UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: March 22, 1994

SUBJECT: Preliminary Close-Out Report for Wausau Groundwater Contamination Site

FROM: Margaret M. Guerriero, RPM
Region 5, Office of Superfund

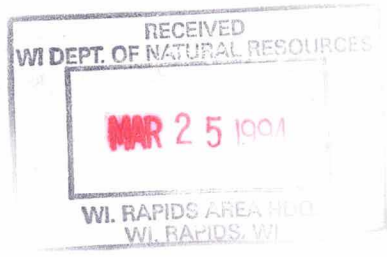
TO: Awilda Fuentes, Region 5 RD/RA Coordinator
HQ Design and Construction Management Branch

Attached please find a copy of the final Preliminary Close-Out Report (PCOR) signed by Region 5's Waste Management Division Director, William Muno, on March 18, 1994. Please include the site on the Superfund construction completion list.

Please contact me if you have any questions or need additional information regarding this matter at (312) 886-0399. Thank you for your assistance in the preparation of the PCOR.

Attachment

cc: Jim Mayka, EPA Region 5
Wendy Carney, EPA Region 5
Don Grasser, WDNR
Jane Lemke, WDNR



SUPERFUND PRELIMINARY CLOSE OUT REPORT
(Long Term Remedial Action)

WAUSAU GROUNDWATER CONTAMINATION SITE
WAUSAU, WISCONSIN

I. INTRODUCTION

This Preliminary Close Out Report documents that all construction activities have been completed on the two operable units at the Wausau Groundwater Contamination Superfund site in accordance with OSWER Directive 9320.2-3C. Operable Units 1 and 2 include groundwater restoration and soil remediation, respectively. In accordance with OSWER Directive 9320.2-06, construction completion for sites with long term groundwater restoration and/or soil remediation is declared when the treatment system has been constructed and is operating according to design. The Wausau Groundwater contamination site meets the criteria for a construction completion.

II. SUMMARY OF SITE CONDITIONS

Background

The City of Wausau is located along the Wisconsin River in north central Wisconsin. The Wausau Groundwater Contamination Superfund site encompasses an area in the northern section of the City which includes the City's well field and six of its production wells (see Figures 1 and 2). 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 with volatile organic compounds (VOCs), primarily Tetrachloroethene (PCE), Trichloroethene (TCE), and 1,2-Dichloroethene (DCE). Contaminant levels in the production wells have remained fairly consistent, ranging between 100 to 300 micrograms per liter (ug/l) of VOCs. Initially, the City blended water from clean wells with contaminated water to meet demand. However, in 1984 U.S. EPA's emergency response team was called in to provide temporary treatment for one of the wells so that demand for water could be met while the city completed construction of two air strippers to treat the water prior to distribution.

Remedial Planning Activities

The site was added to the National Priorities List (NPL) in 1985. The remedial investigation (RI) was completed in two phases. Phase I was conducted from August 1987 to January 1988, results of which are summarized in a technical memo dated April 1988. Phase II was conducted from June to September 1988, with results

included in the final RI report dated August 1989. 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 (see Figure 2).

* Three separate plumes of 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. The plume splits at the boundary of the source area with one leg migrating north to CW6 and the second leg migrating under the river to CW3. The second plume originates from the southern boundary of the Wausau Chemical property and has impacted both CW3 and CW4. 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 site and is impacting CW3. 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, although other chemicals typically found in landfills have also been detected in on-site borings. The soils on the Wausau Chemical property are contaminated primarily with PCE, although other VOCs have also been detected.

* Long-term exposure to low levels of VOCs in the municipal water supply, potential future use of private wells in contaminated groundwater, and air emissions of VOCs from current and planned treatment systems were identified as pathways of exposure at the site. Site specific objectives were developed to address these risks.

Based on the findings of the Phase I RI, a feasibility study (FS) that evaluated alternatives to address migration of the TCE plume was completed in September 1988. U.S. EPA issued an interim Record of Decision (ROD) in December 1988 that called for the installation of a groundwater pump and treat system to remediate the TCE plume. Following completion of the final RI a second FS was completed in August 1989 to evaluate alternatives to address the two remaining groundwater plumes and the source area soils. The final ROD was issued in September 1989 outlining the final

remedy for the site.

Remedial Construction Activities - Operable Unit 1

EPA issued the ROD for Operable Unit 1 on December 23, 1988 specifying for the following remedy:

* 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 Maximum Contaminant Levels (MCLs) and the Wisconsin Administrative Rule Chapter NR 140 for groundwater protection.

EPA entered into a Consent Decree with the responsible parties for implementation of the remedial design/remedial action (RD/RA). The RD was completed on March 22, 1990. The contract for RA construction was awarded on May 14, 1990, and construction commenced on 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 is discharged 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 Wisconsin Department of Natural Resources (WDNR). The WDNR made the determination during the permitting process that the man-made rip rap was acceptable Best Available Technology (BAT) for treatment of VOCs prior to discharge to the surface body of water.

The final inspection of the system 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.

Remedial Construction Activities - Operable Unit 2

EPA issued a ROD for Operable Unit 2 on September 29, 1989 specifying the following remedy:

* Installation of soil vapor extraction (SVE) systems to remove VOCs in soils at each of the identified source areas;
* Treatment of off-gases from the SVE system operation using vapor phase carbon which will be generated off-site;
* Groundwater remediation utilizing specified pumping rates of the municipal wells in order to expedite removal of the contaminant plumes effecting the wells; and
* Treatment of groundwater utilizing the existing air strippers.

The selected remedy establishes clean-up levels for contaminants of concern in groundwater based on 1 x 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.

The final remedy incorporates the interim remedy and together the selected remedies eliminate the principal threat posed to human health and the environment by eliminating the sources, preventing further migration of VOCs in groundwater, and by treating the extracted groundwater to acceptable discharge limits.

EPA entered into a second Consent Decree with the responsible parties for implementation of the remedial design/remedial action (RD/RA) of the final remedy. The RD was completed on June 30, 1993. The contract for RA construction was awarded on September 28, 1993, and construction commenced on October 11, 1993.

Two separate SVE systems were installed at the site. One in the vicinity of the old landfill on the west side of the River that includes two SVE wells, and the other on the east side of the river on the Wausau Chemical property that 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 have a three inch 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.

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.

A pre-final inspection of the SVE system was conducted on January 24, 1994. At that time the system was determined to be operational and functional and capable of continuous, automated operation. A punch list of additional minor tasks to be completed was developed and a schedule for completion of those items was submitted by the responsible parties contractor.

III. DEMONSTRATION OF QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) FROM CLEAN-UP ACTIVITIES

Remedial design and remedial action activities at the site were conducted by the design and construction contractors hired by the responsible parties. All document preparation and field activities were reviewed and approved by EPA, in consultation with the WDNR, to assure consistency with the RODs, consent decrees, and work plans.

The QA/QC program utilized throughout the pre-design and RA construction was in accordance with EPA protocols. Details of the analytical procedures are included in the approved Quality Assurance Project Plan (QAPP) for both RD/RAs and the pre-design work. The remaining groundwater monitoring activities for the RA with be conducted in accordance with the approved QAPP. The laboratories utilized for the analysis of treatment system performance data and groundwater quality have been audited by EPA Region 5 Environmental Services Division and have been found to be acceptable with respect to the analytical protocols employed.

The QA/QC program utilized throughout the RD/RA has been sufficient to allow EPA to make the determination that all reported analytical results are accurate and can be relied upon to assure the remedial action has been satisfactorily performed consistent with the ROD.

IV. MONITORING RESULTS

A monitoring program has been established for the RA. The groundwater monitoring will include chemical and hydraulic monitoring of a network of monitoring wells in the study area. Chemical analysis will include VOCs identified as chemicals of concern in the ROD and periodic screening for priority pollutants. Groundwater monitoring will be performed quarterly

in a core group of wells and annually in the larger network of wells. EPA will certify completion of groundwater remediation activities once it has been demonstrated that clean-up levels have been attained for all chemicals of concern identified in the ROD and consent decree.

The SVE systems began continuous operation in January 1994. The system was constructed according to design specifications, and is expected to meet clean-up standards in the three-year time limit specified in the consent decree. Initial data from the system indicate a reduction in soil gas concentrations at the site.

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. EPA will certify completion of soil remediation activities once it is demonstrated the clean-up levels established during the design have been attained for all chemicals of concern.

V. ACTIVITIES AND SCHEDULE FOR SITE COMPLETION

The final ROD estimated that the groundwater extraction system would need to operate for a minimum of 14 years to achieve required clean-up levels. Groundwater monitoring will be required until attainment of clean-up levels is demonstrated. The estimated operation time required for the SVE systems is three years although it will be required to operate until clean-up levels are met.

The following activities will be completed according to the schedule described below:

Task	Estimated Completion	Responsible Organization
1. Final RA Report	6/30/94	Responsible Parties
2. Five-Year Review	6/25/95	EPA
3. SVE Clean-up Verification	1/31/97	EPA
4. Groundwater Clean-up Verification	10/31/04	EPA
5. Final Inspection/ Close Out Report	12/31/04	EPA

Five-Year Reviews

In accordance with Section 121 of CERCLA, a policy Five-Year Review will be conducted five years from the date that on-site construction of the remedial action for the first operable unit commenced. According to the schedule, the first Five-Year Review will be completed on or before June 25, 1995. Further Five-Year Reviews will be conducted as warranted pursuant to OSWER Directive 9355.7-02, "structure and Components of Five-Year Reviews," or other applicable requirements and/or guidance.

Wm. E. Muno

William E. Muno, Director
Waste Management Division

3/18/94
Date

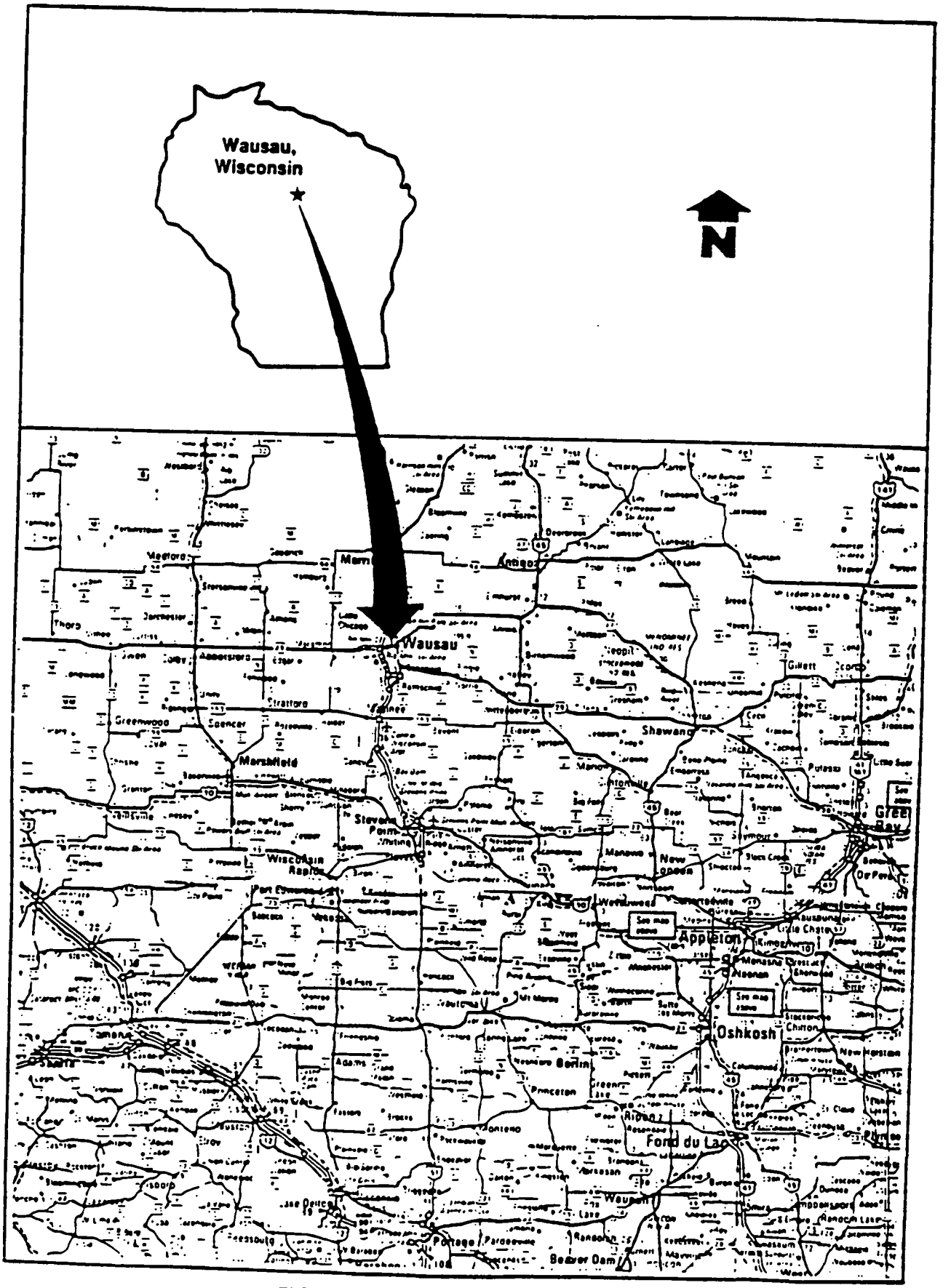
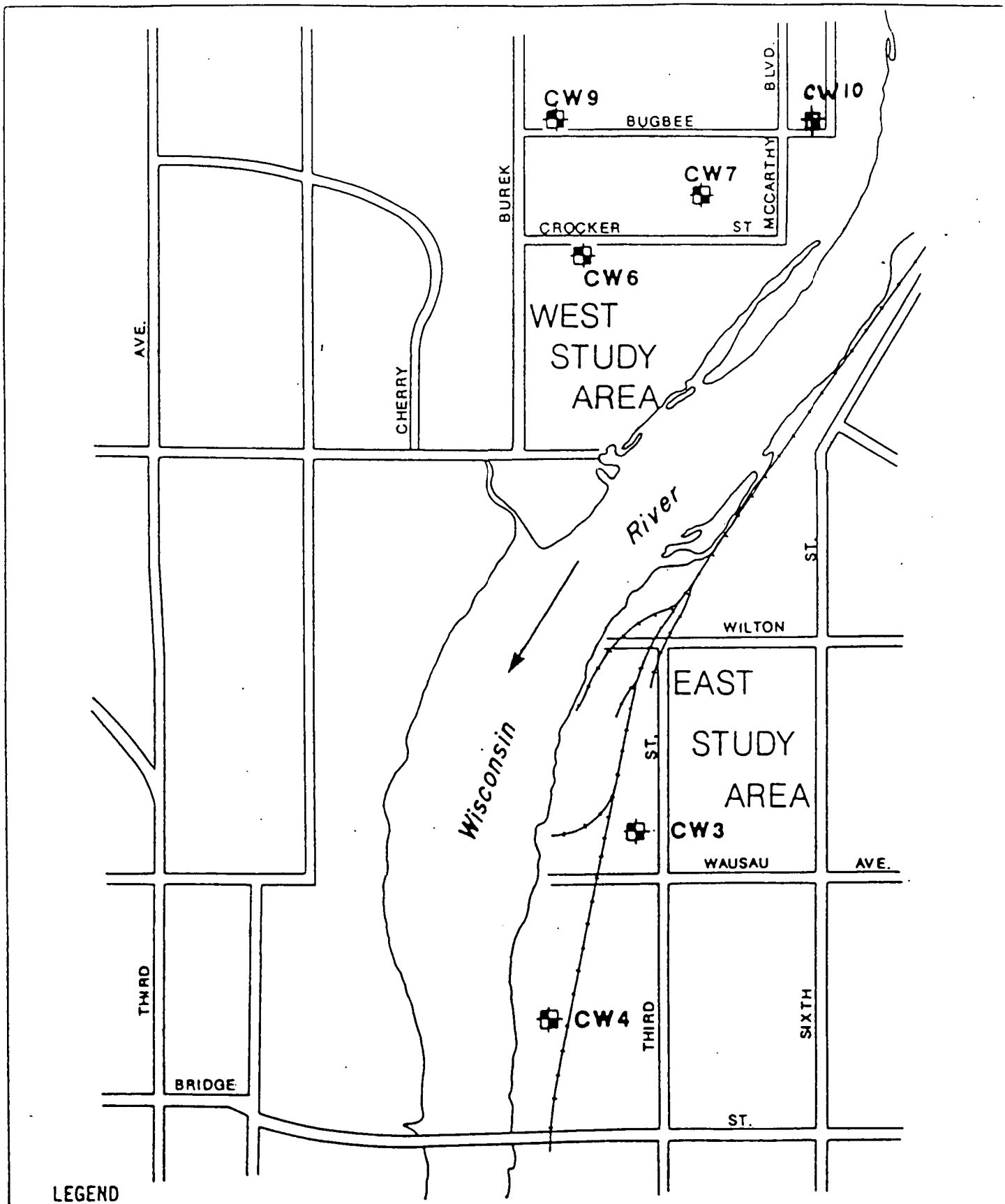


FIGURE 1 REGIONAL LOCATION MAP



NOTE:

BASE MAP DEVELOPED FROM U.S.G.S. 15 MIN.

FIGURE 2