Olean Well Field Superfund Site

Operable Unit 5

Cattaraugus County, New York

July 2023

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered to address soil contamination at a discrete area of the property located at 1695 Seneca Avenue, Olean, New York (AVX Property), which has been designated by EPA as Operable Unit (OU) 5 of the Olean Well Field Superfund Site (Site) in Cattaraugus County, New York and identifies the preferred remedial alternative with the rationale for this preference. For the purposes of this Proposed Plan, OU5 includes contaminated soil that is located beneath and near the footprint of a former manufacturing building located in the northern portion of the Historical Source Area[1] at the AVX Property. The AVX Property is one of four source areas at the Site. In prior EPA decision documents AVX is sometimes referred to as AVX Corporation.[2] A Site location map is provided as Figure 1.

The OU2 Record of Decision (ROD) was amended in 2015 as it related to AVX. The OU2 AVX ROD Amendment selected an interim remedy to address soil and groundwater at the AVX Property. An interim remedy was selected because a final remedy, requiring restoration of the City Aquifer, would not be possible until the soil under the active AVX manufacturing building became accessible and additional soil characterization and testing could be conducted. The OU2 AVX ROD Amendment specified, that in the event there was a change in use of the manufacturing building, a feasibility study would need to be performed to evaluate whether further action in the form of source control and/or restoration actions was necessary to achieve the OU2 ROD goal of aquifer restoration. Therefore, a feasibility study to determine a final remedy could not be completed until the AVX property was no longer operating as an active manufacturing facility. In April 2018, AVX ceased operations at the facility and in 2020 the building was demolished. This allowed for additional characterization and the performance of a feasibility study for contaminated soil located beneath and near the footprint of the former manufacturing building. EPA has designated this portion of the Historical Source Area as OU5 at the Site.

The major components of the interim remedy selected by the OU2 ROD Amendment included: maintenance of existing exposure barriers (the building and paved areas) in the northern portion of the Historical Source Area and the vegetative cover in the drainage swale area (to address soil contamination); construction and operation of a hydraulic trench containment system to address groundwater in the Downgradient Till Unit; hydraulic pumping to contain groundwater in the City Aquifer; implementation of institutional controls; implementation of a long-term groundwater monitoring program; and development of a Site Management Plan (SMP) to provide for the proper management of the interim remedy post-construction. Refer to the OU2 ROD Amendment for a detailed description of the interim remedy.

The preferred remedy for OU5 includes the excavation of impacted soil located beneath and near the footprint of the former manufacturing building. In addition to identifying the preferred remedy to address contaminated soil located beneath and near the footprint of the former manufacturing building, once selected, the OU5 remedy in conjunction with the OU2 ROD Amendment will constitute the final remedy for the AVX Property.

[1] The remedy selected in a September 2015 Amendment to the Operable Unit Two Record of Decision (OU2 ROD Amendment) defined the Historical Source Area as generally consisting of soil and groundwater contamination in a shallow groundwater unit known as the Downgradient Till Unit beneath the former manufacturing building and the land at the southeast corner of the building immediately proximate thereto, including the shallow north-south trending drainage swale that begins to the south of the building. The OU2 ROD Amendment provides further details regarding geologic and hydrogeologic conditions at the Site.

[2] In 2020, AVX Corporation (AVX) became a wholly owned subsidiary of KYOCERA Corporation. In 2021, AVX's name changed to KYOCERA AVX Components Corporation or KAVX. The owner of record of the property is still AVX.

This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA), the lead agency for the Site, in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, also known as Superfund), as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of contamination for OU5 at the Site and the remedial alternatives summarized in this Proposed Plan are more fully described in the Feasibility Study Investigation Report (FSIR), dated June 2022, and the Feasibility Study (FS) Report, dated July 2023, as well as other documents in the Administrative Record file for this remedy. EPA encourages the public to review these documents to gain a more comprehensive understanding of the Site, the Superfund activities that have been conducted, and the remedial alternative that is being proposed.

The purpose of this Proposed Plan is to inform the public of EPA's preferred remedy and to solicit public comments pertaining to all of the remedial alternatives evaluated for OU5, including the preferred remedy.

Changes to the preferred remedy, or a change from the preferred remedy to another remedial alternative described in this Proposed Plan, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. For this reason, EPA is soliciting public comments on all of the alternatives considered in the Proposed Plan and on the detailed analysis section of the FS Report because EPA may select an alternative other than the preferred alternative.

MARK YOUR CALENDAR
PUBLIC COMMENT PERIOD:

July 27, 2023 to August 28, 2023

EPA will accept written comments on the Proposed Plan during the public comment period.

IN PERSON PUBLIC MEETING:

August 8, 2023 at 6:00 pm

TECH Building, Mangano Reception Room, near the Cutco Theater, 305 North Barry Street, Cattaraugus County Campus of Jamestown Community College, Olean, New York

COMMUNITY ROLE IN SELECTION PROCESS

EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, this Proposed Plan has been made available to the public for a public comment period which begins on July 27, 2023 and concludes on August 28, 2023.

A public meeting will be held on August 8, 2023 to present the conclusions of the studies performed, to elaborate further on the reasons for recommending the preferred alternative, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document which formalizes the selection of the remedy.

Written comments on the Proposed Plan should be addressed to:

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INFORMATION REPOSITORIES

Copies of the Proposed Plan and supporting documentation are available at the following information repositories.

Olean Public Library, located at Second and Laurens Streets Olean, New York
(716) 372-0200
Hours: Monday – Thursday, 9:00 AM – 9:00 PM
Friday and Saturday, 9:00 AM – 5:00 PM

USEPA – Region II
Superfund Records Center
290 Broadway, 18th Floor

New York, New York 10007
(212) 637-4308

EPA's website for the Olean Well Field Site:

www.epa.gov/superfund/olean-wellfield

SCOPE AND ROLE OF ACTION

Site remediation activities are sometimes segregated into different phases, or operable units (OUs), so that remediation of different, discrete environmental media or geographic areas of a site can proceed separately, whether sequentially or concurrently. EPA has designated five OUs for the Olean Well Field Site (refer to Figure 2) to address soil and groundwater contaminated with volatile organic compounds (VOCs).

On September 24, 1985, EPA signed a ROD for OU1, which called for, among other things, the treatment of the municipal supply well water and the extension of the public water supply to residents utilizing private wells.

On September 30, 1996, EPA signed a ROD for OU2. The four source areas targeted in the OU2 ROD were as follows: AVX Corporation (AVX) (currently owned by KYOCERA AVX Components Corporation ("KAVX") located at 1695 Seneca Avenue, Olean, New York); Alcas Cutlery Corporation (Alcas) (currently owned and operated by Cutco Corporation and located at 1116 East State Street, Olean, New York); Loohn's Dry Cleaners and Launderers (Loohns) (currently a vacant lot located at 1713 East State Street, Olean, New York); and McGraw-Edison Company (McGraw) (currently operated by Cooper Power Systems, LLC, owned by Cooper Power Systems, Inc., and located at 1648 Dugan Road, Olean, New York).

On September 30, 2014, EPA amended the OU2 ROD to modify the selected remedy for the Alcas component of the OU2 ROD. The Alcas OU2 ROD Amendment addressed soil and groundwater contamination impacting the underlying aquifers, and also selected a remedy to address OU3 groundwater contamination. OU3 addresses groundwater contamination at an area south of the Alcas facility referred to as Parcel B.

On September 30, 2015, EPA again amended the OU2 ROD to modify the selected remedy for the AVX component of the OU2 ROD. The AVX OU2 ROD Amendment selected an interim action to address soil and groundwater contamination impacting the underlying aquifers until a final remedy for the AVX Property is implemented. The AVX OU2 ROD Amendment indicated that a change in the current use of the building in the future would trigger the performance of a feasibility study to evaluate source control and/or restoration actions, leading to the selection of a final remedy. In April 2018, AVX informed EPA that it intended to cease operations at its Olean Manufacturing facility.

On September 30, 2022 EPA signed a ROD for OU4. The OU4 ROD addressed VOCs in groundwater located at certain residential and commercial properties downgradient of the AVX Property and south of the Conrail railroad tracks.

This Proposed Plan concerns OU5, the final planned phase of response activities at the AVX Property, and addresses soil contamination located beneath and near to the former AVX manufacturing building in the northern portion of the Historical Source Area. Once selected, the OU5 remedy in conjunction with the OU2 ROD Amendment will constitute the final remedy for the AVX Property.

SITE BACKGROUND

The Site is located in the eastern portion of the City of Olean and western and northwestern portions of the towns of Olean and Portville in Cattaraugus County, New York. The Site is characterized by VOC-contaminated groundwater underlying the City of Olean, the Town of Olean and the Town of Portville, and by VOC-contaminated soil at certain locations in the City and Town of Olean. The Site is approximately 65 miles

southeast of Buffalo, New York, and seven miles north of the New York/Pennsylvania border.

The AVX Property is currently zoned for manufacturing use, and the areas immediately surrounding the Property are zoned for industrial, commercial, and residential uses. EPA expects that the land-use pattern at and surrounding OU5 of the Site will not change in the foreseeable future.

Beginning in the 1980s, several separate federal-, state- and Potentially Responsible Party (PRP)-led investigations were conducted to identify the sources of contamination to the municipal water supply wells and evaluate the nature and extent of groundwater contamination at the Site. The Site was included on the National Interim Priorities List, by publication in the Federal Register on October 23, 1981, and was included on the first National Priorities List on September 9, 1983. For more details regarding the results of the various investigations and subsequent actions taken to address Site-related contamination refer to the OU4 ROD.

According to EPA's EJScreen tool, there are no demographic indicators for OU5 at the Site that would indicate a community with environmental justice concerns. Within and immediately near OU5, the national and State EJ index percentiles for all of the environmental and socioeconomic indicators are at or below the 52nd percentile. The proposed remedy is not anticipated to result in adverse impacts to environmental resources that would affect low income or minority populations living within the vicinity of OU5.

The following provides a summary of activities at the AVX Property, a source of groundwater contamination at the Site.

As mentioned previously, the remedy selected in the 1996 OU2 ROD addressed multiple sources of VOC contamination to groundwater at the Site. The major components of the selected remedy for AVX, one of the four sources targeted, included the following: excavation and removal of contaminated soil; off-Site low temperature desorption of soil contaminants, if necessary; upgradient and downgradient groundwater monitoring; implementation of groundwater treatment, if excavation and removal of the contaminated soil did not adequately improve the quality of the City Aquifer and if the property continued to affect the groundwater entering the municipal wells; and implementation of groundwater use restrictions.

AVX initiated the excavation of contaminated soil at its property in July 2000. Approximately 5,055 tons of contaminated soil was excavated to a depth of approximately 10 feet below ground surface (bgs) and transported off-Site for disposal before work was halted. AVX could not excavate all of the contaminated soil because the material extended beyond the area identified as contaminated in the OU2 ROD to beneath the southeast corner of the manufacturing building, which was fully occupied with AVX's manufacturing operations. Further excavation had the potential to impact the structural integrity of the occupied building. As a result, the excavation area was backfilled pending further study. Further evaluations revealed significant unknown contamination extending under the building and that additional excavation and removal of all contaminated soil would result in significant disruption to and/or shutdown of the on-going operations.

Following the backfilling at the AVX Property, EPA directed AVX to conduct soil and groundwater sampling activities at the AVX Property and properties to the south as part of a multi-phase investigation to assess the conditions at these properties. Results from these studies indicated that significant previously unknown VOC contamination is present in both soil and groundwater.

As indicated previously, on September 30, 2015, EPA issued a ROD Amendment for OU2 relating to the AVX Property that addressed soil and groundwater contamination in the Historical Source Area, and groundwater contamination in the Downgradient Till Unit and City Aquifer (refer to the Site Geology and Hydrogeology section in the OU2 ROD Amendment for additional detail regarding geological and hydrogeologic conditions at the Site).

The Downgradient Till Unit component of the selected remedy involves the construction and operation of a hydraulic trench containment system involving a gravel trench coupled with active groundwater recovery and treatment to prevent migration of groundwater downgradient of the AVX Property. Construction of this component of the selected remedy was completed in January 2023.

The City Aquifer component of the selected remedy involves hydraulic pumping containment utilizing and maintaining an existing AVX Property production well (PW-1) as an active groundwater recovery system at a pumping rate that prevents further migration of contaminated groundwater within the City Aquifer. The AVX production well, in operation since 1959, continues to operate as part of the implementation of the AVX OU2 ROD Amendment selected remedy even though the plant closed down.

Soil Investigation Results from Previous Investigations at the AVX Property

Results of post-OU2 ROD investigations showed that VOC contamination in soil consists primarily of trichloroethene (TCE), 1,1,1-trichlorethane (1,1,1-TCA), tetrachloroethene (PCE), and the breakdown products cis-1,2-dichloroethene (cis-1,2-DCE), vinyl chloride, and 1,1-dichloroethane (1,1-DCA) with elevated concentrations of other VOCs, including toluene and xylenes.

As set forth in a January 29, 2013 FSIR performed after work was halted on the OU2 ROD remedy, high concentrations of VOCs have been observed in soil (up to 1,614 parts per million (ppm) of total VOCs) beneath the southeast corner of the former manufacturing building by a maintenance shop and a former solvent underground storage tank (both along the eastern edge of the manufacturing building), and in areas immediately to the south and north of the manufacturing building. Minimal detections of VOC contamination were found in soil south of the fenced area of the AVX Property.

Concentrations of VOCs observed in groundwater indicate that a groundwater plume of VOC contamination in the till unit originates from the Historical Source Area and extends through the undeveloped area to the southern property boundary and OU4.

OU5 Feasibility Study Investigation Report (FSIR)

While prior investigations have characterized the hydrogeology and the nature and extent of contaminants in the subsurface throughout much of the AVX Property, the demolition of the former manufacturing building in 2020, enabled the collection of soil and groundwater samples beneath and adjacent to the former structure. This additional soil characterization and testing were also necessary to support the evaluation of remedial alternatives for contaminated soil in and around the footprint of the former manufacturing building. The investigation activities were designed to:

- Define the lateral and vertical extent of contaminants in soil located beneath and near the footprint of the former manufacturing building within and near the northern portion of the Historical Source Area; and
- Characterize the hydrostratigraphic framework to better define the potential contaminant transport pathways within and near the source area.

A portion of the concrete slab of the former building was left in place and is currently acting as an exposure barrier to contaminated soil.

OU5 Soil Investigation Results

The first step of the soil characterization program included screening of near-surface soil/fill for the presence and magnitude of VOCs using a photoionization detector (PID). Information gathered using a PID is classified as screening level data and does not provide chemical specific information. Following the initial soil screening and preliminary surveying, whole core soil sampling (WCSS) and vertical aquifer profile (VAP) sampling was conducted. The locations of WCSS and VAP sampling were adjusted as needed based on access and the results of soil screening. A summary of the results of this work is presented in the following sections.

Soil Screening

The VOC contamination detected in soil consists primarily of TCE, 1,1,1-trichlorethane (1,1,1-TCA), PCE, and the breakdown products cis-1,2-DCE, vinyl chloride, 1,1-DCA, with elevated concentrations of other VOCs, including toluene and xylenes. 114 soil gas screening point locations were selected and organized in a grid layout approximately 25 feet apart, in and around the source area. For all locations and depths where soil gas could be drawn, the gas was pumped by and analyzed with a PID and data were recorded.

The highest concentrations of PID-measured VOCs were observed primarily outside of the footprint of the original building, which was constructed in 1950, with those elevated concentrations observed largely within the footprint of the historical Machine Shop/Maintenance area (constructed in 1978 and used as the building maintenance area), the Receiving Area, and the Chemical Storage area (both constructed in 2001). These levels ranged from 145 - 1,436 ppm. Some elevated PID-measured screening concentrations were also observed beneath adjacent areas within the southeastern corner of the footprint of the original building. These included one area historically noted as the Powder and Barrel Storage area but also on other maps noted as being used for waste storage. Some elevated PID-measured concentrations were also noted farther to the west beneath or near to the historical Tape and Reel Storage area. Refer to Appendix A in the 2023 FS Report for the layout of the former manufacturing building.

Soil Quality Characterization

Following completion of the soil screening activities, WCSS were collected by rotosonic drilling methods on a modified approximately 50-foot grid spacing at 40 locations. Approximately 300 soil samples were analyzed to better characterize the nature and extent of VOCs in soil, both saturated and unsaturated, within the source area. The results are summarized in Table 1 below. The data revealed that the highest mass of VOCs in soil is largely concentrated in areas predicted by the soil gas screening data, with some deviations. The highest concentrations were observed within the former footprint of the Machine Shop/Maintenance area, beneath the former Receiving area, and extending into the former chemical storage/waste storage area. Other notable areas of higher concentrations included the head of the drainage swale to the south of the facility fence, and near the southeastern corner of the former Stage 1 remedial action excavation area.

Table 1: Maximum Soil Contaminant Concentrations

Contaminant	Concentration (ppm)
1,1,1-TCA	226 DJ
TCE	1,500 DJ
PCE	723 DJ
cis-1,2-DCE	93.6 DJ
vinyl chloride	2.05 DJ
1,1-DCA	9.88 D

D = Identifies all compounds identified in the analysis at the secondary dilution factor.
J = The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample.

The concentrations of contaminants were observed to generally diminish with sample depth, though not consistently in all locations. Thin and discontinuous stringers of more permeable soil appear to have acted as pathways for contaminants to reach greater depths in certain locations.

Groundwater

During soil sampling, if retrieved core samples appeared to be both saturated and coarse-grained enough to produce water, VAP samples were collected. In total, only 13 of 40 borings contained enough water to facilitate VAP sampling, with only two of the 13 borings containing adequate water to sample at more than one depth.

Aside from some VAP groundwater sample locations with anomalously high COC concentrations, likely due to the presence of stringers containing more permeable material that can collect water containing high contaminant concentrations, the concentrations of contaminants in the VAP groundwater samples are relatively consistent with concentrations reported for groundwater sampled from monitoring wells during the semi-annual groundwater monitoring events which have been conducted since 2000.

Table 2: Maximum Groundwater Contaminant Concentrations

Contaminant	Concentration (ppm)
1,1,1-TCA	59 D
TCE	120 D
PCE	4
cis-1,2-DCE	17
vinyl chloride	1.8
1,1-DCA	12

D = Identifies all compounds identified in the analysis at the secondary dilution factor.

Refer to the OU5 Feasibility Study Investigation Report for additional details regarding the sampling results.

An assessment of natural attenuation conditions in groundwater was conducted as part of the 2015 OU2 ROD. Overall, the analyses indicated that some level of natural attenuation of Site-related contaminants is occurring. Groundwater samples revealed an increase in concentration of daughter products (e.g., cis-1,2-DCE and vinyl chloride) relative to the concentration of the parent compound (e.g., TCE). Reductive dechlorination is a natural attenuation process that can degrade chlorinated VOCs by transforming chlorinated compounds such as TCE to other compounds. Other natural attenuation processes can include dispersion, dilution, sorption, volatilization. The observed concentrations of contaminants in soil and groundwater near to the former AVX manufacturing building suggest that some level of natural attenuation is occurring.

Additionally, ethene and ethane were detected in groundwater monitoring well samples, demonstrating occurrence of the full sequence of reductive dechlorination. The monitored natural attenuation (MNA) assessment also included analysis of electron acceptors,

which showed moderate to strongly reducing conditions present.

The OU5 FS Report contains additional details, as does the full MNA Screening Analysis conducted in 2012. Both documents can be found in the Administrative Record file for the Site.

Principal Threat Waste

Principal threat wastes are considered source materials, i.e., materials that include or contain hazardous substances, pollutants or contaminants, such as DNAPL in soil, that act as a reservoir for migration of contamination to groundwater, surface water, or as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment in the event exposure should occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of alternatives, using the remedy selection criteria which are described below. The manner in which principal threat wastes are addressed provides a basis for making a statutory finding that the remedy employs treatment as a principal element. Varying concentrations of VOCs were detected in soil samples collected during previous investigations from borings installed within the main manufacturing building at the AVX Property. Results from previous investigations showed concentrations of 1,1,1-TCA as high as 990 ppm and TCE as high as 650 ppm in subsurface soil, indicative of the presence of DNAPL in the soil zone at approximate depths of 16 feet and 6 feet, respectively, below the foundation of the main building.

WHAT IS A "PRINCIPAL THREAT"?

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in ground water may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

During the FSIR, concentrations of 1,1,1-TCA and TCE as high as 226 ppm and 1,500 ppm, respectively in subsurface soil were revealed. The FSIR results are indicative of the presence of DNAPL in the soil zone at an approximate depth of five feet below the foundation of the main building. These findings show the presence of "principal threat" wastes at the AVX Property. The proposed alternative for OU5 discussed in more detail below is expected to remove this contamination through excavation and off-Site disposal. Please refer to the text box entitled, "What is a Principal Threat" for more information on the principal threat concept.

RISK SUMMARY

As part of the 1996 OU2 ROD, a baseline human health risk assessment (HHRA) and a qualitative ecological risk assessment were conducted to estimate the risks and hazards associated with the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects caused by hazardous substance exposure in the absence of any actions to control or mitigate these exposures under current and future site uses.

In the HHRA, cancer risk and noncancer health hazard estimates were based on reasonable maximum exposure (RME) scenarios. The estimates were developed by taking into account various health protective estimates about the concentrations, frequency and duration of an individual's exposure to chemicals selected as chemicals of potential concerns (COPCs), as well as the toxicity of these contaminants.

Human Health Risk Assessment

A four-step human health risk assessment (HHRA) process was used for assessing site-related cancer risks and noncancer health hazards related to soil at the AVX Property during the OU2 ROD (see box on next page "What is Risk and How is it Calculated"). The HHRA evaluated the potential health effects which would result from exposure to groundwater contamination through ingestion, dermal contact and inhalation of volatilized contaminants during showering. Risks associated with exposure to contaminants in surface and subsurface soil were calculated for the ingestion and inhalation of contaminants by construction workers. A residential exposure scenario for soil was not calculated because all of the properties studied during the OU2 RI/FS are zoned for industrial or commercial use. It is expected that the

AVX Property will continue to be used for commercial/industrial purposes in the future.

The results of the OU2 HHRA identified carcinogenic risk and/or noncarcinogenic hazards that were above the acceptable carcinogenic risk range of $1x10^{-6}$ to $1x10^{-4}$ and the noncarcinogenic hazard index (HI) of 1 for future exposure to groundwater. Carcinogenic risks and noncarcinogenic hazards for construction worker exposure to soil were within the risk range and below the noncarcinogenic HI threshold of 1. However, data collected at the time of 2015 ROD Amendment identified higher concentrations of VOCs in soil compared to those evaluated in the OU2 HHRA. Therefore, a qualitative determination was made in the 2015 ROD Amendment that the risks associated with soil in the OU2 HHRA could be underestimated. As discussed in more detail in the following sections, EPA has determined that the results of the OU2 HHRA and the risk evaluation from the 2015 ROD Amendment have not substantially changed. Therefore, an additional HHRA was not performed as part of OU5. Nevertheless, an updated qualitative analysis of the data to evaluate the risks associated with the elevated VOC concentrations detected in soil at the AVX Property is provided below.

Soil

The estimated total risks ($5x10^{-5}$) and hazards (HI=0.5) in soil included in the OU2 ROD Amendment for the AVX Property were primarily due to VOCs in the subsurface soil below the concrete slab floor of the building. It was also determined that contamination in the subsurface soil could serve as a source of continued groundwater contamination. Additional samples were collected as part of the OU5 FS. A comparison of the results for the primary contaminants is included in Table 3 below.

WHAT IS HUMAN HEALTH RISK AND HOW IS IT CALCULATED

Human Health Risk Assessment: A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases under current- and anticipated future-land uses. A four- step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. that were identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other noncancer health hazards, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and noncancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to Site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk. For noncancer health effects, a "hazard index" (HI) is calculated. The key concept for a noncancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which noncancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a noncancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at a site and are referred to as chemicals of concern, or COCs, in the final remedial decision document or Record of Decision.

Table 3. Primary contaminant results in subsurface soil at the AVX Property.

Chemicals	OU2 RI (ppm)	OU5 FS (ppm)
1,1,1-TCA	990	226 DJ
PCE	270	723 DJ
TCE	650	1,500 DJ
cis-1,2 DCE	65	93.6 DJ
Vinyl Chloride	ND	2.05 DJ

ND – Non-Detect
D – Indicates compounds identified in the secondary dilution factor
J – Estimated value

The maximum results of the soil samples collected during the OU5 FS were either higher than those identified in the OU2 RI or are within the same order of magnitude (i.e., 1,1,1-TCA). Notably, the maximum concentrations of PCE and TCE during the OU5 FFS were over two times greater than the OU2 RI. Therefore, EPA has determined that the risk conclusions presented in the OU2 ROD Amendment have not substantially changed and could be underestimated. Additionally, groundwater on the Site continues to exceed drinking water standards from impacts from contaminated soil.

Ecological Risk Assessment

The AVX Property is approximately 18.5 acres in size and currently includes an open area with bare soil due to the recent removal of the former AVX building. Wetlands and a wooded area are located south of the former building area, which remains fenced. The fenced portion of the site that formerly comprised the AVX building does not currently provide habitat that could potentially support populations of indigenous wildlife receptor species. Therefore, there are no ecological risks currently recognized within this area. For the area outside of the fence, which includes the wooded area and wetland area, a qualitative ecological risk assessment was conducted as part of the OU2 ROD to determine if contamination present at the AVX Property was impacting the wooded or wetland area. Given that the potential source of contamination in the wooded and wetland area would be contaminated groundwater discharging to the sediments, sediment samples were collected from the wetlands. Analysis of the samples did not reveal any VOC contamination. Several semi-volatile organic compounds (SVOCs) were detected but were not attributed to the AVX Property. Based on this evaluation, it was determined that there is not a completed exposure pathway from the AVX property to the wooded or wetland areas. Since the levels of contamination in groundwater at the AVX property have remained similar, or have declined, this assumption is still considered valid.

Based on the results of the data collected to support the OU5 FFS, it is EPA's current judgment that the Preferred Alternative identified in this Proposed Plan is necessary to protect public health, welfare and the environment from actual or threatened releases of hazardous substances.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and site-specific risk-based levels.

The followings RAOs have been established for OU5 of the Site:

- Reduce the migration of VOC contaminants in soil to groundwater.
- Eliminate the potential for human exposure to Site contaminants via contact with soil concentrations above NYSDEC soil cleanup objectives for commercial properties.

The RAOs established in the OU2 ROD Amendment for groundwater and the drainage swale remain the same.

The soil preliminary remediation goals established for OU5 COPCs are identified in Table 4.

Table 4: Preliminary Remediation Goals for Soil

Chemicals of Potential Concern (COPCs)	Soil Remediation Goals (ppm)*
TCE	.47
cis-1,2-DCE	.25
vinyl chloride	.02
1,1,1-TCA	.68
1,2-DCA	0.02
Trans-1,2-dichloroethene	.19
PCE	1.3
Toluene	0.7
Xylene	1.6
1,4-dioxane	0.1

* NYSDEC SCOs [6 NYCRR Section 375-6.5] are based on the protection of groundwater.

These PRGs are based on the protection of groundwater and are lower than the NYSDEC soil cleanup objectives for commercial properties. These PRGs would therefore be protective of commercial workers.

SUMMARY OF REMEDIAL ALTERNATIVES

Section 121(b)(1) of CERCLA, 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARs, and utilize permanent solutions and alternative treatment technologies or resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions that employ, as a principal element, treatment to reduce permanently and significantly the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site. Section 121(d) further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to Section 121(d)(4) of CERCLA, 42 U.S.C. §9621(d)(4).

Since principal threat wastes are associated with OU5, treatment of the contaminated soil was considered as a principal element of some of the alternatives developed for OU5.

Detailed descriptions of the remedial alternatives for addressing the contamination associated with OU5 of the Site can be found in the OU5 FS Report, dated July 2023.

For cost-estimating and planning purposes, the FS made certain assumptions regarding the depth of the water table to distinguish between saturated and unsaturated soil and estimated an elevation of 1,430 ft above mean sea level (amsl) as the depth to the water table. While the FS assumed that unsaturated contaminated soils would be addressed under the active remedial alternatives, as part of the remedial design, further evaluation would be conducted to refine the depth of active remediation. Additional active remediation may be performed below the water table to address saturated soil with elevated concentrations of COPCs, which would have the incidental effect of improving remediation timeframes for groundwater. Additional soil sampling would also be conducted during the design, to further refine the extent of contamination. During the performance of the FSIR, analysis of soil samples did not include 1,4-dioxane. Given the presence of elevated concentrations of 1,4-dioxane in groundwater, additional soil sampling would be performed for 1,4-dioxane analysis during the remedial design.

The construction time for each alternative reflects only the actual time required to construct or implement the action and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction.

Common Elements

Each of the alternatives address unsaturated contaminated soil located beneath and near the footprint of the former manufacturing building in the northern portion of the Historical Source Area.

Until a final remedy for the AVX Property is selected, the OU2 Amended Remedy requires implementation of institutional controls and development of a Site management plan (SMP) to provide for the proper operation and maintenance (O&M) of the remedy for the AVX Property post-construction. The ICs selected by the OU2 Amended ROD would continue to apply to the AVX Property and as such would apply to each of the alternatives evaluated for OU5. Implementation of ICs and the SMP are ongoing.

Additionally, because the OU2 amended remedy will result in hazardous substances, pollutants, or contaminants remaining in and around the drainage swale area at the AVX Property above levels that would otherwise allow for unlimited use and unrestricted exposure, pursuant to Section 121(c) of CERCLA, statutory reviews will be conducted no less often than once every five years to ensure that the remedy remains protective of human health and environment.

Alternative 1: No Action

The NCP requires that a “No Action” alternative be used as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial actions actively conducted at OU5 to control or remove soil contaminants. This alternative also does not include monitoring or institutional controls.

Capital Cost:	$0
Periodic Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

Alternative 2: Long-Term Monitoring

This alternative would rely on long-term monitoring of contaminant concentrations in soil to ensure concentrations are decreasing. As discussed above, reductions in contaminant concentrations in groundwater are occuring to limited extent already from various naturally occurring physical, chemical, and biological processes. These processes occur naturally, in-situ, and act to decrease the mass or concentration of contaminants in the subsurface. Only non-augmented natural processes would be relied upon under this alternative. In addition, existing surface covers (concrete slab floor, pavement, and vegetative cover) would be maintained to control potential leaching of contaminants in soil to groundwater and prevent exposure.

For cost-estimating and planning purposes, periodic monitoring of four newly installed groundwater monitoring wells would be conducted to track attenuation of contaminants immediately beneath and/or downgradient of the unsaturated soil source.

Capital Cost:	$44,000
Periodic Costs:	$567,000
Present-Worth Cost:	$291,000
Construction Time:	1 month

Alternative 3: Excavation

The major components of the soil excavation alternative are demolition and removal of the existing concrete slab floor and foundation supports, excavation of impacted unsaturated soil located beneath and near the footprint of the former manufacturing building, off-Site transportation and disposal of excavated material, and restoration with imported clean fill material.

Excavation areas would be restored with imported clean fill material to match the previously existing contours and grades. Imported clean fill material would meet NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation for imported fill or soil at commercial or industrial properties. Surface restoration details would be developed during the remedial design.

For cost estimating and planning purposes, the conceptual design estimates 5,500 cubic yards (cy) of soil requiring excavation and off-Site transportation for disposal as non-hazardous waste at a solid waste landfill. Rainwater/surface water that accumulates in, and is then removed from, any excavation areas would be temporarily containerized onsite (e.g., in 21,000-gallon tanks). It is anticipated that any water that accumulates and is removed from the excavation would be treated by the groundwater treatment system at the AVX Property prior to discharge to the City of Olean sewer system.

Capital Cost:	*$*2,228,000
Periodic Costs:	*$*450,000
Present-Worth Cost:	*$*2,414,000
Construction Time:	4 months

Alternative 4: In-Situ Soil Solidification

The major components of the In-Situ Soil Solidification (ISS) alternative include the demolition and removal of the existing concrete slab floor and foundation supports, excavation and removal of the asphalt paved areas to establish a level working surface for the ISS mixing equipment, construction of a management area adjacent to the ISS target areas to accommodate bulk soil that would swell as a result of the soil mixing process and amendment addition.

Solidification refers to a cleanup method that prevents or slows the release of harmful chemicals from contaminated soil. These methods usually do not destroy the contaminants. Instead, they keep them from "leaching" above safe levels into the surrounding environment. Solidification binds the waste in a solid block of material and traps it in place, using a binding agent. This block is also less permeable to water than the waste.

During the FSIR, a laboratory bench-scale ISS treatability study was conducted with soil from the AVX Property to identify the optimal percentage of reagents, dosing requirements, and effectiveness. This treatability study investigated the ability of (Portland Cement) (PC) and blast furnace slag (BFS), as well as zero-valent iron (ZVI), to reduce the leaching potential of contaminants. Based on the results, for cost-estimating and planning purposes, the conceptual design estimates approximately 5,500 cy of soil would be mixed with a blend of 2.5% PC and 4.5% ground-granulated BFS, with a water-to-reagent ratio of 4.5 (grams of water to grams of reagent) to solidify contaminants in-place, creating a low-permeability monolith.

The conceptual design estimates that a three-foot-thick cover would be designed to maintain the ISS-treated material below the frost line and to promote stormwater drainage away from the treatment zone. The protective cover would consist of a non-woven geotextile demarcation fabric, 2.5 to 3 feet of reuse soil, and approximately six inches of gravel at the surface for erosion protection.

It has been estimated that approximately 3,755 cy of non-impacted soil would be excavated to create the management area and would be used post-ISS construction for installation of a three-foot-thick cover over both the ISS treatment and management areas.

Under this alternative, long term monitoring would be conducted to evaluate the long-term effectiveness and permanence of the solidified mass.

Capital Cost:	$2,715,000
Periodic Costs:	$450,000
Present-Worth Cost:	$2,901,000
Construction Time:	3.5 months

Alternative 5: In-Situ Thermal Remediation

This remedial alternative combines in-situ thermal remediation (ISTR) with a system to address vapor management within and around areas with the highest concentration of contaminants.

In-situ thermal treatment methods move or "mobilize" harmful chemicals in soil using heat. The chemicals move through soil toward wells where they are collected and piped to the ground surface to be treated using ex-situ cleanup methods. For cost estimating and planning purposes, the conceptual design assumes an ex-situ approach for vapor management composed of cooling, phase separation, air stripping, liquid-phase GAC, and vapor-phase granular-activated carbon following. If some water is encountered, multi-phase extraction (MPE) would be utilized.

Electrical resistance heating (ERH) and thermal conduction heating (TCH) were determined, based on their effectiveness for treating lower-permeability till with similar soil electrical properties, to be the most applicable ISTR technologies for source removal within the lower-permeability till unit at OU5. For cost estimating purposes, ERH was assumed for the development of this alternative.

Preliminary ERH layouts were developed using a regular 19-foot triangular grid pattern for the electrodes, with vertical MPE wells and horizontal vapor management wells located at the centroids between adjacent electrodes. Distributed temperature sensor strings would be used for performance monitoring. A thermally insulating vapor cap would be constructed to provide a no-flow barrier at the surface, limit heat losses to ground surface, and minimize the potential for recondensation of vapors near ground surface.

Capital Cost:	$3,395,000
Periodic Costs:	$450,000
Present-Worth Cost:	$3,581,000
Construction Time:	6 months

EVALUATION OF ALTERNATIVES

In evaluating the remedial alternatives, each alternative is assessed against nine evaluation criteria set forth in the NCP namely, overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance. Refer to the table below for a more detailed description of the evaluation criteria.

This section of the Proposed Plan summarizes the evaluation of the relative performance of each alternative against the nine criteria, noting how each compare to the others under consideration. The detailed analysis of alternatives can be found in the FS Report.

Overall Protection of Human Health and the Environment

All of the alternatives except Alternative 1 (No Action) would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through off-site disposal, in-situ treatment, engineering controls, and/or institutional controls. Alternative 2 (Long-Term Monitoring) would provide some protection from future exposure to contaminated soil through the maintenance of the existing cover material (concrete slab floor, pavement, and vegetative cover), and through institutional controls such as land-use restrictions. However, contaminated soil would remain in place above the cleanup goals.

Alternative 3 (Excavation) would permanently remove unsaturated soil with VOCs above the PRGs for off-Site disposal while Alternative 5 (In-Situ Thermal Remediation) would remove VOCs through in-situ treatment and ex-situ recovery for on-Site treatment. Under Alternative 4 (In-Situ Soil Solidification) contaminated soil would not be destroyed, but rather would be treated in-situ to bind the contaminants to the material and prevent or slow the release of contaminants from soil.

Alternatives 2, 3, 4, and 5 would achieve the RAOs. Alternative 1 (No Action) would not achieve the RAOs. Because Alternative 1 is not protective of human health

and the environment, it is not further discussed under the remaining evaluation criteria.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

EPA has identified NYSDEC's soil cleanup objectives for the protection of groundwater (6 NYCRR § 375-6.5) as an ARAR, a "to-be considered," or other guidance to address contaminated soil at the Site. Refer to Table 4 for the preliminary remediation goals for soil.

Under Alternatives 2 through 5, it is intended that ARARs would be achieved. Although soil sampling results indicate that biodegradation of VOC contaminants may be occurring at the AVX Property, given the elevated concentrations of contaminants in soil, achievement of the preliminary remediation goals under Alternative 2 may not be reached for many years. Under Alternative 2, elevated concentrations of contaminants in soil, would result in the prolonged presence of contamination in the unsaturated soil which would continue to act as a source to groundwater contamination and likely prevent or extend the attainment of the remediation goals established in the OU2 ROD Amendment.

Alternatives 2 through 4 would comply with location-specific ARARs, such as the Clean Water Act to mitigate adverse impacts on protected wetlands. Alternatives 2 through 4 would comply with action-specific ARARs, such as hazardous waste management regulations that manage remediation derived waste.

Chemical-, location-, and action-specific ARARs are identified in the July 2023 FS Report, Tables 3-1, 3-2 and 3-3.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the Site, or whether a waiver is justified.

Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

State/Support Agency Acceptance considers whether the State agrees with EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Long-Term Effectiveness and Permanence

Alternative 2 relies on naturally occurring in-situ processes to decrease the concentrations of contaminants over time. While degradation has been shown to occur in soil and groundwater at the AVX Property, given the elevated concentrations of contaminants present, the timeframe to achieve the cleanup levels, long-term protectiveness is not anticipated to occur in a reasonable timeframe. Alternatives 3 through 5 are all effective alternatives in the long-term because they would remove or solidify the contaminants in unsaturated soil located beneath and near the footprint of the former manufacturing building, through physical methods (excavation, Alternative 3), solidification (Alternative 4), and volatilization via thermal treatment followed by soil vapor extraction (Alternative 5). Alternatives 2 through 5 would permanently reduce accessible contaminant concentrations over time, while Alternatives 3, 4, and 5 would achieve permanent contaminant concentration reduction or immobilization more quickly.

Potential Site impacts from climate change have been assessed, and the future performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the Site.

Reduction of Toxicity, Mobility, or Volume

Alternatives 3 and 5 reduce toxicity and volume of contaminants in soil located beneath and near the footprint of the former manufacturing building. Alternative 4 substantially reduces the mobility of contaminants in soil by solidifying them in a solid block of material. Alternative 2 would reduce the toxicity and volume of contaminants in soil over time, however, the timeframe to achieve the cleanup levels and long-term protectiveness may not be reached for many years. Under Alternative 3, the mobility, volume, and exposure to contaminants would be reduced through the removal and disposal of the soil at an approved off-Site facility. Furthermore, although currently not anticipated, off-site treatment, if required, would reduce the toxicity of the contaminated soil prior to disposal. Alternatives 4 and 5 provide active in-situ treatment of contaminants in soil that would greatly reduce the mobility of these contaminants. Alternative 5 would also reduce the volume and toxicity of contaminants because it destroys the contaminants rather than solidifying them in-place.

Short-Term Effectiveness

Alternatives 2 through 5 may have short-term impacts to remediation workers, the public, and the environment during implementation. Alternative 2 could have minimal adverse short-term impacts since work is limited to the installation of four additional groundwater monitoring wells associated with the groundwater sampling program. Occupational health and safety controls would be implemented to mitigate exposure risks. Alternative 2 has an estimated implementation timeframe of 30 years, although it is unclear whether RAOs would be reached within 30 years.

Under Alternative 3, the potential risks to workers, the public, or the environment would increase relative to Alternative 2 due to substantial soil disturbance and offsite transportation of soil, although these activities would be managed through engineering controls, health and safety procedures, and worker training. The implementation timeframe for Alternative 3 is estimated to be approximately 4 months.

Under Alternative 4, the potential risks to workers, the public, or the environment would increase relative to Alternative 2, due to implementation of ISS although these activities would be managed through engineering controls, health and safety procedures, and worker training. The implementation timeframe for Alternative 4 is estimated to be approximately 3.5 months.

Installation of the electrodes and associated SVE and MPE wells for Alternative 5 may result in short-term exposure risks to workers, the public, or the environment, but these potential risks are likely lower than those from Alternatives 3 and 4 because there will be less physical disturbance and movement of soil. These potential risks would be managed through engineering controls, vapor monitoring and mitigation, health and safety procedures, and worker training. The implementation timeframe for Alternative 5 is estimated to be approximately 6 months.

Based on the information contained above, Alternative 2 presents the least short-term impacts. Alternative 5, while presenting more short-term impacts than Alternative 2, has less short-term impacts as compared to Alternatives 3 and 4.

Implementability

All technologies under active Alternatives 3, 4, and 5 are established technologies with commercially available equipment and are implementable.

Alternative 5 would be the most difficult to implement, as it requires the most specialized equipment with the installation of electrodes, wells for vapor management, and MPE wells (as necessary), temperature monitoring

points, a power delivery system, and waste stream controls. However, the equipment is conventional and readily available.

Alternatives 3 and 4 would be easier to implement than Alternative 5, but more difficult than Alternative 2, as Alternative 2 is not an active remedy.

Cost

The estimated capital, O&M, and present worth costs are presented in Table 5 below and discussed in detail in the FS Report. The cost estimates are based on the best available information. Alternative 1: No Action has no cost because no activities are implemented. The highest present worth cost alternative is Alternative 5, at $3.58 million.

Table 5: Summary of Costs

Alternative	Capital Cost	O&M Costs	Present Worth*
Alternative 2	$44,000	$567,000	$291,000
Alternative 3	$2,228,000	$450,000	$2,414,000
Alternative 4	$2,715,000	$450,000	$2,901,000
Alternative 5	$3,395,000	$450,000	$3,581,000

* 30-year present worth calculations are based on a 7% discount rate.

State/Support Agency Acceptance

NYSDEC has consulted with NYSDOH and concurs with the preferred alternative.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the Responsiveness Summary section of the Record of Decision for OU5.

PREFERRED REMEDY AND BASIS FOR PREFERENCE

Based upon an evaluation of the remedial alternatives, EPA, in consultation with NYSDEC, proposes Alternative 3, Excavation, as the preferred remedy for OU5.

The preferred alternative has as its key components: 1) demolition and removal of the existing concrete slab floor and foundation supports; 2) excavation of contaminated unsaturated soil located beneath and near the footprint of the former manufacturing building in the northern portion of the Historical Source Area; 3) off-Site transportation and disposal of excavated material; and 4) restoration with imported clean fill material. Refer to Figure 3 for the conceptual design depicting the estimated excavation area based on the results of the FSIR.

As part of the remedial design, further evaluations would be conducted to define the depth of the water table and resulting excavation. If determined practicable, additional limited active remediation could be performed below the water table to address saturated soil in an effort to improve remediation timeframes for groundwater. During the remedial design, additional soil sampling would also be conducted to further evaluate the extent of contamination, including 1,4-dioxane.

The environmental benefits of the preferred remedy may be enhanced by employing design technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy.[3] During the remedial design, green remediation concepts, including the use of low-sulfur vehicles and the location of the landfill that would receive the excavated soil in an effort to reduce truck trips, would be considered.

The total estimated present-worth cost for the preferred alternative is $2,414,000. This is an engineering cost estimate that is expected to be within the range of plus 50 percent to minus 30 percent of the actual project cost. Further detail on the cost is presented in Appendix C of the FS Report.

This proposed OU5 remedy addressing contaminated soil located beneath and near the footprint of the former manufacturing building, along with the remedy selected in the OU2 ROD Amendment addressing soil in the drainage swale area and groundwater, would constitute the final remedy for the AVX Property.

The ICs selected in the OU2 Amended ROD continue to apply to the AVX Property and as such would apply to the preferred remedy. Because the OU2 amended remedy will result in hazardous substances, pollutants, or contaminants remaining in and around the drainage swale area at the AVX Property above levels that would otherwise allow for unlimited use and unrestricted exposure, pursuant to Section 121(c) of CERCLA, statutory reviews will be conducted no less often than

[3] See http://www.epa.gov/greenercleanups/epa-region-2-clean-andgreen-policy and http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf

once every five years to ensure that the remedy remains protective of human health and environment.

Basis for the Remedy Preference

While Alternatives 3: Excavation, Alternative 4: In-Situ Soil Solidification and Alternative 5: In-Situ Thermal Remediation all use proven technologies to actively treat VOC-contaminated soil in OU5, Alternative 3 would permanently remove the contaminated soil located beneath and near the footprint of the former manufacturing building in a relatively short implementation timeframe. Alternative 3 is also comparatively easier to implement than Alternatives 4 and 5 and uses conventional construction equipment.

Based upon the information currently available, the preferred alternative (Alternative 3, Excavation) meets the threshold criteria and provides the best balance of tradeoffs compared to the other alternatives with respect to the balancing criteria. The EPA expects the preferred alternative to satisfy the following statutory requirements of Section 121(b) of CERCLA: 1) the proposed remedy is protective of human health and the environment; 2) it complies with ARARs; 3) it is cost effective; and 4) it utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Although it is not currently anticipated, if necessary, in order to meet the requirements of the disposal facilities, contaminated material would be treated prior to land disposal and only under such circumstances would the preferred alternative partially satisfy the preference for treatment. With respect to the two modifying criteria of the comparative analysis, state acceptance and community acceptance, NYSDEC concurs with the preferred alternative, and community acceptance will be evaluated upon the close of the public comment period.

Figure 1: Site Location Map

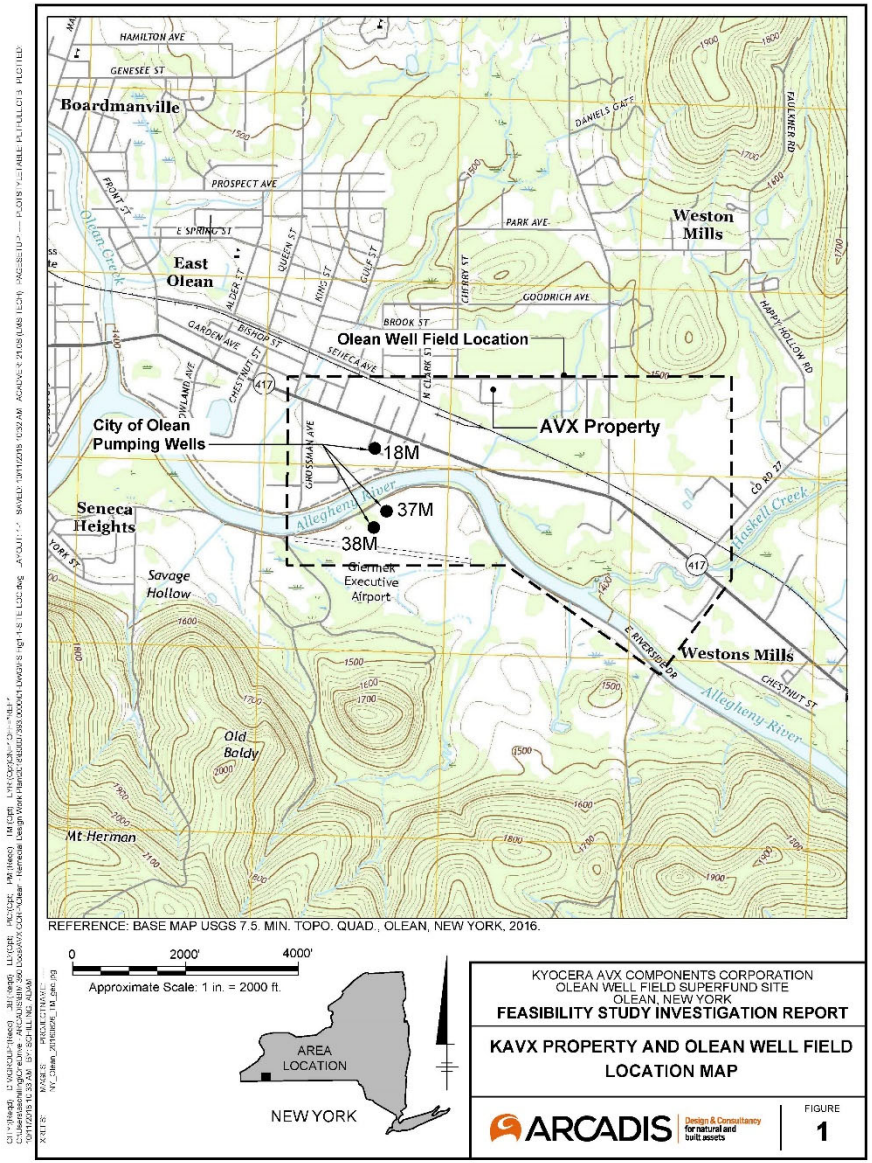

Figure 2: Operable Units

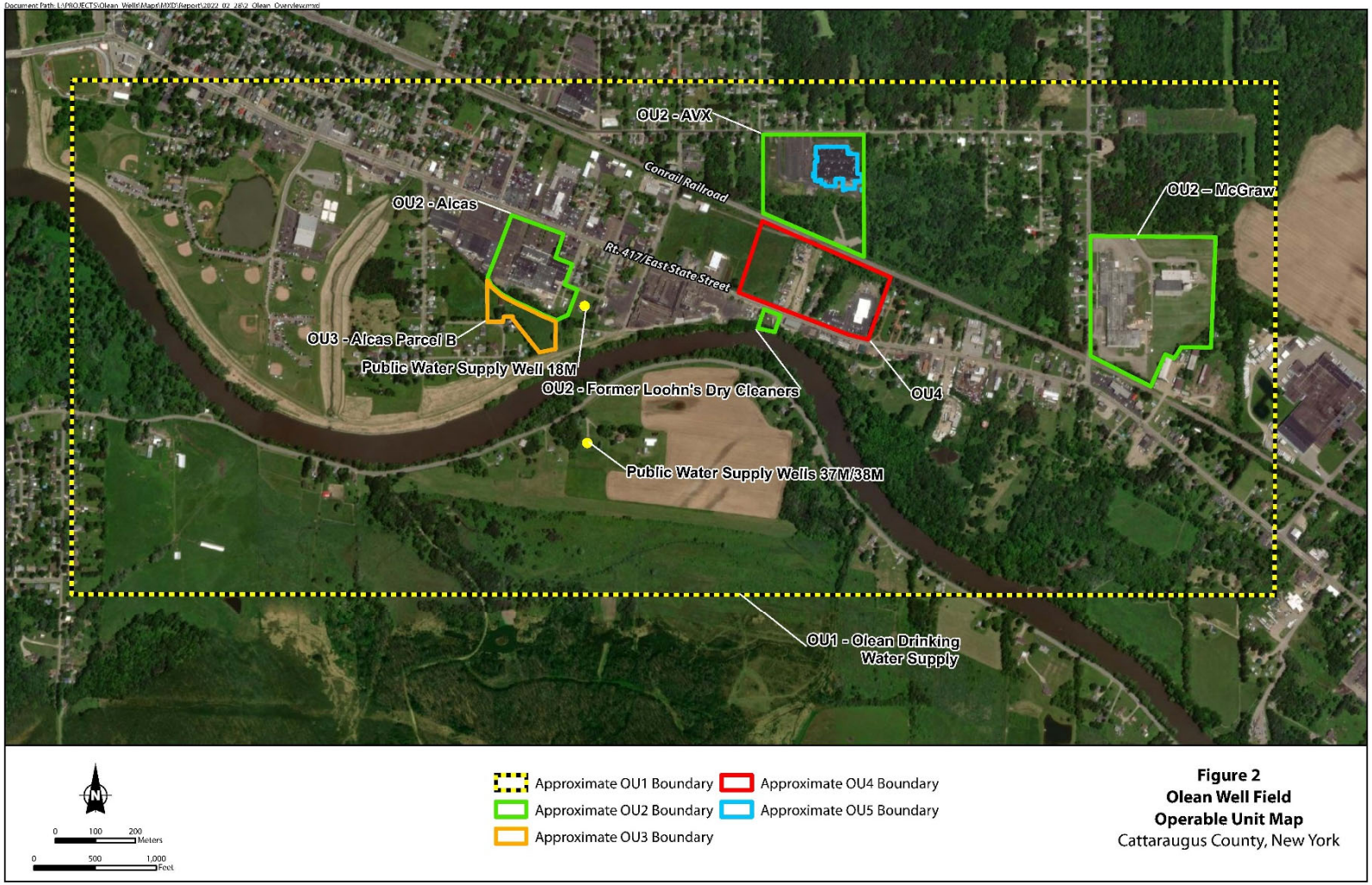

Figure 3: Alternative 3 -Excavation