

DRAFT STATEMENT OF BASIS

FMC Corporation
Operable Unit Number 03: Air Deposition Area 2 (Off-Site)
Middleport, Niagara County
USEPA ID No.: NYD002126845
NYSDEC Site No. 932014
September 2020



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

**Draft Statement of Basis
FMC Corporation
Operable Unit Number 03: AIR DEP. AREA 2 (Off-Site)
Middleport, Niagara County
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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal or release of hazardous wastes at this site, as more fully described in this document, has contaminated various environmental media. The remedy is intended to attain the remedial action objectives identified for the proposed remedy. This document describes the remedy selection process and provides a summary of the information that can be found in the site-related reports and documents.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment. The New York State Hazardous Waste Management Program (also known as the Resource Conservation and Recovery Act, or RCRA) requires corrective action for releases of hazardous waste and hazardous constituents to the environment. This facility is subject to both programs, and this proposed remedy is consistent with the remedial requirements of both programs.

The purpose of this Draft Statement of Basis (DSOB) is to provide background information related to the site contamination and investigation, to present the remedy proposed by the Department to address environmental contamination at the FMC Corporation facility (FMC Facility) for Operable Unit 03: Air Deposition Area 2 (Off-Site), and to present the basis for its selection. This document provides the opportunity for the public to be informed of and to participate in the development of the remedial program for the facility. Public input on all potential remedial alternatives, and on the information that supports the alternatives, is an important contribution to the corrective measure selection process.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all DSOBs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents. Hard copies of this draft Statement of Basis, Fact Sheets, and other pertinent documents are available for inspection at the following locations:

Department of Environmental Conservation
Region 9 Office
Division of Environmental Remediation
270 Michigan Avenue

Buffalo, NY 14203-2999
Contact Person: Joshua Vaccaro
Telephone: (716) 851-7070

Department of Environmental Conservation
Central Office
625 Broadway
Albany, NY 12233-7013
Contact Person: Nathan Freeman
Telephone: (518)402-9767

Middleport Village Library
9 Vernon Street
Middleport, New York 14105

Electronic copies of the Department draft Statement of Basis, Fact Sheets, and other pertinent documents are available through the Department's Public Web Site at <http://www.dec.ny.gov/chemical/54220.html>.

Access project documents through the DECinfo Locator <https://www.dec.ny.gov/data/DecDocs/932014/> and at these location(s):

A public comment period has been set from:

September 30, 2020 to November 16, 2020

To limit the community spread of COVID-19, Governor Cuomo issued Executive Order 202.15 suspending in-person public meetings relating to proposed site remedies. The NYSDEC remains committed to providing the public with ample opportunity to provide input on proposed remedies in their community.

Written comments may also be sent to:

Nathan Freeman
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
nathan.freeman@dec.ny.gov

The Department may modify the proposed remedy or select another of the alternatives presented in this DSOB based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Statement of Basis (SOB). The SOB is the Department's

final selection of the remedy for this site.

Receive Site Citizen Participation Information By Email

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

SECTION 3: FACILITY BACKGROUND

LOCATION: The FMC Facility (FMC Site) is located at 100 Niagara Street in the village of Middleport, Town of Royalton, Niagara County New York. Operable Unit 3, the subject of this document, is located north of the FMC Facility in the Village of Middleport and Town of Royalton, Niagara County and in the Town of Shelby, Orleans County. The location of the FMC Site and Operable Unit 3 is shown on Figure 1 – Site Location Map.

SITE FEATURES: The FMC Site encompasses approximately 102 acres. The southern portion of the FMC site (approximately 39 acres) consists of maintained grassy fields, parking lots, roads, a maintenance building, and an office building. The northern portion of the FMC site is covered with a clay/asphalt cap (North Site Cover), buildings, a large surface impoundment and approximately 2,700 feet of railroad track and bedding. Operable Unit 3, also referred to as Air Deposition Area 2, includes multiple off-site areas including a portion of the Erie Barge Canal Towpath, the southern embankment of the Erie Barge Canal, open agricultural fields and wooded land north of the Erie Canal and east of the FMC facility.

CURRENT ZONING: The FMC Site is currently zoned industrial (F-1) and is surrounded by areas zoned as residential, agricultural, business, and light industrial. Operable Unit 3 is comprised of agricultural and residential zoned parcels.

PAST USES OF THE SITE: Prior to its use as a manufacturing facility, the FMC property and adjacent areas were used for agricultural purposes with the exception the North Railroad Property. The North Railroad Property is traversed by the mainline railroad tracks, which were constructed in the early to mid-1800s and has since been used for the operation of the railroad tracks.

Manufacturing operations began at the FMC Facility in 1904 with the Niagara Sprayer Company. Activities at the site included spraying machine and pesticide manufacturing, formulation and packaging, and research and development. In 1943 FMC (known then as Food Machinery Corporation) purchased Niagara Sprayer Company including the Middleport Facility. The FMC site was used for the manufacturing of chemicals that are used as pesticides and herbicides from the early 1920s to 1985. FMC ceased pesticide manufacturing operations at the Middleport Facility in 1985 and since then the

site has been used for the formulation (mixing and blending) and packaging of crop protection products including Furadan (carbofuran), Talstar (bifenthrin) and Command (clomazone). During its manufacturing period, the plant disposed of hazardous and non-hazardous wastes in an on-site landfill and a number of surface impoundments.

On-site investigations began in 1973 with an extensive soil boring program which confirmed the presence of buried wastes and elevated arsenic in soil over much of the plant property. Further investigations performed in the 1980s identified several hazardous constituents in on-site soil, surface water and groundwater, as well as releases to off-site areas via past production discharges, contaminated surface water run-off and air emissions.

OPERABLE UNITS: The site has been divided into 11 Operable Units (OUs) to facilitate environmental investigations and remediation. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination:

- OU1: On-site – FMC facility including areas of buried waste and impacted soil and the northern railroad property. This OU does not include the eastern parcel of the plant (OU11) or groundwater contamination (OU10);
- OU2: Off-site – Air Deposition Area #1 (south of Erie Canal and west of Niagara/Orleans County Line) where soil has been impacted by past air emissions (primarily arsenic);
- OU3: Off-site – Air Deposition Area #2 (north of Air Deposition Area #1 and east of Niagara/Orleans County Line) where soil has been impacted by past air emissions (primarily arsenic);
- OU4: Off-site – The Royalton-Hartland High School and Middle School property;
- OU5: Off-site – Culvert 105 storm sewer pipe/ditch and flood zone where surface sediment/soil and sub-surface soil has been impacted by past surface water releases;
- OU6: Off-site – Tributary One South of Pearson Road where stream sediment and flood zone soil areas have been impacted by past production discharges;
- OU7: Off-site – Tributary One North of Pearson Road where stream sediment and flood zone soil areas have been impacted by upstream migration of past production discharges;
- OU8: Off-site – Jeddo & Johnson Creeks where stream sediment and flood zone soil areas have been impacted by upstream migration of past production discharges;
- OU9: On-site – Southwest Commercial Property (Former On-site FMC R&D Facility) where soil has been impacted by past air emissions and waste storage operations;
- OU10: On- and off-site groundwater contamination; and
- OU11: On-site – Eastern Plant Parcel (Tax Block and Lot 86.00-3-9).

This document addresses OU3 – Air Deposition Area #2, which includes the Erie Barge Canal Towpath, the southern embankment of the Erie Barge Canal, open agricultural fields and wooded land north of the Erie Canal and east of the FMC facility.

FMC has completed the following Interim Remedial Measures (IRMs) at the site:

1987-1988 North Railroad Property

1996 Roy-Hart School Bleacher IRM (OU4)

1999 Roy-Hart Soil Removal IRM (OU4)

2003 West Properties IRM (OU2)

2007 P-Block Properties IRM (OU2)

2007 Wooded Parcel IRM (OU2)

2007 Culvert 105 Area IRM (OU5)

2011 Culvert 105 Properties AD1 and AE1 Partial IRM (OU5)

A Statement of Basis was issued previously for OUs 2, 4, and 5. A Statement of Basis will be issued for OUs 1, 6, 7, 8, 9, 10 and 11, in the future.

A site location map is attached as Figure 1.

SITE GEOLOGY AND HYDROGEOLOGY: The Middleport area lies north of the Niagara Escarpment which is the dominant landform of the area. The elevation of the top of the escarpment is approximately 600 feet above mean sea level (AMSL) and the face slopes gently to the north to an elevation of approximately 500 feet AMSL at the Village of Middleport.

The soil and unconsolidated overburden material overlying the bedrock in the vicinity of the FMC Facility ranges in thickness from about 4 feet to a depth of over 16 feet. The overburden mainly consists of glacial deposits that in areas have been reworked or may contain fill materials. The glacial deposits consist of end moraine (deposits at the edge of a melting ice sheet) materials along a narrow band north of Middleport and ground moraine deposits that cover most of the area. The end moraine material consists of silty-clay to sandy-silt and is moderately to abundantly stony. The ground moraine deposit (lodgment till) consists of reddish-brown, silty-clay with some sand, cobbles, and boulders. This lodgment till is very dense and overlays the top of bedrock as a discontinuous sheet. The bedrock geology beneath the area is composed of alternating units of shale, sandstone, and limestone rock that dip toward the southeast.

The overburden materials are relatively impermeable due to their high clay content, limiting horizontal groundwater flow in the overburden. Horizontal groundwater flow to wells does not yield appreciable quantities of water, although groundwater will slowly leak to the underlying bedrock. The depth to overburden groundwater is approximately 2.3 feet below ground surface (bgs) north of the FMC Facility

and between 1-6 feet bgs at the FMC Facility. The Erie Canal may have a local effect on the groundwater system by contributing water to the overburden.

Groundwater flow in the shallow bedrock unit occurs primarily at the top of the bedrock surface where glacial action has increased fracture density. The permeability of the shallow bedrock varies depending on the type of rock and fracture density.

SECTION 4: ENFORCEMENT STATUS

In 1990, NYSDEC issued a Consent Order requiring FMC to conduct an off-site Remedial Investigation/Feasibility Study (RI/FS). The findings of this off-site RI/FS were presented by FMC in a 1991 report which was revised and resubmitted by FMC in August 1993. The revised RI/FS was reviewed by NYSDEC but was never approved.

In 1991, FMC signed a Consent Order jointly administered by the USEPA and NYSDEC under the Resource Conservation & Recovery Act (RCRA). This Order required FMC to conduct a comprehensive on-site and off-site RCRA Facility Investigation (RFI) and, if determined necessary, a Corrective Measures Study (CMS). The Order also requires FMC to perform Interim Corrective Measures (ICMs) if deemed necessary by USEPA and NYSDEC.

In 2019, FMC entered into an Order with the NYSDEC which incorporates both on-site and off-site work. The 2019 Administrative Settlement and Order on Consent (Index No. CO 9-20140625-40), effective June 6, 2019 (Order) supersedes the 1991 Order.

SECTION 5: SITE CONTAMINATION

5.1 Summary of the RCRA Facility Investigations

The RCRA Corrective Action process at the FMC Facility began in 1988 with an initial RCRA Facility Assessment (RFA) conducted by the US EPA and NYSDEC (Agencies) which determined that hazardous wastes and/or hazardous constituents had been released from the facility causing contamination of various environmental media (e.g., soil, groundwater, etc.). Based on the RFA, the Agencies required FMC to conduct a RCRA Facility Investigation (RFI) to determine the nature and extent (both on and off-site) of the releases from its Middleport facility. Due to the extent of the potentially impacted area, the RFI is being completed in a phased approach. To date the RFI has been completed for the following OUs: 2, 3, 4, 5, 6, 9 and 11. The remainder of the OUs are still under investigation.

Concurrent to the RFI activities, a study to determine background soil arsenic concentrations for the Middleport area was conducted. Based on the study it was determined that an arsenic level of 20 parts per million (ppm) was representative of the upper end of the local background arsenic soil concentration.

In 2012, FMC submitted the Final RFI Report for OU3 – Air Deposition Area 2 (Report Volume X) which summarized the analytical results from the soil sampling within Air Deposition Area 2 and

defined the nature and extent of contamination. The FMC RFI Report for OU3, which was accepted by the Department on May 9, 2013, is available for review and comment at the following link: <http://www.dec.ny.gov/chemical/54220.html>. The Department had anticipated release of the DSOB for OU3 previously. However, the priority was to implement the Final Remedy/cleanup selected in May 2013 for OU2, OU4 and OU5 (village and school properties).

The RFI has identified arsenic as the contaminant of concern (COCs). This constituent is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. The RFI Report contains a full discussion of the data. Based on the results, the Department determined that corrective measures were required to address some of the areas investigated. The nature and extent of contamination and environmental media requiring action are summarized in **Exhibit A**.

5.1.1: 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 RFI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: <http://www.dec.ny.gov/regulations/61794.html>. In addition to the aforementioned SCGs, the 2003 Development of Arsenic Background in Middleport Soils Report's arsenic level of 20 parts per million (ppm) as representative as the upper end of local background conditions for arsenic in soil.

5.2: Interim Corrective Measures

An interim corrective measure (ICM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Statement of Basis.

There were no IRMs performed for OU3 during the RFI.

5.3: 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 investigation analyzed samples for a full suite of parameters, including volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, pesticides and PCBs. Based on the findings the Department determined that soil was the media of concern within OU3 and the primary contaminant in the soil was arsenic. Arsenic was detected in the soil at concentrations up to 49.3 parts per million

(ppm), exceeding the residential use SCO of 16 ppm and the upper limit of local background of 20 ppm. Based on the results of the RFI, depths of contamination range from 0 to 12 inches bgs. Exhibit A provides additional details on the extent of contamination.

5.4 Exposure Assessment

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

People can come into contact with contaminants in soil by walking on the soil, digging or otherwise disturbing the soil.

5.5 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:

Remediation Objective	Remedial Action
Soil	
<u>Public Health</u> - Prevent ingestion and/or direct contact with contaminated soil. - Prevent the inhalation of, or exposure from contaminants in soil.	Remove soil with elevated arsenic concentrations with off-site disposal in a secure landfill. Replace with clean backfill
<u>Environment</u> - 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.	

SECTION 6: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 5.5.

Potential remedial alternatives for this operable unit were identified, screened and evaluated in the FMC OU3 Corrective Measure Study (CMS) report. However, based on the Department's evaluation of the RFI and the remedial alternatives set forth in the CMS Report, the Department is proposing a remedy that is different than any of the alternatives identified in the CMS. For the purposes of this document, the remedy will be identified as Alternative 3 (Exhibit B). A detailed description and evaluation of the Department's proposed remedy can be found in Exhibit B.

PROPOSED REMEDY

The proposed remedy is referred to as Soil Excavation to 20 ppm Arsenic.

The estimated present worth cost to implement the remedy is \$14,450,000.

The elements of the proposed remedy are as follows:

1. **Remedial Design** - A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:
 - Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
 - Reducing direct and indirect greenhouse gases and other emissions;
 - Increasing energy efficiency and minimizing use of non-renewable energy;
 - Conserving and efficiently managing resources and materials;
 - Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
 - Maximizing habitat value and creating habitat when possible;
 - Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
 - Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
2. **Excavation** – Excavation and off-site disposal of all soils in OU3 which exceed the site-specific soil

cleanup objective of 20 ppm for arsenic based on the local background study. The Department will employ some flexibility in achievement of the 20 ppm cleanup objective pursuant to the criteria in DER-10, the Department's Technical Guidance for Site Investigation. In addition, consideration will also be applied to accommodate property owner concerns related to preservation of their property with respect to specific features such as mature trees, sheds, decorative plantings, or other features of significance to the property owner where possible. Approximately 57,000 cubic yards of contaminated soil will be removed from OU3.

3. Backfill – Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the previous grades in OU3.
4. Where appropriate and, if approved by the Department, in non-residential areas and residential areas larger than 5 acres, excavation may be supplemented with or replaced by in-place soil tilling/blending. Such activities will require additional pilot study(s) under a Department approved work plan demonstrating that in-place soil tilling/blending will achieve the remedial objective.
5. Properties will be restored by seeding (non-residential properties and residential properties greater than 2.5 acres) or placement of sod (residential property less than 2.5 acres). Trees will be replaced at the discretion of the property owner.
6. If soils exceeding the site-specific cleanup objective remain a Site Management Plan will be required, which includes the following:
 - an Excavation Plan which details the provision for manage of future excavations in areas of remaining contamination;
 - an Annual Notification Plan which details the annual notification to property owners where remediation did not occur (including those not previously sampled) or which were determined not to have fully achieved the remedial goal to achieve a no further action letter. The notification plan will require the remedial party to offer the owner(s) of such property the opportunity to have remedial action conducted on their property consistent with the remedy. Such remedial action would be performed by the remedial party. The Notification Plan should be consistent with the 2019 Administrative Order on Consent; and
 - Monitoring of soil to assess the performance and effectiveness of the remedy.
7. Unless implementation of the remedy for OU3 is completed within 60 months of the date of issuance of the final Statement of Basis, FMC shall post financial assurance using one or more of the financial instruments in 6 NYCRR 373-2.8 in the amount of the cost projection for the remainder of the remedy selected in the final Statement of Basis. Financial assurance must include all remedial activities for the site that have not been implemented.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Facilities Investigation (RFI) for all environmental media that were evaluated. As described in Section 5.3, samples were collected from soil 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. 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.

Soil

A summary of findings from the investigations for OU3, including contaminants and areas identified for a corrective measures study, are described below:

- the primary contaminant in the soil in OU3 is arsenic;
- concentrations of arsenic in soil indicate an anthropogenic (human-made) source; and
- arsenical pesticides were manufactured and packaged at the FMC facility.

A total of 216 soil samples were collected from 54 locations on six properties within OU3. All of the properties sampled have arsenic levels of greater than 20 parts per million (ppm) in the soil, with a maximum concentration of 49.3 ppm. Figure 2 attached shows the distribution of arsenic contamination in OU3.

Concurrent with the RFI activities, a study to determine background soil arsenic concentrations for the Middleport area was conducted (2003 Report on the Development of Arsenic Background in Middleport Soils (CRA 2003)). In this study 103 soil samples were collected and analyzed for arsenic from wooded areas, agricultural fields, commercial/industrial properties, residential properties, and orchards in the Gasport area, which is not considered affected by FMC Plant releases. The sample results were weighted to approximate the historic land uses in Middleport (i.e., since 33% of Middleport was historically residential, residential arsenic data was weighted at 33%). The value of 20 ppm represents the weighted 95th percentile of the entire background data set, which means that 95% of the weighted data falls at or below 20 ppm. It also happens to be the 95th percentile (un-weighted) of the residential portion of the background data set (i.e., 95% of the residential data falls at or below 20 ppm). The 20 ppm arsenic level was selected in 2003 as an appropriate upper limit of the estimated range of soil arsenic background in Middleport as appropriately weighted to reflect historic land uses. Therefore, the arsenic background concentration of 20 ppm is the site-specific cleanup objective for arsenic.

Table 2 – OU3 Soil Concentrations

Detected Constituents	Concentration Range Detected (ppm) ^a	Unrestricted SCG ^b (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG ^c (ppm)	Frequency Exceeding Restricted SCG	Site Specific Cleanup Objective	Frequency Exceeding Site Specific Cleanup Objective
Inorganics							
Arsenic	2.1 to 49.3	13	135 of 216	16	52 of 216	20	50 of 216

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

Based on the findings of the Remedial Investigation, the presence of arsenic has resulted in the contamination of soil. The site contaminant identified in soil which is considered to be the primary contaminant of concern, to be addressed by the remedy selection process is, arsenic.

Exhibit B

Description of Remedial Alternatives

In 2015 FMC submitted the draft Corrective Measures Study (CMS) Report to the Agencies. As part of the 2019 FMC Order on Consent, the CMS has been accepted for technical completeness. In evaluating the remedial alternatives set forth in the CMS Report, the Department is proposing an additional remedial alternative. For the purposes of this document, the Department's remedial alternative is identified as Alternative 3. 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 (CMA Alternative A): No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative 2 (CMA Alternative B): Land Use Based Alternative

The Land Use Based Alternative will excavate arsenic contaminated soil from each property to achieve a post-remediation average arsenic soil concentration and a maximum arsenic soil concentration for each property based on land use as shown in Table 1. Based on the criteria listed below, the properties within OU3 do not exceed the average and maximum concentrations for residential. This alternative relies on averaging to determine if certain remedial goals have been achieved, and is not consistent with Department guidance for remedy selection.

Table 1: Alternative 2 Remedial Goals

Land Use	Average Concentration	Maximum Concentration
Residential	20 ppm	40 ppm
Public and Institutional (excluding non-ICM Roy Hart school property)	30 ppm	60 ppm
Agricultural, Commercial	40 ppm	80 ppm
Industrial, Railroad, Utility	40 ppm	80 ppm

Present Worth:\$0

Capital Cost:\$0

Annual Costs:\$0

Alternative 3: Excavation to 20 ppm Arsenic

This alternative achieves all of the SCGs discussed in Section 5.1.1 and Exhibit A and soil meets the site specific cleanup goal of 20 ppm for arsenic in soil. This alternative would include: excavation and off-site

disposal of all soils in OU3 which exceed the site-specific arsenic soil cleanup objective of 20 ppm based on the upper limit of background for this area. The alternative also includes the provision to allow the Department, on a case-specific basis, to supplement or replace excavation with in-place soil tilling/blending for residential and non-residential properties greater than 5 acres . Prior to approving supplementation or replacement with soil tilling/blending, a Department-approved pilot test demonstrating the ability to achieve the required remedial goals would be required. Approximately 57,000 cubic yards of contaminated soil will be removed from the site.

Present Worth:\$14,450,000
Capital Cost:\$14,450,000
Annual Costs:\$50,000

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost (\$)	Annual Costs (\$)	Total Present Worth (\$)
Alternative 1 – No Action	0	0	0
Alternative 2 – Land Use Based	0	0	0
Alternative 3 – Excavation Unrestricted Use	\$14,450,000	\$50,000	\$14,450,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 3 Excavation for Unrestricted Use as the remedy for this site. Alternative 3 would achieve the remediation goals for the site by achieving arsenic levels in soil that are less than 20 ppm. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 3

Basis for Selection

A summary of the remedial alternatives that were considered for this site is presented above. 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.

In proposing this remedy, the Department has identified several issues that were not adequately addressed by any alternative presented in the Draft CMS Report. Accordingly, the Department has elected to create a third alternative (Alternative 3) which is based on the upper level of background concentrations of arsenic in soil. This alternative requires a remedial goal for arsenic of 20 ppm in OU3, with flexibility to make decisions regarding the attainment of the remedial goal based on property-by-property data and information.

The proposed remedy is based on the results of the RFI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. The basis for the Department's proposed remedy is set forth below.

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.

Arsenic is a known human carcinogen. There is strong evidence of arsenic carcinogenicity and of noncarcinogenic health effects based on large scale epidemiological studies. The Department therefore has an obligation to minimize, to the extent practical, both current and potential future human exposure to elevated levels of arsenic in soil when selecting an arsenic remedial goal.

The Department's findings relative to the protection of human health are based on the NYSDOH's review and evaluation of the arsenic human health risk assessments which are provided in the Draft CMS Report. Based on this review/evaluation, the Department and NYSDOH find that the CMS risk assessments do not appropriately assess potential exposure to arsenic and the associated cancer and noncancer human health risks. As a result, the Department and NYSDOH consider that FMC's assessments may substantially underestimate the potential human health risks associated with arsenic exposure, and therefore do not serve as an appropriate basis upon which to make risk management and remedial decisions.

Risk evaluations prepared by the NYSDOH during the development of the State's Soil Cleanup Objectives have determined that the arsenic soil concentration associated with a 10^{-6} (one in one million) cancer risk level is less than 1.0 ppm. The Department and NYSDOH consider this risk evaluation to be applicable and appropriate to the Middleport community. Since typical background levels of arsenic in soil almost always exceed 1.0 ppm, arsenic remedial goals are routinely evaluated in terms of background concentrations, including this site.

The proposed Alternative 3 would most effectively protect human health by removing the potential for exposure to soils with arsenic concentrations above the upper limit of local background. Alternatives 1 and 2 would not effectively protect human health or the environment as neither option would require the removal of any soils.

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.

New York State's regulations governing Inactive Hazardous Waste Disposal Sites (6 NYCRR Part 375) and the Soil Cleanup Objectives (SCOs) contained within those regulations (6 NYCRR Part 375-6 and CP-51) are relevant and appropriate regulations to consider in evaluating CMAs and associated remedial goals. These regulations set forth an arsenic SCO of 13 ppm for ecological resources and 16 ppm for all other land uses, which represents the upper limits of state-wide background levels established from sampling data. These regulations allow for the use of site-specific SCOs based on local background data where appropriate.

The proposed Alternative 3 complies with SCGs to the extent practicable. It would result in the removal and proper disposal of soil that exceeds the site-specific soil cleanup objective. Alternatives 1 and 2 would not comply with the soil cleanup objectives and hence do not comply with the necessary SCGs.

In determining whether an SCO has been achieved through sampling NYSDEC guidance states that: "the use of averages, means, or other statistical techniques are generally not allowed" (See DER-10 "Technical Guidance for Site Investigation and Remediation" at www.dec.ny.gov/regulations/67386.html). Since Alternative 2 relies on averaging to determine if certain of their remedial goals have been achieved, it does not conform to this guidance.

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.

Long-term effectiveness is directly related to the quantity of contamination remaining in the operable unit after remediation. The alternative which best achieves arsenic background soil concentrations will also be

the alternative that reduces long-term arsenic exposure to the greatest extent practicable. In the case of the Middleport community local arsenic background is near/below 20 ppm.

Alternative 3, which calls for removal of arsenic contaminated soil above a concentration of 20 ppm at all locations and depths, is the best way to achieve pre-release, background arsenic concentrations. Alternative 3 would result in less restrictive arsenic remedial goals and would minimize long-term arsenic exposures and their associated potential human health risks.

Alternative 3 would result in the permanent removal of the contamination from the site and would not require long-term institutional controls to limit the risk. Alternative 3 is the most effective in the long-term and permanent remedy of the three alternatives. Alternatives 1 and 2 are not effective nor permanent, as contamination would remain in place. Also, neither Alternative 1 nor Alternative 2 require institutional or engineering controls such as deed restrictions or soil covers, respectively, which would reduce likelihood of exposure of contaminated soils that remain in place.

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 3 would provide the greatest reduction in volume and mobility of contamination in the operable unit of the alternatives under consideration. Although the proposed remedy employs some degree of flexibility with respect to the 20 ppm arsenic remedial goal, approximately 57,000 cubic yards of soil would be excavated and replaced with clean fill. The other alternatives evaluated by FMC, Alternative 1 and Alternative 2, would not reduce toxicity, would not reduce mobility, nor would they reduce volume. Alternative 1 and Alternative 2 are the less desirable options in relation to this criterion.

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.

Excavation activities have the potential to produce some short-term arsenic exposures for construction workers and community residents. Hence, Alternative 3 does have short-term impacts that are associated with excavation. These impacts could include dust creation and worker exposure to contaminated soils. Also, with construction there is always a risk of accidents and injury. However, the proposed remedy includes features designed to mitigate these short-term exposures. It requires the development and implementation of both general and property-specific health and safety plans (HASPs) and engineering controls which are intended to prevent/mitigate exposures for construction workers and the surrounding community. It also requires the use of dust suppression techniques (e.g., wetting the soil) and the implementation of a community air monitoring plan (CAMP) which are designed to work in concert with one another to prevent/mitigate inhalation exposures. With implementation of these mitigation measures it is anticipated that the potential for short-term human exposure to arsenic contaminated soil during excavation activities would be minimal.

Alternatives 1 and 2 would not create any short-term impacts as those alternatives require no remediation to take place.

Alternative 3 would also take the more time to implement, as Alternative 1 and Alternative 2 would require no time as no cleanup would be done. It is estimated that approximately 48 months would be required to implement the design and excavation and restoration of OU3.

Although Alternative 3 is less favorable compared to Alternative 1 and Alternative 2 when using these specific criteria for comparison, the duration of the intrusive work, contemplated by Alternative 3, will generally be limited.

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.

All three alternatives are readily implementable. Alternative 1 and Alternative 2 do not require any remediation.

Excavation and disposal (Alternative 3) are common approaches to addressing metals contamination in soil. Contaminated soil may be excavated and disposed off-site in a permitted waste landfill or hazardous waste landfill based on the contamination levels and the results of toxic characteristic leaching procedure (TCLP) tests. This remedy is technically feasible to implement and may not require institutional and engineering controls if all contaminated material is excavated and disposed off-site.

Alternative 3 would require obtaining site access from the affected property owners.

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

The cost criterion requires each alternative to be evaluated with respect to the capital, engineering, and any long-term costs (e.g., inspection, monitoring, and maintenance). The capital cost consist of two components: 1) direct cost expenditures for construction equipment, labor, and materials to perform the remedial construction; and 2) indirect cost expenditures for engineering, financial, and other services that are not part of the actual construction but required to implement the corrective measure.

The costs of the alternatives vary significantly. See Exhibit 3 for a detailed listing of the various costs. The cost of the proposed remedy Alternative 3 would be approximately \$14,450,000. The cost to implement Alternative 1 and Alternative 2, which requires no cleanup, would be zero. Alternative 3 is the most expensive remedial alternative but this must be weighed against the other criteria including protection of human health and the environment, and adherence to applicable standards, criteria, and guidance. Other alternatives would cost less but would not be as protective to public health and the environment nor would they comply with applicable laws and standards.

In summary although the proposed remedy is more costly than Alternative 1 and Alternative 2 the cost is not the overriding criteria which should prohibit the selection of a remedy necessary for the protection of human health and the environment.

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.

Based on the Department's evaluation of current zoning and FMC's projected future zoning, proposed remedy, Alternative 3, is consistent with current and reasonably anticipated future land uses within OU3. Alternative 3 does not restrict current land usages and accommodates a variety of anticipated future land uses including residential development on all properties.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the draft Statement of Basis are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Summary of CMA Evaluations

A review of the Department's alternative evaluation with respect to the nine criteria indicates that the proposed remedial Alternative 3 is the most favorable in terms of environmental and human health protection criteria and compliance with applicable standards and criteria. It is more favorable or equal to the other alternatives in terms of the long-term effectiveness, reduction of toxicity, mobility, and volume, implementability, and land-use and less favorable to the other alternatives in terms of the cost. While the proposed remedy may not be viewed favorably against each and every criterion the Department considers it to be the most favorable overall.

PROPOSED REMEDY

The proposed remedy is referred to as Soil Excavation to 20 ppm Arsenic.

The estimated present worth cost to implement the remedy is \$14,450,000. The cost to construct the remedy is estimated to be \$2,350,000 and the estimated average annual cost is \$50,000.

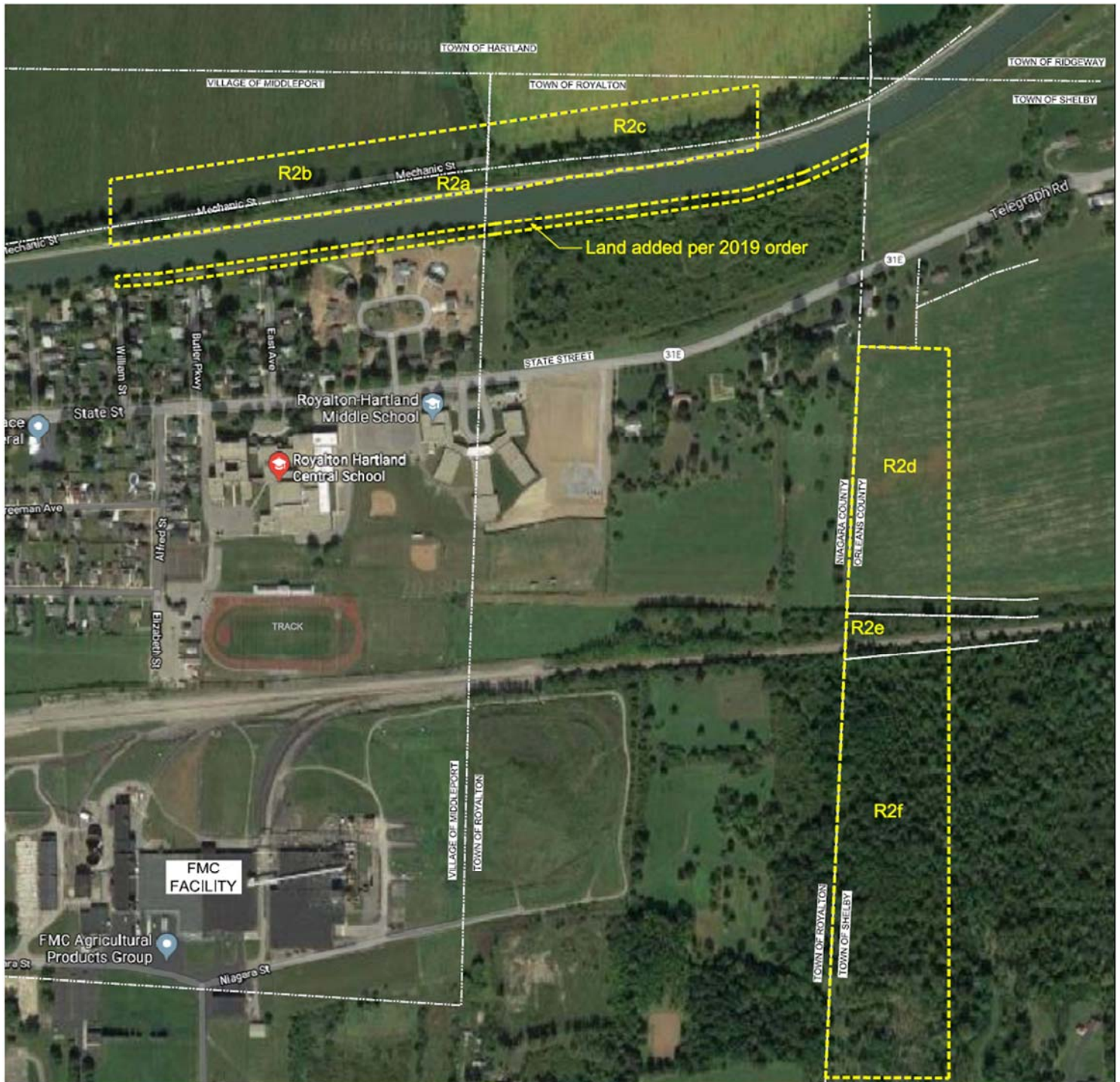
The elements of the proposed remedy are as follows:

1. **Remedial Design** - A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:
 - Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
 - Reducing direct and indirect greenhouse gases and other emissions;
 - Increasing energy efficiency and minimizing use of non-renewable energy;
 - Conserving and efficiently managing resources and materials;
 - Reducing waste, increasing recycling and increasing reuse of materials which would

otherwise be considered a waste;

- Maximizing habitat value and creating habitat when possible;
 - Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
 - Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
2. Excavation – Excavation and off-site disposal of all soils in OU3 which exceed the site-specific soil cleanup objective of 20 ppm for arsenic based on the local background study. The Department will employ some flexibility in achievement of the 20 ppm cleanup objective pursuant to the criteria in DER-10, the Department’s Technical Guidance for Site Investigation. In addition, consideration will also be applied to accommodate property owner concerns related to preservation of their property with respect to specific features such as mature trees, sheds, decorative plantings, or other features of significance to the property owner where possible. Approximately 57,000 cubic yards of contaminated soil will be removed from OU3.
 3. Backfill – Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the previous grades in OU3.
 4. Where appropriate and, if approved by the Department, in non-residential areas and residential areas larger than 5 acres, excavation may be supplemented with or replaced by in-place soil tilling/blending. Such activities will require additional pilot study(s) under a Department approved work plan demonstrating that in-place soil tilling/blending will achieve the remedial objective.
 5. Properties will be restored by seeding (non-residential properties) or placement of sod (residential property less than 2.5 acres). Trees will be replaced at the discretion of the property owner.
 6. If soils exceeding the site-specific cleanup objective remain a Site Management Plan will be required, which includes the following:
 - an Excavation Plan which details the provision for manage of future excavations in areas of remaining contamination;
 - an Annual Notification Plan which details the annual notification to property owners where remediation did not occur (including those not previously sampled) or which were determined not to have fully achieved the remedial goal to achieve a no further action letter. The notification plan will require the remedial party to offer the owner(s) of such property the opportunity to have remedial action conducted on their property consistent with the remedy. Such remedial action would be performed by the remedial party. The Notification Plan should be consistent with the 2019 Administrative Order on Consent; and
 - Monitoring of soil to assess the performance and effectiveness of the remedy.
 7. Unless implementation of the remedy for OU3 is completed within 60 months of the date of issuance of the final Statement of Basis, FMC shall post financial assurance using one or more of the financial instruments in 6 NYCRR 373-2.8 in the amount of the cost projection for the remainder of the remedy selected in the final Statement of Basis. Financial assurance must include all remedial activities for the site that have not been implemented.

FMC – OU3

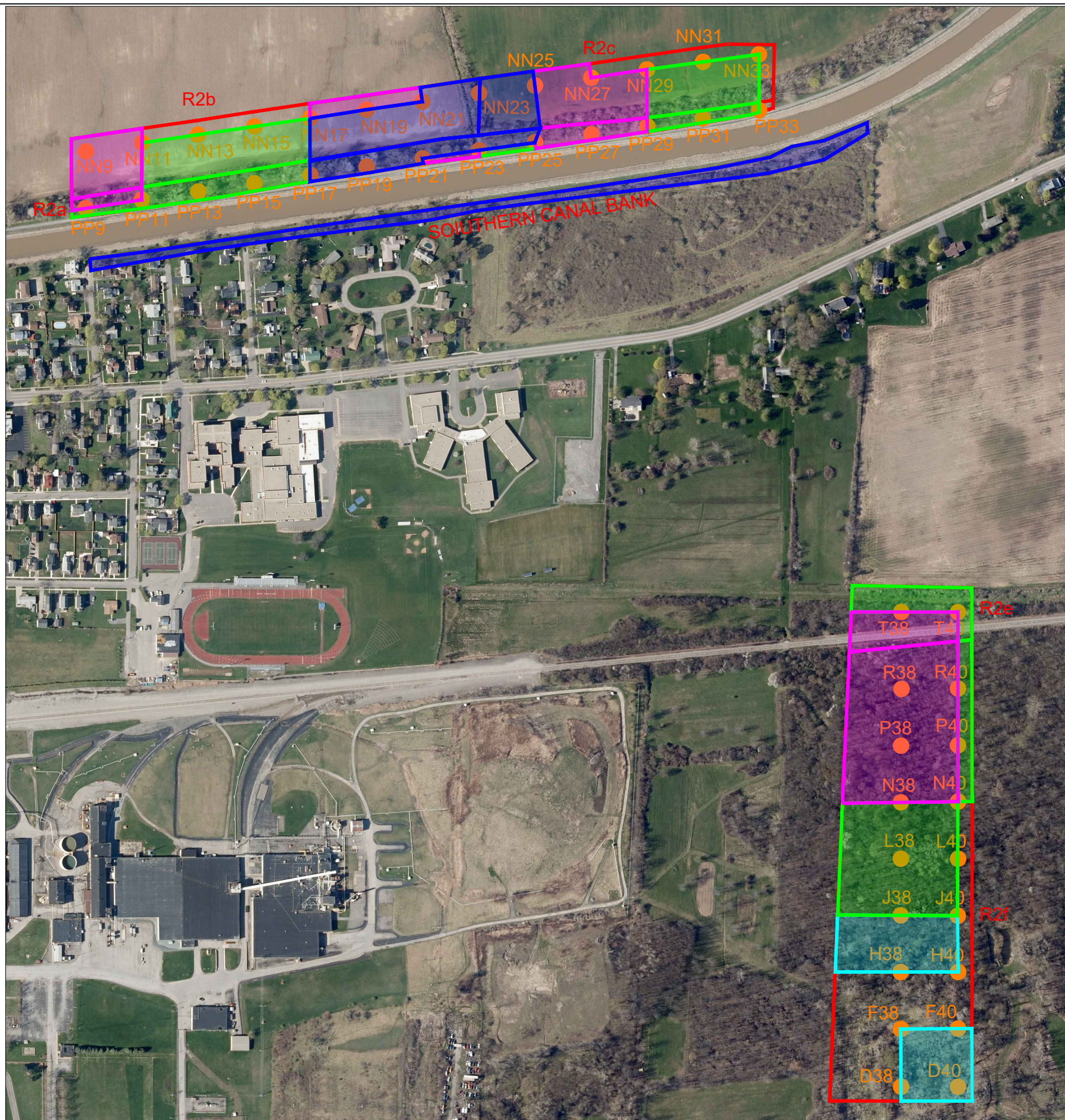


LEGEND

-  ESTIMATED REMEDIATION AREA BOUNDARIES
-  PROPERTY/DIVIDER LINES

FIGURE 1
REMEDATION AREA BOUNDARIES
AIR DEPOSITION STUDY AREA
(OPERABLE UNIT 3)
MIDDLEPORT, NEW YORK





LEGEND

- PP33 ● HISTORIC SOIL BORING LOCATION
- R2e □ PROPERTY WITH IDENTIFIER
- 6 INCH EXCAVATION AREA
- 9 INCH EXCAVATION AREA
- 12 INCH EXCAVATION AREA
- 15 INCH EXCAVATION AREA

NOTES

1. AERIAL PHOTOGRAPHY SHOWN IS FROM NIAGARA COUNTY (2017).
2. HISTORIC SOIL BORING LOCATIONS SHOWN ARE APPROXIMATED FROM FIGURE 2 – SOIL SAMPLING LOCATIONS AND ARSENIC CONCENTRATIONS FROM ARCADIS (7-7-2015).
3. EXTENT OF WORK ZONES ARE BASED ON FIGURES AND DATA PROVIDED BY ARCADIS.



FIGURE 3 PROPOSED OU3 EXCAVATION AREAS
AIR DEPOSITION STUDY AREA (OPERABLE UNIT 3)
MIDDLEPORT, NEW YORK