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DEPARTMENT OF JUSTICE

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February 25, 1991

Mr. Joseph W. Skupniewitz
Clerk
United States District Court
for Western District of Wisconsin
120 North Henry Street
Madison, Wisconsin 53703

Re: United States of America, State of Wisconsin v. City of Wausau,Wisconsin; Marathon Electric Corp.; Wausau Chemical Corporation and James E. Cherwinka, Case No. 90-C-08311-C

State of Wisconsin v. Marathon Electric Manufacturing Corporation; City of Wausau, Wisconsin; Wausau Chemical Corporation and James Cherwinka, Case No. 90-C-0889-C

Dear Mr. Skupniewitz:

I am writing to confirm that the Consent Decree entered on January 24, 1991 in Civil Action No. 90-C-08311C was intended by the parties to apply to and be dispositive of both of the above entitled cases.

Thank you for your attention to this matter.

Sincerely,

Robert A. Selk
Assisitant Attorney General
Administrator
Division of Legal Services

RAS:jpm

cc: Mark A. Thimke
Raymond R. Krueger
James P. Lonsdorf
Michael McNulty
Linda Meyer

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

UNITED STATES OF AMERICA,
STATE OF WISCONSIN

Plaintiffs

v.

CITY OF WAUSAU, Wisconsin
MARATHON ELECTRIC
MANUFACTURING CORP.
WAUSAU CHEMICAL CORPORATION
JAMES E. CHERWINKA

Defendants.

CIVIL ACTION NO.

'90 C 0831 C

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CONSENT DECREE

WHEREAS, The United States Environmental Protection Agency ("U.S. EPA"), pursuant to Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 ("CERCLA"), 42 U.S.C. §9605, placed the Wausau Groundwater Contamination Site (a.k.a. Wausau Water Supply NPL Site), located in Marathon County, Wisconsin (the "Facility" as specifically defined in paragraph 4 of this Consent Decree) on the National Priorities List ("NPL"), which is set forth at 40 CFR Part 300, Appendix B, by publication in the Federal Register on June 10, 1986 (52 Fed. Reg. 21054).

In response to a release or a substantial threat of a release of a Hazardous Substance into, at or from the Facility, the U.S. EPA in July, 1987, commenced a Remedial Investigation and

cc: mailed to McNulty, Selk, Lonsdorf, Krueger, Steinke & AUSA Humphrey on 1-28-91
J Hahn
Deputy Clerk

Feasibility Study ("RIFS") pursuant to 40 CFR §300.68 for the Facility;

During the RIFS process, U.S. EPA determined that an interim "operable unit" remedy could be implemented at the Facility, prior to development of a final remedy, in order to expedite the clean-up of the Facility. U.S. EPA completed a Phased Technical Memorandum Report on April 25, 1988, and completed a Phased Feasibility Study ("PFS") Report and Proposed Plan for Interim Remedial Action on October 3, 1988.

After public notice, opportunity for comment, and response to comments on the proposed interim operable unit remedy, U.S. EPA issued its interim Record of Decision ("interim ROD") on December 23, 1988, recommending an interim operable unit remedial action. Pursuant to a consent decree lodged with the Court on July 17, 1989, and entered on September 8, 1989 (Civil Action No. 89-C-655-C), two of the five Potentially Responsible Parties ("PRPs"), the City of Wausau and Marathon Electric Manufacturing Corporation, have agreed to design and implement the interim operable unit remedy. The interim ROD and the September 8, 1989, consent decree are attached hereto as Appendix 1.

U.S. EPA published the final Remedial Investigation ("RI") Report in July, 1989, and completed the final Feasibility Study ("FS") Report in August, 1989. The FS Report contained a proposed final remedial action at the Facility;

On or about August 14, 1989, U.S. EPA, pursuant to Section 117 of CERCLA, 42 U.S.C. §9617, published notice of the completion of

the RIFS and of the proposed remedial action in a major local newspaper of general circulation and provided opportunity for public comment to be submitted in writing to U.S. EPA by September 12, 1989, or orally at a public meeting held in the City of Wausau, Wisconsin, on August 22, 1989;

U.S. EPA, pursuant to Section 117 of CERCLA, 42 U.S.C. §9617, has kept a transcript of the public meeting and has made this transcript available to the public as part of the administrative record located at U.S. EPA, Region V, 230 South Dearborn Street, Chicago, Illinois and at Wausau City Hall, Wausau, Wisconsin, and at the Marathon County Public Library, Wausau, Wisconsin.

On December 8, 1989, U.S. EPA, pursuant to Section 122 of CERCLA, 42 U.S.C. §9622, notified Settling Defendants that the U.S. EPA determined each party to be a PRP regarding the proposed remedial action at the Facility;

In accordance with Section 121(f)(1)(F) of CERCLA, 42 U.S.C. §9621(f)(1)(F), U.S. EPA notified the State of Wisconsin on December 8, 1989, of negotiations with PRPs regarding the scope of the remedial design and remedial action for the Facility, and U.S. EPA has provided the State with an opportunity to participate in such negotiations and be a party to any settlement;

On October 16, 1989, and November 20, 1989, Settling Defendants provided Wausau Energy Corporation with notice of negotiations regarding the Facility, and provided the opportunity

to Wausau Energy Corporation to participate in such negotiations and be a party to any settlement;

Pursuant to Section 122(j) of CERCLA, 42 U.S.C. §9622(j), on December 8, 1989, U.S. EPA notified the Federal natural resource trustee of negotiations with PRPs on the subject of addressing the release or threatened release of hazardous substances at the Facility;

Certain persons have provided comments on U.S. EPA's proposed remedial action, and to such comments U.S. EPA provided a summary of responses, all of which have been included in the administrative record referred to above;

Considering the proposed remedial action and the public comments received, U.S. EPA has reached a decision on a final remedial action, which is embodied in a document called a Record of Decision ("ROD") signed by the Regional Administrator on September 29, 1989, (attached as Appendix 2 hereto), to which the State has given its concurrence, and which includes a discussion of U.S. EPA's reasons for the final remedial action and for any significant changes from the proposed remedial action contained in the FS;

U.S. EPA, pursuant to Section 117(b) of CERCLA, 42 U.S.C. §9617(b), has provided public notice of adoption of the final remedial action set forth in the ROD, including notice of the ROD's availability to the public for review in the same locations as the administrative record referred to above;

Pursuant to Section 117(d) of CERCLA, 42 U.S.C. §9617(d), the notice has been published in a major local newspaper of general circulation, and the notice includes an explanation of any significant changes from the proposed remedial action contained in the FS and the reasons for such changes;

Pursuant to Section 121(d)(1) of CERCLA, 42 U.S.C. §9621(d)(1), U.S. EPA, the State of Wisconsin, and Settling Defendants ("the Parties") believe that the remedial action adopted by U.S. EPA will attain a degree of cleanup of Hazardous Substances, Pollutants and Contaminants released into the environment and of control of further release which at a minimum assures protection of human health and the environment at the Facility;

The Parties believe the remedial action adopted by U.S. EPA will provide a level or standard of control for such Hazardous Substances, Pollutants, or Contaminants which at least attains legally applicable or relevant and appropriate standards, requirements, criteria, or limitations under Federal environmental law or State environmental or facility siting law in accordance with Section 121(d)(2) of CERCLA, 42 U.S.C. §9621(d)(2), and that the remedial action is in accordance with Section 121 of CERCLA, 42 U.S.C. §9621, and with the National Contingency Plan ("NCP"), 40 CFR Part 300;

Settling Defendants agree to implement the final remedial action, including the interim operable unit, adopted by U.S. EPA in the interim and final RODs as set forth in Appendices 1 and 2

to this Consent Decree and incorporated by reference into this Decree, and U.S. EPA has determined that the work required under this Decree will be done properly by Settling Defendants and that Settling Defendants are qualified to implement the final remedial action; and

The Parties recognize, and intend to further hereby, the public interest in the expedition of the cleanup of the Facility and in avoiding prolonged and complicated litigation between the Parties;

NOW, THEREFORE, it is hereby Ordered and Decreed:

I. PURPOSE OF DECREE

1. a. The purpose of this Consent Decree is to provide for implementation by Settling Defendants of the final remedial design and remedial action for the Facility selected by U.S. EPA, as set forth in the interim and final Records of Decision attached as Appendices 1 and 2, and to provide for payment of certain costs incurred and to be incurred by the United States and the State.

b. This Consent Decree, upon entry, shall supersede the September 8, 1989, interim operable unit consent decree entered in Civil Action No 89-C-655-C, except as set forth in Section XXVI, paragraph 84, of the interim operable unit consent decree.

II. JURISDICTION

2. This Court has jurisdiction over the subject matter herein and over the Parties consenting hereto pursuant to 28 U.S.C. Sections 1331, and 1345, and Sections 107(a), 113(b), and

122 of CERCLA, 42 U.S.C. §§9607(a), 9613(b), and 9622. Settling Defendants shall not challenge this Court's jurisdiction to enter, modify and enforce this Consent Decree. Settling Defendants hereby waive service of the summons and complaint in this action.

III. PARTIES BOUND

3. This Consent Decree applies to and is binding upon the undersigned Parties and their officers, directors, agents, successors and assigns. The undersigned representative of each Party to this Consent Decree certifies that he or she is fully authorized by the Party or Parties whom she or he represents to enter into the terms and conditions of the Consent Decree and to execute and legally bind that Party to it. Settling Defendants shall provide a copy of this Consent Decree to the Contractor(s) hired to perform the Work (as hereinafter defined) required by this Consent Decree and shall require the Contractor(s) to provide written notice and a copy of this Decree to any subcontractor retained to perform any part of the Work.

IV. DEFINITIONS

4. Whenever the following terms are used in this Consent Decree and the Appendices attached hereto, the following definitions shall apply:

A. "Cleanup Standards" means the requirements respecting the degree of cleanup of groundwater, surface water, soil, air or other environmental media that must be achieved and maintained by the remedial action, such requirements being set forth in the

ROD, the Interim ROD, paragraph 12 of this Decree, and in the plans required by this Decree.

B. "Consent Decree" means this Decree and the four appendices hereto. In the event of any conflict between the Decree and any appendix, the Decree shall control.

C. "Contractor" means the company or companies retained by or on behalf of Settling Defendants to undertake and complete the Work required by the ROD, the interim ROD and this Consent Decree. Each Contractor and subcontractor must be qualified to do those portions of the Work for which it is retained. Each contractor and subcontractor shall be deemed to be related by contract to each Settling Defendant within the meaning of 42 U.S.C. §9607(b).

D. "Engineer" or "Architect" means the company or companies retained by the Settling Defendants to prepare the construction plan and specifications needed to accomplish the Work required by the ROD, the interim ROD and this Consent Decree.

E. For purposes of this Consent Decree only, "Facility" means the soil, subsoil, groundwater and the surface water in and around the City of Wausau, Wisconsin, and encompasses the aquifer underlying the City of Wausau, Wisconsin. The Facility is referred to as the Wausau Groundwater Contamination Site (also known as the Wausau Water Supply NPL Site), which Facility is located in Marathon County, Wisconsin, as shown on the map attached as Appendix 3.

F. The term "Hazardous Substance, Pollutant, or Contaminant" shall have the meaning provided in Sections 101(14) and 101(33) of CERCLA, 42 U.S.C. §§9601(14) and 9601(33)

G. "Interim ROD" means the Record of Decision issued on December 23, 1988, attached as Appendix 1 hereto.

H. "National Contingency Plan" or "NCP" shall be used as that term is used in Section 105 of CERCLA, 42 U.S.C. §9605. The NCP is promulgated at 40 CFR Part 300.

I. "Oversight Costs" are those costs incurred by U.S. EPA and the State in monitoring the compliance of the Settling Defendants with this Consent Decree, including but not limited to payroll and other direct costs, indirect and overhead costs, sampling and laboratory costs, travel, contractor costs and costs of review and approval of the Work performed pursuant to this Consent Decree.

J. "Parties" means the United States of America, the State of Wisconsin and the Settling Defendants.

K. "Performance Standards" means the performance requirements for the remedial action which must be met by Settling Defendants, as set forth in this Decree, the ROD, the Interim ROD, the SOW, the RD/RA Work Plan and/or other plans submitted to and approved by U.S. EPA pursuant to this Decree.

L. "RD/RA Work Plan" means the Remedial Design/Remedial Action Work Plan for the design, construction and implementation of the remedial action, and operation and maintenance of the remedial action for the Facility, as submitted by Settling

Defendants and approved by U.S. EPA pursuant to paragraph 13 of this Decree, including any modifications made pursuant to the provisions of this Decree.

M. "Record of Decision" or "ROD" means the administrative Record of Decision issued by U.S. EPA on September 29, 1989, setting forth the remedial action requirements for the Facility, attached as Appendix 2 hereto.

N. "Remedial Project Manager" or "RPM" means the person designated by U.S. EPA to coordinate, monitor or direct remedial activities at the Facility pursuant to the NCP and Section XI hereof.

O. "Response Costs" means any costs not inconsistent with the National Contingency Plan incurred by the United States or the State pursuant to 42 U.S.C. §§9601 et seq.

P. "Scope of Work" or "SOW" means the plan, set forth as Appendix 4 to this Decree, for implementation of the remedial design and remedial action at the Facility pursuant to the Record of Decision, and any subsequent amendments of Appendix 4 pursuant to the provisions of this Decree.

Q. "Settling Defendants" means those Parties other than the United States of America or the State who sign this Consent Decree.

R. "State" means the State of Wisconsin.

S. "WDNR" means the Wisconsin Department of Natural Resources.

T. "United States" means the United States of America.

U. "U.S. EPA" means the United States Environmental Protection Agency.

V. "U.S. DOJ" means the United States Department of Justice.

X. "Work" means the design, construction and implementation, in accordance with this Consent Decree, of the tasks described in the ROD, the Interim ROD, this Decree, the Scope of Work, the RD/RA Work Plan, and any other plans or schedules submitted by Settling Defendants and approved by U.S. EPA pursuant to this Decree.

V. GENERAL PROVISIONS

5. Commitment of Settling Defendants to Perform RD/RA.

A. Settling Defendants agree jointly and severally to finance and perform the Work as defined in paragraph 4 hereof.

B. The Work shall be completed in accordance with all requirements of this Decree, the ROD, the SOW, the RD/RA Work Plan, the Interim ROD, and all other plans or schedules submitted and approved by U.S. EPA under this Decree. In case of conflict between any of the documents, the document listed first in the order listed in the preceding sentence shall control. The procedures for submission and approval of plans are set forth in Section VI below.

6. Compliance with Applicable Laws; Permits and Approvals

A. All activities undertaken by the Settling Defendants pursuant to this Consent Decree shall be undertaken in accordance with the requirements of all applicable federal, state and local laws, regulations and permits as required by CERCLA.

B. Pursuant to Section 121(e)(1) of CERCLA, no federal, state, or local permits are required for work conducted entirely on-site. Settling Defendants shall obtain all permits or approvals necessary for off-site work under applicable federal, state or local laws and shall submit timely applications and requests for any such permits and approvals.

C. The standards and provisions of Section XII hereof describing Force Majeure shall govern delays in obtaining permits required for the Work and also the denial of any such permits, provided that Settling Defendants have made timely and complete application for any such permits.

D. Settling Defendants shall include, in all contracts or subcontracts entered into for Work required under this Consent Decree, provisions stating that such contractors or subcontractors, including their agents and employees, shall perform all activities required by such contracts or subcontracts in compliance with all applicable laws and regulations.

E. This Consent Decree is not a permit issued pursuant to any federal or state statute or regulation.

7. Formal Approval Required. No informal advice, guidance, suggestions or comments by representatives of the United States or the State on plans, reports or other documents submitted by the Settling Defendants shall be construed as relieving them from obtaining any formal approvals, permits or other authorizations required by law or by this Decree. Further, no advice, guidance, suggestions or comments by such government representatives with

respect to any submission by the Settling Defendants shall be construed so as to relieve them of their obligations under this Decree or to transfer any of their liability or obligations under this Decree to any other party or person.

8. Computation of Time. Unless otherwise provided, dates and time periods specified in or under this Decree are in calendar days. If the date for submission of any item or notification required by this Decree falls upon a weekend or state or federal holiday, the time period for submission of that item or notification is extended to the next working day following the weekend or holiday.

9. Conveyance of the Facility

A. Within thirty (30) days of approval by the Court of this Decree, each Settling Defendant shall record a Notice of this Decree with the Office of the Register of Deeds, Marathon County, State of Wisconsin, in the chain of title for each parcel of the Facility owned by the Settling Defendants, including parcels owned by the Wausau Water and Sewerage Utilities, where physical components of the remedial action will be/are located, and those parcels where source areas of contamination are located. These areas include the parcels owned by the City of Wausau and Marathon Electric Manufacturing Corporation which comprise the Old City/Marathon Electric Landfill, the parcels which comprise the Wausau Chemical Corporation property, the parcel(s) of land upon which the interim operable unit extraction well described in the Interim ROD and RD/RA Work Plan will be

located, and the parcels upon which City Well ("CW") 3 and CW6 are located.

B. The areas of the Facility described in paragraph 9.A. above, may be freely alienated provided that at least sixty (60) days prior to the date of such alienation, the Settling Defendant which owns the parcel notifies the United States and the State of such proposed alienation, the name of the grantee, and a description of the Settling Defendant's obligations to be performed by such grantee. Additionally, the Settling Defendant shall provide a copy of the Consent Decree to the proposed grantee at least sixty (60) days prior to the date of such alienation. In the event of such alienation, all of Settling Defendants' obligations regarding the alienated parcel pursuant to this Decree shall continue to be met by all Settling Defendants and the grantee.

C. Any deed, title or other instrument of conveyance regarding a parcel of the Facility described in paragraph 9.A. above shall contain a notice that the parcel is the subject of this Consent Decree, setting forth the name of the case, case number, the court having jurisdiction herein, the address of the Clerk of the Court for the court having jurisdiction herein and a notation that a copy of the Consent Decree may be obtained by contacting the Clerk of the Court or the City Clerk, City Hall, Wausau, Wisconsin.

VI. PERFORMANCE OF WORK BY SETTLING DEFENDANTS

10. Selection of Architect/Engineer and Contractor(s).

A. Architect/Engineer. All remedial design Work to be performed by Settling Defendants pursuant to this Consent Decree shall be under the direction and supervision of a qualified professional architect or engineer. Selection of any such architect or engineer is subject to approval by U.S. EPA in consultation with the State.

B. Contractor. All remedial action Work to be performed by the Settling Defendants pursuant to this Consent Decree shall be under the direction and supervision of a qualified professional engineer. As soon as possible after entry of the Decree, and at least 30 days prior to the date upon which initiation of remedial action Work is required under this Decree, the Settling Defendants shall notify U.S. EPA and the State, in writing, of the name, title, and qualifications of the proposed architect/engineer, and the names of principal contractors and subcontractors proposed to be used in carrying out the Work to be performed pursuant to this Consent Decree. Selection of any such architect/engineer or contractor and/or subcontractor shall be subject to approval by the U.S. EPA in consultation with the State.

C. Disapproval of Architect/Engineer or Contractor. If U.S. EPA disapproves of the initial or subsequent selection of an architect/engineer or contractor, Settling Defendants shall submit a list of alternate architect/engineers or contractors to

U.S. EPA and the State within thirty (30) days of receipt of the notice of disapproval. As soon as practicable after receipt of the list, U.S. EPA, in consultation with the State, will provide written notice of the names of the architects, engineers or contractors on the list of which it approves. Settling Defendants may select any approved architect, engineer or contractor from the list and shall notify U.S. EPA and the State of the name of the person or entity selected within twenty-one (21) days of receipt of the list.

D. Replacement of Architect/Engineer or Contractor. If at any time Settling Defendants propose to change an architect, engineer or contractor previously approved by U.S. EPA, they shall give written notice to U.S. EPA and the State of the name, title and qualifications of the proposed new architect, engineer or contractor. Such architect, engineer or contractor shall not perform any Work until approval by U.S. EPA, in consultation with the State, has been given.

11. Scope of Work. Appendix 4 to this Consent Decree provides a Scope of Work ("SOW") for the implementation and completion of remedial design and remedial action at the Facility. This Scope of Work is incorporated into and made an enforceable part of this Consent Decree.

12. Cleanup and Performance Standards. The Work performed by Settling Defendants under this Consent Decree shall meet the Cleanup Standards and Performance Standards set forth below, as modified by U.S. EPA in consultation with the State, in

accordance with this Consent Decree. These Cleanup and Performance Standards are based upon the Administrative Record, the interim ROD, the final ROD (including response objectives and ARARs as explained at Section IX, especially pages 31-32, of the final ROD), upon the Wisconsin Administrative Code Chapter NR 140 (WAC Chap. NR 140) Groundwater Quality Standards, upon applicable Safe Drinking Water Act ("SDWA") Maximum Concentration Levels ("MCLs"), upon the Clean Water Act ("CWA") Section 301 Best Available Technology ("BAT") requirements and Section 303 Federal Water Quality Standards ("FWQS"), upon the Wisconsin Water Quality Standards (promulgated pursuant to Wisconsin Statutes Chapters 144 and 147), and upon health based levels, as applicable.

Settling Defendants shall operate the components of the final remedy until the Cleanup and Performance Standards are fully achieved, unless otherwise approved by U.S. EPA, in consultation with the State.

Section A.1 below sets forth the Performance Standards which must be obtained and met during the operation of the soil vapor extraction (SVE) components of the final remedy. The SVE Performance Standards are intended to ensure that the SVE systems are operated in a manner which will achieve the Cleanup Standards on a timely basis.

Sections A.2. and A.3. below set forth the Performance Standards which must be obtained and met during operation of the groundwater extraction components of the final remedy. The

groundwater extraction Performance Standards are intended to ensure that the groundwater extraction component of the final remedy is operated in a manner which will achieve the Cleanup Standards set forth below on a timely basis.

Section B.1 below sets forth the Cleanup Standards for groundwater extraction. The groundwater Cleanup Standards are intended to ensure that the groundwater extraction components of the remedy are operated until contaminant levels in the aquifer are reduced to specified concentrations.

Section B.2 sets forth the Cleanup Standards for soil vapor extraction (SVE). The SVE Cleanup Standards are intended to ensure that the SVE components of the remedy are operated until contaminant levels in soils and groundwater are reduced to specified concentrations.

Additional Performance and Cleanup Standards may be established by U.S. EPA, in consultation with the State, in accordance with this Consent Decree.

A. Performance Standards

Settling Defendants shall operate the final remedy such that the Performance Standards are met as specified during the operation of the final remedy. The Performance Standards set forth below may be modified by U.S. EPA as necessary, in consultation with the State, in accordance with this Consent Decree.

1. Soil Vapor Extraction Performance Standards

a. Settling Defendants shall utilize a SVE contractor experienced in performing SVE at Superfund sites and shall obtain U.S. EPA approval, in consultation with the State, of the SVE contractor.

b. Settling Defendants shall employ the optimum spacing of wells and optimum extraction well vacuum pressure at the extraction well head, as approved by U.S. EPA, in consultation with the State. At a minimum, Settling Defendants shall maintain at least a 25% overlap between the cones of influence of adjacent wells, and shall maintain an extraction well vacuum pressure to be approved by U.S. EPA, in consultation with the State.

c. In order to gain U.S. EPA approval to cease operation of the SVE systems, Settling Defendants must meet the SVE Cleanup Standards and must demonstrate that the soil vapor extraction systems have reduced the concentration of total exhaust gas VOCs to 1% of the initial exhaust gas VOC concentration. All measurements, including the initial exhaust gas VOC concentration measurements, shall be performed as approved by the U.S. EPA, in consultation with the State.

d. In order to provide U.S. EPA and the State with data necessary to determine whether the SVE systems are meeting Performance Standards and reducing soil contamination, the Settling Defendants shall implement a SVE monitoring program and perform periodic monitoring of the SVE systems, as approved by U.S. EPA in consultation with the State. Prior to all sampling

events, the SVE systems shall be shut off for a minimum of 48 hours before collecting samples, unless otherwise approved by U.S. EPA, in consultation with the State.

e. In order to demonstrate that the SVE systems are reducing soil contaminant concentrations, Settling Defendants shall conduct performance objective tests as approved by U.S. EPA. These tests shall entail collection and analysis of a predetermined number of random soil samples collected at various U.S. EPA approved locations and depths. At a minimum, soil samples for the performance objective tests shall be obtained prior to startup of the SVE systems, at the midoperation point or within two (2) years of start-up, whichever comes first, and at the completion of the operation of the SVE systems.

2. Operable Unit Groundwater Extraction System Performance Standards

Settling Defendants shall operate the operable unit groundwater extraction system to meet the Performance Standards set forth below, at all times, unless otherwise approved by U.S. EPA in consultation with the State.

a. The operable unit extraction well shall be pumped at a minimum of 1600 gallons per minute (gpm) for at least 125 hours per week, until the Cleanup Standards set forth in paragraph 12.B., and any other Cleanup Standards set by U.S. EPA pursuant to paragraph 12.B., are achieved, as determined by U.S. EPA, in consultation with the State.

b. Settling Defendants shall treat extracted groundwater utilizing the treatment system specified in the

approved final RD/RA Work Plan. At a minimum, any discharges shall meet all requirements of the CWA, including application of CWA Section 301 BAT, and all requirements of Wisconsin Water Quality Standards (promulgated pursuant to Wis. Stat. Chaps. 144 and 147), prior to discharge.

c. Settling Defendants shall implement an U.S. EPA approved monitoring program to provide U.S. EPA with data demonstrating that the operable unit extraction system is meeting Performance Standards.

d. Settling Defendants shall implement and operate the second extraction well as delineated in the Interim ROD, if determined necessary and as approved by U.S. EPA in consultation with the State.

3. Municipal Groundwater Extraction Well System Performance Standards.

Settling Defendants shall operate the Municipal Groundwater Extraction Well System (City Wells CW3 and CW6) to meet the Performance Standards set forth below, at all times, unless otherwise directed by EPA, in consultation with the State. It is understood that the Wausau Water Utility operates the water supply system for the City of Wausau, including CW3 and CW6 and that the Utility is controlled by the City of Wausau. Failure of the Utility to meet the applicable terms of this Consent Decree shall constitute failure of Settling Defendants to meet the terms of the Consent Decree.

The pumping rates set forth below for CW3 and CW6 are based on modelling which assumes an average monthly pumping rate of 1257

gpm for CW10, and 314 gpm for each CW7 and CW9. To the extent possible, the Settling Defendants agree to operate the municipal water supply system so as to approximate the average monthly pumping rates for CW7, CW9 and CW10, in order to achieve timely completion of the final remedy.

a. CW3 shall be pumped at a minimum rate of 1100 gpm for at least 100 hours per week.

b. CW6 shall be pumped at a minimum rate of 1500 gpm for at least 100 hours per week.

c. Settling Defendants shall perform groundwater modelling, utilizing a MODFLOW/RANDOM WALK model or its equivalent, as approved by U.S. EPA in consultation with the State, to provide U.S. EPA with information by which to assess the impact of any proposed changes to the municipal groundwater extraction Performance Standards listed in 3.a. and 3.b. above. Alternatively, U.S. EPA may perform the necessary modelling, and Settling Defendants shall pay for the U.S. EPA modelling as part of Oversight costs.

d. Treatment of extracted groundwater from CW3 and CW6 shall be performed utilizing the existing air strippers. The air strippers shall be maintained and operated such that 99% VOC removal efficiency is maintained at all times.

e. Settling Defendants shall notify U.S. EPA at least twenty-four (24) hours in advance of any shutdowns of CW3 and CW6. In cases of emergency shutdowns, Settling Defendants shall

notify U.S. EPA within twenty-four (24) hours of such shutdown, and shall provide an explanation for the shutdown.

f. Settling Defendants shall include in the Draft RD/RA Work Plan a detailed description and explanation of the operation of the Wausau Water Utility's municipal water supply system. The description shall explain how the operation of the municipal well system will be adjusted to accommodate the required operation of CW3 and CW6 and the goal of approximating the average monthly pumping rates set forth above for CW7, CW9 and CW10. The description shall include the rationale and strategy for operation of the system, and shall describe provisions for meeting changing conditions and contingencies (e.g. changing demand, seasonal variations, precipitation events, breakdowns, maintenance, etc.).

g. Settling Defendants shall include in the monthly progress reports the pumping and maintenance schedule realized for the previous month for the water supply system. This subparagraph shall be effective beginning with the month following the month in which Settling Defendants receive U.S. EPA approval for operation of the municipal well groundwater extraction component of the final remedy.

B. Cleanup Standards

The Settling Defendants shall operate the final remedy until the Cleanup Standards set forth below, and any Cleanup Standards set pursuant to or applicable to this Decree, including all applicable Ground Water Quality Standards set forth in Wis.

Admin. Code Chap. NR 140, are met, as determined by U.S. EPA in consultation with the State.

1. Groundwater Extraction and Treatment Cleanup Standards

For purposes of this Consent Decree, tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,2 dichloroethylene (DCE) are the primary contaminants of concern. In addition, to these, any contaminants specified in WAC NR 140 or in the hazardous substance list (HSL) (40 CFR §302), which are detected during monitoring of the final remedy shall also be included as contaminants of concern, as determined and directed by U.S. EPA in consultation with the State.

a. The Cleanup Standards for contaminants TCE and PCE, based on the WAC NR 140 groundwater standards for TCE and PCE, shall be 1.8 ug/l for TCE, and 1.0 ug/l for PCE. The Cleanup Standard for DCE shall be 70 ug/l, based on the EPA drinking water health advisory level for DCE. Additionally, Cleanup Standards may be specified by EPA, in consultation with the State, for any other contaminants of concern detected during monitoring of the final remedy.

b. The Settling Defendants shall perform periodic monitoring within a specified zone of compliance as specified in the approved final RD/RA Work Plan.

c. In accordance with paragraph 84, monitoring shall continue for at least 5 years after the Certificate of Completion is issued pursuant to this Consent Decree, to demonstrate that Cleanup Standards are being met. After 5 years, U.S. EPA, in

consultation with the State, will evaluate the data produced and determine what, if any, additional monitoring or other work will be required.

2. Soil Vapor Extraction System Cleanup Standards

a. Settling Defendants shall operate the SVE systems until the Cleanup Standards specified pursuant to paragraph B.1., above, are met at the boundary of each contamination source area, unless otherwise approved by U.S. EPA, in consultation with the State, pursuant to paragraph 2.e. below. The boundary of each source area shall be determined by U.S. EPA, in consultation with the State.

b. Settling Defendants shall perform mass-flux groundwater modelling, as approved by U.S. EPA in consultation with the State, utilizing data produced during sampling and monitoring activities, to provide U.S. EPA and the State with data on which to base a Soil Cleanup level. The Soil Cleanup levels designated by U.S. EPA must be achieved in order to eliminate source area contaminant loading to the aquifer, and thereby contribute to the achievement of the Cleanup Standards.

c. Settling Defendants shall operate the SVE systems until Soil Cleanup levels to be specified by U.S. EPA are met, as determined by U.S. EPA in consultation with the State. Settling Defendants shall achieve Soil Cleanup levels within three years of SVE system startup.

d. Pursuant to subparagraph f, below, Settling Defendants may cease operation at a particular source area of one

or more of the SVE components of the final remedy upon a demonstration to U.S. EPA, in consultation with the State, that the SVE Cleanup Standards and SVE Performance Standards have been achieved by the SVE component at a particular source area, as approved by U.S. EPA, in consultation with the State.

e. U.S. EPA and the State recognize that it is possible that one or more components of the SVE systems may achieve SVE Performance Standards and SVE Soil Cleanup levels while groundwater Cleanup Standards have not been met at the boundary of a source area. In such circumstance, Settling Defendants may cease operation of one or more components of the SVE systems where Settling Defendants can demonstrate to U.S. EPA, in consultation with the State, that the exceedance of groundwater Cleanup Standards is due to residual contamination in groundwater, and is not due to residual contamination in soils, as approved by U.S. EPA, in consultation with the State.

f. Notification and Demonstration.

i. When the Settling Defendants believe that one or more of the SVE components at a particular source area have been completed and that the demonstration of compliance with SVE Cleanup and SVE Performance Standards can be made as required in subparagraphs d. and e. above, in accordance with this Consent Decree, they shall submit to the United States and the State a Notification of Completion of SVE Work and an SVE Report which: 1) discusses in detail all of the SVE component work done; 2) demonstrates that SVE Cleanup and Performance Standards have been

achieved at a particular source area; 3) describes any modification made to the SOW or Work Plan(s) thereunder relating to the SVE Cleanup and SVE Performance Standards; and 4) includes all SVE and SVE related groundwater data generated pursuant to this Decree.

ii. Upon receipt of the Notice of Completion of SVE Work, U.S. EPA, in consultation with the State, shall review the SVE Report and supporting documentation, and the SVE actions taken. Based on this review, U.S. EPA in consultation with the State, may direct, and Settling Defendants shall perform, any additional sampling needed to support the demonstration.

iii. Settling Defendants shall resubmit the SVE Report to U.S. EPA and the State, if and as directed by U.S. EPA, in consultation with the State, which incorporates additional data gathered during sampling activities and which addresses U.S. EPA comments, in consultation with the State. The SVE Report must conclusively demonstrate that the SVE Cleanup and SVE Performance Standards have been achieved. The SVE Report shall be prepared and certified as true and accurate by a registered professional engineer and the Settling Defendants' Project Coordinator, and shall include all supporting documentation.

iv. Settling Defendants may cease operation of the SVE component which was the subject of the demonstration after U.S. EPA, in consultation with the State, approves of the SVE Report for that component. However, this approval does not constitute Certification of Completion of Remedial Action, and SVE Work will

not be certified as complete until U.S. EPA issues the Certification pursuant to paragraph 84.

g. In the event U.S. EPA, in consultation with the State, subsequently determines that source area contaminant loading is contributing to the exceedance of Cleanup Standards, Settling Defendants shall perform SVE as directed by U.S. EPA, in consultation with the State.

13. RD/RA Work Plan.

A. Within sixty (60) days of the lodging of this Consent Decree, the Settling Defendants shall submit a Draft Remedial Design/Remedial Action Work Plan ("RD/RA Work Plan") to the U.S. EPA and the State for the design, construction, operation and maintenance of the remedial action at the Facility. Within thirty (30) days of the receipt of U.S. EPA comments, modifications or approval of the Draft Work Plan, the Settling Defendants shall submit a final RD/RA Work Plan. The RD/RA Work Plan shall be developed in conformance with the ROD, the Interim ROD, the SOW, U.S. EPA Superfund Remedial Design and Remedial Action Guidance and any additional guidance documents provided by U.S. EPA. The interim operable unit RD/RA Work Plan for the design, construction, operation and maintenance of the West Side Extraction Well(s), shall be modified, if necessary, as required by the terms of this Decree and as directed U.S. EPA, in consultation with the State. The interim work plan shall be incorporated into the final RD/RA Work Plan, and shall be submitted to U.S. EPA and the State no later than the date upon

which the draft Final RD/RA Workplan is due. The interim Workplan shall guide operation of the West Side extraction wells until the Final RD/RA Workplan is approved, unless otherwise directed by U.S. EPA, in consultation with the State.

B. If the Consent Decree is not subsequently entered, Settling Defendants shall complete the RD/RA Work Plan and shall have their liability for the Facility reduced accordingly or, at their option, Settling Defendants may discontinue their work on the RD/RA Work Plan and receive no reduction of their liability for the Facility by reason of costs incurred for such work. Settling Defendants shall not be required to pay any Oversight Costs for U.S. EPA's or the State's review of their work prior to entry of the Decree under this paragraph, but following entry shall pay all such costs that accrued prior to entry pursuant to Section XV hereof.

C. The RD/RA Work Plan submittal shall include all Project Plans listed in Task I below, and shall include a description and schedule addressing how Settling Defendants will accomplish the Work listed in Tasks II, III, and IV below:

* Task I: Project Plans
    1. Description and Qualifications of Personnel
    2. Health and Safety Plan
    3. Quality Assurance Project Plan
    4. Monitoring Program Plan, addressing:
        * SVE
        * Municipal Wells
        * Operable Unit Well(s)
    5. Modelling Plans (SVE mass-flux and municipal groundwater extraction)
    6. Project Schedule for Completion of Tasks

* Task II: Remedial Design

1. Design Plans and Specifications
2. Operation and Maintenance Plan
3. Cost Estimate
4. Construction Schedule
5. Construction Quality Assurance Plan
6. Community Relations

* Task III: Final Remedy Construction

1. Construction Quality Assurance (CQA) Program Plan:
   a. Responsibility and Authority
   b. Construction Quality Assurance Personnel Qualifications
   c. Inspection Activities
   d. Documentation
2. Implementation of CQA Program Plan

* Task IV: Reports

1. Progress
2. Draft
3. Final
4. SVE Completion

D. The RD/RA Work Plan shall be subject to review, modification and approval by U.S. EPA, in consultation with the State, in accordance with the procedures set forth in paragraph 14 below.

E. The fully approved RD/RA Work Plan, as modified, shall be deemed incorporated into and made an enforceable part of this Consent Decree. All Work shall be conducted in accordance with the National Contingency Plan, the U.S. EPA Superfund Remedial Design and Remedial Action Guidance, and the requirements of this Consent Decree, including the standards, specifications and schedule contained in the RD/RA Work Plan.

14. Approval Procedures for Work Plans and Other Documents.

A. Upon review of each work plan or other document required to be submitted and approved by U.S. EPA pursuant to

this Decree, and after consultation with the State, the U.S. EPA Remedial Project Manager (the "RPM") will notify Settling Defendants, in writing, that a document is (1) approved, (2) disapproved, (3) modified by U.S. EPA to cure deficiencies, or (4) to be returned to Settling Defendants for modification.

B. Unless otherwise directed by the U.S. EPA (including the schedule contained at Section V of the SOW) or unless otherwise agreed by the Parties, within thirty (30) days of approval or modification of a submission by U.S. EPA, Settling Defendants shall proceed to implement the Work required.

C. In the event of partial U.S. EPA disapproval the Settling Defendants shall proceed, within thirty (30) days of receipt of notice from U.S. EPA or by such other time as may be agreed to by the Parties, to implement the Work in any approved portions of the submission upon request by U.S. EPA, and shall submit a revised document to U.S. EPA and the State curing the deficiencies.

D. Settling Defendants may submit any disapproval, modification, or conditions of approval of a document, to which they object, for dispute resolution pursuant to Section XIII hereof. The provisions of Section XIII (Dispute Resolution) and Section XVI (Stipulated Penalties) shall govern the implementation of Work and accrual and payment of any stipulated penalties during dispute resolution. Implementation of non-deficient portions of the submission shall not relieve Settling

Defendants of any liability for stipulated penalties under Section XVI.

VII. ADDITIONAL WORK AND MODIFICATION OF THE SOW

15. No Warranty. The provisions of the SOW attached as Appendix 4 reflect the Parties' best efforts at the time of execution of this Decree to define the technical work required to perform the remedial action described in the ROD. The Parties acknowledge and agree that approval by U.S. EPA of the SOW or the RD/RA Work Plan does not constitute a warranty or representation of any kind that the SOW or RD/RA Work Plan will achieve the Cleanup and Performance Standards, and shall not foreclose the United States or the State from seeking compliance with the applicable Cleanup and Performance Standards.

16. Modification of the Scope of Work

The Parties recognize that modification of the SOW may be required at some point in the future, e.g. to provide for modifications of design, construction or operation, to provide for additional Work needed to perform the Remedial Action, or for additional Work needed to meet the Clean-up and Performance Standards. In such event, the following procedures shall be followed to amend the SOW:

a. The party that determines that additional Work or other modification of the SOW is necessary shall provide written notice of such determination to the other Parties.

b. The other Parties shall respond to such notice in writing within thirty (30) days of receipt or such other time as may be agreed to by the Parties.

17. Modification by Agreement. If the Parties agree on the modifications to the SOW, the agreement shall be in writing and shall be filed with the Court along with the amended SOW. Approval of the Court shall be requested for material modifications.

18. Dispute Resolution. If the Parties do not agree on the proposed modifications or additional Work within thirty (30) days of receipt of the notice required by paragraph 16.a. above, they may initiate dispute resolution pursuant to Section XIII of this Decree. The scope and standard of review set forth in paragraph 38 shall govern any judicial determination in such dispute. Within thirty (30) days of any resolution of a dispute that requires modification of the SOW, or such other time as may be agreed to by the Parties, the Settling Defendants shall submit a revised SOW in conformance with the decision for EPA's approval.

VIII. QUALITY ASSURANCE

19. Settling Defendants shall use quality assurance, quality control, and chain of custody procedures in accordance with U.S. EPA's "Interim Guidelines and Specifications For Preparing Quality Assurance Project Plans" (QAM-005/80) and subsequent amendments to such guidelines upon notification to Settling Defendants of such amendments by U.S. EPA. Prior to the commencement of any monitoring program under this Consent Decree, Settling Defendants must have EPA approval of the final Quality Assurance Project Plan ("QAPP"), consistent with the SOW and applicable guidelines, in accordance with paragraphs 13-14

hereof. Sampling data generated consistent with the QAPP(s) shall be admissible as evidence, without objection, in any proceeding to enforce this Decree. Settling Defendants shall assure that U.S. EPA and State personnel or authorized representatives are allowed access to any laboratory utilized by Settling Defendants in implementing this Consent Decree. In addition, Settling Defendants shall have a designated laboratory analyze samples submitted by U.S. EPA or the State for quality assurance monitoring.

IX. FACILITY ACCESS, SAMPLING, DOCUMENT AVAILABILITY

20. Access to Facility and Other Property Controlled by Settling Defendants. As of the date of lodging of this Consent Decree, the United States, the State, and Settling Defendants' contractors shall have access at all times to the parcels of the Facility owned by Settling Defendants described in paragraph 9.A. above, and shall have access to any other property controlled by or available to Settling Defendants to which access is necessary to effectuate the remedial design or remedial action required pursuant this Decree. Access shall be allowed for the purposes of conducting activities related to this Decree, including but not limited to:

A. Monitoring the Work or any other activities taking place at the Facility;

B. Verifying any data or information submitted to the United States;

C. Conducting investigations relating to contamination at or near the Facility;

D. Obtaining samples;

E. Assessing the need for, planning, or implementing additional response actions at or near the Facility;

F. Inspecting and copying records, operating logs, contracts or other documents maintained or generated by Settling Defendants or their agents, consistent with this Decree and applicable law; or

G. Assessing Settling Defendants' compliance with this Consent Decree.

21. Access to Other Property. To the extent that the Facility or other areas where Work is to be performed hereunder is presently owned by persons other than Settling Defendants, Settling Defendants shall use best efforts to secure from such persons access for Settling Defendants' contractors, the United States, the State, and their authorized representatives, as necessary to effectuate this Consent Decree. If access is not obtained, despite best efforts, within 45 days of the date of entry of this Decree, Settling Defendants shall promptly notify the United States. The United States thereafter may assist Settling Defendants in obtaining access, to the extent necessary to effectuate the remedial action for the Facility, using such means as the United States deems appropriate. The United States' costs in this effort, including attorney's fees and other expenses, shall be considered costs of response and shall be paid

by Settling Defendants in accordance with Section XV of this Decree (Payment).

22. Access Authority Retained. Nothing herein shall restrict in any way the United States' access authorities and rights under CERCLA, RCRA or any other applicable statute, regulation or permit.

23. Sampling Availability. Settling Defendants shall make available to U.S. EPA and the State the results of all sampling and/or tests or other data generated by Settling Defendants with respect to the implementation of this Consent Decree. U.S. EPA and the State, upon request, shall make available to the Settling Defendants the results of finalized QA/QC sampling and/or finalized QA/QC tests or other finalized QA/QC data generated by U.S. EPA, the State, or their contractors.

24. Split Samples. At the request of U.S. EPA or the State, Settling Defendants shall allow split or duplicate samples to be taken by U.S. EPA, the State and/or their authorized representatives, of any samples collected by Settling Defendants with respect to implementation of this Consent Decree. Settling Defendants shall notify U.S. EPA and the State, in writing, not less than fourteen (14) days in advance of any such sample collection activity, unless otherwise agreed by the Parties. In addition, U.S. EPA and the State shall have the right to take any additional samples that U.S. EPA or the State deem necessary. In the event of sampling by U.S EPA, U.S. EPA shall, to the extent practicable under the circumstances, notify Settling Defendants

not less than fourteen (14) days in advance of any sample collection activity pursuant to the implementation of this Consent Decree. To the extent not covered in the QAPP, U.S. EPA shall, to the extent practicable under the circumstances, advise Settling Defendants of the parameters to be analyzed in such sampling. At the request of the Settling Defendants, U.S. EPA shall, to the extent practicable under the circumstances, allow split or duplicate samples to be taken by Settling Defendants and/or their authorized representative of any samples collected by U.S. EPA pursuant to the implementation of this Consent Decree.

X. REPORTING REQUIREMENTS

25. Monthly Progress Reports. Settling Defendants shall prepare and provide to the United States and the State written monthly progress reports which:

(1) describe the actions which have been taken toward achieving compliance with this Consent Decree during the previous month, and attach copies of appropriate supporting documentation such as invoices, contract documents and photographs;

(2) include all results of sampling and tests and all other data received by Settling Defendants during the course of the work which has passed quality assurance and quality control procedures;

(3) include all plans and procedures completed under the RD/RA Work Plan during the previous month;

(4) describe all actions, data and plans which are scheduled for the next month and provide other information relating to the progress of construction;

(5) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of RD/RA Scope of Work

or Work Plan, and a description of efforts made to mitigate those delays or anticipated delays.

Progress reports are to be submitted to U.S. EPA and the State by the tenth (10th) day of every month following the date of entry of this Consent Decree.

26. Other Reporting Requirements. Settling Defendants shall submit to EPA and the State reports, plans and data required by the SOW, the RD/RA Work Plan or other approved plans in accordance with the schedules set forth in such plans.

27. Reports of Releases. Upon the occurrence of any event during performance of the Work which, pursuant to Section 103 of CERCLA, requires reporting to the National Response Center, Settling Defendants shall promptly orally notify the U.S. EPA Remedial Project Manager ("RPM"), or in the event of the unavailability of the U.S. EPA RPM, the Emergency Response Section, Region V, United States Environmental Protection Agency, in addition to the reporting required by Section 103. Within twenty (20) days of the onset of such an event, Settling Defendants shall furnish to the EPA and the State a written report setting forth the events which occurred and the measures taken, and to be taken, in response thereto. Within thirty (30) days of the conclusion of such an event, Settling Defendants shall submit a report setting forth all actions taken to respond thereto.

28. Annual Report. Settling Defendants shall submit each year, within thirty (30) days of the anniversary of the entry of the Consent Decree, a report to the Court and the Parties setting

forth the status of the remedial action at the Facility, which shall include at a minimum a statement of major milestones accomplished in the preceding year, a statement of tasks remaining to be accomplished, and the schedule for implementation of the remaining Work.

XI. REMEDIAL PROJECT MANAGER/PROJECT COORDINATORS

29. Designation/Powers. U.S. EPA shall designate a Remedial Project Manager ("RPM") and the State shall designate a Project Coordinator for the Facility, and they may designate other representatives, including U.S. EPA and State employees, and federal and state contractors and consultants, to observe and monitor the progress of any Work undertaken pursuant to this Consent Decree. The RPM shall have the authority lawfully vested in an RPM by the National Contingency Plan, 40 CFR Part 300. In addition, the RPM shall have the authority to halt any Work required by this Consent Decree and to take any necessary response action when conditions at the Facility may present an imminent and substantial endangerment to public health or welfare or the environment. Settling Defendants shall also designate a Project Coordinator who shall have primary responsibility for implementation of the Work at the Facility.

30. Communications. To the maximum extent possible, except as specifically provided in the Consent Decree, communications between Settling Defendants, the State and U.S. EPA concerning the implementation of the Work under this Consent Decree shall be made between the Project Coordinators and the RPM.

31. Replacements. Within twenty (20) calendar days of the entry of this Consent Decree, Settling Defendants, the State and U.S. EPA shall notify each other, in writing, of the name, address and telephone number of the designated Project Coordinator and an Alternate Project Coordinator, and the RPM and Alternate RPM. If the identity of any these persons changes, notice shall be given to the other Parties at least five (5) business days before the changes become effective.

XII. FORCE MAJEURE

32. Definition. "Force Majeure" for purposes of this Consent Decree is defined as any event arising from causes beyond the control of Settling Defendants which delays or prevents the performance of any obligation under this Consent Decree notwithstanding Settling Defendants' best efforts to avoid the delay. Increased costs or expenses or non-attainment of the Performance or Clean-Up Standards shall not constitute "force majeure" events.

33. Notice to RPM Required. When Settling Defendants become aware or should become aware of circumstances which may delay the completion of any phase of the Work or delay access to the Facility or to any property on which any part of the Work is to be performed, whether or not caused by a "force majeure" event, Settling Defendants shall immediately notify the RPM and the State Project Coordinator by telephone, or in the event of their unavailability, the Director of the Waste Management Division of U.S. EPA. Within ten (10) days of the event which Settling

Defendants contend is responsible for the delay, Settling Defendants shall supply to the United States and the State in writing the reason(s) for and anticipated duration of such delay, the measures taken and to be taken by Settling Defendants to prevent or minimize the delay, and a proposed timetable for implementation of such measures. Failure to give such oral notice and written explanation in a timely manner shall constitute a waiver of any claim of "force majeure".

34. If U.S. EPA agrees that a delay is or was attributable to a "force majeure" event, the Parties shall modify the SOW or RD/RA Work Plan to provide such additional time as may be necessary to allow the completion of the specific phase of Work and/or any succeeding phase of the Work affected by such delay.

35. If U.S. EPA does not agree with Settling Defendants that the reason for the delay was a "force majeure" event, or that the duration of the delay is or was warranted under the circumstances, or that the length of additional time requested by Settling Defendants for completion of the delayed work is necessary, Settling Defendants shall initiate a formal dispute resolution proceeding under Section XIII below or no later than the fifteenth (15th) day after the receipt of U.S. EPA's negative finding. In such a proceeding, Settling Defendants have the burden of proving that the event was a force majeure, that best efforts were exercised to avoid and mitigate the effects of the delay, that the duration of the delay is or was warranted, that the additional time requested for completion of the Work involved

is necessary to compensate for the delay, and that the notice provisions of paragraph 33 were complied with.

XIII. DISPUTE RESOLUTION

36. The Parties to this Consent Decree shall attempt to resolve expeditiously any disagreements concerning the meaning, application or implementation of this Consent Decree. Any party seeking dispute resolution first shall provide the other Parties with an "Informal Notice of Dispute" in writing and request an informal dispute resolution period, which shall not exceed fifteen (15) days.

37. If the dispute is not resolved within the informal discussion period, any party may initiate formal dispute resolution by giving a written "Formal Notice of Dispute" to the other Parties no later than the tenth (10th) day following the conclusion of the informal dispute resolution period. A party may seek formal dispute resolution prior to the expiration of the informal discussion period.

38. Formal dispute resolution for disputes pertaining to the selection or adequacy of remedial design or remedial action (including the selection and adequacy of any plans which are required to be submitted for government approval under this Decree and the adequacy of Work performed) shall be conducted according to the following procedures:

a. Within ten (10) days of the service of the Formal Notice of Dispute pursuant to the preceding paragraph, or such other time as may be agreed to by the Parties, the party who gave

the notice shall serve on the other Parties to this Decree a written statement of the issues in dispute, the relevant facts upon which the dispute is based, and factual data, analysis or opinion supporting its position (hereinafter the "Statement of Position"), and shall provide copies of all supporting documentation on which such party relies.

b. Opposing Parties shall serve their Statements of Position and copies of supporting documentation within ten (10) days after receipt of the complaining party's Statement of Position or such other time as may be agreed to by the Parties.

c. U.S. EPA shall maintain an administrative record of any dispute governed by this paragraph. The record shall include the Formal Notice of Dispute, the Statements of Position, all supporting documentation submitted by the Parties, and any other material on which the U.S. EPA decisionmaker relies for the administrative decision provided for below. The record shall be available for inspection and copying by all Parties. The record shall be closed no less than ten (10) days before the administrative decision is made, and U.S. EPA shall give all Parties prior notice of the date on which the record will close.

d. Upon review of the administrative record U.S. EPA will issue a final decision and order resolving the dispute.

e. Any decision and order of U.S. EPA pursuant to subparagraph d. shall be reviewable by this Court, provided that the proper motion is filed with the Court within 10 days of receipt of U.S. EPA's decision and order. Judicial review will

be conducted on U.S. EPA's administrative record and U.S. EPA's decision shall be upheld unless it is demonstrated to be arbitrary and capricious or in violation of law.

39. Judicial dispute resolution for any issues not governed by the preceding paragraph may be initiated by petition to the Court and shall be governed by the Federal Rules of Civil Procedure. Except as specifically provided in other provisions of this Decree, e.g. Section XII, this Decree does not establish burdens of proof for such dispute resolution proceedings.

40. The invocation of the procedures stated in this Section shall not extend or postpone Settling Defendants' obligations under this Consent Decree with respect to the disputed issue unless and until U.S. EPA agrees otherwise. U.S. EPA's position on an issue in dispute shall control until such time as the Court orders otherwise in accordance with the provisions of this Section.

41. Any applicable Stipulated Penalties continue to accrue during dispute resolution, as provided in Section XVI hereof. Settling Defendants may seek forgiveness of stipulated penalties that accrue during dispute resolution by petition to U.S. EPA and/or the Court pursuant to paragraph 60 below.

42. Upon the conclusion of any formal or informal dispute resolution under this Section which has the effect of nullifying or altering any provision of the RD/RA Work Plan or any other plan or document submitted and approved pursuant to this Decree, Settling Defendants shall submit an amended plan, in accordance

with the decision, to U.S. EPA within fifteen (15) days of receipt of the final order or decision. Amendments of the SOW as a result of dispute resolution proceedings are governed by Section VI above. Amendments of a plan or other document as a result of dispute resolution shall not alter any dates for performance unless such dates have been specifically changed by the order or decision. Extension of one or more dates of performance in the order or decision does not extend subsequent dates of performance for related or unrelated items of Work unless the order or decision expressly so provides or the Parties so agree.

XIV. RETENTION AND AVAILABILITY OF INFORMATION

43. Settling Defendants shall make available to U.S. EPA and the State and shall retain the following documents until six (6) years following the issuance of the Certificate of Completion pursuant to paragraph 82 of this Decree all records and documents in their possession, custody, or control which relate to the performance of this Consent Decree, including, but not limited to, documents reflecting the results of any sampling, tests, or other data or information generated or acquired by any of them, or on their behalf, with respect to the Facility and all documents pertaining to their own or any other person's liability for response actions or costs under CERCLA. After this period of document retention, Settling Defendants shall notify U.S. DOJ, U.S. EPA and the State at least ninety (90) calendar days prior to the destruction of any such documents, and upon request by

U.S. EPA, Settling Defendants shall relinquish custody of the documents to U.S. EPA or the State.

44. Settling Defendants may assert business confidentiality claims covering part or all of the information provided in connection with this Consent Decree in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. §9604(e)(7), and pursuant to 40 CFR (2.203(b) and applicable State law. Information determined to be confidential by U.S. EPA will be afforded the protection specified in 40 CFR Part 2, Subpart B and, if determined to be entitled to confidential treatment under State law by the State, afforded protection under State law by the State. If no such claim accompanies the information when it is submitted to U.S. EPA or the State, the public may be given access to such information without further notice to Settling Defendants.

45. Information acquired or generated by Settling Defendants in performance of the Work that is subject to the provisions of Section 104(e)(7)(F) of CERCLA, 42 U.S.C. (9604(e)(7)(F), shall not be claimed as confidential by Settling Defendants.

46. In the event that Settling Defendants' obligation to produce documents under this Section includes documents which are privileged from disclosure as attorney-client communications, attorney work-product or other privilege recognized by law, Settling Defendants may seek to withhold production of such documents to avoid improper disclosure. At the time production is requested, Settling Defendants must provide the United States and the State all information necessary to determine whether the

document is privileged, including such information as is generally required under the Federal Rules of Civil Procedure. If the United States does not agree with the Settling Defendant's claim of privilege, Settling Defendants may seek protection of the documents from the Court. Settling Defendants shall not withhold as privileged any information or documents that are created, generated or collected pursuant to requirements of this Decree, regardless of whether the document has been generated in the form of an attorney-client communication or other generally privileged manner. Settling Defendants may not withhold as privileged any documents that are subject to the public disclosure provision of Section 104(e)(7)(F) of CERCLA, 42 U.S.C. §9604(e)(7)(F).

XV. PAYMENT

47. Within ten (10) days of the entry of this Consent Decree, Settling Defendants shall pay ONE MILLION SIX-HUNDRED AND FIFTY THOUSAND DOLLARS ($1,650,000.00), plus interest on that sum at EIGHT and FORTY-SEVEN one-hundredths percent (8.47%) from April 1, 1990 until the date of entry of this Consent Decree, to the U.S. EPA Hazardous Substances Superfund, delivered to the U.S. EPA, Superfund Accounting, P.O. Box 70753, Chicago, Illinois 60673 in the form of a certified or cashier check payable to "EPA Hazardous Substances Superfund," and referencing the Court Docket Number affixed to this Decree, the CERCLA Site Identifier Number TJB 05B6N8 and DOJ Case Number 90-11-2-444A. A copy of such check shall be sent to the Director, Waste Management Division,

U.S. EPA, Region V and to the Assistant Attorney General, Land and Natural Resources Division, U.S. Department of Justice, at the addresses provided in Section XX (Notices).

48. The payment made under the preceding paragraph is for payment of Response Costs incurred prior to the entry of this Decree claimed by the United States in this action. Upon receipt of the payment required above, the United States covenants not to sue Settling Defendants for any Response Costs incurred prior to the date of entry of this Decree, pursuant to CERCLA, 42 U.S.C. §9601 et seq.

49. A. Within sixty (60) days of the signing of this Consent Decree by the Parties, the State shall submit to the Settling Defendants an itemization of past attorneys' and WDNR staff costs related to the negotiation and preparation of this Consent Decree. Within forty-five (45) days of receipt of itemization by the Settling Defendants or the entry of this Consent Decree, whichever is later, Settling Defendants shall pay in full the itemized amounts. Payment due to the Wisconsin Department of Justice shall be by certified or cashier's check payable to, "Wisconsin Department of Justice," which shall be mailed or delivered to Robert A. Selk, Assistant Attorney General, Department of Justice, 123 W.Washington Avenue, P.O.Box 7857, Madison Wisconsin, 53707-7857. Payment due to WDNR shall be by certified or cashier's check payable to, "WDNR Environmental Repair Program, " which shall be mailed or delivered to Mark

Geisfeldt, Chief, WDNR Environmental Response and Repair Section, P.O.Box 7921, Madison WI 53707.

B. In the event that the State, through an arrangement with U.S. EPA, performs the Oversight for this Consent Decree, the Settling Defendants shall pay, within thirty (30) days after an itemized cost statement and a demand for payment is received from the State, all State Oversight Costs: 1) which are incurred by the State after the date of entry of this Consent Decree; and 2) which, when added to operable unit oversight costs incurred by the State prior to the entry of this Consent Decree, exceed the Thirty Thousand Dollar ($30,000.00) advance which was paid to the State pursuant to the consent decree which was entered on September 8, 1989, in Civil Action No. 89-C-655-C (Appendix 1). The State shall provide itemized Oversight Cost statements to the Settling Defendants for all State Oversight Costs incurred as soon as practicable after the end of each State fiscal year. Payment shall be made as specified in paragraph 49.A. above.

50. A. Settling Defendants shall pay all Response Costs incurred by the United States and/or the State after the date of entry of this Consent Decree, including all Oversight Costs, all costs of access required to be paid pursuant to Section IX herein, and all costs incurred in enforcing this Decree in any proceeding or action in which the United States or the State prevails. The United States' claims for Oversight Costs shall be submitted on an annual basis, as soon as practicable after each anniversary date of this Consent Decree, along with itemized cost

statements (such as an Annotated SPUR Report). In the event the State and U.S. EPA enter into an arrangement for the State to perform oversight for the Remedial Action, U.S. EPA shall submit its claims for outstanding Oversight costs, from the date of entry of this Decree through the date of the U.S. EPA-State arrangement, as soon as practicable after the date of the arrangement. The United States' itemized cost statement (such as an Annotated SPUR Report) for such Costs shall be paid by the Settling Defendants within thirty (30) days of the submission of such claims to the Settling Defendants.

B. The State's claims for Oversight costs which, when added to operable unit oversight costs incurred by the State prior to the entry of this Consent Decree, exceed the Thirty Thousand Dollar ($30,000.00) advance which was paid to the State pursuant to the consent order which was entered on September 8, 1989, in Civil Action No. 89-C-655-C, shall be paid by the Settling Defendants within thirty (30) days after the submission of a State claim and a demand for payment to the Settling Defendants. Payments shall be made as specified in paragraphs 47 and 49.A. above.

51. Settling Defendants may agree among themselves as to the apportionment of responsibility for the payments required by this Section, but their liability to the United States and the State for these payments shall be joint and several.

XVI. STIPULATED PENALTIES

52. Settling Defendants shall pay stipulated penalties in the amounts set forth below to the United States for each failure to complete any of the following requirements of this Decree in an acceptable manner and within the time schedules specified in the SOW, the RD/RA Work Plan or in other plans submitted and approved under this Consent Decree:

VIOLATION	PENALTY (per day)		
	UP TO 30 DAYS	UP TO 60 DAYS	OVER 60 DAYS
Failure to submit progress reports	$500	$1,500	$2,500
Failure to submit RD/RA Work Plan or any portion thereof	$1,500	$5,000	$10,500
Failure to submit Design or construction plans or submittals (per plan/submittal)	$1,500	$5,000	$10,000
Failure to complete any component(s) of remedial action:	$1,500	$5,000	$10,000
Failure to comply with notice or any other requirements of the Decree not listed here:	$1,500	$2,500	$5,000
Failure to take action to abate an endangerment under Section XXII:	$5,000	$10,000	$15,000

53. All penalties begin to accrue on the day that complete performance is due or a violation occurs, and continue to accrue through the final day of correction of the noncompliance or

completion of performance. Any modifications of the time for performance shall be in writing and approved by U.S. EPA. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Consent Decree.

54. Following U.S. EPA's determination that Settling Defendants have failed to comply with any of the requirements of this Consent Decree, U.S. EPA shall give Settling Defendants written notification of the same and describe the non-compliance. This notice shall also indicate the amount of penalties due. However, penalties shall accrue as provided in the preceding paragraph regardless of whether U.S. EPA has notified Settling Defendants of a violation.

55. All penalties owed to the United States under this Section shall be payable within thirty (30) days of receipt of the notification of non-compliance, unless Settling Defendants invoke the dispute resolution procedures under Section XIII.

56. Settling Defendants may dispute the United States' right to the stated amount of penalties on the grounds that the violation is excused by the Force Majeure provisions of Section XII or that it is based on a mistake of fact. The dispute resolution procedures under Section XIII shall be followed for such a dispute.

57. Neither the filing of a petition to resolve a dispute nor the payment of penalties shall alter in any way Settling Defendants' obligation to continue and complete the performance required hereunder.

58. Penalties shall continue to accrue as provided in paragraph 53 during the dispute resolution period, but need not be paid until the following decision points:

a. If the dispute is resolved by agreement or by decision or order of U.S. EPA which is not appealed to this Court, accrued penalties shall be paid to U.S. EPA within fifteen (15) days of the agreement or the receipt of U.S. EPA decision or order;

b. If the dispute is appealed to this Court, accrued penalties shall be paid to U.S. EPA within fifteen (15) days of receipt of the Court's decision or order, except as provided in subparagraph c below;

c. If the District Court's decision is appealed by any party, Settling Defendants shall pay all accrued penalties into an interest-bearing escrow account within fifteen (15) days of receipt of the Court's decision or order. Penalties shall be paid into this account as they continue to accrue, at least every thirty (30) days. Within fifteen (15) days of receipt of the appellate court decision, the escrow agent shall pay the balance of the account to U.S. EPA and/or to Settling Defendants to the extent that they prevail, as determined pursuant to paragraph 59 below.

59. Settling Defendants shall not owe stipulated penalties for any items upon which they prevail in dispute resolution.

60. Notwithstanding the above provisions, the Settling Defendants shall have the right to petition the Court or U.S. EPA

(according to the level of dispute resolution reached) for forgiveness of stipulated penalties that accrue during dispute resolution for items upon which they did not prevail, based on a finding: (1) that the delay in work or other violation that caused the stipulated penalty to accrue was necessary and appropriate during the dispute resolution proceeding; and (2) that Settling Defendants' position regarding the dispute had substantial support in law and fact and reasonably could have been expected to prevail, considering the applicable standard of review, and (3) that Settling Defendants sought dispute resolution at the earliest practicable time and took all other appropriate steps to avoid any delay in remedial action work as a result of the dispute. If the Court or U.S. EPA so finds, they may grant an appropriate reduction in the stipulated penalties that accrued during the dispute resolution period. Settling Defendants shall have the burdens of proof and persuasion on any petition submitted under this provision.

61. Interest shall begin to accrue on the unpaid balance of stipulated penalties on the day following the date payment is due. Pursuant to 31 U.S.C. §3717, interest shall accrue on any amounts overdue at a rate established by the Department of Treasury for any period after the date of billing. A handling charge will be assessed at the end of each thirty (30) day late period, and a six percent per annum penalty charge will be assessed if the penalty is not paid within ninety (90) days of

the due date. Penalties shall be paid as specified in paragraph 47 hereof.

62. If Settling Defendants fail to pay stipulated penalties, the United States or the State may institute proceedings to collect the penalties. In any such proceeding, penalties shall be paid as provided in paragraph 47 above.

63. Notwithstanding any of the above provisions, U.S. EPA may elect to assess civil penalties and/or to bring an action in U.S. District Court pursuant to Section 109 of CERCLA to enforce the provisions of this Consent Decree. Payment of stipulated penalties shall not preclude U.S. EPA from electing to pursue any other remedy or sanction to enforce this Consent Decree, and nothing shall preclude U.S. EPA or the State from seeking statutory penalties against Settling Defendants for violations of statutory or regulatory requirements.

XVII. COVENANT NOT TO SUE

64. Except as otherwise specifically provided in the following paragraph or elsewhere in this Decree, the United States and the State covenant not to sue the Settling Defendants for monies paid to the United States and State pursuant to this Decree and pursuant to the consent decree entered on March 21, 1990, in Case No. 89-C-0918-C, and for monies expended for Work satisfactorily performed, as determined pursuant to Section XXV (Certification of Termination).

65. This Covenant Not To Sue does not include:

a. Liability arising from hazardous substances removed from the Facility;

b. Natural resource damages;

c. Criminal liability;

d. Claims based on a failure by the Settling Defendants to meet the requirements of this Consent Decree;

e. Any matters for which the United States is owed indemnification under Section XVIII hereof; or

f. Liability for violations of Federal or State law which occur during implementation of the remedial action.

66. Notwithstanding any other provision in this Consent Decree, (1) the United States and the State (except as the State is limited by the final judgement and release in Case No. 89-C-0918C, entered in the U.S. District Court for the Western District of Wisconsin and as limited by CERCLA) reserve the right to institute proceedings in this action or in a new action or to issue an Order seeking to compel the Settling Defendants to perform any additional response work at the Facility, and (2) the United States and the State reserve the right to institute proceedings in this action or in a new action seeking to reimburse the United States for its Response Costs and to reimburse the State for its matching share of any response action undertaken by U.S. EPA and/or the State under CERCLA, relating to the Facility, if:

a. for proceedings prior to U.S. EPA certification of completion of the remedial action concerning the Facility,

(i) conditions at the Facility, previously unknown to the United States, are discovered after the entry of this Consent Decree, or

(ii) information is received, in whole or in part, after the entry of this Consent Decree,

and these previously unknown conditions or this information indicates that the remedial action is not protective of human health and the environment; and

b. for proceedings subsequent to U.S. EPA certification of completion of the remedial action concerning the Facility,

(i) conditions at the Facility, previously unknown to the United States, are discovered after the certification of completion by U.S. EPA, or

(ii) information is received, in whole or in part, after the certification of completion by U.S. EPA,

and these previously unknown conditions or this information indicates that the remedial action is not protective of human health and the environment.

c. With regard to the State, nothing in this paragraph shall modify the covenant not to sue contained in the consent decree entered on March 21, 1989, Civil Action No. 89-C-918-C.

67. For purposes of subparagraph a. of the preceding paragraph, the information received by and the conditions known to the United States are that information and those conditions set forth in the Interim and final RODs attached as Appendices 1 and 2, hereto, or in documents contained in U.S. EPA's administrative record supporting the RODs. For purposes of

subparagraph b. of the preceding paragraph, the information received by and the conditions known to the United States are that information and those conditions set forth in the Interim and final RODs, the administrative record supporting the RODs, or in reports or other documents submitted to U.S. EPA pursuant to this Consent Decree or generated by U.S. EPA in overseeing this Consent Decree prior to certification of completion.

68. Notwithstanding any other provisions in this Consent Decree, the Covenant Not To Sue in this Section shall not relieve the Settling Defendants of their obligation to meet and maintain compliance with the requirements set forth in this Consent Decree, including the conditions in the RODs, SOW, the RD/RA Work Plan and any other plans, schedules, submittals or conditions which are set forth herein or modifications made hereto. The United States reserves its rights to: A) take response actions at the Facility in the event of a breach of the terms of this Consent Decree; and B) to seek recovery of costs incurred after entry of the Consent Decree: 1) resulting from such a breach; 2) relating to any portion of the Work funded or performed by the United States; or 3) incurred by the United States as a result of having to seek judicial assistance to remedy conditions at or adjacent to the Facility.

69. Settling Defendants hereby release and waive any rights to assert any claims against the United States or any agency of the United States relating to the Facility.

70. Nothing in this Consent Decree shall constitute or be construed as a release or a covenant not to sue regarding any claim or cause of action against any person, firm, trust, joint venture, partnership, corporation or other entity not a signatory to this Consent Decree for any liability it may have arising out of or relating to the Facility. The United States and the State expressly reserve the right to continue to sue any person, other than the Settling Defendants, in connection with the Facility.

XVIII. INDEMNIFICATION; OTHER CLAIMS

71. Settling Defendants agree to indemnify, save and hold harmless the United States, the State and/or their representatives from any and all claims or causes of action arising from the acts or omissions of Settling Defendants and/or their representatives, including contractors and subcontractors, in carrying out the work here pursuant to this Consent Decree. The United States and the State shall notify Settling Defendants of any such claims or actions as soon as practicable after receipt of notice that such a claim or action is anticipated or has been filed.

72. The United States and the State do not assume any liability of Settling Defendants by virtue of entering into this agreement or by virtue of any designation that may be made of Settling Defendants as U.S. EPA's representatives under Section 104(e) of CERCLA for purposes of carrying out this Consent Decree. The United States and the State are not to be construed as Parties to any contract entered into by Settling Defendants in

carrying out the work pursuant to this Consent Decree. The proper completion of the Work under this Consent Decree is solely the responsibility of Settling Defendants.

73. Settling Defendants waive their rights to assert any claims against the Hazardous Substances Superfund under CERCLA that are related to the Facility, including any costs incurred in the Work performed pursuant to this Consent Decree, and nothing in this Consent Decree shall be construed as U.S. EPA's preauthorization of a claim against the Hazardous Substance Superfund.

XIX. INSURANCE/FINANCIAL RESPONSIBILITY

74. Settling Defendants shall purchase and maintain in force for the duration of the remedial action work, comprehensive general liability and automobile insurance, or the equivalent, as determined by U.S. EPA in consultation with the State, with limits of five million and one million dollars, respectively, combined single limit, naming as additional insureds the United States and the State, covering the acts or omissions of the U.S. EPA and the State in carrying out activities pursuant to this Consent Decree. In addition, for the duration of this Consent Decree, Settling Defendants shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of workmen's compensation insurance for all persons performing Work on behalf of Settling Defendants in furtherance of this Consent Decree.

Prior to commencement of the Work at the Facility, Settling Defendants shall provide U.S. EPA and the State with a certificate of insurance and a copy of the insurance policy. If Settling Defendants demonstrate by evidence satisfactory to the United States and the State that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then with respect to that contractor or subcontractor Settling Defendants need provide only that portion of the insurance described above which is not maintained by the contractor or subcontractor.

75. Settling Defendants shall provide financial security, in the amount of $3,000,000.00, in the manner required by 40 C.F.R. 264.145(f), to assure completion of the Work at the Facility.

XX. NOTICES

76. Whenever, under the terms of this Consent Decree, notice is required to be given, a report or other document is required to be forwarded by one party to another, or service of any papers or process is necessitated by the dispute resolution provisions of Section XIII hereof, such correspondence shall be directed to the following individuals at the addresses specified below:

As to the United States or U.S. EPA:

a. Felipe N. Gomez
Assistant Regional Counsel
Office of Regional Counsel
111 W. Jackson 3d Floor
Chicago, IL 60604

As to the State:

a. Linda Meyer
Bureau of Legal Services
Dept. of Natural Resources
101 S. Webster Street
P.O. Box 7921
Madison WI 53707-7921

b. Director, Waste Management Division
Attn: Margaret Guerierro
Remedial Project Manager (5HE)
U.S. Environmental Protection Agency
230 S. Dearborn Street
Chicago, Illinois 60604

b. Mark Giesfeldt
Section Chief
Environmental Response and Repair Section
Bureau of Solid and Hazardous Waste Management
Dept. of Natural Resources
101 S. Webster Street
P.O. Box 7921
Madison, WI 53707-7921

c. Assistant Attorney General
Land & Natural Resources Division
Attn: Michael McNulty
U.S. Department of Justice
10th & Pennsylvania Ave., N.W.
Washington, D.C. 20530

c. Michelle DeBrock-Owens
North Central District Headquarters
Dept. of Natural Resources
107 Sutliff Avenue
Box 818
Rhinelander, WI 54501

As to Settling Defendants:

a. Mark A. Thimke
Foley & Lardner
777 E. Wisconsin Avenue
Milwaukee, WI 53202-5367

b. James P. Lonsdorf
Lonsdorf & Andraski
610 Jackson Street
P.O. Box 872
Wausau, WI. 54401

c. Raymond R. Krueger
Charne, Clancy & Taitelman S.C.
100 E. Wisconsin Avenue
Suite 2400
Milwaukee, WI 53202-4113

XXI.

CONSISTENCY WITH NATIONAL CONTINGENCY PLAN

77. The United States and the State agree that the Work and additional Work if any, if properly performed and completed, is consistent with the provisions of the National Contingency Plan.

XXII.

ENDANGERMENT AND EMERGENCY RESPONSE

78. In the event of any action or occurrence during the performance of the Work which causes or threatens a release of a hazardous substance into the environment which presents or may present an imminent and substantial endangerment to public health or welfare or the environment, Setting Defendants shall immediately take all appropriate action to prevent, abate, or minimize such release and endangerment, and shall immediately notify the RPM or, if the RPM is unavailable, the U.S. EPA Emergency Response Section, Region V, U.S. EPA. Settling Defendants shall take such action in accordance with all applicable provisions of the Health and Safety Plan and the Contingency Plan developed pursuant to the SOW and approved by U.S. EPA. In the event that Settling Defendants fail to take appropriate response action as required by this paragraph and U.S. EPA or the State takes such action instead, Settling Defendants shall reimburse all costs of the response action not inconsistent with the NCP. Payment of such costs shall be made in the manner provided in Section XV hereof.

79. Nothing in the preceding paragraph or in this Consent Decree shall be deemed to limit the response authority of the United States under 42 U.S.C. §9604.

XXIII. COMMUNITY RELATIONS

80. Settling Defendants shall cooperate with U.S. EPA and the State in providing information regarding the progress of remedial design and remedial action at the Facility to the public. As requested by U.S. EPA or the State, Settling Defendants shall participate in the preparation of all appropriate information disseminated to the public and in public meetings which may be held or sponsored by U.S. EPA or the State to explain activities at or concerning the Facility.

XXIV. RETENTION OF JURISDICTION; MODIFICATION

81. Retention of Jurisdiction. This Court will retain jurisdiction for the purpose of enabling any of the Parties to apply to the Court at any time for such further order, direction, or relief as may be necessary or appropriate for the construction or modification of this Consent Decree, or to effectuate or enforce compliance with its terms, or to resolve disputes in accordance with Section XIII hereof.

82. Modification. No material modification shall be made to this Consent Decree without written notification to and written approval of the Parties and the Court except as provided below or in Section VII. The notification required by this Section shall set forth the nature of and reasons for any requested modification. No oral modification of this Consent Decree shall be effective. Nothing in this paragraph shall be deemed to alter the Court's power to supervise or modify this Consent Decree.

XXV.

EFFECTIVE DATE AND CERTIFICATION OF COMPLETION OF REMEDY

83. This Consent Decree shall be effective upon the date of its entry by the Court except to the extent provided in paragraph 13 (RD/RA Work Plan).

84. Certification of Completion of Remedial Action.

a. Application. When the Settling Defendants believe that Work has been completed and that the demonstration of compliance with Cleanup and Performance Standards has been made in accordance with this Consent Decree, they shall submit to the United States a Notification of Completion of Remedial Action and a Final Report which discusses in detail all of the work done, any modification made to the SOW or Work Plan(s) thereunder relating to the Cleanup and Performance Standards, and including all data generated pursuant to this Decree. The Final Report must conclusively demonstrate that the Cleanup and Performance Standards have been achieved. The Final Report shall be prepared and certified as true and accurate by a registered professional engineer and the Settling Defendants' Project Coordinator, and shall include all supporting documentation.

b. Certification. Upon receipt of the Notice of Completion of Remedial Action, U.S. EPA shall review the final report and supporting documentation, and the remedial actions taken. U.S. EPA shall issue a Certification of Completion of Remedial Action upon a determination that Settling Defendants have completed the Work in accordance with the terms of this

Consent Decree and have demonstrated compliance with Cleanup and Performance Standards, and that no further Work is required.

c. Post-Certification Obligations.

Following Certification, Settling Defendants shall continue to perform the following Work: As required by paragraph 12.B.1.c., Settling Defendants shall perform monitoring, as approved by U.S. EPA in consultation with the State, of the final remedy for five (5) years after the Certificate of Completion is issued. U.S. EPA shall review the monitoring data and determine if further Work is required.

85. Effect of Settlement. The entry of this Consent Decree shall not be construed to be an acknowledgment by the Parties that the release or threatened release concerned constitutes an imminent and substantial endangerment to the public health or welfare or the environment. Except as provided in the Federal Rules of Evidence, the participation by any Party in the process under this section shall not be considered an admission of liability for any purpose, and the fact of such participation shall not be admissible in any judicial or administrative proceeding, including a subsequent proceeding under this section.

ENTERED this 24th day of January, 1991.

Barbara B. Crabb

U.S. District Judge

The Parties whose signatures appear below hereby consent to the terms of this Consent Decree. The consent of the United States is subject to the public notice and comment requirements of Section 122(i) of CERCLA and 28 C.F.R. §50.7.

FOR THE UNITED STATES OF AMERICA:

By: Richard B. Stewart

Richard B. Stewart
Assistant Attorney General
Land & Natural Resources Division
U.S. Department of Justice
Washington, D.C. 20530

Date: 11-2-90

By: Valdas V. Adamkus

Valdas V. Adamkus
Regional Administrator
United States Environmental Protection Agency
Chicago, IL 60604

Date: 9/13/90

FOR THE STATE OF WISCONSIN:

By: Carroll D. Besadny
Carroll D. Besadny, Secretary
Wisconsin Department of Natural Resources

Date: 9-13-90

By: Robert A. Selk 9.13.90
Robert A. Selk
Assistant Attorney General
Wisconsin Department of Justice

The undersigned Settling Defendant hereby consents to the foregoing Consent Decree in U.S. v. City of Wausau, et al.

The City of Wausau

By: John Robinson

Mayor John Robinson
Name of Officer (Print)

Mayor
Title

May 8, 1990
Date

(Corporate acknowledgment/Seal)

If different from above, the following is the name and address of this Settling Defendant's agent for service of process:

Name

Address

Prior Notice to all Parties shall be provided by Settling Defendant of any change in the identity or address of the Settling Defendant or its agent for service of process.

The undersigned Settling Defendant hereby consents to the foregoing Consent Decree in U.S. v. City of Wausau, et al.

Marathon Electric Manufacturing Corporation

By: David Eisenreich

David Eisenreich
Name of Officer (Print)

Vice President, Administration
Title

May 8, 1990
Date

(Corporate acknowledgment/Seal)

If different from above, the following is the name and address of this Settling Defendant's agent for service of process:

Name

Address

Prior Notice to all Parties shall be provided by Settling Defendant of any change in the identity or address of the Settling Defendant or its agent for service of process.

The undersigned Settling Defendant hereby consents to the foregoing Consent Decree in U.S. v. City of Wausau, et al.

Wausau Chemical Corporation

By: James P. Cherwinka

JAMES CHERWINKA
Name of Officer (Print)

PRESIDENT
Title

5-10-90
Date

(Corporate acknowledgment/Seal)

If different from above, the following is the name and address of this Settling Defendant's agent for service of process:

Name

Address

Prior Notice to all Parties shall be provided by Settling Defendant of any change in the identity or address of the Settling Defendant or its agent for service of process.

The undersigned Settling Defendant hereby consents to the foregoing Consent Decree in U.S. v. City of Wausau, et al.

By: James E. Cherwinka

Name of Officer (Print)

Title

5-10-90

Date

(Corporate acknowledgment/Seal)

If different from above, the following is the name and address of this Settling Defendant's agent for service of process:

Name

Address

Prior Notice to all Parties shall be provided by Settling Defendant of any change in the identity or address of the Settling Defendant or its agent for service of process.

LIST OF APPENDICES

RECORD OF DECISION

SELECTED INTERIM REMEDIAL ALTERNATIVE

Site Name and Location

Wausau Groundwater Contamination Site
Wausau, Wisconsin

Statement of Basis and Purpose

This decision document presents the selected interim remedial action for the Wausau Groundwater Contamination Site in Wausau, Wisconsin, developed in accordance with CERCLA, as amended by SARA, and to the extent practicable, the National Contingency Plan. This decision is based on the administrative record for this site. The attached index identifies the items that comprise the administrative record upon which the selection of the remedial action is based.

The State of Wisconsin has concurred with the selected remedy.

Description of the Selected Remedy

The selected remedy is an operable unit that will address the West Well Field contaminant plume in the City of Wausau's well field. The selected remedy is considered cost-effective and is consistent with the eventual final remedy. The specific components of the selected remedy include:

- 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.

Declaration

As required by Section 121(a) of CERCLA as amended by SARA, the selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate to

the remedial action, and is cost effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site. Because treatment of the principal threats of the site was not found to be practicable within the limited scope of this action, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy.

12/23/88
Date

Valdas V. Adamkus
Regional Administrator

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

December 19, 1988

FILE REF: 4430

Mr. Valdus Adamkus
Regional Administrator
US EPA, Region V
230 S. Dearborn St.
Chicago, IL 60604

Subject: Wausau Municipal Well Field - Interim Superfund Remedy

Dear Mr. Adamkus:

Your staff has requested this letter to document our position on the interim remedy for the Wausau municipal well field. The proposed interim remedy, identified as Alternative Number 3, is discussed fully in the Record of Decision and includes:

- Installation of a groundwater extraction well in the southern end of the contaminant plume;

- Implementation of a treatment system for removal of VOC's;

- Discharge of the treated water to the Wisconsin River; and

- Provisions to modify Alternative 3 to include an additional extraction well, if necessary.

The costs of the selected interim remedy are estimated to be:

- Capital Costs - $422,000

- First year operation and maintenance - $105,000

- Subsequent annual operation and maintenance - $81,000

Based on our review of the Phased Feasibility Study and Alternatives Array, our agency concurs with the selected alternative. We also understand that if the responsible parties do not agree to fund the interim remedy, the State of Wisconsin will contribute ten percent of the remedial action costs. The State's cost share for this project would be $42,200. In addition to cost sharing on the remedy, we acknowledge our responsibility for operation and maintenance. Since this is a water treatment/restoration remedy, the period of cost sharing may be up to ten years. The specific length of time will be negotiated in a State Superfund Contract. Again, this is all contingent upon responsible party action.

Thank you for your support and cooperation in addressing this contaminated municipal water supply. If you have any questions regarding this matter, please contact Mr. Mark Giesfeldt, Chief of the Environmental Response & Repair Section at (608) 267-7562.

Sincerely,

C. D. Besadny
Secretary

cc: L. Wible-AD/5
P. Didier/M. Giesfeldt-SW/3
G. Kulibert/M. Owens-NCD
B. Dobbins-NCD
S. Bangert/C. Diebels-SW/3
Honorable John Robinson, Wausau

ADMINISTRATIVE RECORD INDEX
WAUSAU, WISCONSIN
GROUNDWATER CONTAMINATION SITE

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
	1	84/09/24	Record of Communication from Richard O'Hara of the WDNR re: Wausau PA and SI.	Michael Strimbu-USEPA		Communication Record	
	1	84/09/24	Record of Communication to Jim Anklam of the WDNR re: Wausau Preliminary Assessment	Michael Strimbu-USEPA		Communication Record	
	1	84/09/25	Record of Communication from Jim Vennie of the WDNR re: Wausau SI.	Michael Strimbu-USEPA		Communication Record	
	1	84/12/20	Record of Communication of call to Dan Wilson of the WDNR re: Populations served by the municipal water systems.	Michael Strimbu-USEPA		Communication Record	
	1	84/12/27	Record of Communication of call from Dick Boers of Wausau Utilities re: alternate source of drinking water and continuing efforts to locate a new well field.	Michael Strimbu-USEPA		Communication Record	
	2	84/12/27	Record of Communication of call to David Pyles-Weston Sper TAT re: Ground Water Gradients in Wausau.	Michael Strimbu-USEPA		Communication Record	
	1	85/01/07	Record of Communication of call to Jack Saltes of the WDNR re: Wausau water supply - usage and pump rates.	Michael Strimbu-USEPA		Communication Record	
	1	85/01/07	Record of Communication of call to Kurt Stimpson of Weston Sper re: VOC migration and final report on removal activities.	Michael Strimbu-USEPA		Communication Record	
	2	86/03/19	Record of Conversation	Tim Conway-USEPA		Communication Record	

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CHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
			with Mark Thimke-contact person for the PRP's. PRP's decline to participate in the RI/FS and that the PRP's plan to initiate their own investigation. USEPA will initiate the program-funded RI/FS.				
	2	86/06/18	Memo of call from Tom Stolzenberg of RMT, Inc., contractors for Marathon Electric, on use of USEPA well for water measurements and sampling and the USEPA recommendation on that request.	Margaret Guerriero-USEPA		Communication Record	
	1	88/06/13	Record of verbal comments by Frank Rovers on the PFS.	USEPA		Communication Record	
	3	85/10/24	Notification of a proposed Superfund project to be funded by the USEPA.	Basil Constantelos-USEPA	D.Hanson-Wis.Dept.ofAdmin	Correspondence	
	3	86/01/06	Response to Information Request.	Russell Susag-3M	Janet Haff-USEPA	Correspondence	
	7	86/01/10	Request that the recipient of this letter, before the government undertakes necessary action at this site,would voluntarily perform the work required to abate any release or threatened releases of hazardous subatances, etc. into the groundwater.	Basil Constantelos-USEPA	See service list	Correspondence	
	2	86/03/24	Additional Request for Information. Sent to counsel to Wausau Chemical.	Tim Conway-USEPA	R.Krueger-Charne,Glassner	Correspondence	
	2	86/04/07	Confirmation of recent conversations in which was discussed the status of further negotiations with the PRP's.	Mark Thimke-Foley & Lardner	Tim Conway-USEPA	Correspondence	

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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
	3	86/05/01	Confirmation of results of recent negotiations and discussion of recent correspondence regarding the RI/FS.	Tim Conway-USEPA	Mark Thimke-Foley&Lardner	Correspondence	
	1	87/01/17	Transmittal of the plans for the proposed extraction well and a request for a meeting re: the same well.	Mark Thimke-Foley & Lardner	Tim Conway-USEPA	Correspondence	
	4	87/01/24	Installation of an additional monitoring well for the Wausau Water Supply Investigation and summary of contract lab sample numbers.	Craig Rawlinson-Warzyn Eng.	Margaret Guerriero-USEPA	Correspondence	
	2	87/08/26	The WDNR is concerned that the proposal by Marathon Electric to begin a groundwater extraction system to remove contaminated groundwater north of the plant wil cause problems. These problems include changing the configuration of the contaminant plume and interferring with the USEPA's study of the area.	Gary Kulibert-WDNR	Mark Thimke-Foley&Lardner	Correspondence	
	17	87/10/27	Package of correspondence recieved from the city of Wausau and a request that the USEPA bring the senator up to date on the project.	Sen Robert Kasten Jr.	Valdas Adamkus-USEPA	Correspondence	
	4	87/12/03	Transmittal of analytical results from initial sampling activities. Letters sent to Lonsdorf of Lonsdorf & Andrask; Dan LaCerta; R.Krueger of Charne, Glassner; and M.Thimke of Foley & Lardner.	Margeret Guerriero-USEPA	See title	Correspondence	

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IE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
	2	87/12/08	Explanation of concerns as to the implications of prohibiting PRP's from implementing clean-up activity.	Bruce Cutright-Geraghty & Miller	Fleischer-SenProxmire Off	Correspondence	
	3	87/12/29	Explanation of USEPA action in light of concerns expressed by the City of Wausau.	Valdas Adamkus-USEPA	Sen. Robert Kasten Jr.	Correspondence	
	1	88/01/22	Correction to letter sent 12/29/87.	Basil Constantelos-USEPA	Sen. Robert Kasten Jr.	Correspondence	
	1	88/01/25	Response to request for meeting by counsel for Marathon Electric.	Tim Conway-USEPA	Mark Thimke-Foley-Lardner	Correspondence	
	1	88/02/03	Transmittal of missing four pages of the analytical results package.	Margaret Guerriero-USEPA	R.Krueger-Charne,Glassner	Correspondence	
	3	88/02/04	Explanation of why the USEPA will not allow installation of a groundwater extraction well to be installed on Marathon Electric's property.	Valdas Adamkus-USEPA	Sen. William Proxmire	Correspondence	
	4	88/02/05	Transmittal of analytical results of ground water sample data collected during monitoring well installation. Results sent to Dan LaCerta; R.Krueger of Charne, Glassner; Mark Thimke of Foley & Lardner and J.Lonsdorf of Lonsdorf & Andrask.	Margaret Guerriero-USEPA	See title	Correspondence	
	4	88/02/17	Transmittal of data generated as part of the Phase I RI. Data sent to Krueger, LaCerta, Lonsdorf & Thimke, seperately.	Margaret Guerriero-USEPA	See title	Correspondence	
	3	88/03/01	Supplemental Request for Information Pursuant to Section 104(e) of CERCLA and Section 3007 of RCRA.	Mary Gade-USEPA	Lonsdorf-Lonsdorf&Andrans	Correspondence	

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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
			Sent to counsel for the City of Wausau.				
	3	88/03/01	Supplemental Request for Information Pursuant to Section 104(e) of CERCLA and Section 3007 of RCRA. Sent to counsel for Marathon Electric.	Mary Gade-USEPA	Mark Thimke-Foley&Lardner	Correspondence	
	4	88/03/08	Affidavit of James P. Lonsdorf in response to the Supplemental Request for Information.	James P. Lonsdorf	Janet Haff-USEPA	Correspondence	
	52	88/03/22	Supplemental Response to Information Request.	David L. Eisenreich-Marathon Elec.	Janet Haff-USEPA	Correspondence	
	2	88/03/30	Notice of intent to delay the issuance of a WPDES permit to discharge contaminated groundwater to the Wisconsin River from a proposed extraction well.	Percy Mather-WDNR	Mark Thimke-Foley&Lardner	Correspondence	
	7	88/04/26	Letter on behalf of the Wausau Energy Corp. discussing the review of the Final Work Plan for the RI/FS.	Doran,Possin-Foth & Van Dyke,Assoc.	Margaret Guerriero-USEPA	Correspondence	
	4	88/04/27	Transmittal of Technical Memorandum for Phase I of the RI. Sent to Thimke, Lonsdorf, LaCerta and Krueger, seperately.	Margaret Guerriero-USEPA	See title	Correspondence	
	25	88/05/02	First set of revisions to the comprehensive ARAR's document provided on 3/6/87.	Mark Giesfeldt-WDNR	"Bill" Constantelos-USEPA	Correspondence	
	4	88/05/06	Transmittals of analytical results of soil samples collected during monitoring well installation. Results sent to Thimke, LaCerta, Lonsdorf and Krueger, seperately.	Margaret Guerriero-USEPA	See title	Correspondence	

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CHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
	2	88/05/11	Work scope, schedule and preliminary report outline for the PFS.	Dennis Iverson-Warzyn	Tim Conway-USEPA	Correspondence	
	2	88/06/06	Notice that the PFS is to performed along with a listing of subtasks.	Kevin Adler-USEPA	Dennis Iverson-Warzyn	Correspondence	
	1	88/06/06	Transmittal of the analytical results for the second round of the ground water sampling.	Kevin Adler-USEPA	Mark Thimke-Foley&Lardner	Correspondence	
	16	88/06/24	Approval of the addendum QAPP for Phase II of the RI/FS.	Andrea Jirka-USEPA	Beverly Kush-USEPA	Correspondence	
	1	88/06/30	Invitation for any further questions or comments on the Phase II RI/FS.	Kevin Adler-USEPA	Michelle Owens-WDNR	Correspondence	
	4	88/06/30	Transmittal of the Phase II Work Plan. Sent to Dave Stewart of DeWitt & Porter; Thimke of Foley & Lardner; Krueger of Charne, Glassner and Lonsdorf of Lonsdorf & Andrask.	Kevin Adler-USEPA	See title	Correspondence	
	2	88/08/03	Response to request for ARAR's.	Michelle DeBrock-Owens--WDNR	Kevin Adler-USEPA	Correspondence	
	7	88/08/12	Comments on the ARAR's - quality based effluent limitations.	Michelle DeBrock-Owens--WDNR	Kevin Adler-USEPA	Correspondence	
	3	88/08/31	Correction to Alternatives Array Document.	Brian Christian-Warzyn Eng.	Kevin Adler-USEPA	Correspondence	
	1	88/09/06	Formal notification of an additional state ARAR for the PFS.	Mark Giesfeldt-WDNR	Margaret Guerriero-USEPA	Correspondence	
	1	88/09/13	Perferred alternative of the State of Wisconsin is a combination of alternatives three and four.	Michelle Owens-WDNR	Margaret Guerriero-USEPA	Correspondence	

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CHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
	1	88/09/23	Comment on PFS: Report is complete and accurate.	Michelle Owens-WDNR	Margaret Guerriero-USEPA	Correspondence	
	4	88/10/12	Special Notice of Potential Liability.	Mary Gade-USEPA	See service list	Correspondence	
	40	88/10/24	Group of documents representing comments by the counsel for Marathon Electric.	Mark Thimke-Foley & Lardner	Georgette Nelms-USEPA	Correspondence	
	7	88/10/24	Comments on the Public Comment Draft Phased Feasibility Study made by the counsel for Wausau Chemical Corp.	R.Krueger-Charne,Glassner ,et al.	M.Guerriero&G.Nelms-USEPA	Correspondence	
	4	87/09/00	"Superfund Activities Start In Wausau."	USEPA		Fact Sheet	
	4	88/10/17	"Wausau Well Field Phased Feasability Study Underway: Public Meeting October 17, 1988, 7:00 p.m., City Hall, Lower Level (Rear Cafeteria), 407 Grand Street, Wausau, Wisconsin."	USEPA		Fact Sheet	
	1	82/06/21	Well Log for Wausau Monitoring Well No. Five.	Soil Exploration Co.		Log	
	7	87/09/05	Typed notes on meeting regarding City of Wausau Groundwater Contamination Site - August 5, 1987.			Meeting Notes	
	11	83/03/28	VOC Contamination of Wausau's Water Supply.	Kreul & Baltus-WDNR		Memorandum	
	3	83/05/09	Toxicity Rating for Asbestos and Trichlorcethlyene.	Stephen Caldwell-USEPA	All USEPA Regions	Memorandum	
	16	87/06/10	ACTION MEMORANDUM: Authorization to Proceed with the Remedial Investigation and Feasibility Study at	Basil Constantelos-USEPA	Valdas Adamkus-USEPA	Memorandum	

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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
			the Wausau Water Supply Site in Wausau,Wisconsin.				
4		87/05/24	ACTION MEMORANDUM: Authorization for Obligating Funds for Multi-Sites for Community Relations.	Basil Constantelos-USEPA	Valdas Adamkus-USEPA	Memorandum	
4		87/09/29	Approval of QAPP for the RI/FS.	James Adams-USEPA	Dikinis & Guerriero-USEPA	Memorandum	
2		87/11/24	ACTION MEMORANDUM: Authorization to Obligate Additional Funds for the Remedial Investigation/ Feasibility Study at the Wausau Water Supply Site, Wausau, Wisconsin.	Basil Constantelos-USEPA	Valdas Adamkus-USEPA	Memorandum	
2		88/09/06	ACTION MEMORANDUM: Authorization for Supplemental Funding for the Phased Feasibility Study at the Wausau Water Supply Site, Wausau, Wisconsin.	Basil Constantelos-USEPA	Valdas Adamkus-USEPA	Memorandum	
1		88/12/16	Air regulations concerning the proposed Stripping Tower in the Wausau NPL site Phased Feasibility Study.	Neal Baudhuin-WDNR	M.DeBrock-Owens-WDNR	Memorandum	
2		85/01/25	"State Will Seek Superfund Aid For Wausau's Wells."	WDNR		News Release	
1		87/09/09	"EPA To Hold Public Meeting On Wausau Ground-Water Contamination"	USEPA		News Release	
2		88/09/27	"EPA, WDNR Reschedule Public Meeting And Comment Period On Wausau Superfund Site"	USEPA		News Release	
6		88/05/11	Administrative Record Index: Wausau Ground Water Contamination Emergency	Terry Quirk-DPRA	USEPA	Other	

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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
			Removal.				
	1	88/06/29	Administrative Record Index: Wausau Ground Water Emergency Removal - Update.	Terry Quirk-DPRA	USEPA	Other	
	2	88/08/16	Meeting agenda - Wausau Well Field NPL Site Phased Feasability Study along with sign-in list.			Other	
	3	00/00/00	Narrative: Site History and Description.	Jim Anklam-WDNR		Reports/Studies	
	12	00/00/00	Proposed Plan For Remedial Action	USEPA		Reports/Studies	
	19	00/00/00	Documentation Records for Hazard Ranking System.	USEPA		Reports/Studies	
	13	00/00/00	Compilation of Monitoring Well Analytical Results.	Weston*Sper		Reports/Studies	
	21	84/05/03	Site Assessment and Recommended Immediate Actions For Wausau Municipal Water Supply.	Pyles & Stimpson-Weston*Sper	Richard Bowden-USEPA	Reports/Studies	
	4	84/08/17	Potential Hazardous Waste Site Preliminary Assessment.	Jim Anklam-WDNR	USEPA	Reports/Studies	
	7	84/12/27	Hazard Ranking System Scoring Package.	Michael Strimbu-USEPA	USEPA	Reports/Studies	
	227	85/09/00	Hydrogeological Investigation Of Volatile Organic Contamination In Wausau, Wisconsin, Municipal Wells.	Weston-Sper TAT	USEPA	Reports/Studies	
	19	87/07/00	Plan Of Remedial Work Marathon Electric Manufacturing Company Wausau, Wisconsin.	Conestoga-Rovers & Assoc.	Marathon Electric	Reports/Studies	
	33	87/09/04	Final Health And Safety Plan.	Warzyn Engineering	USEPA	Reports/Studies	

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ICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
	71	87/09/04	Final Work Plan: Remedial Investigation/Feasibility Study	Warzyn Engineering	USEPA	Reports/Studies	
	263	87/09/23	Final Quality Assurance Project Plan (QAPP).	Warzyn Engineering	USEPA	Reports/Studies	
	25	87/11/16	Community Relations Plan	CH2M Hill	USEPA	Reports/Studies	
	29	88/03/04	Scope of Work for Installation of an Interceptor/Extraction Well and Construction of a Water Main Across the Wisconsin River.	Geraghty&Miller and Conestoga-Rover	Marathon Electric	Reports/Studies	
	413	88/04/00	Technical Memorandum- Phase I Remedial Investigation.	Warzyn Engineering	USEPA	Reports/Studies	
	60	88/06/16	Final Phase II Work Plan.	Warzyn Engineering	USEPA	Reports/Studies	
	161	88/06/29	Final Quality Assurance Project Plan Addendum (QAPP).	Warzyn Engineerring	USEPA	Reports/Studies	
	74	88/07/00	Request For Applicable or Relevant and Appropiate Requirements (ARARs).	Warzyn Engineering	USEPA	Reports/Studies	
	177	88/09/30	Public Comment Draft Phased Feasibility Study	Warzyn Engineering	USEPA	Reports/Studies	
	75	88/12/23	Record of Decision (ROD) Selected Interim Remedial Alternative.	Valdas Adamkus-USEPA		Reports/Studies	
	48	88/10/17	Transcript of Wausau Wellfield Superfund Site Public Meeting, Wausau City Hall, 10/17/88.	Nina Bostwick-Court Reporter		Transcript	

ADMINISTRATIVE RECORD SAMPLING/DATA INDEX
WAUSAU, WISCONSIN GROUNDWATER CONTAMINATION SITE
DOCUMENTS MAY BE REVIEWED AT THE USEPA
REGION V OFFICES, CHICAGO, IL.

DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE
87/00/00	Summary of Samples Collected During Existing Well Sampling Wausau NPL RI/FS September29-October 7, 1987.			Sampling/Data
87/00/00	Summary of Soil Samples Collected During Drilling Activities Wausau NPL RI/FS October 14 to November 14, 1987.			Sampling/Data
87/12/10	Summary of data samples collected during new and existing well sampling Wausau NPL RI/FS-12/2-10/87.			Sampling/Data
87/12/21	Results of split samples from monitoring well sampling.	Pencak & Cutright-Geraghty & Miller	Margaret Guerriero-USEPA	Sampling/Data
88/01/13	Review and data package: SMO case no. 8270; SMO traffic no. EN 331, 333, 334.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/01/23	Review and data package: SMO case no. SAS 3477E; SMO traffic no. E 01-22.	Curtis Ross-USEPA	Warzyn Eng.	Sampling/Data
88/01/25	Review and data package: SMO case no. 8485; SMO traffic no. EN 367-376, 387-391.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/02/01	Summary tables for sample descriptions for December, 1987 round of sampling.	Dennis Iverson-Warzyn Engineering	Margaret Guerriero-USEPA	Sampling/Data
88/02/04	Phase I Data: * Monitoring well construction details and water level measurements. * Water sampling results for samples collected during drilling activities. * Soil gas sampling results for	Dennis Iverson - Warzyn Engineering	Margaret Guerriero-USEPA	Sampling/Data

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DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE
	samples collected during the soil gas investigation.			
88/02/05	Reveiw and data package: SMO case no. 8628, SMO traffic no. MEQ 251-259.	Curtis Ross-USEPA	Warzyn Eng.	Sampling/Data
88/02/05	Review and data package: SMO case no. 8709 , SMO traffic no.MEQ 260-274.	Ida Levin-USEPA	Warzyn Eng.	Sampling/Data
88/02/08	Review and data package: SMO case no. 8333; SMO traffic no. EN 342, 348-351.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/03/10	Review and data package: SMO case no. SAS3498E; EQ1-123, 137-147, 150-160.	Ida Levin-USEPA	Warzyn Eng.	Sampling/Data
88/03/11	Analytical results for VOC analysis.	Pencak & Cutright-Geraghty & Miller	Lonsdorf-Lonsdorf&Andrask	Sampling/Data
88/03/14	Review and data package: SMO case no. 8637SAS3498E; ER472, 474, 476, 484, 485, 489, 496, 499, 201-323, 329-333, 336, 338, 341-344, 346, 347.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/03/16	Review and data package: SMO case no. SAS 3477E; SMO traffic no. E 01-27, 29, 30.	Curtis Ross-USEPA	Warzyn Eng.	Sampling/Data
88/03/23	Review and data package: SMO case no. 8709, SMO traffic no. ER 328, 470, 471, 473, 475, 477-483, 486-488, 490-494, 497, 498, 500.	Kevin Bolger-USEPA	Warzyn Eng.	Sampling/Data
88/03/24	Review and data set: SMO case no. 8628; SMO traffic no.ER334, 335, 337,339,340,345,348-350.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/06/23	Review and data package:	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data

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DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE
	SMO case no. 9952SAS3919E; SMO Traffic No. ECD76-83.			
88/06/23	Review and data package: SMO case no. 9694, SMO Traffic No. EP879-883.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/07/07	Review and data package: SMO case no. 9694; SMO traffic no. ER 457-465, 467-469, ER 324-327, 511-515, 517-518, 520, 594-597, 599.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/07/11	Review and data package: SMO case no. 9694, SMO traffic no. MEP 700-708, 710-720.	Curtis Ross-USEPA	Warzyn Eng.	Sampling/Data
88/07/14	Data and data package: SMO case no. 9694, SMO traffic no. MEP 721-728.	Curtis Ross-USEPA	Warzyn Eng.	Sampling/Data
88/07/19	Review and data package: SMO case no. 9694, SMO traffic no. EQ 749, EP 884-890.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/07/19	Review and data package: SMO case no. 9659, SMO traffic no. ER 413-431, 398.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/08/01	Review and data package: SMO case no. 9659SAS38878, SMO traffic no. ER351-391, 436, 439,EQ810-813, 815-816, EP899.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/08/04	Review and data package: SMO case no. 9918SAS3919E, SMO traffic no. ECD11-16.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/08/09	Review and data package: SMO case no. 9918; SMO traffic no. MEQ 282-287, 289.	Curtis Ross - USEPA	Warzyn Eng.	Sampling/Data

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DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE
88/08/09	Review and data package: SMO case no. 9918SAS3919E; SMO traffic no. ECD61-64, 72.	Kevin Bolger-USEPA	Warzyn Eng.	Sampling/Data
88/08/16	Review and data package: SMO Case No. 9918; SMO Traffic No. MEN986-999, MEP911-915, MEQ281.	Curtis Ross-USEPA	Warzyn Eng.	Sampling/Data
88/08/18	Review and data package: SMO case no. 9918SAS3919E; SMO tarffic no. ECD19,20, 31,41-43.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/08/22	Review and data package: SMO Case No. 9918; SMO Traffic No. ECD01-03,05,09,10, 17,18,21-27,36-40.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/09/31	Review and data package: SMO case no. 9952; SMO traffic no. MES 2351-358.	Curtis Ross - USEPA	Warzyn Eng.	Sampling/Data
88/09/13	Chain-of-Custody Records and validated analytical data for samples collected and groundwater monitoring wells.	Dennis Iverson-Warzyn Engineering	Margaret Guerriero-USEPA	Sampling/Data
88/09/14	Review and data package: SMO Case No. 9952; SMO Traffic No. ECD56-57, 66-70, 73.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/10/06	Review and data package: SMO Case No. 10299; SMO Traffic No. EP891-897.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/10/19	Review and data package: SMO case no. 9918; SMO traffic no. ECD 46,47,51-54, 71.	Patrick Churillo-USEPA	Warzyn Eng.	Sampling/Data
88/12/30	Review and data package: SMO case no. SAS 3477E; SMO Traffic No. E01-E22.	Curtis Ross-USEPA	Warzyn Eng.	Sampling/Data

WAUSAU, WISCONSIN GROUND WATER CONTAMINATION SITE
GUIDANCE DOCUMENTS FOR THE ADMINISTRATIVE RECORD.
DOCS. NOT COPIED - MAY BE REVIEWED AT THE
USEPA REGION V OFFICES, CHICAGO, ILLINOIS.

TITLE	AUTHOR	DATE
OSWER Dir. 9834.3 Procedures for Identifying Responsible Parties: Uncontrolled Hazardous Waste Superfund	USEPA	82/02/01
OSWER Dir. 9355.0-03 Uncontrolled Hazardous Waste Site Ranking System - A Users Manual	USEPA	82/07/16
OSWER Dir. 9230.0-02 Superfund Community Relations Policy	USEPA	83/05/09
OWSER Dir. 9832.1 Cost Recovery Actions Under CERCLA	USEPA	83/08/26
OSWER Dir. 9230.0-03 Community Relations in Superfund: A Handbook, Interim Version.	USEPA	83/09/01
OSWER Dir. 9230.0-05 Community Relations Requirements for Operable Units.	USEPA	83/10/02
OSWER Dir. 9230.0-04 Community Relations Guidance for Evaluating Citizens Concerns at Superfund Sites.	USEPA	83/10/17
OSWER Dir. 9280.0-01 Flood Plain Requirements	USEPA	83/11/14
OSWER Dir. 9835.1 Participation of Potentially Responsible Parties In Development of Remedial Investigation and Feasibility Studies.	USEPA	84/03/20
OSWER Dir. 9340.1-01 Participation of Potentially Responsible Parties in Development of RI's and	USEPA	84/03/20

WAUSAU, WISCONSIN GROUND WATER CONTAMINATION SITE
GUIDANCE DOCUMENTS FOR THE ADMINISTRATIVE RECORD.
DOCS. NOT COPIED - MAY BE REVIEWED AT THE
USEPA REGION V OFFICES, CHICAGO, ILLINOIS.

TITLE	AUTHOR	DATE
FS's.		
OSWER Dir. 9834.4 Policy for Enforcing Information Requests in Hazardous Waste Cases.	USEPA	84/09/10
OSWER Dir. 9240.0-01 User's Guide to the Contract Laboratory Program.	USEPA	84/10/01
OSWER Dir. 9834.1 Guidance on Issuance of Notice Letters	USEPA	84/10/12
OSWER Dir. 9285.1-01-B Standard Operating Safety Guide Manual	USEPA	84/11/19
OSWER Dir. 9835.0 Interim CERCLA Settlement Policy	USEPA	84/12/05
OSWER Dir. 9285.2-03 FSOP #3 - Air Surveillance	USEPA	85/01/01
OSWER Dir. 9285.2-02 FSOP #7 - Decontamination of Response Personnel	USEPA	85/01/01
OSWER Dir. 9285.2-01 FSOP #4 - Site Entry	USEPA	85/01/01
OSWER Dir. 9340.2-01 Preparation of Decision Documents For Approving Fund-Financed and PRP RA's Under CERCLA.	USEPA	85/02/27
OSWER Dir. 9285.2-05 FSOP #9 - Site Safety Plan.	USEPA	85/04/01
OSWER Dir. 9285.2-04 FSOP #6 - Work Zones.	USEPA	85/04/01
OSWER Dir. 9295.1-01 MOU Between the ATSDR and EPA.	USEPA	85/04/02

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TITLE	AUTHOR	DATE
OSWER Dir. 9835.2 Guidance on Drafting Consent Decrees in Hazardous Waste Cases	USEPA	85/05/01
OSWER Dir. 9355.0-05C Guidance on Feasibility Studies Under CERCLA	USEPA	85/06/01
OSWER Dir. 9355.0-06B Guidance on Remedial Investigations Under CERCLA	USEPA	85/06/01
OSWER Dir. 9280.0-02 Policy on Flood Plains and Wetlands Assessments.	USEPA	85/08/06
OSWER Dir. 9234.0-02 CERCLA Compliance With Other Environmental Statutes.	USEPA	85/10/02
OSWER Dir. 9932.3 Timing of CERCLA Cost Recovery Actions.	USEPA	85/10/07
OSWER Dir. 9834.2 Timely Initiation of Responsible Party Searches, Issuance of Notice Letters, and Releases of Information.	USEPA	85/10/09
OSWER Dir. 9355.1-01 Draft - Federal Lead Remedial Project Management Manual	USEPA	85/01/01
OSWER Dir. 9375.1-04 State Participation In The Superfund Program Manual, Vol. I	USEPA	86/03/01
OSWER Dir. 9375.1-04-09 State Participation in the Superfund Program, Vol. I: Chapter 9, Audits of Response Agreements.	USEPA	86/03/20
OSWER Dir. 9240.0-02	USEPA	86/03/20

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TITLE	AUTHOR	DATE
Analytical Support For Superfund		
OSWER Dir. 9355.0-04A Superfund Remedial Design and Remedial Action Guidance	USEPA	86/06/01
OSWER Dir. 9285.4-01 Superfund Public Health Evaluation Manual.	USEPA	86/11/07
Standard RI/FS Tasks Under REM Contracts	OWSER Dir. 9242.3-7	86/11/13
Federal Lead Remedial Project Management Manual.	OWSER Dir. 9355.1-01	85/12/00
Guidance Document for Providing Alternative Water Supplies	OWSER Dir. 9355.3-01	85/12/00
OSWER Dir. 9355.0-19 Interim Guidance on Superfund Selection of Remedy.	USEPA	85/12/24
Interim Guidance on State Participation in Pre-Remedial and Remedial Response.	OWSER Dir. 9375.1-09	87/02/00
OWSER Dir. 9835.4 Interim Guidance: Streamline The Settlement Decision Process	USEPA	87/02/12
OWSER Dir. 9285.4-02 Coordinating ATSDR Health Assessment Activities with Superfund Remedial Process	USEPA	87/03/11
Oswer Dir. 9355.0-7B Objectives for Remedial Response Activities	USEPA	87/04/01
Final Guidance for the Cooperation of ATSDR Health Assessment Activities with the Superfund Remedial Process.	OWSER Dir. 9285.4-02	87/04/22

WAUSAU, WISCONSIN GROUND WATER CONTAMINATION SITE
GUIDANCE DOCUMENTS FOR THE ADMINISTRATIVE RECORD.
DOCS. NOT COPIED - MAY BE REVIEWED AT THE
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TITLE	AUTHOR	DATE
Superfund Selection of Remedy: Background Documentation on Remaining Issues.		87/05/12
Superfund Public Health Evaluation Manual.	OWSER Dir. 9285.4-01	87/07/00
Interim Guidance on Compliance with Applicable or Relevant and Appropiate Requirements. 52 FR 32496 (8/27/87).	OWSER Dir. 9234.0-05	87/07/09
OSWER Dir. 9235.0-05 Interim Guidance on Compliance with Applicable or Relevant and Appropiate Requirements.	USEPA	87/07/09
OSWER Dir. 9355.0-21 Additional Interim Guidance for FY'87 Records of Decision.	USEPA	87/07/24
Interim Guidance on PRPs participation in RI/FS.	OWSER Dir. 9835.1a	87/10/02
Interim Final Guidance on Removal Action Levels at Contaminated Drinking Water Sites.	OWSER Dir. 9360.1-10	87/10/06
Interim Guidance on Administrative Records for Decisions on Selection of CERCLA Response Actions.	OWSER Dir. 9833.4	87/11/09
Revised Procedures for Planning and Implementing Off Site Response Actions.	OWSER Dir. 9834.11	87/11/13
FY '88 Region V ROD Process Guidance. Memo from Chief of the Emergency & Remedial Response Branch- Waste Mgmt. Div.	Mary Gade-USEPA	88/01/20
Draft Guidance on Preparing Superfund Decision Documents:	OWSER Dir. 9355.3-02	88/03/00

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GUIDANCE DOCUMENTS FOR THE ADMINISTRATIVE RECORD.
DOCS. NOT COPIED - MAY BE REVIEWED AT THE
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TITLE	AUTHOR	DATE
The Proposed Plan and ROD.		
Draft Guidance on PRP Participation in the RI/FS.	OWSER Dir. 9835.1A	88/04/00
Record of Decision Questions & Answers - Draft.		88/04/01

SUMMARY OF INTERIM REMEDIAL ALTERNATIVE SELECTION

WAUSAU GROUNDWATER CONTAMINATION SITE
WAUSAU, WISCONSIN

I. SITE LOCATION AND DESCRIPTION

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 five of its production wells. (See Figures 1 and 2).

The City of Wausau provides drinking water for approximately 33,000 people. The City presently operates six groundwater production wells, five of which are located on the north side of the City. A sixth well, Production Well CW8 (CW8), is located adjacent to the Wausau Municipal Airport, on the south side of the City. The water from CW8 has a high concentration of iron and is used only during peak demand periods. Production wells CW6, CW7, and CW9 are located west of the Wisconsin River and are collectively referred to as the West Well Field. The West Well Field (Figure 2) is located in a predominantly residential area, although a few industrial facilities are located in this area. Production wells CW3 and CW4 are located on the east side of the Wisconsin River and are referred to as the East Well Field. The East Well Field is located in a predominantly industrial section of the City.

The six production wells are screened in an aquifer of glacial outwash and alluvial sand and gravel deposits which underlie and are adjacent to the Wisconsin River. This unconfined aquifer supplies nearly all potable, irrigation, and industrial water to residents and industries located in Wausau and the surrounding areas. Within the study area the alluvial aquifer ranges from 0 to 160 feet thick, and has an irregular base and lateral boundaries.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Site History

The City discovered in early 1982 that its production wells CW3, CW4, and CW6 were contaminated by volatile organic compounds (VOCs). Toluene, ethylbenzene, and xylene were also detected at CW4. Trichloroethene (TCE) is the predominant volatile organic compound detected at CW6, although below method detection limit (EMDL) concentrations for tetrachloroethene (PCE) and 1,2-dichloroethene have also been previously reported (Weston, 1984). Since the contamination was first detected in early 1982, TCE concentrations from CW6 have ranged from 70 micrograms per liter (ug/L) to 260 ug/L. The most recent sampling (March 1988)

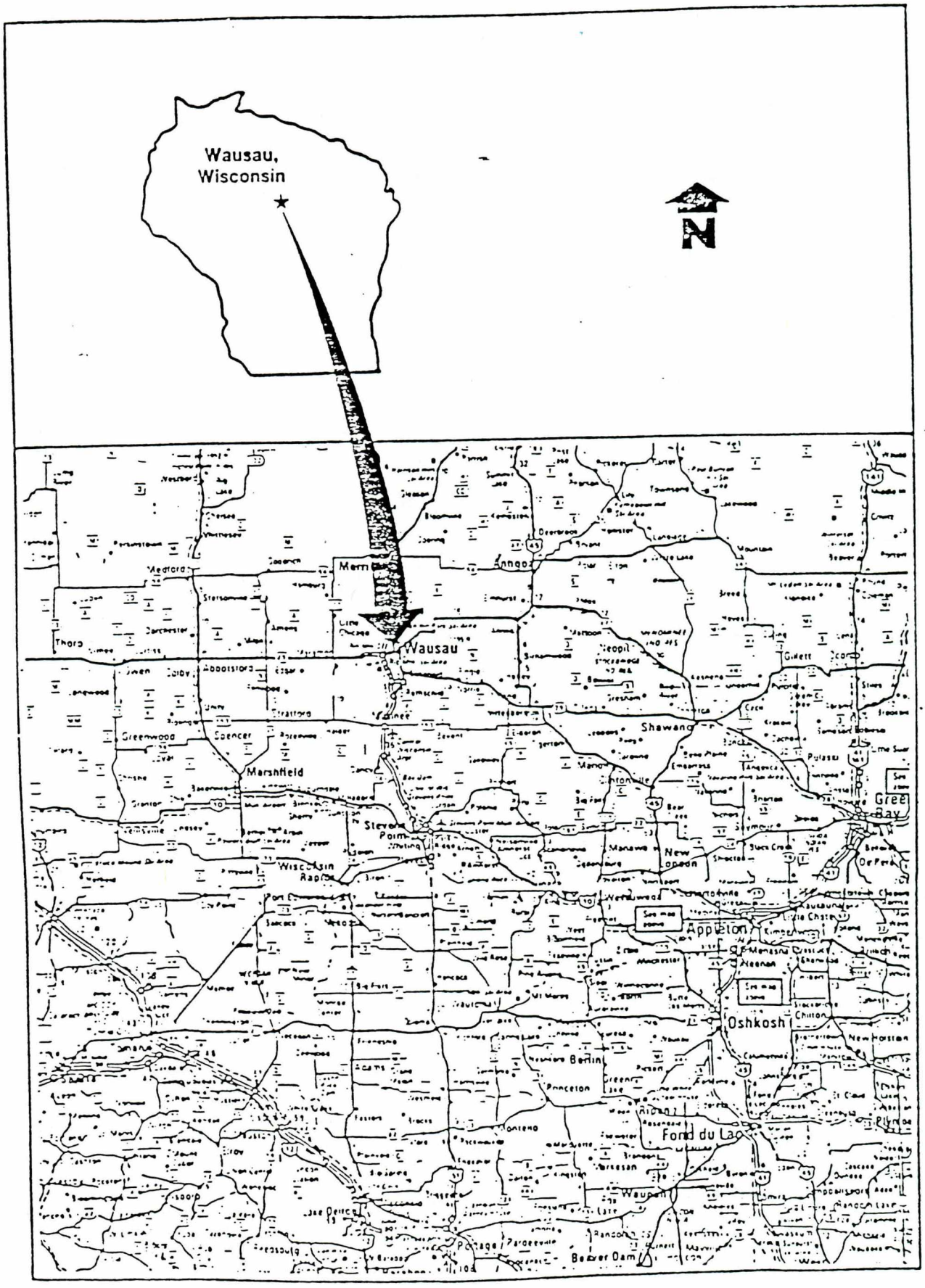
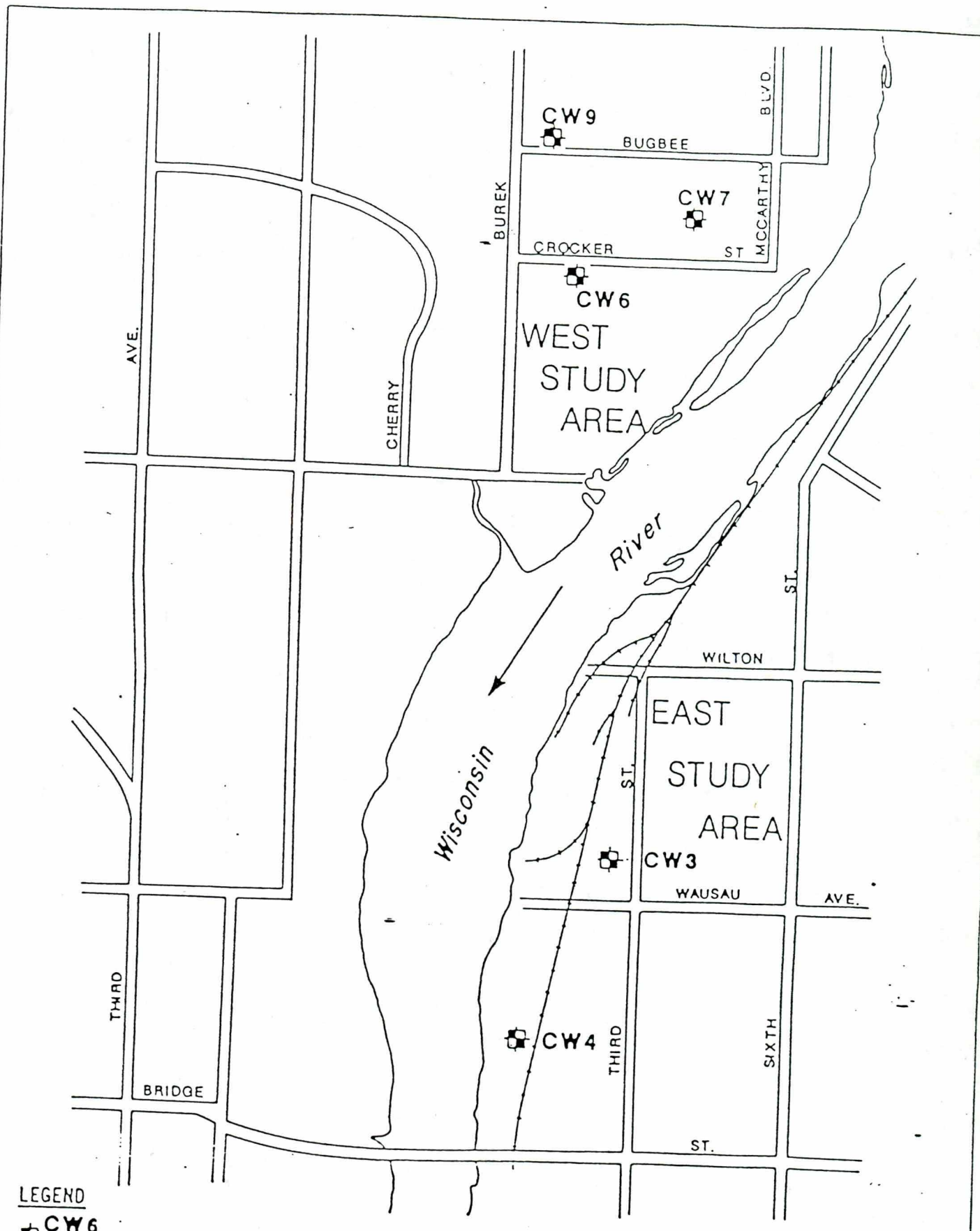


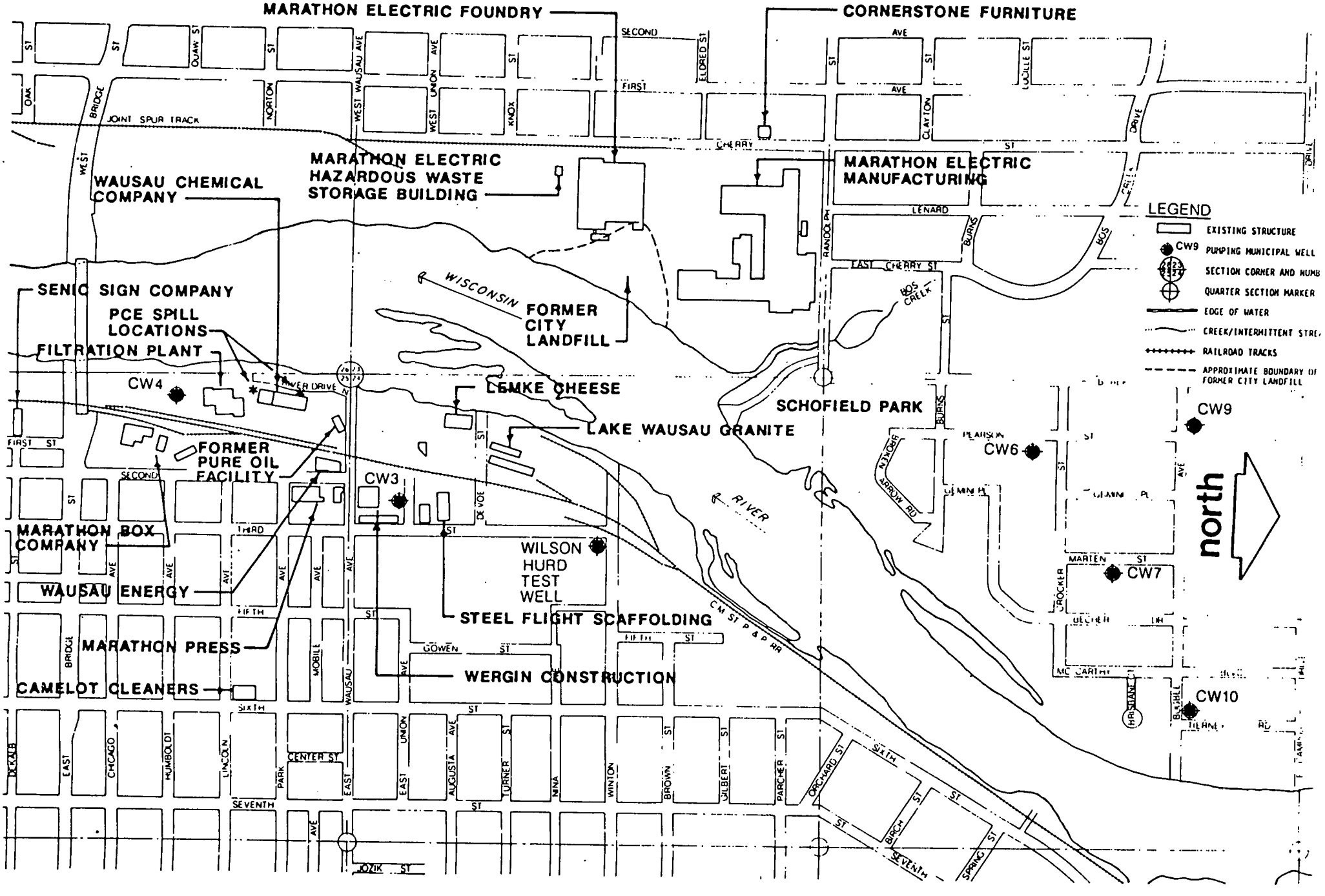
FIGURE 1 REGIONAL LOCATION MAP



NOTE:

BASE MAP DEVELOPED FROM U.S.G.S. 15 MIN. QUADRANGLE MAPS WAUSAU EAST & WAUSAU WEST DATED 1963, PHOTOREVISED 1978.

FIGURE 2



LOCATION OF MUNICIPAL WELLS & INDUSTRIAL SURVEY BUSINESSES

FIGURE

indicates TCE concentrations of approximately 160 ug/L. Sample results from the East Well Field (CW3 and CW4) have indicated considerable PCE, TCE, and DCE impact at both wells. CW4 has generally indicated steadily decreasing concentrations of the three constituents since February 1984. CW3 has indicated decreasing PCE and DCE concentration since the VOCs were discovered in early 1982. However, TCE concentrations at CW3 have remained relatively constant at concentrations ranging between 80 ug/L and 210 ug/L.

To reduce VOC concentrations, the City originally instituted a program where uncontaminated water from CW9 and CW7 was blended with water from CW3, CW4, and CW6 to dilute the VOC concentrations. However, increasing VOC concentrations in groundwater caused this method to be ineffective, and resulted in then current regulatory limits being exceeded.

In 1983, the United States Environmental Protection Agency (U.S. EPA) awarded the City of Wausau a federal grant to help fund the design and installation of a packed tower VOC stripper in order to provide sufficient water of acceptable quality to City residents. However, because VOC levels in the distribution system continued to increase, U.S. EPA's emergency response team was asked for assistance. As an interim measure in June 1984, the U.S. EPA installed a granular activated carbon (GAC) treatment system on CW6. VOC stripping towers were installed in the Summer and Fall of 1984 at the City water treatment plant to treat water from CW3 and CW4. Subsequently, 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.

The City has been blending water treated for VOC removal with water from uncontaminated supply sources (CW7 and CW9) to reduce VOC concentrations in the water supply distribution system. Data indicate that prior to installation of treatment units (pre-July 1984), drinking water samples taken from various taps in the City of Wausau consistently contained TCE with concentrations ranging from detectable levels (>1 ug/L) to 80 ug/L. Lower levels of PCE and DCE were identified shortly after discovery of the contamination, probably before blending had reduced the levels of VOCs. Following installation of the packed tower VOC strippers, the water supply distribution system has had relatively low levels of VOC's (generally below detection limits of 0.5 to 1.0 ug/L). These levels are dependent on continued effective operation of the treatment system for CW3 and CW4, the influent VOC concentration for each well, and continued use of the two uncontaminated wells (CW7 and CW9).

B. Previous Studies

Previous investigations have identified several potential point sources of VOC contamination in the vicinity of City production wells. Becher-Hoppe Engineers, Inc. was contracted by the City of Wausau to conduct an investigation of the East Well Field in the vicinity of CW3. The study concentrated on the Wergin Construction Co. property, the former site of

a City maintenance garage. Foth & Van Dyke and Associates, Inc. performed a groundwater investigation at the Wausau Energy Company property located just south of the above property, in order to determine the effect of past bulk oil operations at the site. STS Consultants Ltd. performed groundwater investigations at the Wausau Chemical Company, also located in the East Well Field, and instituted a groundwater extraction and treatment system to remediate effects of past VOC releases from their facility operations. Twin City Testing and Engineering Laboratory, Inc. conducted investigations in the East Well Field vicinity on behalf of the Wisconsin Department of Natural Resources (WDNR). Roy F. Weston Inc. conducted an investigation of both the East and West Well Fields as part of the U.S. EPA emergency response action. CH_2M Hill Inc. was contracted by the WDNR to perform a hydrogeologic investigation of the abandoned City of Wausau landfill, located on property presently owned by Marathon Electric Company in the southern part of the West Well Field. RMT Inc. and Geraghty & Miller Inc., representing Marathon Electric Corporation and the City of Wausau, respectively, performed a hydrogeologic investigation to determine the source of TCE in the groundwater in the vicinity of CW6. Geraghty & Miller, Inc. also installed several wells in the East Well Field in order to investigate VOC contamination of CW3. Locations of facilities discussed above are illustrated in Figure 3, and a listing of previous studies is presented in Table 1.

Investigations conducted previously have produced inconclusive results. Potential sources have been identified, but data gaps exist on source concentration, release rates, migration routes, aquifer characteristics, effect of river stage and groundwater pumping on flow direction, and velocity of groundwater and contaminants. The conclusions of most of these studies include a recommendation for further study. At least two studies also expressed the need for a comprehensive investigation to address the entire well field. The remedial investigation, currently in progress, was therefore initiated by U.S. EPA to fill the data gaps and determine a cost-effective solution to the groundwater problem.

C. CERCLA Enforcement

CERCLA enforcement activities began at the site in 1986. U.S. EPA identified five Potentially Responsible Parties (PRPs) as having potential responsibility as waste generators and/or transporters. Notice letters informing PRPs of their potential liabilities and offering them the opportunity to perform the Remedial Investigation/Feasibility Study (RI/FS) were sent via certified mail on January 17, 1986 to the five identified PRPs listed below:

* City of Wausau
* Marathon Electric Company
* Wausau Chemical Company
* Wausau Energy Company
* Amoco Oil Corporation

Several negotiation meetings were held to discuss technical and legal issues of a consent decree for the site. However, due to problems within the PRP group, and failure of the PRPs to agree to key requirements,

TABLE 1

Existing Reports On Wausau, Wisconsin Water Supply Site

1. Hydrogeological Investigation Of Volatile Organic Contamination In Wausau, Wisconsin Municipal Wells, (for U.S.EPA), Roy F. Weston, Inc., September, 1985.

2. Subsurface Exploration and Testing Program to Evaluate Ground Water Quality at the Wausau Chemical Facilities in Wausau, Wisconsin, (for Wausau Chemical Company), STS Consultants, Ltd., July, 1984.

3. Investigation of An Abandoned City of Wausau Landfill, (for WDNR), CH_2M Hill, February, 1986.

4. Existing Conditions Report and Exploration Program, Wausau East Municipal Well Field, Wausau, Wisconsin, (for WDNR), Twin City Testing Corporation, August, 1986.

5. Groundwater Investigation, (for City of Wausau), Beecher Hoppe Engineers, Inc., 1983.

6. VOC Groundwater Investigation At The Former Wausau Energy Facility In Wausau, Wisconsin, (for Wausau Energy Corporation), Foth & Van Dyke and Associates, Inc., December, 1986.

7. Hydrogeological Investigation of the Alluvial Aquifer Beneath City Well 6, Wausau, Wisconsin, (for City of Wausau and Marathon Electric), RMT, Inc. and Geraghty & Miller, Inc., July, 1987.

negotiations were unsuccessful, and the PRPs declined to participate in the RI/FS. The U.S. EPA then contracted with Warzyn Engineering, Inc. to conduct the RI/FS.

Although the PRPs failed to reach an agreement with U.S. EPA, they have maintained considerable involvement in U.S. EPA's study. Two of the five PRPs conducted an investigation of the West Well Field and all have requested split samples and/or results of data collected. In addition, two of the PRPs, the City of Wausau and Marathon Electric, offered to perform the phased feasibility study (PFS), and have indicated a willingness to perform the operable unit Remedial Design/Remedial Action (RD/RA). Correspondence regarding this matter is included in the administrative record for the site.

In January, 1988, U.S. EPA filed suit against four of the PRPs for recovery of past costs spent on U.S. EPA's emergency response actions. A fifth PRP, Amoco Oil, was not named in the lawsuit based on prosecutorial discretion. Trial proceedings are scheduled to begin in November 1989.

Negotiations with the PRPs are under way for the operable unit RD/RA. Special Notice letters were sent out on October 13, 1988 to the five PRPs listed above. Negotiations are proceeding according to U.S. EPA's general guidance and policies. As discussed above, two of the PRPs have expressed a willingness to perform the RD/RA, and are the only PRPs to continue to attend these negotiations to date.

III. COMMUNITY RELATIONS

A RI/FS "kick-off" public meeting was held in September 1987, to inform the local residents of the Superfund process and the work to be conducted. Issues raised during the meeting, attended mostly by PRP agents and City officials, included the cost of the RI/FS, the estimated time to complete the study, and the number of previous studies performed for the site.

Information repositories have been established at Wausau City Hall, 407 Grant Street, and the Marathon County Public Library, 400 First Street, Wausau, Wisconsin. In accordance with section 113(k)(1) of CERCLA, the administrative record for the site is available to the public at these locations. The draft PFS and the proposed plan were available for public review and comment from October 3, 1988 to October 24, 1988. A public meeting was held on October 17, 1988 to discuss the findings of the Phase I RI and PFS, and to present the proposed plan. Two formal public comments were received during the public meeting and written comments were also received during the public comment period. All comments received during the comment period and U.S. EPA's responses are included in the attached responsiveness summary. The provisions of sections 113(k)(2)(i-v) and 117 of CERCLA relating to community relations have been satisfied.

IV. SCOPE OF OPERABLE UNIT

A contaminant plume, composed mainly of TCE, exists in the West Well Field and is being drawn toward CW6 due to pumpage. The apparent source area is located to the south, on or near current Marathon Electric property.

Until recently, CW6, which the City pumped directly into Bos Creek as waste (subsequently contaminating Bos Creek), served as a blocking well to the rest of the West Well Field. The discharge of CW6 to Bos Creek has resulted in a contaminated groundwater mound between the source area and CW6. The influence of the groundwater mound may not have fully penetrated the glacial outwash aquifer, but Phase I RI data suggest that the mound served effectively to divide the West Well Field contaminant plume into northern and southern portions, indicating that contaminant migration from the source area has been slowed.

In summer 1988 the City of Wausau placed CW6 back in service after completion of a transport pipe to carry contaminated water to the air stripper. Because of this, the pumping rate of CW6 has increased substantially, and the untreated discharge to Bos Creek has been discontinued. These two factors tend to increase the rate of migration from the source area toward CW6. Water from CW6 is treated for VOC removal using the existing air strippers at the water utility. However, if no further action is taken, CW6 will continue to serve as an interceptor well, providing the sole protection for the remaining wells in the West Well Field.

The scope of this operable unit is limited to the contaminant plume impacting the West Well Field and CW6. Ultimately, the solution to protecting the West Well Field will involve additional controls to prevent contaminants from migrating to the north from the source area. Due to the apparently slowed contaminant migration to the north caused by discharge of CW6 to Bos Creek, additional protection of the West Well Field is possible by preventing or limiting the extent of future contaminant movement to the north. Implementation of plume migration controls will effectively limit the time during which CW6 draws in contaminants, thereby also limiting the period during which water consumers are exposed to trace levels of contaminants.

An expedited operable unit remedial action is desirable from a public health standpoint. Taking action now rather than waiting for the final action will shorten the time required to achieve long-term protection of the water supply. This expedited operable unit remedial action is therefore considered to be consistent with achieving a final site remedy.

The FFS evaluated alternatives to address plume migration control in the West Well Field of the site. A discussion of remedial action objectives and goals, as well as a description and evaluation of alternatives developed, is included in Section VII of this document.

V. CURRENT SITE STATUS AND SITE CHARACTERISTICS

A. Current Site Status

A RI/FS is currently being conducted for U.S. EPA by its contractor, Warzyn Engineering, Inc. The RI entailed two phases or field sampling events. Phase I of the RI field work was conducted from August through January 1988, results of which are summarized in the April 1988 technical memorandum. Phase II of the RI field work was conducted from June to September 1988. Results of this phase of work will be included in the RI report for the site which is currently being prepared. The final FS, which addresses remediation of the entire site, is under development. The PFS prepared for this operable unit remedial action addresses only a limited portion of the site, the West Well Field plume, and is discussed in detail later in this document. The PFS was completed in September 1988.

Currently being developed, the FS will detail the development and evaluation of an array of remedial action alternatives to address the entire Wausau Groundwater Contamination site and sources impacting it.

B. Site Characteristics

1. Hydrogeology

The City production wells are located within glacial outwash and alluvial sediments underlying and adjacent to the Wisconsin River. The aquifer is located within a bedrock valley which is underlain and laterally bounded by relatively impermeable igneous bedrock. Groundwater flow within the unconfined glacial aquifer has been drastically changed by the installation of the production wells. Under non-pumping conditions, groundwater flows toward the Wisconsin River and its tributaries (Bos Creek). Groundwater naturally discharges at the surface water bodies. However, under pumpage conditions, groundwater flows toward the production wells. The natural groundwater flow directions are frequently reversed due to City well pumping which induces recharge of surface water into the aquifer. The horizontal flow in the vicinity of the well field is indicated by the potentiometric contours shown in Figure 4.
The potentiometric surface map also indicates that the cone of depression from the East Well Field appears to affect groundwater flow below and to the west of the Wisconsin River. Monitoring well nests located at Marathon Electric indicate very slight downward gradients adjacent to the Wisconsin River. Below the Wisconsin River, the East Well Field production well pumpage has induced surface water recharge of the aquifer, causing flow downward through the river bed and toward CW3.
Aquifer hydraulic conductivity tests performed during the Phase I RI investigation indicated hydraulic conductivity values ranging from 1.7×10^{-4} cm/sec to 8.1×10^{-2} cm/sec. The overall average hydraulic conductivity of the outwash aquifer is approximately 2.2×10^{-2} cm/sec, based on test data at monitoring wells.

2. Chemical Characteristics

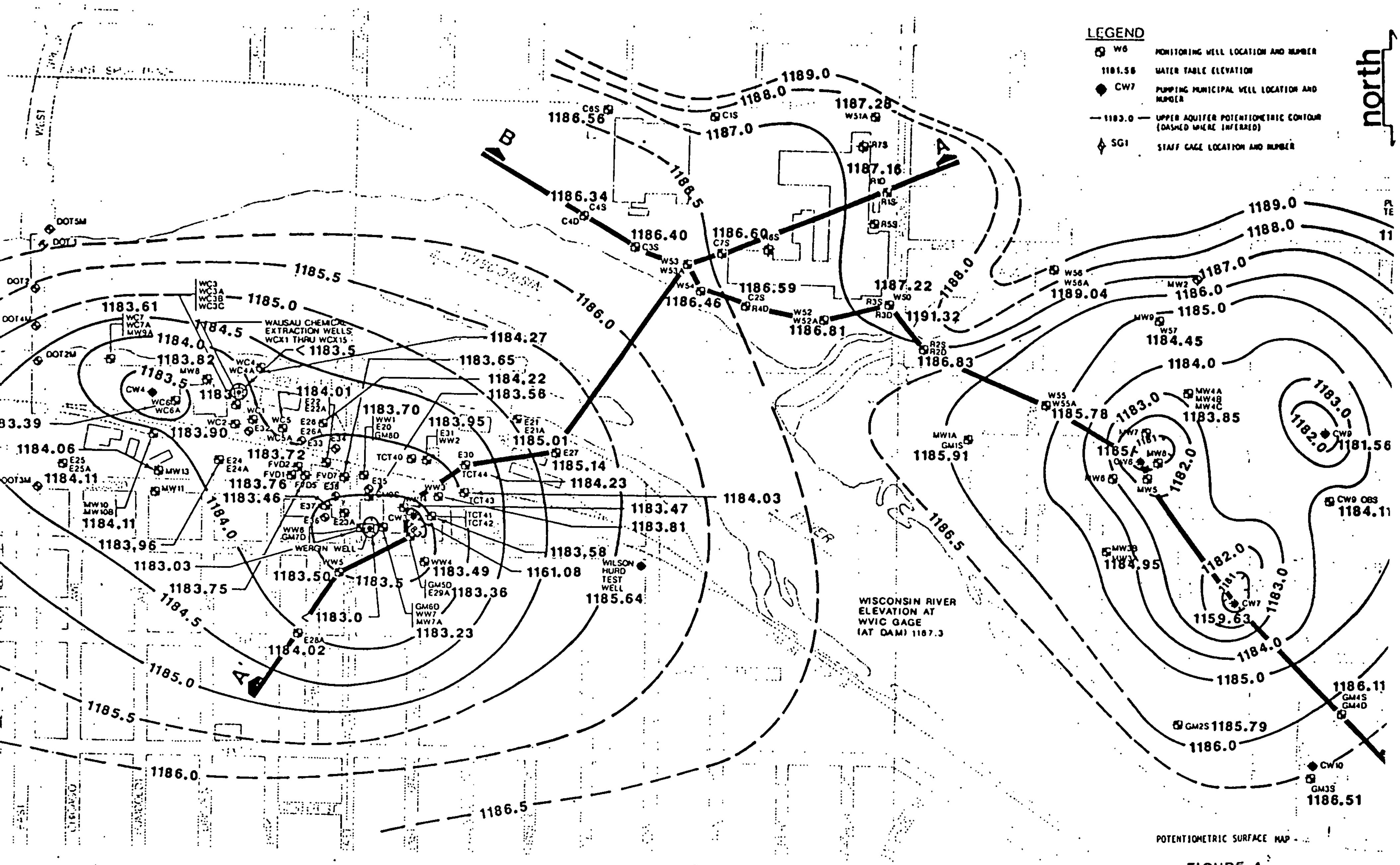
a. Groundwater Quality

Groundwater quality sampling conducted during the Phase I investigation has identified a vertical and lateral distribution of total chlorinated ethenes which suggest that a minimum of three sources are affecting the City well field. The estimated areal distribution of total chlorinated ethenes is shown on Figure 5. The distribution is based on a combination of data obtained from laboratory VOC analyses of Round 1 groundwater samples (October 1987) and field laboratory analyses of groundwater samples collected during drilling (October and November 1987).

West side monitoring wells appear to delineate a deep (greater than 100 foot) north-south trending TCE plume. Based on the vertical distribution of TCE throughout the aquifer in the vicinity of the old City landfill and the presence of TCE in the unsaturated zone in this area, a source appears to be located within the northern portion of the former City (of Wausau) Landfill. The plume appears to have migrated northward, under influence of pumpage from CW6. The highest TCE concentration (4200 ug/L) within this plume was detected approximately 550 feet south of CW6.

TCE was also observed in the shallow aquifer between Bos Creek and CW6. This plume is shown on Figure 5 by the lightly screened contours between Bos Creek and CW6. The shallow aquifer TCE contamination appears to result from the induced infiltration of surface water from Bos Creek, which has been contaminated by the discharge from CW6. The induced surface water recharge of the aquifer is evident from the downward vertical gradients at monitoring well nests in that area. Based on laboratory analyses of samples collected during October 1987, TCE concentrations adjacent to the CW6 discharge were above 100 ug/L. TCE concentrations in the ponded area downstream were approximately 70 ug/L. TCE was not detected in surface water samples collected upstream of the CW6 discharge, nor was it detected at the point of discharge of Bos Creek to the Wisconsin River.

The distribution of TCE in monitoring wells located between the Wisconsin River and CW3 suggest eastward migration of a deep TCE plume below the Wisconsin River from the vicinity of the former City Landfill (refer to Figure 5). TCE appears to be vertically distributed throughout the aquifer in the vicinity of the old City landfill, indicating close proximity to the source area. Slight vertical downward gradients were observed in monitoring wells in the area. The highest concentrations of TCE were detected at a depth of approximately 115 feet. After moving into the deeper portion of the aquifer, a portion of the plume appears to migrate eastward under the influence of pumpage from CW3 (refer to Figure 4). A part of the plume has also been captured by the pumpage from CW6 and appears to migrate northward under the influence of this well. The TCE-contaminated portion of the aquifer appears to be less than 20 feet thick and is laterally restricted to a relatively narrow flow path into the production wells. Since CW6 produces water nearly equally from all



LEGEND
W6 MONITORING WELL LOCATION AND NUMBER
1181.56 WATER TABLE ELEVATION
CW7 PUMPING MUNICIPAL WELL LOCATION AND NUMBER
1183.0 UPPER AQUIFER POTENTIOMETRIC CONTOUR (DASHED WHERE INFERRED)
SG1 STAFF GAGE LOCATION AND NUMBER
north
WISCONSIN RIVER ELEVATION AT WVIC GAGE (AT DAM) 1187.3
WAUSAU CHEMICAL EXTRACTION WELLS WCX1 THRU WCX15
WILSON HURD TEST WELL
WERGIN WELL
1189.0
1188.0
1187.0
1186.5
1186.0
1185.5
1185.0
1184.5
1184.0
1183.5
1183.0
1182.0
1187.28
1187.16
1186.56
1186.34
1186.40
1186.60
1186.59
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1186.81
1187.22
1191.32
1186.83
1189.04
1184.45
1185.78
1183.85
1185.91
1181.56
1184.11
1184.95
1159.63
1186.11
1185.79
1186.51
1183.61
1183.82
1183.39
1183.90
1184.06
1184.11
1183.96
1183.03
1183.75
1183.50
1184.02
1183.0
1184.27
1183.65
1184.22
1183.56
1184.01
1183.70
1183.95
1185.01
1185.14
1184.23
1184.03
1183.47
1183.81
1183.58
1161.08
1185.64
1183.49
1183.36
1183.23
1183.72
1183.76
1183.46
< 1183.5
A
A'
B
POTENTIOMETRIC SURFACE MAP

FIGURE 4

sides of the 50 foot screened interval, the resulting dilution factor appears to range from 15 to 25. Thus, concentrations observed at the supply well are likely to be 15 to 25 times less than actual in plume concentration.

b. Source Location

The predominant source of TCE contamination to CW6 and CW3 appears to be the Marathon Electric/Former City Landfill area. Elevated concentrations of TCE were detected in groundwater, soil, and soil gas samples obtained from the northern portion of the landfill. Soil gas concentrations within the landfill range from below minimum detection limits (1.0 ug/L) to approximately 82 ug/L. Soil samples obtained from boring in the vicinity of the landfill contain concentrations of approximately 200 ug/kg. Groundwater samples obtained from the water table in the vicinity of the landfill indicate TCE concentrations ranging from 16 ug/L to approximately 1900 ug/L. Also detected in the vicinity of the landfill were 1,1,1-trichloroethane (TCA), 1,2-dichloroethene (1,2-DCE), chloroform, and carbon tetrachloride at concentrations generally below 100 ug/L. Potential sources within the landfill were investigated in greater detail during the Phase II RI, and will be evaluated during the final FS.

VI. SUMMARY OF SITE RISKS

The risks associated with the West Well Field contaminant plume have been evaluated in the PFS for this operable unit. This effort entailed identification of contaminants, routes of migration of populations exposed to the contaminants associated with the West Well Field. This information was then used to estimate health risks based on exposure levels and toxicologic data of the contaminants. The final FS will contain a comprehensive assessment of risk for the entire site.

The predominant contaminant identified in the groundwater in the West Well Field is TCE. The exposure pathway of concern is the City's water supply. The City water distribution system supplies potable water, derived exclusively from the Wausau groundwater source aquifer, to approximately 33,000 residents. Routes of exposure to residents through contaminated groundwater include ingestion via drinking and cooking, as well as inhalation and dermal exposure while bathing. During the period of 1982 through mid-1984, prior to pumping CW6 directly into Bos Creek and the installation of the VOC strippers, levels of TCE sampled at various drinking water taps throughout the water distribution system ranged from approximately 10 to 100 ug/L. PCE and DCE were periodically detected, but usually below minimum detectable limits. Presently, the City treats water from CW6 prior to distribution using an air stripper. Monitoring in the distribution system indicates undetectable levels of TCE (detection limit 0.5 ug/L).

Because TCE is the predominant contaminant present, it was identified as the indicator contaminant, or contaminant of concern, for the West Well Field. The toxicological effects of TCE, including acute exposure, subchronic exposure, and carcinogenic risk, were evaluated.

Based on undetectable levels of TCE present in the treated water within the City water distribution system, the short-term carcinogenic risks to health associated with TCE contamination would appear to be minimal under current water usage practices. The long-term cancer risk associated with City water use is more difficult to quantify. The U.S. EPA has set a Maximum Contaminant Level (MCL) of 5 ug TCE/L of drinking water. MCLs are enforceable standards promulgated under the Safe Drinking Water Act. Because TCE is carcinogenic and is not considered to be without hazard below a given threshhold, the U.S. EPA has set a non-enforceable Maximum Contaminant Level Goal (MCLG) of zero for TCE in drinking water.

Protection of residents from exposure to TCE is dependent on adequate treatment of the water. The potential for exposure exists in that failure of the treatment system could result in an exposure pathway through the City's drinking water. In addition, if CW6 was turned off, the TCE contaminant plume would migrate north, impacting the remaining clean wells, CW7 and CW9, in the City well field.

Based on the possibility of failure of CW6 and/or the air strippers, a potential future risk of exposure to TCE via drinking water ingestion exists at the site. Therefore, plume migration control to mitigate future risks is considered a prudent response action to address site risks. This action will mitigate potential long-term risks from migration of contaminants in water and will be consistent with the final remedy for the site.

VII. DESCRIPTION OF ALTERNATIVES

A. Response Objectives

The phased feasibility study was initiated to evaluate alternatives for remediation of the West Well Field contaminant plume. Based on the risk assessment, two primary site-specific response objectives were identified; 1) protection from long-term exposure to low levels of TCE from ingestion of drinking water; and, 2) protection from future increased levels of contaminants to the West Well Field.

A variety of technologies to address response objectives were identified for further consideration. From these, four alternatives were developed and subjected to detailed analysis using the nine evaluation criteria developed under the Superfund Amendments and Reauthorization Act (SARA). Table 2 lists the four alternatives.

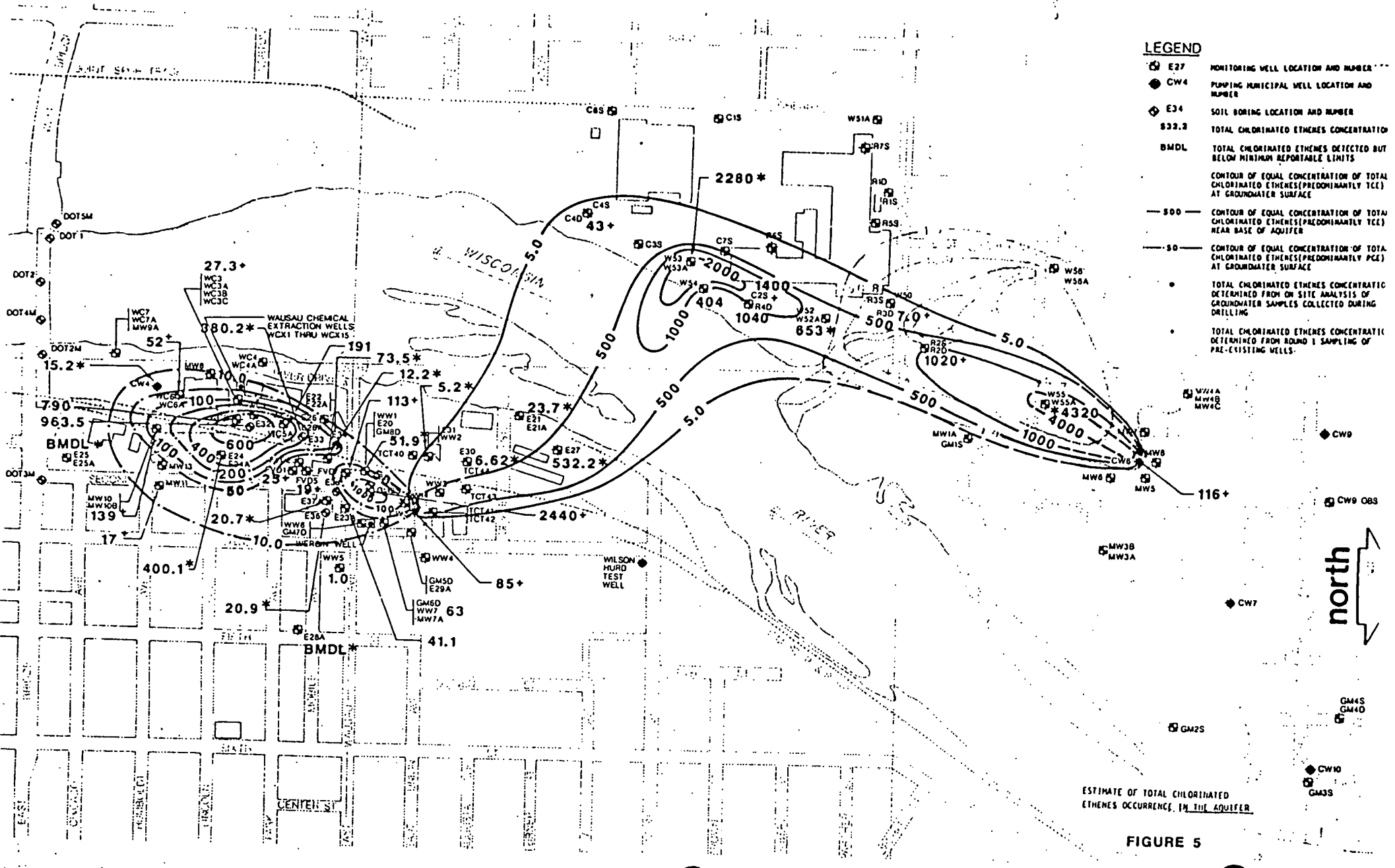

LEGEND
E27 MONITORING WELL LOCATION AND NUMBER
CW4 PUMPING MUNICIPAL WELL LOCATION AND NUMBER
E34 SOIL BORING LOCATION AND NUMBER
533.2 TOTAL CHLORINATED ETHENES CONCENTRATIO
BMDL TOTAL CHLORINATED ETHENES DETECTED BUT BELOW MINIMUM REPORTABLE LIMITS
CONTOUR OF EQUAL CONCENTRATION OF TOTAL CHLORINATED ETHENES(PREDOMINANTLY TCE) AT GROUNDWATER SURFACE
500 CONTOUR OF EQUAL CONCENTRATION OF TOTAL CHLORINATED ETHENES(PREDOMINANTLY TCE) NEAR BASE OF AQUIFER
50 CONTOUR OF EQUAL CONCENTRATION OF TOTAL CHLORINATED ETHENES(PREDOMINANTLY PCE) AT GROUNDWATER SURFACE
TOTAL CHLORINATED ETHENES CONCENTRATIO DETERMINED FROM ON SITE ANALYSIS OF GROUNDWATER SAMPLES COLLECTED DURING DRILLING
TOTAL CHLORINATED ETHENES CONCENTRATIO DETERMINED FROM ROUND 1 SAMPLING OF PRE-EXISTING WELLS.
E. WISCONSIN
W. WISCONSIN
WALWORTH
CENTER ST
WILSON HURD TEST WELL
WALWORTH CHEMICAL EXTRACTION WELLS WCX1 THRU WCX15
north
ESTIMATE OF TOTAL CHLORINATED ETHENES OCCURRENCE IN THE AQUIFER

FIGURE 5

TABLE 2

REMEDIAL ACTION ALTERNATIVES

Alternative 1	No Action
Alternative 2	Extraction well located north of Bos Creek, with packed tower stripping and discharge to the Wisconsin River.
Alternative 3	Extraction well located south of Bos Creek near the source area, with packed tower stripping and discharge to the Wisconsin River.
Alternative 4	A combination of Alternatives 2 and 3.

B. Treatment

Groundwater treatment was incorporated into each of the alternatives, (except No Action) as a result of technology-based effluent limit requirements. Section 301(b)(2) of the Clean Water Act and federal regulations (40 CFR 122.44(a)) require the consideration and use of the Best Available Technology (BAT) that is economically achievable for treating water prior to discharge. Corresponding State requirements are found in section 147.04, Wisconsin Statutes and Chapters NR 215 and 217, of the Wisconsin Administrative Code.

The maximum observed in-plume contamination concentrations are lower than either acute or available chronic toxicity values for effluent limits for discharge to surface waters. Extraction wells would exert a hydraulic influence radially and throughout the saturated thickness of the aquifer, drawing in both uncontaminated and contaminated groundwater, thereby lowering contaminant concentrations in extracted water (relative to in-plume concentrations) as a result of dilution. Treatment would therefore not be required as a result of water quality-based effluent limits.

The acute and chronic toxicity numbers listed in Table 3 (below) for the three major west side plume contaminants are currently being considered by the Wisconsin DNR in determining effluent limits for discharge to surface waters. The numbers are being used pending promulgation of new Wisconsin Administrative Code chapters regulating the discharge of toxic substances.

TABLE 3

Water Quality Effluent Limits for Surface Water Discharge

Compound	Acute	Chronic	Max. Observed
	ug/L		
trans-1,2-Dichloroethene (DCE)	13,500	Not Avail.	641
Trichloroethene (TCE)	5,200	Not Avail.	3,200
Tetrachloroethene (PCE)	528	84	55

The acute toxicity values are essentially end-of-pipe effluent limits, because these values are not to be exceeded within the mixing zone. The chronic toxicity values are not to be exceeded in the stream after mixing. To calculate allowable effluent limits based on chronic toxicity, a mass balance is performed using upstream, discharge, and downstream flow rates and concentrations.

Groundwater treatment required under the Clean Water Act is determined on a case-by-case basis pursuant to section 402(a)(1), using the guidelines of 40 CFR 125.3. Some flexibility is allowed in determining appropriate treatment technology in a particular application. The final determination regarding specific technologies will be made by WDNR during the design phase. The treatment system choice requires justification based on literature data and/or bench or pilot scale testing that demonstrates effective performance.

The treatment technology used for the purposes of alternative evaluation and development of cost estimates in the PFS is air stripping utilizing a packed tower stripper. Air stripping is effective for the types of contaminants in the groundwater at this site. However, a BAT-equivalent treatment could be provided by a passive VOC stripping system, and its use will be evaluated as BAT by the WDNR during the design phase of the remedy.

C. Alternatives

Alternative 1 - No Action

Under this alternative, no response action would be taken at this time to protect the uncontaminated municipal wells in the West Well Field or to reduce the amount of time that CW6 draws in contaminants.

Production Well CW6 is now on line as a water supply well. The discharge to Bos Creek has been halted. Based on communications with water utility representatives, CW6 will be pumped nearly continuously at a rate of

approximately 1600 gpm during the high-demand summer months and possibly at a lower rate during other times of the year. Contaminants will continue to be drawn to the north under the influence of CW6 pumpage. Water from Production Well CW6 is being treated at the water utility for VOC removal using an existing stripping tower.

Figure 6a shows a simulated piezometric head contour map for the No Action alternative under summertime pumping conditions of 11 cubic feet per second (cfs) total flow. A piezometric surface divide trending northeast to southwest would be created. This divide would extend from the southern portion of Marathon Electric toward Gilbert Park to the northeast. The apparent source area located on Marathon Electric property is located on the divide. The influence of the West Well Field pumping wells extends to the source area. Contaminants would be drawn to the north from the source area into the West Well Field. Under these conditions, CW6 would function as an interceptor well, capturing contaminants drawn toward the West Well Field. Both the deep and shallow contaminant plumes (see Figure 5) are within the zone of influence of CW6. Without any other controls, this situation would continue until the west side contaminant plume has been effectively purged from the aquifer by production well pumping.

Comparison of Figures 7a and 7b shows the effect of taking CW6 off line. Figure 7a reflects the same conditions discussed above. Figure 7b shows simulated piezometric head contours with CW6 off and the total summer production well pumpage of 11 cfs maintained. The piezometric surface divide is shifted slightly to the north, reflecting a relatively greater influence of West Well Field production wells. The source area and west side plumes would be within the zone of influence of CW7 and CW9.

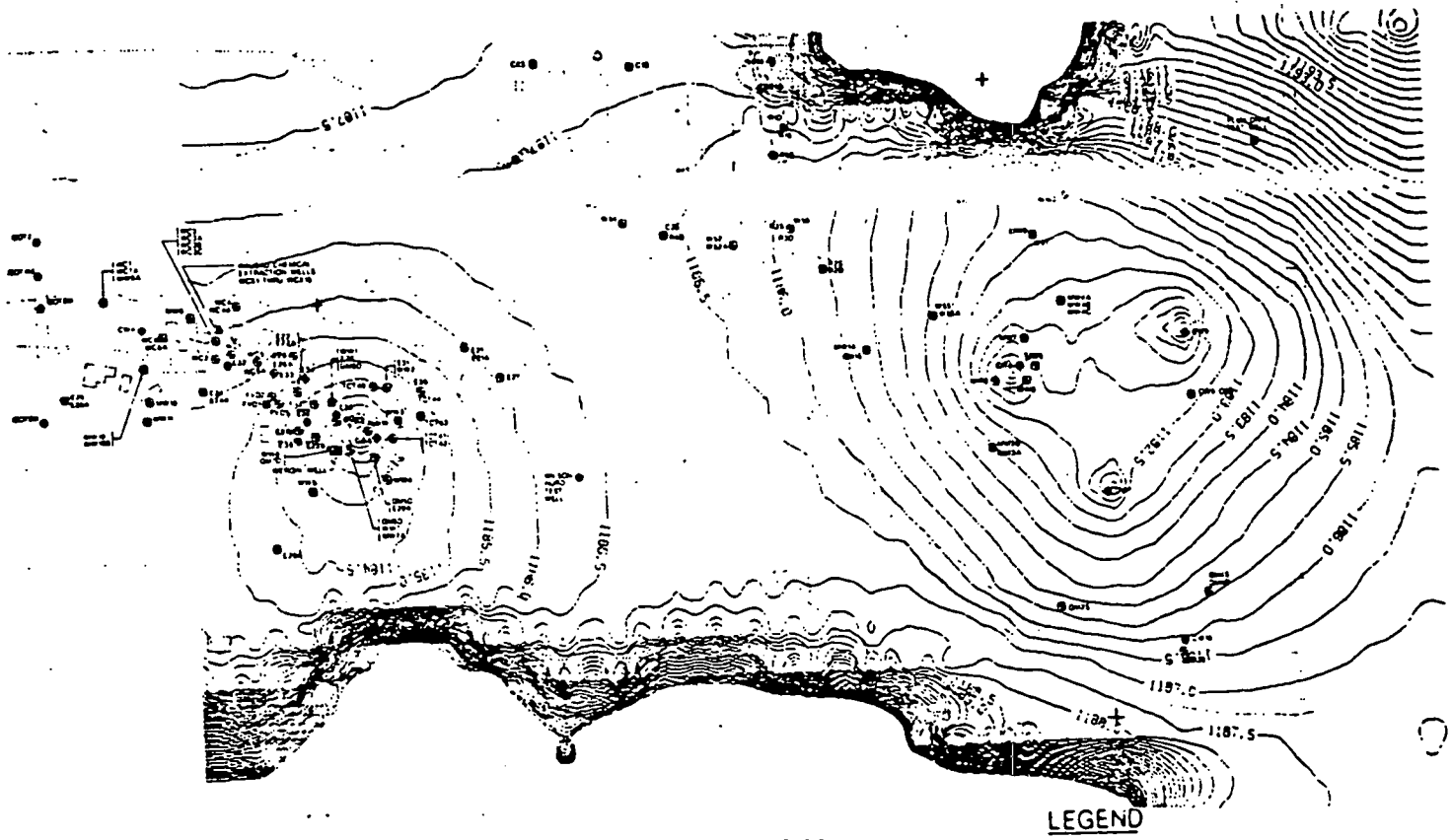
If CW6 ceased pumping, contaminants would be expected to migrate further north under the influence of CW7 and CW9 pumpage. There would be no provision for protecting uncontaminated CW7 and CW9 in the event of a failure that results in substantial down time for CW6.

Applicable or relevant and appropriate requirements (ARARs) for the No Action alternative are summarized in Table 4. The only ARARs identified are federal drinking water standards and Wisconsin Chapter NR 140 standards and requirements. Drinking water MCLs can be met as a result of VOC removal at the water treatment plant.

Under the No Action alternative, there would be no time associated with implementation however, the time during which water consumers would be exposed to trace (less than detectable) levels of contaminants in drinking water would be maximized. A single City water supply well (CW6) would be relied on to draw contaminants from the source area and from the aquifer on the west side, preventing further northward contaminant migration to other west well field water supply wells.

There is no cost or operation and maintenance (O&M) associated with the No Action Alternative. Annual costs to operate the present air stripper were not considered as O&M under this alternative.

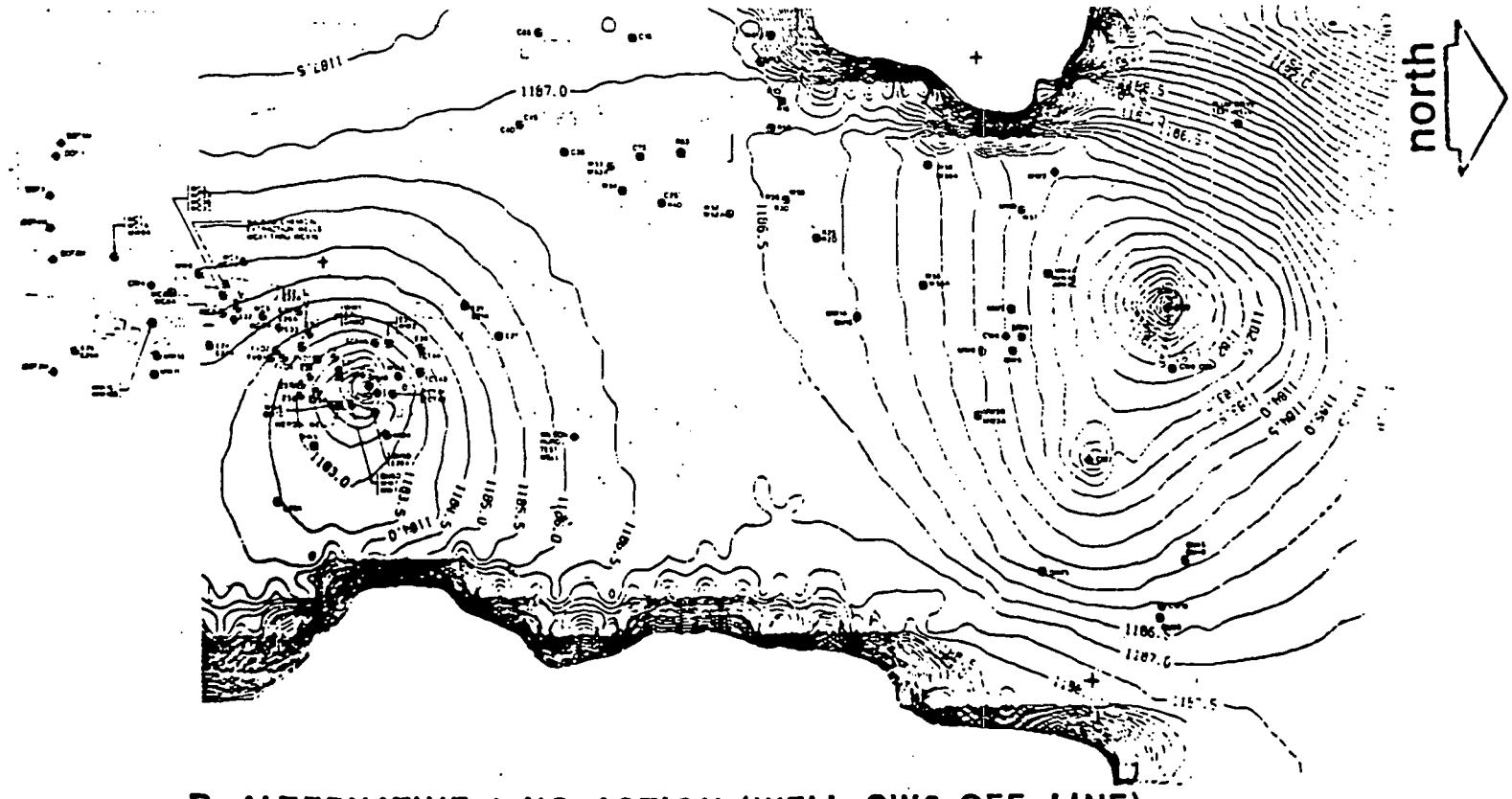
SIMULATED PIEZOMETRIC HEAD MAPS: EFFECT OF
PRODUCTION WELL CW6 PUMPING



A. ALTERNATIVE 1-NO ACTION

LEGEND

- E27 MONITORING WELL LOCATION AND NUMBER
- CW4 PUMPING MUNICIPAL WELL LOCATION AND NUMBE
- E34 SOIL BORING LOCATION AND NUMBER
- SIMULATED HEAD CONTOUR



B. ALTERNATIVE 1-NO ACTION (WELL CW6 OFF-LINE)

FIGURE 7

TABLE 4

ARARS: ALTERNATIVE 1 - NO ACTION
PHASED FEASIBILITY STUDY
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Regulatory Requirement	Comment
	CHEMICAL-SPECIFIC ARARs
Safe Drinking Water Act; 40 CFR 141; NR 109 WAC	Drinking water MCLs and corresponding State standards for health-related compounds are relevant and appropriate as goals for cleaning up a public water supply source aquifer.
	LOCATION-SPECIFIC ARARs
No location-specific ARARs were identified for the No Action alternative.	
	ACTION-SPECIFIC ARARs
No action-specific ARARs were identified for the No Action alternative.	

Alternative 2 - Extraction Well North of Bos Creek

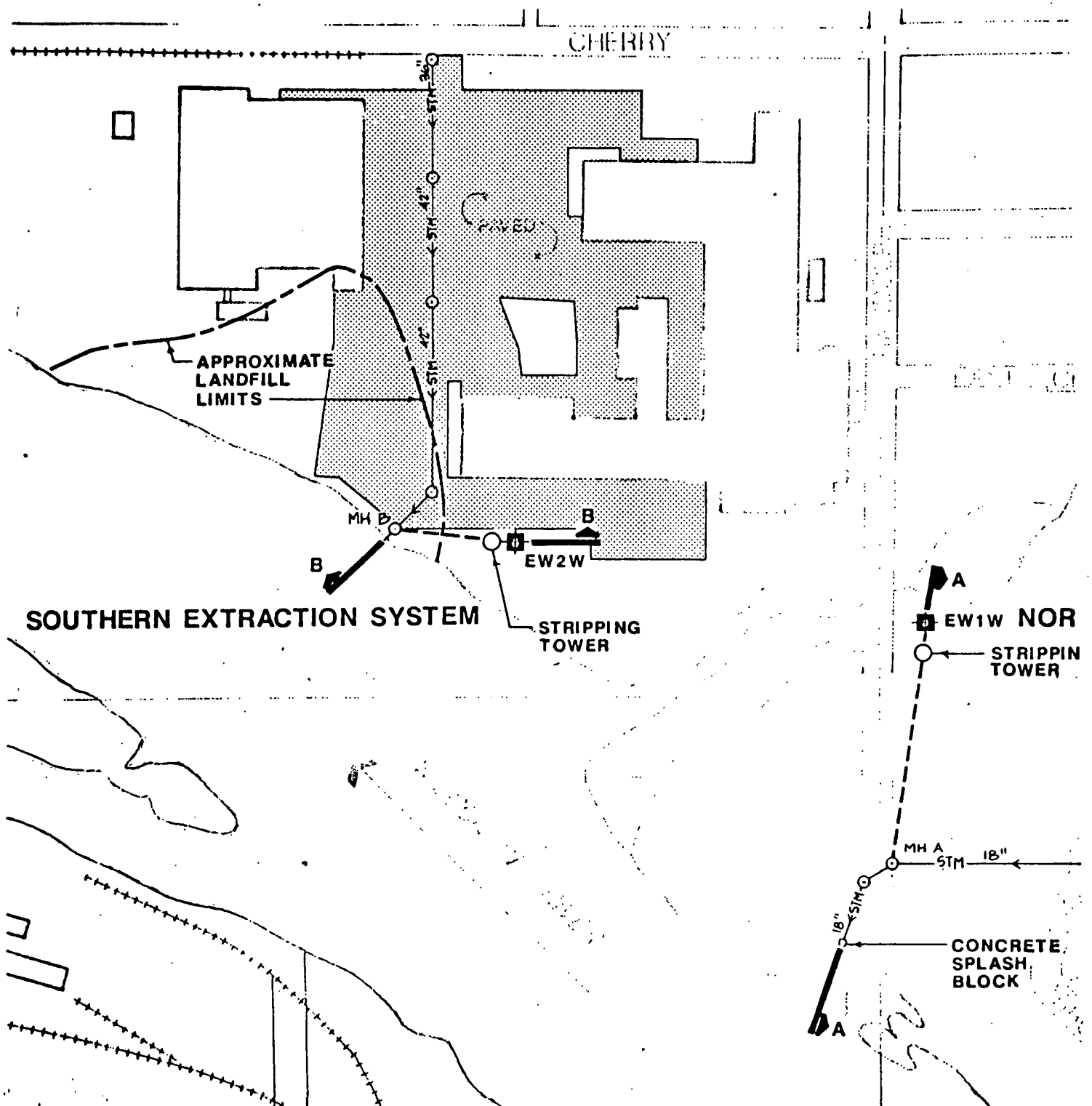
Alternative 2 involves installation of a groundwater extraction well north of Bos Creek and south of CW6. Groundwater would be treated and discharged to the Wisconsin River.

The extraction well would be located in the vicinity of Schofield Park on a City-owned parcel at the northwest corner of the intersection of Randolph and Burek Streets (See Figure 8). This places the well near the apparent center of the contaminant plume which would be the most effective location. The well would serve to remove contaminants from the northern portion of the TCE plume, and would draw in and intercept contaminants from the south. Based on information gathered to date, the plume is estimated to be approximately 500 feet wide and 20 feet thick in that area, and it appears to be within approximately 50 feet of the bedrock base of the aquifer. A deep well would therefore be used.

Groundwater flow model results indicate a groundwater piezometric surface divide would be created between the extraction well and CW6 (see Figure 6b). The divide would be located between Burns and Randolph Streets. Contaminants located north of the divide would migrate toward CW6, and contaminants located south of the divide would migrate to the extraction well. The influence of the extraction well also extends south to include the apparent source area. The extraction well would therefore draw in contaminants from the source area.

A conceptual system layout for the northern extraction, treatment, and discharge system is illustrated on Figure 8. A well and pump house are located on City-owned property near the intersection of Randolph and Burek Street. Section A-A' (Figure 9) shows that a 130 foot well with a 40 foot long, 20 inch diameter screen would be constructed. A small pump house would be constructed at the well head to protect the well head, motor starter and controls, and above ground piping. Above ground piping would incorporate a check valve, flow control valve, sampling tap and totalizer flow. A package tower stripper incorporating an above-ground discharge slump would be located on a concrete pad next to the well house. The tower pad would be surrounded by a chain link fence with a locking gate. For a 1500 gpm design flow and a stripping factor of 0.2, a 7 foot diameter tower with 15 feet of 3.5 inch nominal size polyethylene Pall ring packing would provide an estimated 85% removal of TCE. Treated effluent would flow by gravity to the discharge line and ultimately to an out-fall at the Wisconsin River shoreline. The BAT requirement will be determined by the WDNR during the design phase of the project.

ARARs for Alternative 2 are summarized in Table 5. The action would comply with NR 140 requirements. In general, the highest contaminant concentrations observed in the west side plume are less than effluent limits (5.2 mg/L for TCE) established by the WDNR, so water quality-based requirements can be satisfied. Technology-based effluent limits can be satisfied with the VOC stripping technology.


CHERRY
APPROXIMATE LANDFILL LIMITS
MH B
B
B
EW2W
SOUTHERN EXTRACTION SYSTEM
STRIPPING TOWER
A
EW1W
NOR
STRIPPIN TOWER
MH A
STM
18"
CONCRETE SPLASH BLOCK
A

NORTHERN EXTRACTION SYSTEM
SECTION A-A

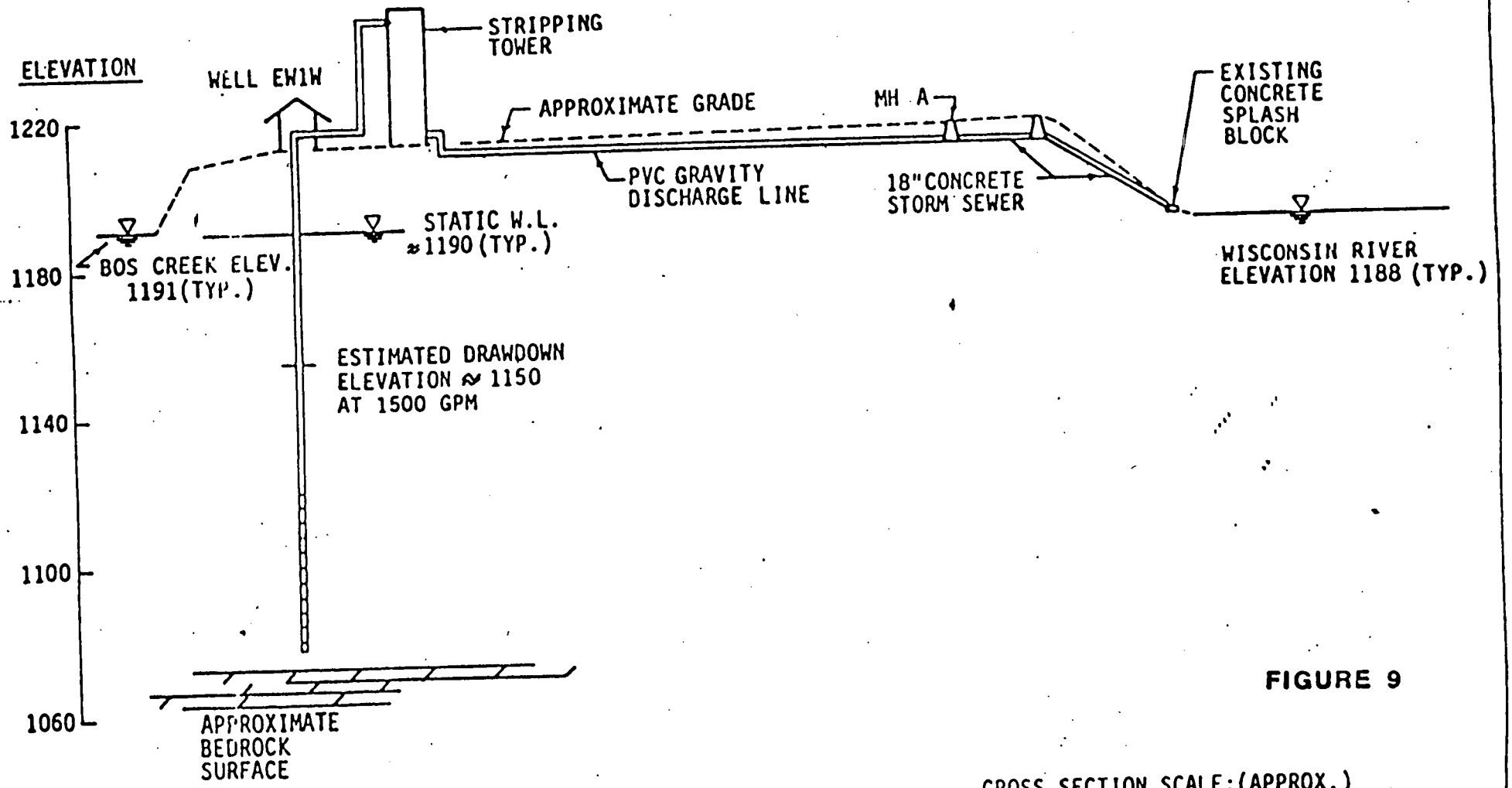


FIGURE 9

CROSS SECTION SCALE:(APPROX.)
VERTICAL: 1" = 40'
HORIZONTAL: 1" = 100'

TABLE 5

ARARS: ACTION ALTERNATIVES 2, 3, AND 4
PHASED FEASIBILITY STUDY
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Regulatory Requirement	Comment
	CHEMICAL-SPECIFIC ARARs
NR 140 WAC	Groundwater Quality Standards are applicable. RI/FS process is considered to satisfy substantive requirements for investigation, analysis and consideration of appropriate response actions.
Clean Water Act	General requirement for regulating discharges to surface water are applicable. Federal AWQC are ARARS, state numbers are more stringent.
NR 102 WAC NR 104 WAC	Interim numbers used in establishing effluent limits for toxics are to be considered (TBC).
Safe Drinking Water Act; 40 CRF 141; NR 109 WAC	Drinking water MCLs and corresponding State standards are relevant and appropriate as goals for cleaning up a public water supply source aquifer.
	LOCATION-SPECIFIC ARARs
Chapter 30 Statutes; NR 115-117 WAC	May be applied although proposed facilities do not appear to lie within regional floodway or floodway fringe.
	ACTION-SPECIFIC ARARs
CWA Section 301; 40 CFR 122; Chapter 147.04 Statutes	Technology-based effluent limits are applicable.
NR 112 WAC	Applicable to extraction wells.
NR 200 WAC NR 217 WAC	Requirement for application for discharge permit and State review may be applicable. Requirement for permit may be waived under CERCLA on-site action exemption. Monitoring and reporting requirements may be applicable.
NR 219 WAC	Sampling and testing methods would be applicable for monitoring.
ILHR 81-84 WAC ILHR 50-53 WAC IND 1, 6 WAC	Applicable to system piping. Applicable to pump house. Applicable to construction phase for worker safety.

Probable costs of Alternative 2 are summarized in Table 6. Major capital cost items include the extraction well, pump house, stripping tower and foundation, controls and utilities, piping and piping appurtenances. Major operation and maintenance cost item include energy costs, sampling and monitoring, analytical laboratory, routine systems inspection and maintenance, and reporting. Capital costs are estimated to be $432,000. The first-year operation and maintenance costs are estimated to be $105,000, and annual operation and maintenance costs for subsequent years are estimated to be $82,000. The five-year present net worth (10% discount rate) associated with the above costs is $760,000.

Response objectives would begin to be met shortly after the well begins pumping. Contaminants not captured by the system would be drawn to CW6, and contaminated water would be treated at the City water treatment plant to meet drinking water MCLs. A design and construction period of less than six months is considered realistic for this action. Risk to water consumers are minimized by the time it takes for CW6 to draw in contaminants presently situated beyond the northern extent of influence of the extraction well.

Implementation of this alternative is not expected to be a problem. The technology is readily available, conventional, and well demonstrated. Construction is straight forward and no unusual features are anticipated to be required for the system. Coordination between U.S. EPA and the City of Wausau will be required to accomplish implementation of the system.

Alternative 3 - Extraction Well South of Bos Creek

Under Alternative 3, a groundwater extraction well would be constructed south of Bos Creek. Groundwater would be extracted, treated and discharged to the Wisconsin River.

The extraction well would be located near the center of the southern portion of the plume and north of the apparent TCE source area. A location near the southeast corner of the eastern-most Marathon Electric Company building would be suitable, based on available information (See Figure 8). The plume appears to be relatively wide in this area, and contamination has been observed throughout most of the 130 foot saturated thickness of the aquifer (See Figure 5). The concentration of chlorinated ethenes (primarily TCE) ranges from approximately 500 ug/L to 2,000 ug/L in this area, based on Phase I RI results. A deep well would be used to remove contaminants from the southern portion of the plume, and draw some contaminants back to the south, away from CW6.

Groundwater flow modeling was conducted to evaluate the effects of pumping from the southern extraction well. Modeling results indicate that a divide in the groundwater piezometric surface would be created between the extraction well and CW6. Figure 6c shows that a divide trending from west-northwest to east-southeast would be located in the vicinity of Bos Creek and Randolph Street. Contaminants located in

TABLE 6
SUMMARY OF PROBABLE COSTS: ALTERNATIVE 2
PHASED FEASIBILITY STUDY
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

CAPITAL COSTS

Item	Cost
Extraction Well	$55,000
Well House and Utilities	$14,000
Well House Piping and Appurtenances	$10,000
Discharge System	$19,000
Stripping Tower, Foundation, Appurtenances	$150,000
Capital Facilities Subtotal	$248,000
Engineering Design (25%)	$62,000
Contract Administration (10%)	$25,000
Legal and Administrative (10%)	$25,000
Capital Subtotal	$360,000
Contingencies (20%)	$ 72,000
Capital Total	$432,000

ANNUAL OPERATION AND MAINTENANCE COSTS

	First Year	Subsequent Years
Water Levels	$ 4,500	$ 3,600
Water Quality	$26,000	$ 8,200
Flow Monitoring	$ 2,700	$ 2,700
Energy	$42,000	$42,000
General O&M Labor	$ 6,000	$ 6,000
Reporting	$ 3,000	$ 3,000
Administration	$ 3,000	$ 3,000
O&M Subtotal	$87,200	$68,500
Contingencies (20%)	$17,400	$13,500
O&M Total	$104,600	$82,000

FIVE-YEAR PRESENT WORTH

Present Worth of Capital (10% discount rate)	$430,000
Present Worth of O & M (10% discount rate)	$330,000
Present Worth Total	$760,000

roughly the northern one-half of the west side contaminant plume would migrate toward CW6. Contaminants located south of the contaminant plume would be drawn to the extraction well. Figure 6c shows that a second divide is located beneath the Wisconsin River. Contaminants near the source area would be prevented from migrating away from the source to the east or north. An extraction well at this location accomplishes control of contaminant migration away from the source to both the east and west well fields, while capturing a large portion of the west side contaminant plume.

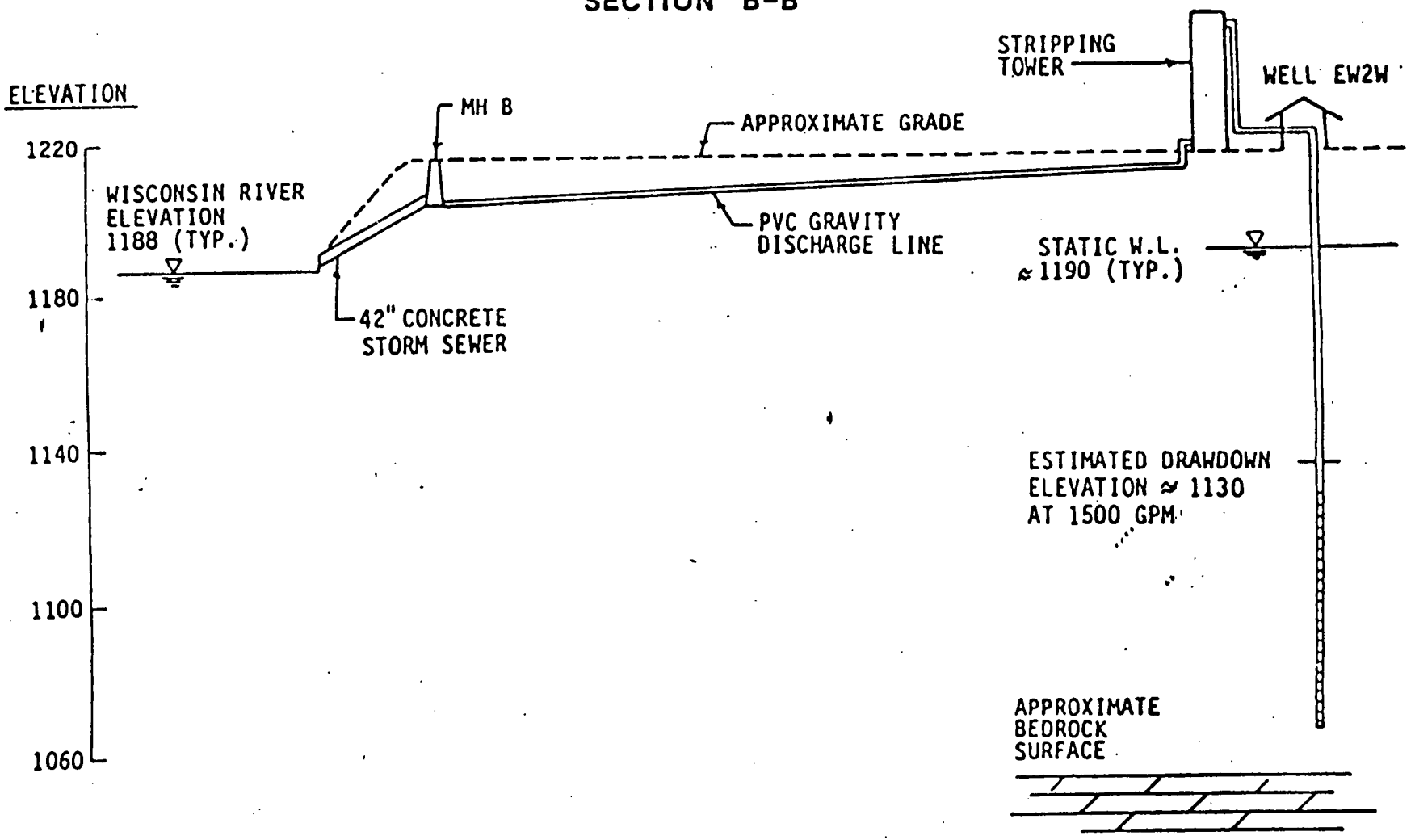
A conceptual system layout for the southern groundwater extraction and discharge system is shown of Figure 8. A well and pump house are located on Marathon Electric property east and slightly north of the southeast corner of the Marathon Electric manufacturing building. Section B-B' (Figure 10) shows that a 150 foot, 16 inch diameter well with a 60 foot screen would be constructed. A small pump house would be constructed at the well head and a stripping tower would be provided. Approximately 220 feet of buried gravity discharge piping would then extend south across Marathon Electric property to an existing storm sewer manhole. A 42-inch storm sewer drops from the manhole to an out fall at the Wisconsin River shoreline.

ARARs for Alternative 3 are summarized in Table 5. The action would comply with NR 140 requirements. State groundwater quality standards apply to the alternative. Drinking water standards (MCLs) for VOCs can be achieved by treatment of water from CW6 at the City water treatment plant. The highest contaminant concentrations observed in the west side contaminant plume are less than effluent limits, so water quality-based effluent limits can be satisfied. Technology-based effluent limits can be satisfied with the VOC stripping technology. The BAT requirement will be determined by the WDNR during the design phase of the project.

Probable costs for Alternative 3 are summarized in Table 7. Major capital cost items include the extraction well, pump house, stripping tower and foundation, controls and utilities, trenching, piping and piping appurtenances. Major operation and maintenance cost items include energy costs, sampling and monitoring, analytical laboratory services, routine systems inspection and maintenance, and reporting. Capital costs are estimated to be $422,000. The first year operation and maintenance costs are estimated to be $105,000 and annual operation and maintenance costs for subsequent years are estimated to be $81,000. The five-year present net worth (10% discount rate) associated with the above costs is $750,000.

Response objectives would begin to be met shortly after extraction well pumping begins. A design and construction period of less than six months is considered realistic for this action. The time until long-term protection is achieved depends on the time required for CW6 to draw in contaminants from the northern half of the west side contaminant plume and from the shallow groundwater plume caused by the discharge of CW6 into Bos Creek.

SOUTHERN EXTRACTION SYSTEM
SECTION B-B



CROSS SECTION SCALE:(APPROX.)
VERTICAL: 1" = 40'
HORIZONTAL: 1" = 40'

FIGURE 10

TABLE 7
SUMMARY OF PROBABLE COSTS: ALTERNATIVE 3
PHASED FEASIBILITY STUDY
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

CAPITAL COSTS

Item	Cost
Extraction Well	$57,000
Well House and Utilities	$14,000
Well House Piping and Appurtenances	$10,000
Discharge System	$12,000
Stripping Tower, Foundation, Appurtenances	$150,000
Capital Facilities Subtotal	$243,000
Engineering Design (25%)	$61,000
Contract Administration (10%)	$24,000
Legal and Administrative (10%)	$24,000
Capital Subtotal	$352,000
Contingencies (20%)	$ 70,000
Capital Total	$422,000

ANNUAL OPERATION AND MAINTENANCE COSTS

	First Year	Subsequent Years
Water Levels	$ 4,500	$ 3,600
Water Quality	$26,000	$ 8,200
Flow Monitoring	$ 2,700	$ 2,700
Energy	$42,000	$42,000
General O&M Labor	$ 6,000	$ 6,000
Reporting	$ 3,000	$ 2,400
Administration	$ 3,000	$ 2,400
O&M Subtotal	$87,200	$67,300
Contingencies (20%)	$17,400	$13,500
O&M Total	$104,600	$80,800

FIVE-YEAR PRESENT WORTH

Present Worth of Capital (10% discount rate)	$420,000
Present Worth of O & M (10% discount rate)	$330,000
Present Worth Total	$750,000

Implementation of this alternative is not expected to be a problem. The technology is readily available, conventional, and well demonstrated. Construction is straight forward and no unusual features are anticipated to be required for the system. Coordination between U.S. EPA, WDNR, the City of Wausau, and Marathon Electric Company will be required to accomplish implementation of the system.

Alternative 4 - Extraction Wells North and South of Bos Creek

Alternative 4 is essentially a combination of Alternatives 2 and 3. Two extraction wells would be used: one north and one south of Bos Creek. This system would provide plume capture to the north, and source area groundwater removal to the south. Extracted groundwater would be treated at each location and discharged to the Wisconsin River.

Groundwater flow modeling was conducted to evaluate the effects of pumping simultaneously from the northern and southern extraction wells. Well locations are shown on Figure 8. Groundwater flow modeling results indicate two divides in the groundwater piezometric surface would be created in the west side contaminant plume area. One divide would be located between the northern extraction well and CW6, and a second divide would be located between the northern and southern extraction wells. Figure 6d shows the locations of the divides. The northern divide runs approximately east-west and is located between Randolph and Burns streets.

Plume capture would be accomplished such that contaminants in the northern one-third of the plume would be drawn in by CW6. Contaminants in the central portion of the deep west side plume would be captured by the northern extraction well. A portion of the shallow contaminant plume would also be drawn in by this well. Contaminants near the source area and southern portion of the deep west side plume would be captured by the southern extraction well.

As shown on Figure 6d, a large southwest to northeast trending divide in the piezometric surface is located beneath the Wisconsin River. This indicates the extraction system would be effective in controlling the potential migrating of contaminants to the East Well Field.
Comparison of Figures 7c and 7d shows the effect of a shutdown of CW6 for Alternative 4. Figure 7c shows a piezometric surface contour map for the Alternative 4 system with CW3, CW6, CW7, and CW9 pumping at a combined rate of 1437 gpm (11 cfs). Figure 9d shows a corresponding map for Alternative 4 with CW6 off-line and CW3, CW4, CW7, and CW9 pumping at the combined rate of 1437 gpm. With CW6 off-line, the northern extent of influence of the extraction system is shifted a few hundred feet to the north, as indicated by the east-west divide located slightly south of Burns Street. Contaminants located north of this divide would be drawn toward CW7 and CW9.

Conceptual system layouts for the groundwater extraction, treatment, and discharge system are shown on Figure 8. The cross section for the two

TABLE 8
SUMMARY OF PROBABLE COSTS: ALTERNATIVE 4
PHASED FEASIBILITY STUDY
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

CAPITAL COSTS

Item	Cost
Extraction Wells	$112,000
Well Houses and Utilities	$28,000
Well House Piping and Appurtenances	$20,000
Discharge Systems	$30,000
Stripping Towers, Foundations, Appurtenances	$300,000
Capital Facilities Subtotal	$490,000
Engineering Design (25%)	$123,000
Contract Administration (10%)	$49,000
Legal and Administrative (10%)	$49,000
Capital Subtotal	$711,000
Contingencies (20%)	$142,000
Capital Total	$853,000

ANNUAL OPERATION AND MAINTENANCE COSTS

	First Year	Subsequent Years
Water Levels	$ 4,500	$ 3,600
Water Quality	$ 32,000	$ 10,000
Flow Monitoring	$ 3,500	$ 3,500
Energy	$ 84,000	$ 84,000
General O&M Labor	$ 11,000	$ 11,000
Reporting	$ 3,000	$ 2,400
Administration	$ 3,000	$ 2,400
O&M Subtotal	$141,000	$117,000
Contingencies (20%)	$28,000	$ 23,000
O&M Total	$169,000	$140,000

FIVE-YEAR PRESENT WORTH

Present Worth of Capital (10% discount rate)	$ 850,000
Present Worth of O & M (10% discount rate)	$ 550,000
Present Worth Total	$1,400,000

systems are shown on Figures 9 and 10. The details of each system have been discussed previously.

Response objectives would be met shortly after the wells begin pumping. Contaminants not captured by the system would be drawn into CW6.

A design and construction period of less than six months is considered realistic for this action. The time until risks to water consumers are minimized would be the time required for CW6 to draw in contaminants in the plume beyond the influence of the northern extraction well.

ARARs for Alternative 4 are summarized in Table 5. The action will comply with NR 140 requirements. State groundwater quality standards apply to the alternative. Drinking water standards can be met (MCLs) for VOCs by treatment at the City water treatment plant. The highest contaminant concentrations observed in the west side plume are less than effluent limits, so water quality-based effluent limits can be satisfied. Technology-based effluent limits can be satisfied with the VOC stripping technology. The BAT requirement will be determined by the WDNR during the design phase of the project.

Probable costs for Alternative 4 are summarized in Table 8. Major capital cost items include the extraction wells, pump houses, stripping tower and foundation, control systems and utilities, trenching, and piping. Major O&M items include energy costs, sampling and monitoring, analytical laboratory services, routine systems inspection and maintenance, and reporting. Capital costs are estimated to be $853,000. The first year operation and maintenance costs are estimated to be $169,000, and annual operation and maintenance costs for subsequent years are estimated to be $140,000. The five-year present net worth (10% discount rate) associated with the above costs is $1,400,000.

As with Alternatives 2 and 3, implementation is not expected to be a problem. Technologies are readily available and well demonstrated. Coordination between U.S. EPA, WDNR, the City of Wausau, and Marathon Electric would be required to implement the system.

VIII. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In order to determine the most appropriate alternative that is protective of human health and the environment, attains ARARs, is cost-effective, and utilizes permanent solutions and treatment technologies to the maximum extent practicable, alternatives were evaluated against each other. Comparisons were based on the nine evaluation criteria outlined in SARA. A summary of the comparison is provided in Table 9. Following is a discussion of each of the criteria and the alternatives' performance against each of these.

TABLE 9

SUMMARY OF ALTERNATIVES EVALUATION
PHASED FEASIBILITY STUDY
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Evaluation Factor	Alternative 1 No Action	Alternative 2 Northern Extraction Well	Alternative 3 Southern Extraction Well	Alternative 4 North and South Extraction Well
Short-Term Effectiveness	No additional protection of community and workers is required.	Risk to workers during implementation addressed by standard personal protection. Risks to community considered minimal. Production Well CW6 draws in contaminants from northern one-third of west side plume. VOC removal at water treatment plant provides protection of water consumers.	Risk to workers during implementation addressed by standard personal protection. Risks to community considered minimal. Production Well CW6 draws in contaminants from northern one-half of west side plume. VOC removal at water plant provides protection of water consumers.	Risks to workers during implementation addressed by standard personal protection. Risks to community considered minimal. Production Well CW6 draws in contaminants from northern one-third of west side plume. VOC removal at water plant provides protection of water consumers.
	Production Well CW6 draws in contaminants from west side plume indefinitely.			
	VOC removal at water treatment plant provides protection of water consumers.			
	Period of exposure to trace contaminants in treated water from west side plume is longest.	Period of exposure to trace contaminants in treated water is shortest similar to Alternative 4).	Period of exposure to trace contaminants slightly longer than Alternatives 2 or 4.	Period of exposure to trace contaminants in treated water is shortest (similar to Alternative 2).
	Requires longest time for purging aquifer due to lack of active remediation.	Requires longest time for purging aquifer among action alternatives.	Requires intermediate time for purging aquifer among action alternatives (substantially less than Alternative 2).	Requires shortest time for purging aquifer among action alternatives.
	Contaminants drawn away from source by production wells.	Contaminants drawn away from source before capture.	Contaminants captured near source area.	Contaminants captured near and away from source area.
	Migration of contaminants to east well field is likely.	Provides protection against eastward contaminant migration.	Provides best protection against eastward contaminant migration.	Provides best protection against eastward contaminant migration.
Long-Term Effectiveness	Could achieve MCLs and State groundwater standards on west side due to long term purging by municipal Production Wells CW6, (west side) and CW3 (east side).	Can achieve MCLs and State groundwater standards on west side due to purging by Production Well CW6 and northern extraction well.	Can achieve MCLs and State groundwater standards on west side due to purging by Production Well CW6 and southern extraction well.	Can achieve MCLs and State groundwater standards on west side due to purging by Production Well CW6 and two extraction wells.

TABLE 9 (Continued)

SUMMARY OF ALTERNATIVES EVALUATION
PHASED FEASIBILITY STUDY
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Evaluation Factor	Alternative 1 No Action	Alternative 2 Northern Extraction Well	Alternative 3 Southern Extraction Well	Alternative 4 North and South Extraction Well
		High capacity well and discharge system are reliable. Repair or replacement in relatively short time is feasible, should failure occur.	High capacity well and discharge system are reliable. Repair or replacement in relatively short time is feasible, should failure occur.	High capacity well and discharge system are reliable. Repair or replacement in relatively short time is feasible, should failure occur.
		Long term management consists of monitoring water levels, water quality, discharge quantity, and routine maintenance.	Long term management consists of monitoring water levels, water quality, discharge quantity, and routine maintenance.	Long term management consists of monitoring water levels, water quality, discharge quantity, and routine maintenance.
Reduction of Toxicity, Mobility, Volume	None	None	None	None
Implementability	Technical feasibility not relevant, because no additional technologies are used.	Well, treatment and discharge are conventional and readily constructed. Potential future actions are not precluded. System effectiveness and performance are readily monitored.	Well, treatment and discharge are conventional and readily constructed. Potential future actions are not precluded. System effectiveness and performance are readily monitored.	Well, treatment and discharge are conventional and readily constructed. Potential future actions are not precluded. System effectiveness and performance are readily monitored.
	Not administratively feasible because public water supply is threatened with long-term contamination.	Coordination between U.S. EPA and WDNR for plan review and approval. Coordination with local agencies is required. Coordination with PRP group may be required. No apparent administrative difficulties.	Coordination between U.S. EPA and WDNR for plan review and approval. Coordination with local agencies is required. Coordination with PRP group may be required. No apparent administrative difficulties.	Coordination between U.S.EPA and WDNR for plan review and approval. Coordination with local agencies is required. Coordination with PRP group may be required. No apparent administrative difficulties.
	No additional services required.	Required technologies and services are available. Off-site services including POTW and sanitary landfill may be required, and are considered available.	Required technologies and services are available. Off-site services including POTW and sanitary landfill may be required, and are considered available.	Required technologies and services are available. Off-site services including POTW and sanitary landfill may be required, and are considered available.

TABLE 9 (Continued)

SUMMARY OF ALTERNATIVES EVALUATION
PHASED FEASIBILITY STUDY
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Evaluation Factor	Alternative 1 No Action	Alternative 2 Northern Extraction Well	Alternative 3 Southern Extraction Well	Alternative 4 North and South Extraction Well
Cost	No direct monetary cost	Capital $432,000 1st year O&M $105,000 Subsequent Annual O&M $82,000 5-Year Present Worth $760,000 Discount Rate 10%	Capital $422,000 1st Year O&M $105,000 Subsequent Annual O&M $81,000 5-Year Present Worth $750,000 Discount Rate 10%	Capital $853,000 1st year O&M $169,000 Subsequent Annual O&M $140,000 5-Year Present Worth $1,400,000 Discount Rate 10%
Compliance with ARARs	MCLs achieved for municipal water supply.	MCLs achieved for municipal water supply.	MCLs achieved for municipal water supply.	MCLs achieved for municipal water supply.
		complies with NR 140 requirements for response to groundwater contamination.	complies with NR 140 requirements for response to groundwater contamination.	complies with NR 140 requirements for response to groundwater contamination.
	MCLs and State groundwater standards may be achieved in aquifer in long term.	MCLs and State groundwater standards could be achieved in aquifer in long term.	MCLs and State groundwater standards could be achieved in aquifer in long term.	MCLs and State groundwater standards could be achieved in aquifer in long term.
		Effluent standards can be met for contaminants in discharge.	Effluent standards can be met for contaminants in discharge.	Effluent standards can be met for contaminants in discharge.
		Other identified action-specific ARARs related to design, review and approval, construction and monitoring can be met.	Other identified action-specific ARARs related to design, review and approval, construction and monitoring can be met.	Other identified action-specific ARARs related to design, review and approval, construction and monitoring can be met
Overall Protection of Human Health and Environment	MCLS are met by VOC removal at City water treatment plant.	MCLs are met by VOC removal at City water treatment plant.	MCLs are met by VOC removal at City water treatment plant.	MCLs are met by VOC removal at City water treatment plant.
	Period of exposure to trace residual VOCs (after treatment) is maximized.	Provides greatest reduction in period exposure from west side Production Well CW6.	Provides substantial reduction in period of exposure from west side Production Well CW6.	Provides greatest reduction of period of exposure from west side Production Well CW6.
	Continued migration from source to west side and east side well fields.	Contaminants drawn away from source prior to capture.	Contaminants removed form aquifer near source area.	Contaminants removed from aquifer near source area.

TABLE 9 (Continued)

SUMMARY OF ALTERNATIVES EVALUATION
PHASED FEASIBILITY STUDY
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Evaluation Factor	Alternative 1 No Action	Alternative 2 Northern Extraction Well	Alternative 3 Southern Extraction Well	Alternative 4 North and South Extraction Well
	No source area control.	Some potential for contaminant migration to east well field.	Best source area control, minimizing migration to east well field.	Best source area control, minimizing migration to east well field.
	Requires most time to purge contaminants from aquifer by sole reliance on City supply wells.	Reduces time required to purge contaminants from aquifer.	Substantially reduces time required to purge contaminants from aquifer.	Requires least time to purge contaminants from aquifer.
	Likely would not comply with ARARs.	Complies with identified ARARs.	Complies with identified ARARs.	Complies with identified ARARs.
State and Community Acceptance	Likely not acceptable to the State. Specific concerns or preferences to be addressed in the Record of Decision.	Specific concerns or preferences to be addressed in the Record of Decision.	Specific concerns or preferences to be addressed in the Record of Decision.	Specific concerns or preferences to be addressed in the Record of Decision.

1. Short-Term Effectiveness

Each of the alternatives (except No Action) is accompanied by similar short-term risk to workers and the community. These potential risks are associated with exposing contaminated materials from subsurface areas. Alternative 2 uses the area most accessible to the community, but access can be controlled. Alternative 3 would be implemented on private property, but plant workers may be nearby. Access to the construction area can be controlled. Alternative 4 involves both areas. In all three cases, site workers can be protected by personal protection equipment. None of the alternatives are considered to present appreciable risks to populations away from the construction areas, and vapor monitoring can be used during construction.

Response objectives can be met by each of the action alternatives, and the desired hydraulic influence by extraction wells is expected to be realized within several weeks of the start of pumping. The effects of the various systems can be summarized as follows.

* Alternative 1 - provides no active remediation of the aquifer. Contaminants would be drawn to CW6 from the source area. Contaminant migration to the east is also anticipated as a result of CW3 pumping.

* Alternative 2 - provides capture of approximately the southern two-thirds of the west side plume. Contaminants in roughly the northern third of the plume would migrate to CW6. Contaminants would be removed from the aquifer as they are drawn away from the source and are intercepted by the northern extraction well. The northern well is expected to have an influence extending east of the source area, beneath the Wisconsin River, thereby reducing the potential for eastward migration of contaminants.

* Alternative 3 - provides capture of approximately the southern half of the plume. Migration of contaminants to CW6 would also occur under the alternative. The southern extraction well is expected to have a pronounced influence extending beneath the Wisconsin River thereby preventing potential eastward migration more effectively than Alternative 2. Contaminants near the source area would be removed before migrating off-site, although the northern extent of influence (for drawing back contaminants) is less than for Alternative 2.

* Alternative 4 - combines Alternatives 2 and 3. The northern extent of plume capture would be similar to that under Alternative 2. Removal of contaminants and control of migration away from the source would be accomplished as under Alternative 3.

Under each of the alternatives, contaminated water in the northern section of the west side plume would migrate to CW6, and contaminated

water would be treated at the City water treatment plant for removal of VOCs.

Because of the difference among the alternatives in the areas of extraction well influence, the major distinctions among the alternatives are: (1) the time required to achieve protection and (2) control/capture of source area groundwater.

2. Long-Term Effectiveness and Permanence

There are differences in the time required to achieve long-term protection of the public water safety, as discussed above. However, each of the alternatives (including No Action) is expected to achieve low contaminant concentrations (i.e., approaching MCLs and State groundwater standards) as a result of aquifer purging. The long-term residual risks are therefore similar for each of the alternatives, but interim (short-term) risks are different, as discussed above.

The reliability of each of the action alternatives is similar. Large portions of the west side contaminant plume would be captured. The No Action alternative is less reliable, because CW6 is used as the sole protection for the west side wells. Contaminants would also migrate to the East Well Field under the No Action alternative.

The technologies used in each of the alternatives are relatively simple and reliable. Each of the alternatives relies on CW6 initially as the last barrier to additional West Well Field contamination. The consequences of failure would be similar for each of the alternatives, i.e., contaminated water would be drawn toward CW6. In the event of remedy failure, risk to water consumers should be no greater than at present, as long as the City keeps CW6 in operation and maintains VOC removal capabilities at the water treatment plant.

3. Reduction in Toxicity, Mobility and Volume

No reduction in toxicity, mobility, or volume of waste or hazardous substances are achieved by any of the four alternatives. Such reduction of toxicity, mobility, or volume is not cost-effective when compared with the effectiveness and relatively lower cost of an extraction well and air stripping system alone, versus a system which utilizes granular activated carbon to control air emissions, considering the relatively low levels of contaminants to be treated.

4. Implementability

The individual technologies used in each of the alternatives are conventional and well demonstrated. No unusual difficulties in construction of wells or treatment and discharge systems are anticipated. Alternatives 3 and 4 may involve trench excavation through rubble in the

former City landfill, but this does not appear to constitute a substantial disadvantage to these alternatives.

The technologies and services used under each of the alternatives are conventional and similar. Required contractor services for extraction well, treatment system and discharge system construction are similar and available. Each alternative requires a clean water supply for well construction, and compliant off-site facilities for disposal of possible drill cuttings and/or trench spoils, and for treatment and disposal of drilling fluids, if required. Services and materials are considered to be available for each alternative.

Coordination between U.S. EPA, WDNR, the City of Wausau, and, under Alternatives 3 and 4, Marathon Electric, would be required for each of the alternatives. Potential future actions would be possible and effectiveness could easily be monitored with each of the alternatives.

5. Cost

Estimated costs for the alternatives are presented in Tables 6 through 8. Major capital cost items for each alternative include extraction well, pump house, stripping tower and foundation, control systems, utilities, trenching, and piping. Major operation and maintenance items include energy costs, sampling and monitoring, analytical laboratory services, routine systems inspection, and maintenance and reporting. Capital, annual operation and maintenance, and five-year present worth costs (10% discount rate) are summarized in Table 9. Variation in costs of major capital and O&M items do not affect the cost comparison, because similar items are included in each alternative.

6. Compliance with ARARs

As shown in Table 5, the same ARARs were identified for each of the action alternatives. State groundwater standards could be met in the long-term. Drinking water MCLs can be met under each alternative due to water treatment by the air strippers prior to distribution.

Technology-based or water quality-based effluent limitations can be met by each of the action alternatives. Other action-specific ARARs can be met by each of the alternatives. CERCLA exempts on-site actions from permit requirements, but State review of plans will be required.

7. Overall Protection of Human Health and the Environment

Short-terms risk associated with the contaminated water supply can be addressed by treatment for VOC removal at the water treatment plant. The alternatives differ in their ability to capture contaminants and in the time required to achieve long-term protection of the water supply and a

resulting risk reduction. Alternative 2 is less effective than Alternative 3 or 4 in controlling source area contaminants, because Alternative 3 and 4 incorporate source area groundwater removal and Alternative 2 draws contaminants away from the source before they are captured. The time required under Alternatives 2 and 3 would be longer than for Alternative 4. The No Action alternative would require the longest time to achieve long-term protection.

Ultimately, the long-term residual risks are expected to be similar for each of the alternatives. None of the action alternatives are anticipated to have substantial adverse effects on public health or the environment as a result of implementation. Effluent standards can be met to protect surface water quality. Each of the alternatives, except for No Action, complies with ARARs.

8. State Acceptance

The State has expressed favor for Alternative 3 with the provision for implementation of an additional well if Alternative 3 does not achieve response objectives for this operable unit. The State and U.S. EPA will work together in determining whether Alternative 3 is achieving the objectives. A discussion on criteria to be used in evaluating the performance of this remedy is included in Section IX of this document.

9. Community Acceptance

The City of Wausau and Marathon Electric, both of whom are PRPs, have expressed a preference for Alternative 3. However, they have also expressed a desire to implement an alternate treatment technology that meets the technology-based requirements of BAT in the Clean Water Act. The community in Wausau has not expressed a preference for any alternative. Specific comments received during the public comment period and at the public meeting for the proposed plan are addressed in the responsiveness summary included with this document.

Summary of Comparison

Under Alternative 1 (no action), contaminants would be purged only through pumping of CW6. Neither control of eastward contaminant migration nor protection from further west side contamination would be achieved. This alternative is not consistent with the objectives for the interim response action at the site and is therefore not considered a viable option for the site.

Although Alternatives 2, 3, and 4 provide similar results when evaluated against the nine criteria, there are some important differences. Alternative 2 provides the least amount of time in which contaminants will continue to reach CW6, but it requires the longest time for aquifer purging. Under Alternative 4, the amount of time contaminants will

migrate to City Well 6 is the same, however, Alternative 4 requires the least amount of purge time. Alternative 3 has an intermediate time associated with both these factors. Alternative 2 provides less protection against eastward migration than Alternatives 3 and 4, and it results in moving contamination from the source area further into the aquifer before capture by the extraction well.

These two factors, in addition to requiring the longest purge time of the three action alternatives, makes Alternative 2 the least attractive. Between Alternatives 3 and 4, the purge time and costs are the major differences. Because CW6 is acting as a contaminant barrier well in the West Well Field, and the water is treated to safe drinking levels, the small difference in purge time between Alternatives 3 and 4 is not considered to cause any additional long-term health risk. Therefore, because Alterative 4 is twice as costly without providing additional protection, Alternative 3 is considered the cost-effective alternative.

IX. SELECTED REMEDY AND STATUTORY DETERMINATIONS

Section 121 of SARA required that all remedies for Superfund sites be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions and alternate treatment technologies to the maximum extent practicable. Alternative 3, with the modification presented below, is believed to provide the best balance of trade-offs among alternatives with respect to the criteria used to evaluate remedies. The modification includes the implementation of an additional extraction well if Alternative 3 is unable to perform as modelled, thereby failing to meet the response objectives for this operable unit, as outlined earlier. Based on the evaluation of the alternatives, U.S. EPA and the State of Wisconsin believe that Alternative 3 (modified) would be protective, attain ARARs, be cost-effective, and would not be inconsistent with the final remedy at the site. The final remedy will attempt to utilize permanent solutions and alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

The selected remedy entails:

* Installation of an extraction well located in the southern portion of the contaminant plume;

* Implementation of a treatment system for removal of VOCs;

* Discharge of the treated water to the Wisconsin River; and,

* Provision for implementation of an additional well, as necessary.

Determination of whether the initial well meets the response objectives

for this remedial action will be made following start-up of the system. Criteria used in making this determination include:

* The extent of the cone of depression created by pumping of the extraction well;

* The ability of the extraction well to capture the plume;

* The amount of VOCs removed by the system over time; and,

* The system's ability to protect CW7 and CW9 from contaminants, should CW6 fail.

Evaluation of the system will be based on data collected from existing monitoring wells during start-up and after the system achieves steady state conditions in the aquifer.

As stated above, the remedy is considered the most cost-effective remedial action. It complies with Federal and State ARARs. It is protective of human health and the environment by mitigating contaminant movement towards CW6 and by providing protection against operational failure of CW6 or the air stripper currently treating water from CW6. Requirements of Section 121(b)(1)(A-G) which have been determined to be applicable to this operable unit are discussed below. If a particular section is not addressed, it was determined not to be applicable to this operable unit.

1. Protection of Human Health and the Environment

Based on the risk assessment developed for this operable unit, chronic exposure to low levels of VOCs, and contaminant plume migration to the West Well Field are the identified risks associated with the west side contaminant plume. Implementation of an extraction well in close proximity to the source area, and treatment of extracted groundwater under Alternative 3 provides protection to human health and the environment by reducing chronic exposure to low level VOCs and providing additional protection to the west well field from plume migration. An added benefit of this alternative is the capture of contaminants migrating eastward under the Wisconsin River toward CW3.

Additional protection is also provided if Alternative 3 does not perform as predicted. The provision for implementation of Alternative 4 if necessary provides a backup to the southern extraction well in the event that Alternative 3 does not control plume migration in the northern part of the study area.

Implementation of Alternative 3 will not pose any unacceptable short-term risks or cross-media impacts to the site, the workers, or the community.

2. Attainment of Applicable or Relevant and Appropriate Requirements of Environmental Laws

Alternative 3 will be designed to meet all applicable or relevant and appropriate requirements (ARARs) of Federal and more stringent State environmental laws. Table 5 lists the ARARs that apply to each of the action alternatives and the following discussion provides the details of the ARARs that will be met by Alternative 3.

a. Federal: Clean Water Act (CWA)

Discharge of extracted groundwater is subject to the requirements of the Clean Water Act. Ambient Water Quality Criteria (AWQC) for protection of freshwater aquatic organisms related to discharges to surface bodies is an ARAR. General requirements for discharges to surface waters under the Wisconsin Pollutant Discharge Elimination System (WPDES) discharge regulations are also an ARAR.

Treatment of extracted groundwater prior to discharge is an ARAR. Section 301(b)(2) of the Clean Water Act requires the application of Best Available Technology (BAT) economically achievable to treat pollutants prior to discharge. BAT is determined on a case-by-case basis by the WDNR pursuant to Section 402(a)(1) of the Clean Water Act, using guidelines outlined in 40 CFR 125.3.

b. Federal: Safe Drinking Water Act (SDWA)/State: Chapter NR 109 Wisconsin Administrative Code (WAC)

The SDWA and corresponding State standards specifies maximum contaminant levels (MCLs) for drinking water at public water supplies. Since VOCs, and in particular TCE, are regulated under the SDWA MCLs, requirements for achieving MCLs are relevant and appropriate for this remedial action.

c. State: Chapter NR 140 WAC

Wisconsin groundwater protection Administrative Rule, Chapter NR 140 WAC, regulates public health groundwater quality standards for the State of Wisconsin. The enforceable groundwater quality standard for TCE is 1.8 ug/L. Groundwater quality standards as found in NR 140 WAC are ARARs for this remedial action.

d. State: Chapters NR 102 WAC and NR 104 WAC

Chapters NR 102 and NR 104 of the Wisconsin Administrative Code regulate surface water quality standards and discharges of wastewater to surface water, respectively. Under NR 102 WAC, interim values used for establishing effluent limits for the contaminants of concern are TBC (to

be considered), for this remedial action. NR 104 WAC sets effluent limits and classifies surfaces waters in the State of Wisconsin.

e. State: Chapter NR 112 WAC

Chapter NR 112 WAC addresses well construction and pump installation for extraction wells which withdraw 70 gpm or greater. Requirements under this regulation will be addressed during the design phase of the remedial action. Additional action-specific ARARs pertaining to construction of the remedy will also be addressed during design. These include, but are not limited to, ILHR 81-84 WAC, ILHR 50-53 WAC, and IND 1 and 6 WAC.

f. State: Chapters NR 200, 217, and 219 WAC

These chapters of the Wisconsin Administrative Code cover discharge permit applications, effluent limitations, and monitoring and reporting requirements for discharge activities to surface water bodies in the State. All substantive technical requirements under these regulations will be met for this remedial action.

3. Cost-effectiveness

Alternative 3 affords a high degree of effectiveness by providing protection from chronic low level exposure of TCE for production wells CW3 and CW6, as well as providing protection from plume migration in the West Well Field. Alternative 3 is the least costly alternative that is protective of human health and the environment. Therefore, Alternative 3 is considered to be the most cost-effective alternative that is protective.

4. Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

U.S. EPA and WDNR believe the selected remedy is the most appropriate alternative for meeting the response objectives for this operable unit. All of the alternatives evaluated (except No Action) provide adequate protection from chronic exposure to low levels of TCE and protection from plume migration. Alternative 2 does not effectively provide protection from TCE migration to the East Well Field, nor does it provide for capture of contaminants at the source area. Alternatives 3 and 4 are comparable with respect to the nine criteria with the exception of purge time and costs. Because CW6 is acting as a contaminant barrier well for the northern portion of the plume, and the water is treated to safe drinking levels through an existing air stripper, the small difference in purge time between the two does not cause any appreciable additional health risk. Therefore, because Alternative 4 is twice as costly without

providing additional protection, Alternative 3 is the preferred alternative.

Extraction of the contaminated groundwater in the vicinity of the source area will eliminate additional loading of contaminants to the aquifer and will extract contaminants in the groundwater. This action will be consistent with a final remedy to permanently restore the sole-source aquifer. Air stripping of extracted water prior to discharge is an appropriate treatment considering the low levels that are expected to be found and released via the air. The treatment system will be determined by the WDNR during the design phase of the project. Therefore, the selected remedy provides the best balance of trade-offs with respect to the nine criteria and represents the maximum extent to which permanent solutions and treatment are practicable. The final remedy will attempt to utilize permanent solutions and alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

5. Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment which permanently and significantly reduces toxicity, mobility, or volume of hazardous substances as a principal element is not satisfied. Treatment of extracted groundwater to reduce toxicity, mobility, or volume would seem to be desirable to satisfy the statutory preference. However, treatment of contaminants which permanently and significantly reduces toxicity, mobility, or volume of hazardous substances was not found to be practicable or cost-effective within the limited scope of this operable unit.

RESPONSIVENESS SUMMARY: WAUSAU GROUNDWATER CONTAMINATION SITE
WAUSAU, WISCONSIN

PURPOSE

This responsiveness summary is developed to document community involvement and concerns during the development of the phased feasibility study (PFS) for the Wausau Groundwater Contamination site, Wausau, Wisconsin. Comments received during the public comment period were considered in the selection of the operable unit remedial action for the site. The responsiveness summary serves two purposes: It provides U.S. EPA with information about community preferences and concerns regarding the remedial alternatives, and it shows members of the community how their comments were incorporated into the decision-making process.

This document summaries the oral comments received at the public meeting held October 17, 1988, and the written comments received during the public comment period of October 3 to October 24, 1988.

OVERVIEW

The preferred alternative for the Wausau Groundwater Contamination (Wausau) site was announced to the public just prior to the beginning of the public comment period. The preferred alternative includes:

* Installation of a groundwater extraction well in the vicinity of the source of the West Well Field contaminant plume;

* Treatment of the extracted water; and,

* The discharge of the treated water to the Wisconsin River; and

* A provision for implementation of an additional well, as necessary.

Judging from the comments received during the public comment period, all parties support the extraction of contaminated groundwater from the West Well Field. However, concern has been expressed over the type of treatment system to be used prior to discharge to the Wisconsin River.

SUMMARY OF PUBLIC COMMENTS AND AGENCY RESPONSES

The public comment period was held from October 3 to October 24, 1988 to receive comments concerning the draft phased feasibility study (PFS). Because of the similarities, individual comments have been summarized and grouped where appropriate.

A. Comment: The Mayor of Wausau, the Wausau City Council President, and Marathon Electric Corporation have all expressed concern regarding the type of treatment system to be utilized for removal of Volatile Organic Compounds (VOCs) from the extracted groundwater. Each party indicated that they favor the implementation of a passive volatilization system for treating VOCs, rather than a forced-air stripping system, because of cost considerations.

A. Response: As discussed in the PFS and the Record of Decision (ROD) for this operable unit remedial action, the Clean Water Act (CWA) requires treatment of the extracted groundwater for VOC removal prior to discharge*. This requirement is not based on effluent limits, but rather on the availability of treatment technologies to remove contaminants prior to discharge.

The responsibility for regulating discharges under the CWA has been delegated to the State. Therefore, the type of treatment that would satisfy the BAT requirement will be determined by the Wisconsin Department of Natural Resources (WDNR) during the design phase of the project. U.S. EPA conservatively proposed an air stripper for treatment of VOCs in the PFS and ROD only for the purposes of cost-estimation, in order to comply with BAT requirements. However, another type of treatment system may also meet the BAT requirement. The effectiveness of a passive system for treating VOCs will be evaluated by the WDNR during the design phase of the project.

B. Comment: Wausau Chemical Corporation recommended that the proposed remedial action be implemented such that the contaminants found on the east side of the Wisconsin River are not pulled to the west side due to pumping of the proposed extraction well. It further recommended that the remedy must reduce or minimize the existing migration of contamination from the west side sources(s) to the East Well Field.

B. Response: The consideration of this comment is embodied in the selection of Alternative 3, in that this alternative is expected to have a substantial impact on eastward migration of TCE. Pumping of the extraction well, as outlined in the PFS, is not expected to induce East Well Field contaminant migration to the West Well Field. Modelling performed during the phased feasibility study supports this conclusion. Furthermore, water level monitoring will be performed during start-up and subsequent operation of the system to ensure that the desired performance is attained. Any adverse impacts will be corrected as necessary.

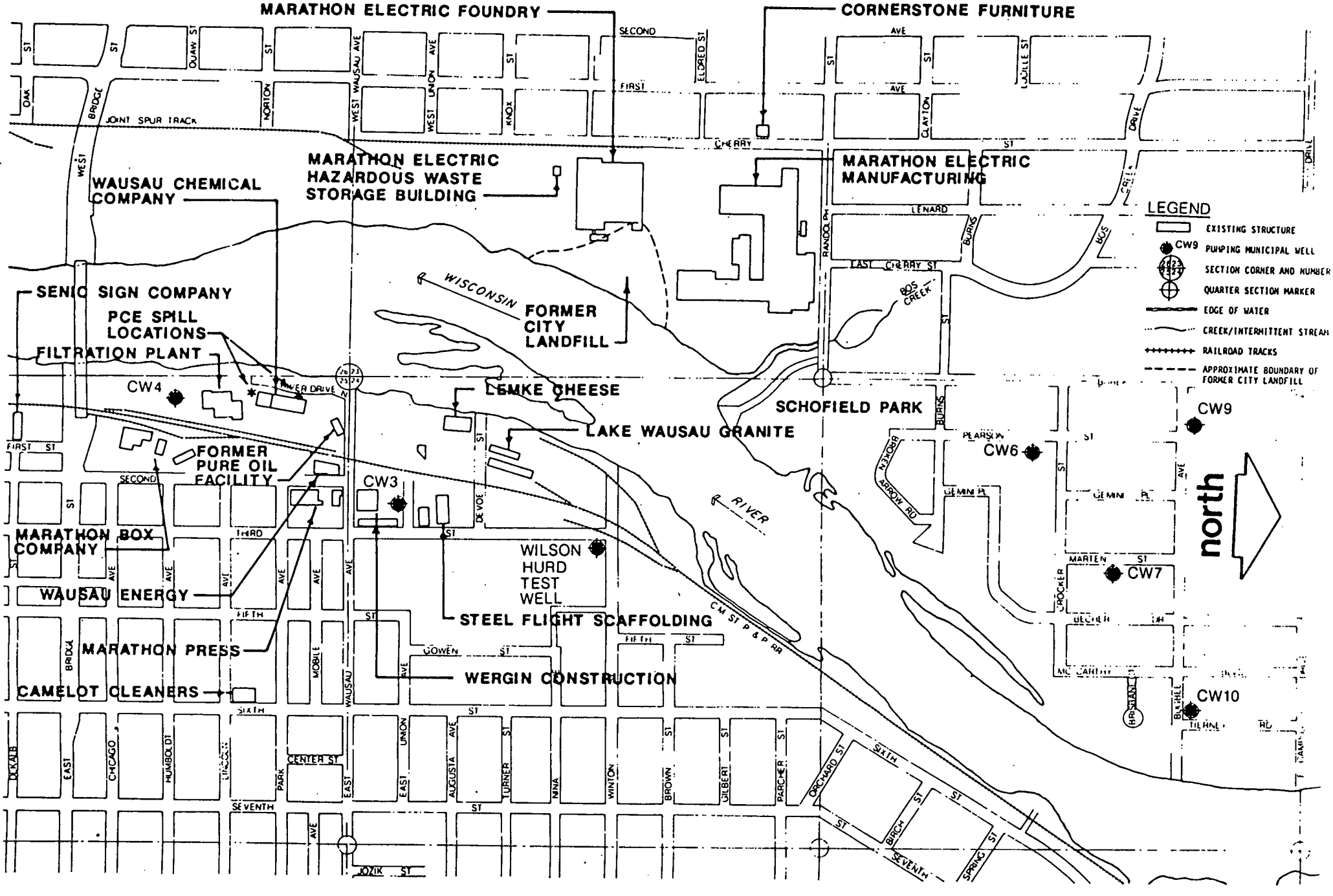
*The regulation may be summarized as follows: For any discharge of contaminants to surface water bodies, the Best Available Technology (BAT) for treatment of that contaminant that is readily available and not cost-prohibitive should be applied prior to discharge of that water.

C. Comment: Marathon Electric Corporation requested that the ROD allow U.S. EPA to approve the use of extracted water as a non-contact coolant in Marathon Electric's foundry operations.

C. Response: Since the above use of the water was not considered in the feasibility study, U.S. EPA would not specifically address this request in the ROD. Approval for this type of action would be required from the WDNR through issuance of a discharge permit, and thus the decision will be made during the design phase of the project.

D. Comment: The City of Wausau and Marathon Electric Corporation have pointed out the fact that they offered to implement (a variation of) the preferred alternative over a year ago and are concerned with the apparent lack of action taken so far by U.S. EPA.

D. Response: At the time of the proposal, U.S. EPA felt the action was premature due to identified data gaps regarding contamination plumes and source areas. Specifically, the location of the source(s) for the West Well Field contaminant plume and the occurrence of TCE migration beneath the Wisconsin River had yet not been identified. Furthermore, U.S. EPA was required to evaluate protective, cost-effective remedies prior to undertaking remedial action at Superfund sites. At the time of the proposal, no development or evaluation of alternatives had been completed. The data gaps have now been narrowed, and U.S. EPA feels that it is prudent to go forward with the implementation of Alternative 3 (modified).



LOCATION OF MUNICIPAL WELLS & INDUSTRIAL SURVEY BUSINESSES

FIGURE 3

APPENDIX 4

SCOPE OF WORK FOR THE FINAL REMEDIAL DESIGN AND REMEDIAL ACTION WORK PLAN AT THE WAUSAU GROUNDWATER CONTAMINATION SITE, WAUSAU, WISCONSIN

I. PURPOSE

The purpose of this Scope of Work (SOW) is to implement the final Remedial Design/Remedial Action (final remedy) for the Wausau Groundwater Contamination Site (site) as embodied in the final Record of Decision (ROD) which was signed by the Regional Administrator on September 29, 1989. The U.S. EPA Superfund Remedial Design and Remedial Action Guidance, the final and interim Records of Decision, the approved final Remedial Design/Remedial Action (RD/RA) Work Plan, any additional guidance provided by U.S. EPA, the Consent Decree and this Scope of Work shall be followed in designing and implementing the final remedy at the Wausau site.

II. DESCRIPTION OF THE FINAL REMEDY

The final remedy entails:

- Installation of soil vapor extraction (SVE) systems to remove Volatile Organic Compounds (VOCs) in soils at each of the three identified source areas;

- Treatment of off-gases from the SVE operation using vapor phase carbon units which shall be regenerated at an off-site RCRA approved site;

- Implementation of Monitoring Program;

- Groundwater remediation utilizing specified pumping rates of the municipal supply wells in order to expedite removal of the groundwater contaminant plumes affecting these wells;

- Groundwater remediation utilizing specified pumping rate of the operable unit extraction well(s), with provision for addition of a second operable unit extraction well, if necessary;

- Treatment of groundwater utilizing existing City air strippers and operable unit extraction well treatment system.

The standards and specifications of the components of the final remedy for the Wausau site shall be designed and implemented by

the Settling Defendants as described below and as approved by U.S. EPA in consultation with the State:

A. **Installation of Soil Vapor Extraction (SVE) Systems at Identified Source Areas.**

The SVE systems shall entail a network of wells, screened within the unsaturated soils and finished just below the water table, at the identified source areas of contaminated soils. The systems shall be designed to meet the Performance Standards listed in Paragraph 12 of the Consent Decree, and shall remove contaminated soil vapors from the soils, using the extraction well array and vacuum process to be specified in the approved final design submittal. Settling Defendants shall operate the SVE systems until the Cleanup Standards set forth in Paragraph 12.B. of the Consent Decree are met, as directed by U.S. EPA in consultation with the State, in order to eliminate loading of contaminants from soils to groundwater.

B. **Treatment of Off-Gas Vapors from SVE Systems.**

Extracted soil vapors from the SVE systems shall be treated using vapor phase activated carbon. Carbon units shall be included as part of each SVE system and carbon shall be regenerated off-site at a RCRA approved facility, in order to achieve removal and destruction of the contaminants in the soil at source areas. Air emissions from the systems shall comply with all applicable air quality standards, including those set by WAC NR 445.

C. **Implementation of Monitoring Program.**

The monitoring program shall be designed to detect changes in the chemical concentration of contaminants in the groundwater and soils at the site. Monitoring shall include collection and laboratory analysis of samples from monitoring wells and from soils located within the site area, as directed by U.S. EPA, in consultation with the State. The exact monitoring wells and soil sample locations to be included in the monitoring program and parameters to be analyzed will be specified by U.S. EPA in consultation with the State.

D. **Operation of Existing Municipal Wells as a Groundwater Extraction System and Utilization of Existing Municipal Air Strippers as Treatment for Extracted Water.**

The groundwater extraction system shall include City Wells (CWs) 3 and 6. Pumping rates of these wells shall be approved by U.S. EPA, in consultation with the State, and the wells shall be operated such that the wells completely

capture and remove contaminated groundwater from the site, as approved by U.S. EPA, in consultation with the State. Extracted groundwater shall be pumped to the existing air strippers for removal of contaminants to the Cleanup Standards required by Paragraph 12 of the Consent Decree, prior to discharge to the water supply system.

E. **Operation of Operable Unit Groundwater Extraction Well(s) with Treatment System for Extracted Water.**

The final remedy shall include completion of design, implementation, operation and maintenance of the operable unit extraction well/treatment system, as directed in the approved final RD/RA Work Plan. Provisions shall be made in the final RD/RA Work Plan for implementation of a second operable unit extraction well, if such is determined to be necessary by U.S. EPA, in consultation with the State. Treatment of extracted groundwater shall be performed, as approved by U.S. EPA in consultation with the State. Settling Defendants shall operate the operable unit extraction well(s) until the Cleanup Standards set forth in Paragraph 12 of the Consent Decree are met, as determined by U.S. EPA in consultation with the State.

III. SCOPE

The final RD/RA Work Plan shall include the Project Plans listed in paragraph III.A. below (Task I), and shall address the performance of the Work listed in paragraphs III.B., C. and D. below (Tasks II, III, and IV), as outlined in Section IV of this SOW:

A. **Task I: Project Plans**

1. Description and Qualifications of Personnel
2. Health and Safety Plan
3. Quality Assurance Project Plan
4. Monitoring Program Plan, addressing:
   a. SVE
   b. Municipal Wells
   c. Operable Unit Well(s)
5. Project Schedule for Completion of Tasks

B. **Task II: Remedial Design**

1. Design Plans and Specifications
2. Operation and Maintenance Plan
3. Cost Estimate
4. Construction Schedule
5. Construction Quality Assurance Plan
6. Community Relations

C. **Task III: Final Remedy Construction**

1. Construction Quality Assurance (CQA) Program Plan:
   a. Responsibility and Authority
   b. Construction Quality Assurance Personnel Qualifications
   c. Inspection Activities
   d. Documentation
2. Implementation of CQA Program Plan

D. **Task IV: Reports**

1. Progress
2. Draft
3. Final
4. SVE Completion Report

Settling Defendants may utilize and submit previously approved operable unit plans (from the interim RD/RA work plan) as part of the required final RD/RA Work Plan submittals, where applicable and appropriate. Any such previously approved operable unit plans are subject to U.S. EPA modification and must be re-approved by U.S. EPA, in consultation with the State.

IV. RD/RA Work Plan Contents

Settling Defendants shall prepare and submit an RD/RA Work Plan which includes the project plans described in paragraph IV.A. below (Task I), and which describes how Settling Defendants will accomplish the Work prescribed in paragraphs IV.B., C., and D. below (Tasks II, III, and IV)

A. Task I: PROJECT PLANS

The Settling Defendants shall prepare, and submit according to the schedule set forth at Section V below, Project Plans which shall describe and document the overall management strategy for performing the design, construction, operation, maintenance and monitoring of the final remedy.

The Project Plans shall include:

A1. Description and Qualifications of Personnel

Settling Defendants shall describe and document the responsibility and authority of all organizations and personnel involved with the implementation of the final remedy, including a description of qualifications of personnel directing the final remedy, including contractors and contractor personnel.

A2. Health and Safety Plan

The Settling Defendants shall submit a Health and Safety Plan to address the activities to be performed at the site to implement the final remedy. The Health and Safety Plan developed for the operable unit extraction well(s) may be made a part of the final Health and Safety Plan, to the extent applicable.

A3. Quality Assurance Project Plan (QAPP)

The Settling Defendants shall prepare a QAPP for final remedy sampling, analysis and data handling. The QAPP shall be consistent with the requirements of the U.S. EPA Contract Lab Program (CLP) for laboratories proposed outside the CLP. At a minimum, the QAPP shall include the following:

a. Statement of Purpose
b. Project Description
c. Project Organization and Responsibility
d. Sampling Procedures and Objectives
e. Sample Custody and Document Control
f. Calibration Procedures and Frequency
g. Analytical Procedures Data Reduction, Validation, Assessment and Reporting
h. Internal Quality Control Checks and Frequency
i. Performance System Checks and Frequency
j. Preventive Maintenance Procedures and Frequency
k. Data Precision, Accuracy and Completeness Assessment Procedures
l. Corrective Action
m. Quality Assurance Reporting

A4. Monitoring Program Plan

Settling Defendants shall submit detailed monitoring plans describing the type, frequency and schedule for monitoring of the final remedy. The monitoring plan shall address groundwater, soil gas, and air monitoring for each of the components of the final remedy (e.g. 1. SVE, 2. Municipal Wells, and 3. Operable Unit Well(s)).

A5. Project Schedule for Completion of Tasks

The Settling Defendants shall develop a Project Schedule for construction and implementation of the final remedy which identifies timing for initiation and completion of all tasks. Settling Defendants shall specify dates for completion of the final remedy and major interim milestones.

B. Task II: REMEDIAL DESIGN

The Settling Defendants shall prepare and submit the plans and specifications listed below, in order to implement the final remedy at the site, according to the schedule in Section V of this SOW. Settling Defendants shall assure general correlation between drawings and technical specifications, such being a basic requirement of any set of working construction plans and specifications. Before submitting the design plans and specifications, prior to the 95% prefinal design submittal, the Settling Defendants shall:

* Coordinate and cross-check the specifications and drawings; and

* Perform complete proofing of the edited specifications and required cross-checking of all drawings and specifications.

Additionally, the Settling Defendants shall prepare, and include in the technical specifications, contractor requirements for providing appropriate service visits by experienced, qualified personnel to supervise the installation, adjustment, startup and operation of the treatment systems, and training covering appropriate operational procedures once the startup has been successfully accomplished.

B1. Contents of Design Plans

The Remedial Design Plans and Specifications shall include, at a minimum:

a. Design Plans and Specifications

The Settling Defendants shall develop clear and comprehensive design plans and specifications which include but are not limited to the following:

i. Discussion of the design strategy and the design basis, including how Settling Defendants will achieve:

   I. Compliance with all applicable or relevant environmental and public health standards; and

   II. Minimization of environmental and public impacts.

ii. Discussion of relevant technical factors including:

   I. Use of currently accepted environmental control measures and technology;

   II. The constructability of the design; and

III. Use of currently acceptable construction practices and techniques.

iii. Description of assumptions made and detailed justification of these assumptions;

iv. Discussion of the possible sources of error and listing and discussion of possible operation and maintenance problems;

v. Detailed drawings of the proposed design including;

I. Qualitative flow sheets; and

II. Quantitative flow sheets.

vi. Tables listing equipment and specifications;

vii. Tables giving material and energy balances;

viii. Appendices including;

I. Sample calculations (one example presented and explained clearly for significant or unique design calculations);

II. Derivation of equations essential to understanding the report; and

III. Results of laboratory and field tests.

Settling Defendants shall submit Design Plans and Specifications, completed to the degree of completion, at each of: 1. 30% completion of design; 2. 60% completion (if required by U.S. EPA); 3. 95% of completion; and 4. 100% of completion.

b. Operation and Maintenance Plan

The Settling Defendants shall prepare an Operation and Maintenance Plan which shall assure both implementation and long term operation and maintenance of the final remedy. At a minimum, the plan shall be composed of the following elements:

i. Description of normal operation and maintenance (O&M), including;

I. Description of tasks for operation;

II. Description of tasks for maintenance;

III. Description of prescribed treatment or operation conditions; and

IV. Schedule showing frequency of each O&M task.

ii. Description of potential O&M problems, including;

I. Description and analysis of potential O&M problems;

II. Sources of information regarding problems; and

III. Description of remedies to be implemented to resolve O&M problems.

iii. Description of routine monitoring and laboratory testing, including;

I. Description of monitoring tasks;

II. Description of required laboratory tests and their interpretation;

III. Required Data Collection, Quality Assurance Plan; and

IV. Schedule of monitoring frequency and dates;

iv. Description of alternate O&M, including;

I. In event of partial or total failure of the final remedy, alternate procedures which shall be implemented to prevent undue hazard; and

II. Analysis of vulnerability and additional resource requirements should partial or total failure occur.

v. Corrective Action;

I. Description of corrective actions to be implemented in the event that the final remedy fails in part or whole, and/or if groundwater action levels are exceeded; and

II. Schedule for implementing these corrective actions;

vi. Safety plan;

I. Description of precautions, of necessary equipment, etc., for site personnel; and

II. Safety tasks required in event of systems failure.

vii. Description of equipment; and

I. Equipment identification;

II. Installation of monitoring components;

III. Maintenance of site equipment; and

IV. Replacement schedule for equipment and installed components.

viii. Records and reporting mechanisms required.

I. Daily operating logs;

II. Laboratory records;

III. Records for operating costs;

IV. Mechanism for reporting emergencies;

V. Personnel and maintenance records; and

VI. Monthly/annual reports to State agencies.

A Draft Operation and Maintenance Plan shall be submitted simultaneously with the Prefinal Design submittal (95% completion of Design). Settling Defendants shall revise the Draft Plan as directed by U.S. EPA, in consultation with the State, and shall submit a Final Operation and Maintenance Plan simultaneously with the Final Design submittal (at 100% completion of design).

c. Cost Estimate

The Settling Defendants shall develop cost estimates for the purpose of assuring that the Settling Defendants have the financial resources necessary to construct and implement the final remedy. The cost estimate developed in the Feasibility Study (August 1988) shall be refined to reflect the more detailed/accurate design plans and specifications being developed. The cost estimate shall include both capital and operation and maintenance costs.

An Initial Cost Estimate shall be submitted simultaneously with the Prefinal Design submittal (95% completion) and the

Final Cost Estimate shall be submitted simultaneously with the Final Design submittal (100% completion).

d. Construction and Operation Schedule

The Settling Defendants shall develop a Construction and Operation Schedule for construction and implementation of the final remedy which identifies timing for initiation and completion of all tasks. Settling Defendants shall specify dates for construction and operation of the final remedy and shall specify major interim milestones.

A Draft Schedule shall be submitted with the Prefinal Design submittal (95% completion of design) and a revised Final Schedule shall be submitted with the Final Design submittal (100% completion)

e. Construction Quality Assurance Objectives

The Settling Defendants shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation. These objectives shall be discussed in the Prefinal and Final Design Submittals.

B2. Design Phases

Settling Defendants shall prepare and submit the plans outlined in paragraph IV.B.1.a-e. above as follows:

a. Preliminary Design Plan

The Settling Defendants shall submit the Preliminary Design submittal when the design effort is 30% complete. At this stage, the Settling Defendants shall have verified the existing conditions of the site. The Preliminary Design submittal shall reflect a level of effort such that the technical requirements of the project have been addressed and outlined so that they may be reviewed to determine if the Final Design will provide an operable and usable final remedy. Supporting data and documentation shall be provided with the design documents defining the functional aspects of the program. The preliminary construction drawings submitted by the Settling Defendants shall be organized and clear. The scope of the technical specifications shall be outlined in a manner reflecting the

final specifications. The Settling Defendants shall include with their preliminary submission, design calculations reflecting the same percentage of completion as the designs they support.

b. Intermediate Design Plan

At the discretion of the U.S. EPA, in consultation with the State, a design review may be required at 60% completion of the project. Settling Defendants shall submit an Intermediate Design Plan which shall include the same elements as the Prefinal Design Plan.

c. Prefinal Design and Final Design Submittal

i. Prefinal Design submittal

The Settling Defendants shall submit the Prefinal Design Submittal at 95% completion of design (i.e., prefinal). After U.S. EPA, in consultation with the State, approves of the Prefinal Design submittal, the Settling Defendants shall incorporate the required revisions and submit a complete Prefinal Design Submittal, including reproducible drawings and specifications.

The Prefinal Design submittal shall consist of the Design Plans and Specifications, Draft Operation and Maintenance Plan, Initial Capital and Operating and Maintenance Cost Estimate, Draft Construction and Operation Schedule, Draft Quality Assurance Project Plan and Draft Health and Safety Plan.

ii. Final Design Submittal

The Settling Defendants shall submit the Final Design Submittal at 100% completion of design. The Final Design submittal shall consist of the Final Design Plans and Specifications, the Final Construction Cost Estimate, the Final Operation and Maintenance Plan, Final Quality Assurance Project Plan, the Final Project Schedule and Final Health and Safety Plan

The quality of the design documents shall be such that the Settling Defendants would be able to include them in a bid package and invite contractors to submit bids for the construction project.

B3. Additional Studies

The final remedy may require additional studies to supplement the available technical data. At the direction of the U.S. EPA, in consultation with the State, for any such studies required by U.S. EPA, the Settling Defendants shall furnish all services, including field work as required, materials, supplies, physical plant, labor, equipment, investigations, studies and superintendence. Sufficient sampling, testing and analysis shall be performed to optimize the required treatment and/or disposal operations and systems. There shall be an initial meeting of all principal personnel involved in the development of the program. The purpose will be to discuss objectives, resources, communication channels, roles of personnel involved and orientation to the site, etc. Settling Defendants shall submit an interim report which shall present the results of the testing with the recommended configuration of the final remedy (including alternative options). A review conference shall be scheduled after the interim report has been reviewed by U.S. EPA and all interested parties. Settling Defendants shall also submit a final report of the testing which shall include all data taken during the testing, a summary of the results of the studies, and a discussion of the results.

B4. Community Relations Support

A community relations program will be implemented jointly by the U.S. EPA and the Wisconsin Department of Natural Resources (WDNR). The responsible parties shall cooperate with the U.S. EPA and the WDNR, participate in the preparation of all appropriate information disseminated to the public, and in public meetings that may be held or sponsored by the U.S. EPA or the WDNR to explain activities at or concerning the site, including the findings of the RI/FS.

Community relations support will be consistent with Superfund community relations policy as stated in the "Guidance for Implementing the Superfund Program" and "Community Relations in Superfund - A Handbook".

C. TASK III: FINAL REMEDY CONSTRUCTION

C1. Preparation of Construction Quality Assurance Program Plan

Following U.S. EPA approval, in consultation with the State, of the Final Design submittal, the Settling Defendants shall develop and implement a construction quality assurance (CQA) program to ensure that the completed final remedy meets or exceeds all design criteria, plans and specifications. The CQA plan is a site specific document which shall be submitted to the U.S. EPA for approval, in consultation with the State,

prior to the start of the construction. At a minimum, the CQA plan shall include the elements which are summarized below:

a. Responsibility and Authority

The responsibility and authority of all organizations (i.e. technical consultants, construction firms, etc.) and key personnel involved in the construction of the final remedy shall be described fully in the CQA plan. The Settling Defendants shall identify a CQA officer and the necessary supporting inspection staff.

b. Construction Quality Assurance Personnel Qualifications

The qualifications of the CQA officer and supporting inspection personnel shall be presented in the CQA plan and shall demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities.

c. Inspection Activities

The observations, tests and inspections that will be used to monitor the construction and/or installation of the components of the final remedy shall be summarized in the CQA plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with the environmental requirements and include, but not be limited to, inspection of air quality and emissions monitoring records, solid and hazardous waste disposal records (including RCRA transportation manifests), etc. The inspections shall also ensure compliance with all health and safety procedures. In addition to oversight inspections, the Settling Defendants shall conduct the following activities:

i. Preconstruction Inspection and Meeting

Prior to initiation of construction activities and as directed by U.S. EPA, in consultation with the State, the Settling Defendants shall conduct a Preconstruction Inspection and Meeting to:

I. Review methods for documenting and reporting inspection data;

II. Review methods for distributing and storing documents and reports;

III. Review work area security and safety protocol;

IV. Discuss any proposed modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and

V. Conduct a site walk-around to verify that the design criteria, plans and specifications are understood and to review material and equipment storage locations.

The Preconstruction Inspection and Meeting shall be documented by a designated person and minutes shall be transmitted to all Parties to the Consent Decree.

ii. Prefinal Inspection

Upon preliminary construction completion, Settling Defendants shall notify U.S. EPA and the State to conduct a Prefinal Inspection. The Prefinal Inspection shall consist of a walk-through inspection of the entire site area. The inspection is to determine whether the final remedy construction is complete and consistent with the contract documents and the U.S. EPA approved final remedy. Any outstanding, incorrect or incomplete construction items discovered during the inspection shall be identified, noted, and rectified by Settling Defendants.

Additionally, equipment shall be operationally tested by Settling Defendants. The Settling Defendants shall certify that the equipment will function as designed and that all specifications have been met. Settling Defendants shall correct deficiencies and initiate and complete retesting, as directed by U.S. EPA, in consultation with the State. The Settling Defendants shall submit a Prefinal Inspection Report within thirty (30) days of the prefinal inspection which shall document all outstanding, incorrect, or incomplete construction items, actions required to resolve these items, completion date for these items, and shall set a date for the Final Inspection.

iii. Final Inspection

Upon completion of all outstanding construction items, the Settling Defendants shall notify U.S. EPA and the State to conduct a Final Inspection. The Final inspection shall consist of a walk-through inspection of the site area. The Prefinal Inspection Report shall be used as a checklist for the Final Inspection, including the outstanding construction items identified in the Prefinal Inspection. Settling

Defendants shall certify that all outstanding items have been resolved.

d. Documentation

Reporting requirements for CQA activities shall be described in detail in the CQA plan. This shall include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records shall be presented in the CQA plan.

C2. Implementation of CQA Program Plan

Upon U.S. EPA approval, in consultation with the State, of the CQA Plan, the Settling Defendants shall construct and implement the final remedy in accordance with the approved design, schedule and the CQA plan.

D. TASK IV: Reports

The Settling Defendants shall prepare plans, specifications, and reports as set forth in Tasks I through Task IV to document the design, construction, operation, maintenance, and monitoring of the final remedy . The documentation shall include, but not be limited to, the following:

D1. Progress

The Settling Defendants shall, at a minimum, provide the U.S. EPA and the State, with signed, monthly progress reports during the design and construction phases and monthly progress reports for operation and maintenance activities containing:

a. A description and estimate of the percentage of the final remedy completed;

b. Summaries of all findings;

c. Summaries of all approved changes made in the final remedy during the reporting period;

d. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;

e. Summaries of all problems or potential problems encountered during the reporting period;

f. Actions being taken to rectify problems;

g. Changes in personnel during the reporting period;

h. Projected work for the next reporting period; and

i. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

D2. Draft Plans and Reports

a. The Settling Defendants shall submit a draft final remedy RD/RA Program Plan as outlined in Task I;

b. The Settling Defendants shall submit Draft Construction Plans and Specifications, Design Reports, Cost Estimates, Schedules, Operation and Maintenance plans, and Study Reports as outlined in Task II;

c. The Settling Defendants shall submit a Draft Construction Quality Assurance Program Plan and Documentation as outlined in Task III; and,

d. At the completion of the construction of the final remedy, the Settling Defendants shall submit a Draft Construction Completion Report to the U.S. EPA and the State. The Construction Completion Report shall document that the final remedy construction is consistent with the design specifications. The Report shall include, but not be limited to the following elements:

i. Synopsis of the final remedy and certification of the design and construction;

ii. Explanation of any proposed and/or U.S. EPA approved modifications to the plans and why these are/were necessary for the project;

iii. Results of all pilot and/or field tests/studies, site monitoring, and certification that the final remedy will meet or exceed the Performance Standards.

iv. Listing of the Performance and Clean-up Standards.

v. Explanation of the operation and maintenance and monitoring to be undertaken at the site.

D3. Final Plans and Reports

a. Finalization of Plans and Reports

As directed by U.S. EPA in consultation with the State, the Settling Defendants shall finalize all submissions, including the final RD/RA Work Plan, Construction Plans and Specifications, Design Reports, Cost Estimates, Project Schedule, Operation and Maintenance Plan, Study Reports, Construction Quality Assurance Program Plan/Documentation and the Construction Completion Report, incorporating U.S. EPA comments received on draft submissions.

b. Draft Completion of Final Remedy Report

No later than fourteen years from start-up of the final remedy (unless otherwise directed by U.S. EPA in consultation with the State), Settling Defendants shall submit a Draft Completion of Final Remedy Report, which shall document the completion of the final remedy. At a minimum, the Draft Report shall document that all Performance and Clean-up Standards have been achieved by the final remedy. Settling Defendants shall conduct any additional activities needed to complete the final remedy, as directed by U.S. EPA in consultation with the State.

c. Final Completion of Final Remedy Report

Settling Defendants shall incorporate U.S. EPA comments and modifications to the Draft Completion of Final Remedy Report, and shall perform all required additional activities as directed by U.S. EPA in consultation with the State. Upon completion of these additional activities and as directed by U.S. EPA in consultation with the State, Settling Defendants shall submit a Final Completion of Final Remedy Report, which shall document that the final remedy for the site has been fully completed.

d. SVE Completion Report

In accordance with paragraph 12.B.2., and as set forth in paragraph 12.B.2.f., Settling Defendants shall submit to the U.S. EPA and the State a Notification of Completion of SVE Work and an SVE Report for each SVE component which Settling Defendants believe has been completed. U.S. EPA, in consultation with the State, shall review the Report, direct additional sampling (if necessary), and provide comments to Settling Defendants. Settling Defendants shall incorporate U.S. EPA comments, and any additional data gathered, into the Report and shall resubmit the Report, if and as directed by U.S. EPA in consultation with the State.

V. Submission Summary

A summary of the information reporting requirements contained in this SOW is presented below:

Submission	Due Date
- RD/RA Work Plan (Contents listed at SOW Section III.A., B., C., & D. and described in SOW Section IV.A., B., C. & D.)	
* Draft RD/RA Work Plan (Task I & Description of Tasks II, III and IV)	60 days after the lodging date of the Consent Decree
* Final RD/RA Work Plan (Completed Task I Project Plans & Description of Tasks II, III and IV)	30 days after receipt of EPA comments on Draft RD/RA Work Plan
- Design Phases & Task II.A. Submittals (See SOW Section IV.B.)	
* Preliminary Design (30% completion)	60 days after submittal of Final Work Plan
* Intermediate Design (60% completion)	90 days after submittal of Final Work Plan
* Prefinal Design (95% completion)	180 days after submittal of Final Work Plan
* Final Design (100% completion)	30 days after EPA comment on Prefinal Design Plan
- Remedial Design Tasks II.B through II.E (SOW Section IV.B.)	
* Draft Submittals (Draft O & M Plan, Draft	Concurrent

Cost Estimate, Draft Construction Schedule, Draft QAPP)	with Prefinal Design Submittal
* Final Submittals	Concurrent with Final Design Submittal
- Additional Studies	
* Additional Studies: Interim Report	As required by EPA
* Additional Studies: Final Report	30 days after EPA comment on Interim Report
* Draft Construction Quality Assurance Plan (Task III)	30 days after approval of Final Design Submittal
* Final Construction Quality Assurance Plan	30 days after EPA comment on Draft Construction Quality Assurance Plan
* Preconstruction Inspection and Meeting	Within 30 days (minutes and notes) of Inspection and Meeting
* Prefinal Inspection Report	30 days after Prefinal Inspection
* Draft Construction Completion Report	30 days after EPA comment on Prefinal Inspection Report
* Final Construction Completion Report	30 days after EPA comment on Draft

	Construction Completion Report
* Draft Completion of Final Remedy Report	Upon completion of final remedy, but no later than 14 years from start-up, or as otherwise directed by EPA
* Final Completion of Final Remedy Report	30 days after EPA comment on Draft Completion of Final Remedy Report
* SVE Completion of Work Report(s)	When Settling Defendants believe SVE work has been completed at a particular source area
Progress Reports for Tasks I through IV	MONTHLY
Progress Reports During Operation and Maintenance	MONTHLY

*All due dates are subject to modification at EPA direction or upon EPA approval.