Five Year Review Report

Wausau Groundwater Contamination Site
Wausau, WI

Pursuant to CERCLA

Prepared by:

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Region 5
Chicago, Illinois

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Date

I. INTRODUCTION

A. Authority and Purpose

The United States Environmental Protection Agency (U.S. EPA), Region 5, conducted this statutory five-year review under Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The purpose of a statutory five-year review is to evaluate whether a completed remedial action remains protective of human health and the environment at sites where hazardous waste remains on-site at levels that do not allow for unlimited use and unrestricted exposure. The Type Ia review conducted for this site is applicable to a site at which response is ongoing. This review will be placed in the Site files and local repository for the Wausau Groundwater Contamination Superfund Site (the Site) in Wausau, Wisconsin.

B. Site History

The City of Wausau is located along the Wisconsin River in Marathon County, Wisconsin. The Wausau Groundwater Contamination Site encompasses an area in the northern section of the city which includes the City Well Field and six of its production wells (Figure 1). The City of Wausau provides drinking water for approximately 35,000 people. In 1982 three of the City's production wells were found to be contaminated by volatile organic compounds (VOCs). The major contaminants include Tetrachloroethene (PCE), Trichloroethene (TCE), and 1,2, dichloroethene (DCE). In 1983, the U.S. EPA awarded the City of Wausau a federal grant to help fund the design and installation of packed tower VOC strippers in order to provide sufficient water of acceptable quality to City residents. However, because VOC levels in the distribution system continued to increase, the City asked the U.S. EPA's Emergency Response Team for assistance to meet immediate demand. As an interim measure, the U.S. EPA installed a granular activated carbon (GAC) treatment system on one of the City's supply wells until VOC strippers were completed for two other wells. The GAC system was removed from service in October 1984. In December 1985 the Wausau Groundwater Contamination site was added to the National Priorities List (NPL) for remedial activities under Superfund.

A number of point source investigations were conducted in the area of the City's well field on behalf of the U.S. EPA, the Wisconsin Department of Natural Resources (WDNR), the City of Wausau, and other private parties. The U.S. EPA conducted a Remedial Investigation/Feasibility Study (RI/FS) to fill data gaps and to determine a cost-effective solution to the groundwater problem. The RI/FS was conducted in two phases, and was completed in August 1989. Results of Phase I of the RI field work are summarized in an April 1988 Technical Memorandum. Phase II field work was completed in September 1988 and results of both phases of work were included in the final RI report for the Site. The major findings of the RI include:

- The City's production wells are finished in a wedge shaped aquifer composed of glacial outwash materials deposited within the pre-glacial bedrock river valley of the Wisconsin River. The aquifer is the sole-source of potable water for the City of Wausau.

- Two separate sources of contamination were identified within the zone of influence of the City's production wells. The first source is an old municipal landfill located south of City Well Six (CW6) on the Marathon Electric property in the west study area. The second source is the Wausau Chemical facility located between CW3 and CW4 in the east study area.

- Three separate plumes of groundwater contamination exist within the zone of influence of the City's production wells. The first of which is composed primarily of TCE and is emanating from the old landfill (plume #1). The plume splits at the boundary of the source area with one leg migrating north to CW6 (#1a) and the second leg migrating under the river to CW3 (#1b). The second plume originates from the southern boundary of the Wausau Chemical property and has impacted both CW3 and CW4 (plume #2). This plume is comprised primarily of PCE, but contains other VOCs as well. The third plume originates from the northern boundary of the Wausau Chemical property and is impacting CW3 (plume #3). This plume is also comprised primarily of PCE.

- Soils at both source areas are contaminated with VOCs. The soils in the vicinity of the old landfill are contaminated primarily with TCE, and soils on the Wausau Chemical property are contaminated primarily with PCE, along with other VOCs.

Following completion of Phase I RI field work a Phased Feasibility Study was completed for an interim remedy to address the contaminant plume affecting CW6 and the West Well Field (plume #1a). An Operable Unit (OU1) Interim Record of Decision to address the groundwater contaminant plume was signed in December 1988. Remedial Design and Remedial Action for Operable Unit 1 at the Site were completed by the responsible parties at the Site, under a Consent Order entered on September 8, 1989.

The final FS detailed the development and evaluation of an array of remedial action alternatives to address the entire Wausau Site and sources impacting it. These included the two source areas to groundwater contamination and three remaining groundwater plumes (plumes #1b, #2 and #3). A final ROD for the Site was signed on September 29, 1989, which also incorporated the interim remedy. The final Remedial Design and Remedial Action were performed by the responsible parties under a Consent Decree, entered on January 25, 1991.

II. DISCUSSION

A. Remedial Objectives

The remedial action objectives of the ROD for Operable Unit 1 (Interim Action ROD) were to 1) prevent exposure to contaminated drinking water from groundwater supply wells located within the contaminant plume threatening the West Well Field (#1a), and 2) protect the West Well Field from future increased levels of contamination. The remedy selected to meet these objectives included:

- installation of an extraction well located in the southern portion of the contaminant plume;

- implementation of a treatment system for removal of contaminants;

- discharge of the treated water to the Wisconsin River; and,

- a provision for implementation of an additional well, as necessary.

The selected remedy established clean up levels for the contaminants of concern in groundwater based on the Safe Drinking Water Act Maximum Contaminant Levels (MCLs) and the Wisconsin Administrative Rule Chapter NR 140 for groundwater protection.

The remedial action objectives of the ROD for Operable Unit 2 (Final ROD) were to address the remaining concerns at the Site, following implementation of the Interim Action, and included; 1) elimination of the continued sources of groundwater contamination identified as the former City landfill/Marathon Electric property and the Wausau Chemical property, and 2) prevent exposure to contaminants present in the three remaining groundwater contaminant plumes (plumes #1b, #2 and #3). The remedy selected to meet these objectives included:

- Installation of soil vapor extraction (SVE) systems to remove contaminants from soils at each of the identified source area;

- Treatment of off-gases from the SVE system operation using vapor phase carbon units which will be regenerated off-site; and

- Groundwater remediation utilizing the municipal wells and existing air strippers for expedited removal of shallow groundwater contamination.

The selected remedy established clean up levels for contaminants of concern in groundwater based on 1×10^{-6} health-based risk factors and the Wisconsin Administrative Rule Chapter NR 140 for groundwater protection. Soil clean up levels for contaminants of concern were determined using a mass-flux groundwater model to identify the acceptable levels that can remain in soils without contributing to contamination in groundwater above the established groundwater clean up levels.

B. Remedial Action

On-site work on Operable Unit 1 (Interim Remedial Action) began June 25, 1990. A groundwater extraction well was installed at the north boundary of the old landfill generally in the location where the plume splits. The well has a 16-inch diameter and is screened over the bottom 40 feet of the aquifer. Originally the well pumped at 1600 gallons per minute (gpm) but was later reduced to approximately 850 gpm following a determination that the zone of influence of the well extended too far to the south. A pump house and Discharge Outlet, and the associated force main and piping, were installed to facilitate treatment and discharge of the extracted

groundwater. The groundwater is pumped from the well via a vertical turbine pump located in the pump house, and was originally discharged directly to a manhole that leads through a storm sewer to a rip rap outfall structure designed to enhance volatilization of the VOCs prior to final discharge into the Wisconsin River. A Wisconsin Pollution Discharge Elimination System (WPDES) permit was issued by the WDNR for the discharge. In June 1995, Marathon Electric presented technical information in support of use of the extracted groundwater for non-contact cooling water applications. A portion of the water is diverted from the well piping to the water cooled equipment in each of Marathon Electric's manufacturing buildings. After passing through the equipment heat exchangers, the water is piped back to the extraction well manhole and over the rip rap to the Wisconsin River. The request was approved by the U.S. EPA in July 1995 and has eliminated the purchase and use of City water for Marathon Electric's cooling applications.

The entire site has been seeded and mulched and a walk way and stairway have been constructed to access the riprap discharge section for sampling. The area was enclosed with a secured chain link fence. The Final Inspection was conducted on October 1, 1990. The system was determined to be operational and functional and has been successfully operating since that date, with the exception of minor down time for maintenance. A quarterly monitoring program was implemented at system start-up to track changes in VOC concentrations within the affected zone and to ensure continued capture of the entire plume.

Construction commenced on Operable Unit 2 (Final RA) on October 11, 1993. Two separate SVE systems were installed at the site. One system is located in the vicinity of the old landfill on the west side of the Wisconsin River and includes two SVE wells, and the other is on the east side of the river on the Wausau Chemical property, and includes four SVE wells. Both SVE systems consist of the SVE wells, piping manifolds, control valves, monitoring gauges, a water knock out tank, a blower, and off-gas treatment vapor phase carbon units. The SVE wells are either eight or three inches in diameter and are screened from five feet below grade to just below the water table. The treatment units consist of two carbon canisters in series. The systems are designed to operate continuously with automated controls designed to shut off the system and notify operators when preset limits are reached. On January 4 and 5, 1994 the SVE systems were started up on the West and East side areas, respectively. A final inspection was conducted for both systems on June 8, 1994 and the systems were determined to be operational and functional.

The SVE system is expected to meet soil clean up standards in the three-year time limit specified in the Consent Decree. Soil gas monitoring will be conducted throughout the operation of the SVE systems to monitor system progress and to measure decreases in concentrations of VOCs. Collection and analysis of soil samples at the source areas are required at the pre-startup, mid-operational, and final stages of operation of the SVE systems. Following the midpoint sampling, the PRPs submitted a Mid-Point of Operations report for the SVE system in October 1995. U.S. EPA approved shut down of the West bank SVE system and 2 of the East bank SVE wells following successful demonstration, through confirmatory soil sampling, that soil clean up levels had been achieved in these areas. Operation of SVE wells in the southern portion of the East bank area (Wausau Chemical property) will continue with some modifications designed to help the system meet soil clean up levels in this area at the end of the three-year time limit.

As part of the final remedy, the City of Wausau is required to operate CW6 and CW3 at specified rates to enhance the expedited removal of the VOC plumes impacting these wells. Extracted water is treated to acceptable health-based levels in accordance with the Safe Drinking Water Act prior to distribution utilizing the City's air strippers.

III. RECOMMENDATIONS

I recommend the continued operation of the groundwater extraction and treatment system at Operable Unit 1 and the requirements for operation and treatment of groundwater at CW6 and CW3 to ensure continued capture of all groundwater contaminants and to accelerate achievement of groundwater clean up standards for groundwater contaminants of concern at the Wausau Site.

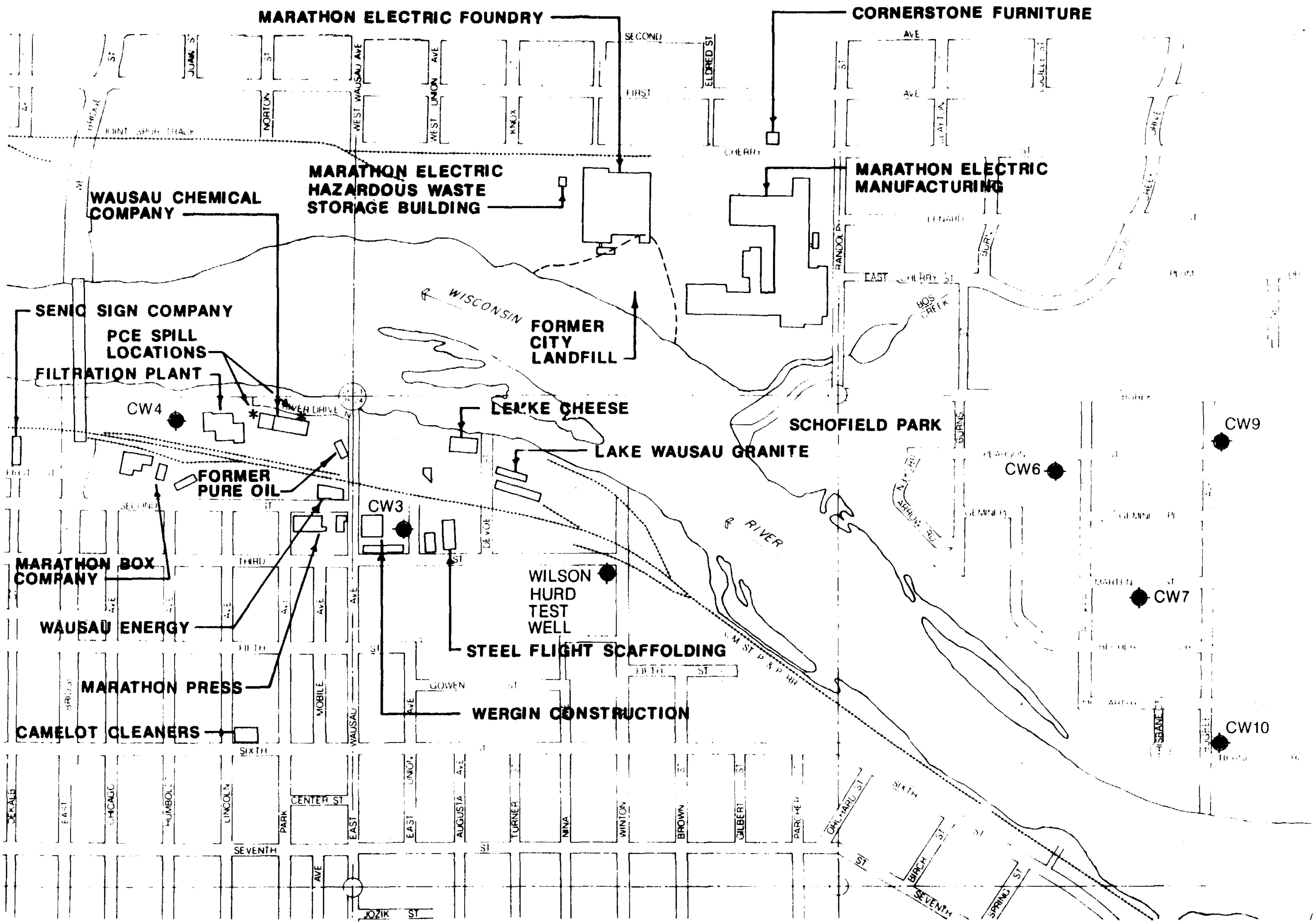
I recommend the continued implementation of the SVE system in the southern portion of the East bank (Wausau Chemical property) with previously approved U.S. EPA modifications until soil clean up standards are achieved in this area. I recommend performance of soil confirmation sampling as originally scheduled at the end of the projected three-year operation, approximately Spring 1997.

IV. STATEMENT ON PROTECTIVENESS

I certify that the remedies selected for this sites remain protective of human health and the environment.

V. NEXT FIVE-YEAR REVIEW

The next five-year review will be completed by June 30, 2000, which is less than five years from the date of this review because this review was conducted more than 5 years from the date on-site construction mobilization for Operable Unit 1 at the Site (June 25, 1990).


MARATHON ELECTRIC FOUNDRY
CORNERSTONE FURNITURE
MARATHON ELECTRIC HAZARDOUS WASTE STORAGE BUILDING
MARATHON ELECTRIC MANUFACTURING
WAUSAU CHEMICAL COMPANY
SENIC SIGN COMPANY
PCE SPILL LOCATIONS
FILTRATION PLANT
FORMER CITY LANDFILL
WISCONSIN
RIVER
CW4
LEMKE CHEESE
SCHOFIELD PARK
CW9
LAKE WAUSAU GRANITE
CW6
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CW3
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CW10
SECOND
FIRST
CHERRY
EAST CHERRY ST
RIVER DRIVE
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TURNER
NINA
WINTON
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GILBERT
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WAUSAU
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BOS CREEK
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Figure 1