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February 9, 2010

Via E-Mail and Overnight Mail

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UNITED STATES ENVIRONMENTAL
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Re: RCRA Section 3008(h) Administrative Order on Consent (AOC)
Docket No. II-RCRA-90-3008(h)-0209
FMC Corporation, Middleport, NY Facility
EPA I.D. No. NYD002126845
Submittal of Corrective Measures Study Technical Memorandum -
Evaluation of Tree Preservation Measures for Suspected Air Deposition
and Culvert 105 Study Areas

Dear Messrs. Mortefolio and Infurna:

In accordance with the above-referenced Administrative Order on Consent (AOC), FMC Corporation (FMC) is currently implementing the “Corrective Measures Study Work Plan for Suspected Air Deposition and Culvert 105 Study Areas” (August 2009, AMEC Geomatrix) (CMS Work Plan). The CMS Work Plan was approved by the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (USEPA) (collectively, “the Agencies”), in consultation with the New York State Department of Health (NYSDOH). As described in the approved CMS Work Plan, the enclosed document entitled “Corrective Measures Study Technical Memorandum - Evaluation of Tree Preservation Measures for Suspected Air Deposition and Culvert 105 Study Areas” (February 2010, ARCADIS) has been prepared to identify and evaluate the effectiveness and ability to implement potential tree preservation measures in the course of remediation of potentially FMC-related constituents (predominantly arsenic) in soil in off-site properties in these study areas.

Hard copies of this letter and the enclosure will be placed in the document repository at the Middleport Library and at FMC’s Neighborhood House at 17 Vernon Street in Middleport, New York and made available for community review. The enclosed document will also be available at the following website:

- <http://www.middleportny.com/library/>



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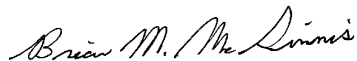
FMC will hold public information sessions tentatively scheduled for March 10, 15, 22 and 23, 2010 to present the information contained in the enclosure, to answer questions, and to solicit input from the community and stakeholders. A notice identifying the dates, times and place of the information session, information sheets and/or a survey form relative to the enclosure, and comment forms will also be mailed or distributed in late February 2010 or early March 2010 to property owners within the Suspected Air Deposition and Culvert 105 CMS Study Areas and to Village of Middleport officials.

In addition, FMC's representatives will be attending and will provide information on the enclosure during the February 11, 2010 Middleport Community Input Group meeting.

In order to meet the schedule for performance of the CMS, FMC requests that the Agencies and community members provide any comments on the enclosed document by April 2, 2010.

If there are any questions or if additional information is needed at this time, please contact me at (215) 299-6047 or at the above address.

Sincerely,



Brian M. McGinnis
Remediation Project Manager

Enclosure

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pc: Without enclosure

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FMC Neighborhood House



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Middleport, New York

Corrective Measures Study
Technical Memorandum

Evaluation of Tree
Preservation Measures for
Suspected Air Deposition and
Culvert 105 Study Areas

February 2010

**Corrective Measures Study
Technical Memorandum**

**Evaluation of Tree
Preservation Measures for
Suspected Air Deposition and
Culvert 105 Study Areas**

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FMC Corporation

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Acronyms

AOC	Administrative Order on Consent
CAOs	Corrective Action Objectives
CMS	Corrective Measures Study
DBH	Diameter at breast height
FMC	FMC Corporation
ICM	Interim corrective measure
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
RCRA	Resource Conservation and Recovery Act
USEPA	United States Environmental Protection Agency

Evaluation of Tree
Preservation MeasuresFMC Corporation
Middleport, New York**Executive Summary**

FMC Corporation (FMC) has completed an evaluation of potential tree preservation measures that might be employed in the course of remediation of potential FMC-related constituents (primarily arsenic) in soil located within the protected root zones of trees found within the off-site Suspected Air Deposition and Culvert 105 Study Areas (Study Areas) in Middleport, New York. This evaluation was implemented consistent with the *Corrective Measures Study Work Plan for Suspected Air Deposition and Culvert 105 Study Areas* dated August 2009 (CMS Work Plan) (AMEC Geomatrix 2009), which was approved by the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (USEPA) (the latter two entities are referred to together as “the Agencies”), in consultation with the New York State Department of Health (NYSDOH). This evaluation is also consistent with the Agencies’ Final Corrective Action Objectives Applicable to Off-Site Soil and Sediment (“CAOs”), which specifically state that one of the goals of corrective measures is to “[m]inimize disturbance and disruption of the community so that the character of the neighborhoods can be maintained.” The preservation of trees is understood to be an important element in maintaining the character of the Middleport community and/or an affected property, and therefore a study of potential tree preservation measures was included as a task in the CMS Work Plan. The conclusions of this evaluation will be considered in the development and analysis of corrective measure alternatives in the Corrective Measures Study (CMS).

The feasibility of tree preservation during implementation of corrective measures (e.g., soil removal, soil tilling or blending) within the protected root zones of trees is dependent on a variety of factors, including distribution of FMC-related constituents; tree species; tree age, health and condition; and soil type. Due to the wide range of factors that must be considered, no single measure will apply to all situations within the Study Areas. This study provides an evaluation of nine identified potential tree preservation measures based on the following factors: the effectiveness of soil removal; maintenance of aesthetic character of the property or neighborhood; relative ease of implementation; minimizing inconvenience to property owners (i.e., noise and length of construction); tree structural stability; tree survival probability; post-remediation maintenance requirements; short- and long-term safety of workers, property owners and the community; and cost effectiveness.

The evaluation concludes as follows:

- Any disturbance (e.g., soil removal, soil tilling, soil compaction) within the protected root zone could jeopardize the health or stability of an otherwise healthy tree. Measures implemented to attempt to preserve a tree offer varying likelihoods for success. For this reason, the most common approach in soil remediation projects is to remove the tree and replant with a new tree.

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- Removal of larger trees and replanting with smaller trees would have an effect on the aesthetic character of an affected property and neighborhood. Based upon two recent inventories of trees located in right-of-ways in the Village of Middleport, approximately 80% of the trees have a trunk diameter (measured at breast height) of greater than 10 inches. The information from these inventories provides an indication of tree species and tree sizes found in a portion of the Study Area. Decades of growth time would likely be needed to fully replace the size of these trees.
- Not all trees can or should be preserved. The determination of whether a tree can or cannot be preserved is dependent on a number of property-specific or tree-specific factors. For example, an older tree with dwindling health would have a low probability of long-term survival if any soil removal was attempted within the protected root zone.
- No single tree preservation measure will apply to all situations within the Study Area. A final remedial design plan would likely include removal of numerous trees (e.g., those that are unhealthy, have been pruned, are over-mature, are poorly located, etc.) and preservation of other trees using selected measures identified in this Technical Memorandum.
- If a tree is to be preserved, limited depth excavation, using either mechanical or pneumatic pressure, would appear to present the best opportunity to preserve the tree and warrants further consideration as part of the CMS. The depth of excavation would be limited to approximately 6 inches below the soil surface, and would be completed in one continuous effort. Precedent was identified for limited depth manual excavation at four similar remediation projects within residential neighborhoods.
- Other identified measures to excavate soils within the protected root zones of trees were not recommended for further evaluation based upon practicability of implementation, lower probabilities for tree survivability, tree structural stability concerns, and safety concerns for workers, residents, and the community.
- Long term maintenance or monitoring of the preserved tree (i.e., watering, fertilizing) and/or subsequent removal of the tree would be the responsibility of the property owner.

1. Introduction

This *Corrective Measures Study Technical Memorandum – Evaluation of Tree Preservation Measures for Suspected Air Deposition and Culvert 105 Study Areas* (“Technical Memorandum”) has been prepared by ARCADIS on behalf of FMC Corporation (FMC) for off-site properties in Middleport, New York. This Technical Memorandum identifies and evaluates the effectiveness and ability to implement potential tree preservation measures in the course of remediation of potentially FMC-related constituents (predominantly arsenic) in soil in off-site properties. The evaluation of tree preservation measures is being performed because corrective measures alternatives that include tree preservation measures will be evaluated in the Corrective Measures Study (CMS) for the Suspected Air Deposition and Culvert 105 Study Areas (collectively referenced hereinafter as “Study Area”) (properties shaded green on Figure 1-1). FMC is performing the CMS in accordance with the terms and conditions of an Administrative Order on Consent (AOC), Docket No. II RCRA-90-3008(h)-0209, entered into by FMC and by the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (USEPA) (the latter two entities are referred to jointly as “the Agencies”).

1.1 Background

FMC is currently implementing tasks described in the *Corrective Measures Study Work Plan for Suspected Air Deposition and Culvert 105 Study Areas* dated August 2009 (CMS Work Plan) (AMEC Geomatrix 2009), which was approved by the Agencies in consultation with the New York State Department of Health (NYSDOH). One of the tasks detailed in the CMS Work Plan is the identification and evaluation of tree preservation measures. This task is consistent with the Agencies’ Final Corrective Action Objectives Applicable to Off-Site Soil and Sediment (dated March 26, 2009 and included in Appendix A of the CMS Work Plan) (“CAOs”), which specifically states that one of the goals of corrective measures is to “[m]inimize disturbance and disruption of the community so that the character of the neighborhoods can be maintained.”

The Study Area consists of approximately 230 off-site properties that are not owned by FMC. Most of the properties, which are located in the Village of Middleport, are occupied by single and multi-family homes (approximately 200 properties). The other properties within the Study Area consist of commercial businesses, agricultural or undeveloped land, Village of Middleport land (e.g., right-of-ways), and the Royalton-Hartland Central School District property. Interim corrective measures (ICMs) conducted previously at 26 residential properties in the Study Area south of the Erie Canal (i.e., at residential properties in the Suspected Air Deposition Area) have required removal of nearly all trees within the remediated areas to effectively remove soil with elevated arsenic levels. Based on observations and experience from the ICMs, the Middleport residents are cognizant of the potential impact remediation and

Evaluation of Tree
Preservation MeasuresFMC Corporation
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removal of trees can have on the aesthetic character of the Middleport neighborhoods. Concerns raised by the community about the potential loss of more trees due to remediation has led to this evaluation of potential preservation measures for trees in the Study Area as part of the CMS process.

1.2 Objectives

The primary objectives of this Technical Memorandum are to identify potential tree preservation measures and evaluate the relative effectiveness and ability to implement these measures. The evaluation included the following considerations as identified in the Agency approved CMS Work Plan (AMEC Geomatrix 2009):

- Ability to perform the work without causing permanent damage to the tree.
- The level of effort and type of equipment required.
- The safety of workers, residents and neighbors during implementation.
- The potential for the tree to fall down or die during or after completion of the work.
- The degree to which the soil removal and replacement can be accomplished.
- The effectiveness of the method to reduce soil arsenic levels and/or human health risk levels associated with remaining soil arsenic concentrations.
- Costs for performance of the work and potential future costs/liabilities.
- The time of year during which soil removal in the root zone will have the least effect on the tree.
- The ability of partial soil removal within the root zone over multiple years to avoid damaging an otherwise healthy tree.
- The soil replacement type and any additives that may serve to enhance tree preservation.
- How far into the tree root zone (typically approximated by the tree's drip line) can excavation be performed without expected damage to an otherwise healthy tree?
- How deep can soil be removed within the root zone without expected damage an otherwise healthy tree?

Site-specific information and data on tree abundance, species diversity, and tree health are presented in subsequent sections of this Technical Memorandum, along with information on factors that may result in tree damage and steps that can be taken to minimize or prevent damage to trees that are impacted by remediation activities (referred to herein as "Best Management Practices") (Sections 2 through 4).

**Evaluation of Tree
Preservation Measures**

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Middleport, New York

Discussions on the identification and evaluation of potential tree preservation measures are provided in Sections 5 and 6, respectively. Conclusions and recommendations relative to particular tree preservation measures that would be evaluated in the CMS are presented in Section 7. Reference materials are listed in Section 8.

