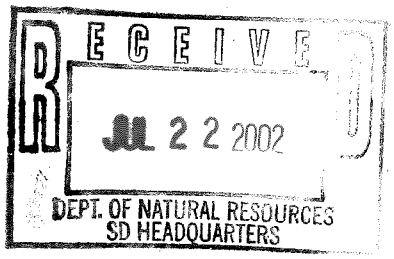


Second Five-Year Review Report

Second Five-Year Review Report
for
Oconomowoc Electroplating Company, Inc. Superfund Site
Town of Ashippun
Dodge County, Wisconsin

July 2002

PREPARED BY:

United States Environmental Protection Agency
Region 5
Chicago, Illinois

Approved by: Date:

Wm. E. Muno

William E. Muno, Director
Superfund Division

7/12/02

Table of Contents

List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	United States Environmental Protection Agency
CFR	Code of Federal Regulations
ESD	Explanation of Significant Difference
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PAH	Polyaromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PPB	Parts per Billion
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
VOC	Volatile Organic Compound
WDNR	Wisconsin Department of Natural Resources

Executive Summary

The remedy for the Oconomowoc Electroplating Company, Inc. (OECI) Superfund Site(the site) included excavation and disposal of lagoon sludge and surrounding soils, excavation and disposal of non-lagoon contaminated soils and debris (including an abandoned electroplating building) from the site, excavation and disposal of metals-contaminated sediments from the wetlands area adjacent to Davy Creek, and extraction and treatment of groundwater contamination to State groundwater quality standards. The site achieved construction completion with the signing of the Preliminary Close Out Report (PCOR) on September 25, 1996. This five-year review is the second five-year review conducted for the site. The first five-year review for this site was completed on September 29, 1997. The trigger for this five-year review was the completion date for the first five-year review.

The assessment of this five-year review found that the remedy was constructed in accordance with the requirements of the Record of Decision (ROD). One Explanation of Significant Difference (ESD) was issued in 1991 to establish cleanup goals for the wetlands and Davy Creek. Another ESD, issued in 1994, addressed the removal of the abandoned electroplating building and hazardous chemicals inside.

The remedy is protective of human health and the environment in the short term. There are no current exposure pathways and the remedy appears to be functioning as designed. The removal of lagoon sludge, soils, debris and sediment to eliminate the source of contamination has achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contaminants in soils and sediments.

The other remaining component of the cleanup is groundwater containment and restoration by a pump and treat system. Operation and maintenance of the groundwater pump and treat system has, on the whole, been effective. However, the United States Environmental Protection Agency (EPA) is currently in the process of evaluating opportunities for system optimization. Work has been initiated to analyze the current capture zone, delineate current groundwater contamination, and recommend appropriate well-field modifications. EPA anticipates implementing appropriate well-field modifications by summer 2003.

Long-term protectiveness of the groundwater pump and treat portion of the remedial action will be verified by obtaining additional data/information on the well-field capture zone, delineation of groundwater contamination and implementing appropriate modifications to the well field. The additional investigative work was initiated in November 2001 and is expected to be completed by early 2003. Implementation of appropriate well-field modifications is expected to occur in summer 2003. The groundwater pump and treat portion of the remedy will then be expected to be protective of human health and the environment upon attainment of groundwater cleanup goals.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name ***(from WasteLAN)***: Oconomowoc Elelctroplating Company, Inc. Superfund Site		
EPA ID ***(from WasteLAN)***: WID006100275		
Region: 5	**State:** WI	**City/County:** Ashippun/Dodge

SITE STATUS	
NPL status: ☒ Final ☐ Deleted ☐ Other (specify)	
Remediation status (choose all that apply): ☐ Under Construction ☒ Operating ☐ Complete	
Multiple Ous?* ☐ YES ☒ NO	**Construction completion date:** 9 / 25 / 1996
Has site been put into reuse? ☐ YES ☒ NO	

REVIEW STATUS	
Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency	
Author name: Steven J. Padovani	
Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA, Region 5
Review period:** 3 / 12 / 2002 to 7 /31 / 2002	
Date(s) of site inspection: 3 / 12 / 2002 & 5 / 22 / 2002	
Type of review: ☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion)	
Review number: ☐ 1 (first) ☒ 2 (second) ☐ 3 (third) ☐ Other (specify)	
Triggering action: ☐ Actual RA On-site Construction at OU #___ ☐ Construction Completion ☐ Other (specify)	☐ Actual RA Start at OU# NA ☒ Previous Five-Year Review Report
Triggering action date ***(from WasteLAN)***: 9 / 12 / 1995	
Due date ***(five years after triggering action date)***: 9 / 29 / 2002	

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

1) Need for continued evaluation of cyanide and metals treatment processes shut down.

2) Need for capture zone analysis.

3) Inadequate data to verify that contamination in the area of residential wells is captured by the extraction well field.

4) Need for continual operation, maintenance and optimization of groundwater pump and treat system.

Recommendations and Follow-up Actions:

1) Continue monitoring influent and effluent for metals and cyanide Wisconsin Pollution Discharge Elimination System (WPDES) exceedances, and maintain cyanide and metals treatment equipment in operating condition until all well-field modifications are completed.

2) Complete on going capture zone analysis, and make appropriate well-field modifications to ensure protectiveness and to decrease cleanup time.

3) Complete on going delineation of groundwater contamination west of Eva Street in residential area with drinking water wells, and make modifications to well field that ensures capture of contamination in that area.

4) Continue operating pump and treat system until cleanup goals have been met. Continue to identify and implement opportunities to optimize operation of the groundwater pump and treatment system.

Protectiveness Statement(s):

The remedy is protective of human health and the environment in the short term. There are no current exposure pathways and the remedy appears to be functioning as designed. The removal of lagoon sludge, soils, debris and sediment to eliminate the source of contamination has achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contaminants in soils and sediments.

Long-term Protectiveness:

The other remaining component of the cleanup is groundwater containment and restoration by a pump and treat system. Operation and maintenance of the groundwater pump and treat system has, on the whole, been effective. However, EPA is currently in the process of evaluating

opportunities for system optimization. In November 2001, work was initiated for more current capture zone analysis and delineation of groundwater contamination. EPA anticipates implementing appropriate well-field modifications by summer 2003.

There is some concern that a portion of the plume is present in the shallow aquifer below the nearby residences. Furthermore, there is not convincing evidence that this area of contamination is captured by the extraction system. The domestic wells in the area produce water from the deeper bedrock aquifer and are sampled annually by the Wisconsin Department of Natural Resources (WDNR). Volatile Organic Compounds (VOCs) or metals of concern were not detected in domestic well water samples from the most recent sampling event (August 2001) with a couple of exceptions. In two residential wells, trace amounts of chlorinated solvents were detected. 1,2-Dichloroethene-cis was detected in two wells at .73 ppb and .90 ppb. The Wisconsin health advisory for this compound is 70 ppb. Tetrachloroethene was detected at 0.68 ppb in one residential well. The health advisory for this compound is 5 ppb. In addition, lead was detected at 15 ppb in one residential well sample at 15 ppb (the State action level is 15 ppb). However, it is believed that the lead is associated with lead in plumbing. These concerns are being investigated in the on-going capture zone analysis and groundwater contamination study initiated in November 2001.

Long-term protectiveness of the groundwater pump and treat portion of the remedial action will be verified by obtaining additional data/information on the well-field capture zone, delineation of groundwater contamination and implementing appropriate modifications to the well field. The additional investigative work was initiated in November 2001 and is expected to be completed by early 2003. Implementation of appropriate well-field modifications is expected to occur in summer 2003. The groundwater pump and treat portion of the remedy will then be expected to be protective of human health and the environment upon attainment of groundwater cleanup goals.

Other Comments:

None.

OCONOMOWOC ELECTROPLATING SUPERFUND SITE
ASHIPPUN, WISCONSIN
SECOND FIVE-YEAR REVIEW REPORT

I. INTRODUCTION

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

EPA is preparing this Second Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

EPA interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

EPA, Region 5, conducted the second five-year review of the remedy implemented at the OECI Superfund Site in Ashippun, Wisconsin. This review was conducted by the Remedial Project Manager (RPM) for the entire site from May through September 2002. This report documents the results of the review.

This is the second five-year review for the OECI Superfund Site. The first five-year review was completed on September 29, 1997. The triggering action for this statutory review is the initiation of the remedial action on June 30, 1993. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

II. SITE CHRONOLOGY

Table 1 - Chronology of Site Events

EVENT	*DATE*
Proposed on NPL	September 8, 1983
Listed on NPL	September 21, 1984
OECI Operations	1957 - 1990
RI/FS (entire site)	April 24, 1987 - September 20, 1990
ROD (entire site)	September 20, 1990
ESD	September 30, 1991
RD	September 26, 1990 - June 30, 1993
Building Removal	April 1991 - March 1992
Pre-Final Inspection of Building Removal	March 21, 1992
ESD	March 8, 1994
Remediation of Lagoons, Soils and Sediments	August 1994 - June 1995
Construction of Groundwater Pump & Treat System	May 1995 - September 1996
Pre-Final Inspection of Lagoon, Soil and Sediment Remediation	June 12, 1995
Pre-Final Inspection of Groundwater Pump & Treat System	September 25, 1996
Final Inspection of Entire Site	October 10, 1996
First Five-Year Review	September 29, 1997
PCOR	September 25, 1996
Second Five-Year Review Site Inspections	January 29-31, March 12, and May 22, 2002
Modification/Optimization of Groundwater Pump and Treat System	January 2002 - Present
Next Five-Year Review	September 30, 2007

III. BACKGROUND

Physical Characteristics

The 10.5-acre OECI site comprises the 4-acre site of a former electroplating facility located at 2572 Oak Street, Ashippun, Wisconsin and 6.5 acres of an adjacent wetlands area located to the southwest of the former facility. The cities of Oconomowoc and Watertown are approximately 8 miles south and 10 miles west of the site, respectively. Milwaukee lies approximately 35 miles to the southeast. A small creek, Davy Creek, is located approximately 500 feet south of the site. Davy Creek, which flows through the wetlands, is a tributary to the Rock River. A map of the OCEI site is provided in attachment 1.

The OECI site is bordered on the north by Eva and Oak Streets and on the south by Davy Creek and the property occupied by the Ashippun Town Garage. Several small businesses line Oak Street to the northwest, and back up to the Chicago and North Western Railroad tracks. Residential areas are west (200 feet) and northwest (200 feet) of the OECI site beyond Eva Street, and southeast (1,400 feet) of the OECI site beyond the town garage facilities.

Land and Resource Use

The 4-acre OECI facility consisted of a main building which housed the office and process lines; a wastewater treatment building (to the west); parking area (to the north and east); two formerly used wastewater treatment lagoons (to the south); various storage tank and container deposit areas; a fill area and a lowlands area between the main building and adjacent property. The site also included Davy Creek and the adjacent wetlands. Since 1990, the OECI facility has been inactive.

The natural resource areas associated with the OECI site are the adjacent wetalnds, Davy Creek, and the wildlife associated with them. Davy Creek is a warm water sport fishery. Residents in the area rely on groundwater for their source of drinking water.

Two parks with facilities for playing baseball, skeet shooting, and picnicking are also near the site. One park with a playground is adjacent to the town garage between Oak and Elm Streets, and the other is beyond the residential block to the northwest.

History of Contamination

OECI began operation in 1957. Electroplating processes performed at the facility used nickel, chrome, zinc, copper, brass, cadmium, and tin. Finishing processes have included chromate conversion, coating, and anodizing. OECI ceased operations in October 1990 due to financial hardship. The electroplating facility was demolished and removed in May 1992.

Wastewaters formerly generated at the OECI facility can be divided into three categories: 1) cyanide-bearing (from rinses following zinc, copper, nickel, brass, and cadmium plating); 2) chromium-bearing (from chrome and chrome conversion operations); and 3) acid-alkaline (from rinses following cleaning, anodizing, and plating operations). Tin plating was suspended at the facility in 1981 and chromium, copper, and nickel plating in 1982. Plating of cadmium ceased in October 1984, and as of February 1985, OECI had suspended all cyanide plating processes, and afterwards only utilized a zinc plating process.

In conjunction with the electroplating process, degreasing operations were also performed at the OECI site and contributed to the waste stream. A number of VOCs are believed to have been used by OECI and include: chloroform; 1-1-dichloroethane; 1-2 dichloroethane; 1,1-dichloroethylene; tetrachloroethylene; 1,1,1-trichloroethane, and trichloroethylene. These contaminants became incorporated in both sludge bottoms and wastewater streams.

In 1972, OECI constructed two unlined settling lagoons to supplement their wastewater treatment system. Each lagoon was 60 foot by 40 foot wide with a sidewall depth of 5 feet. The walls were concrete on two sides and sloped gravel on the others. There was a concrete divider running lengthwise between the two lagoons. Over the years, both lagoons accumulated large volumes of plating sludges. In the past, untreated plating sludges overflowed the settling lagoons and accumulated in the wetlands between the OECI site and Davy Creek, which is also known as the Davy Creek wetlands.

Prior to 1972, untreated waste waters were discharged directly into the wetland area south of the OECI property. In November 1973, after installation of a wastewater treatment system, a WPDES Permit was issued for discharging treated wastewater to the creek. Spills from the wastewater treatment unit are well documented in the WDNR files. In August 1978, OECI was denied a WPDES permit by the WDNR; however, OECI appealed the permit denial and the facility continued to operate.

In 1979, the effects of the wastewater discharge and sludge overflow were investigated by the Solid Waste Management Division of the WDNR. Analytical results of stream sediment samples collected from Davy Creek downstream of the OECI's discharge point confirmed the presence of high concentrations of heavy metals. Specifically, cadmium, chromium copper and nickel. An analysis of surface soil samples collected from the wetlands area adjacent to the facility showed comparable concentrations of metals.

In 1980, OECI contracted with Waste Management, Incorporated to remove the sludge in the lagoons. Approximately 1 million pounds of sludge were removed and disposed. However, OECI did not have sufficient funds to complete the job. The lagoons were left approximately one-third full of electroplating sludges. Because these sludges were wastewater treatment sludges from electroplating operations, they were defined as listed hazardous waste (F006) by the Resource Conservation and Recovery Act (RCRA) 40 CFR Part 261 Subpart D-261.31.

Initial Response

A preliminary assessment was performed in May 1983 by the EPA Field Investigation Team (FIT). The site (including the Davy Creek wetlands) received a Hazard Ranking Score (HRS) score of 31.86 and was placed on the National Priorities List (NPL) September 21, 1984.

By letter dated September 18, 1985, the EPA notified OECI officials that they had been identified as a Potentially Responsible Party (PRP) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for the documented release or threatened release of hazardous substances. No other responsible parties have been named to date. On October 9, 1985, OECI informed EPA that it did not have the financial resources to conduct a Remedial Investigation/Feasibility Study (RI/FS) and formally declined to participate in the CERCLA process.

Between 1983 and 1987, the WDNR sampled residential wells in the area on seven different occasions. In 1985, three shallow monitoring wells were installed by the Wisconsin Geological and

Natural History Survey (WGNHS); two near the lagoons and one southeast of the OECI site on the town garage property. Sampling efforts indicated elevated concentrations of cadmium, nickel, and zinc. In addition, sampling efforts indicated the presence of 1,1-dichloroethane, 1,1,1-trichloroethane, and trichloroethylene.

In summer 1986, the Technical Assistance Team (TAT), a contractor to the EPA Emergency Response Section, conducted a limited sediment sampling survey in the wetlands. The analytical results of these samples indicated high concentrations of metals and cyanide in the wetlands area immediately south of OECI. In March and April of 1987, the TAT conducted an extensive sampling program which covered approximately 300 acres of wetlands along Davy Creek. This program also included sampling of the OECI sludge lagoons and soils at the ballpark located southeast of OECI. The analytical results indicated that several acres of the wetlands adjacent to OECI and the sludge is contaminated with cadmium, chromium, nickel, copper, zinc, (as high as 90,000 mg/kg in one area) and cyanide associated with the facility's electroplating process.

After OECI declined to participate in the RI/FS process, EPA used Federal funds to perform an RI/FS. EPA initiated the RI/FS in April 1987. The RI/FS was completed in September 1990 and made available to the public. A Proposed Plan identifying EPA's recommended remedy was presented to the public on July 23, 1990, starting the period for public comment.

Basis for Taking Action

Contaminants

Hazardous substances that have been released at the site in each media include:

Soil	Lagoon Sludge/Liquid
Arsenic	Arsenic
Cadmium	Cadmium
Chromium	Chromium
Copper	Copper
Lead	Lead
Nickel	Nickel
Zinc	Zinc
Cyanide	Cyanide
Acetone	Acetone
Methylene Chloride	Methylene Chloride
1,1-Dichloroethane	1,1-Dichloroethane
1,2-Dichloroethene (total)	1,1,1-Trichloroethane
1,1,1-Trichloroethane	Trichloroethene
Trichloroethene	Tetrachloroethene
Tetrachloroethene	Toluene
Toluene	Ethylbenzene
Xylene	Xylene

Groundwater	Wetland Sediment
Cadmium	Cadmium
Nickel	Chromium
Cyanide	Copper
Acetone	Lead
Methylene Chloride	Nickel
1,1-Dichloroethene	Zinc
1,1-Dichloroethane	Cyanide
1,2-Dichloroethene (total)	
1,2-Dichloroethane	
1,1,1-Trichloroethane	
Trichloroethene	
Vinyl Chloride	

Exposure to soil and groundwater are associated with significant human health risks due to exceedances of EPA's risk management criteria for the reasonable maximum exposure scenarios. The carcinogenic risks were highest for exposure to contaminated groundwater from a possible future ingestion pathway. Soil contaminants posed the greatest non-carcinogenic risk to human health through dermal contact and ingestion by children and future workers, primarily from cadmium and lead.

The major areas of environmental concern associated with the OECI site are Davy Creek and the adjacent wetlands area. Davy Creek and the wetlands area were contaminated with elevated levels of cadmium, chromium, nickel, copper, lead, zinc and cyanide. The levels of contaminants exceeded what was expected to be highly toxic to various aquatic species. Toxicity tests confirmed these expectations.

IV. REMEDIAL ACTIONS

Remedy Selection

A ROD was signed for the site on September 20, 1990. The Remedial Action Objectives (RAOs) were developed as a result of data colleted during the RI and included multiple removal activities to eliminate the source of contamination from the site and to contain and remediate the contaminated groundwater. These include:

1) Excavation and disposal of the lagoon sludge and surrounding soils;

2) Excavation and disposal of non-lagoon contaminated soils and debris from the site;

3) Excavation and disposal of metals contaminated sediments from the wetlands area adjacent to Davy Creek;

4) Extract and treat groundwater contamination to state groundwater quality standards.

The selected remedy has the following specific components:

1) For the surface water, sludge and contaminated soils associated with the two RCRA Subtitle C lagoons located behind the OECI facility: Clean closure by excavation, treatment and disposal at an off-site RCRA Subtitle C disposal facility.

2) For all other contaminated soil around the OECI facility not associated with the RCRA lagoons, or beneath the manufacturing buildings, including the fill area, the lowlands area, the drainage ditches, and the parking lot: Treatment and disposal at an off-site RCRA Subtitle C disposal facility.

3) For contaminated groundwater associated with the site: Construction and operation of a groundwater pump and treat system to achieve state groundwater quality standards. The treated water to be discharged into the adjacent Davy Creek is to be in compliance with the substantive requirements of a WPDES permit.

4) For the most highly contaminated sediments in the Davy Creek/Wetlands area: Excavation, treatment and disposal at an off-site RCRA Subtitle C disposal facility. This was an interim action when the ROD was signed because cleanup goals had not been determined for the contaminated sediment. Additional monitoring of Davy Creek and the wetland will be performed after the remediation to determine the effectiveness of the remedy.

5) For the building foundation, chemicals left inside, and underlying soils that require further investigation: Removal under remedial authority.

Two ESDs were signed on September 30, 1991 and March 8, 1994. The 1991 ESD established cleanup goals for the wetlands and Davy Creek. The 1994 ESD addressed the removal of the abandoned electroplating building and hazardous chemicals inside.

Health-based performance standards in the ROD for the soil specified in the ROD are: Arsenic, 47 mg/kg; lead, 300 mg/kg; cadmium, 500 mg/kg; nickel, 2500 mg/kg; copper, 1500 mg/kg; chromium, 1200 mg/kg; zinc, 4500 mg/kg; cyanide, 90 mg/kg; 1,1-dichloroethane, .07 mg/kg; toluene, .075 mg/kg; and 1,1,1-trichloroethane, .21 mg/kg.

The cleanup goals for the wetland and creek sediment as established in the 1994 ESD are: 4 mg/kg for cyanide; 54 mg/kg for nickel; and 85 mg/kg for copper.

Cleanup goals for the groundwater are preventive actions levels (PALs) established by the WDNR as follows:

Groundwater Contaminant	Cleanup Goal (ppb)
Arsenic	5
Cadmium	1
Chromium	5
Copper	500
Lead	5
Manganese	25
Mercury	0.2
Zinc	2,500
Cyanide	40
1,1-Dichloroethane	85
1,2-Dichloroethane	0.05
1,1-Dichloroethene	0.024
1,2-Dichloroethene	10
Tetrachloroethene	0.1
1,1,1-Trichloroethane	40
1,1,2-Trichloroethane	0.06
Trichloroethene	0.18
Vinyl Chloride	0.0015

The selected remedy eliminates the principle threat posed by the site by reducing the toxicity and mobility of the highly contaminated materials, thereby reducing the potential exposure to VOCs, and metals. The groundwater treatment train consists of granular activated carbon for VOCs removal, chemical precipitation for metals, and chemical oxidation for cyanide.

Remedy Implementation

On September 30, 1990, an Interagency Agreement (IAG) was signed with the U.S. Army Corps of Engineers (USACE) to perform a Remedial Design (RD) for the site. The RD was conducted in conformance with the ROD as modified by the two ESDs. The RD was completed on June 30, 1993.

From April 27, 1991 to March 31, 1992, prior to completion of the RD, removal of the building and the hazardous chemicals inside was performed under remedial authority. The soil was also removed and stockpiled at that time because it posed a significant threat to surrounding residents. The hazardous chemicals and soil were removed for treatment and disposal at approved hazardous waste treatment facilities. EPA conducted a prefinal inspection on March 21, 1992 and found no outstanding construction items.

In August 1994, remediation of the lagoons, stockpiled soil, and sediments in the wetland and Davy Creek sediment began. The hazardous soil and sediment was removed for treatment and disposal at an approved hazardous waste treatment facility. On June 12, 1995, a pre-final inspection was performed, in conjunction with the WDNR and a list of outstanding construction items was made.

From May 1995 through September 1996, the groundwater pump and treat treatment system was constructed. A pre-final inspection was performed on September 25, 1996 and the system has been operational since then. A layout of the groundwater pump and treat system and monitoring wells is provided in attachment 2.

The groundwater pumping (extraction) system includes five wells, four of which were installed during construction of the treatment plant. These four wells are 6 inches in diameter and have approximately 30 feet of screen, extending from approximately 7 feet below the surface to a 5-foot-long sump set into bedrock. The fifth well was installed for a pump test conducted during the pre-design investigation. This well is significantly shallower (15 feet deep). Each well is supplied with a Grundfos submersible pump. The well heads are completed above ground inside a hinged, locked and insulated fibergalss housing. The connections to the extraction piping, flow-control valve, flow meter, and sample port are all contained inside the housing. Power and control lines are run in below-grade conduits parallel to the collection piping. All the extraction wells are connected to the treatment plant by a common 1 to 1.5-inch header pipe.

The groundwater extraction wells discharge into a 20,000-gallon equalization storage tank. Water is pumped from the equalization storage tank to the cyanide and metals removal tanks. The water is then filtered through a 4-foot diameter continuous backwash sand filter, before being processed through a six-tray low profile air stripper for VOC removal. The air stripper effluent is treated through two GAC units in series, each containing 1,000 pounds of GAC. The effluent is then discharged via a 3-inch force main to a percolation bed located below the surface water level in the wetland area in the flood plain of Davy Creek.

Sludges are produced in the cyanide and metals removal tanks. Sludges are transferred to a sludge-settling tank and allowed to consolidate in the bottom of the unit prior to being pumped to a 30-cubic foot plate and frame filter press. The sludge cake was analyzed and found to be below toxicity characteristic leaching procedure (TCLP) concentrations for metals and organics. However, the WDNR considers the sludge to be a listed F006 waste (due to the historical use of the site as an electroplating facility), which requires disposal at a RCRA Subtitle C landfill.

The entire site achieved construction completion status when the PCOR was signed on September 25, 1996.

EPA and the WDNR have determined that all RA construction activities were performed according to specifications. It is expected that cleanup levels for all groundwater contaminants will have been reached within 30 years, as specified in the ROD. After groundwater cleanup levels have been met, EPA will issue a Final Close Out Report.

System Operations/Operation and Maintenance (O&M)

Through yearly IAG amendments, the USACE is conducting O&M of the groundwater pump and treat system and long-term groundwater monitoring according to the June 1998 O&M Plan and subsequent modifications to that plan. The primary activities associated with O&M activities includes:

- Operation of the treatment plant 24 hours per day, seven days per week while treating water from all active extraction wells;
- Inspection and maintenance of groundwater extraction and monitoring wells;
- Inspection, maintenance and operation of the treatment system;

- Weekly monitoring of treatment system influent and effluent to ensure compliance with the substantial requirements of the WPDES permit;

- Quarterly monitoring of groundwater; and

- Monthly reporting on treatment system monitoring and O&M activities/problems.

The primary cleanup of the OECI site took place during the construction phase of the RA (i.e., lagoon sludge, soils, debris and sediment removal activities to eliminate the source of contamination). The other remaining component of cleanup is groundwater containment and restoration by a pump and treat system. Therefore, as indicated in the planned elements previously described, the primary O&M activities have been focused on operation and maintenance of the groundwater pump and treat system and groundwater monitoring.

A currently evolving issue exists regarding the improvement of the efficiency and effectiveness of the groundwater pump and treat system. In spring 2000, the OECI site was selected to be part of a national pilot study to evaluate and make recommendations for the improvement of operating groundwater pump and treat systems. This national effort is refereed to as the "Hydraulic Optimization Demonstration Project" and is being headed up by the EPA's Technology Innovation Office (TIO). The process is meant to identify cost savings through changes in operation and technology, to evaluate performance and protectiveness (as required by the NCP and five-year reviews), assure clear and realistic remediation goals and exit strategy, and verify adequate maintenance of Government-owned equipment. It is TIO's intent to eventually evaluate all Superfund pump and treat systems. For more information contact Kathy Yager at 732-321-6738 yager.kathleen@epamail.epa.gov.

The results of TIO's evaluation of the OECI site are detailed in an August 2000 report titled, "Remediation System Evaluation [RSE] for Oconomowoc Electroplating Superfund Site." The RSE report suggested many potential modifications to the existing pump and treat system to address protectiveness issues and life-cycle cost reductions. The following is a summary of the primary recommendations:

- Conduct a capture zone analysis to evaluate the adequacy of the capture zone of the pumping wells, and better understand impacts to the capture zone due to contribution of water from the adjacent wetlands;

- Conduct an additional delineation of groundwater contamination west of Eva Street, in a residential area with drinking water wells;

- Remove the cyanide treatment process. This recommendation was based on consistently low (below cleanup standards) or non-detect concentrations of cyanide in influent samples. The RSE estimated a potential savings over the operating life-cycle of over $600,000 as a result of the elimination of the need to purchase chemical additives; and

- Remove the metals precipitation process. This recommendation was based on consistently low (below cleanup standards) or non-detect concentrations of metals in influent samples. The RSE estimated a potential savings of over $500,000 over the operating life-cycle as a result of the elimination of sludge generation and disposal.

The RSE estimated that the removal of the cyanide and metals treatment systems would save an additional estimated $117,000 in annual labor costs due to reduced staffing requirements at the treatment plant (savings over the operating life-cycle of over $2.3 million).

It should be noted that EPA-Region 5, WDNR and USACE were already in the process of evaluating issues described in the RSE report prior to TIO's involvement at the site. However, the RSE report proved extremely useful because it provided the project with a third party objective evaluation of system problems, supported the need for additional investigation funds, and memorialized system issues in one comprehensive document.

Based on the RSE recommendations, on January 21, 2002 a cyanide and metals treatment process shut-down pilot study was initiated. The pilot study was anticipated to last approximately three months. During those three months, the cyanide and metals treatment systems were maintained and operators maintained availability so the system could be brought back on line, if necessary. In addition, the system was evaluated for potential problems such as clogging of the GAC and air stripper from particulate matter and bacteria, and exceedences of the WPDES permit discharge requirements.

During the pilot test, minor fowling occurred and the system was easily modified to remedy the problem. In addition, the treatment system remained in compliance with the substantive WPDES requirements. Based on the success of the pilot study, the cyanide and metals treatment processes to date have not been brought back on line. However, the cyanide and metals treatment equipment will be maintained and operators retained until after any well-field modifications have been implemented (discussed in the following paragraph). This will be done as a precaution in the event that any well-field modifications were to significantly alter the nature (i.e., increase cyanide and/or metal concentrations) of the influent.

Also based on the RSE recommendations, in November 2001, work was initiated for capture zone analysis and the delineation of groundwater contamination. Through a Cooperative Agreement (CA) with the WDNR, a contractor (RMT, Inc.) was retained to conduct the work. RMT prepared a final work plan in November 2001. This work is currently in progress and a report, including well-field modification recommendations, is anticipated to be completed in early 2003. EPA anticipates implementing appropriate well-field modifications by summer 2003.

In general, O&M costs include USACE O&M contract management, sampling and monitoring efforts, well maintenance, treatment system maintenance (including parts and labor), treatment system and well maintenance chemicals, sludge disposal, and utilities (electric and gas). Since system start up in 1996, costs have be relatively consistent with the exception of the time periods from October 1998 to September 1999 and October 2001 to September 2002 (estimated cost). During the period from October 1998 to September 1999, the lower cost is likely a result of lower treatment system maintenance due to relatively limited system upgrades and problems. The lower estimated costs for the time period from October 2001 to September 2002 are a result of the cyanide and metals treatment process shut-down. As a result of the cyanide and metals treatment processes shutdown, there is an estimated O&M cost savings for the time period from September 2001 to September 2002 of $67,000. With the elimination of chemicals and sludge disposal, subsequent yearly O&M cost savings may be as a high as $92,000. If the systems remain shut down after well-field modifications, an additional estimated $117,000 in annual labor costs will also be saved.

Table 2 - Annual System Operations/O&M Costs

Dates		Total Cost
From	To	
10/1996	9/1997	$600,000
10/1997	9/1998	$650,000
10/1998	9/1999	$500,000
10/1999	9/2000	$600,000
10/2000	9/2001	$645,000
10/2001	9/2002	$520,780 (estimated)

The following is a breakdown of estimated O&M costs for the period between October 2001 and September 2002:

O&M Costs	Annual Costs
Utilities	$18,000
Analytical: Treatment Plant	$53,171
Analytical: Groundwater	$18,540
Sludge Disposal	$24,683
Chemicals	$3,000
Labor (contractor)	$248,841
Over Time Labor (contractor)	$31,945
Oversight (USACE)	$35,000
Spare Parts	$21,000
Field Office	$22,850
Contingencies	$41,000
Other	$2,750
Total	**$520,780**

V. PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

Table 3: Actions Taken Since the Last Five-Year Review

Recommendations From Previous Review	Party Responsible	Action Taken
Continue Operation of Groundwater Pump & Treat System	EPA	On going Operation
Continue Groundwater Monitoring	EPA	On going Groundwater Monitoring

The first five-year review recommended continued operation of the groundwater pump and treat system and continued groundwater monitoring. During the past five years, the groundwater pump and treat system has operated on a relatively consistent basis with intermittent shutdowns for system maintenance, adjustments, modifications to remedy iron bacteria fowling problems, and malfunctions. On average, the influent flow rate has been approximately 20 to 30 gals per minute and the treatment system has treated approximately 13 million gallons of water per year (65 million gallons over five years). In addition, groundwater monitoring has consistently occurred over the last five years. However, implementation of both actions are under review as discussed in the Operation and Maintenance section of this five-year review.

VI. FIVE-YEAR REVIEW PROCESS

Administrative Components

Members of the WDNR and USACE were notified of the initiation of the five-year review in January 2002. The OECI Five-Year Review team was led by Steve Padovani of EPA, RPM for the OECI site, and included the WDNR (Paul Kozol) and representatives of the USACE.

From April 1, 2002 to April 15, 2002, the RPM established the review schedule. Its components included:

- Community Notification;
- Document Review;
- Data Review;
- Site Inspections;
- Five-Year Review Report Development and Review.

The schedule extended through July 31, 2002.

Community Involvement

Activities to involve the community in the five-year review process were initiated in April 2002 with a notification to the Community Involvement Coordinator (CIC) for the OECI Superfund site. A notice was published on May 29, 2002 in the local newspaper (Watertown Daily News) that a five-year review was to be conducted. In addition, EPA issued a press release on June 13, 2002 announcing the five-year and inviting citizens to get involved in the process.

Since the notice and press release were issued, no member of the community voiced any interest or opinion concerning the five-year review process. One member of the community voiced an interest via e-mail in getting on an informational list for the Site and asked whether there was a web site they could access for documents.

Document Review

This five-year review consisted of a review of relevant documents including O&M records, evaluation reports and monitoring data (See Attachment 3). Applicable groundwater cleanup standards, as listed in the 1990 ROD, were reviewed (See Attachment 4).

Data Review

The groundwater plume was defined during the RI and in the Pre-Design Investigation and consisted primarily of various chlorinated organics, including trichloroethene (TCE), perchloroethene (PCE), 1,1,1 trichloroethane (1,1,1 TCA), and breakdown products of those solvents. Maximum levels of TCE at the time exceeded 10,000 ug/L along the southeast boundary of the site and southwest of the site near the wetlands. Nickel, cadmium and cyanide were also present at significant levels at the time the RI was completed. The plume extended from the northeast side of the site southwest into the wetlands and from the Town of Ashippun Maintenance yard west toward the residences along Elm Street northwest of Eva Street.

The high levels of organics, metals and cyanide have dropped significantly following the extensive excavation of site soils and impacted sediments in the wetlands, and installation/operation of the groundwater pump and treat system in the mid-1990s. Overall, 10 of the 18 contaminants for which groundwater cleanup levels have been established are currently below their respective cleanup goals. Recent monitoring results for the eight contaminants are shown in table 3.

Over the past year, there have been sporadic occurrences of arsenic and cadmium just above cleanup standards in various wells. Chromium and manganese exceedances have been common. However, based on the most recent sampling event (April 2002), metals, with the exception of chromium and manganese, are below cleanup standards.

Six VOCs (1,1-dichloroethane, 1,1-dichloroehtene, 1,2-dichloroethene-cis, 1,1,1-TCA, TCE, and vinyl chloride) are detected above cleanup levels in select wells. Currently, maximum concentrations of these VOCs range between 5.9 and 511 ug/L. TCE, 1,1,1-TCA and their breakdown products predominate. The highest levels are found in the central part of the site. Based on Table 3, concentrations of VOCs over the last year appear to fluctuate, but remain steady.

Table 4 - Quarterly Comparison of Groundwater Concentrations

Contaminant	Well No.	PAL (ppb)	Concentration in ppb						
			3/2001	6/2001	7/2001	8/2001	9/2001	12/2001	4/2002
Chromium	MW13S	*5*	270	40	120	90	160	70	460
Chromium	MW16S	*5*	10	⟨8	10	10	30	8	10
Manganese	MW02D	*25*	30	30	40	30	30	30	40
Manganese	MW05D	*25*	90	120	140	190	200	150	130
Manganese	MW12B	*25*	70	10	90	30	20	30	120
Manganese	MW12D	*25*	70	70	50	50	110	110	40
Manganese	MW13S	*25*	220	100	170	120	250	100	180
Manganese	MW14D	*25*	60	60	60	60	50	60	60
Manganese	MW15D	*25*	210	220	170	290	230	240	200
Manganese	MW16S	*25*	350	270	420	420	57,000	470	180
1,1-Dichloroethane	MW12D	*85*	151	97	83	83	75	141	149
1,1-Dichloroethene	MW12D	*.024*	53	30	39	39	27	50	51
1,2-Dichloroethene Cis	MW05D	*10*	68	70	10	80	⟨.27	162	138
1,2-Dichloroethene Cis	MW12D	*10*	34	20	38	38	27	42	32
1,2-Dichloroethene Cis	MW16S	*10*	275	286	256	256	280	214	358
1,1,1-Trichloroethane	MW12D	*40*	161	90	328	328	260	154	116
Trichloroethene	MW05D	*0.18*	578	296	527	527	8300	631	511
Trichloroethene	MW12D	*0.18*	44	16	127	127	120	40	34
Trichloroethene	MW15D	*0.18*	31	18	5.7	5.7	27	26	26
Vinyl Chloride	MW12D	*.0015*	⟨0.5	⟨0.2	⟨0.1	⟨1	⟨2	7.4	5.9
Vinyl Chloride	MW16S	*.0015*	119	107	148	148	⟨2	147	93

Bold = Exceeds Cleanup Level

The concentration of TCE in MW15D (26 ug/l) suggests that a portion of the plume is present in the shallow aquifer below the nearby residences. Furthermore, there is no convincing evidence that this area of contamination is captured by the extraction system. The domestic wells in the area produce water from the deeper bedrock aquifer and are sampled annually by the WDNR. VOCs or metals of concern were not detected in domestic well-water samples from the most recent sampling event (August 2001)

with a couple of exceptions. In two residential wells, trace amounts of chlorinated solvents were detected. 1,2-Dichloroethene-cis was detected in two wells at .73 ppb and .90 ppb. The Wisconsin health advisory for this compound is 70 ppb. Tetrachloroethene was detected at 0.68 ppb in one residential well. The health advisory for this compound is 5 ppb. In addition, lead was detected at 15 ppb in one residential well sample at 15 ppb (the State action level is 15 ppb). However, it is believed that the lead is associated with lead in plumbing.

Site Inspections

Inspections at the site were conducted during the week of January 27th, 2002, on March 12, and on May 22, 2002 by the EPA. In addition, a site inspection and evaluation was conducted by EPA, TIO and USACE as part of the RSE process on March 14 through March 15, 2000. The RSE process is discussed in the operation and maintenance section of this report. The purpose of the inspections was to assess the protectiveness of the remedy, evaluate the performance of the groundwater pump and treat system, and verify the integrity of fencing to restrict access to the treatment system, well protection, and the restored wetland.

During the week of January 27, 2002, EPA/Environmental Response Team Center (ERTC) conducted a wetlands site inspection and collected sediment samples for chemical and toxicological analysis from the remediated portion of the wetlands. The objectives were to provide EPA with information regarding the effectiveness of contaminated sediment remedies in general, and to evaluate the success of the sediment remediation at the OECI site. To date, a report on the findings has not been finalized and the RPM has not been given any specific schedule as to when the report will be available.

The March 12, 2002 site inspection included the RPM and three EPA representatives from the Office of the Inspector General (OIG). OIG was interested in the RSE process overall and wanted to visit one of the pump and treat sites involved in TIO's nation optimization pilot study. OIG did not indicate any specific issues with the site, but was more interested the technical operations of groundwater pump and treat systems overall. To date, the RPM is not aware of any OIG reports or concerns related to the site visit.

The May 22, 2002 site inspection included the RPM and treatment plant operator. It should be noted that during the inspection, the treatment plant was temporarily shut down between 7:30 a.m. and 1:30 p.m. because Wisconsin Electric Power Company was installing new power lines along the road where the treatment plant is located.

Other than issues presented in the August 2000 RSE report which are being actively addressed, no other significant issues have been identified at any time regarding the groundwater pump and treat system. Significant issues have not been identified at any time regarding the integrity of fencing to restrict access to the treatment system, well protection, and the restored wetland. In fact, during the May 22, 2002 site visit, the RPM observed that the wetland contained an abundance of life, including thick vegetative growth and numerous birds (including blue heron).

Interviews

Interviews with individuals beyond the five-year review project team were not conducted. Since the news paper add and press release were placed, no member of the community or any other individual voiced any interest in conducting an interview related top the five-year review.

VII. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, applicable or relevant and appropriate requirements (ARARs), risk assumptions, and the results of the site inspection indicates that the remedy is functioning as intended by the ROD, as modified by the ESDs. The removal of lagoon sludge, soils, debris and sediment to eliminate the source of contamination has achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contaminants in soils and sediments.

The other remaining component of the cleanup is groundwater containment and restoration by a pump and treat system. Operation and maintenance of the groundwater pump and treat system has, on the whole, been effective. EPA is currently in the process of evaluating opportunities for system optimization. On January 21, 2002 the cyanide and metals treatment process was shut down as a pilot study to evaluate whether these two costly parts of the system could be permanently eliminated from the treatment train. In addition, in November 2001, work was initiated to conduct a more current capture zone analysis, delineate groundwater contamination, and make well-field modification recommendations. EPA anticipates implementing appropriate well-field modifications by summer 2003.

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?

There have been no changes in the physical conditions of the OECI site that would affect the protectiveness of the remedy.

Changes in Standards and To be Considers

As the remedial work has been completed, most ARARs for sediment, soil and debris contamination cited in the ROD have been met. ARARs that still must be met at this time and that have been evaluated include: The Safe Drinking Water Act (SDWA)(40 CFR 141.11-141.16) and the state of Wisconsin groundwater quality standards (Ch. NR 140, WAC. Chapter 160, Wis. Stats.) from which many of the groundwater cleanup levels were derived - [Maximum Contaminant Levels (MCLs), MCL Goals (MCLGs), and NR 140 Preventative Action Limits (PALs)]. A list of ARARs is included in Attachment 3. There have been no changes in these ARARs and no new standards or to be considers (TBCs) affecting the protectiveness of the remedy.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The exposure assumptions used to develop the Human Health Risk Assessment included exposure to contaminated groundwater and soils from a possible future ingestion pathway, and exposure

to contaminated soils from a possible future dermal contact pathway. The exposure assumptions used to develop the ecological assessment for Davy Creek and the adjacent wetlands area included high toxicity to various aquatic species from high metal concentrations. Toxicity tests confirmed these expectations.

There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline rick assessment. These assumptions are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels. No change to these assumptions, or the cleanup levels developed from them is warranted. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. The remedy is progressing as expected and it is expected that all groundwater cleanup levels will be met within 30 years, as specified in the ROD. However, after modifications to the well field are made as discussed previously, EPA anticipates a significant reduction in cleanup time, possibly achieving cleanup goals within ten years after well field modifications.

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

No other events have affected the protectiveness of the remedy and there is no other information that calls into question the short term protectiveness of the remedy. However, as stated above, long term protectiveness is being evaluated.

There is some concern that a portion of the plume is present in the shallow aquifer below the nearby residences. Furthermore, there is not convincing evidence that this area of contamination is captured by the extraction system. The domestic wells in the area produce water from the deeper bedrock aquifer and are sampled annually by the WDNR. No VOCs or metals of concern were detected in domestic well water samples from the most recent sampling event (August 2001) with a couple of exceptions. In two residential wells, trace amounts of chlorinated solvents were detected. 1,2-Dichloroethene-cis was detected in two wells at .73 ppb and .90 ppb. The Wisconsin health advisory for this compound is 70 ppb. Tetrachloroethene was detected at 0.68 ppb in one residential well. The health advisory for this compound is 5 ppb. In addition, lead was detected at 15 ppb in one residential well sample at 15 ppb (the State action level is 15 ppb). However, it is believed that the lead is associated with lead in plumbing. These concerns are being investigated in the on-going capture zone analysis and groundwater contamination study initiated in November 2001.

Technical Assessment Summary

According to the data reviewed and the site inspections, the remedy is functioning as intended by the ROD, as modified by the ESDs. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs for soil and sediment contamination cited in the ROD and ESDs have been met. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. On going well-field investigations, when completed, are anticipated to provide further insight into well-field modifications needed to optimize the capture zone. There is no other information available that calls into question the protectiveness of the remedy.

VIII. ISSUES

Table 5 - Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Need for continued evaluation of cyanide and metals treatment processes shut down.	N	N
Need for capture zone analysis.	N	N
Inadequate data to verify that contamination in the area of residential wells is captured by the extraction well field.	N	Y
Need for continual operation, maintenance and optimization of groundwater pump and treat system.	N	N

IX. Recommendations and Follow-Up Actions

Table 6 - Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Cyanide and metals treatment processes shut down.	1) Continue monitoring influent and effluent for WPDES exceedances; 2) Maintain cyanide and metals treatment equipment in operating condition until all well-field modifications are completed.	EPA/USACE	State/EPA	Fall 2003	N	N

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Capture zone analysis	1) Complete on-going capture zone analysis; 2)Make appropriate well-field modifications to ensure protectiveness and to decrease cleanup-up time.	EPA/WDNR	EPA/WDNR	Summer 2003	N	N
Inadequate data	1) Complete on going delineation of groundwater contamination west of Eva Street in residential area with drinking water wells; 2) Make modifications to well field that ensure capture of contamination in that area.	EPA/WDNR	EPA/WDNR	Summer 2003	N	Y
Pump and Treat O&M	1) Continue operating pump and treat system until cleanup goals have been met. 2) Continue to identify and implement opportunities to optimize operation of the groundwater pump and treatment system.	EPA/WDNR /USACE	EPA/WDNR /USACE	Until cleanup goals are met	N	N

X. Protectiveness Statement

The remedy is protective of human health and the environment in the short term. There are no current exposure pathways and the remedy appears to be functioning as designed. The removal of lagoon sludge, soils, debris and sediment to eliminate the source of contamination has achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contaminants in soils and sediments.

The other remaining component of the cleanup is groundwater containment and restoration by a pump and treat system. Operation and maintenance of the groundwater pump and treat system has, on the whole, been effective. However, EPA is currently in the process of evaluating opportunities for system optimization. In November 2001, work was initiated to conduct a more current capture zone analysis, delineate groundwater contamination, and make recommendations on appropriate well-field modifications. EPA anticipates implementing appropriate well-field modifications by summer 2003.

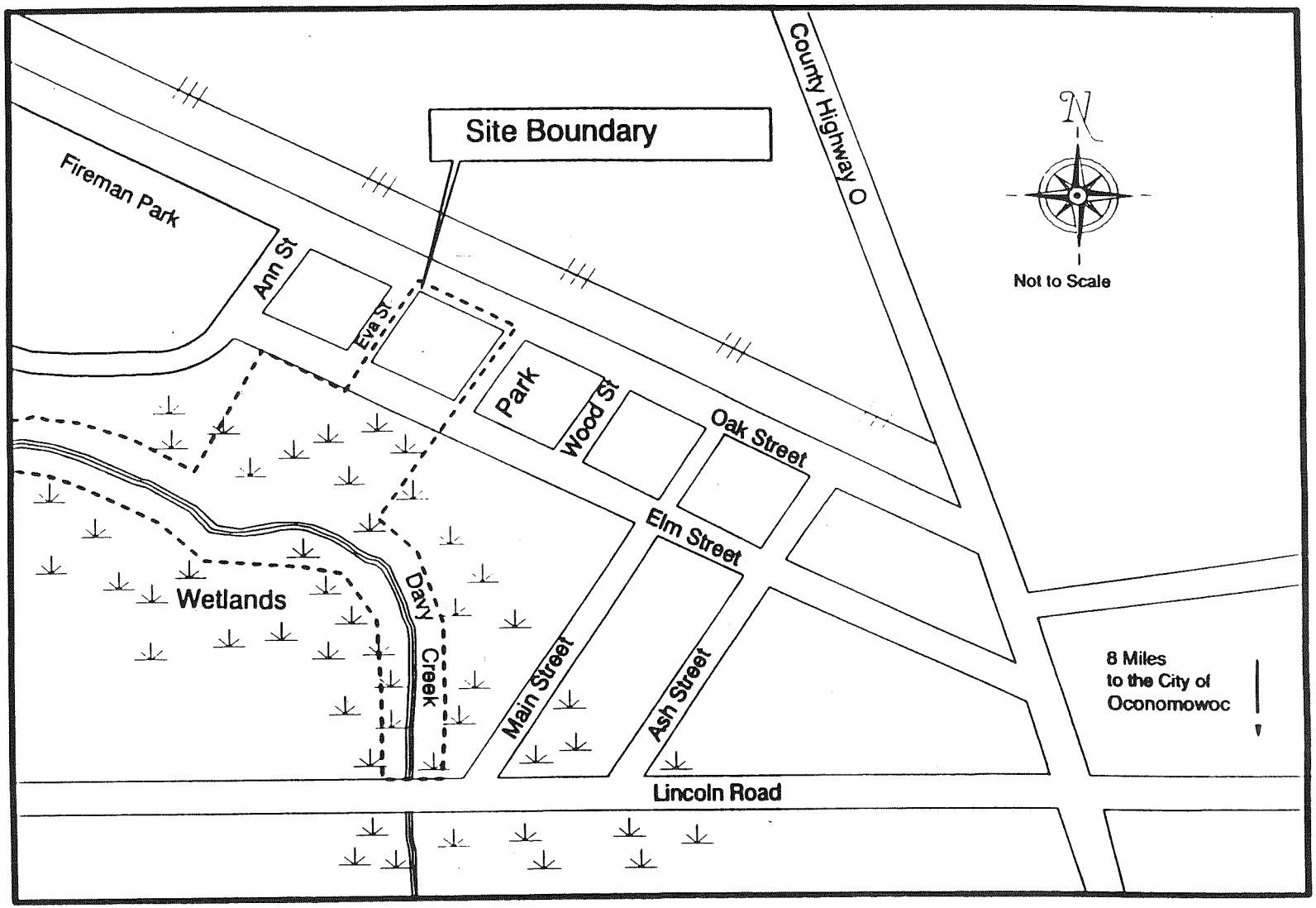
Also, there is some concern that a portion of the plume is present in the shallow aquifer below the nearby residences and their domestic wells. Furthermore, there is not convincing evidence that this area of contamination is captured by the extraction system.

Long-term protectiveness of the groundwater pump and treat portion of the remedial action will be verified by obtaining additional data/information on the well-field capture zone, delineation of groundwater contamination and implementing appropriate modifications to the well-field. The additional investigative work was initiated in November 2001 and is expected to be completed by early 2003. Implementation of appropriate well-field modifications is expected to occur in summer 2003. The groundwater pump and treat portion of the remedy will then be expected to be protective of human health and the environment upon attainment of groundwater cleanup goals.

XI. Next Review

The next five-year review for the OECI site is required by September 2007, five years from the date of this review.

ATTACHMENTS



Oconomowoc Site Location Map

Attachment 1

LEGEND

- RAILROAD TRACK
- EXISTING STRUCTURE
- FORMER STRUCTURE
- GRID LOCATION
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING FENCE
- 800 EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- × 815.1 EXISTING SPOT ELEVATION
- EXISTING DEPRESSION
- EXISTING TREE LINE
- EXISTING WET AREA
- EXISTING EDGE OF WATER
- APPROXIMATE LIMITS OF WETLAND
- SG-2 STAFF GAUGE
- P-2 DRIVE POINT WELL
- HP-23 HYDROPUNCH BORING
- MW-16S WATER TABLE WELL
- EW-2 EXTRACTION WELL
- MW-2D PIEZOMETER
- OW-5 ABANDONED WELL
- WATER SUPPLY WELL
- EXISTING SEWER MANHOLE LOCATION
- BM-01 EXISTING BENCHMARK LOCATION
- EXISTING LIGHT POLE
- EXISTING CULVERT
- gte EXISTING TELEPHONE BOX
- gas EXISTING GAS
- EXISTING ELECTRIC POWER POLE
- elec EXISTING ELECTRIC MANHOLE LOCATION
- water EXISTING WATER
- EXISTING PRIVATE WELL
- EXISTING HYDRANT
- EXISTING SEWER VENT

NOTES

1. BASE MAP DEVELOPED FROM AERIAL PHOTOGRAPHS DATED 3/28/1999 PREPARED BY AEROMETRICS, INC., SHEBOYGAN, WISCONSIN.
2. VERTICAL DATUM (ELEVATION) IS REFERENCED TO USGS MEAN SEA LEVEL DATUM, 1929 ADJUSTMENT. TOPOGRAPHIC CONTOUR INTERVAL: 2 FEET.
3. THE HORIZONTAL DATUM IS BASED ON THE WISCONSIN STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM (NAD) 1927 – WISCONSIN SOUTH.
4. MONITORING WELL LOCATIONS AND ELEVATIONS ARE BASED ON A SURVEY PERFORMED BY SPATIAL DATA SURVEYS ON 12/00/99
5. SITE BENCHMARKS ESTABLISHED BASED ON SURVEY FROM BENCHMARK MONUMENT LOCATED ON THE SOUTHWEST CORNER OF THE INTERSECTION OF MAPLETON ROAD AND MILL ROAD. NE 1/4 OF NE 1/4 OF SECTION 8, TOWNSHIP 8 NORTH, RANGE 17 EAST.

Attachment 2

JUN 07 2002

N

0 100' 200'

SCALE 1" = 200'

NO	BY	DATE	REVISION	APP'D
3				
2				
1				

PROJECT
GROUNDWATER INVESTIGATION
FORMER OCONOMOWOC ELECTROPLATING COMPANY, INC.
ASHIPPUN, WISCONSIN

SHEET TITLE
EXISTING CONDITIONS MAP

DRAWN BY: NOLDENR	SCALE:	PROJ. NO. 061050.02
CHECKED BY:	1"=200'	FILE NO. 61050206.DWG
APPROVED BY:	DATE PRINTED:	
DATE: MAY 2002		

RMT INC
744 Heartland Trail
Madison, WI 53717-1934
P.O. Box 8923 53708-8923
Phone 608-831-4444
Fax 608 831-3334

ATTACHMENT 3

List of Documents Reviewed

OECI Superfund Site Record of Decision, September 20, 1990

OECI Superfund Site Explanation of Significant Difference, September 30, 1991

OECI Superfund Site Explanation of Significant Difference, March 8, 1994

OECI Superfund Site First Five-Year Review, September 29, 1997

OECI Superfund Site Preliminary Close-Out Report, September 25, 1997

OECI Superfund Site Operation and Maintenance Plan, June 1998

OECI Superfund Site Remediation System Evaluation Report, August 2000

OECI Superfund Site Operation and Maintenance Costs 2001 and 2002

OECI Superfund Site monthly Operation and Maintenance and System Monitoring Reports, 2001 and 2002

OECI Superfund Site Groundwater Investigation Workplan, November 2001

OECI Superfund Site Quarterly Groundwater Monitoring Reports, 2001 and 2002

RCRA permitted landfill. Cleanup levels will be consistent with clean closure levels, in accordance with 40 CFR 264 and NR 181, WAC;

B. OU2; Alternative S1, onsite soil excavation of approximately 700 cubic yards of soil as shown on Figure 4-1 and off-site treatment and disposal. Cleanup levels will be risked-based pursuant to Wisconsin law and the EPA policy on implementing hybrid closures. Cumulative carcinogenic risk due to soil ingestion should not exceed 1×10^{-6} risk level, and the cumulative Hazard Index should not exceed 1.0;

C. OU3; Alternative GW2, installation of groundwater recovery wells, an onsite treatment system including ion exchange, air stripping and carbon absorption. A chemical oxidation system will be utilized for treatment of cyanide if a treatability study determines that ion exchange is ineffective in removing cyanide from the groundwater. The resultant ion exchange resin from this treatment process would be properly disposed off-site at a RCRA permitted landfill because it will contain an F006 waste. It will be determined whether or not the spent carbon requires disposal in a RCRA permitted landfill.

D. OU4; Alternative DW1 excavation of contaminated sediment in Davy Creek and the wetlands to a depth of two feet, and off-site stabilization and disposal of the contaminated sediment. Sediment to a depth of approximately two feet will be removed from the wetland and Davy Creek in order to remove the most contaminated sediments in these areas. Additional bioassay and risk assessment work will be performed to determine the final exposure levels.

X. Statutory Determinations

The selected remedy must satisfy the requirements of Section 121(a-e) of CERCLA to:

A. Protect human health and the environment;
B. Comply with ARARs;
C. Be cost-effective;
D. Utilize permanent solutions and alternate treatment technologies to the maximum extent practicable; and,
E. Satisfy a preference for treatment as a principle element of the remedy.

The implementation of Alternatives L1, S1, GW2, and DW1 at the OEC site satisfies the requirements of CERCLA as detailed below:

A. Protection of Human Health and the Environment

Implementation of the selected alternatives will reduce and control potential risks to human health posed by exposure to contaminated soil, sediment, and ground water. Lagoon cleanup will be to RCRA clean closure 40 CFR Part 264 Subpart G levels, or the appropriate State RCRA requirements. Extraction and treatment of contaminated ground water will be conducted to meet federal and state Ground-Water Cleanup Standards. Soil and debris at the site (i.e., the non-RCRA lagoon soils) will be excavated and backfilled so that the direct contact exposure risk will be reduced to 10^{-6} and migration of contaminants to ground water will be mitigated to standards, consistent with EPA's guidelines on hybrid clean closure. Cleanup levels in the wetlands and Davy Creek have not been established pending the results of the bioassay work. The selected remedy also protects the environment by reducing the potential risks posed by site chemicals discharging to surface water (Davy Creek) and the wetlands.

With regard to the community and onsite workers, all alternatives will pose potential risks from dust and air emissions generated during excavation activities. Perimeter air monitoring will be needed during remedial activities to determine if steps are needed to protect the community from adverse air emissions. Workers will be required to wear the proper protective health and safety equipment to protect their safety. None of these short-term risks will result in unacceptable exposures to human health or the environment.

B. Compliance With ARARS

The remedies selected for operable units 1, 2, and 3, will comply with the federal, and state standards where more stringent, of applicable or relevant and appropriate requirements (ARARs). The selected, interim remedy for Operable Unit 4 will comply with those ARARs that are pertinent, given the limited scope of this action. The ARARs for the four operable units are listed below.

B.1 Chemical-specific ARARS

Chemical-specific ARARs regulate the release to the environment of specific substances having certain chemical characteristics. Chemical-specific ARARs typically determine the extent of cleanup at a site.

B.1.a Soils

The soil clean-up standards for the OEC site will be based on the State's clean closure requirements (for the lagoons) and on EPA's hybrid closure guidelines for the contaminated soil and debris at the site.

B.1.b Sediments

The removal criteria for the sediments in the wetlands, and potentially Davy Creek, will be based on existing sediment studies, as well as any additional information collected during remedial design and action.

B.1.c Ground Water

i. Federal ARARs

Maximum Contaminant Levels (MCLs), and the non-zero Maximum Contaminant Level Goals (MCLGs), the Federal drinking water standards promulgated under the Safe Drinking Water Act (SDWA), are applicable to municipal water supplies servicing 25 or more people. At the OEC site, MCLs and MCLGs are not applicable, but are relevant and appropriate, since the sand and gravel aquifer is a Class IIA source which could potentially be used for drinking in the area of concern (the contaminant plume). MCLGs are relevant and appropriate when the standard is set at a level greater than zero (for non-carcinogens), otherwise, MCLs are relevant and appropriate. The point of compliance for ground water standards will be attained throughout the plume within a reasonable period of time, once all sources on site have been addressed.

ii. State ARARs

The State of Wisconsin is authorized to administer the implementation of the Federal SDWA. The State has also promulgated ground-water quality standards in Ch. NR 140, WAC. Chapter 160, Wis. Stats., directs the WDNR to take action to prevent the continuing release of contaminants at levels exceeding standards at the point of standards application. Ground-water quality standards established pursuant to Ch. NR 140, WAC, will be preventive action limits (PALs), where economically and technically feasible, or alternative concentration limits (ACLs) not to exceed the State's ES. Preventive action limits (PALs) and enforcement standards (ESs) contained in section NR 140.10, WAC, for the Chemicals of Concern are listed in Table 2-13. PALs (and ESs) are generally more stringent than corresponding Federal standards . The State's ground water law and code is a ARAR for this site, since those laws were created to address ground water quality in general.

The implementation of the selected remedy at the OEC site will be in compliance with Ch. NR 140, WAC, in that preventive action limits (PALs) will be the clean-up standard for ground water. The effectiveness of the ground water system in achieving that goal will be reviewed periodically to determine if achieving the PAL is technically and economically feasible, based on site-specific

With regard to the community and onsite workers, all alternatives will pose potential risks from dust and air emissions generated during excavation activities because all alternatives require some excavation. Perimeter air monitoring would be needed during remedial activities to determine if steps are needed to protect the community from adverse air emissions. Workers will be required to wear the proper protective health and safety equipment to protect their safety.

With regard to the time until remedial objectives are met, all alternatives with the exception of GW1 and GW2 should take a few weeks to a few months to implement. Alternatives GW1 and GW2 could take up to 30 years to achieve the cleanup goals.

With regard to environmental impacts, alternatives GW1 and GW2 may result in a change in groundwater flow and will have to be monitored so that no adverse impacts result to the wetlands. Alternatives DW1 and DW2 will have environmental impacts to the wetlands and Davy Creek and a plan to mitigate these impacts (e.g. restricting vehicle traffic in the wetland) will be developed.

None of these alternatives will result in unacceptable short-term risks to worker, residents, or the environment.

F. Implementablity

This evaluation addresses the technical and administrative feasibility of implementing the alternatives and the availability of the various services and materials required during its implementation.

The alternatives L1, S1, D1 and D2, include excavation, stabilization and off-site disposal which are all demonstrated and commercially available. Conditions external to the site, such as equipment availability, materials and services present no problem at this time. The contaminated solids would be treated and disposed of in an off-site landfill. Stabilization has been determined to be the Best Developed Available Technology (BDAT) for wastes contaminated with F006 wastes. At this time, the specific location and capacity of the off-site landfill have not yet been determined but should not pose a problem. Alternative S2, capping, is well demonstrated and commercially available. Alternatives GW1 and GW2 are proven technologies and commercially available. A treatability study will be necessary to determine if ion exchange or chemical oxidation will be more practical in removing cyanide from the groundwater.

Administratively, none of the alternatives should have any problem with regard to implementation, although coordination at both the State and local level will be necessary for implementation.