# Final Close-Out Report

## FMC Dublin Road Superfund Site
## Towns of Shelby and Ridgeway, Orleans County
## New York

## I. INTRODUCTION

The United States Environmental Protection Agency (EPA) has determined that all appropriate response actions for the FMC Dublin Road Superfund Site (Site) have been successfully implemented in accordance with the *Close-Out Procedures for National Priorities List Sites (OSWER Directive 9320.2-22, May 2011).*

All appropriate response actions at the Site have been successfully implemented. Specifically, based upon field observations associated with EPA oversight and the results of a final inspection of the Site on September 11, 1996, as well as subsequent five-year review (FYR) inspections, the most recent of which was October 25, 2019, it has been determined that the remedy has been constructed in accordance with the 1993 Record of Decision (ROD). In addition, groundwater monitoring data for samples collected from the groundwater monitoring well network since 2013 indicate that groundwater restoration cleanup levels identified in the ROD have been achieved.

The ROD included recommendations for limiting future use of the Site and the groundwater through deed restrictions to ensure that the remedial measures taken on the Site will not be disturbed and that the Site will not be used for purposes incompatible with the completed remedial action. The deed restrictions are memorialized in an Environmental Easement and Declaration of Restrictive Covenants recorded at the Orleans County Clerk's Office in June 2015.

It has been determined that no further response, other than long-term monitoring, operations and maintenance, and five-year reviews, is warranted. Human exposures and contaminated groundwater releases are under control.

## II. SUMMARY OF SITE CONDITIONS

### Background

The Site is located in northwestern New York in Orleans County, and is situated partly in the Town of Ridgeway and partly in the Town of Shelby. The 30-acre property originally consisted of a rectangular portion of approximately 21 acres lying north of Dublin Road, and a triangular portion of approximately nine acres lying south of Dublin Road. The northern section is partially wooded and contains a wetland, a drainage swale, and two inactive rock quarries. Jeddo Creek runs in a northerly direction through the northeast corner of the Site. The southern portion of the Site contained a waste pile, a rectangular pond and a swampy area; it is bounded by the New York State Barge Canal to the south and west, Dublin Road to the north, and a municipal landfill to the east.

The major hydrogeologic units consist of an overburden aquifer, upper bedrock aquifer, and lower bedrock aquifer. Overburden at the site ranges from 0 to 25 feet in thickness and consists of natural

soils, fill and waste material. The underlying Grimsby Formation, which is up to 52 feet in thickness, consists of red and white sandstone with the upper 25 feet of the formation having intense fracturing."

In or about 1944, the FMC Corporation (FMC) purchased the 30-acre Site as part of its acquisition of the Niagara Sprayer and Chemical Company, Inc. From about 1933 to 1968, approximately six acres of the Site south of Dublin Road were used for the disposal of coal ash cinders, laboratory wastes (consisting of glass bottles and chemical residues), residues from lime sulfur solution filtration, building debris, and residues from the cleanup of the pesticide production areas and equipment. The wastes, other than the laboratory wastes, were generated at FMC's Middleport, New York manufacturing plant. The laboratory wastes came from FMC's Tonawanda laboratory.

In 1978, an environmental assessment indicated the presence of chemicals on-Site surface water and groundwater. Surface water runoff transported contaminants from the waste pile to the rectangular pond, swamp, and quarries. Chemicals detected in sediment and surface water included arsenic, copper, lead, zinc, BHC and its isomers, DDT and its metabolites.

In 1981, additional monitoring wells were installed in the overburden and bedrock aquifers, soil, and sediment. Groundwater samples were collected and analyzed. Based on these results, it was concluded the chemicals were migrating into the groundwater and off-Site through the lower bedrock aquifer.

In 1982, the New York State Department of Environmental Conservation (NYSDEC) and FMC entered into an Administrative Order on Consent (AOC), whereby FMC agreed to conduct a field investigation. The Site was proposed to the National Priorities List (NPL) on October 15, 1984 (49 FR 40320) and placed on the NPL on June 10, 1986 (51 FR 21054). The CERCLIS ID is NYD000511857. FMC and NYSDEC entered into a second Consent Order in February 1988 under which FMC agreed to further define the extent of contamination at the Site, complete the Remedial Investigation/Feasibility Study (RI/FS) and perform the remedial action. The 1988 Consent Order superseded and replaced the 1982 Order.

**Remedy Selection**

The RI, including a supplemental field investigation, was completed in May 1989 and was approved by NYSDEC in June 1990. The FS was approved in January 1991. On March 31, 1993, NYSDEC and EPA issued a joint Record of Decision (ROD) selecting a remedial action for the Site. The elements of the selected remedy were as follows:

- Excavation, screening, and stabilization of all contaminated materials (soil and sediments) from the waste pile, rectangular pond, swamp, drainage swale, the quarries, and other areas contaminated above cleanup levels;
- Stabilization of materials that failed the toxicity characteristic leaching procedure (TCLP);
- Construction of a customized on-Site containment cell complete with a leachate collection system and permanent cap designed to meet the New York States Landfill Regulations at 6 NYCRR Part 360;
- Deposition of stabilized material and other soil/sediment contaminated above cleanup levels

in the on-Site containment cell;
- Collection of contaminated groundwater via a series of extraction wells;
- Treatment of contaminated runoff water, construction water, and groundwater in an on-Site groundwater treatment system;
- Restoration of the wetlands that existed on-Site;
- Installation of permanent fencing around the Site;
- Placement of deed restrictions on the property at the completion of remediation; and
- Performance of a long-term operation, maintenance, and monitoring plan (OM&M) at the Site.

**Remedial Action Objectives (RAOs)**

The RAOs established in the ROD are as follows:

- Adequately protect against ingestion of, or contact with, contaminated soil;
- Minimize damage to and provide adequate protection of the saturated zone from contaminants migrating from soil;
- Minimize damage from and adequately protect against the spread of the contaminated groundwater;
- Adequately protect against future ingestion of, or contact with, contaminated groundwater;
- Adequately protect against contamination of surface water and sediments in the Site vicinity;
- Adequately protect against contaminated dust emissions into ambient air.

The contaminants of concern at the Site and cleanup levels are provided in Table 1.

**Remedial Construction Activities**

FMC implemented the remedial action pursuant to a 1988 consent order with NYSDEC. Mobilization for remedial construction occurred in May 1994. Remedial construction activities at the Site included excavation, stabilization and containment of stabilized material in an on-Site containment cell; treatment of contaminated runoff/construction water, surface water, groundwater, and any leachate from the containment cell in an on-Site water treatment system, and reconstruction of disturbed wetlands. The primary contractors who performed the remedial construction and supplied remedial systems included:

- Remcof, Inc., General Contractor for the 1994 construction season;
- FMC, Inc., General Contractor for the 1995 construction season;
- Smith Environmental, Inc., General Contractor for the 1996 construction season;
- Andco Environmental Process, Water treatment equipment and engineering services;
- BEI, RI/FS and remedial design for Site; engineering reviews and quality control inspections; and
- Solmax Geosynthetics, Inc., Supplied and installed liner systems (containment cell/leachate collection system/cap).

In general, construction activities for the remedial action at the Site were conducted from 1994 through 1996. Construction activities performed during the 1994 season included:

- Mobilization of on-Site support services (establish electrical and telephone connections to temporary offices);
- Clearing, grubbing, and chipping Site vegetation;
- Installing fencing around the perimeter of excavation and treatment areas;
- Abandoning on-Site monitoring wells located in proposed construction and/or excavation areas;
- Constructing an area for the stabilization process and mobilizing stabilization equipment;
- Constructing an on-Site containment cell and leachate collection system (consistent with 6 NYCRR Part 360) to contain stabilized material and soils contaminated above RAOs;
- Constructing a temporary water treatment unit;
- Constructing erosion control barriers and collecting surface water runoff from the Site;
- Treating the collected surface water and decontamination water through a temporary water treatment system consisting of bag filters and activated carbon and discharge to a temporary pond and settling basin that was constructed with a 100,000 gallon storage capacity.
- Surveying a Site grid system in preparation for excavation and verification sampling of contaminated areas;
- Dewatering the existing swamp, rectangular pond, and quarries;
- Excavating 44,931 cubic yards of contaminated soils and sediment from the waste pile, rectangular pond, quarries, exclusion zones and other areas with contamination exceeding cleanup levels;
- Storing stabilized material in a temporary stockpile and testing to ensure it passed the TCLP test;
- Depositing the treated material (after passing the TCLP and other tests) into the containment cell;
- Implementing a winterizing program that included: demobilization of shower trailer, decontamination trailer, treatment area equipment, and temporary water treatment unit; and
- Installation of temporary geomembrane liners over the containment cell, treatment area, and decontamination pad; installation of erosion control measures at containment cell and treatment area; surface water controls; containment cell leachate monitoring; security measures; and both weekly and monthly Site inspections.

During construction of the remedy, it was discovered that the amount of contaminated soils at the Site was greater than originally estimated. Since the size of the on-Site containment cell was based on the original estimates, an extension to the cell was required to accommodate the additional material, the NYSDEC and the USEPA then issued an Explanation of Significant Difference (ESD) in July 1995 to inform the public that the remedy called for in the ROD would be modified and to document the modification. The ESD was published in the local newspapers and a fact sheet was distributed to the public.

Construction activities performed during the 1995 season included:

- Installing an on-Site permanent groundwater treatment system;

- Constructing a containment cell extension, including composite liner and leachate collection/removal system, to hold additional material exceeding cleanup levels;
- Sampling areas prior to excavation and analysis for comparison to cleanup levels;
- Excavating and disposing of 25,947 cubic yards of contaminated soil and sediment from the waste pile area, rectangular pond, swamp area and other areas with contamination exceeding the cleanup levels;
- Completed placing material in the containment cell extension and installing a permanent cap on containment cell/cell extension;
- Installing and testing the groundwater extraction system comprising of electrochemical precipitation, pH adjustment, sedimentation, filtration, and carbon absorption.
- Implementing a winterizing program that included: installation of erosion control measures around wetland stockpiled material, culvert crossing Dublin Road, and containment cell; pumping of leachate into temporary holding basin for storage; and
- Implementing surface water controls; installation of heating system on the water treatment unit; routine security monitoring by local law enforcement; and weekly and monthly Site inspections.

Post excavation sampling indicated that all soil and sediment remediation goals were achieved.

Construction activities performed during the 1996 season included:

- Monitoring domestic wells downgradient (within one mile) of the Site;
- Continuing to pump leachate collection system/runoff/construction/quarry water through the on-Site water treatment system;
- Resampling of sediment in quarries, removing 771 cubic yards of contaminated sediment and disposing of material in an off-Site secure landfill;
- Restoring and vegetating former drainage swale as a wetland area;
- Grading excavated areas with clean fill and seeding to prevent ponding of surface water;
- Completing installation of permanent fence around the Site;
- Reversing drainage gradient of adjacent municipal landfill to drain away from the Site; and
- Beginning operation of groundwater extraction and treatment systems in November of 1996.

NYSDEC conducted a pre-final Site construction inspection on August 1, 1996. A minor list of outstanding construction items was generated and were addressed by FMC before the final inspection. NYSDEC and the USEPA conducted a final construction inspection on September 11, 1996. EPA documented the completion of construction activities in the Preliminary Closeout Report on May 29, 1997. In June 1997, FMC submitted a report entitled *Interim Remedial Action Report for the Dublin Road Site* to the NYSDEC and EPA documenting the remedial construction activities performed.

***Institutional Controls***

The ROD included recommendations for limiting future use of the Site and the groundwater through deed restrictions to ensure that the remedial measures taken on the Site will not be disturbed and that the Site will not be used for purposes incompatible with the completed remedial action. The deed restrictions are memorialized in an Environmental Easement and Declaration of Restrictive Covenants recorded at the Orleans County Clerk's Office on June 17, 2015.

**Site Management Plan**

An operation and maintenance (O&M) program is part of this remedy and has been developed and implemented. The O&M program includes operation and maintenance of the pump and treat system, leachate collection system, and the containment cell. The pump and treat systems began operating in November 1996. A monitoring program was also developed and initiated and included groundwater, surface water, and treatment system discharge monitoring. Details of the O&M program are included in the O&M Manual which was approved by the NYSDEC on December 3, 1996. Subsequent monitoring indicated that the containment and treatment systems were operating as designed.

In August 2005, FMC submitted a proposal to EPA and NYSDEC for the shutdown of the groundwater extraction system at the Site and for modifications of the Site monitoring program based on data. By letter dated August 28, 2006, the Agencies provided comments to FMC and advised that for purposes of the evaluation by the Agencies relative to discontinuing or modifying the groundwater extraction remedy, FMC should perform a Technical Impracticability (TI) Evaluation based on EPA guidance. Ultimately, because of decreasing concentrations of groundwater in containment cell monitoring wells and perimeter monitoring wells located outside of the containment cell, the report did not provide a rationale for a TI waiver at the Site, instead it simply provided the justification that continued operation of the groundwater treatment system was no longer necessary. On May 29, 2012, NYSDEC approved FMC's TI Report and the operation of the groundwater extraction and treatment system was terminated on May 29, 2012.

The Site Management Plan (SMP) includes operation and maintenance of the leachate collection system and maintenance of the containment cell. When the water level measured in the 12 containment cell collection sumps is greater than 0.8 foot, the water is removed and placed into a holding tank within the treatment building. The treatment building continues to be maintained in accordance with the SMP. However, as noted in the SMP, FMC may propose dismantlement of the extraction well pumping system and groundwater treatment plant after a five-year shut down period. Periodic adjustments and/or modifications to the constructed remedy are performed by FMC to maintain optimum performance. The SMP also includes periodic groundwater and surface water monitoring. Currently, groundwater is sampled on a semi-annual basis and surface water is sampled annually to assess performance of the remedy and/or surface and groundwater conditions at the Site. The groundwater monitoring well network consists of monitoring wells both upgradient and downgradient of the Site, as well as wells inside and around the perimeter of the containment cell.

## III. MONITORING RESULTS

### *Groundwater Quality Monitoring*

A network of monitoring wells monitors groundwater conditions both upgradient and downgradient of the Site. The network consists of containment cell and perimeter wells. Following the suspension of the groundwater extraction and treatment activities, sampling of the 11 extraction wells was no longer conducted effective the second quarter of 2012.

Containment Cell Monitoring Wells

The containment cell wells are intended to monitor the integrity of the containment cell and the

potential to impact groundwater quality at the Site. The containment cell is monitored by three overburden wells (M27, MW92, and MW93) and four wells installed in the upper bedrock (MW40, MW 89M, W90, MW91). These wells were sampled in November 1996 to establish baseline conditions. In accordance with the requirements in the SMP, the containment cells are sampled semi-annually for pesticides (4 BHC isomers) and metals (arsenic, copper, lead and zinc), with the exception of samples that could not be collected during the monitoring event due to insufficient water volume in the well.

Since 2013, analytical results from groundwater collected at the containment cell monitoring wells were all non-detect or were detected or estimated at concentrations below respective groundwater cleanup levels for all parameters analyzed.

Perimeter Wells

The Site perimeter wells are intended to assess whether contaminated groundwater is migrating off-Site. The Site perimeter is monitored by five wells: overburden well MW20, upper bedrock wells MW24, MW42, and MW61, and lower bedrock well MW60. Overburden monitoring well MW20 is located at the northeast corner of the Site hydraulically down-gradient from the remedial area. Upper bedrock monitoring wells MW24 and MW42 are located at the down-gradient perimeter of the Site near Jeddo Creek. Lower bedrock monitoring well MW-60 and upper bedrock monitoring well MW61 are located on the northeast corner of the Site near Jeddo Creek. In accordance with the requirements in the SMP, the perimeter monitoring wells were sampled quarterly from 1996 through 2012 and subsequently semi-annually for pesticides (4 BHC isomers) and metals (arsenic, copper, lead, and zinc), with the exception of samples that could not be collected during the monitoring event due to insufficient water volume in the well.

Since 2010, analytical data results from groundwater samples collected at the perimeter monitoring wells were all non-detect or were detected or estimated at concentrations below the respective groundwater cleanup levels for all parameters analyzed. Monitoring of these wells will continue.

**Surface-Water Quality Sampling**

In accordance with the requirements in the SMP, surface water monitoring of the on-Site wetland and East and West quarries is performed to assess potential migration of residual contaminated groundwater to surface water. Surface water monitoring is currently performed annually. The surface water samples are collected from three locations at the Site (the wetland [SW-1], East quarry [SW-2] and West quarry [SW-3]) and analyzed for pesticides (4 BHC isomers) and metals (arsenic, copper, lead, and zinc). In 2014, surface water samples were also analyzed for mercury.

Analytical data results from surface water samples analyzed from September 2015 through November 2019 for the fifth five-year review indicated no exceedances of New York State Ambient Water Quality Standards for all parameters. Monitoring of these surface water locations will continue.

**Wetlands, Quarries and Drainage Culverts**

Observations of the Site ditches and culverts indicated that they are all free of debris and are free

flowing. Also, observations made during routine visits revealed no problem with wetland vegetation or the integrity of the dike associated with wetlands.

**Soil/Sediments Verification Sampling and Analysis**

Sampling and analysis activities conducted as part of the soil remedial action included verification sampling of off-site backfill material and excavated areas, and confirmation sampling of stabilized material. In July 1994, seventeen soil samples were collected from an off-site borrow pit to be used as fill material. The sampling results indicated that the material met the cleanup requirements. Approximately 70,900 cubic yards of contaminated soils and sediments were excavated as part of the remedial action. While 23,980 cubic yards passed TCLP analysis and was placed directly into the containment cell, approximately 46,150 cubic yards was treated via soil stabilization before placement in the containment cell. The 771 cubic yards of contaminated sediment excavated from the quarries during the 1996 construction season as a result of the resampling was disposed of in an off-Site secure landfill.

## IV. ATTAINMENT OF GROUNDWATER RESTORATION CLEANUP LEVELS

As noted above in Section III, groundwater monitoring results indicate that concentrations of Site-related contaminants in the perimeter and containment cell monitoring wells are all below groundwater restoration cleanup levels identified in the ROD.

## V. SUMMARY OF OPERATION AND MAINTENANCE REQUIRED

A long-term operation, maintenance and monitoring program is being implemented in accordance with the O&M Plan and was designed to ensure that the implemented remedy remains effective. The O&M Plan was approved in December 1996 and subsequently modified in May 1997 and March 2012.

The O&M plan which is being conducted by Parsons, consultant for FMC, includes numerous activities. The following activities are conducted on an annual basis:

- Site-wide inspection;
- surface water sampling; and
- periodic review reporting.

The following activities are completed semi-annually:

- mowing of the containment cell cover;
- inspection of the containment cell cover;
- sampling of the five perimeter wells;
- sampling of the seven containment cell wells; and
- hydraulic monitoring of Site groundwater monitoring wells.

The following activities are conducted monthly:

- visual inspection of the wetland weir, wells, sumps, treatment plant, perimeter security fence; and
- measurement and pump-out of water in the containment cell sumps.

In addition to media monitoring, O&M activities include periodic certification that the institutional controls established in the environmental easement attached to the Site property are unchanged and that nothing has occurred that would impair the ability to protect public health and the environment. This certification is provided in the Annual O&M Status and Periodic Review Report by FMC.

## VI. DEMONSTRATION OF CLEANUP ACTIVITY QA/QC

RA activities conducted at the Site were undertaken in a manner consistent with the ROD and with the RD plans and specifications, as modified by the as-built documentation. All applicable EPA and NYSDEC quality assurance and quality control (QA/QC) procedures and protocols were incorporated into the RD. All procedures and protocols followed during the RA are documented in the RD reports and the sample analyses were performed at state-certified laboratories.

The QA/QC program used throughout the RA was rigorous and in conformance with EPA and NYSDEC standards; therefore, EPA and NYSDEC have determined that all analytical results are accurate to the degree needed to assure satisfactory execution of the RA, and that they are consistent with both the ROD and the RD plans and specifications, as modified by the as-built documentation.

## VII. FIVE-YEAR REVIEW

Because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure a statutory five-year review is required. The fifth five-year review was completed in March 2020. The review concluded that the remedy is functioning as intended by the decision documents and is protective of human health and the environment. The five-year review did not include any issues or recommendations. The next five-year review is underway and is scheduled to be completed before March 2025.

## VIII. SITE COMPLETION CRITERIA

The Site meets all the Site-completion requirements as specified in *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.2-22, May 2011). Specifically, the implemented remedy achieved the degree of cleanup specified in the ROD for all pathways of exposure. The remedy, remedial action objectives, and associated cleanup goals are consistent with agency policy and guidance. No further Superfund response action beyond the ongoing maintenance activities, groundwater and surface water monitoring, and monitoring of institutional controls are needed to protect human health and the environment. Five-year reviews will continue to be performed to ensure the remedy remains protective.

Approved:

Evangelista, Pat

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06/11/2020

Pat Evangelista, Director
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Date

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*Fourth Five-Year Review, FMC Dublin Road Superfund Site*, EPA, September 30, 2015

*Fifth Five-Year Review, FMC Dublin Road Superfund Site, EPA, March 31, 2020*

*O&M Status and Periodic Review Report, FMC Dublin Road Superfund Site*, Parsons, January 2019

Table 1

Chemicals of Concern

| Chemical of Concern | Groundwater[1] | Surface Water[2] | Soils[3] | Sediment[4] |
|---|---|---|---|---|
| | | | | |
| Arsenic | 0.025 | 0.019 | 35 | 5 |
| Copper | 0.2 | 0.027 | 25 | 19 |
| Lead | 0.025 | 0.011 | 93 | 27 |
| Mercury | NE | NE | 0.1 | 0.11 |
| Zinc | 0.3 | 0.030 | 30 | 85 |
| BHC (total)* | | 0.00001 | NR | NE |
| Alpha BHC | ND[3] | | 0.48 | NE |
| Beta BHC | - | | 1.6 | NE |
| Gamma BHC | - | | 2.3 | NE |
| DDT | ND[4] | 0.000001 | 8.8 | NE |
| DDE | ND[4] | 0.000001 | 8.8 | NE |
| DDD | ND[4] | 0.000001 | 12.4 | NE |

1. ARAR – NYSDEC, 1991. Title 6 NYCRR Part 701 for Class GA Groundwater.
2. ARAR – NYSDEC, 1991. Title 6 NYCRR Part 701 for Class C Water. Calculated based on a measured hardness of 268 ppm from Jeddo Creek Tributary.
3. BE, 1990. RAO established in the FS Outline and approved by NYSDEC.
4. BE, 1990. RAPs established in the FS outlined and approved by NYSDEC>
5. The approved RAO for BHC compound is 0.00005 mg/l based on analytical constraints (BEI, 1990).
6. The approved RAO for DDT, DDE, and DDD is 0.0001 mg/l based on analytical constraints (BEI, 1990).

ND = not detectable.
NE – ROAs for these contaminants not established. It is anticipated that cleanup to the RAOs for the remaining contaminants will remove all or most of the sediments in the rectangular pond will be cleared to the RAOs for soils before backfilling.
NR – Value not required. RAOs for individual BHC compounds will govern.
* Applies to sum of all isomers.