

## **CAMU Application**

FMC Corporation

Middleport, New York

March 27, 2008



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Middleport, New York

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## Acronyms

AOC	Administrative Order on Consent
CAMU	Corrective Action Management Unit
CMS	Corrective Measure Study
CRA	Conestoga-Rovers & Associates
DDD	dichlorodiphenyldichloroethene
DDT	dichlorodiphenyltrichloroethane
ESI	Eastern Surface Impoundment
ETU	Ethylene thiourea
FMC	FMC Corporation
GIPL	Groundwater Indicator Parameter List
GMP	Groundwater Monitoring Program
HDPE	high density polyethylene
ICM	Interim Corrective Measure
IRM	Interim Remedial Measure
L/kg	liter per kilogram
MCIG	Middleport Community Input Group
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NYSDEC	New York State Department of Environmental Conservation
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
Roy-Hart	Royalton-Hartland Central School
SPDES	State Pollutant Discharge Elimination System
SWMU	Solid Waste Management Units



TCLP	Toxicity Characteristic Leaching Procedure (USEPA)
USEPA	United States Environmental Protection Agency
WSI	Western Surface Impoundment



## 1. Introduction

This application has been prepared to request approval from the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (USEPA) (collectively "the Agencies") on the designation of a Corrective Action Management Unit (CAMU) at FMC Corporation's (FMC's) pesticide formulation plant site located at 100 Niagara Street in Middleport, New York ("Facility" or "Site") (Figure 1). The proposed CAMU would be located on the eastern portion of the FMC Facility for the permanent management of contaminated soil and debris from past and future remedial actions performed by FMC under the Resource Conservation and Recovery Act (RCRA) Corrective Action program. This application provides information regarding the Facility and the proposed CAMU required by applicable state and federal regulations.

### 1.1 Overview

FMC owns and operates a pesticide formulation facility in Middleport, Niagara County, New York (refer to Figure 1 for the location of the FMC Facility). The Facility has been used for the manufacturing and/or formulation of agricultural products since the 1920s. FMC is implementing several related investigative, monitoring, and/or remedial programs under the terms and conditions of an Administrative Order on Consent (AOC), Docket No. II RCRA-90-3008(h)-0209, entered into by FMC, the NYSDEC, and the USEPA, and effective July 2, 1991 (USEPA, NYSDEC, and FMC, 1991). The work being performed under the AOC includes the following activities: 1) performance of a RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) in accordance with RCRA Corrective Action Program guidance; 2) continuation of the inactive status of the former Eastern Surface Impoundment (ESI) pending completion of the RFI/CMS process for the Facility and compliance with the applicable closure requirements for the ESI; 3) maintenance of the Western Surface Impoundment (WSI) as an Interim Corrective Measure (ICM); 4) continued routine groundwater monitoring and evaluation under the Facility's Groundwater Monitoring Program (GMP); 5) implementation of ICMs to control and remediate contaminated groundwater beneath the Facility; and 6) implementation of ICMs deemed necessary by the Agencies and/or early action remedial measures proposed by FMC and approved by the Agencies.

Since 1987, FMC has implemented several interim remedial measures (IRMs) and ICMs on-Site and off-Site. These measures have consisted of removing arsenic-containing soil and debris, and, with the approval of the Agencies, placing the excavated soil and debris within and adjacent to the ESI at the northeastern portion of

the Facility (collectively known as the “ESI Fill Area”). As part of FMC’s ongoing RCRA investigation and remedial programs being performed under the AOC, FMC needs the eastern portion of the Facility for the permanent management of remediation-related waste materials (e.g., soil, debris), including past remediation waste that was placed in the ESI Fill Area and also non-hazardous soil and debris excavated from on-Site and off-Site areas as part of future remedial activities. Accordingly, in late 2006, FMC initiated discussions with the Agencies concerning the designation of the eastern portion of the Facility, which includes the ESI Fill Area and an adjacent area to the south, as a CAMU under the applicable state and federal regulations. The proposed location of the CAMU at the Facility is shown on Figures 2 and 3.

State and federal regulations authorize the NYSDEC and/or USEPA to designate an area of a RCRA-regulated facility as a CAMU for the permanent management of remediation waste from RCRA-regulated environmental cleanups. A CAMU is defined as “an area within a facility that is used only for managing remediation wastes for implementing corrective action or cleanup at the facility” (6 NYCRR 370.2(b)(37) and 40 CFR 260.10). The CAMU at the Facility would be designed, constructed, and used in accordance with state and federal CAMU regulations (6 NYCRR 373-2.19(c) and 40 CFR 264.552, respectively).

This application has been prepared pursuant to the applicable CAMU regulations and includes:

- Background information including existing environmental conditions and remediation programs at the Facility
- Description of the proposed CAMU (including justification and usage)
- Bases for the proposed CAMU design
- Design details including CAMU geometry, stormwater management, and temporary cover plan
- Closure and Post-Closure Plan requirements, including the final cover plan

A checklist of regulatory requirements and the corresponding sections of this application that address each requirement are included as Appendix A.

## 1.2 Facility Description

FMC began manufacturing and formulating agricultural products at the Facility beginning in the 1920s, and ceased pesticide manufacturing operations at the Facility

in 1985. FMC has conducted only formulating and packaging of agricultural products at the Facility from the mid-1980s to the present. FMC currently employs approximately 54 people at this Facility.

The current Facility (based on property ownership in 2007) consists of approximately 102 acres of contiguous land. The western portion of the Site is situated within the corporate limits of the Village of Middleport and the eastern portion of the Site is situated within the Town of Royalton, outside of the Village limits (see Figure 3). The northern portion of the Facility is currently zoned industrial, the southwestern portion of the Facility is currently zoned light industrial, and the remaining [eastern] portion of the Facility is currently zoned for business usages (see Figure 3).

The Facility is bounded by residential properties to the west, agricultural lands to the east, an automobile junkyard to the southeast, a commercial business to the southwest, and a state highway (Route 31) to the south. A drive-in theater, a church, a park, commercial businesses, and residential properties are located south of Route 31. Properties that are adjacent to FMC's northern property boundary, north of the mainline railroad tracks, consist of a farm field, the Royalton-Hartland Central High School and Middle School, the southern right-of-way for Alfred Street (owned by the Village of Middleport), commercial/industrial properties, and a residential property.

The Facility's security fence currently encloses approximately 83 acres of land. All the pesticide formulating operations are situated within the security fence. Approximately 19 acres of FMC-owned land is situated outside of the Facility's security fence. Access to the Site is controlled by this security fence, signs, and locked entryways for vehicle and/or rail traffic to/from the Site.

The southern portion of the Facility contains an open, mowed field, with access roads that enter the facility from Route 31, and office buildings. The northern portion of the Facility currently contains several large buildings used for pesticide formulation and warehousing, a Water Treatment Plant and storage tanks, an active and lined non-hazardous stormwater retention basin (the WSI), and several railroad spurs. The ESI Fill Area is located at the northeastern portion of the Site. The areas discussed above are all located within FMC's security fence.

The location of the proposed CAMU is within the eastern portion of the Facility, and was selected in accordance with conceptual design objectives (discussed below in Section 4.2) and in consideration of a number of additional Site factors, including but not necessarily limited to the following:

- Locations and congestion of existing Facility features
- Available, constructible, contiguous land area
- Ease of access
- Ongoing industrial operations at the Facility
- Locations of existing Facility-based environmental and security controls
- Ability to control visibility

Further discussion on these considerations is presented in Section 4.3, below.

### 1.3 Geology and Hydrogeology

The native overburden soils at and around the Facility predominantly consist of silt and clay and range in thickness from 3.5 to 16.5 feet. Pockets of contaminated fill and waste materials are present down to bedrock within the northern and eastern portions of the Site.

The bedrock surface dips to the northwest. There are two bedrock groundwater flow regimes at the Site – shallow and deep bedrock. The shallow bedrock zone consists primarily of weathered and fractured limestone and sandstone above a shale layer. The deep bedrock zone consists of rock formations, predominantly sandstones, below this shale layer. This shale layer (known as Cambria Shale Formation) between the shallow and deep bedrock zone is of low hydraulic conductivity relative to the other bedrock materials.

Overburden and shallow bedrock groundwater beneath the Facility flows toward groundwater collection underdrains, blast-fractured trenches and extraction wells installed at the Site (see Figure 4). Separate from the influences of the groundwater extraction system, groundwater flow is generally from south to north.

Surface water runoff at the Facility is managed using a system of drainageways and retention structures. Figure 5 presents a Site watershed drainage map reflecting current conditions. As described in Section 1.4, runoff from certain areas of the Facility is collected and treated at the on-Site Water Treatment Plant.



## 1.4 Existing Site Remedial Systems

As a result of historic manufacturing operations and material and waste handling practices at the Facility, the soil and groundwater beneath the northern and eastern portions of Facility have been contaminated. The 1999 Draft RCRA Facility Investigation Report (Conestoga Rovers & Associates 1999) describes the nature and extent of the impacted media at the Facility. As noted in the 1999 Draft RFI Report, 54 Solid Waste Management Units (SWMUs) were identified at the Facility and evaluated as part of the RFI. Impacted soil, groundwater and surface water have been and continue to be addressed as part of several ICMs being performed under the AOC. The remedial systems currently in place at the Facility consist of engineered systems, contaminated surface water and groundwater collection systems, and the Water Treatment Plant.

Most of the northern portion of the Facility is covered with a clay and/or asphalt cap (called the "North Site Cover") constructed in 1987-1988. In addition, the northern portion of the Facility contains a network of overburden underdrains, sumps, piping, and swales that collect contaminated groundwater and/or stormwater for treatment at the Facility's Water Treatment Plant. The North Site Cover and underdrain systems were constructed to prevent or minimize the off-Site migration of Site-related constituents from the Facility via surface water and air pathways and to facilitate closure of three RCRA-regulated surface water impoundments (the Western, Central, and Eastern Surface Impoundments) at the Facility. FMC initiated the first phase of closure (pursuant to the applicable RCRA regulations) for the WSI in September 1988, and currently operates the WSI as a non-hazardous stormwater retention basin as an ICM under the AOC. In April 1989, FMC completed closure of the Central Surface Impoundment under the applicable RCRA regulations. The ESI was taken out of service in 1988 as a RCRA-regulated surface water impoundment and is awaiting final closure as part of the RCRA Corrective Action program for the Facility. The North Site Cover and underdrain systems are maintained by FMC in accordance with the procedures presented in the North Site Cover Operations and Maintenance Program Manual (Conestoga Rovers & Associates 1989).

In 2005, FMC installed an engineered cover system over FMC-owned land (North Railroad Property) along the mainline railroad tracks as part of the Phase 1 ICM for the North Railroad Property. The western portion of the North Railroad Property has an interim vegetated soil cover that is anticipated to be covered with an engineered cover system as part of the Phase 2 ICM for the North Railroad Property in 2008. Locations of these areas are shown on Figure 3.

Stormwater runoff from the northern portion of the Facility (south of the mainline railroad tracks, with the exception of the western portion of the Phase 2 ICM area of the North Railroad Property) is directed into a series of grassy and/or asphalt-lined swales, or into collection sumps/drains and is collected in the WSI or untreated water storage tanks. The collected stormwater is treated at the Facility's Water Treatment Plant for discharge to surface water (Tributary One) in accordance with the Facility's State Pollutant Discharge Elimination System (SPDES) permit. Stormwater runoff from the southern portion of the Facility is directed into a series of grassy swales or buried pipelines and combines with the treated water effluent from the Water Treatment Plant.

The treated stormwater and groundwater and untreated stormwater from the southern portion of the Facility are discharged to Tributary One in accordance with the terms and conditions of the Facility's SPDES permit (NY No. 0000345).

In addition to the North Site Cover underdrain collection systems, bedrock groundwater collection and extraction systems have been constructed, operated, and monitored at the Facility for hydraulic containment and recovery of impacted groundwater beneath the Site since 1987. The groundwater remedial systems at the Facility, which include blast-fractured bedrock collection trenches and 14 groundwater extraction wells, are described further in Section 3.6. Contaminated groundwater from the groundwater extraction systems is treated at the Facility's Water Treatment Plant prior to discharge at the SPDES-permitted outfall. Based on the use of the Facility's groundwater collection/containment and treatment system, the NYSDEC prepared and transmitted an Environmental Indicator Determination (CA750) to the USEPA in May 2007 that migration of contaminated groundwater from the Facility is under control (see Appendix B).

## 2. Rationale and Description of Proposed CAMU

### 2.1 Rationale for a CAMU at the Facility

Designation of a CAMU at the Facility for the permanent management of remediation wastes would facilitate the comprehensive Corrective Action Program, including the remediation of off-Site areas consistent with the seven criteria specified in state and federal regulations **[6 NYCRR Part 373-2.19 (c)(3) and 40 CFR Part 264.552(c)]**. Each of the criteria is discussed below relative to the CAMU proposed for the Facility.

#### 2.1.1 Implementation of Reliable, Effective, Protective, and Cost-Effective Remedies; 6 NYCRR Part 373-2.19 (c)(3)(i) and 40 CFR Part 264.552(c)(1)

Remediation projects performed to date under the AOC have involved the removal of soils containing elevated levels of arsenic from non-FMC-owned properties and from some of the FMC property (e.g., North Railroad Property). The designation of a CAMU at the Facility would facilitate the continuation of this proven remedial approach in a way that is more timely and cost effective than off-Site disposal of contaminated soils in a commercial disposal facility due to the significant reduction in time associated with transportation of this material for off-Site disposal. Placement of remedial soils and debris in a CAMU sited at the Facility would also save valuable space at off-Site commercial facilities.

Using the proposed CAMU at the Facility for the permanent management of remediation wastes from RCRA corrective actions would:

- a) Allow for a faster and more flexible remediation schedule due to the proximity of the CAMU to the off-Site areas that may need to be remediated.
- b) Be less disruptive and more protective to the community due to decreased truck traffic on residential streets and other roadways.
- c) Allow remediation soil and debris already placed within the ESI Fill Area to remain and not be excavated and transported again.
- d) Be less costly than using a commercial landfill.
- e) Due to the proximity of the CAMU to the remediation areas, fuel consumption for the transportation of remediation wastes would be less than that required to transport materials to a commercial facility or facilities (nearest commercial facilities are approximately 30 to 40 miles from Middleport).

**2.1.2 Protective of Human Health and the Environment; NYCRR Part 373-2.19 (c)(3)(ii) and 40 CFR Part 264.552(c)(2)**

Management of remediation wastes in the proposed CAMU would be protective of human health and the environment. The CAMU is an engineered disposal unit that would be designed, constructed, and managed with controls in place to protect human health and the environment. The CAMU would be located within the Facility's security fence (the existing security fence would be extended as needed), and the remediation soils and debris placed atop the ground surface would be covered with interim clean soil cover materials and then closed with a clean vegetated soil cover, thereby reducing the potential for human and environmental exposure to constituents in the remediation wastes. The cover materials would be inspected and maintained by FMC to be protective of human health and the environment in both the short and long term. The cover would isolate the soils and debris placed in the CAMU from surface water contact and wind erosion, and would be designed to shed water and minimize infiltration. Thus, the cover would minimize the potential for off-Site migration of impacted media via surface water, groundwater, and air pathways.

Groundwater beneath and adjacent to the proposed CAMU is being monitored as part of the Facility's GMP and controlled by existing groundwater remedial systems. These controls would remain in place, and enhanced, as needed, to address CAMU requirements. Additional information regarding the operation and performance monitoring of the groundwater remedial systems is provided in Sections 3.6.3, 3.6.4, and 3.6.5.

The construction and use of the CAMU would also be controlled by project-specific health and safety procedures to minimize any potential unacceptable level of worker exposure.

**2.1.3 Inclusion of Unaffected Areas in the CAMU; NYCRR Part 373-2.19 (c)(3)(iii) and 40 CFR Part 264.552(c)(3)**

The proposed location for the CAMU is an area of the Facility with significant soil and groundwater contamination and, as discussed in Section 3.3, its footprint will encompass some existing SWMUs. As a result, there is an active groundwater collection system in place with respect to this portion of the Facility. Furthermore, the CAMU is proposed in the only currently viable location within the Facility for a CAMU.



As can be seen on Figures 2 and 3, much of the existing land area at the Facility is currently occupied by existing Site features; therefore, the amount of contiguous on-Site land area available for the construction of a CAMU is limited. The eastern and contiguous southeastern portions of the Facility, however, are largely unused, with the exception of the ESI Fill Area, which is actively being used for the placement of excavated soils and debris from on-Site and off-Site Facility-related remediation projects and represents an area of existing contamination at the Facility.

As discussed in more detail in Section 4, below, there are a number of reasons for locating a CAMU in the eastern portion of the Facility, including proximity to existing areas of contamination (e.g., the ESI and the former eastern process wastewater lagoon), the absence of existing Facility features such as utilities or buildings, and existing groundwater collection and extraction.

**2.1.4 Areas Within the CAMU, Where Wastes Remain In Place After Closure of the CAMU, Shall be Managed and Contained so as to Minimize Future Releases, to the Extent Practicable; NYCRR Part 373-2.19 (c)(3)(iv) and 40 CFR Part 264.552(c)(4)**

The CAMU is intended to be used for the permanent disposal of remediation waste. After closure of the CAMU, post-closure inspection, maintenance, and monitoring activities would be conducted to ensure that the materials are contained and managed to minimize future releases. Information regarding post-closure activities is described in Section 5. FMC would have continuing obligations for the operation and maintenance of the CAMU and for the final corrective measures for the Facility under the AOC. Deed restrictions would be placed on this property as part of the post-closure activities to control future uses of the Facility.

**2.1.5 The CAMU Shall Expedite the Timing of Remedial Activity Implementation, When Appropriate and Practicable; NYCRR Part 373-2.19 (c)(3)(v) and 40 CFR Part 264.552(c)(5)**

Designation of a CAMU would expedite the timing of implementation of remedial action that entails soil removal due to shorter haul routes and opportunity for flexibility in scheduling this work. Reductions in travel time between the locations of the remedial activities and the disposal site would facilitate faster and more flexible construction schedules, reduce costs, and enable the construction work force (trucks, drivers, traffic coordinators, etc.) to focus on remedial activities as opposed to transportation activities. Placing remediation wastes in a CAMU located at the Facility in Middleport

would also result in less disruption to surrounding communities by reducing the number of trucks (and personnel) necessary for remediation. This approach would eliminate the need for heavy truck traffic to transport arsenic-contaminated soil across farther distances to off-Site commercial disposal facilities and then traveling back empty to Middleport over the same distance for more loads.

**2.1.6 The CAMU Shall Enable the Use, When Appropriate, of Treatment Technologies (Including Innovative Technologies) to Enhance the Long-Term Effectiveness of Remedial Actions by Reducing the Toxicity, Mobility, or Volume of Wastes That Will Remain In Place After Closure of the CAMU; NYCRR Part 373-2.19 (c)(3)(vi) and 40 CFR Part 264.552(c)(6)**

The use of treatment technologies for the reduction of toxicity, mobility, or volume of wastes is not applicable or necessary for the remediation wastes proposed for placement in the CAMU. Soils and debris from past RCRA corrective actions that have already been placed within the limits of the CAMU would not be subject to treatment, and no wastes that may require treatment would be placed in the CAMU in the future.

**2.1.7 The CAMU Shall, To the Extent Practicable, Minimize the Land Area of the Facility Upon Which Wastes Will Remain In Place After Closure of the CAMU; NYCRR Part 373-2.19 (c)(3)(vii) and 40 CFR Part 264.552(c)(7)**

The proposed footprint of the CAMU is approximately 16.9 acres. Using a phased filling plan, the CAMU would be designed and constructed to minimize, to the extent practical, the area used for disposal of remediation materials during soil placement. Each phase of construction would involve filling the CAMU to its maximum fill height prior to construction of the next phase (final CAMU height at closure of the CAMU will be 35 feet). This will enable elimination of a phase (e.g., Phase 3 or Phase 2) if the volume of remediation waste does not require its use, thereby reducing the land area affected.

## **2.2 Description of Proposed CAMU**

FMC proposes to locate the CAMU on the eastern portion of the FMC Facility, which is located outside the Village of Middleport, within the Town of Royalton. The eastern side of the Facility has been historically used for the management of process wastewater from approximately 1964 to mid-1977 in an unlined basin (SWMU #3); temporary storage of stormwater from approximately 1978 through 1988 in the unlined ESI (SWMU#50), the placement of soil and debris removed as part of the

Northern Ditches Interim Remedial Measures (IRM) in an encapsulated unit (SWMU #53) and the placement of remediation soil and debris in the former ESI (SWMU# 54). Figure 6 shows the SWMU locations relative to the proposed final footprint of the CAMU. Section 3.3 further discusses the historic uses of these SWMUs and summarizes the environmental impacts on the eastern side of the Facility. In addition to the SWMUs, the eastern portion of the Facility currently contains several groundwater extraction well systems, associated blast-fractured bedrock trenches, ancillary piping, and numerous groundwater monitoring wells on and off-site (see Figure F-1 in Appendix F)

The ESI Fill Area (SWMU#54) currently contains approximately 95,000 cubic yards (see Section 3.3.1) of remediation-related soil and debris. As part of FMC's ongoing RCRA Corrective Action program being performed under the AOC, it is anticipated that additional soil and debris will be removed from off-Site areas and possibly on-Site areas as part of future RCRA remedial activities. However, the precise quantities of remediation waste to be generated are not currently known. Accordingly, FMC proposes to construct the CAMU in three phases (i.e., Phases 1, 2, and 3) for the permanent disposal of soil and debris to be generated from remediation projects. The first phase would consist of placing remediation waste within the ESI Fill Area, the second would consist of placing remediation waste within the area south of the Eastern Access Road, and the third phase would consist of placing remediation waste over the Eastern Access Road (between the Phase 1 and Phase 2 areas) and the southern and northern portions of the Phase 1 and 2 areas, respectively, blending all three phases together. While this application covers all three phases and FMC is requesting designation of a CAMU for the area/footprint taken up by all three phases, FMC plans to construct the CAMU in phases and will only utilize the capacity required by the volume of the remediation wastes that are generated in the course of completing the RCRA Corrective Action Program. Figure 7 identifies the footprints of the proposed CAMU by construction phases.

The maximum height of the CAMU, to the top of final cover, or each phase of the CAMU, will be 35 feet above the surrounding grade, which is the maximum height allowed by the Town of Royalton building code.

The configuration of each of the three CAMU phases, and their locations on the site, are depicted on Figures 8, 9 and 10, respectively. A typical cross-section of the CAMU is provided in Figure 11. Details on the CAMU design are provided below and in the additional attached figures. Figure 12 depicts a conceptual Vegetative Site

Plan. The final design document for the proposed CAMU will include a detailed planting scheme with specific planting species and locations.

Phase 1 (ESI Fill Area) comprises the area north of the Eastern Access Road and constitutes a vertical and lateral continuation of the existing ESI Fill Area. The current footprint of the ESI Fill Area, as presented in the existing Scope of Work for Filling and Grading of the ESI Fill Area, is approximately 7.6 acres (i.e., to the final toe of fill), with a maximum height of approximately 24 feet above surrounding grade. The final footprint of the Phase 1 CAMU (i.e., to the limit of final cover) will be approximately 8.8 acres, with a maximum height to the top of final cover of approximately 35 feet above surrounding grade.

Phase 2 (Southeastern Area) of the CAMU will be located south of the Eastern Access Road. This is an area within which clean soil stock piles have been placed over time. The clean soils have historically been used as a source for ESI Fill Area soil cover material. The clean soil stock piles were initially placed in the area during the 1987-1988 North Site Cover construction project for future remediation projects (i.e., closure of the ESI, repair and maintenance of the North Site Cover). Any remaining stockpiles of clean soil will be removed prior to development and filling of the Phase 2 area of the CAMU. The final footprint of the Phase 2 portion of the CAMU will be approximately 6.3 acres, with a maximum height to the top of final cover of approximately 35 feet above surrounding grade. As shown on Figure 9, Phase 2 of the CAMU will be filled only after Phase 1 has been filled to the dimensions described above.

Phase 3 (Eastern Access Road Area) of the CAMU will fill in the divide between the Phase 1 and Phase 2 portions of the CAMU (i.e., the area currently occupied by the Eastern Access Road) and would also involve placing additional fill in some of the Phase 1 and Phase 2 areas to achieve final grade for the CAMU (due to the overlapping/blending of Phase 3 within portions of the Phase 1 and Phase 2 areas). The Phase 3 area is anticipated to be completed last to allow continued use of the Eastern Access Road during Phase 1 and Phase 2 activities. Prior to Phase 3 construction, the Eastern Access Road would be re-routed around the southern end of the Phase 2 portion of the CAMU. In addition, the aboveground force main associated with the groundwater extraction system would be re-routed. The final footprint of the Phase 3 portion of the CAMU will be approximately 1.8 acres, not including the overlap into the Phase 1 and Phase 2 areas. As shown on Figure 10, Phase 3 filling would overlap into the Phase 1 CAMU area approximately 7.4 acres and into the Phase 2 CAMU area approximately 1.7 acres. Therefore, collectively



Phase 3 would encompass 10.9 acres. The maximum final height to the top of final cover of the Phase 3 portion of the CAMU would be approximately 35 feet above surrounding grade.

Overall, the final footprint of the CAMU, upon completion of all three phases of construction, if fully constructed, would be approximately 16.9 acres, with a maximum height to the top of final cover of approximately 35 feet above surrounding grade. The CAMU final cover surface would have a maximum slope of 25 percent and a minimum design slope of 4 percent. The overall potential capacity of the CAMU, from original grade to the bottom of final cover, is approximately 468,000 cubic yards, including the approximately 95,000 cubic yards of remediation waste previously placed in the ESI Fill Area. This capacity would be occupied with a combination of remediation-related soil and debris as well as interim soil cover materials (i.e., final cover is not included in this volume estimate).

### 2.3 Proposed CAMU Eligible Waste

CAMU eligible waste is defined as follows:

*"All solid and hazardous wastes, and all media (including ground water, surface water, soils, and sediments) and debris, that are managed for implementing cleanup. As-generated wastes (either hazardous or non-hazardous) from ongoing industrial operations at a site are not CAMU-eligible wastes."*[6 NYCRR 373-2.19(c)(1)(i)('a') and 40 CFR Part 264.552(a)(1)]

The proposed CAMU would be approved for the permanent disposal of remediation waste already in the ESI Fill Area, and the placement of non-hazardous soils and debris removed as part of FMC's future remediation activities. The soil and debris may include non-hazardous material that is encountered during remedial activities (e.g., wood, demolition debris, concrete, weeds, roots, vegetation, and stones) but would NOT include the following:

- RCRA characteristic or listed hazardous wastes
- Industrial wastes (hazardous or non-hazardous) from ongoing industrial operations at the Facility
- Intact containers containing hazardous wastes
- Liquid wastes
- Municipal waste and/or

- Waste that is not generated in the course of implementation of remedial action under the RCRA Corrective Action Program

This list of excluded waste is more restrictive than state and federal regulations, and was developed as an additional conservative measure to provide a protective remedy using the CAMU at the Facility.

Remediation wastes to be placed in the CAMU would be from both on-Site and off-Site RCRA remedial activities. The origins of these wastes are discussed below.

#### Off-Site Remediation Waste Origin

Under the terms and conditions of the AOC, FMC has been conducting numerous environmental studies in off-Site locations to characterize the nature and extent of potential FMC-related constituents. These off-Site locations have been impacted by historic process wastewater and stormwater discharges from the Facility and/or historic fugitive and stationary source air emissions from the Facility. The off-Site study areas have, to date, included:

- FMC's Former Research and Development Property (Former R&D Property)
- Historic Air Deposition Off-Site Study Area consisting of residential, agricultural, public, commercial and industrial properties bound by the Erie Canal to the north, the Niagara and Orleans County line to the east, Tributary One and Main Street to the west and Route 31 to the south
- Culvert 105 storm sewer consisting of buried and open swale sections north and south of the Erie Barge Canal and adjoining land
- Tributary One South of Pearson/Stone Roads and its floodplain
- Tributary One North of Pearson Road and its floodplain and contributing swales (approximately from Stone Road to its confluence with Jeddo Creek)
- Jeddo Creek and its floodplain and contributing swales (approximately from its confluence with Tributary One to its confluence with Johnson Creek)
- Johnson Creek and its floodplain and contributing swales (approximately from its confluence with Jeddo Creek to the Johnson Creek Pond in Lyndonville)

As part of environmental investigations, in 1987-1988 FMC compiled a list of all compounds produced or used at the Facility, with the time of such production or use, and with the quantities estimated (Master Compound List). This list was submitted to

NYSDEC in 1988 and revised based on comments received. It is included in the 1991 Description of Current Conditions Report and in the 1999 draft RFI Report, both of which have been submitted to the Agencies under the AOC. Impacted media at the Facility and in off-Site areas were sampled and analyzed for the constituents on the Site Specific Parameter List. Based on those results, it was concluded that arsenic is the most predominant FMC-related constituent in soils and sediment, and to a lesser degree, lead and chlorinated pesticides.

#### On-Site Remediation Waste Origin

Major areas of soil and groundwater contamination exist in the northern and eastern portions of the Facility as a result of the historic use of SWMUs<sup>1</sup>, including the former process wastewater lagoons/basins, a land burial area, and the former arsenical pesticide production area.

Process wastewater generated prior to 1977 was stored in former lagoons or basins at the Facility prior to treatment and/or discharge. Wastewater containing ammonia was generated as part of the Ambam dithiocarbamate pesticide manufacturing process, as well as manufacturing of some other dithiocarbamate products (e.g., Polyram), during a period from the early 1960's to 1983 or 1984. These lagoons and basins were located within the northern and eastern portions of the Facility. Pesticide production/formulation wastes were also buried within the northern portion of the Facility until 1970. Areas where former arsenical pesticide production activities (located on the northern portion of the Facility) were located may be contaminated from operational activities. The North Site Cover was constructed over the northern portion of the Facility where the majority of the Facility's historic pesticide production operations and waste disposal practices occurred.

#### Waste Treatment Standards

Inasmuch as only non-hazardous soils and debris will be managed in the CAMU, the minimum treatment standards set forth in 40 CFR Section 264.552(e)(4) do not apply.

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<sup>1</sup> A SWMU (as defined in the 1990 Subpart S proposed rule [55 FR 30798, July 27, 1990] is "any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released."

### 3. CAMU Design Basis

No remediation waste from projects other than the FMC Middleport RCRA Corrective Action program would be placed in the CAMU. Additionally, no hazardous waste, liquid waste, or municipal waste would be placed in the CAMU. This limitation on usage, the low leaching potential of the emplaced materials, and the groundwater controls for the CAMU negate any need for incorporation of leachate collection and low-permeability cap and liner systems into the CAMU design as discussed in the following subsections. Therefore, FMC proposes to construct the CAMU with a cover that would be permeable but would prevent direct contact and potential erosion and transport (wind and water) of the placed materials. Although no liner or leachate collection system would be included in the CAMU, as noted later in this section, the Facility groundwater extraction and treatment system would serve as a source control by collecting and treating water that might infiltrate and percolate through the CAMU.

These design features constitute an “alternate CAMU design” as authorized under the CAMU regulations that would not include a liner or an impermeable cap. The following subsections describe the regulatory basis for the alternate design and demonstrate how the proposed alternate design meets the regulatory requirements.

#### 3.1 Conceptual CAMU Design Components

The key design components of a CAMU consist of the following:

- Geometry of the CAMU (area, height and shape)
- Liner (or bottom) design requirements unless alternate requirements are approved
- Filling procedures, including interim cover and groundwater monitoring
- Closure plans and final cap
- Post-closure plan

The CAMU regulations [6 NYCRR 373-2.19(c)(5)(iii) and 40 CFR Part 264.552(e)(3)] specify “Minimum Design Requirements” for the CAMU, which consist of a composite liner (clay and flexible membrane liner) and leachate collection system, unless the Regional Administrator approves alternate design requirements. FMC proposes an alternate design for the CAMU at the Facility without a liner and leachate collection system, as authorized under the CAMU regulations [6 NYCRR 373-2.19(c)(5)(iii) and 40 CFR Part 264.552(e)(3)].



The proposed CAMU would include remediation waste placed in SWMU 54 and future waste generated as part of the RCRA Corrective Actions implemented pursuant to the AOC. In addition to the soil, some vegetation and debris (such as concrete, stone, and wood) generated during remediation activities would also be disposed at the CAMU. No hazardous waste, liquid waste, or municipal waste would be placed in the CAMU. No wastes or materials from projects other than those conducted as part of FMC's RCRA corrective action program would be managed in the CAMU. Section 2.3 provides a more detailed description of the types and sources of remediation wastes that would be placed in the proposed CAMU. Section 4 further discusses the construction and fill requirements for the CAMU.

The CAMU regulations **[6 NYCRR 373-2.19(c)(5)(v) and 40 CFR Part 264.552(e)(5)]** require ongoing detection monitoring for any potential release of hazardous constituents from the CAMU to groundwater. If a release is detected in the groundwater, characterization of the release and/or corrective action to address the release may be required. As discussed in Section 3.3, existing groundwater and soil within and adjacent to the proposed CAMU location contain elevated concentrations of site related constituents. FMC currently pumps and treats contaminated groundwater at the Facility (including the eastern portion of the Facility) and is implementing an ongoing GMP (pursuant to the AOC) which complies with the groundwater monitoring requirements specified in the CAMU regulations. As necessary, additional monitoring as part of the GMP would be conducted to satisfy CAMU requirements. Section 3.6.3 further describes the existing groundwater remedial systems in and around the proposed CAMU location.

The CAMU regulations **[6 NYCRR 373-2.19(c)(5)(v) and 40 CFR Part 264.552(e)(6)]** also specify the closure and post-closure requirements for the CAMU (after filling activities have completed). The regulations require that the closure of the CAMU must: 1) minimize the need for further maintenance; and 2) control, minimize, or eliminate post-closure escape of hazardous wastes, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, to surface waters, or to the atmosphere. to the extent necessary to protect human health and the environment. To meet those requirements, the CAMU closure regulations **[6 NYCRR 373-2.19(c)(5)(vi)(d) and 40 CFR Part 264.552(e)(6)(iv)]** specify that the final cover for the CAMU must be designed to meet five performance criteria **or** alternate Site-specific performance criteria, if authorized by the Agency(ies), to facilitate the performance of the CAMU. FMC proposes to design the final cover/cap using alternate Site-specific performance criteria. Section 5.1.1 presents the alternate Site-specific performance criteria for final cover/cap design. The proposed design of final cover