REGION 5
CHICAGO, IL 60604

EXPLANATION OF SIGNIFICANT DIFFERENCES

MOSS-AMERICAN SUPERFUND SITE
MILWAUKEE, WISCONSIN

May 2024

I. Introduction

This decision document presents an Explanation of Significant Differences (ESD) for the Moss-American Superfund Site (Site) located in Milwaukee, WI. The Record of Decision (ROD) addressed in this ESD was issued in September 1990 and was amended by an ESD issued in 1997, a ROD Amendment issued in 1998, and an ESD issued in 2007. This ESD is issued in accordance with § 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9617(c), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), § 300.435(c)(2)(i). The U.S Environmental Protection Agency (EPA) is the lead agency supported by the Wisconsin Department of Natural Resources (WDNR). The Director of the Superfund & Emergency Management Division has been delegated the authority to sign this ESD. This ESD and all technical information and data relating to it shall become part of the Administrative Record for the Site, which has been developed in accordance with § 113(k) of CERCLA, 42 U.S.C. § 9613(k), and NCP § 300.825(a)(2). The references included in the update to the administrative record for this ESD are included in Appendix A. The Administrative Record is available for review at the Good Hope Library, 7715 W. Good Hope Rd., Milwaukee, Wisconsin, at the EPA, Region 5 Superfund Records Center at 77 W. Jackson Boulevard in Chicago, Illinois, or online at: https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.ars&id=0505024&doc=Y&colid=1745&region=05&type=AR

II. Statement of Purpose

The purpose of this ESD is to document additional source material that was discovered, the 2018 source material response action taken by the State, and the change of the excavated soil treatment technology from low-temperature thermal desorption to offsite disposal for discovered source material. These changes are based on a 2011 Remediation System Evaluation of the groundwater remedy recommending excavation of non-aqueous phase liquid (NAPL)-impacted soil to shorten the time needed to achieve cleanup objectives and gain site closeout. EPA prepares an ESD when it is determined by the Agency that changes to the original selected remedy are significant, but do not fundamentally alter the remedy selected in the ROD with respect to scope, performance, or cost.

III. Site History and Contamination

The 88-acre Moss-American Site is located at 8716 N. Granville Road in the northwestern section of the City of Milwaukee, Wisconsin and encompasses a former wood-treating facility, plus several miles of the Little Menomonee River and its adjacent floodplain. It is bounded by the intersection of Brown Deer and Granville Roads on the west, and Brown Deer Road and

91st Street on the east. Twenty-three (23) acres are zoned industrial and owned by the Union Pacific Railroad, which used the property as a loading and storage area. Milwaukee County (County) owns the remaining sixty-five (65) acres, containing part of the former wood-treating facility and the parklands/floodplain corridor. The County's portion of the Site features recreational hiking and bicycle trails along the five-mile stretch of the Little Menomonee River.

The former wood-treating facility began operating in 1921. The facility preserved railroad ties, poles, and fence posts with creosote, a mixture of 200 or more chemical compounds derived from coal tar and fuel oil. The process used a 50/50 mixture of creosote and No. 6 fuel oil and was the source of the contamination seen at the site. The facility was originally owned by the T.J. Moss Tie Company, which was then sold to Kerr-McGee in 1963 who changed the facility's name to Moss-American. The name was changed again in 1974 to Kerr-McGee Chemical Corporation – Forest Products Division. This entity would later be merged into a new Kerr-McGee subsidiary called Kerr-McGee Chemical Worldwide LLC that would become Tronox Worldwide LLC, and that entity's membership interests would go into a new holding company called Tronox, Incorporated (Tronox) spun off in 2006. In 2009, Tronox declared Chapter 11 bankruptcy.

Until the Tronox bankruptcy in 2009, Remedial Design/Remedial Action (RD/RA) work had been conducted under a Consent Decree with Kerr-McGee Chemical Corporation entered on March 29, 1996. The federal government subsequently obtained settlements that addressed the site in the Tronox bankruptcy case on February 14, 2012, and in litigation with Anadarko Petroleum on January 21, 2015.

In 1983, EPA proposed the Site to the Superfund National Priorities List (NPL) and finalized the Site on the NPL in September 1984.

EPA conducted a baseline human health and ecological risk assessment as part of the Remedial Investigation effort for the Site between 1987 and December 1989. Major site contaminants fell into the chemical groups of polycyclic aromatic hydrocarbons or PAHs and BTEX (benzene, toluene, ethylbenzene, xylene) compounds. PAHs are a primary component of creosote blends and have been associated with lung, stomach, and skin cancers. As for the BTEX compounds, benzene has been associated with occurrences of leukemia, while toluene and xylenes appear to cause depression of the human central nervous system. EPA defined three exposure scenarios in the risk assessment to describe potential human exposures for current site conditions and potential future uses. These exposure scenarios were direct contact, direct or indirect ingestion, and inhalation of suspended particles.

IV. Selected Remedy

EPA issued a ROD on September 27, 1990, that included: 1) excavation and onsite treatment/disposal of highly contaminated soil, 2) removal and disposal of contaminated sediments from the river and diverting river flow into a new channel, 3) collecting and treating contaminated groundwater, and 4) fencing and institutional controls (ICs) to minimize dermal contact.

The major components of the selected remedy included the following:

- Excavation of 80,000 cubic yards of highly contaminated soil for treatment in a bioslurry vessel to health-based risk levels of 1 x 10^{-4} or less. The removal criterion of "highly contaminated soil or sediment" is defined as an extractable organic (EO) level of 1000 mg/kg or greater, or the presence of tarry or oily material and/or a creosote odor. The removal of highly contaminated soil and sediment is expected to remove all contaminated materials that exceed a risk level of 1 x 10^{-4}, which is defined as 6.1 milligrams per kilogram (mg/kg) of CPAHs in soil, and 388 mg/kg of CPAHs in sediment;
- Removal and offsite disposal of 5,200 cubic yards of highly contaminated sediments to a health-based risk level of 1 x 10^{-6} (15 mg/kg CPAHs) or less from the Little Menomonee River, creating a new channel in the vicinity of the Little Menomonee River and then diverting flow into the new channel, and filling the dewatered existing channel with soils from the new channel excavation;
- Disposal and cover of 210,000 cubic yards of treated soil and lesser-contaminated soils onsite, with re-vegetation of the excavated areas;
- Onsite disposal of residue from the treatment of Northeast Landfill soil in a RCRA-compliant unit within the area of contamination;
- Fencing and ICs to minimize potential dermal contact (ICs, in the form of deed restrictions, were further addressed in a 1998 ROD Amendment); and
- Collection and treatment of contaminated site groundwater.

In 1997, EPA signed, with WDNR concurrence, an ESD that addressed the following:

- Groundwater containment and in-situ treatment

In 1998, EPA issued, with WDNR concurrence, a ROD Amendment that addressed the following:

- Soil treatment technology changed from bioslurry to low-temperature thermal desorption (LTTD). Also known as low-temperature thermal volatilization or thermal stripping, LTTD is an ex-situ remedial technology that uses heat to physically separate petroleum hydrocarbons from excavated soils.
- Clarified soil clean-up levels based on land use and deed restrictions.
- Provided for a Corrective Action Management Unit (CAMU) under the Resource Conservation and Recovery Act (RCRA).

In 2007, EPA issued, with WDNR concurrence an ESD to address the following:

- Dredging portions of the Little Menomonee River (in-lieu of rerouting).

In 2009, EPA issued a Preliminary Close-Out Report. Through a 2015 cooperative agreement (CA) with EPA, WDNR took over Site groundwater monitoring along with appropriate property maintenance.

V. Basis for the ESD

The 2010 Five-Year Review (FYR) for the Site recommended an optimization study to determine a solution to elevated levels of COCs in the local area of the funnel and gate. (EPA, 2010). In 2011, the US Army Corps of Engineers (USACE) completed a Remediation System Evaluation (RSE) of the groundwater remedy for EPA (USACE, 2011). The USACE RSE process is designed to help site operators and managers improve effectiveness, reduce operation costs, improve technical operation, and gain site closeout. The RSE identified persistent, elevated COC levels in groundwater that continue to increase long-term operations and overall costs.

The RSE made the following recommendations and conclusions:

- Increase groundwater monitoring
- Complete NAPL investigation
- Excavate NAPL-impacted soil
- Excavation of NAPL-impacted soil has the greatest potential to shorten the time needed to achieve cleanup objectives.

Removal of residual NAPL would eliminate the continued source to the dissolved-phase contaminated groundwater plume and would shorten the time to Site closeout. The RSE also recommended the use of an oxygen-releasing compound to enhance bioremediation in the vicinity of the excavation.

Subsequent to the 2011 RSE, WDNR completed an investigation of the areas recommended for cleanup action and found additional source material that met the requirements established for excavation and treatment in the ROD, as amended in 1998. Based on the limited area of soil to address, WDNR determined that they would dispose of most of the contaminated soil offsite.

In 2018, under a CA with EPA, WDNR completed a response action to remove remaining sources of groundwater contamination at the Site (i.e., NAPL in soil), which were preventing compliance with groundwater cleanup goals identified in the 1990 ROD (SIGMA, 2018). To accomplish this, WDNR implemented recommendations made in the 2011 RSE. This involved excavation of over 10,000 tons of NAPL-contaminated material. Approximately 7,060 tons of NAPL-impacted material were excavated and hauled offsite for disposal. The remaining 3,000 tons of low-level contaminated soil were treated in place with the addition of chemical oxidant (OBC™) reagent. The use of the chemical oxidant reagent both degraded the low-level contaminants and enhanced biodegradation of dissolved-phase contaminants in groundwater. See Figure 1.

In 2020, review of the quarterly groundwater monitoring data indicated contaminant concentrations within most of the monitoring wells were either non-detect or at levels less than the NR 140 Enforcement Standards [ESs]. However, concentrations of naphthalene (a fingerprint constituent of creosote historically used at the site) within three monitoring wells (MW-33S, PZ-02, and PZ-03) have been fluctuating at persistently high concentrations. Concentrations of naphthalene within monitoring well PZ-03 have been found to exceed the NR 140 ES by a factor of 40, indicating the presence of contaminant mass (free phase product) in

the vicinity. Concentrations of naphthalene within monitoring wells MW-33S and PZ-02 have fluctuated and exceeded the NR 140 ES as well.

Based on the high concentrations of naphthalene in these wells, a phased investigation was completed in 2021 and 2022. The 2021 investigation focused on MW-33S, PZ-02, and PZ-03 (Sigma, 2021). Results of the investigation in the vicinity of monitoring wells MW-33S and PZ-02 indicated impacted groundwater is limited in extent and that no free product was observed. Naphthalene impacts within soil are limited to four locations at concentrations slightly higher than the NR 720 groundwater pathway residual contaminant level (RCL) of 0.6582 mg/kg. The naphthalene impacts within groundwater were identified at concentrations greater than the NR 140 ES but were not indicative of free product.

The 2022 supplemental investigation focused on the PZ-03 area (Sigma, 2022). Results of the 2021 and 2022 investigations in the vicinity of monitoring well PZ-03 indicate high concentrations of naphthalene in both soil and groundwater, and free product was observed. The highest concentration of naphthalene within soil was reported at 1,230 mg/kg, or 50 times higher than the industrial direct contact RCL. The highest concentration of naphthalene within groundwater was reported at 4,100 micrograms per liter (ug/L), or 40 times higher than the NR 140 ES. Naphthalene impacts were identified based on soil sample results and the observed presence of free product at depths ranging from 7.5 to 13 feet below ground surface (bgs), with the highest concentrations detected at 8 to 10 feet bgs. The investigation indicated a combined total of approximately 3,500 tons of impacted soil requires removal from areas related to MW-33S, PZ-02, and PZ-03 (Sigma, 2023). See Figure 1.

Excavation of soil containing source material identified in the 2021 and 2022 investigations will greatly reduce the time to achieve the ROD groundwater cleanup standard for naphthalene of 10 ug/L.

VI. Description of Significant Differences

The significant difference between the current remedy and the past and proposed actions is based on the increased scope of the additional source material discovered at the Site. The excavation and offsite disposal of highly impacted soil and treatment of less impacted soil in 2018 had a positive impact on reducing groundwater contamination. Further excavation and offsite disposal will continue to improve the groundwater quality.

Under the current selected remedy, highly contaminated soils are subject to excavation and treatment with LTTD prior to placement in an onsite disposal unit. Due to the limited extent of contaminated soils in the MW-33S, PZ-02, and PZ-03 areas, it is more cost-effective to dispose of excavated soils offsite than to treat with LTTD onsite. Offsite disposal is estimated to cost $657/ton or $2.3M, while LTTD is estimated to cost significantly more at $960/ton or $3.36M. Offsite disposal also requires less equipment mobilization and site preparation effort than LTTD. Offsite disposal completely and permanently eliminates the excavated source material from the site in a shorter amount of time than LTTD. Offsite disposal will require importing suitable

material for backfill following excavation. The volume of soil to be addressed under the selected remedy is the same regardless of the disposal method.

VII. Support Agency Comments

EPA consulted with WDNR and provided it the opportunity to comment on this ESD in accordance with NCP § 300.435(c)(2) and (c)(2)(i) and CERCLA Section 121(f), 42 U.S.C. § 9621(f). WDNR concurred with this ESD in a letter dated March 5, 2024 (Appendix B).

VIII. Statutory Determinations

EPA has determined that these significant changes comply with the statutory requirements of CERCLA § 121, 42 U.S.C. § 9621, are protective of human health and the environment, comply with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, are cost-effective, and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted no less often than each five years after the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

IX. Public Participation

The public participation requirements set out in the NCP § 300.435(c)(2) have been met by publishing this ESD, making it available to the public on EPA's website at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0505024 and in the Administrative Record, and publishing a notice summarizing the ESD in a major local newspaper.

X. Authorizing Signature

I have determined the remedy for the Site, as modified by this ESD, is protective of human health and the environment, and will remain so provided the actions presented in this report are implemented as described above.

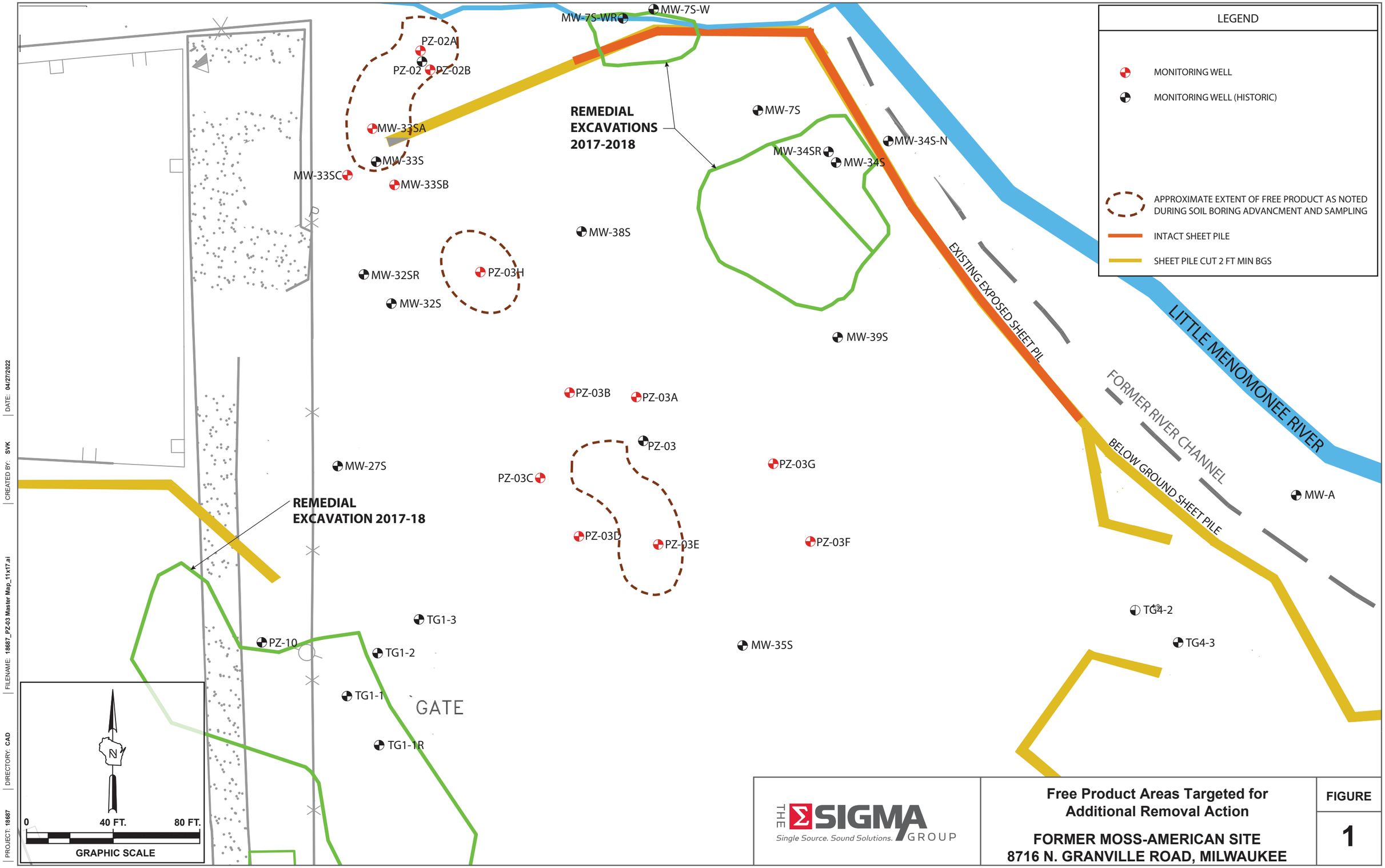
This ESD documents the significant changes related to the remedy at the Site. EPA selected these changes with the concurrence of WDNR. I therefore approve this ESD for the Moss-American Superfund Site.

Approved By

5/29/2024

X Douglas Ballotti

Douglas Ballotti, Director
Superfund & Emergency Management Division
Signed by: DOUGLAS BALLOTTI



DATE: 04/27/2022
CREATED BY: SVK
FILENAME: 18687_PZ-03 Master Map_11x17.ai
DIRECTORY: CAD
PROJECT: 18687

THE SIGMA GROUP
Single Source. Sound Solutions.

Free Product Areas Targeted for Additional Removal Action

FORMER MOSS-AMERICAN SITE
8716 N. GRANVILLE ROAD, MILWAUKEE

FIGURE
1

Appendix A

Update to Administrative Record

U. S. Army Corps of Engineers 2011. Remediation System Evaluation Moss-American Superfund Site Milwaukee, Wisconsin, March

U. S. EPA 1990. Record of Decision Moss-American Site Milwaukee, WI, September

The Sigma Group 2020. Quarterly Report of Groundwater Sampling (October 2020 Event), December

Appendix B

Concurrence Letter from Wisconsin Department of Natural Resources

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Tony Evers, Governor

Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

March 5, 2024

Mr. Douglas Ballotti, Director
Superfund & Emergency Management Division
U.S. EPA – Region 5
77 West Jackson Street
Chicago, IL 60604

Subject: Concurrence on the Explanation of Significant Differences, Moss-American Co., Inc. (Kerr-McGee Oil Co.) Superfund Site, Milwaukee, Wisconsin
DNR BRRTS Activity #02-41-529585; FID No. 241378280
EPA Site ID: WID039052626

Dear Mr. Ballotti:

The Wisconsin Department of Natural Resources (Department) is providing you with this letter to document the Department's concurrence with an Explanation of Significant Differences (ESD) to the September 27, 1990 Record of Decision (1990 ROD) for the Moss-American/Kerr-McGee Superfund site (Site). The 1990 ROD was previously amended by the April 1997 ESD, the September 1998 ROD Amendment, and the November 2007 ESD. We believe the modifications to the remedy described in the draft 2023 ESD comply with Wisconsin statutes and Administrative Code requirements.

The purpose of this ESD is to document the decision to change the soil treatment technology from low temperature thermal desorption to offsite disposal. The 1990 ROD included excavation and onsite treatment/disposal of highly contaminated soil. The 1998 ROD Amendment modified the soil treatment technology from bioslurry to low temperature thermal desorption. A 2011 optimization review conducted by the U.S. Army Corps of Engineers recommended excavation of remaining soil source areas to shorten the time to achieve groundwater cleanup goals.

The Department concurs with the modifications to the selected remedy at the Site, as described above and in the draft 2023 ESD.

Thank you for your support and cooperation in addressing the contamination at the Moss-American/Kerr-McGee Superfund site. Should you have any questions regarding this matter please contact Judy Fassbender at (414) 507-5571.

Sincerely,

Christine Sieger

Christine Sieger, Director
Bureau for Remediation and Redevelopment

Cc: Michele Norman, WDNR
Lee Delcore, WDNR
Jason Lowery, WDNR
William Murray, RPM, EPA Region 5