SIXTH FIVE-YEAR REVIEW REPORT FOR UNIVERSITY OF MINNESOTA (ROSEMOUNT RESEARCH CENTER) SUPERFUND SITE DAKOTA COUNTY, MINNESOTA

Prepared by

U.S. Environmental Protection Agency
Region 5
CHICAGO, ILLINOIS

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FFS	Focused Feasibility Study
FGOW	Former Gopher Ordnance Works
FUDS	Formerly Used Defense Sites
GPS	Global Positioning System
GUE	George's Used Equipment
GUE Deep	Area at the GUE site where PCBs up to 25 ppm were placed and capped
GUE Shallow	Area at the GUE site where PCBs up to 10 ppm were spread and soil-covered
HRL	Health Risk Limits
IC	Institutional Control
MDH	Minnesota Department of Health
MEDD	Minnesota Enforcement Decision Document
MERLA	Minnesota Environmental Response and Liability Act
MPCA	Minnesota Pollution Control Agency
NCP	National Contingency Plan
ng/L	Nanograms per Liter
NPL	National Priorities List
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
PE	Porter Electric and Machine Company
ppm	Parts per Million
RAL	Recommended Allowable Limit (State of Minnesota health-based limit for private drinking water supplies, precursor to the Health Risk Limit)
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act of 1976
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
Site	University of Minnesota (Rosemount Research Center) Superfund Site
SWRAU	Site-Wide Ready for Anticipated Use
TBC	To Be Considered
TDU	Thermal Destruction Unit
TSCA	Toxic Substances Control Act
UMore	University of Minnesota Outreach, Research and Education [Park]
UMRRC	University of Minnesota (Rosemount Research Center)
University	University of Minnesota
USACE	U.S. Army Corps of Engineers
UST	U.S. Transformer
UU/UE	Unlimited Use and Unrestricted Exposure

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the sixth FYR for the University of Minnesota Rosemount Research Center (UMRRC) Superfund Site (Superfund Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of three Operable Units (OUs) and all three OUs will be addressed in this FYR. OU1 addressed the groundwater contaminated with chloroform. OU2 addressed soil contaminated by lead, copper, and polychlorinated biphenyls (PCBs) from the George's Used Equipment (GUE) area; and OU3 addressed the soil and concrete contaminated with lead, copper, and PCBs from the GUE, U.S. Transformer (UST) and Porter Electric and Machine Company (PE) areas.

The UMRRC Superfund Site FYR was led by Giang-Van Nguyen, Remedial Project Manager at EPA Region 5. Participants included Garry Krueger, the Minnesota Pollution Control Agency (MPCA) Project Manager. The University of Minnesota (University), the Potentially Responsible Party, was notified of the initiation of the five-year review. The review began on June 8, 2021.

Site Background

The UMRRC Site is located within the city limits of Rosemount in Dakota County, approximately 15 miles southeast of Minneapolis/St. Paul, Minnesota (Appendix C, Figure 1). UMRRC is an agricultural research station and covers approximately five square miles and was used by some light manufacturing and service companies. The former operation and disposal practices of some of the lessees, and some former disposal practices of the University, resulted in suspected soil and groundwater contamination. Between 1960 and 1973, the University buried or incinerated gaseous, liquid, and solid chemical laboratory wastes on the site. In 1972, the University detected volatile organic chemicals and heavy metals in monitoring wells and soil on the site.

The UMRRC Site is located within the boundaries of the area known as University of Minnesota Outreach, Research and Education (UMore) Park (Appendix C, Figure 2). UMore Park is divided into three general areas: UMore East, UMore Mining Area and Vermillion Highlands (Appendix C, Figure 2). UMore East is along the northern and eastern boundaries of the UMore Park property. The UMRRC Site is within the UMore East Area. The UMore Mining Area is along the western portion of the UMore Park property and is used for sand and gravel mining.

Vermillion Highlands is along the southern boundary and is a scientific and natural area managed by the Minnesota Department of Natural Resources.

The UMore East area also contains the Former Gopher Ordnance Works (FGOW) Site, which is a Formerly Used Defense Site (FUDS) project managed by the U.S. Army Corps of Engineers. The FGOW Site was not part of the UMRRC Site.

The UMRRC Site consists of four former waste disposal areas: the GUE area (Parcels A and B), the UST area (Parcel C), the Burn Pit area (Parcel D), and the PE area (Parcel E). The Site includes groundwater contamination related to the former Burn Pit area operated by the University. Groundwater in the region starts about 70 to 80 feet below the surface and flows generally northeast towards the Mississippi River, with some local deviations due to fractured flow in bedrock. The Site also includes contaminated soils related to the three other disposal areas resulting from activities of the three tenants, GUE, PE, and UST.

UMore East is the subject of an area-wide land use planning process coordinated by the University, in cooperation with the City of Rosemount, Dakota County, and various State agencies including MPCA. In the past and currently, use of the Site is as a multi-use agricultural research center for the University. Current land uses in UMore East include active agricultural fields, unused parcels with ruins of the Former Gopher Ordinance Works, and various University operations.

Currently, a large residential redevelopment project is planned for a northwest portion of the UMore East area, just to the west of the Dakota County Technical College campus. Redevelopment plans have and are being implemented with oversight of the MPCA's Brownfield Program. Residences in the developed area will have access to municipal services, such as a public drinking water supply.

The University has initiated a Focused Feasibility Study (FFS) for portions of the FGOW under the oversight of the MPCA's Superfund Program. The University will be evaluating potential response actions for portions of the FGOW site in anticipation of potential redevelopment for residential or commercial purposes. The FFS is planned for completion in calendar year 2022.

The UMore Park administration building near the Site has a well that is used for sanitary purposes but is not a potable supply due to nitrate from the surrounding agricultural areas. The wells are regularly monitored by Minnesota Department of Health (MDH). There were no Site related contaminants detected in the well. Most of the residents nearby the Site are connected to a rural community water supply system. The main supply well for that system is developed in the Jordan aquifer and is located one mile upstream of the contamination plume. Groundwater at the Site and in the UMore East Area is used for agricultural irrigation.

The UMRRC Site was addressed by the University under MPCA oversight. The Site is part of EPA's Enforcement Deferral Pilot Agreement with MPCA. MPCA continues to be the lead agency for the Site as well as the lead agency for investigation and future cleanup of other areas of the UMRRC, including the area known as UMore East. The Site was added to the Minnesota Permanent List of Priorities (PLP) on October 30, 1984, and finalized on the EPA National Priority List (NPL) on June 10, 1986.

Additional Site background information and the Site Chronology can be found in Appendix B and at www.epa.gov/superfund/university-minn-rosemount

FIVE-YEAR REVIEW SUMMARY FORM

Site Name:	**University of Minnesota (Rosemount Research Center)**	
EPA ID:	MND980613780	
Region: 5	**State: MN**	**City/County:** Rosemount/Dakota

NPL Status: Deleted	
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes

Lead agency: EPA
Author name: Giang-Van Nguyen
Author affiliation: EPA
Review period: 6/8/2021 - 2/8/2022
Date of site inspection: not completed due to COVID-19 work travel restrictions
Type of review: Statutory
Review number: 6
Triggering action date: 6/9/2017
Due date *(five years after triggering action date)*: 6/9/2022

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The major contaminants of concern identified at the Site are lead, copper, and PCBs for soil and chloroform for groundwater.

Remedial Investigation (RI) activities were conducted by the University from 1984 through 1988 (Twin City Testing Corporation, Undated; IT Corporation, August 1986; IT Corporation, September 1986) under the 1985 Response Action Agreement with MPCA (MPCA 1985). The RI determined that soil and concrete at the GUE, UST, and PE areas were contaminated with lead, copper, and PCBs at maximum concentrations of 63,000 parts per million (ppm), 310,000 ppm and 40,000 ppm, respectively.

Groundwater was found to be contaminated with chloroform at a maximum concentration of

72 parts per billion (ppb) which exceeded the State of Minnesota Recommended Allowable Limit (RAL) of 1.9 ppb at the time of the RI. This concentration was found in a monitoring well one mile east of the Burn Pit area. Other chemicals from the Burn Pit area were found in the groundwater but were at lower levels that did not qualify as chemicals of concern.

The endangerment assessment (IT Corporation, October 1986) identified dermal contact and/or ingestion of lead/PCB contaminated soils as an exposure pathway of concern. The potential receptors for this pathway were site workers. An additional exposure pathway was the ingestion use of ground water contaminated by chloroform from the University's Burn Pit area. The potential receptors for this pathway were the private well users. The surface water run-off is recharged directly to groundwater and does not represent a potential pathway. No unacceptable risks are present for ecological receptors.

Response Actions

In 1984, the MDH issued well advisories to 27 families whose wells were contaminated with chloroform above the State of Minnesota Recommended Allowable Limit (RAL) level at that time. Based on data in the RI, a groundwater pump out and air stripper system was installed in 1987 to control migration of the chloroform groundwater plume.

On December 4, 1986, MPCA signed a Minnesota Enforcement Decision Document (MEDD) (MPCA, 1986) to select a remedy to address chloroform in groundwater at the Site. EPA did not sign nor concur on the MEDD. MPCA later signed a Record of Decision (ROD) for the Site on June 11, 1990 (1990 ROD) (MPCA/EPA 1990), and EPA concurred with the ROD on June 29, 1990 (MPCA/EPA 1990). With EPA concurrences, MPCA modified the 1990 ROD via an Explanation of Significant Differences (ESD) decision document in August 1991 (1991 ESD) (MPCA/EPA 1991), October 1993 (1993 ESD), and August 2014 (2014 ESD) (EPA 2014).

Remedial Action Objectives (RAOs):

The RAOs identified in the 1990 ROD for the remedies are:

- OU1: To prevent ingestion of groundwater contaminated with volatile organic compounds.
- OU2 and OU3: To eliminate human health risks presented by ingestion or direct dermal contact with soil and concrete contaminated with lead, copper, and PCBs or ingestion of PCB and lead contaminated groundwater

The 1990 ROD established the soil cleanup levels of 1,000 parts per million (ppm) for lead and copper; and 10 ppm for PCBs. The 1990 ROD identified copper as a soil contaminant associated with lead contamination of soil. Lead was viewed as an indicator chemical for the copper contamination. The 1990 ROD established a groundwater cleanup level of 57 parts per billion (ppb) for chloroform, based on the State of Minnesota RAL. There is no federal Maximum Contaminant Level (MCL) for chloroform.

The cleanup levels summary for soil and groundwater contaminants of concern are provided in Table 1 below.

Table 1 – Cleanup Levels Summary

Medium	Contaminant	Cleanup Level
Groundwater	Chloroform	57 ppb
Soil	Lead, Copper	1000 ppm
Soil	PCBs	10 ppm

The major components of the selected remedy in the 1990 ROD, as modified by the three ESDs were:

OU1:

- Continued operation of the pump and treat system as selected in the MEDD until groundwater reached the RAL for chloroform of 57 ppb and construction of a rural public water supply system for the residential wells.

OU2 & OU3:

- Excavation and on-Site thermal treatment of soil and concrete from the GUE, PE, and UST areas contaminated with PCBs greater than 25 ppm.
- Consolidation of soil from the three disposal areas contaminated between 10 and 25 ppm PCBs into the GUE Depression (later known as GUE Deep) and restricting access.
- Excavation and transporting all soils contaminated with lead and copper exceeding 1,000 ppm lead to an off-site Resource Conservation and Recovery Act (RCRA)-permitted landfill. Transporting oils containing PCBs to a Toxic Substance Control Act (TSCA)/RCRA-permitted landfill.
- Backfilling all excavated areas with clean soil, grading, and restoring with vegetation.
- Request a review of the effectiveness of the remedial action three years after completion of the remedy.
- Land use restrictions for the soil containing contamination above standards for UU/UE.

Status of Implementation

Remedy implementation is summarized by OU below:

OU1: In 1987, in accordance with the MEDD, the University installed a groundwater pump-out system to remove and treat contaminated groundwater, while also preventing further off-site movement of the contaminants. The groundwater remedy selected in the MEDD had also required installation of new individual residential wells drilled into the Franconia Aquifer, but residents subsequently rejected the individual wells in the Franconia Aquifer because of potential problems with bacteria.

At the time of the detection of chloroform contamination, the RAL (the applicable health-based drinking water value at that time) established by MDH for chloroform was 5 ppb. MDH advised the affected well owners not to use their well water and the University provided them with bottled water. In 1988, based on new information from EPA indicating chloroform was less toxic than initially believed, the RAL was raised to 57 ppb. Since the concentration of chloroform in all residential wells was below 57 ppb, the drinking water well advisories issued by MDH to the Rosemount residents became unnecessary. However, the University decided to proceed with its plan to provide the residents with an alternate, long-term groundwater remedy - a community rural water supply. The water supply system consisted of two wells drilled in the Jordan

Sandstone Formation and distribution lines to the 27 residences whose wells had drinking water advisories previously issued by MDH. In May 1989, the residences were hooked into the community rural water system. On June 16, 1992, the University completed the community rural water system and transferred the new system to the City of Rosemount.

The groundwater remedy was completed in 1991, when groundwater sample results from the contaminated area met the 1990 ROD groundwater cleanup criterion and State RAL for chloroform of 57 ppb. On October 30, 1991, MPCA approved to shut down the pump and treat system. The University continued to monitor area groundwater under MPCA requirements. Based on groundwater monitoring sampling data at the Site from 2000 to 2002 (Delta, 2002), MPCA determined that the groundwater was potable, and no further groundwater sampling was necessary.

OU2: During July and August 1990, the University excavated and disposed of soil contaminated with lead and copper from the GUE site. The soil contaminated with lead and copper which contained less than 50 ppm PCBs was disposed of at the Adams Center Landfill in Ft. Wayne, Indiana, a RCRA-permitted landfill. Soil contaminated with lead and copper which contained greater than 50 ppm PCBs was disposed of at the Chemical Waste Management, Inc., Landfill in Emelle, Alabama, a TSCA/RCRA-permitted landfill. Approximately 4,384 tons of soil were removed and placed in these landfills.

OU3: Implementation of the OU3 remedial action began in the summer of 1992 with the excavation of contaminated soil from multiple areas of the Site. The University contractor's work proceeded rapidly and included the following activities: (1) assembly of the mobile Thermal Destruction Unit (TDU) began in December 1992; (2) burning of clean soil was initiated in February 1993; (3) incineration of contaminated soil started in March 1993; and (4) the contractor completed the incineration in July 1993.

A total of approximately 7,000 cubic yards of soil were excavated, and 12,100 tons of soil were thermally treated. Large pieces of contaminated concrete were also excavated, but due to low levels of contamination, these pieces were consolidated at the GUE Deep rather than incinerated because of likely damage to the rotating kiln. GUE Deep is the name given to the pit where the ash and soil contaminated with between 10 and 25 ppm PCBs were placed at the GUE site.

In 1993 and 1994, after demobilization of the TDU, an additional 350 cubic yards of soil and concrete between 10 and 25 ppm PCBs were consolidated at the GUE Deep pursuant to the second 1993 ESD. Also consolidated in the GUE Deep were approximately 65 cubic yards of soil scrapings removed from operational areas that were contaminated with greater than 1 ppm (and less than 25 ppm) PCBs. Another 36 cubic yards of PCB-contaminated soil exceeding 25 ppm PCBs discovered during pre-remedial sampling were sent to the U.S. Pollution Control Inc. Grassy Mountain Facility in Clive, Utah.

By the summer of 1994, all excavated areas were backfilled, compacted, and graded. A 16-inch cover of material containing less than 2 ppm PCBs was placed over the GUE Deep. The top six inches of this cover was topsoil with less than 1 ppm PCBs. The cover was vegetated, and a fence was designed to restrict access to the GUE Deep and placed around its perimeter.

A 10-inch cover of less than 1 ppm PCBs was placed over all areas left (GUE Shallow area) with between 1 and 10 ppm PCBs. The top six inches of this cover was clean topsoil of less than 1

ppm PCBs, which was also vegetated. At the conclusion of the TDU soil incineration, 25,000 gallons of TDU wastewater or process water remained for on-Site disposal. The process water met the disposal criteria of 15 ppb lead; 0.5 ppm PCBs; and no detectable dioxins or furans at a detection of 1.0 nanograms/gram/congener. The MPCA staff granted a waiver to its disposal criterion of 250 ppm chlorides for the slightly elevated process water concentrations of 229 to 472 ppm chlorides. The process water was disposed of on-Site at the GUE.

In 1993, during the implementation of the remedy for OU3, the University identified and transported an additional 100 cubic yards of soil contaminated with lead above 1,000 ppm (but less than 50 ppm PCBs) to the Adams Center Landfill and placed other lead-contaminated soil in the GUE Deep. Post-remedial sampling indicated that the highest lead concentration found outside of GUE Deep was 669 ppm lead, with most samples indicating less than 100 ppm lead.

On September 24, 1993, MPCA and EPA conducted a preliminary Site close-out report inspection. A final close-out report inspection was conducted on September 30, 1994, and all construction activities were found to be completed.

In all, 4,384 tons of contaminated soil were removed from the GUE site under OU2, and 12,100 tons of contaminated soil and concrete were excavated and treated from the GUE, PE, and UST sites under OU3.

In 2000, the University recorded a declaration and affidavit with Dakota County that requires maintenance of the 10 inches soil cover over areas with contamination exceeding 10 ppm PCBs, limits the sites to commercial and industrial use, and prohibits the following uses: day care centers, educational facility, churches, social centers, hospitals, elder care, nursing homes, recreational, or housing.

Site Deletion: In 1994, the University completed the cleanup set forth in the ROD, as amended by the ESDs. On June 19, 1996, MPCA signed a Final Closeout Report for the Site (MPCA, 1996), documenting that all MERLA/CERCLA response actions were complete. Following confirmatory groundwater monitoring, EPA deleted the Site from the NPL on February 6, 2001.

Institutional Controls

A summary of the implemented institutional controls (ICs) for the Site is listed in Table 2 below and ICs are further discussed below. A map showing the area in which the ICs apply is included in Appendix C, Figure 2.

Table 2: Summary of Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Soil -- Parcel A	Yes	Yes	See IC map	1) Prohibits disturbance or alteration of any nature	-Declaration of Restrictions and

(GUE Deep)			(Appendix C)	on, above or beneath Parcel A without prior written approval of MPCA. -Requires that a 10-inch soil cap (or other form of impervious cap, such as an asphalt cap) be maintained. -Requires, at minimum, a six-foot chain link fence to restrict access to authorized personnel.	Covenants dated 1/3/2000 and recorded in Dakota County 5/11/2000. -Amendment to Declaration of Restrictions and Covenants dated 12/26/2007 and recorded in Dakota County 4/17/2008.
				2) Discloses that property is contaminated with hazardous wastes. Provides identity, location, quantity, etc. of hazardous substances.	Affidavit Concerning Real Property Contaminated with Hazardous Substances dated 11/5/1999 and recorded in Dakota County 5/11/2000.
Soil -- Parcel B (GUE Shallow) and Parcel C (UST)	Yes	Yes	See IC map (Appendix C)	1) Limits land use to commercial/ industrial. -Prohibits use for day care center, any type of educational facilities, churches, social centers, hospitals, elder care facilities, nursing homes, recreational, and single or multiple family dwellings. -Requires that a 10-inch soil cap be maintained. -Prohibits soils excavated from Parcels B and C from being used as clean fill off-Site. Any removal of soils for other purposes must be approved by MPCA. -Any disturbance or alteration that results in discovery of any contamination above 10 ppm PCBs requires immediate reporting to the MPCA and to follow procedures outlined in the IC.	-Declaration of Restrictions and Covenants dated 1/3/2000 and recorded in Dakota County 5/11/2000. -Amendment to Declaration of Restrictions and Covenants dated 12/26/2007 and recorded in Dakota County 4/17/2008.
				2) Discloses that property is contaminated with hazardous wastes.	Affidavit Concerning Real Property Contaminated with

				Provides identity, location, quantity, etc. of hazardous substances.	Hazardous Substances dated 11/5/1999 and recorded in Dakota County 5/11/2000.
Soil -- Parcel D (Burn Pit)	Yes	Yes	See IC map (Appendix C)	1) Prohibits disturbance or alteration of any nature on, above or beneath Parcel D without prior written approval of MPCA. Requires that a soil cap be maintained in all outdoor exposure areas to minimize direct contact and infiltration.	-Declaration of Restrictions and Covenants dated 1/3/2000 and recorded in Dakota County 5/11/2000 -Amendment to Declaration of Restrictions and Covenants dated 12/26/2007 and recorded in Dakota County 4/17/2008.
				2) Discloses that property is contaminated with hazardous wastes. Provides identity, location, quantity, etc. of hazardous substances.	Affidavit Concerning Real Property Contaminated with Hazardous Substances dated 11/5/1999 and recorded in Dakota County 5/11/2000.
Soil -- Parcel E (PE Site)	Yes	Yes	See IC map (Appendix C)	1) Limits land use to commercial/industrial. -Prohibits use for day care center, any type of educational facilities, churches, social centers, hospitals, elder care facilities, nursing homes, recreational, and single or multiple family dwellings. -Prohibits soils excavation or removal unless in accordance with a Contingency Plan approved by MPCA. -Any disturbance or alteration that results in discovery of any contamination above 10 ppm PCBs requires immediate reporting to the MPCA and to follow procedures outlined in the IC.	-Declaration of Restrictions and Covenants dated 1/3/2000 and recorded in Dakota County 5/11/2000. -Amendment to Declaration of Restrictions and Covenants dated 12/26/2007 and recorded in Dakota County 4/17/2008.

				2) Discloses that property is contaminated with hazardous wastes. Provides identity, location, quantity, etc. of hazardous substances.	Affidavit Concerning Real Property Contaminated with Hazardous Substances dated 11/5/1999 and recorded in Dakota County 5/11/2000.

Status of Access Restrictions and ICs: The 1990 ROD did not include ICs as part of the remedy. However, the ROD did include the use of a fenced enclosure, which is an access control, to limit access to the GUE Deep area (or remotely accessible soils), where soils containing 10 to 25 ppm PCBs were consolidated and capped. A fence was designed to restrict access to the GUE Deep and placed around its perimeter, as required. EPA issued an ESD on August 4, 2014, to document that ICs are a necessary component of the soil remedy and became part of the selected remedy.

Land Control ICs in the form of an "Affidavit Concerning Real Property Contaminated with Hazardous Substances" and a "Declaration of Restrictions and Covenant" have been recorded and are being implemented at the Site. The Affidavit was recorded in Dakota County on May 11, 2000. The Affidavit discloses that contamination remains at the Site after completion of the source control remedy and provides notification requirements in the event of any planned activities/uses that are inconsistent with the remedial action or that could potentially disturb contamination or structures associated with the response action. The Declaration was recorded in Dakota County on May 11, 2000. The Declaration contains the following restrictions for areas with soil contamination up to 10 ppm PCBs: 1) maintenance of a minimum of 10-inch soil cap in outdoor exposure areas; 2) limitation to commercial and industrial use; and 3) prohibition of certain uses (day care centers, any form of primary or secondary educational facility, churches, social centers, hospitals, elder care facilities, nursing homes, recreational, and single or multiple family dwellings). Both the Declaration and the Affidavit contain, as exhibits, "Sketch[es] of Description" prepared by a Registered Land Surveyor that map out the metes and bounds of the areas requiring use restrictions, including the Parcel A (OU2 – GUE Deep), Parcel B (OU2 – GUE Shallow), Parcel C (OU3 – UST), Parcel D (OU1 – Burn Pit), and Parcel E (OU3 – PE).

The original Declaration for Parcel E indicated that PCBs remain in the soil at a concentration of 3.5 ppm. Upon further investigation, MPCA concluded that Release Sampling Exhibits M and N from the Affidavit support the 1 ppm PCB cleanup level for the PE site. Therefore, the 3.5 ppm PCB concentration stated in the Declaration is in error. The University has amended the Declaration to say that 1 ppm PCBs are remaining at Parcel E. This amendment was recorded in Dakota County on April 17, 2008.

On December 31, 2007, the University completed an IC evaluation, as recommended in the 2007 FYR. The University evaluated the property title for prior-in-time encumbrances, and the University's Director of Real Estate certified that there were none. The University subsequently amended the Declaration of Restrictions and Covenants for the PE site, as noted above.

The University's IC evaluation activities reveal that the remedy is currently functioning as intended with regard to the ICs, and effective procedures are in place for long-term stewardship at the Site.

Current Compliance: Based on the inspections conducted in 2020 and 2021 as part of annual Site inspections by the University, no Site uses which are inconsistent with the implemented ICs or the remedy IC objectives were noted.

IC Follow-up Actions Needed: All ICs are in place and are effective. No follow-up actions are needed.

Long Term Stewardship: Long-term protectiveness at the Site requires compliance with the ROD, ESDs, and effective ICs to assure the remedy continues to function as intended. The implemented ICs must be maintained, monitored, and enforced. In 2020, the University began submitting an annual Site inspection report to EPA in 2020 and 2021 which provides the status of the ICs at the Site, results of the ICs compliance inspection, and certification that ICs remain in-place and are effective. However, in order to ensure continued protectiveness, long-term stewardship must be assured which includes maintaining and monitoring effective ICs. A Long-term Stewardship Plan should be developed to document long-term stewardship procedures. Long-term stewardship procedures should describe, at a minimum: (1) monitoring activities and schedules; (2) responsibilities for performing each task; (3) reporting requirements; and (4) a process for addressing any potential IC issues that may arise during the reporting period.

Site-Wide Ready for Anticipated Use: In 2015, EPA determined that the site met the requirements for a Site-Wide Ready for Anticipated Use (SWRAU) determination based on previous remedial action and all documents reviewed for the Site. A SWRAU determination was signed by EPA on September 18, 2015.

Systems Operations/Operation & Maintenance

The University continues to perform the maintenance and annual Site inspections to verify that no inconsistent uses with the IC restrictions in place have occurred, that ICs remain in place and effective, and that any necessary contingency actions have been executed. The University has submitted the Annual Site inspection reports containing the results of the maintenance and ICs monitoring activities to EPA since 2020 (University of Minnesota 2020 and 2021). There were no problems noted in the maintenance and ICs activities at the Site during this FYR period. The annual Site inspections covered the four former waste disposal areas located within the boundaries of UMore Park: Burn Pit (Parcel D), GUE (Parcels A and B), PE (Parcel E), and UST (Parcel C).

The public water supply system is owned and operated by Empire Township. These wells are regularly monitored by MDH; no site related contaminants have been detected in the wells. The system was not reviewed for this FYR because groundwater is no longer contaminated due to Site-related activities.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR as well as the recommendations from the last FYR and the current status of those recommendations.

Table 3: Protectiveness Determinations/Statements from the 2017 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	The remedy at OU1 is protective of human health and the environment because the community rural water supply system is functioning as intended and groundwater meets drinking water standards for Site-related contaminants.
2, 3	Protective	The remedies at OU2 and OU3 are protective of human health and the environment because PCB-contaminated soil was excavated, treated on-Site and disposed of on-Site and off-Site. The implementation of ICs through the Declaration of Restrictions and Covenants and the Affidavit Concerning Real Property Contaminated with Hazardous Substances prevents exposure to, or ingestion of, contaminated soil. The University should continue its annual inspection and certification to EPA that no inconsistent uses have occurred, that ICs are in place and effective, and that any necessary contingency actions have been executed.
Sitewide	Protective	The remedy at the UMRRC Site is protective of human health and the environment because groundwater meets drinking water standards for Site-related contaminants and contaminated soil was excavated, treated, and disposed of appropriately. All remedial activities specified in the 1990 ROD, 1991 ESD, 1993 ESD and 2014 ESD are completed. The implementation of ICs through the Declaration of Restrictions and Covenants and the Affidavit Concerning Real Property Contaminated with Hazardous Substances prevents exposure to, or ingestion of, contaminated soil. The University should continue its annual inspection and certification to EPA that no inconsistent uses have occurred, that ICs are in place and effective, and that any necessary contingency actions have been executed.

There were no issues & recommendations affecting remedy protectiveness in the 2017 FYR.

The 2017 FYR identified several recommendations identified as Other Findings that do not affect current nor future protectiveness. A status update is provided below.

Recommendation 1: The University needs to certify annually to EPA that all ICs are in place and functioning as intended.

The current status of this recommendation: As noted above, the University has started to submit the Annual Site inspection reports containing the results of the maintenance and ICs monitoring activities to EPA in 2020 and 2021 (University of Minnesota 2020 and 2021). However, in order to ensure continued protectiveness, long-term stewardship must be assured which includes maintaining and monitoring effective ICs. A Long-term Stewardship Plan should be developed to document long-term stewardship procedures. Long-term stewardship procedures should describe, at a minimum: (1) monitoring activities and schedules; (2) responsibilities for

performing each task; (3) reporting requirements; and (4) a process for addressing any potential IC issues that may arise during the reporting period.

Recommendation 2: The University needs to provide the new Site map of the GUE Shallow, GUE Deep, PE, UST, and the Bum Pit containment areas with GPS coordinates identifying their boundaries.

The current status of this recommendation: This recommendation has been completed.

Recommendations 3 & 4: The University should install new safety and/or warning signs for GUE, PE, UST and Burn Pit sites, and to replace signs that have been degraded over the years. The University should maintain the vegetative cover over the capped areas by periodic mowing and removal of woody plants, cutting back encroaching vegetation around the fence, and replacing the top rail of the fence where missing.

The current status of these recommendations: The University has addressed these recommendations as part of the annual O&M. The containment area cap, the signs and fence were inspected, and repairs were made in 2020 and 2021.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice was made available by newspaper in the *Dakota County Tribune* on February 4, 2022, stating that there was a FYR and inviting the public to submit any comments to EPA. Neither EPA nor MPCA received any comments. As a result, no formal interviews were conducted because of the lack of response and because there were no significant changes at the Site since the last FYR, other than ongoing O&M.

The results of the review and the report will be made available at the MPCA office, 520 Lafayette Rd., St. Paul, at www.umorepark.umn.edu/planning/gowinvestigation/repository/ and at www.epa.gov/superfund/university-minn-rosemount. A copy of the public notice can be found in Appendix D.

Data Review

At this time, the OU1, OU2, and OU3 remedies are completed, and cleanup levels have been met.

There is no new data for the soil cleanups that were performed under the OU2s and OU3 since it was completed in 1993,1994, and 2011.

As groundwater monitoring is no longer required, there is no new data associated with the remedy to be reviewed for this FYR.

Site Inspection

The FYR inspection of the Site was postponed due to health and safety considerations and work travel restrictions from the COVID-19 pandemic. This has been identified as an issue and recommendation for follow-up in this FYR. The FYR Site inspection will be conducted in 2022

to complete the Site inspection checklist and document photos of current conditions of the Site to include in the Site's files.

During 2020 and 2021, the University conducted a Site inspection as part of annual IC activities. The University inspected the fence and the cap area and verified they were in good condition. The results of the inspections show that no actions have been taken at the Site that would be inconsistent with or potentially damaging to the implemented remedy. The details of these inspections are included in the 2020 and 2021 Annual Site Inspection Reports (University of Minnesota, 2020 and 2021).

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?
Answer: Yes.

Remedial Action Performance. Remedial components included in the Site 1990 ROD, and 1991, 1993, and 2014 ESDs have been implemented and continue to provide adequate protection of human health and the environment. The review of documents, ARARs and risk assumptions indicate that the implemented remedies in OUs 1, 2, and 3 currently are functioning as intended for the areas identified as the Site in the ROD and ESDs.

The Site has achieved the 1990 ROD cleanup objectives to prevent ingestion of groundwater contaminated with volatile organic compounds for OU1; and to eliminate human health risks by ingestion of/direct contact with soil and concrete contaminated with lead, copper, and PCBs for OU2 and OU3. Lead and copper in soils has been removed to levels of 1000 ppm; PCBs in soils in nonrestricted use area has been removed to levels of 10 ppm; chloroform in groundwater is below 57 ppb; and all other clean-up actions specified in the ROD and subsequent ESDs have been achieved.

Implementation of Institutional Controls and Other Measures: The ICs in the form of the Declaration of Restrictions and Covenants (and amendment) and the Affidavit Concerning Real Property Contaminated with Hazardous Substances have been implemented for preventing exposure to contaminated soil and to ensure that the remedy remains protective. Further, physical controls or access restrictions that are in place for the Site include a secure perimeter fence around the cap area with a locked gate and warning signs to restrict access.

ICs are reviewed regularly as part of the Site O&M program, and EPA receives updates on IC status in the annual Site inspection reports from the University. Based on inspections and discussions with MPCA during this FYR period, EPA is not aware of Site or media uses that are inconsistent with the implemented ICs' stated objectives. Therefore, the ICs and access controls are proving to be effective at preventing exposures to contaminants at the Site.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?
Answer: Yes.

The RAOs in place at the time of remedy selection are still valid. The assumptions and data are still valid and there have been no changes in the physical conditions of the Site that would affect

the protectiveness of the remedy. The RAOs at the Site has been achieved to prevent ingestion of groundwater contaminated with volatile organic compounds; and to eliminate human health risks presented by ingestion of/direct contact with soil and concrete contaminated with lead, copper, and PCBs.

Changes in Standards and TBCs: Standards outlined and updated in the decision documents are still valid at the Site. There have been no known changes in Applicable or Relevant and Appropriate Requirements affecting the protectiveness of the remedy.

Groundwater: Both State and Federal groundwater standards have changed since the ROD. The 1990 ROD identified chloroform was the only contaminant which exceeded health-based levels, although several other contaminants were present at low levels. The 1990 ROD established a groundwater cleanup level of 57 ppb for chloroform based on a State of Minnesota RAL. There was no Federal MCL for chloroform at the time. Chloroform is also included in a standard for a group of chemicals called Trihalomethanes, which are disinfection byproducts. The current MCL for Total Trihalomethanes is 80 ppb. The State of Minnesota has replaced RALs with a new standard called Health Risk Limits (HRLs). HRLs apply to private groundwater drinking water wells only. The State of Minnesota subsequently established the chloroform HRL of 30 ppb in 2008 and of 20 ppb in 2016. The 1990 ROD should be reviewed to determine whether it is necessary to recognize a new lower HRL groundwater standard for chloroform and assess whether the groundwater is still meeting the lower HRL level.

Lead*:* EPA updated two inputs to the Adult Lead Model, which increased the default cleanup goal for lead in soil from 2,240 to 2,737 mg/kg for an adult industrial scenario (May 2017 OLEM Directive 9285.6-56 "Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters"). The lead cleanup level of 1,000 ppm for contaminated soils for the Site in the 1990 ROD was based on potential human health risk. As a general matter, toxicity factors and methods of calculating risks from exposure to soil have changed since the time of the 1992 ROD; therefore, soil cleanup levels would be different if recalculated using present day methods. With respect to the Site, however, although the existing soil cleanup levels may have changed, the remedy remains protective because it prevents any human exposure to soil on-Site.

Region 5 understands that EPA Headquarters is considering changes to EPA's national lead policy. Following issuance of a revised national lead policy, Region 5 EPA would assess how any such changes affect the protectiveness of the remedy at this Site. If the Site's soil remedy was found to no longer be protective, then appropriate changes to the selected remedy would be documented in an appropriate decision document.

Changes in Toxicity and Other Contaminant Characteristics*:* There have been no changes in the toxicity factors for the contaminants of concern nor other contaminant characteristics at the Site since the ROD and the last FYR.

Changes in Risk Assessment Methods: Standardized risk assessment methods have not changed in a way that could affect the assessment of the protectiveness of the remedy.

Changes in Exposure Pathways: There are no new exposure pathways that have been discovered at the Site during this FYR. Therefore, there are no current public health concerns associated with the Site. There have been no changes to either land use or expected land use at

the Site. However, if the land use in the restricted area changes or new toxicological information becomes available on-site contaminants, then the potentially exposed populations would need to be re-evaluated for the new information.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. The Site has not been impacted by any natural disasters and has no new climate change vulnerabilities. No other information, beyond what has been previously discussed in this FYR report, has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
None

Issues and Recommendations Identified in the Five-Year Review:				
OU(s): 1, 2, 3	**Issue Category: Other** **Five Year Review Site Inspection**			
	Issue: The FYR inspection of the Site was postponed due to health and safety considerations and work travel restrictions from the COVID-19 pandemic.			
	Recommendation: Conduct FYR site inspection in 2022 in order to complete the site inspection checklist and document photos of current conditions of the Site to include in the Site's files.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	EPA/State	EPA	12/31/2022

OU(s): 1, 2, 3	**Issue Category: Institutional Controls**	
	Issue: There are no long-term stewardship procedures documented to help ensure ICs continue to be monitored, maintained, and enforced at the Site.	
	Recommendation: Develop a Long-term Stewardship Plan to contain a provision for a regular inspection of ICs at the Site and annual certification to EPA. The University should continue its annual inspection and certification to EPA that no inconsistent uses have occurred, that ICs are in	

	place and effective, and that any necessary contingency actions have been executed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	6/30/2023

OU(s): 1	**Issue Category: Monitoring**			
	Issues: State standard for chloroform in groundwater changed again from the 57 ppb RAL value to a lower HRL value of 20 ppb.			
	Recommendation: The 1990 ROD should be reviewed to determine whether it is necessary to recognize a new HRL lower groundwater standard for chloroform and assess whether the groundwater is still meeting the lower HRL level.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	6/30/2023

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
Operable Unit: OU1	*Protectiveness Determination:* Short-term Protective

The remedy at OU1 currently protects human health and the environment because the community rural water supply system is functioning as intended and groundwater meets drinking water standards for Site-related contaminants. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness:

- conduct the FYR site inspection in 2022;
- long-term stewardship procedures must be developed ensuring compliance with effective ICs, which must be monitored and maintained; the University should continue its annual inspection and certification to EPA that no inconsistent uses have occurred, that ICs are in place and effective, and that any necessary contingency actions have been executed; and
- the 1990 ROD should be reviewed to determine whether it is necessary to recognize a new lower HRL groundwater standard for chloroform and assess whether the groundwater is still meeting that lower HRL level.

Operable Unit: OU2 & OU3	*Protectiveness Determination:* Short-term Protective

The remedies at OU2 and OU3 currently protect human health and the environment because PCB-contaminated soil was excavated, treated on-Site and disposed of on-Site and off-Site. The implementation of ICs through the Declaration of Restrictions and Covenants and the Affidavit Concerning Real Property Contaminated with Hazardous Substances prevents exposure to contaminated soil. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness:

- conduct the FYR site inspection in 2022; and
- long-term stewardship procedures must be developed ensuring compliance with effective ICs, which must be monitored and maintained; the University should continue its annual inspection and certification to EPA that no inconsistent uses have occurred, that ICs are in place and effective, and that any necessary contingency actions have been executed.

Sitewide Protectiveness Statement

Protectiveness Determination:
Short-term Protective

Protectiveness Statement:
The remedy at the UMRRC Site currently protects human health and the environment because groundwater meets drinking water standards for Site-related contaminants and contaminated soil was excavated, treated, and disposed of appropriately. All remedial activities specified in the 1990 ROD, 1991 ESD, 1993 ESD and 2014 ESD are completed. The implementation of ICs through the Declaration of Restrictions and Covenants and the Affidavit Concerning Real Property Contaminated with Hazardous Substances prevents exposure to contaminated soil. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness:

- conduct the FYR site inspection in 2022;
- long-term stewardship procedures must be developed ensuring compliance with effective ICs, which must be monitored and maintained; the University should continue its annual inspection and certification to EPA that no inconsistent uses have occurred, that ICs are in place and effective, and that any necessary contingency actions have been executed; and
- the 1990 ROD should be reviewed to determine whether it is necessary to recognize a new lower HRL groundwater standard for chloroform and assess whether the groundwater is still meeting that lower HRL level.

VIII. NEXT REVIEW

The next FYR report for the UMRRC Superfund Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Barr Engineering Co., 2016, Oiled Roads Investigation Summary Report, Delisted UMRRC Superfund Site, December 22, (SEMS ID 932541)

Bay West, 2015, Response Action Report - George's Used Equipment - UMore Park OU2 and OU3, July 10, (SEMS ID 484293)

Delta Environmental Consultants Inc, 2002, 2001-2002 Ground Water Monitoring Results University of Minnesota Rosemount Research Center Rosemount, Minnesota, February 28, (SEMS ID 285458)

EPA, 2017, Fifth Five-Year Review University of Minnesota Rosemount Research Center Site (UMRRC), June 9, (SEMS ID 532181)

EPA, 2014, Third Explanation of Significant Differences, UMRRC, August 04, (SEMS ID 461792)

EPA, 2012, Fourth Five-Year Review, UMRRC, June 14, (SEMS ID 435594)

EPA, 2000, Federal Register, Vol 65, No 237, pages 76945 – 76947, Notice Announcing Direct final deletion of the University of Minnesota Rosemount Research Center Superfund Site from the National Priorities List (NPL) December 8, (SEMS ID 633618)

IT Corporation, 1994, Interim Response Action Final Report – Volumes 1 and 2, January 7, (SEMS IDs 285460 and 285461)

IT Corporation, 1994, Response Action Final Report, August 18, (SEMS ID 285459)

IT Corporation, October 1986, Endangerment Assessment Rosemount Research Center University of Minnesota, October 21, (SEMS ID 203920)

IT Corporation, September 1986, Letter Report of the Investigation of the Porter Electric Area as an addendum to the 1986 Final Supplemental RI Report for the Rosemount Research Center, September 2005, (SEMS ID 310020)

IT Corporation, August 1986, Final Supplemental RI Report Rosemount Research Center Rosemount, Minnesota, Prepared for University of Minnesota, August 15 (SEMS ID 329429)

MDH October 2016, Minnesota Department of Health, Chloroform and Drinking Water, (SEMS ID 955175)

MPCA, 1996, Final Site Close Out Report - University of Minnesota Rosemount Research Center, June 19, (SEMS ID 285457)

MPCA, 1986, Minnesota Enforcement Decision Document (MEDD), December 4, (SEMS ID 929833)

MPCA, 1993, Supplemental Explanation of Significant Differences in the Approved Remedy for Soil Contamination with PCBs at the University of Minnesota Rosemount Research Center in Rosemount, Minnesota, October 15. (SEMS ID 2004254)

MPCA/EPA 1991, First Explanation of Significant Differences, UMRRC, August 1, (SEMS ID 132968)

MPCA/EPA 1990, Record of Decision, June 11 and EPA Concurrence Letter, June 29, UMRRC, (SEMS ID 203919)

Twin City Testing Corporation, Undated, Remedial Investigation Final Report for George's Used Equipment Site, U.S. Transformer Site, Coates Dump Site Oxidation Pond and Former Process Water Lagoon, (SEMS ID 310014)

University of Minnesota, 2021, 2021 Annual Inspection Report, December 15, (SEMS ID 955150)

University of Minnesota, 2020, 2020 Annual Inspection Report, October 29, (SEMS ID 955149)

University of Minnesota, 2008, First Amendment to Declaration of Restrictions and Covenants, April 17, (SEMS ID 302007)

University of Minnesota, 2000, Declaration of Restrictions and Covenants, January 3, (SEMS ID 248715)

University of Minnesota, 1999, Affidavit Concerning Real Property Contaminated with Hazardous Substances, November 5, (SEMS ID 248717)

APPENDIX B - SITE CHRONOLOGY AND ADDITIONAL SITE INFORMATION

A. Site Chronology

Event	Date
Discovery of problem (groundwater)	Jan. 31, 1984
Listed on State Permanent List of Priorities	October 1984
Request for Response Action issued by MPCA to University	Oct. 4, 1984
Phase I RI Report (groundwater) submitted to MPCA	March 13, 1985
Response Action Agreement under MERLA signed between MPCA and University of Minnesota	May 30, 1985
Listed on National Priorities List	June 10, 1986
Minnesota Enforcement Decision Document signed (groundwater only)	Dec. 4, 1986
Response Action Plan (RAP) for groundwater submitted	May 12, 1986
Groundwater pump and treat system constructed	1987
Remedial Investigation/Feasibility Study (soil and groundwater)	1986 – 1990
ROD signed by MPCA (soil remedy and further documenting previous groundwater remedy)	June 11,1990
EPA concurrence with ROD	June 29, 1990
Water supply line extensions completed	1991
First remedy modification (Explanation of Significant Differences)	August 1991
Pump and treat system shut down following increase in MCL	1991
Second remedy modification (Explanation of Significant Differences)	Oct. 1, 1993
U of M conducted soil removal, operation of thermal destruction unit, on-site containment unit constructed	1990-1993
Construction completion date (Preliminary closeout report)	June 29, 1994
MPCA signs Final Close-out Report	June 19, 1996
First five-year review	June 6, 1997
Institutional controls put in place	1999-2000

Event	Date
MPCA deleted Site from PLP	September 2000
EPA deletes Site from NPL	Feb. 6, 2001
Second five-year review	June 21, 2002
Third five-year review	June 15, 2007
Institutional controls update recorded in Dakota County	April 17, 2008
Maintenance improvements made for GUE Deep containment area	2011
Additional soil and groundwater sampling at Site performed as part of UMore Park East Remedial Investigation	2011
Fourth five-year review	June 14, 2012
Third remedy modification (Explanation of Significant Differences)	August 4, 2014
Site-Wide Ready for Anticipated Use (SWRAU)	September 2015
Fifth five-year review	June 2017

B. Background

Physical Characteristics

The Site was described at the time of listing on the National Priorities List as the UMRRC property covering approximately 12 square miles. This property includes what is now known as UMore East/Gopher Ordnance Works and the Vermillion Highlands. During the Remedial Investigation, Site boundaries for the MERLA/CERCLA response action were clarified to encompass specific areas of the UMRRC as described in the Record of Decision.

The Site is located in the City of Rosemount, Dakota County, Minnesota, approximately 15 miles south of the St. Paul metropolitan area (Attachment 1). Approximately 22,000 people currently live in the City of Rosemount. The Site was previously used as an agricultural research station and for a variety of industrial uses. A State enforcement-lead Superfund cleanup was conducted at the Site in areas known as the George's Used Equipment (GUE) site, the Porter Electric and Machine Company (PE) site, the U.S. Transformer (UST) site, and the Burn Pit site (Attachment 2).

The topography of the Site is generally level. The Site is underlain by 75 to 150 feet of outwash sand and gravel which constitute the uppermost water-bearing unit or aquifer. The water table in the outwash aquifer is present at a depth of 50 to 70 feet below ground surface. Flow is generally to the northeast, except where it is affected locally by the presence of bedrock valleys. Groundwater discharges to the Mississippi River approximately five miles from the Site.

The sand and gravel aquifer are underlain by fractured dolomite (in some areas separated from the sand/gravel by clays). The dolomite is hydraulically connected to the underlying Jordan

Sandstone, a water-bearing unit or aquifer. This unit is underlain by the St. Lawrence Formation, a dolomitic siltstone that retards water flow, that is, an aquitard. A third aquifer, the Franconia formation, underlies the St. Lawrence Formation.

History of Contamination and Investigation

Wider UMRRC Property

The UMRRC property was originally developed in the early 1940s by the U.S. War Department as the Gopher Ordnance Works (GOW), a plant dedicated to the manufacturing of smokeless gunpowder and related products. The GOW operated for approximately nine months during 1945. Operation ceased due to the end of the World War II. Title to the property was transferred to the University of Minnesota in 1947 (a portion now known as UMore Park) and 1948 (a portion now known as Vermillion Highlands). Production facilities were located in the portion now known as UMore Park.

There have been a number of investigations conducted on UMore Park and Vermillion Highlands. The MPCA conducted a limited investigation of the area in 1981. The U.S. Army Corps of Engineers conducted several inspections and evaluations of the property beginning in 1985. In 2009, the U.S. Army Corps of Engineers conducted an investigation on the Vermillion Highlands area. In 2010, the University of Minnesota completed an Environmental Impact Statement process for a portion of UMore Park known as the UMore Park Sand and Gravel Mining Area, which included assessment of environmental hazards. In 2011, the University entered into a lease agreement with Dakota Aggregates LLC for sand and gravel mining at the property. Between 2011 and 2016, with oversight provided by the MPCA's Superfund Program, the University of Minnesota voluntarily conducted an RI for a large portion of UMore Park known as UMore Park East, which includes production areas of the former GOW. Workplans were prepared in accordance with MPCA Superfund and/or Brownfields Program guidance, were not inconsistent with EPA RI guidance, and were approved by MPCA.

The wider UMRRC property, including portions of UMore Park related to GOW production areas and Vermillion Highlands, was not part of the area subject to the MERLA/CERCLA action and therefore are not part of EPA's five-year review activities at the Site. In March 2016, the University, with ongoing discussions for support with the U.S. Army Corps of Engineers, submitted application to the MPCA's Voluntary Brownfields Program for technical assistance with managing the environmental conditions for the approximately 8,000 acres referred to as UMore Park/Former GOW. All future assessments, investigations, feasibility studies and/or response actions for UMore Park East (including GOW production areas) and Vermillion Highlands will be done with MPCA Superfund and/or Brownfields Program oversight.

UMRRC MERLA/CERCLA Site

Beginning in the 1960's and continuing for a number of years, the University contracted with tenants who used some of the UMRRC property for disposal of lead, copper, and PCBs. Disposal occurred in three areas known as the GUE site, the PE site, and the UST site. The University also disposed of chemical wastes in an area known as the Burn Pit site. Because of these activities, the University was considered a Potential Responsible Party for the Site. Soil at the GUE, PE and

UST sites, and groundwater at the Burn Pit site were identified in the MEDD and ROD as the Site and are the subject of this five-year review.

The GUE site was used as an electrical equipment storage facility and a general salvage facility between 1968 and 1985. The activities conducted at GUE included reclamation of copper wire by burning off insulation, the salvage of electrical equipment, batteries, and drums; incineration of liquids including PCB-contaminated oils; and unidentified drum handling/storage and transfer activities. Most of the PCB oils were apparently disposed of in a depression area, although low-level contamination was widespread at the GUE site. Some solvents were also released at the GUE area. The contamination of soil with lead is believed to have been associated with lead acid battery and wire reclamation activities at the GUE site.

The Porter Electric and Machine Company leased property immediately south of the GUE site and operated from 1968 to 1971. The property was used for storage and reconditioning of used industrial electrical equipment. PCB-contaminated oils generated from these activities reportedly were spread on roads in the area. An area of soil contaminated by PCBs existed at the PE site.

U. S. Transformer leased property approximately 2000 feet northeast of the GUE site and operated there from 1973 to 1978. The property was used for dismantling and salvaging electrical transformers. Waste oils from these activities were reportedly washed off a concrete slab onto the soil at the UST site. An extensive area of PCB-contaminated soil existed at the UST site.

The Burn Pit site, located just north of 160th Street, mid-way between Akron and Blaine Avenues, was used by the University as a disposal area for waste chemicals. Unconfirmed reports suggest disposal of chemicals began in this area in the early 1960s. University records indicate that between 1968 and 1974, approximately 90,000 gallons of laboratory chemicals, solvents, corrosives, salts, heavy metals, organic compounds and inorganic compounds were infiltrated and/or burned in the pit. The pit was lined with lime, backfilled with sand, and capped with clay in 1980.

Initial Response

The investigation of the Site began in January 1984, when, during routine monitoring of the neighboring Pine Bend Landfill, the Minnesota Department of Public Health (MDH) detected chloroform at a concentration of 1.3 parts per billion (ppb) in a residential well up-gradient of the landfill. In July 1984, additional sampling occurred, as well as a site inspection by MPCA, County and University officials. As a result of these investigations, the MDH issued well advisories to 27 families whose wells were contaminated with chloroform above the State's health-based level, the Recommended Allowable Limit (RAL).

On October 4, 1984, the MPCA issued a Request for Response Action (RFRA) to the University. After formal negotiations, the University and the MPCA signed a Response Action Agreement (Agreement) on May 30, 1985, under MERLA for the cleanup of the Site. In June 1986, the Site was placed on EPA's National Priorities List.

The University of Minnesota's Burn Pit site was capped in 1980. At this site, volatile organic chemicals (VOCs) that were not completely burned infiltrated into the groundwater and contaminated the drinking water of some nearby Rosemount residents. In 1984, 16 residential

wells to the northeast of the Burn Pit site were found to be contaminated with chloroform. The primary contaminant of concern for OU1 was chloroform. Other chemicals from the Burn Pit site were found in the groundwater but were at lower levels that did not qualify as chemicals of concern.

The maximum concentration of chloroform found was 72 parts per billion (ppb). This concentration was found in a monitoring well one mile east of the Burn Pit site. The chloroform groundwater plume was found to extend approximately four miles to the east and northeast of the Burn Pit site.

In late 1985, the GUE/PE/UST soil remedial investigation (RI) became a separate investigation from the groundwater solvent contamination. The RI determined that soil and concrete on these three industrial disposal sites were contaminated by PCBs.

At the GUE site, the surface soil PCB concentrations ranged from 1.7 to 42,000 parts per million (ppm). The PCBs were generally found in the upper nine feet of soil. However, high concentrations of PCBs were also found in a natural depression to a depth of 36 feet and trace amounts of PCBs in the depression extended to a depth of 61 feet below the surface. The PCBs were identified as Aroclors 1260 and 1254. Lead concentrations in soil ranged up to 40,000 ppm and copper concentrations in soil ranged up to 310,000 ppm. These metal contaminants were generally confined to surface soil at the GUE site. Lead and copper were not found in amounts to make these contaminants of concern at the UST and PE sites.

At the PE site, the soil PCB concentrations range from 3.8 to 63,000 ppm. The PCBs were identified as Aroclors 1242, 1248, 1254, and 1260. PCBs were found to a depth of 75 feet below the surface, but generally were at concentrations less than 10 ppm below 43 feet.

At the UST site, the soil PCB concentrations were widespread but at low concentrations. The PCBs were identified as Aroclor 1260.

At the end of the RI, the University estimated that the volume of materials contaminated in excess of 1 ppm PCB and 50 ppm lead was 2,500 cubic yards of lead-contaminated soil; 160 cubic yards of PCB-contaminated concrete; and 57,000 cubic yards of PCB-contaminated soil. Lead and PCBs were not found in the groundwater under these three industrial sites. The Site contaminants of concern were identified as chloroform (OU1), lead, copper, and PCBs (OU2 and OU3).

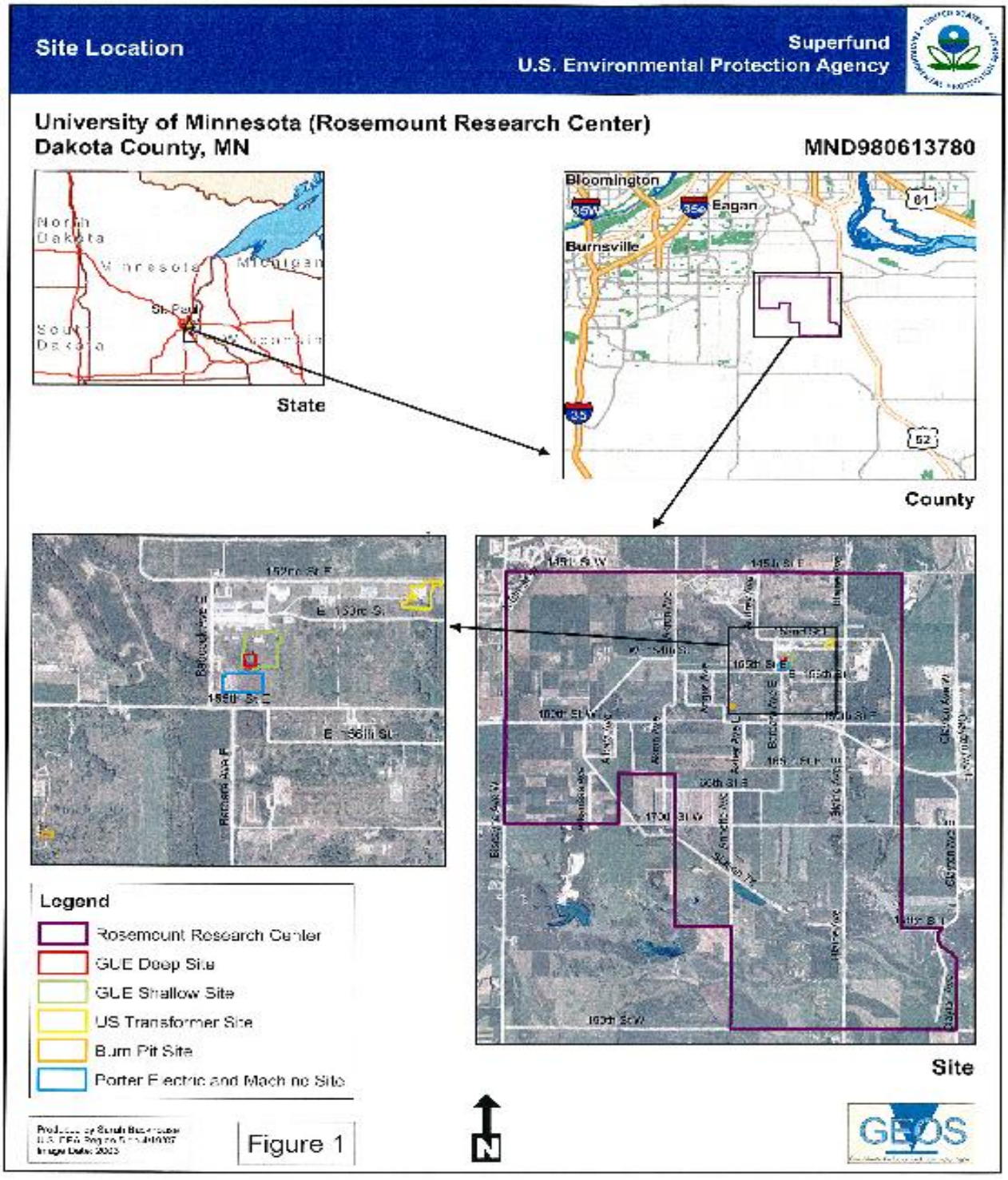
Review of Mandatory Cleanup Levels and Other Remedial Alternatives for Soil

In response to the ROD requirement to review mandatory cleanup levels and other remedial action alternatives for lead and PCBs in soil, the University conducted studies and submitted several reports. In November 1996, the University submitted three reports regarding lead clean-up technology carried out at the Coleraine Minerals Research Laboratory. In February 1997, the University submitted a feasibility study report evaluating both lead and PCB remedies.

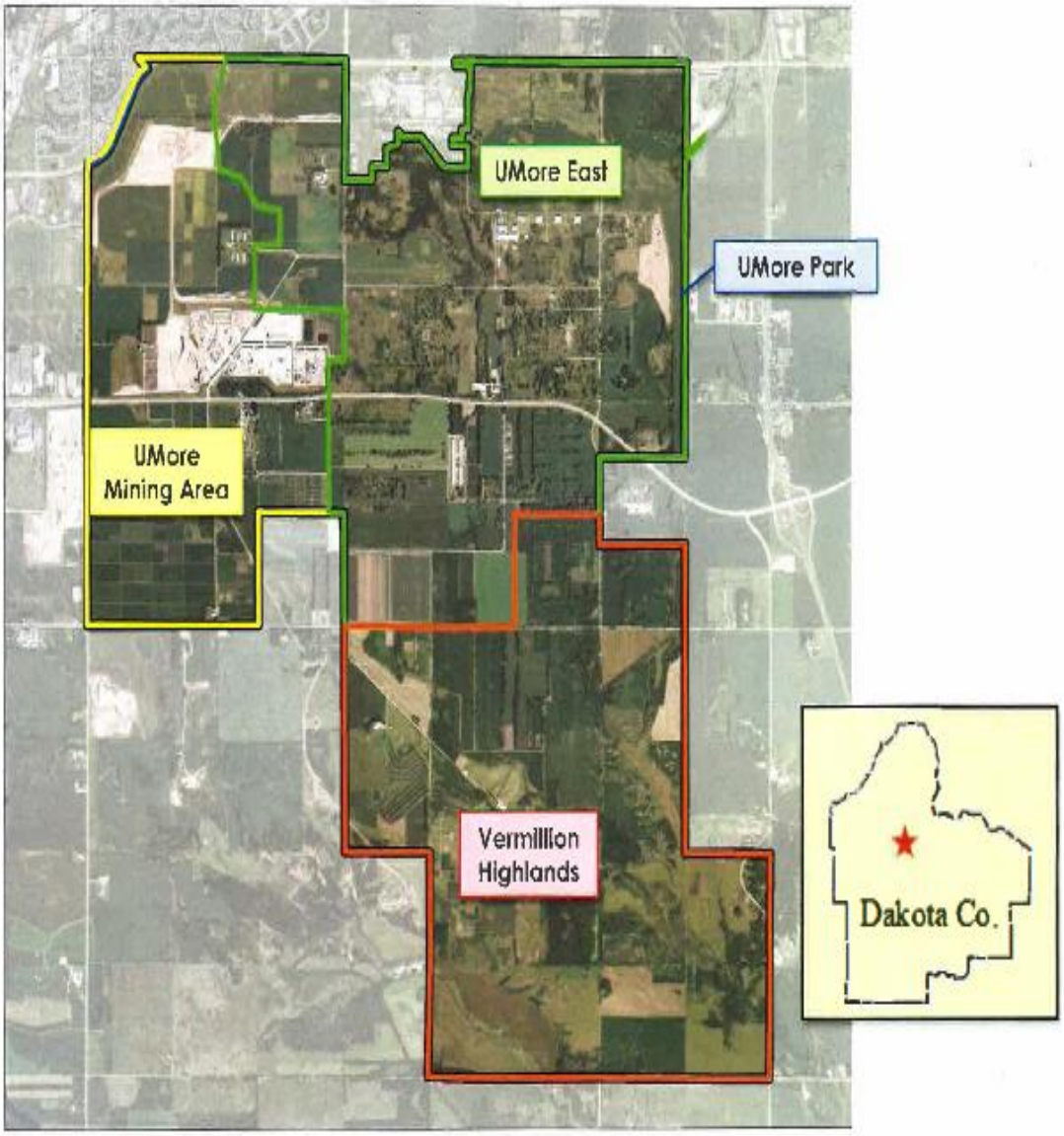
The feasibility study report evaluated three new technologies that could possibly remediate approximately 750 cubic yards of residual PCB- and lead-contaminated soil that remained in the restricted area of the Site. The technologies included a biological process for treating PCBs, a dechlorination/detoxification treatment for PCBs and a particle separation process for lead-impacted soil. The recommendations from the feasibility report were that all of the methods

evaluated were less cost-effective than the on-site incineration or off-site disposal alternatives that were previously implemented at the Site. In addition, treatability studies would be required to determine the actual effectiveness of the soil remedies. The high cost associated with additional treatability studies and the remedies themselves lead to the recommendation that these alternatives are not pursued. MPCA concurred with the recommendation.

APPENDIX C – SITE MAPS AND FIGURES



UMore Park Map
Figure 2

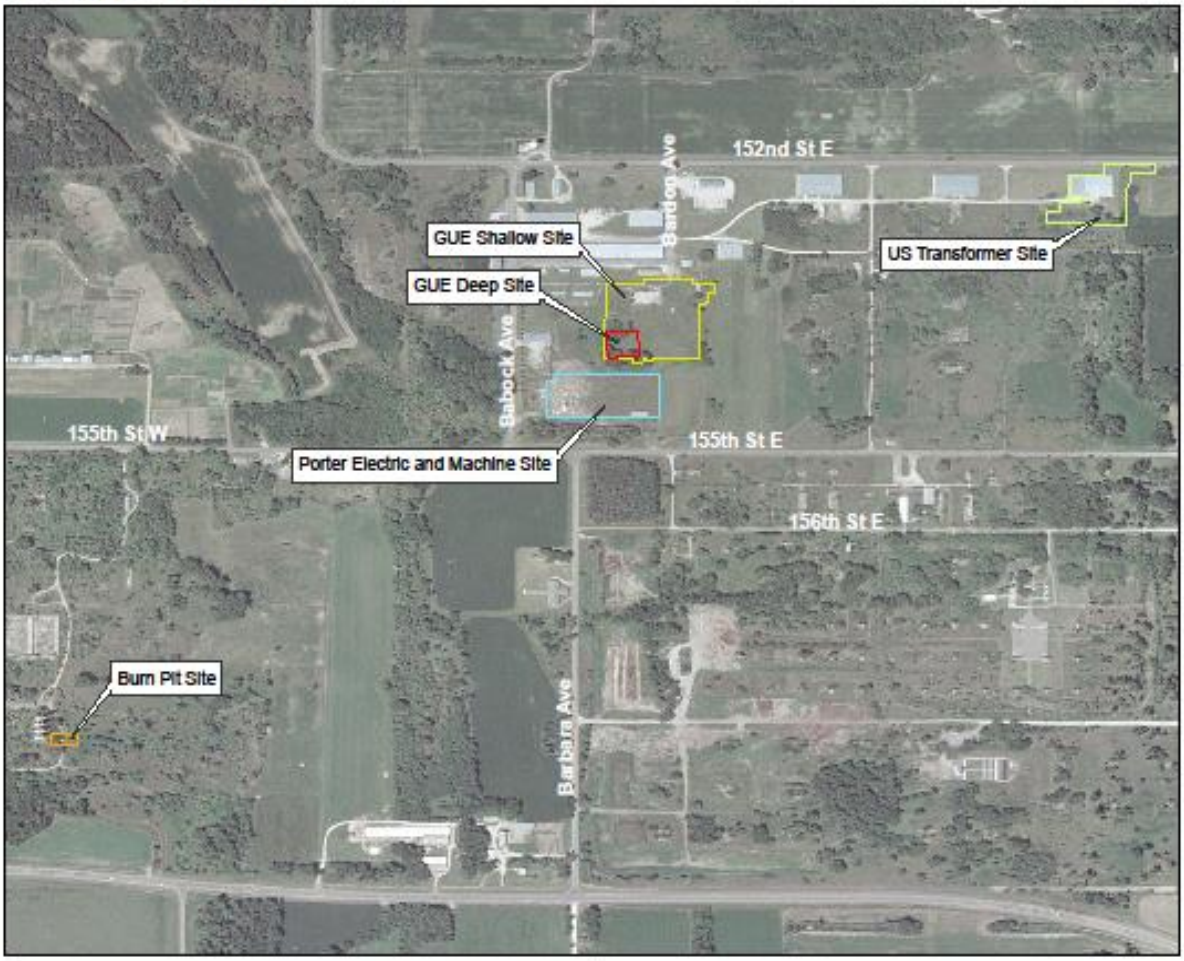


Institutional Control (IC) Review

Areas Depicting Implemented Institutional Controls

Superfund
U.S. Environmental Protection Agency

University of Minnesota Rosemount Research Center
Dakota County, MN



Legend

Implemented IC:
Declaration of Restrictions and Covenants (2000)

- Restricted Access Parcel A
  - -Fence
  - -Soil cap
- Restricted Parcel B
  - -Commercial and industrial use only
  - -Removal of excavated soil prohibited
  - -Soil cap on exposed outdoor areas
- Restricted Parcel C
  - -Commercial and industrial use only
  - -Removal of excavated soil prohibited
  - -Soil cap on exposed outdoor areas
- Restricted Parcel D
  - -Soil cap on exposed outdoor areas
- Restricted Parcel E
  - -Commercial and industrial use only
  - -Soil cap on exposed outdoor areas

0 400 800 Feet

EPA Disclaimer: Please be advised that areas depicted in this map were based estimated. This map does not create any rights enforceable by any party. EPA may revise or change this data and map at any time.

Created by Geoff Beckhouse
U.S. EPA Region 5 on 6/18/2009
Image Date: 2008

APPENDIX D – PUBLIC NOTICE

EPA Begins Review of University of Minnesota Rosemount Research Center Superfund Site
Rosemount, Minnesota

U.S. Environmental Protection Agency is conducting a five-year review of the University of MN - Rosemount Research Center Superfund site at 15325 Babcock Ave. The Superfund law requires regular checkups of sites that have been cleaned up – with waste managed on-site – to make sure the cleanup continues to protect people and the environment. This is the sixth five-year review of this site.

Cleanup at the site, managed by the University of Minnesota with oversight by the Minnesota Pollution Control Agency, consisted of removing, treating, and containing PCB and lead-contaminated soil, and installing new water supply wells and a treatment system to treat contaminated groundwater. EPA removed the site from the National Priorities List in 2001 but continues monitoring to ensure the site remedy remains protective.

More information is available at MPCA office, 520 Lafayette Rd., St. Paul, and at www.umorepark.umn.edu/planning/gowinvestigation/repository/. You can also visit www.epa.gov/superfund/university-minn-rosemount. The review is due in June. The five-year review is an opportunity for you to tell the EPA about site conditions and any concerns you have. Contact:

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You may also call Region 5 toll-free at 800-621-8431, 8:30 a.m. to 4:30 p.m., weekdays.