soil sampling for metals in the southern portion of the site; and additional sampling for SVOCs in the low-lying areas. The capital costs also include the costs to implement the excavations, complete site restoration activities, place the environmental easement on the site, develop the Site Management and complete a Final Engineering Report. Annual costs under this alternative for the 30-year cost estimation period include the cost to maintain the cover system and monitor groundwater. The estimated costs to implement Alternative 3 are as follows:

Present Worth: ..... *$ 2,960,000*
Capital Cost: ..... *$ 2,830,000*
Annual Costs: ..... *$ 8,500*

Alternative 4: Excavation to Restricted-Residential Use SCOs

This alternative includes the same elements as Alternative 3 except:

- the surface soils impacted by arsenic will be disposed of off-site, rather than being consolidated on-site;
- the on-site excavations of petroleum-impacted soils must achieve restricted-residential use SCOs (*i.e.*, there is no provision for a cover system for areas where the petroleum excavation(s) cannot achieve restricted residential use SCOs in a cost effective manner); and

This eliminates the need for a clean soil cover system and the need to maintain the cover system.

This alternative will take approximately the same amount of time to implement as Alternative 3. The capital costs for this alternative include the same items as discussed for Alternative 3. Annual costs under this alternative for the 30-year cost estimation period are the same as under Alternative 3, except that there is no need to maintain a cover system. The estimated costs to implement Alternative 4 are as follows:

Present Worth: ..... *$ 3,190,000*
Capital Cost: ..... *$ 3,060,000*
Annual Costs: ..... *$ 8,500*

Alternative 5: *Ex-situ* Enhanced Bioremediation with Off-site Disposal

This alternative includes the same elements as Alternative 3 except that rather than disposing of the petroleum contaminated soil off-site, it will be treated on-site *ex-situ* via enhanced bioremediation, and then reused on-site.

The petroleum-contaminated soil/materials, including soil/materials from the low-lying areas, will first be excavated as described under Alternative 3. Under this alternative certain excavation areas will be backfilled with clean, imported fill. Excavation(s) at off-site residential properties will be backfilled with imported fill, as will any excavation area within approximately 10 to 20 feet of a residential property boundary in order to protect the adjacent properties. The off-site excavations will be backfilled with soil which meets the requirements of 6 NYCRR 375-6.7(d) for unrestricted use and restored to their pre-remedial condition (*e.g.*, lawn, paving, etc.), including repairing any active subsurface utilities/structures/facilities, such as septic system leach fields, which may be removed or damaged during the course of remediation. The on-site excavations/excavation areas to be backfilled will be filled with soil which meets the requirements of 6 NYCRR 375-6.7(d) for restricted residential use. The areas surrounding the excavations will be re-graded to partially backfill the excavations over the course of the treatment period, which is estimated at 36 months. This will create a larger disturbed area, but will reduce the depth of the open excavation pits, and thereby increase safety given the protracted treatment period without requiring fill to be imported. The acceptable depth of residual excavation and interim grading plan for the treatment period will be determined during the remedial design.

The petroleum-contaminated soil will be treated on-site *ex-situ* via enhanced bioremediation. Enhanced bioremediation consists of creating and maintaining a favorable environment for microorganisms, either indigenous (naturally existing) or non-indigenous (brought in from another site), to break down contaminants into non-hazardous substances.

The treatment objectives will be to treat the soil until it does not exceed any applicable SCOs, does not contain elevated level of TICs, does not create a nuisance situation, and potentially until it does not contain an elevated level of total petroleum hydrocarbons (TPH).

As with Alternative 4, the arsenic-impacted soils will be excavated and disposed of off-site. Reuse of the arsenic-impacted soils within the excavations for the petroleum-impacted soils may not be feasible since the petroleum-impacted soils may undergo treatment over many months to several years, and so the arsenic-impacted soils would be exposed over this period unless an appropriate cover were constructed for the interim period, which would not be cost effective.

This alternative may need to rely on the use of a cover system over a portion of the site depending on the level of success of the biopile/biocell treatment. Therefore, it is assumed the requirements of the EE and SMP under this alternative are the same as under Alternative 3, which also relies on a cover system.

The capital costs to implement this alternative include the costs to complete the remedial design, which will include performing a pre-design investigation and developing engineering specifications and drawings defining the remedial action. The pre-design investigation will include the same activities as described for Alternative 3. The remedial design process may also include bench and/or pilot scale tests of the treatment system in order to

determine the operating conditions and determine the need for any amendments. The capital costs also include the costs to implement the excavations; construct the biopile/biocell; operate, maintain and monitor the biopile/biocell over a period of approximately three years; perform site restoration; place the environmental easement on the site; develop the Site Management Plan; and complete the Final Engineering Report. Annual costs under this alternative for the 30-year cost estimation period include the cost to monitor groundwater and inspect the cover system (if needed). The estimated costs to implement Alternative 5 are as follows:

Present Worth: ..... *$ 2,510,000*
Capital Cost: ..... *$ 2,380,000*
Annual Costs: ..... *$ 8,500*

Alternative 6: Restoration to Pre-Disposal 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 includes, the same elements as Alternative 3 except that any soils impacted by contaminants at concentrations greater than the unrestricted use SCOs will be excavated and disposed of off-site.

This alternative includes additional sampling prior to remediation in areas outside of, and below, areas which require excavation per Alternative 3. Any areas which exceed unrestricted use SCOs will be disposed of off-site. Backfill will be imported to restore the excavated areas. The backfill will meet the requirements of 6 NYCRR 375-6.7(d) for unrestricted use.

The capital cost to implement this alternative include the costs to complete the remedial design, which will include performing a pre-design investigation and developing engineering specifications and drawings defining the remedial action. The pre-design investigation will include, but not necessarily be limited to, the same activities as described for the pre-design investigation for Alternative 3, plus additional soil sampling to better define areas which exceed unrestricted SCOs. The capital costs also include the costs to implement the excavations and develop a Final Engineering Report. The estimated costs to implement Alternative 6 are as follows:

Capital Cost: ..... *$ 16,300,000*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Alternative 1 - No Further Action	0	0	0
Alternative 2 – Institutional Controls	50,000	8,500	181,000
Alternative 3 – Excavation and Off-site Disposal, with On-site Consolidation	2,830,000	8,500	2,960,000
Alternative 4 – Excavation to Restricted-Residential Use SCOs	3,060,000	8,500	3,190,000
Alternative 5 – *Ex-situ* Enhanced Bioremediation, with Off-site Disposal	2,380,000	8,500	2,510,000
Alternative 6 – Restoration to Pre-Disposal Conditions	16,300,000	0	16,300,000

Exhibit D

Summary of the Selected Remedy

The Department has selected Alternative 3, Excavation and Off-site Disposal, with On-site Consolidation as the remedy for this site. Alternative 3 will achieve the remediation goals for the site by removing and/or cleaning any remaining infrastructure, which may be sources of contamination; removing other source areas of contamination; and preventing human exposure to contamination through institutional and engineering controls. The elements of this remedy are described in Section 7. The selected remedy is depicted in Figure 4.

Basis for Selection

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

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

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

The selected remedy (Alternative 3) will satisfy this criterion by removing and/or cleaning any remaining infrastructure that contain petroleum and/or are sources of contamination; removing the most heavily impacted petroleum-contaminated soils, which present a threat to groundwater quality; removing surface soil impacted by petroleum and/or PAHs; removing site-impacted soils from off-site areas; excavating contaminated surface soil and consolidating on-site below a cover system, thus preventing exposure; and removing the potential for off-site migration, or further off-site migration, of contamination. Remaining contamination will be managed through the cover system, environmental easement and Site Management Plan, thus ensuring the goals are met long-term. The sources of potential groundwater contamination will be removed and the potential for soil vapor intrusion will be significantly reduced by removing the petroleum-contaminated soil.

Alternative 1 (No Further Action) does not provide any further protection to public health and the environment (beyond what has been provided by the IRMs) and will not be evaluated further. No further protection of the environment will be provided by Alternative 2 (Institutional Controls). Groundwater and surface water will remain threatened by site contamination, contamination will remain in the low-lying areas, and the potential for exposure to contaminated surface soil will remain for humans and wildlife. The potential for uncontrolled human exposure to on-site subsurface contamination will be reduced if the institutional controls are adhered to. The potential for exposure to off-site subsurface contamination will remain. As such, Alternative 2 does not satisfy this threshold criterion and will not be evaluated further.

Alternative 4 (Excavation to Restricted-Residential Soil Cleanup Objectives) will satisfy this criterion in a similar fashion to Alternative 3; however it does not rely on a cover system. Alternative 5 (*Ex-situ* Enhanced Bioremediation, with Off-site Disposal) will satisfy this threshold criterion by removing surface soils contaminated by metals, thus eliminating the potential for exposure; treating the petroleum-contaminated soils, thus eliminating the source of groundwater contamination and the potential for exposure; and preventing future exposures through engineering and institutional controls.

Alternative 6 (Restoration to Pre-Disposal Conditions) satisfies this criterion by removing all contaminated soil from the site, which will remove sources of groundwater contamination and remove the threat to surface water quality.

Alternatives 3, 4 and 5 rely on a restriction of groundwater use at the site to protect human health. Alternative 6 may require a short-term restriction on groundwater use. The potential for soil vapor intrusion will be significantly reduced by Alternatives 3, 4, 5 and 6.

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 3 complies with SCGs to the extent practicable. It addresses source areas of contamination and complies with the restricted-residential use SCOs at the surface through construction of a cover system. It also creates the conditions necessary to restore groundwater quality. Alternative 5 complies with SCGs in a similar manner, though the source removal is accomplished through on-site treatment rather than off-site disposal. Alternative 4 complies with SCGs in a similar fashion, but complies with restricted-residential use SCOs everywhere without the use of a cover system. Alternative 6 complies with the unrestricted use SCOs across the site and complies with other SCGs in a similar fashion as the other alternatives.

Because Alternatives 3, 4, 5, and 6 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

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

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

Alternative 6 is the most effective in the long-term because it removes all soil contamination, which will create the conditions to allow for groundwater to achieve SCGs, and eliminates the potential for soil vapor intrusion.

Alternative 4 is effective in the long-term because it removes all soil contamination from off-site areas; removes all soil contamination exceeding restricted-residential use SCOs, and removes the sources and potential sources of groundwater contamination. Since contamination will remain on-site at concentrations greater than unrestricted use SCOs, it relies on an environmental easement and Site Management Plan to achieve long-term effectiveness.

Alternative 3 is similarly effective in the long-term as Alternative 4, though it will also rely on a cover system in the consolidation area, and potentially other areas if the excavations cannot achieve restricted-residential use SCOs in a cost-effective manner.

Alternative 5 is similarly effective in the long-term, though it is achieved through on-site treatment rather than off-site disposal; however, Alternative 5 may be less reliable since the technology is effective at treating lighter petroleum products, like gasoline or kerosene, but less effective for heavier petroleum products such as are present at this site.

Alternative 5 and 6 are the most effective in the long-term, followed by Alternative 4, then Alternative 3, though, all are effective in the long-term. All four of the alternatives are permanent since the contamination will either be permanently removed, covered, or destroyed.

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 6, by removing all contaminated soil, results in the largest reduction in the volume of contamination present at the site. Alternative 4 and 3 also result in a reduction in the volume of contamination present at the site, with the reduction under Alternative 4 being slightly greater than under Alternative 3. Alternative 5 will result in a reduction of toxicity of the petroleum-contaminated solids, as long as the treatment can fully degrade the contamination to low-toxicity or non-toxic end products, such as carbon dioxide and methane. Alternative 4 will also result in a reduction volume by removing the arsenic-contaminated soil.

Alternatives 3, 4 and 6 rely on off-site disposal, so the contamination is transferred to a secure location, whereas Alternative 5 relies on treatment, which will permanently destroy the contamination. It is noted, though, that the petroleum contamination will probably degrade within a landfill, so some of the contamination will be destroyed even under Alternatives 3, 4 and 6.

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.

The potential and actual short-term adverse impacts are greatest for Alternative 6. The potential and actual short-term adverse impacts under Alternative 3 and 4 will be of a similar nature and magnitude.

Alternatives 3, 4 and 6 will create noise and traffic, due to the operation of construction equipment and hauling soil to and from the site. Alternative 6 will create the most noise and traffic, followed by Alternative 4, then Alternative 3. Each requires the disturbance of contaminated soils. During intrusive activities the potential exists to generate dust which could migrate off-site if not controlled. The potential also exists to generate contaminated runoff from exposed soils. The greater the volume of soil disturbed, the greater the potential for off-site impacts, though controls employed routinely during field activities will mitigate these risks.

Alternative 5 will create noise and traffic due to the operation of construction equipment and hauling soil from the site; however, the volume of soil leaving the site is expected to be much lower than under the other alternatives, and so the traffic will be much lower. Soil will be excavated and transported across the site to the treatment cell(s). Alternative 5 requires the disturbance of contaminated soils. During intrusive activities the potential exists to generate dust which could migrate off-site if not controlled. The potential also exists to generate contaminated runoff from exposed soils, though controls employed routinely during field activities will mitigate these risks. Since the treatment cell will be on-site for several years the potential exists for the generation of odors, contaminated runoff/leachate if the cells are not properly constructed, operated, maintained and monitored.

Alternative 6 requires more energy input in order to implement than the other alternatives, and therefore results in greater greenhouse gas (GHG) emissions during implementation of the remedy due to the longer construction period and the greater number of truck loads needed to haul soil to and from the site. Alternative 4 will result in

the next highest amount of GHG emissions, followed by Alternative 3, and Alternative 5 results in the least GHG emissions.

Considerably more landfill space will be utilized by Alternative 6 than the other alternatives, followed by Alternative 4, then 3. Alternative 5 will require some off-site disposal (arsenic-contaminated soil) so utilizes some landfill space, but considerably less than the other alternatives. More natural resources (clean soil) need to be utilized in order to implement Alternative 6 than the other alternatives, followed by Alternative 3, then 4, and Alternative 5 requires the least amount of imported, clean soil.

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

Alternatives 3, 4 and 6 are all readily implementable using standard construction equipment which is readily available, though Alternative 6 requires the excavation and removal of a very large volume of soil, which presents implementability challenges. Alternative 5 requires a greater level of technical and administrative effort in order to implement due to the need for bench or pilot tests and regular operation, maintenance and monitoring of the treatment cell(s) over several years, and it may not be fully feasible since the technology is typically less effective for heavier petroleum products such as are present at this site.

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

Alternative 6 costs significantly more than Alternatives 3, 4 and 5 and provides little additional protection of the environment. The cost of Alternatives 3 and 4 are similar, with the cost of Alternative 3 being lower while providing the same level of protection of groundwater and ecological resources. The cost estimate for Alternative 5 is lower than Alternatives 3 or 4; however, there is less certainty in its cost estimate due to the protracted treatment period and the potential for significant cost increase if adequate treatment is not achieved and the treated soil requires off-site disposal. If all or a significant portion of the treated soil must be placed under a cover system the cost of Alternative 5 will increase measurably as well.

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.

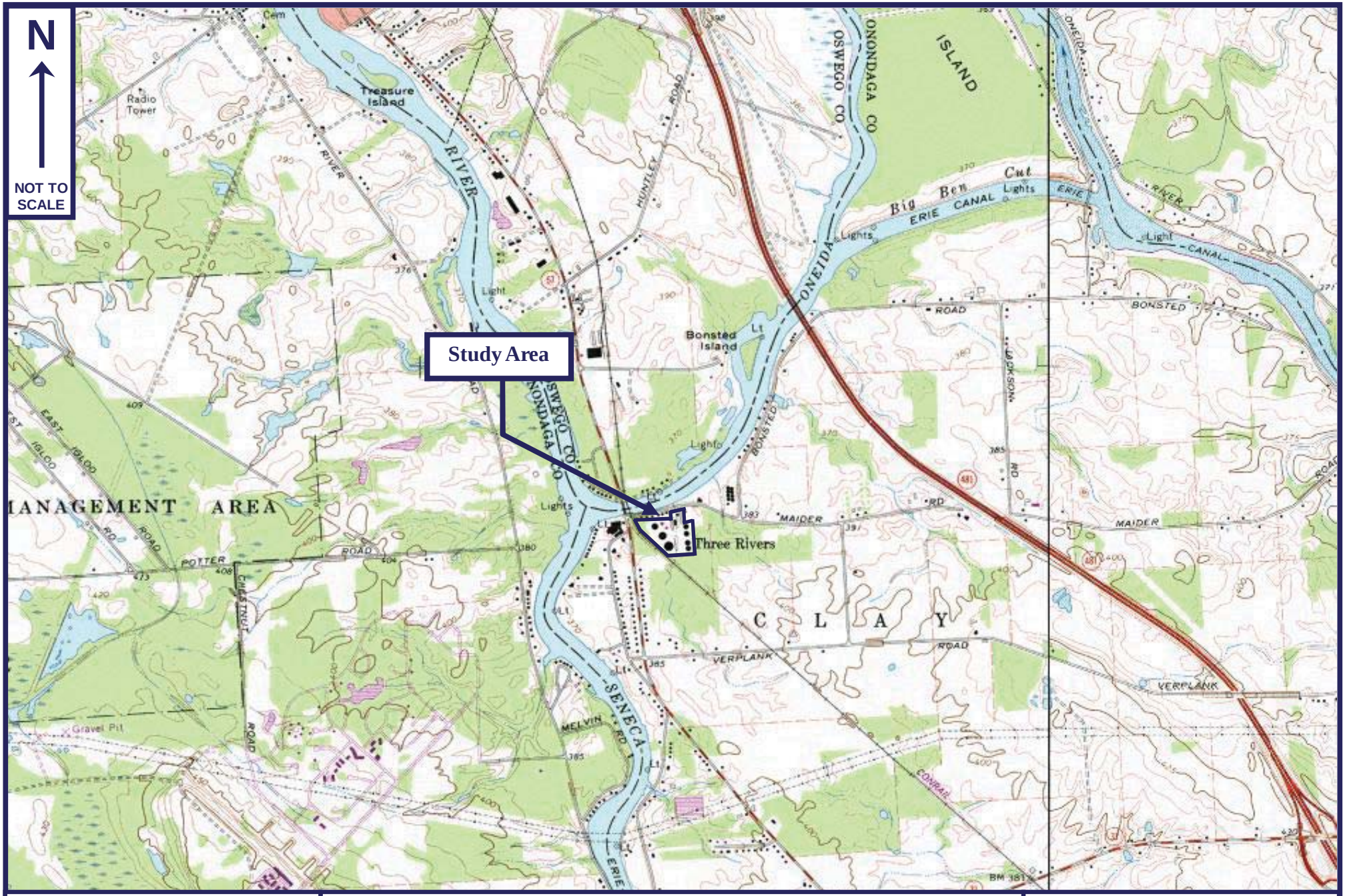
Each alternative under consideration allows for the anticipated next use of the site (restricted-residential use). Alternative 6 will not result in any restriction on future use.

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

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary has been prepared that describes public comments

received and the manner in which the Department will address the concerns raised.

Alternative 3 has been selected because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.



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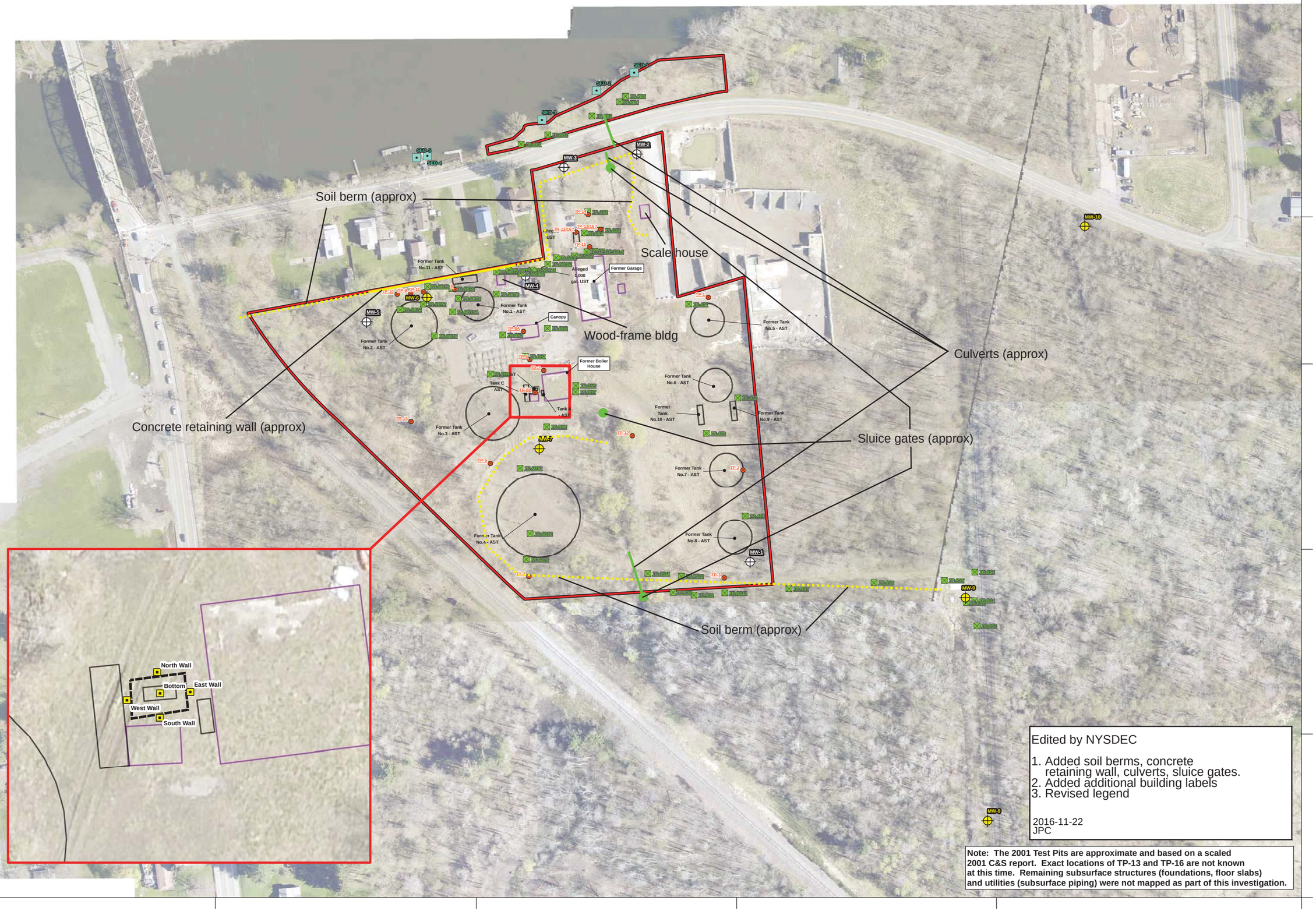
OPERATIONS

Source: USGS Topographic Maps
USGS Baldwinsville Quadrangle
Dated 1973, Photorevised/inspected in 1978

Project Location Map – Maider Road Brownfield Site
Town of Clay, Onondaga County, New York

Figure 1



Edited by NYSDEC

1. Added soil berms, concrete retaining wall, culverts, sluice gates.
2. Added additional building labels
3. Revised legend

2016-11-22
JPC

Note: The 2001 Test Pits are approximate and based on a scaled 2001 C&S report. Exact locations of TP-13 and TP-16 are not known at this time. Remaining subsurface structures (foundations, floor slabs) and utilities (subsurface piping) were not mapped as part of this investigation.

F:\Project\195 - TOWN OF CLAY\195705001 Maider Road Brownfield\GIS\Projects\Figure 2 2001 Investigation Map.mxd

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TOWN OF CLAY ONONDAGA CO. N.Y. EST 1827

N

0 40 80 160 Feet

1 inch = 80 feet

DATE:	April 2016
SCALE:	AS SHOWN

Source: Aerial Imagery from Pictometry Online, Inc.

Legend

- Test Pits - 2001
- Monitoring Wells - 2007
- Test Pits - 2007
- Sediment Sampling - 2007
- Monitoring Wells - Unknown Year
- Approxamite 2006 Excavation
- Site Boundary
- Former Tanks
- Former Structures

Maider Road Brownfield Site
Former Cibro Facility
Town of Clay
Onondaga County, New York

FIGURE 2

Site Features & 2001-2007 Investigation

Note: The locations were collected with a mapping grade Trimble GPS unit.

Document Path: F:\Project\195-TOWN OF CLAY\195705001\Maider Road Brownfield\GIS\Projects\Figure_3_2015_Investigations_Map_updated_013017.mxd

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N

0 40 80 160 Feet

1 inch = 80 feet

DATE:	January 2017
SCALE:	AS SHOWN

Source: Aerial Imagery from Pictometry Online, Inc.

Legend

2015 Explorations

- Boring
- Offsite Boring
- Surface Sample
- Shallow Sample from Low-Lying Area
- Decomissioned Monitoring Wells
- Site Boundary
- Former Tanks
- Former Structures

Maider Road Brownfield Site
Former Cibro Facility
Town of Clay
Onondaga County, New York

FIGURE 3

2015
Investigations Map

Edited by NYSDEC

1. Expanded excavation areas
2. Added potential pipeline NW of SS-6
3. Revised legend
4. Corrected Tank 9 and Tank 10 label

2016-12-19
JPC

Note: The 2001 Test Pits are approximate and based on a scaled 2001 C&S report. Exact locations of TP-13 and TP-16 are not known at this time. Remaining subsurface structures (foundations, floor slabs) and utilities (subsurface piping) were not mapped as part of this investigation.

F:\Project\195 - TOWN OF CLAY\195705001 Maider Road Brownfield\GIS\Projects\Figure_5_Proposed_Remediated_Areas.mxd

C&S COMPANIES®

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TOWN OF CLAY ONONDAGA CO. N.Y. EST. 1827

N

0 30 60 120 Feet

1 inch = 60 feet

DATE:	April 2016
SCALE:	AS SHOWN

Source: Aerial Imagery from Pictometry Online, Inc.

Legend

- Proposed Monitoring Wells
- Decomissioned Monitoring Wells - 2015
- Monitoring Wells - 2007 (To be Decommisioned)
- Monitoring Wells - Unknown Year (To Be Decommisioned)

Areas to be Remediated

- Petroleum/PAH Surface Impacts Delineate and Remove
- Arsenic Delineate and Remove
- Petroleum Impact Removal
- Alleged Existing Pipeline To Be Removed
- Site Boundary
- Former Tanks
- Former Structures

EXCEEDANCE OF NYSDEC SOIL CLEANUP OBJECTIVES

- NOT SAMPLED
- NO EXCEEDANCE
- SAMPLE EXCEEDS UNRESTRICTED USE FOR AT LEAST ONE COMPOUND
- SAMPLE EXCEEDS RESIDENTIAL USE FOR AT LEAST ONE COMPOUND
- SAMPLE EXCEEDS RESTRICTED RESIDENTIAL USE FOR AT LEAST ONE COMPOUND
- SAMPLE EXCEEDS INDUSTRIAL USE FOR AT LEAST ONE COMPOUND

Maider Road Brownfield Site
Former Cibro Facility
Town of Clay
Onondaga County, New York

FIGURE 4

Remediation Areas

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Maider Road Waterfront Site
Environmental Restoration Project
Town of Clay, Onondaga County, New York
Site No. B00015

The Proposed Remedial Action Plan (PRAP) for the Maider Road Waterfront Site (site) was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 13, 2017. The PRAP outlined the remedial measure proposed for the contaminated soil, groundwater and soil vapor at the Maider Road Waterfront Site.

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

A public meeting was held on March 9, 2017, which included a presentation of the remedial investigation and alternative analysis (RI/AA) for the Maider Road Waterfront Site as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 30, 2017.

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

COMMENT 1: Is there funding available to implement the remediation?

RESPONSE 1: Currently the Department is not accepting applications for the Environmental Restoration Program (ERP). As of 2008, applications for funding for ERP projects exceeded the $200 million authorized for the ERP under the 1996 Clean Water/Clean Air Bond Act, and the Department has not accepted applications for the ERP since that time. The 2015-16 New York State budget made available up to $10 million per year in funding for the ERP. The application process and other program elements are being updated after which the Department can begin accepting applications.

The Brownfield Cleanup Program is however available to a developer who could implement the cleanup and then redevelop the site while being eligible for substantial tax credits from the state.

COMMENT 2: Could the State require a potentially responsible party (PRP) implement the remedy?

RESPONSE 2: The Department will seek to identify PRPs to implement the remedy.

COMMENT 3: Why is it acceptable to consolidate the arsenic-contaminated soil on-site?

RESPONSE 3: Covering contaminated soil with a clean soil cover or impervious structures is protective of public health and the environment, because the cover reduces exposures by preventing direct contact with site contaminants, as long as the soil being covered does not represent a source that could threaten other environmental media (e.g., groundwater). Two feet of clean soil is the cover depth identified by the Department and NYSDOH as protective for restricted residential site use. Based on the site sampling data, the arsenic-contaminated soil does not pose a threat to groundwater, and arsenic does not create a potential for soil vapor intrusion. The consolidation area would be constructed on the site and subject to the site management plan. A buffer would be provided when locating the consolidation area in relation to nearby surface waters.

COMMENT 4: What is the timeline for implementation?

RESPONSE 4: Once a means for implementing the remedy is identified (e.g., under the 2015-16 ERP funding, Brownfield Cleanup Program, or by a responsible party), the estimate for implementation is 15-24 months for the remedial design, 8-12 months for remedial action, and approximately four additional months to complete the Site Management Plan and Final Engineering Report.

COMMENT 5: Could the State consider allowing remediation to another use, such as commercial or industrial, and would that affect the cost?

RESPONSE 5: Remediation to restricted residential use allows for commercial and industrial use. A remediation conducted to commercial or industrial use standards would still need to address source areas. Further, the contaminants of concern that will drive the site's remediation outside of the source areas include benzo(a)pyrene and arsenic. The soil cleanup objectives for arsenic for industrial use and restricted residential use are identical (16 parts per million [ppm]) and for benzo(a)pyrene are nearly identical (1 ppm for restricted residential use versus 1.1 ppm for industrial use), so there would be minimal change in the selected remedial action. Remediation to commercial or industrial use standards would only require one foot of clean soil cover, as compared to two feet for restricted residential; however, based on the estimated volumes of soil to be addressed, it appears there will be ample space to consolidate the arsenic-contaminated soil at depths greater than two feet below grade. So, for this site, the actions required to achieve commercial or industrial use standards would be the similar to the actions required to achieve restricted residential use.

Also, the Department must consider surrounding land use and zoning when determining appropriate remedial clean-up goals.

COMMENT 6: The Town of Clay is considering installing solar panels on the site. If implementation of the remedy cannot move forward soon, is there a way the solar project could be installed prior to completion of the remedy?

RESPONSE 6: There is the possibility for this use on a portion of the site. Any work conducted by the Town would require a legal agreement (e.g., Brownfield Cleanup Agreement, Order on

Consent) between the Town and the Department. The development would have to be conducted so as to not prohibit eventual implementation of the remedy. That would probably entail either (a) implementing the remedy for the affected area or (b) utilizing an area of the site that does not require active remediation, which may require some additional work to verify there is no active remediation required in the affected area. Operation and maintenance of the solar panels would also need to be conducted in a manner that was protective of public health and the environment. This use could also be undertaken by a developer or the Town in the Brownfield Cleanup Program (BCP) who could receive tax credits for the cost to clean up the site as well as credits for the site development.

COMMENT 7: Could the portion of the site where the solar panels are to be installed be remediated to commercial use or industrial use? Can a site be remediated to allow for more than one use in different areas of the site (i.e., one area that is restricted residential, and another that is commercial or industrial)? That could help save money if the arsenic-contaminated soil, or a portion thereof, needed to be addressed. That would then only require one foot of clean soil cover over the affected area and/or the consolidation area.

RESPONSE 7: See Response 5.

COMMENT 8: Can the Town utilize its own employees to conduct the necessary work that would be required during development of the solar panels?

RESPONSE 8: Workers conducting remedial work would need to have appropriate training and certifications required, including but not necessarily limited to, the 40-hour training required by the Occupational Safety and Health Administration (OSHA) under 29 CFR 1910.120, which is the OSHA standard concerning hazardous waste operations and emergency response.

APPENDIX B

Administrative Record

Administrative Record

Maider Road Waterfront Site
Environmental Restoration Project
Town of Clay, Onondaga County, New York
Site No. B00015

1. Proposed Remedial Action Plan for the Maider Road Waterfront Site, dated February 2017, prepared by the Department.

2. The Department and the Town of Clay entered into a State Assistance Contract, Contract No. C302587, June 21, 2005.

3. State Assistance Contract (SAC) No. C302587, and SAC Amendments 1 through 5.

4. Geophysical Investigation Report, dated February 28, 2008, prepared by C&S Engineers, Inc.

5. Letter dated March 24, 2008 from the New York State Department of Environmental Conservation to the Town of Clay regarding the February 28, 2008 Geophysical Investigation Report.

6. Site Investigation/Remedial Alternatives Analysis Report, dated March 2014, prepared by C&S Engineers, Inc.

7. Letters dated July 14, 2015 and October 21, 2015 from the New York State Department of Health to several property owners regarding soil vapor intrusion sampling.

8. Supplemental Site Investigation/Remedial Alternatives Analysis Report, dated December 2015, prepared by C&S Engineers, Inc.

9. Report dated April 29, 2016 from C&S Engineers, Inc. to the New York State Department of Environmental Conservation containing corrections and supplemental information for the December 2015 report.