



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION III
STATEMENT OF BASIS
FMC Corporation
Baltimore, Maryland
EPA ID NO. MDD0030781875

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I. Introduction

The United States Environmental Protection Agency (EPA) has prepared this Statement of Basis (SB) under the Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984 (RCRA), 42 U.S.C. § 6901 *et. seq.*, to explain its proposed remedy for the facility owned by FMC Corporation (FMC) and located at 1701 East Potapscoc Avenue, Baltimore, Maryland (Facility or Site). After reviewing all available Site data, EPA is proposing as the remedy for the Facility the expansion of the existing Groundwater Recovery System, including the possible construction of barrier walls, if necessary; the development and implementation of a Comprehensive Groundwater Treatment Plan; the development and implementation of a Soil Management Plan; the installation of soil vapor control systems at new and existing buildings; the development and implementation of a Comprehensive Study of Impacts to Site-Adjacent Sediments and Biota, and the implementation of institutional controls.

The purpose of this document is to solicit public comment on EPA's proposed remedy prior to making the final remedy selection for the Facility. The information presented in this SB can be found in greater detail in the work plans and reports submitted by the Facility to EPA and the Maryland Department of Environment (MDE). To gain a more comprehensive understanding of the RCRA activities that have been conducted at the Facility, EPA encourages the public to review these documents which are found in the Administrative Record. The Administrative Record and index are available for public review at the EPA Region III Office in Philadelphia and at the Enoch Pratt Library – Brooklyn Branch.

The public may participate in the remedy selection process by reviewing this SB and documents contained in the Administrative Record and submitting written comments to EPA during the public comment period. Public participation is discussed in further detail in Section VII, below. EPA will address all significant comments submitted in response to the proposed remedy described in this SB. EPA will make a final remedy decision and issue a Final Decision and Response to Comments (FDRTC) after it considers information submitted during the public comment period. If EPA determines that new information or public comments warrant a modification to the proposed remedy, EPA may modify the proposed remedy or select other alternatives based on such new information and/or public comments.

II. Facility Background

The Facility is located on approximately 90 acres in Baltimore, Maryland. It is bordered by Curtis Bay to the south, by Stonehouse Cove to the west and by both industrial and commercial properties to the north and east.

U.S. Industrial Chemicals Inc. began manufacturing ethanol and acetone at the Facility in 1915. In 1954, FMC purchased the Facility from U.S. Industrial Chemicals Inc. From 1954 until May 2008, FMC manufactured pesticides and herbicides at the Facility. Throughout the Facility's history, a number of chemical waste residuals were managed and/or disposed of at several locations at the Facility.

In May 2008, FMC stopped its manufacturing operations at the Facility and began dismantling the plant. The Facility is no longer operating and approximately 90 percent of the manufacturing buildings and equipment has been dismantled. Seven buildings remain for possible future use. FMC remains the owner of the Facility.

III. Summary of Environmental History

In January 1986, the Maryland Department of Health and Mental Hygiene Waste Management Administration (DWMA), which subsequently changed its name to MDE, entered into an Administrative Consent Order, CO-85-498, (Consent Order) with FMC. Pursuant to the Consent Order, FMC submitted to DWMA for review and approval a Groundwater Report. The Groundwater Report summarized groundwater studies conducted by FMC from 1981 to 1985.

On December 13, 1989, EPA issued a RCRA Corrective Action Permit, EPA ID No. MDD003071875 (Permit), under RCRA Section 3004(u), 42 U.S.C. Section 6924(u), to FMC for the Facility. The Permit, which on its terms expired on December 13, 1999, has been administratively extended. The Permit requires, among other things, FMC to characterize the extent of groundwater contamination at the Facility and evaluate remedy options.

Based on EPA-approved groundwater characterization reports, EPA has identified the following Contaminants of Concern (COCs) in Facility groundwater:

Table 1: Contaminants of Concern

Volatile Organic Compounds (VOCs)	Semi-Volatile Organic Compounds (SVOCs)
Benzene Bromoform Chlorobenzene Chloroethane Choloform Cis-1,3-Dichloropropene Ethylbenzene Methylene Chloride Trans-1,3-Dichloropropene Trichlorofluoromethane	1,2,4-Trichlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 2,4,6-Trichlorophenol 2,4-Dinitrophenol 2-Chlorophenol 2-Methylphenol 2-Nitrophenol 4-Choloro-3-methylphenol Aniline Bis(2-choloroethoxy)methane Bis(2-chloroisopropyl)ether Bis(2-ethylhexyl)phthalate Butyl benzyl phthalate Chrysene Diethylphthalate Di-n-butylphthalate Pentachlorophenol Phenol

In September 1993, EPA approved a Supplemental Groundwater Characterization Report (Supplemental Report) submitted by FMC pursuant to the Permit. The Supplemental Report provided additional information necessary to characterize the groundwater conditions at the Facility and to assess any biological impacts to Curtis Bay. Three subsurface units were identified: surface fill; the Pleistocene Formation; and the Patapsco Formation. Shallow groundwater generally flows from north to south across the Facility, and becomes radial as it approaches Stonehouse Cove and Curtis Bay. Groundwater flow in the Patapsco Aquifer is to the southeast, consistent with the regional dip of the Patapsco Formation. Based on the results from aquifer performance tests which were completed as part of the Supplemental Report, groundwater collection appeared to be a viable remedial option.

In August 1994, EPA approved a Contaminant Characterization Report which described the nature and extent of contamination at the Facility and presented corrective measures for the biologic impacts to Curtis Bay associated with the discharge of contaminated groundwater from the Facility. In August 1995, EPA conditionally approved a Corrective Measures Plan in which

FMC identified groundwater recovery and treatment as the preferred remedial alternative for the Facility. In May 1996, EPA approved the Final Basis of Design for RCRA Corrective Measures/Stabilization which provided the design details for a groundwater recovery and treatment system (Groundwater Recovery System). In May 1997, pursuant to the interim measures provisions of the Permit, FMC installed the Groundwater Recovery System. At the request of EPA, FMC installed an additional recovery well in the Upper Patapsco in November 2005. Currently, FMC is operating the Groundwater Recovery System and is conducting quarterly groundwater monitoring at the Facility under the interim measures provisions of the Permit.

In November 1999 and, again in April 2003, the U.S. Army Corps of Engineers (Corps), on behalf of EPA, conducted Visualization of Groundwater Contamination studies to evaluate the effectiveness of the Groundwater Recovery System. Bioassay studies were also conducted at the Facility in 1985, 1992, 1999, and 2006, respectively, to evaluate the toxicity of groundwater discharging from the Site to aquatic organisms in Stonehouse Cove and Curtis Bay. Based on the findings of the various studies, EPA has determined that not all Facility-related contaminants are being captured by the Groundwater Recovery System.

In October and November 2008, FMC conducted Site-wide groundwater sampling. The sampling data revealed a plume of contaminated groundwater in the northern 23 acres at the Facility which is referred to as the North Parcel. Groundwater and soils in the North Parcel contain volatile organic compounds (VOCs) in concentrations above their respective Maximum Contaminant Levels (MCLs) promulgated at 40 C.F.R. Part 141 pursuant to Section 1412 of the Safe Drinking Water Act, 42 U.S.C. Section 300g-1, or Region III's Risk Based Concentrations (RBCs) if no MCL exists. Pursuant to the interim measures provisions in the Permit, FMC is currently investigating and delineating the plume and characterizing the soils at the North Parcel.

IV. Proposed Corrective Measures

EPA intends to require FMC to implement EPA's final remedy for the Facility through the issuance of a Permit Modification to include the following corrective measures if selected by EPA in the FDRTC.

A. Groundwater Remediation Strategy

EPA's corrective action goals for Facility groundwater are 1) to restore groundwater to drinking water standards established by the MCLs or RBCs, if there are no MCLs, and 2) to control Site-related groundwater contamination from entering Stonehouse Cove and/or Curtis Bay. In addition, FMC will be required to conduct a Comprehensive Groundwater Recovery and Treatment Study (Comprehensive Study), described in more detail below. As part of the Comprehensive Study, FMC will have to develop and implement a Comprehensive Sediment and Pore Water Sampling and Analyses Plan to measure the impacts of Facility-related contaminated groundwater on Stonehouse Cove and Curtis Bay.

1. Restoration of Groundwater to Drinking Water Standards

EPA proposes to require FMC to expand and operate the Groundwater Recovery System

until drinking water standards established by the MCLs or RBCs, if no MCLs exist, are restored. EPA proposes to have FMC expand the existing Groundwater Recovery System by installing additional groundwater recovery and monitoring wells. Using the data from the October/November 2008 comprehensive Site-wide groundwater sampling event as a baseline, EPA and MDE will approve the locations and number of additional wells proposed to be installed by FMC. If necessary, EPA will require that additional wells be installed to capture the contaminated groundwater plume under the North Parcel. The North Parcel contaminated groundwater plume is presently being investigated and characterized under the Permit. Based on the results of the on-going investigation, EPA will determine the location and number of wells necessary to remediate this contamination from the North Parcel plume.

2. Control Contamination From Entering Stonehouse Cove and/or Curtis Bay

EPA proposes to have FMC conduct a Comprehensive Groundwater Recovery and Treatment Study (Comprehensive Study) to evaluate the short-term and long-term effectiveness of the expanded Groundwater Recovery System in controlling Site-related groundwater contamination from entering Stonehouse Cove and/or Curtis Bay. If the results of the Comprehensive Study show that groundwater is not being effectively controlled and Site-related contamination continues to enter Stonehouse Cove and/or Curtis Bay at unacceptable concentrations, EPA may require FMC to evaluate the use of chemical and/or bio-remediation technologies at identified source areas, and/or the construction of a physical barrier to contain contaminated groundwater. If EPA believes that any such additional corrective measures are necessary to protect human health and/or the environment, EPA will solicit public comments on any such additional corrective measures prior to amending the FDRTC and including them in the final remedy for the Facility.

EPA proposes that the Comprehensive Groundwater Recovery and Treatment Study include the following elements:

1) Three years of semi-annual groundwater sampling

After the additional recovery and monitoring wells, as described in Section A.1., above, are installed, FMC will conduct three years of semi-annual groundwater sampling. A new set of monitoring wells will be selected from new and existing wells for the three-year study. The parameters to be analyzed for will be the same 10 VOCs and 20 SVOCs identified in Table 1: Contaminants of Concern, that are currently required to be sampled annually under the Permit and any compound that was equal to or exceeded the EPA Screening Level for that compound during the Site-wide groundwater sampling program implemented in the fall of 2008.

2) Sediment and Pore Water Sampling

FMC will develop and conduct sediment and pore water sampling in accordance with an EPA and MDE-approved Comprehensive Sediment and Pore Water Sampling and Analyses Plan. The sampling data will be used to measure the impacts of Facility-related contaminated groundwater on Stonehouse Cove and Curtis Bay. Based on the results of the sediment and pore water sampling, EPA will determine if benthic studies will be necessary. Based on the results of the sediment and pore water sampling, and subsequent benthic studies as applicable, EPA will

solicit public comments on any additional corrective measures it believes necessary to remediate Stonehouse Cove and/or Curtis Bay prior to amending the FDRTC and including them in the final remedy for the Facility.

B. Soil Management Strategy

EPA’s proposed remedy requires the development and implementation of a Soil Management Plan to be approved by EPA and MDE before any earth moving activities, including construction and drilling, can be done on Facility property. The Soil Management Plan will detail how all excavated soils will be handled and disposed. All excavated soils will be analyzed for the following groups of chemicals by the following methods:

Table 2: Analytical Methods

Chemicals	Method
VOCs	EPA Method 8260B
SVOCs	EPA Method 8270D
Polychlorinated biphenyls (PCBs)	EPA Method 8082A
Organochlorine pesticides	EPA Method 8081B
EPA Contract Laboratory Program Target Analyte List for Metals and Cyanide, except for calcium, magnesium, potassium and sodium. (The list can be found at: http://www.epa.gov/superfund/programs/clp/ismtarget.htm)	EPA Contract Laboratory Program Method

Soil remediation cleanup standards will be determined by EPA and MDE using EPA Region III’s Risk-Based Concentrations (RBCs) for industrial screening levels. In addition, all soils that are stockpiled will be sampled using the Toxicity Characteristic Leaching Procedure (TCLP) and will be disposed off-site. The Soil Management Plan will also detail soil characterization and/or capping requirements for areas of undisturbed, but potentially contaminated, soils, as well as areas that are currently covered with gravel. In addition, the Soil Management Plan will include soil stabilization requirements to minimize contact between storm water runoff and the Site soils. Soil stabilization measures may include the construction of berms to prevent storm water from flowing onto certain areas as well as the construction of sumps with pumps to remove ponded water from low lying areas.

C. Installation of Vapor Mitigation Systems

Buildings located above a contaminated groundwater plume are vulnerable to subsurface vapor intrusion coming from the plume and entering through cracks, joints and utilities openings.

Due to the known presence of VOC contamination in the groundwater beneath the Facility, EPA's proposed remedy includes the installation of vapor control systems in all new and existing Facility buildings. EPA did require FMC to conduct a soil gas survey during the summer of 2009 to evaluate the potential for vapor intrusion at all existing buildings and at locations for proposed buildings at the Facility. FMC is awaiting the results from that survey. EPA will use the results to determine the specific vapor controls necessary to eliminate the potential for vapor intrusion.

D. Implementation of Institutional Controls

EPA proposes that institutional controls be implemented in order to prevent any activities which would interfere with or adversely affect the integrity and protectiveness of the final remedy. The institutional controls are necessary to ensure that (1) contaminated groundwater is not used for potable purposes or any other use that could result in human exposure; (2) the integrity and protectiveness of the groundwater remediation system is maintained; (3) the Facility is not used for residential purposes, (4) subsequent purchasers of the Facility property are informed of the environmental conditions at the Facility and of EPA's final remedy for the Facility and (5) exposure to vapor intrusion and contaminated soils is limited.

Institutional controls may include, but may not be limited to, an environmental covenant to be entered pursuant to the Maryland Uniform Environmental Covenants Act, Maryland Environment Code, Sections 1-801 to 1-815 (UECA) and to be recorded with the deed for the Facility property. The Environmental Covenant would be required to include the following:

- i. a restriction on the use of groundwater beneath the Facility for potable purposes or any other use that could result in human exposure, unless such use is required by the Final Remedy,
- ii. a restriction on well drilling at the Facility without prior EPA approval, to prevent inadvertent exposure to the contaminated groundwater and adverse affects to the Final Remedy,
- iii. a restriction that the Facility not be used for any purpose other than industrial unless it is demonstrated to EPA that another use will not pose a threat to human health or the environment and EPA provides prior written approval for such use;
- iv. a requirement that any earth moving activities by any entity on Facility property, including construction and drilling, be done in accordance with the EPA and MDE-approved Soil Management Plan, and
- v. a requirement that a vapor control system, the design of which shall be approved in advance by EPA, is installed in any existing and all new structures constructed at the Facility.

V. Evaluation of EPA's Proposed Decision

This section provides a description of the criteria EPA uses to evaluate proposed remedies under the Corrective Action Program. The criteria are applied in two phases. In the

first phase, EPA evaluates three criteria, known as Threshold Criteria. In the second phase, EPA uses seven balancing criteria to select among alternative solutions, if more than one solution is proposed. The Facility has demonstrated that the current conditions meet the threshold criteria established by EPA and because EPA is not selecting among alternatives, an evaluation of the balancing criteria is not necessary.

The following is a summary of EPA's evaluation of the Threshold Criteria:

1. Protect Human Health and the Environment

The components of the proposed remedy described in Section IV protect human health and the environment from exposure to contamination in groundwater and soils for current and anticipated land use.

There are no current known human health threats associated with domestic uses of the contaminated groundwater originating from the Facility because groundwater is not currently used for potable purposes. The properties in the vicinity of the Facility are serviced by public water from a source not affected by Facility related contamination and there are no private wells located in the area.

FMC will be operating the expanded Groundwater Recovery System until groundwater is restored to drinking water standards. Until those standards are met, EPA is proposing to require institutional controls, as necessary, to restrict use of groundwater beneath the Facility for potable purposes or any other use that could result in human exposure. EPA's proposed remedy also requires the implementation of institutional controls to prevent any activities which would interfere with or adversely affect the integrity or effectiveness of the remedial actions performed at the Facility.

A primary concern associated with the contaminated groundwater under current conditions is the discharge of site-related contamination into the Stonehouse Cove and Curtis Bay. If EPA determines that the groundwater is not being effectively controlled and site-related contamination in excess of acceptable concentrations continues to enter Stonehouse Cove and/or Curtis Bay, EPA will require FMC to evaluate additional remedial actions, including the construction of physical barriers, to contain site-related groundwater contamination to protect the sediments, surface waters, and biota of Stonehouse Cove and Curtis Bay. In addition, based on the results of the sediment and pore water sampling, and subsequent benthic studies as applicable, sediment remediation may be required. If EPA determines that additional corrective measures are necessary to prevent site-related contamination from entering Stonehouse Cove and/or Curtis Bay and/or remediate sediment, EPA will solicit public comments on any such corrective measures prior to amending the FDRTC and including them in the final remedy for the Facility.

There is also concern that contaminated groundwater from the plume can volatilize and migrate vertically through soil into buildings through cracks, joints and utilities openings. The proposed remedy will require the installation of a vapor control system in each new and existing building. Based on sampling conducted in the summer of 2009, EPA will determine the specific engineering controls necessary for the vapor control systems to eliminate the potential for vapor

intrusion.

With respect to soil contamination, a Soil Management Plan will be developed that will contain soil remediation cleanup standards determined by EPA and MDE. All construction activities or other activities that might disturb contaminated soil will be completed in accordance with the approved Soil Management Plan. The Soil Management Plan will also address final capping requirements for areas of exposed undisturbed soils and the areas with only a gravel cover. Soil stabilization measures will also be addressed as part of the Soil Management Plan. Storm water runoff will be controlled on Site to the extent necessary to comply with Maryland's Stormwater Management Program.

2. Achieve Media Cleanup Standards

The expanded Groundwater Recovery System will be operated until groundwater is restored to drinking water standards. EPA will also have FMC evaluate whether the expanded Groundwater Recovery System is preventing site-related groundwater contamination from entering Stonehouse Cove and/or Curtis Bay. If the evaluation shows that site-related contamination continues to enter Stonehouse Cove and/or Curtis Bay at unacceptable concentrations, EPA will require FMC to evaluate additional remedial actions including construction of a barrier wall to contain Site-related groundwater contamination to protect the sediments, surface waters, and biota of Stonehouse Cove and Curtis Bay. In addition, based on the results of the sediment and pore water sampling, and subsequent benthic studies as applicable, sediment remediation may be required.

On-site soils are primarily capped with building foundations, asphalt, or several inches of gravel. Soils that are disturbed during construction activities, including well installations, will be addressed in accordance with an approved Soil Management Plan. The Soil Management Plan will also address final capping requirements for areas of exposed undisturbed soils and the areas at the Facility which are covered by gravel.

3. Remediating the Source of Releases

In all remedy decisions, EPA seeks to eliminate or reduce further releases of hazardous wastes or hazardous constituents that may pose a threat to human health and the environment. FMC is presently conducting a hydrogeologic study on an approximately 23-acre portion of land referred to as the North Parcel at the Facility. FMC discovered significant groundwater contamination at this parcel during a site-wide groundwater sampling effort in the autumn of 2008. Once the Comprehensive Study is completed, FMC will propose the remedial action for the North Parcel. In addition, as part of the Comprehensive Study required by the proposed remedy, FMC will identify source areas and propose various remedies to address those source area. EPA and MDE will evaluate FMC's proposals and will provide field oversight as necessary for the project.

FMC will continue to operate the Groundwater Recovery Systems to reduce the mass of VOC contamination in the groundwater and minimize the future migration of contaminants into Stonehouse Cove and Curtis Bay. The Soil Management Plan will require the proper removal and off-site disposal of contaminated soils that are disturbed during any earth moving activities

conducted on-Site, thereby removing the source of contaminants from Facility soils as well as a source of groundwater contamination.

VI. Financial Assurance

EPA will require FMC to provide assurances of financial responsibility for completing the Final Remedy. Financial Assurance details will be provided in the Permit modification.

VII. Public Participation

Interested persons are invited to comment on EPA's proposed decision. The public comment period will last thirty (30) calendar days from the date that notice is published in a local newspaper. Comments may be submitted by mail, fax, e-mail, or phone to:

Mr. William Wentworth (3LC20)
U.S. EPA Region III
1650 Arch Street
Philadelphia, PA 19103

Phone: (215) 814-3184
Fax: (215) 814 -3114

Email: Wentworth.William@epa.gov

A public meeting will be held upon request. Requests for a public meeting should be made to Mr. Wentworth at the address listed above. A meeting will not be scheduled unless one is requested.

The Administrative Record contains all the information considered by EPA for the proposed decision at this Facility. The Administrative Record is available at the following location[s]:

U.S. EPA Region III
1650 Arch Street
Philadelphia, PA 19103

Contact: Mr. William Wentworth (3LC20)
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Letter from EPA to FMC, Re: Continuance of RCRA Corrective Action Permit (EPA ID No. MDD003071875). 25 February 2003.