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WAUSAU GROUND WATER CONTAMINTION SITE

CIVIL LITIGATION REFERRAL

Received from EPA on 12/8/87

WAUSAU CHEMICAL CORPORATION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:

25 NOV 1987

5RA-14

MEMORANDUM

SUBJECT: Recommended Concurrence on Referral of a Section 107 CERCLA Cost Recovery Action involving the Wausau Ground Water Contamination Site, Wausau, Wisconsin

FROM: Valdas V. Adamkus
Regional Administrator

TO: Thomas L. Adams
Assistant Administrator for Enforcement
and Compliance Monitoring

I recommmend that a case involving the Wausau Ground Water Contamination Site be referred for filing pursuant to Section 107 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. §9601, et. seq., (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, 100 Stat. 1613 (1986)(SARA), to recover $459,718.14 in costs incurred by the United States.

A. NATURE OF THE CASE

This case involves the recovery of CERCLA funds expended to perform an emergency immediate removal in the City of Wausau Wisconsin. In June of 1984, U.S. EPA was requested to assist the City of Wausau in removing VOC's, which were contaminating the municipal drinking water supplies. U.S. EPA installed a Calgon Granular Activated Carbon (GAC) system on one of three contaminated wells to provide an interim water supply, and then installed an air stripper at the Wausau Water Treatment Plant as a long-term interim measure. The removal action also involved investigatory tasks designed to delineate and identify the sources of the VOC's. The removal was completed in December 1984 or early January 1985. A fund lead RI/FS is currently underway.

The investigations produced solid evidence of contribution to the contamination problem on the part of Wausau Chemical Corporation; however, no other PRP's were clearly implicated by the investigations. Thus, only Wausau Chemical Corporation (W.C.C.), and its president, chief executive officer, sole owner, James

Cherwinka, are being pursued. Demand was served on W.C.C. on November 9, 1987.

B. CAUSE OF ACTION

U.S. EPA's authority to bring this action is based upon Section 107 of CERCLA, which imposes liability upon the owner or operator of a facility for all costs of removal or remedial actions incurred by the United States pursuant to Section 104, where there is a release or threatened release of a hazardous substance.

C. PROPOSED REMEDY

The remedy for recovery of funds expended pursuant to Section 104 of CERCLA is a cost-recovery action under Section 104 of CERCLA.

D. ISSUES OF NATIONAL OR PRECEDENTIAL SIGNIFICANCE

This case involves at least two issues of possible national and precedential significance.

First, the retroactive applicability of SARA's §113(g) 3-year statute of limitations may be at issue here, since this removal was completed in either December 1984 or January 1985. Filing of this action by December 1, 1987, should eliminate this affirmative defense. Filing after December 1 may risk that CERCLA §113(g) will operate to bar this action, should the court decide that SARA was intended to apply retroactively to pre-SARA removals.

Second, the end date of a removal may be put at issue here, due to the fact that the date is crucial to determining when CERCLA §113(g) statute of limitations is triggered. Currently, December 1, 1984, is the assumed end date, based on the on-site contractor's demobilization date. However, documentation exists which may allow a later end date to be assigned, based on the date the tasks called for in the Scope of Work are completed. (This date is approximately January 3, 1985, based on the final Pollution Report (POLREP) from the On-Scene Coordinater). The significance is that, if this case is adjudicated, a precedent may be set in regard to what a court will consider the end date for a removal, thus possibly cutting off recovery on other pre-SARA removals approaching the possible CERCLA §113(g) 3-year limitation period.

E. REGIONAL CONTACT PERSON

Felipe N. Gomez is assigned to this case for the Office of Regional Counsel. He may be contacted at FTS 886-6833. Robert Bowden is the supervisor of Briand Wu, who was the On-Scene Coordinator of the site (Mr. Wu is no longer with the Agency). Mr. Bowden can be reached at FTS 886-6236.

Valdas V. Adamkus

Attachment

cc: Roger Marzulla
Acting Assistant Attorney General
Land and Natural Resources Division
United States Department of Justice
Washington, D.C.

Patrick J. Fielder
United States Attorney
Western District of Wisconsin

# CIVIL LITIGATION REPORT

## Wausau Ground Water Contamination Site
## Wausau, Wisconsin

Prepared by: Felipe N. Gomez
Office of Regional Counsel
U.S. EPA - Region V
FTS 886-6833

COVER PAGE

I. Region: U.S. EPA - Region V
District: Western District of Wisconsin
Statute:

The Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. §9601, et. seq., (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, 100 Stat. 1613 (1986)(SARA).

II. Defendants:

A. Wausau Chemical Corporation, formely Wausau Chemical Company

B. James Cherwinka, President, Sole Owner, and Operator of Wausau Chemical Corporation

III. Site Name and Location:

Wausau Ground Water Contamination Site, Wausau, Wisconsin

IV. Regional Contacts:

Frank Rollins - FTS 886-4663 (CES)
Felipe N. Gomez - FTS 886-4663 (ORC)
Robert Bowden-FTS 886-6236(ERT)

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I. Synopsis of the Case.

Wausau is a central Wisconsin metropolis of approximately 60,000 city and suburban residents. (Figure 1) In 1982 carcinogenic volatile organic contaminants (VOC's) were detected in three of Wausau's six drinking water wells. City wells 3, 4 and 6 were found to be contaminated by carcinogens tetrachloroethlene (PCE), trichloroethene (TCE) and dichloroethlyne (DCE). (Figures 2 and 3).

During the summer of 1982, in an effort to determine the extent of the contamination problem, the city of Wausau installed seven monitoring wells around city well #3. Although the city took well 4 off-line and blended wells 3 and 6 with uncontaminated wells 7 and 9, tap water was still found to contain unacceptable levels of VOC's (Figure 4).

Contamination of Wausau's water supply continued unabated through 1983 and into 1984. The city continued to blend contaminated water from wells 3 and 6 with clean water from wells 7 and 9 to meet demand. As of the spring of 1984, the City of Wausau, therefore, was faced with the prospect of meeting water demands by continuing to blend contaminated water with uncontaminated water to dilute concentrations.

Prospects of successfully meeting demands during mid-summer peak periods using only the uncontaminated wells 7 and 9 was entirely dependent upon actual use. It was anticipated that contaminated wells would have to be frequently employed to meet demand, especially

since the pumping system of clean well 7 appeared to be in a deteriorated state and would likely require repair. This repair activity would require that the entire city water demand be met by uncontaminated well 9 blended with contaminated wells 3 and 6.

Due to high levels of VOC's in wells 3 and 6 and the distribution system, wells 3 and 6 were taken off line during the early part of June 1984. Since municipal well 4 was already off line due to VOC contamination, removal of wells 3 and 6 from the distribution system created a problem for the city of Wausau to meet average daily water requirements of approximately 5 million gallons per day.

The existing water treatment facilities provided only a marginal level of VOC reduction and did not consistently keep VOC levels in the distribution system safely below health advisory levles at all times.* Recognizing that high summer demand and increased use of well 3 combined with the increased contaminant levels in well 3 would very likely reduce the chance of keeping the VOC level below health advisory levels, the city decided to take emergency action by requesting an emergency removal action.

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*During this time frame, findings of the National Academy of Sciences Carcinogen Assessment Group (CAG) established a draft health advisory concentration of 28 ppb for volatile organic compounds ($10^{-5}$ excess cancer risk rate) in potable water.

Wausau Chemical Corporation, due to documented spills of PCE, evidence of VOC contamination beneath the facility, and the TAT team's documentation of a VOC plume extending from the facility into city well #4, has been identified, along with W.C.C. president owner and operator James Cherwinka, as a PRP. Solid evidence has not been adduced which would strongly implicate any other entities, although it is known that there are other contaminant sources besides W.C.C. The relief sought here is restitution for $459,718.14 of CERCLA funds expended for the removal, plus any additional costs incurred due to the W.C.C. releases.

II. Information Identifying the Defendants.

A. Wausau Chemical Corporation.

1. Name: Wausau Chemical Corporation, formerly Wausau Chemical Company.

2. Type of Operation: Bulk storage, reclamation, manufacture(?) and sale of bulk solvents and chemical compounds.

3. Dates of Operation: 1962 to present

4. Date of Incorporation: January 1, 1962

5. State of Incorporation: Wisconsin

6. Legal Counsel: Raymond Krueger, of the Milwaukee firm of Charne, Glasser, Tehan, Clancy and Taitleman. (414) 273-2000.

B. James Cherwinka.

1. Born: 1934

2. Previous Empoyer: Klenzade Products, Inc. Beloit, WI.

3. Education: B.S. Chemical Engineering-University of Wisconsin.

4. Positions: President, CEO, Treasurer, 100% owner

5. Theory of Liability: (See Attachment G)

III. Statutory Authority

U.S. EPA's authority to bring a cost-recovery action against the Wausau Chemical Corporation (formerely Wausau Chemical Company of Wausau, Wisconsin, for the cleanup of releases from the W.C.C. facility is based upon Section 107(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601, et seq., (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, 100 Stat. 1613 (1986) (SARA), which provides:

> Notwithstanding any other provisions or rule of law, and subject only to the defenses set forth in subsection (b) of this section -
>
> (1) the owner and operator of a . . . facility
>
> (2) any persons who at the time of disposal of any hazardous substance owned or operated any facility at which such hazardous substrances were disposed of, from which there is a release, or a threatened release which causes the incurrence of response costs, of a hazardous substance, shall be liable for -
>
> (A) all costs of removal or remedial action incurred by the United States Government . . . not inconsistent with the national contingency plan; . . .

U.S. EPA's authority to respond to the emergency condition which was presented at the Wausau Ground Water Contamination Site is provided by Section 104(a)(1) of CERCLA:

> Whenever (A) any hazardous substance is released or there is a substantial threat of such a release into the environment, or (B) there is a release or substantial threat of relase into the environment of any pollutant or contaminant which may present an imminent and substantial

> danger to public health or welfare, the President is authorized to act, consistent with the national contingency plan, to remove or arrange for the removal of, . . . such hazardous substance, pollutant, or contaminant at any time . . .
>
> or take any other response measure consistent with the national contingency plan which the President deems necessary to protect the public health or welfare or the environment . . . When the President determines that such action will be done properly and promptly by the owner or operator of the facility . . . or by any other responsible party, the President may allow such person to carry out the action, conduct the remedial investigation, or conduct the feasibility study in accordance with Section 122.

## IV. Description of Defendant's Business and Pollution Source.

### A. Facility Description.

The Wausau Chemical Corporation (W.C.C.) is located at 2001 North River Drive, Marathon County, Wausau, Wisconsin.

The W.C.C. property extends from East Wausau Avenue on the north, to the City of Wausau Water Treatment Plant on the south. W.C.C. is bounded on the east by the C.M. St. P & P Railroad and on the west by North River Drive. (fig 5).

#### 1. Background.

Wausau Chemical Corporation is a small business enterprise wholly owned by James Cherwinka operating within a small market area of central Wisconsin. The Company was established in 1962. W.C.C. purchased all captial stock of American Cleaning Supplies, Inc. of Milwaukee in June 1983: this company's assets and liabilities were consolidated into

W.C.C. on September 1, 1985 and the Milwaukee location is now a branch of W.C.C. Another branch is located at 13137 W.Glendale Avenue, Butler, WI.

2. Type of Business.

W.C.C. conducts two primary operations. First, W.C.C. acts as a transfer station for collection and shipment of waste chemicals and solvents from area business to reclamation or incineration facilities. Secondly, W.C.C. is a distributor of chemicals and solvents to area dry cleaners and other businesses. The distribution activities involve repackaging and sale of bulk and reclaimed solvents to approximately 1,000 customers.

W.C.C. filed a RCRA Generator Notification in August, 1980, which indicated hazardous substance generation greater than 100 kg but less than 1000 kg per month. No waste designation was provided in the notification.

3. Description of Premises.

W.C.C. consists of a large single floor metal framed building on a concrete slab foundation. Four loading docks are located on the east side of the building. Drum storage areas are located on the east and south sides of the building. Several storage tanks are located near the southeast corner of W.C.C. Offices are located in the southwest portion of the building.

B. Source of Pollution and Environmental Harm

1. Sources.

File information indicates that soil excavations conducted for the Wausau water treatment plant expansion in 1975 encountered soils contaminated by PCE, TCE, Toluene, and Xylene along the south side of the W.C.C. property. Apparently, this was the first discovery of the VOC's on or near the W.C.C. property. The Wisconsin Department of Natural Resources (WDNR) requested that W.C.C. remove the contaminated soil, however, it does not appear that any action was taken by W.C.C. to comply with the WDNR request.

At least two spills have been documented at the W.C.C. property. On February 15, 1983, approximately 135 gallons of Tetrachloroethylene (PCE) was released to the ground when a valve broke on a tank. (Attachment A) On December 19, 1983, approximately 800 gallons of PCE was released to the ground when a storage tank located south of the main building experienced a valve malfunction. (Attachment B). There have been unconfirmed reports of a large spill of unidentified chemicals prior to 1983 at the W.C.C. facility and of a small 1986 release.

Several other sources of contamination must exist in the area, since contamination was detected in city well #6, upgradient and across the river from W.C.C. However, analytical data available to date is insufficient to clearly delineate

other sources of contamination. A review of RCRA files is under way and may produce documentation of other releases in the area.

2. Contaminant Characteristics.

The characteristics of the contaminant of concern, Tetrachloroethylene (PCE-Molecular weight: 166, specific gravity: 1.46, solubility: 150 mg/l), , are of particular importance to understanding the interaction between PCE and ground water. A key characteristic of PCE is that it biodegrades into the other two contaminants found in Wausau groundwater, Tricloroehtylene (TCE-MW: 131, SG: 1.46, Sol: 160 mg/l) and Dichloroethylene(DCE-MW: 97, SG: 1.27, Sol: 350-630 mg/l)

The parent compound, PCE, undergoes a biodegradational transformation after entering the anaerobic subsurface environment. PCE degrades to TCE, TCE subsequently degrades to DCE, and DCE then degrades to form the end product of the chlorinated ethane series, Vinyl Chloride. Thus, the presence of TCE and DCE in ground water can be attributed to a release of a single parent compound, PCE. Consequently, the presence of TCE and DCE in Wausau's ground water can be attributed, in part, to W.C.C.'s releases of PCE.

A second important characteristic of the chlorinated ethanes is that their transport behavior is largely controlled by the parameters of specific gravity and solubility. Contaminants with a specific gravity greater than 1 and low solubility (PCE and TCE) will tend to sink to the bottom of the aquifer, while contaminants

with lower specific gravity (Xylene and Toluene) and and higher solubility (TCE) will will tend to float on the top of the aquifer. This trend is somewhat inhibited by vertical gradients in the ground water which tend to suspend some of the heavier contaminants. The importance of this characteristic is that monitoring wells at shallow depths may not detect the lower lying, heavier contaminants, while wells screened at depth may miss the floating, lighter contaminants.

3. Environmental Harm.

The City of Wausau Water supply wells #3 and #4 lie north and south respectively of the W.C.C. property and are vulnerable to contamination from W.C.C. sources. Water samples taken from the City of Wausau water supply wells #3, #4 and #6 indicated significant concentrations of Carcinogenic VOC's PCE, TCE, and DCE. Analyses of City of Wausau drinking water also indicated high levels of VOC's. VOC's are still being detected in the ground water.

The VOC's of concern, all of which are carcinogens or suspected carcinogens, and their health effects are:

- Tetrachloroethylene (PCE); Routes of exposure include inhalation, ingestion and direct contact; causing damage to the liver, kidneys, eyes upper respiratory system and central nervous system.

- Tricloroethylene (TCE); routes of exposure include inhalation, ingestion, direct contact, causing damage to the respiratory system, heart, liver, kidneys, central nervous system and skin.

- 1, 2, trans-dichloroethylene (DCE); routes of exposure include inhalation, ingestion and direct contact, causing damage to the respiratory system, eyes and central nervous system.

- Xylene; routes of exposure include inhalation, absorption, ingestion and direct contact, causing damage to the central nervous system, gastrointestinal tract, blood, liver, kidneys and skin.

- Toluene; routes of exposure include inhalation, absorption, ingestion and direct contact causing damage to the central nervous system, liver, kidneys and skin.

The presence of VOC's in the soils and groundwater of the Wausau area pose risks to various aquatic and terrestrial species. Assessment of risks to such species is difficult due to limited environmental monitoring data within the Wausau area. The presence of VOC's in the city drinking water posed an unacceptable risk of both short and long term harm to humans, animals and plants.

C. Removal Action.

The U.S. EPA, Region V, was informed of the water supply problem in late May or early June of 1984. The U.S. EPA, through the Technical Assistance Team (TAT) contractor, Rov F. Weston Inc., Northbrook Illinois, immediately conducted an assessment of the situation. The TAT site assessment confirmed a potential threat to residents dependent upon the Wausau water supply and as a result, the U.S. EPA initiated an immediate removal under CERCLA.

U.S. EPA's first objective in the emergency action was to implement measures that would assure an uninterrupted supply of uncontaminated water to the residents of Wausau until an air stripper was designed, tested, and on-line at the Wausau water treatment plant. Toward this end, U.S. EPA, through CERCLA funding, installed a granular activated carbon (GAC) treatment system on municipal well 6. (City Well 6 was selected because of its high yield capacity, needed to supplement demand, and accessibility for GAC Retrofitting.) The filtration system consisted of four contact vessels, each containing 20,000 lbs. of granular activated carbon. The carbon vessels operated in parallel and were capable of treating 1.8 million gallons per day (mgd) for a period of six months.

The activity was undertaken on June 20, 1984, and the units were on-line by July 2, 1984. The GAC units successfully

operated until October 29, 1984, when the air stripper began operation in August 1984.

The EPA's second objective under the CERCLA immediate removal was to characterize the extent of the ground water contamination, identify potential contamination sources, and evaluate ground water rehabilitation alternatives. The EPA tasked the TAT to develop and implement a hydrogeologic investigation of the Wausau ground water problem in June of 1984. This study, initiated on June 20, 1984, was undertaken in several phases, as follows:

Phase I

- Initiate an investigative study.
- Conduct a seismic refraction survey to map the bedrock configuration and characterize the aguifer configuration.

Phase II

- Conduct an industrial survey to identify potential users and /or source areas.
- Survey past and present landfills.
- Identify possible source areas using monitoring wells.
- Sample river sediments of VOC's
- Monitor contaminant concentrations in ground water.

The results of this study are, in large part, the basis of the government's evidence for this action.

D. Remedial Action.

Wausau groundwater contamination site is currently on the National Priority List of Superfund sites, and a RI/FS is underwav, to be completed in 1989.

V. Administrative and Enforcement History.

In 1975, WDNR requested that W.C.C. remove the contaminated soils found during the excavation for the expansion of the Wausau water treatment plant. W.C.C. apparently never complied with this request. In 1982 or 1983, WDNR requested and W.C.C. performed contaminated soil removal and installation of the 'B' series monitoring wells. In 1983, WDNR ordered the City of Wausau to resolve the VOC contamination. In 1984, Wausau called in the U.S. EPA.

Due to the imminent and substantial endangerment to the public caused by VOC's in the potable water supply, U.S. EPA conducted the removal action without initially conducting a responsible party search. As part of the removal action an industrial survey was conducted to determine PRP's. W.C.C. was notified by U.S. EPA of its potential liability at the Wausau Ground Water Contamination Site by letter dated December 2, 1985. In the letter, U.S. EPA notified W.C.C. of the proposed RI/FS to be conducted at the Site. U.S. EPA gave W.C.C. the opportunity to voluntarily undertake the RI/FS.

Three months of negotiations failed to produce a good faith offer by the PRPs. In September, 1987, U.S. EPA initiated the

Wausau Ground Water Contamination Site RI/FS. It does not appear that W.C.C. was offered an opportunity to perform the removal, due in great part to the emergency situation.

VI. Required Elements of Proof and Evidence.

A. Elements of Proof.

The elements of proof necessary to bring a cost recovery action under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), are

1. A release or threatened release . . .

2. Of a hazardous substance . . .

3. From a facility . . .

4. That caused the incurrence of response costs . . .

5. Which were expended by the United States in a manner not inconsistent with the National Contingency Plan (NCP).

Upon a showing of proof of these elements, the United States can fix liability upon those persons designated in Section 107(a)(1)-(4) of CERCLA, 42 U.S.C. § 9607(a)(1)-(4): current owners or operators, past owners or operators, generators and transporters.

B. Application of Elements to Facts of Case.

1. Release or threatened release

CERCLA § 101(22) defines releases, and includes the leaching of hazardous substance into oil or groundwater and the leaking of hazardous substances from tanks, pipelines, or

drums. At least two and possibly three actual releases have been documented at the Wausau Chemical Corporation (W.C.C.) facility which can be argued to have contributed to Wausau's drinking water contamination problem.

During a May 1975 expansion of Wausau's water treatment plant, analysis of soil samples from W.C.C. property indicated high levels of PCE, TCE, xylene and toluene. (See Attachment C, "TAT report" p. 43.) Documents substantiating this incident are now being sought and would be a subject for discovery.

The second and third incidents invoice documented PCE releases. Approximately 135 gallons of PCE was spilled from a tank's broken valve on February 15, 1983. (Attachment A). Approximately 800 gallons of PCE was spilled on December 19, 1983. (Attachment B). Apparently, some remedial action was taken; However, groundwater wells installed by W.C.C., as well as U.S. EPA and other wells (fig. 5), confirmed the presence of VOC contaminated ground water beneath the facility. (figs. 6 & 7).

These contaminants are migrating from the north and south ends of the W.C.C. facility and are being drawn into city drinking water well 4 and possibly well 3. (Attachment C, pp. 49 and 53). Furthermore, the TAT team observed a possible threatened release at the W.C.C. facility in that W.C.C.'s bulk storage tanks and diked perimeter appeared to be structually inadequate. Additionally, visual observations identified stained soils in or near a drum storage area.

2. Of a Hazardous Substance.

CERCLA § 101 (14), 42 U.S.C. § 6904 (14) and 40 CFR § 302.4 describe hazardous substances. All contaminants of concern are wihtin §101(14)'s definition of hazardous substances.

3. From a facility.

CERCLA 101(a), 42 U.S.C. 6901(a) defines 'facility' and clearly includes the W.C.C. property as such.

4. Caused incurrence of response costs.

CERCLA § 101 (23) defines removals. Response costs include, inter alia, investigations, sampling, removal studies, monitoring and the time required to identify the nature and extent of a release or threatened release and the corresponding damage to public health or welfare of the environment. Response costs also include provision of an alternate water supply where existing supply is contaminated or threatened with contamination. Response costs clearly have been incurred here.

The TAT investigation, as noted above, definitively found that W.C.C. was causing contamination of city well 4, and possibly well 3. Thus, W.C.C.'s documented releases of PCE's, and other probable releases, can be said to have contributed to the Wausau drinking water contamination problem, at least in part, and thus W.C.C. 'caused' the incurrence of at least some response costs. Here $459,718.14 is being sought as restitution. (Attachment D-Cost Summary)

5. 'Not inconsistent with the NCP.

The on-scene co-ordinator, Brian Wu (no longer with U.S. EPA) and the TAT personnel have assured cost-effectiveness and have performed the removal in a non-arbitrary or capricious manner and will attest to the fact.

6. 'Attributable to owner/operator of the facility.

W.C.C. owned the property upon which the documented and suspected spills occured at all relevant times. W.C.C. was and is wholly owned by its president and operator, James Cherwinka. Thus W.C.C. and James Cherwinka are the owners and operators of the W.C.C. facility and are jointly and severally liable for all response costs not inconsistent with the NCP.

C. Evidence of Violation.

Evidence of violation in this case is substantial concerning W.C.C., but is somewhat lacking for other possible defendants. Evidence includes eyewitness accounts and testimony, analytical results from U.S. EPA and other investigations, documents existing at WDNR, the city of Wausau and in U.S. EPA files, and documented costs.

1. Eyewitness accounts.

a. U.S. EPA personnel.

On Scene Coordinator (OSC) Brian Wu, although no longer with the agency, could be expected to give accounts of and testify to the need for and efficacy of the U.S. EPA removal response action.

b. Technical Assistant Team (TAT).

Members of U.S. EPA's contractors, who performed the various response activities, could be expected to testify favorably on behalf of the agency. Roy F. Weston, Inc. was the prime contractor, in association with ICF, Inc., Jacobs Engineering, Inc., and Terra Tech, Inc. Although the activity was over 3 years ago, recollection should not be a major problem.

c. WDNR personnel.

Wisconsin state personnel directly involved with the removal action offer a further pool of possible eyewitnesses, especially as to W.C.C.'s past practices and operational history.

d. City of Wausau Personnel.

Local personnel can also be expected to testify as to the existence of a drinking water problem and the success of the subsequent U.S. EPA removal, as well as to possible releases.

e. Local Citizens.

The local citizenry could also be expected to testify to the existence of a drinking water problem and the success of the subsequent U.S. EPA removal, as well as to possible releases.

2. Analytical results

a. TAT report.

The September 1985 Roy F. Weston report (attachment C) is a comprehensive, solid investigation for which chain of custody forms and other evidentiary documents are readily available.

This document will be introduced as evidence in support of the response action and can be expected to be of major import proving W.C.C.'s liability.

b. WDNR Data.

If in existence, WDNR sampling data could also be introduced, assuming proper authentication is available.

c. W.C.C. Data:

It may be possible to introduce W.C.C.'s own data to prove the existence of a release from W.C.C. as well as to show groundwater contamination beneath the facility. WDNR may possibly also have the data as a result of split sampling events.

d. City of Wausau.

It is likely that data is available from the city which would be useful in proving U.S. EPA's case.

3. Documents.

U.S. EPA hazardous waste notification forms, manifests, inspection reports, correspondence and the spill reports will be available to bolster the government's assertions of liability, causation and cost effectiveness

4. Cost Documentation.

Cost documentation is attached. (attachment D). Notice of demand was made on W.C.C. on November 9, 1987 by certified mail (Attachment E).

D. Evidence of Environmental Harm.

In this case, the mere presence of carcinogenic VOC's, at levels up to nearly three times the allowable limits, in drinking water at the tap is prima facie evidence of a grave threat of harm to human health and the environment.

E. Discovery.

Discovery would be somewhat laborious in this case due to a potentially voluminous documentary file. However, discovery of W.C.C. documents and evidence should be highly fruitful. The only targets of discovery are W.C.C. and James Cherwinka.

F. Favorable evidence.

1. Evidence favorable to violator.

W.C.C. is actually somewhat favored by a lack of evidence regarding direct causation between W.C.C.'s release and Wausau's drinking water contamination. However the evidence against W.C.C. is fairly substantial and is sufficient to at least swing the burden of proving non-connectin to W.C.C.

2. Evidence favorable to government.

As noted above, the documented W.C.C. PCE spills in 1983, past WDNR enforcement action and evidence of groundwater contamination beneath the W.C.C. facility strongly favors the government's position.

H. Government witnesses.

See Section VI B. above.

I. Defense witnesses. As usual in a battle of experts case, defendant will be able to counter our expert testimony;

however, the documentary evidence which will be or is in USEPA possession should be adequate to overcome expert defense witnesses.

J. Resource needs: Substantial expenditures of time can be expected, as defendant will most likely refuse settlement. If W.C.C. files bankruptcy, resource needs would be reduced.

VII. Relief Requested.

The Region requests that this matter be referred to the Department of Justice for commencement of a cost recovery action pursuant to Section 107 of CERCLA, 42 U.S.C. § 9607. The relief requested is judgment for the United States for the costs incurred at the site, plus court costs and attorney fees. A Complaint is appended as Attachment F.

VIII. Anticipated Issues.

A. Possible Defenses.

1. No release occurred at W.C.C. facility.

While this argument will probably be made by defendant, it cannot stand in the face of the government's substantial documentation and eyewitness testimony available to contradict such an assertion.

2. If release did occur at W.C.C. facility, it did not cause the incurrence of response costs.

Here defendant would essentially argue that the government lacked sufficient evidence to show W.C.C.'s release as the proximate cause of the contamination in Wausau's water supplies. As stated in Section VI. above, the U.S. has technical experts and analytical and historical documentation which can closely link W.C.C.'s releases to Wausau contamination. Furthermore,

it has been held that the doctrine of proximate cause does not apply to CERCLA. Violet v. Picillo, 25 Env't Rep. Cas. at 1329 (D. R.I. 1986).

Additionally, case law exists which would allow the government to counter with the argument that indirect proof is sufficient. The government's argument would be based on analogy to generator case law. In general, response cost case law involves situations where a particular site is cleaned up, and owners and other parties responsible for on-site wastes are held liable. In the instant case, the situation is clouded by the fact that W.C.C.'s contaminated site was not the focus of the response action. However, it should be sufficient for the U.S. to show that the same substances were involved in both the W.C.C. spills and also the contamination in the City of Wausau water supply.

This showing is analogous to the prima facie case for generator liability which, in addition to the first four elements cited in section VI. A., above, requires only a showing that hazardous substances like those of the generator were present at the 'site'. U.S. v. Wade, 577 F. Supp. 1236 (E.D. PA. 1983), U.S. v. Conservation Chemical Co., 619 F. Supp. 177 (W.D. Mo. 1985).

Here, the 'site' is the Wausau drinking water supply, namely the wellfield beneath the city. The substance spilled in 1983 by W.C.C. was PCE, thus, detection of either PCE, DCE and TCE in city wells 3, 4 and 6, as well as detection in various other nearby monitoring and private wells indicates that W.C.C. contributed to a release which caused incurrence of response costs. (See Attachment C and figures 3, 4 and 6 for

data).

A related issue applicable here is the question of indivisible harm. Clearly, it would be impossible to apportion, to a reasonable degree of certainty, responsibility between W.C.C. and other potential sources of contamination. However, CERCLA liability is joint and several where harm is indivisible. New York v. Shore Realty Corp., 759 F.2d 1032, 1043 (2d Cir. 1985); U.S. v. Miami Drum Services, Inc., 25 Env't Rep. Cas. at 1474; U.S. v. A & F Materials. 592 F. Supp. 842 (S.D. Ill 1984). Harm has been held indivisible where, due to commingling, it will be difficult, if not impossible, to prove who is responsible for a leak. U.S. v. A & F Materials 582 F. Supp. 842. These principles would be useful both in our prima facie case as well as a rebuttal to a claim of lack of 'proximate cause' or lack of sufficient evidence to prove W.C.C.'s § 107 liability.

3. The response action was inappropriate or unjustified.

This contention is easily refuted by the fact that city water was highly contaminated by PCE and it's degradational sub-compounds, DCE and TCE. Considerable evidence is available to the government to substantiate the need for the response action, as discussed in Section VI. above.

4. Statute of Limitations.

This removal cost-recovery action, under one interpretation of SARA, may be barred by SARA's § 113(g)(2)(A) 3-year statute of limitations if it is not filed before December 1, 1984. SARA is silent as to whether § 113(g) (2)(A) is to apply to pre-SARA removals. However, the last sentence of § 113(g)(1)(B) (the sentence immediately preceeding § 133(g)(2)) does limit § 113(g)(i)(B)(ii)'s effect to only post SARA damages actions:

Thus an argument lies that Congress would have similarly expressly limited the 3-year statute of limitations to post SARA removals had it intended such to be the case.

Alternatively, it could be argued that the fact that § 113(g)(1)(B)'s last sentence allows natural resources damage actions filed before SARA to be continued, added to the congressional and judicial mandate that CERCLA be liberally construed (U.S. v. Reilly Tar), means that SARA should not be construed to bar either damage or cost recovery actions whose cause accrued prior to SARA.

Prior to SARA, no express statute of limitations was imposed by CERCLA upon § 107 cost recovery actions, and various statute of limitations have been applied. At least three district courts have held that no statute of limitation applied under (pre-SARA) CERCLA. U.S. v. Mottolo, 605 F. Supp. 398 (D.N.H. 1985) U.S. v. Dickerson, 640 F. Supp. 448 (D. Md 1986); U.S. v. Miami Drum Services Inc., 23 Env't Rep. Cas. 1319 (D.R.I. 1986). At least two courts have implied that § 112(d)'s damage claims 3-year statute of limitations applied by analogy to § 107 cost recovery actions. Mola Development Corp. v. U.S., 22 Env't Rep. Cas. 1230 (S.C. Ind. 1983); See also, Colorado v. ASARCO, 616 F. Supp. 822 (D Col. 1985) (Dicta). But see, U.S. v. Dickerson, 640 F. Supp. 448, 450, (D.Md. 1986)(§ 112(d) CERCLA damage action 3-year statute of limitation is not available to defendant as defense against § 107 Cost Recovery Liability). Two courts have implied that a six-year statute of limitations contained in 28 U.S.C. § 2415(a) (U.S. Government restitution actions barred after six years) is applicable. See, U.S. v.

Miami Drum Services, Supra.(alternative holding); See, U.S v. P/R STCO 213, On 527/979, 756 F.2d 364 (5th Cir. 1985) (Six-year contract statute of limitations governs actions brought by U.S. under F.W.P.C.A.).

For present purposes, the statute of limitations will not be an issue if the U.S. files before December 1, 1987. Filing after this date carries increased risk that a retroactive three-year statute of limitations will be imposed by a court. There is a possibility that the removal action ended before December 1, 1984; if so, the existence of the cause of action may be in doubt. However, if the removal ended after December 1, 1984, there may be additional time to file.

B. Equitable Defenses.

1. Inconsistency with NCP.

All costs associated with the removal will be certified as not inconsistent with the National Contingency Plan and as being cost-effective.

2. Estoppel.

There is no indication of facts supporting an estoppel argument. W.C.C. apparently never complied with the 1975 WDNR order. W.C.C.'s possible compliance with any WDNR orders would not estop the U.S. from asserting liability for costs incurred due to releases from W.C.C.'s facility. U.S. v. Dickerson, supra; C.C.C., supra.(defense of lack of negligence or exercise of due care by responsible party not defense to § 107 liability).

3. Superceding Intervening Cause.

As discussed above, proximate cause does not apply under CERCLA's strict joint and several liability standard. Violet v. Picillo, 25 Env't Rep. Cas. at 1329. Thus, the fact that other nearby facilities may also be contributing to the Wausau Contamination problem should not be relevant to W.C.C.'s § 107 liability.

4. Inability to Pay.

W.C.C. may and probably will argue, as it has previously, that it cannot afford to pay for U.S. EPA response costs. If, in fact, W.C.C.'s funds are quite limited, this argument will be a partial defense to liability for the full removal costs, thus reducing the government's recovery.

C. Pendency of any Related Action.

None known.

D. Other Possible Issues.

1. Ending Date for CERCLA Removals.

A potential issue, of significant national importance, could arise in regard to the exact ending date for a removal if this action is filed after December 1, 1987. Under current U.S. EPA policy, a removal may end in two ways: 1) Upon the date all activities at the site are completed - demobilization at site; or 2) upon the date of completion last activity called for in the scope of work (SOW).

The present end date of December 1, 1984 is reportedly the date the last well was drilled at the site. However, this well was sampled and analysis was performed in Niles, Michigan,

with these costs being billed to W.C.C. The purpose of the sampling was to complete the investigation phase (Phase II) of the removal action. The SOW included all Phase II investigative activities. Thus, it could be argued that the removal did not actually end until the last analytical package was delivered and reviewed, around January 3, 1985.

It is possible that U.S. EPA can internally assign a later date in this removal, and still stay within policy guidelines. It is possible that similar arguments or adjustments could be made in other removal actions faced with an upcoming possible 3-year statute of limitations, thus buying time and preserving the cause of action.

2. Joinder of Potential Defendants by W.C.C.

It is possible and desirable that W.C.C. join other potentially responsible parties to the action. This would increase government changes of full recovery. However, it is possible that such parties may not be impleaded as necessary or even permissive parties, since both W.C.C. and PRP's will arguably be able to protect their interests in a separate action for contribution pursuant to CERCLA § 113(f)(1). Alternatively, W.C.C. could be expected to utilize § 113(A)(1) to bring in other PRP's. However, the statute of limitations may be a successful argument for PRP's joined after December 1, 1987.

3. Intervention by Wisconsin or City of Wausau.

CERCLA § 113(i) provides for intervention as a matter or right for any person whose interest will be affected without their prior input. It is possible that Wisconsin, Wausau or

other affected entities will seek intervention.

E. Potential Practical Problems.

Potential problems could include location of witnesses, documents and related evidence. However, this aspect should not be a major problem. RI/FS negotiations were unproductive and a fund-lead RI/FS was initiated in July, 1987 (to be completed January, 1989), thus no current negotiations would be affected. Future RD/RA negotiations may be impeeded if non-named, potentially responsible parties become aware of the current lack of U.S. EPA information and evidence of their liability. This problem may be mitigated upon receipt of further information on PRP's pursuant to the RI/FS. Additional state or local information is also likely to become available.

Another potential problem associated with naming only W.C.C. is that as mentioned in Section VIII B(4), the chances of 100% recovery are reduced. However, zero recovery is a possibility if the U.S. delays filing until sufficient additional evidence is adduced, thus risking being time-barred.

IX. Litigation Strategy

A. Other Potential Defendants. Due to a lack of firm evidence of releases by the following potential defendants, it is recommended they not be named as defendants at this time.

1. Marathon Electric Manufacturing-used chlorinated VOC's.
2. Marathon Box Company-evidence of ground water contamination beneath facility.
3. Marathon Pilot Graphics-disposed of solvents into sewer and had W.C.C. remove other solvents.
4. Chicago, Milwaukee, St. Paul and Pacific (C.C. St. P. & P.) Railroad-owns possibly

contaminated strip of land nearby W.C.C., thought to have transported solvents to W.C.C.

5. City of Wausau-via ownership of old city garage and Maratrion Electric Landfill.

6. Owner of Strip of Land on Bos Creek-possible VOC source.

7. Owners, generators, transporters, operators, disposers related to abandoned landfills in area.

B. Jurisdiction and Venue.

Jurisdiction is proper pursuant to 28 U.S.C. §§ 1331 and 1345; and 42 U.S.C. §§ 9607 and 9613.

Venue is proper in the western district Wisconsin pursuant to 28 U.S.C. §1391(b) and (c) and 42 U.S.C. §9613(b), because the claims arose in this district, the releases of hazardous substance or threatened releases of hazardous substance occurred in this district and the corporate defendant does business in the state.

C. Potential for Settlement.

Low-W.C.C. net 1986 worth was $1.3 million.

D. Potential for Summary Judgement.

Low; factual issues regarding analytical data, sampling procedures and other U.S. EPA actions will most likely be challenged, thus putting factual issues in dispute and precluding summary judgement.

## X. List of Attachments and Figures

### I. Attachments:

A. February 15, 1983 spill report from W.C.C. to WDNR.

B. December 19, 1983 spill report fromm W.C.C. to WDNR.

C. Weston, Inc. Technical Assistance Team (TAT) report.

D. Removal action cost documentation.

E. November 9. 1987 demand letter to W.C.C.

F. Complaint.

G. Summary of case law supporting personal liability of W.C.C. president/owner James Cherwinka.

### II. Figures:

1. Wausau Regional Area Map.

2. Local Area map showing locations of city wells and W.C.C.

3. Tables 1, 2 and 3 from TAT report showing VOC levels found in city wells 3, 4, and 6.

4. Table 4 from TAT report showing VOC levels in blended municipal drinking water.

5. Figure 5 from TAT report showing locations of monitoring wells in and around W.C.C. property.

6. Table 10 from TAT report showing VOC levels found in W.C.C. area monitoring wells.

7. Table 8 from TAT report showing VOC levels in all monitoring wells and city wells.

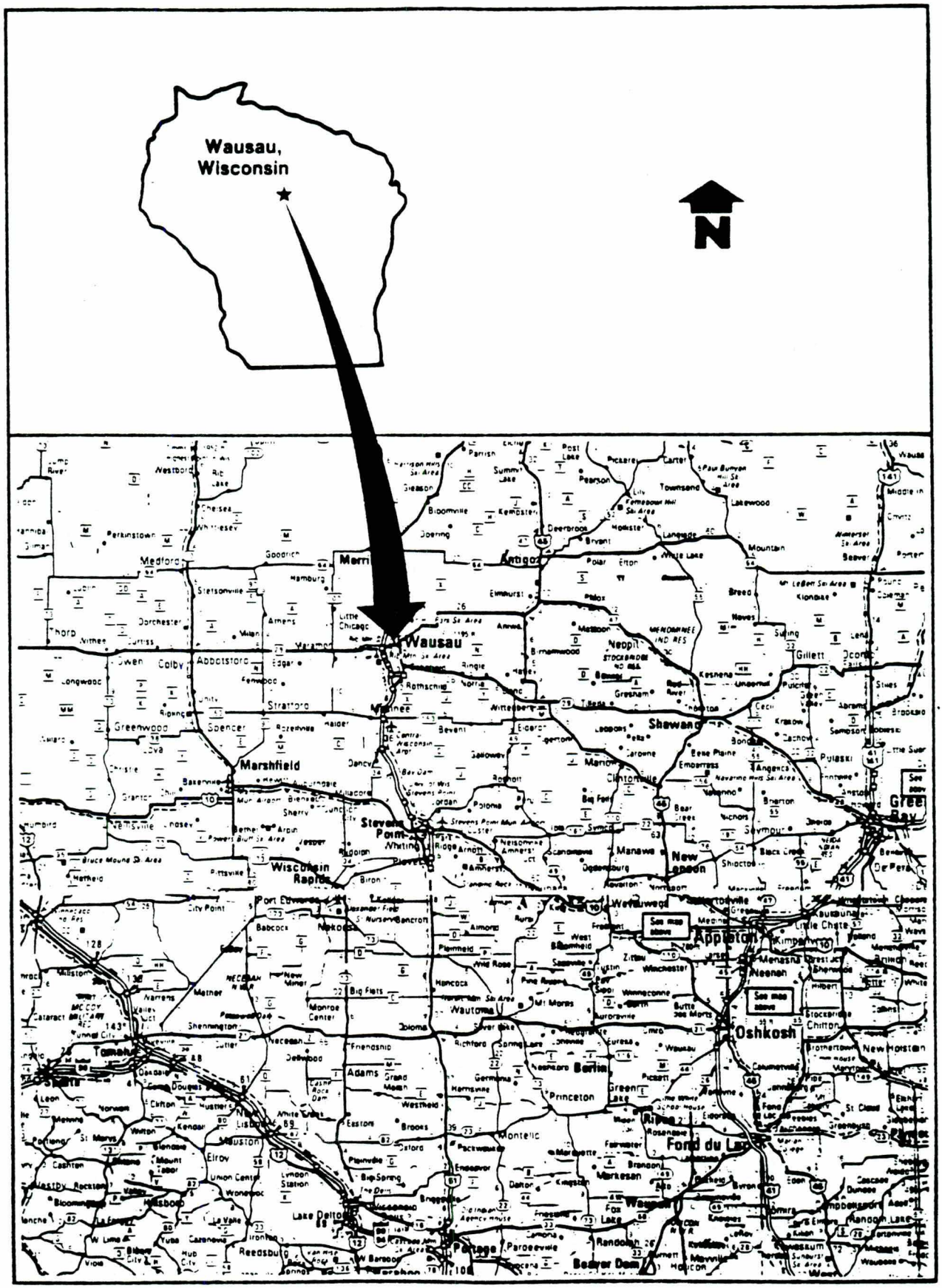



**FIGURE 1 REGIONAL LOCATION MAP**

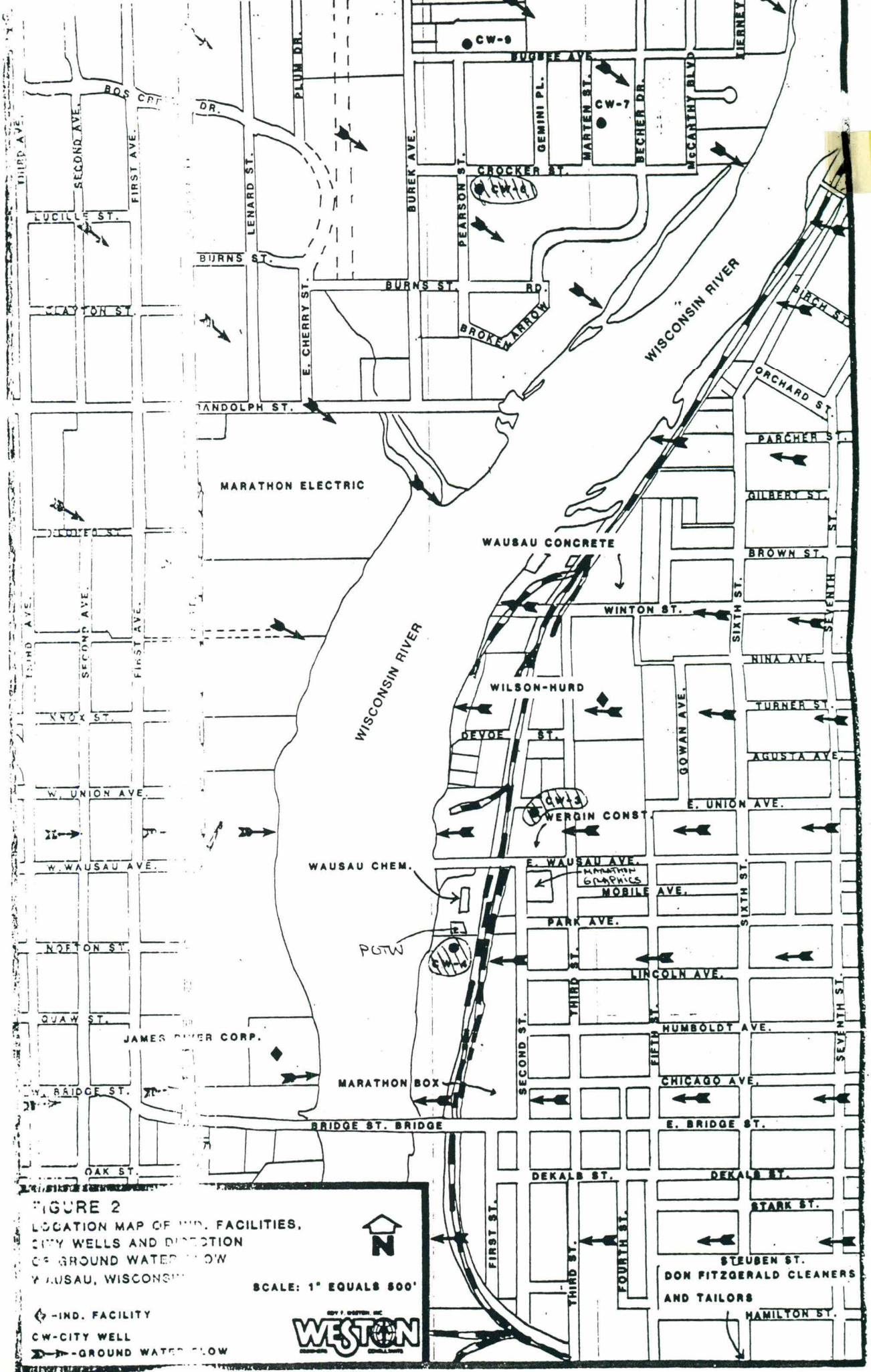



FIGURE 2

LOCATION MAP OF IND. FACILITIES, CITY WELLS AND DIRECTION OF GROUND WATER FLOW WAUSAU, WISCONSIN

FIGURE 2

WESTON

TABLE 1

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANT
CONCENTRATIONS IN CITY WELL #3
MARCH 1982 - NOVEMBER 1984

| Collection Date | Concentration-ppb* | | |
|---|---|---|---|
| | PCE | TCE | DCE |
| 3-16-82 | 100 | 100 | 50 |
| 4-07-82 | 90 | 140 | 110 |
| 4-15-82 | 80 | 130 | 90 |
| 6-14-82 | 40 | 80 | - |
| 6-14-82 | 50 | 20 | 80 |
| 6-14-82 | 60 | 120 | 40 |
| 6-16-82 | 50 | 70 | 60 |
| 7-13-82 | 60 | 110 | 70 |
| 8-09-82 | 60 | 90 | 50 |
| 9-09-82 | 20 | 190 | 20 |
| 9-24-82 | 30 | 130 | 20 |
| 9-27-82 | 20 | 140 | 30 |
| 9-28-82 | 30 | 100 | 30 |
| 10-28-82 | 20 | 90 | 10 |
| 2-07-83 | 10 | 80 | 10 |
| 5-03-83 | 10 | 100 | 10 |
| 6-30-83 | 10 | 80 | 10 |
| 6-30-83 | 10 | 70 | 10 |
| 7-06-83 | 10 | 70 | 10 |
| 11-30-83 | 10 | 120 | 10 |
| 1-10-84 | 10 | 90 | 10 |
| 1-17-84 | 10 | 100 | 10 |
| 2-06-84 | 10 | 130 | 10 |
| 2-20-84 | 10 | 150 | 10 |
| 5-07-84 | <10 | 140 | <10 |
| 9-17-84 | 10 | 150 | 20 |
| 10-01-84 | 0 | 150 | 10 |
| 10-03-84 | <10 | 160 | 10 |
| 10-17-84 | 0 | 110 | 0 |
| 11-08-84 | 0 | 210 | 10 |

* Reported values have been rounded to two significant figures
- Non-Detectable Concentration
+ Less than 10 ppb

WESTON

TABLE 2

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANT
CONCENTRATIONS IN CITY WELL #6
MARCH 1982 - OCTOBER 1984

| Collection Date | Concentration-ppb* | | |
|---|---|---|---|
| | PCE | TCE | DCE |
| 3-16-82 | - | 80 | - |
| 4-07-82 | - | 110 | - |
| 4-15-82 | - | 110 | + |
| 6-14-82 | - | 120 | + |
| 6-14-82 | - | 70 | + |
| 6-14-82 | - | 140 | + |
| 6-16-82 | - | 110 | + |
| 8-09-82 | - | 120 | + |
| 11-15-82 | - | 190 | - |
| 2-07-83 | - | 120 | - |
| 5-03-83 | + | 150 | + |
| 11-30-83 | + | 180 | + |
| 2-20-84 | + | 210 | + |
| 5-07-84 | + | 140 | + |
| 6-30-84 | - | 210 | + |
| 7-03-84 | - | 220 | + |
| 7-04-84 | - | 220 | + |
| 7-05-84 | - | 220 | + |
| 7-06-84 | - | 220 | + |
| 7-07-84 | - | 220 | + |
| 7-08-84 | - | 230 | + |
| 7-11-84 | - | 190 | + |
| 7-18-84 | - | 80 | + |
| 7-26-84 | - | 160 | + |
| 8-02-84 | - | 180 | + |
| 8-08-84 | - | 170 | - |
| 8-15-84 | - | 190 | + |
| 8-22-84 | - | 220 | + |
| 8-30-84 | - | 260 | + |
| 9-05-84 | - | 220 | + |
| 9-12-84 | - | 200 | - |
| 9-17-84 | - | 140 | - |
| 9-19-84 | - | 170 | - |
| 9-25-84 | - | 170 | - |
| 9-26-84 | - | 190 | - |
| 10-01-84 | - | 110 | - |
| 10-17-84 | - | 190 | - |
| 10-24-84 | - | 150 | - |

* Reported values have been rounded to two significant figures
- Non-Detectable Concentration
+ Less than 10 ppb

WESTON

TABLE 3

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANT CONCENTRATIONS IN CITY WELL #4
MARCH 1982 - JANUARY 1985

| Collection Date | Concentration-ppb* | | | | |
|---|---|---|---|---|---|
| | PCE | TCE | DCE | Toluene | Xylene |
| 3-16-82 | - | - | - | - | # |
| 4-15-82 | - | - | - | - | # |
| 6-14-82 | - | + | - | - | # |
| 6-14-82 | - | - | - | - | # |
| 6-16-82 | - | - | - | - | # |
| 10-28-82 | 50 | 60 | 340 | - | # |
| 11-02-82 | 30 | 10 | 300 | - | # |
| 6-30-83 | 20 | + | 160 | - | # |
| 6-30-83 | 20 | + | 200 | - | # |
| 7-06-83 | 10 | + | 200 | - | # |
| 10-30-83 | 20 | + | 80 | 10 | # |
| 11-30-83 | 130 | 80 | 500 | 120 | # |
| 1-10-84 | 110 | 180 | 410 | - | # |
| 1-17-84 | 90 | 170 | 340 | 90 | # |
| 2-20-84 | 80 | 190 | 210 | - | # |
| 2-27-84 | 150 | 320 | 380 | 100 | # |
| 5-07-84 | 80 | 90 | 80 | 30 | # |
| 9-17-84 | 50 | 70 | 80 | 30 | # |
| 10-01-84 | 40 | 60 | 90 | 30 | # |
| 10-17-84 | 40 | 60 | 70 | - | # |
| 10-29-84 | 60 | 70 | 70 | 30 | # |
| 11-08-84 | 40 | 80 | 70 | - | # |
| 12-11-84 | 40 | 60 | 80 | 20 | # |
| 12-19-84 | 30 | 70 | 110 | 20 | # |
| 1-02-85 | 30 | 40 | 80 | 10 | # |

* Reported values have been rounded to two significant figures
\- Non-Detectable Concentration
\+ Less than 10 ppb
\# Less than 20 ppb

TABLE 4 - F16 81

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANT CONCENTRATIONS IN THE CITY DISTRIBUTION SYSTEM USING BLENDED WATERS

All Results in ppb*

| Date of Sample | Location | PCE in ug/l | TCE in ug/l | DCE in ug/l |
|---|---|---|---|---|
| 03-02-82 | Water Treatment Plant | + | 60 | 30 |
| 03-16-82 | WTP - Effluent | 60 | 100 | 30 |
| 04-07-82 | City Hall | 20 | 30 | 30 |
| 04-15-82 | Mary Gardens Apt. | + | 10 | + |
| 04-15-82 | Art Museum | 20 | 20 | 20 |
| 04-15-82 | City Hall | + | + | + |
| 04-15-82 | WWTP | + | 10 | 10 |
| 04-15-82 | UW Marathon | 10 | 30 | 10 |
| 04-15-82 | Mount View Manor | + | 50 | 10 |
| 04-15-82 | Employers Regional | + | 50 | + |
| 04-15-82 | Ground Reservoir | 10 | 40 | 10 |
| 04-15-82 | NCTI | 10 | 20 | 10 |
| 05-03-82 | WTP - Effluent | - | 10 | - |
| 05-03-82 | City Hall | - | 20 | - |
| 05-03-82 | Airport | - | + | - |
| 05-06-82 | Water Treatment Plant | - | 30 | - |
| 05-06-82 | Water Treatment Plant | - | 20 | - |
| 05-06-82 | Water Treatment Plant | - | 40 | - |
| 06-14-82 | City Hall | - | 20 | - |
| 06-14-82 | City Hall | - | 20 | - |
| 06-14-82 | Airport | - | + | - |
| 06-14-82 | Airport | - | + | - |
| 10-28-82 | City Hall | + | 70[1] | 60[1] |
| 10-28-82 | Airport | + | 60[1] | 70[1] |
| 12-30-82 | Water Treatment Plant | 10 | 50 | - |
| 02-07-83 | Fire Station | + | 30 | + |
| 02-07-83 | Bob Johnson's Chevy | + | 40 | + |
| 05-03-83 | Holiday Inn | + | 50 | + |
| 05-03-83 | City Hall | + | 30 | + |

[1] Values the result of city well #4's contamination and was immediately taken off line.

FIGURE 4

TABLE 4 (Continued)

| Date of Sample | Location | PCE in ug/l | TCE in ug/l | DCE in ug/l |
|---|---|---|---|---|
| 06-13-83 | Marathon County Health Care | - | 70 | - |
| 06-13-83 | Holiday Inn | - | 80 | - |
| 06-13-83 | Central Fire Station | - | 80 | - |
| 06-13-83 | City Hall | - | 80 | - |
| 11-14-83 | Holiday Inn | - | + | - |
| 12-28-83 | City Hall | + | 60 | - |
| 12-28-83 | Marathon County Health Care | + | 30 | - |
| 01-25-84 | Health Care Center | + | 50 | + |
| 01-25-84 | City Hall | + | 20 | + |
| 02-06-84 | McDonalds | + | 50 | - |
| 02-13-84 | Holiday Inn | + | 30 | - |
| 02-13-84 | Health Care Center | + | 20 | - |
| 02-13-84 | City Hall | - | 10 | - |
| 04-02-84 | Health Care Center | + | 40 | - |
| 04-02-84 | City Hall | + | 30 | - |

FIGURE 4

TABLE 4 (Continued)

| Date of Sample | Location | PCE in ug/l | TCE in ug/l | DCE in ug/l |
|---|---|---|---|---|
| 05-07-84 | Water Treatment Plant | - | 40 | - |
| 05-07-84 | City Hall | + | 60 | - |
| 05-07-84 | North Central Health Care | + | 50 | - |
| 05-07-84 | Holiday Inn | + | 50 | - |
| 05-07-84 | Central Fire Station | + | 50 | - |
| 05-30-84 | Wausau Child Care Center | + | 30 | - |
| 05-30-84 | John Muir Middle School | + | 10 | - |
| 05-30-84 | North Central Technical Institute | + | + | - |

All results are from the Wisconsin State Laboratory.

* Reported values have been rounded to two significant figures
- Non-Detectable Concentration
+ Less than 10 ppb

FIGURE 4

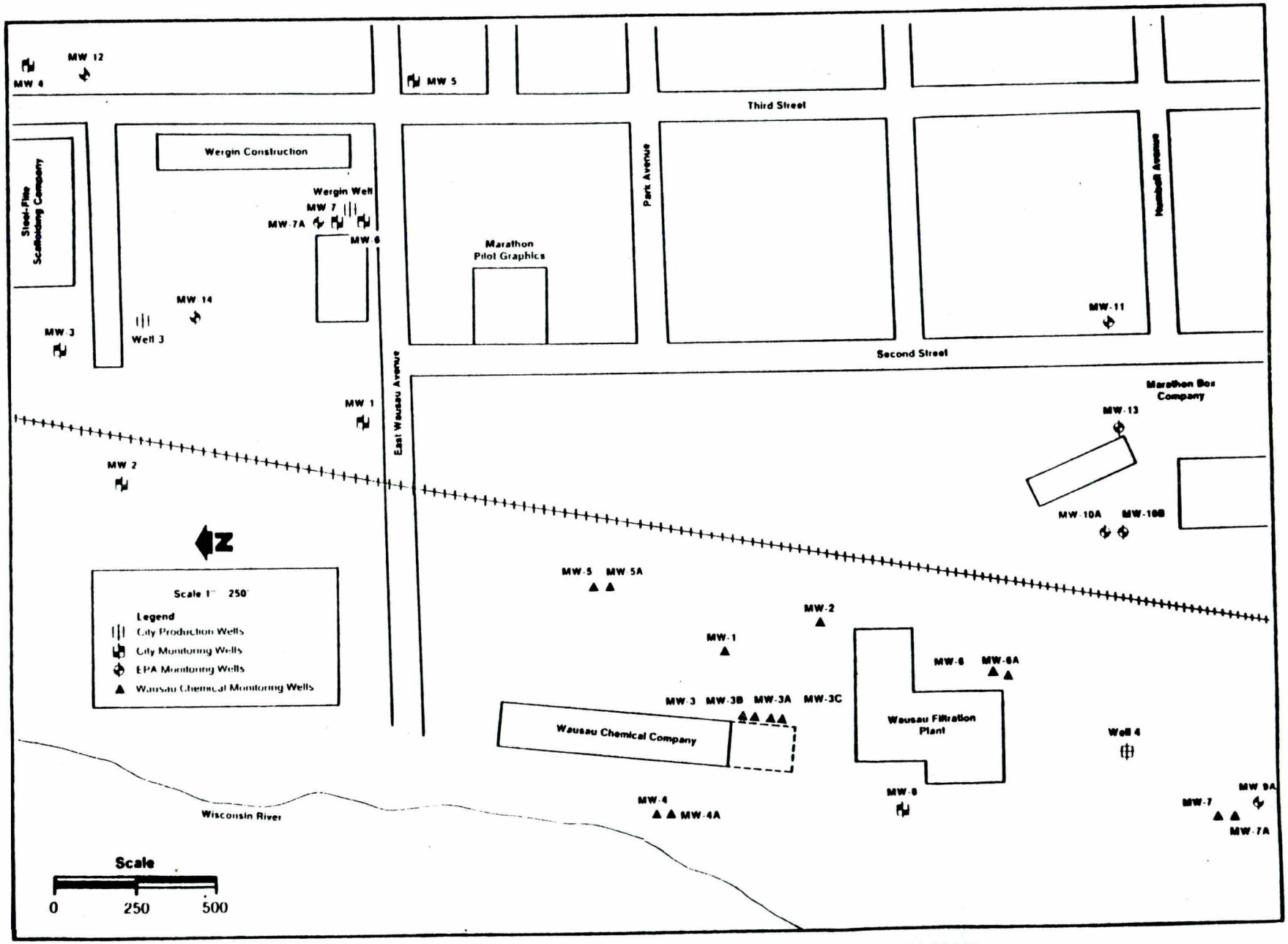



**FIGURE 5 EAST STUDY AREA WELL LOCATION MAP**

5

WESTON

TABLE 10

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANTS
AT THE WAUSAU CHEMICAL COMPANY

All results in ppb*

| MW #B-1 | PCE | TCE | DCE |
|---|---|---|---|
| 05-16-84 | 180 | 30 | 20 |
| 10-01-84 | 200 | 150 | 90 |
| 10-17-84 | 120 | 70 | 80 |
| 11-08-84 | 30 | 20 | 30 |
| **MW #B-2** | | | |
| 05-04-84 | 490 | 50 | 20 |
| 09-17-84 | 540 | 170 | 70 |
| 10-01-84 | 330 | 210 | 100 |
| 10-17-84 | 170 | 90 | 70 |
| 11-09-84 | 80 | 80 | 30 |
| **MW #B-3** | | | |
| 05-16-84 | + | + | + |
| 05-31-84 | + | + | + |
| 09-17-84 | - | + | - |
| 10-01-84 | + | + | + |
| 10-17-84 | - | + | + |
| 11-08-84 | - | + | + |
| **MW #B-3A** | | | |
| 05-16-84 | 3200 | 2600 | 630 |
| 05-31-84 | 4300 | 4800 | 680 |
| 09-17-84 | 2300 | 2700 | 3100 |
| 10-01-84 | 6480 | 4860 | 3300 |
| 10-17-84 | 870 | 1502 | 2100 |
| 11-08-84 | 1260 | 1120 | 920 |
| **MW #B3-C** | | | |
| 10-17-84 | - | 3330 | 750 |
| 11-08-84 | + | 100 | - |
| **MW #B-4** | | | |
| 10-01-84 | + | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |

TABLE 10 (Continued)

| MW #B4-A | PCE | TCE | DCE |
|---|---|---|---|
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **MW #B-5** | | | |
| 10-01-84 | + | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | + | - | - |
| **MW #B5-A** | | | |
| 10-01-84 | 170 | + | - |
| 10-17-84 | 380 | 10 | + |
| 11-08-84 | 2600 | 40 | + |
| **MW #B-6** | | | |
| 10-01-84 | - | - | + |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | + |
| **MW #B6-A** | | | |
| 10-01-84 | 1920 | 880 | 310 |
| 10-17-84 | 790 | 1100 | 570 |
| 11-08-84 | 3930 | 2040 | 730 |

Table 10 (Continued)

| MW #B-7 | PCE | TCE | DCE |
|---|---|---|---|
| 10-01-84 | 10 | + | - |
| 10-17-84 | - | - | - |
| 11-08-84 | + | - | - |
| **MW #B7-A** | | | |
| 10-01-84 | + | + | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **EPA MW #9** | | | |
| 10-01-84 | - | + | - |
| 10-17-84 | - | + | + |
| 11-08-84 | - | + | - |
| **CITY MW #8** | | | |
| 05-16-84 | 30 | + | + |
| 09-17-84 | 40 | + | - |
| 10-01-84 | 30 | + | - |
| 10-17-84 | + | - | - |
| 11-08-84 | + | - | - |

* Reported values have been rounded to two significant figures.
- Non-Detectable Concentration
+ Less than 10 ppb

TABLE 8

ANALYTICAL RESULTS FOR THE SIMULTANEOUS SAMPLING PROGRAM
WAUSAU, WISCONSIN

All results in ppb*

| MW #1 | PCE | TCE | DCE |
|---|---|---|---|
| 07-13-82 | - | - | - |
| 07-21-82 | - | - | - |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **MW #2** | | | |
| 07-13-82 | - | - | - |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **MW #3** | | | |
| 07-13-82 | - | - | - |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | |
| 11-08-84 | - | - | - |
| **MW #4** | | | |
| 07-13-82 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **City MW #5** | | | |
| 10-28-82 | + | + | + |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |

7

FIGURE 7

TABLE 8 (Continued)

| City MW #6 | PCE | TCE | DCE |
|---|---|---|---|
| 09-09-82 | 190 | 150 | 440 |
| 09-27-82 | 230 | 240 | 2910 |
| 10-28-82 | 280 | 260 | 140 |
| 09-17-84 | + | - | + |
| 10-01-84 | 20 | - | + |
| 10-17-84 | 20 | + | + |
| 11-08-84 | + | + | + |
| **City MW #7** | | | |
| 09-09-82 | 310 | 110 | 370 |
| 09-27-82 | 790 | 220 | 1140 |
| 10-28-82 | 220 | 120 | 520 |
| 09-17-84 | 20 | + | + |
| 10-01-84 | + | + | + |
| 10-17-84 | 30 | + | + |
| **Wergin Well** | | | |
| 07-13-82 | 110 | 230 | 2100 |
| 07-21-82 | 130 | 200 | 1260 |
| 09-09-82 | 800 | 150 | 620 |
| 09-24-82 | 530 | 90 | 520 |
| 09-27-82 | 390 | 110 | 2020 |
| 10-28-82 | 520 | 130 | 960 |
| 05-03-83 | 370 | 60 | 550 |
| 02-20-84 | 270 | 20 | 80 |
| **City #3** | | | |
| 09-17-84 | + | 150 | 20 |
| 10-01-84 | + | 150 | + |
| 10-17-84 | - | 110 | + |
| 11-08-84 | - | 210 | + |
| **City #4** | | | |
| 09-17-84 | 50 | 70 | 80 |
| 10-01-84 | 40 | 60 | 90 |
| 10-17-84 | 40 | 60 | 70 |
| 11-08-84 | 40 | 80 | 70 |
| **City #6** | | | |
| 09-17-84 | - | 140 | + |
| 09-25-84 | - | 170 | - |
| 10-01-84 | - | 150 | + |
| 10-17-84 | - | 180 | - |
| 11-08-84 | - | 130 | - |

TABLE 8 (Continued)

| City #7 | PCE | TCE | DCE |
|---|---|---|---|
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **City #8** | | | |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **City #9** | | | |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **EPA MW #1A** | | | |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| 11-29-84 | - | - | - |
| **EPA MW #2A** | | | |
| 09-25-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| 11-29-84 | - | - | - |
| **EPA MW #3A** | | | |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| 11-29-84 | - | - | - |
| **EPA MW #3B** | | | |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| 11-29-84 | - | - | - |

WESTON

TABLE 8 (Continued)

| EPA MW #4B | PCE | TCE | DCE |
|---|---|---|---|
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| 11-29-84 | + | - | - |
| **EPA MW #4C** | | | |
| 10-31-84 | + | + | - |
| 11-01-84 | - | + | - |
| 11-08-84 | - | - | - |
| 11-29-84 | - | - | - |
| **EPA MW #5** | | | |
| 11-08-84 | - | - | - |
| 11-09-84 | - | - | - |
| 11-29-84 | - | - | - |
| **EPA MW #6** | | | |
| 11-08-84 | - | + | - |
| 11-09-84 | + | + | + |
| 11-29-84 | - | - | - |
| **EPA MW #7** | | | |
| 11-28-84 | - | + | - |
| **EPA MW #7A** | | | |
| 10-01-84 | + | - | - |
| 10-17-84 | + | - | - |
| 11-08-84 | - | - | - |
| **EPA MW #8** | | | |
| 11-29-84 | - | - | - |
| **EPA MW #9** | | | |
| 12-03-84 | - | + | - |

WESTON

TABLE 8 (Continued)

| EPA MW #9A | PCE | TCE | DCE |
|---|---|---|---|
| 10-01-84 | - | + | - |
| 10-17-84 | - | + | + |
| 11-08-84 | - | + | - |
| **EPA MW #10A** | | | |
| 10-01-84 | 40 | + | + |
| 10-17-84 | 60 | + | - |
| 11-08-84 | + | + | 30 |
| **EPA MW #10B** | | | |
| 10-01-84 | 120 | 70 | 580 |
| 10-17-84 | 120 | 70 | 480 |
| 11-08-84 | 70 | 50 | 380 |
| **EPA MW #11** | | | |
| 10-31-84 | + | + | - |
| 11-01-84 | + | + | + |
| 11-08-84 | + | + | + |
| **EPA MW #12** | | | |
| 11-05-84 | - | - | - |
| 11-08-84 | - | - | - |
| **EPA MW #13** | | | |
| 11-29-84 | 50 | 20 | 30 |
| **EPA MW #14** | | | |
| 10-30-84 | + | + | - |

* Reported values have been rounded to two significant figures.
- Non-Detectable Concentration
+ Less than 10 ppb

TATE OF WISCONSIN
ENT OF NATURAL RESOURCES

STATE DIV. EMERGENCY GOVT. 608/266-3[illegible]
U.S. NAT'L. RESPONSE CENTER 800/424-8[illegible]
CHEMTREC/PESTICIDES/CHLORINE 800/424-9300

# TOXIC AND HAZARDOUS INCIDENT REPORT

FORM 3200-49 REV. 7-79

| E OF INCIDENT | DAY OF WEEK | TIME OF INCIDENT | REPORTED BY (NAME) | TELEPHONE NUMBER |
|---|---|---|---|---|
| 2-15-83 | Tues. | ≈ 1:15 ☐ AM ☒ PM | James Cherwinka | 715 / 642-21[illegible] |
| E REPORTED | DAY OF WEEK | TIME REPORTED | AGENCY OR FIRM REPORTING | REPORTED THRU DIV. EMERGEN GOVT. |
| 2-16-83 | Wed | 10 ☒ AM ☐ PM | Wausau Chemical | ☑ YES ☐ NO |

| SUBSTANCE INVOLVED | QUANTITY | UNITS | PERSON OR FIRM RESPONSIBLE |
|---|---|---|---|
| Tetrachloroethylene | ≈ 137 | gal. | Wausau Chemical Company |
| SUBSTANCE INVOLVED | QUANTITY | UNITS | CONTACT NAME / TELEPHONE NUMBER |
| | | | James Cherwinka / 715 / 842-21[illegible] |

PHYSICAL CHARACTERISTICS
☐ SOLID ☒ LIQUID ☐ SEMISOLID ☐ GAS
COLOR clear
ODOR sweet

ADDRESS — STREET OR ROUTE: 2001 N. River Drive
CITY, STATE, ZIP CODE: Wausau, Wisconsin 54401

CAUSE OF INCIDENT
Broken valve on 22 gal. delivery tank

☒ TRANSP. RELATED ☐ FACILITY RELATED
SPCC PLAN ☒ YES ☐ NO ☐ NA

ACTION TAKEN BY SPILLER
☐ NO ACTION TAKEN ☐ NO NOTIFICATION ☑ DELAYED NOTIFICATION
☐ CONTAINMENT; TYPE
☑ CLEANUP; METHOD Flush by Marginal [illegible]
☐ DISPOSAL; LOCATION
☐ FIRE DEPARTMENT ACTION
☐ CONTRACTOR HIRED; NAME
☑ OTHER ACTION [illegible]

EXACT LOCATION DESCRIPTION (INTERSECTION, MILEAGE, ETC.)
N. River Dr and Test Well on A[illegible]

| COUNTY LOCATION | ¼¼, ¼, SECTION, TOWN, RANGE | | |
|---|---|---|---|
| Marathon | ___ ___ ___ ___, T ___ N, R ___ | | |
| DNR DISTRICT | DNR AREA | SURFACE WATERS AFFECTED | DRAIN. BASIN |
| NC | Antig. | ☐ YES ☐ NO ☑ POT | |
| NAME OF SURFACE WATER | NEAREST SURF. WATER | NEAREST STORM SEWER | |
| Wisconsin R. | ≈ 50 FT. | ≈ 200 FT. | |
| GROUNDWATERS AFFECTED | NEAREST WELL | | |
| ☐ YES ☐ NO ☑ POT | ☐ PRIV. ☑ MUNIC. ≈ 600 FT. | | |

WEATHER CONDITIONS
TEMPERATURE ≈ 35 °F
WIND SPEED ___ MPH DIRECTION OF WIND ___
PRECIPITATION: ☒ YES 2-16-83 ☐ NO
DIRECTION OF SPILL MOVEMENT W-T - Toward River

| DATE DISTRICT NOTIFIED | DAY OF WEEK | TIME DISTRICT NOTIFIED | DISTRICT PERSON NOTIFIED | TELEPHONE NUMBER |
|---|---|---|---|---|
| 2-16-83 | Wed. | ≈ 10 ☒ AM ☐ PM | | / . |
| DATE INVESTIGATED | DAY OF WEEK | TIME INVESTIGATED | PERSON INVESTIGATING | TELEPHONE NUMBER |
| 2-16-83 | Wed. | 2:20 ☐ AM ☒ PM | Ed Kreul | 715 / 627-45[illegible] |

ACTION TAKEN BY DNR
☐ NO ACTION TAKEN ☑ INVESTIGATION ☐ 29.29 ENFORCEMENT
☐ CONTAINMENT; TYPE
☐ CLEANUP; METHOD
☐ SUPERVISE CLEANUP (PERSON)
☐ DISPOSAL; LOCATION
☐ SPILLER REQUIRED TO TAKE ACTION; TYPE
☐ CONTRACTOR HIRED BY DNR; NAME
☐ DNR SPILL EXPENSE SENT TO MADISON CENTRAL OFFICE.
☐ EVIDENCE COLLECTED:
☑ PHOTOGRAPHS ☐ STATEMENTS OF WITNESSES
☐ SAMPLES ☐ OTHER

LIST HUMAN HAZARDS OR CASUALTIES
☐ REAL ☐ POTENTIAL ☑ NONE

ENVIRONMENTAL HAZARD/DAMAGE
☐ REAL ☑ POTENTIAL
☐ VEGETATION
☐ FISH
☐ WILDLIFE
☐ BIRDS
☐ OTHER
☐ NONE
COMMENTS: Surface - Groundwater

OTHER AGENCIES ON SCENE
LOCAL
STATE
FEDERAL

PERSON FILING THIS REPORT (PRINT NAME): Edward J. Kreul
SIGNATURE: Edward J. Kreul DATE SIGNED: 2-17-[illegible]

ADDITIONAL COMMENTS:
PEIC was pulled when valve broke on 22 ga. delivery tank during unloading. See attached memo for further details.

ATTACHMENT A

3229

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

STATE DIV. EMERGENCY GOVT. 608/266-3232
U.S. NAT'L. RESPONSE CENTER 800/424-8802
CHEMTREC/PESTICIDES/CHLORINE 800/424-9300

# TOXIC AND HAZARDOUS INCIDENT REPORT

FORM 3200-49 REV. 7-79

| DATE OF INCIDENT | DAY OF WEEK | TIME OF INCIDENT | REPORTED BY (NAME) | TELEPHONE NUMBER |
|---|---|---|---|---|
| 12-19-83 | Monday | 8:00 ☒ AM ☐ PM | Wausau Chemical | 715 1842-2258 |
| **DATE REPORTED** | **DAY OF WEEK** | **TIME REPORTED** | **AGENCY OR FIRM REPORTING** | **REPORTED THRU DIV. EMERGEN. GOVT.** |
| 12-19-83 | Monday | 9:00 ☒ AM ☐ PM | Emergency Gov't. | ☒ YES ☐ NO |

| SUBSTANCE INVOLVED | QUANTITY | UNITS | PERSON OR FIRM RESPONSIBLE |
|---|---|---|---|
| tetrachloroethylene | Gin To Sec | Gallons | Wausau Chemical Corp. |
| SUBSTANCE INVOLVED | QUANTITY | UNITS | CONTACT NAME / TELEPHONE NUMBER |
| | | | 715 1842-22[illegible] |

PHYSICAL CHARACTERISTICS: ☐ SOLID ☒ LIQUID ☐ SEMISOLID ☐ GAS — COLOR Brownish — ODOR

ADDRESS — STREET OR ROUTE: 2001 N River Drive

CITY, STATE, ZIP CODE: Wausau Wis 54401

CAUSE OF INCIDENT: Broken Pipe

☐ TRANSP.-RELATED ☒ FACILITY RELATED — SPCC PLAN ☐ YES ☐ NO ☐ NA

EXACT LOCATION DESCRIPTION (INTERSECTION, MILEAGE, ETC.)

| COUNTY LOCATION | ¼/¼, ¼, SECTION, TOWN, RANGE | | | |
|---|---|---|---|---|
| Marathon | ___.___.___, T___N, R___ | | | |
| **DNR DISTRICT** | **DNR AREA** | **SURFACE WATERS AFFECTED** | **DRAIN. BASIN** | |
| NC | Antigo | ☐ YES ☒ NO ☐ POT | Wis. River | |
| **NAME OF SURFACE WATER** | **NEAREST SURF. WATER** | **NEAREST STORM SEWER** | | |
| ~~Wis. River~~ | 100 FT. | UNK FT. | | |
| **GROUNDWATERS AFFECTED** | **NEAREST WELL** | | | |
| ☐ YES ☐ NO ☒ POT | ☐ PRIV. ☐ MUNIC. | UNK FT. | | |

ACTION TAKEN BY SPILLER
☐ NO ACTION TAKEN ☐ NO NOTIFICATION ☐ DELAYED NOTIFICATION
☒ CONTAINMENT; TYPE Dikes
☒ CLEANUP; METHOD Picked up with absorbent
☐ DISPOSAL: LOCATION
☐ FIRE DEPARTMENT ACTION
☐ CONTRACTOR HIRED; NAME
☐ OTHER ACTION

WEATHER CONDITIONS
TEMPERATURE 20 °F
WIND SPEED 10-15 MPH — DIRECTION OF WIND NW
PRECIPITATION: ☐ YES ☒ NO
DIRECTION OF SPILL MOVEMENT S.W.

| DATE DISTRICT NOTIFIED | DAY OF WEEK | TIME DISTRICT NOTIFIED | DISTRICT PERSON NOTIFIED | TELEPHONE NUMBER |
|---|---|---|---|---|
| 12-19-83 | Monday | 9:00 ☒ AM ☐ PM | James Blankenheim | 715 1362-7016 |
| **DATE INVESTIGATED** | **DAY OF WEEK** | **TIME INVESTIGATED** | **PERSON INVESTIGATING** | **TELEPHONE NUMBER** |
| 12-19-83 | Monday | 9:15 ☒ AM ☐ PM | Donald H. Meze: | 715 1359-8411 |

ACTION TAKEN BY DNR
☒ NO ACTION TAKEN ☐ INVESTIGATION ☐ 29.29 ENFORCEMENT
☐ CONTAINMENT; TYPE
☐ CLEANUP; METHOD
☐ SUPERVISE CLEANUP (PERSON)
☐ DISPOSAL; LOCATION
☒ SPILLER REQUIRED TO TAKE ACTION; TYPE Contain & clean up
☐ CONTRACTOR HIRED BY DNR; NAME
☐ DNR SPILL EXPENSE SENT TO MADISON CENTRAL OFFICE.
☐ EVIDENCE COLLECTED:
☐ PHOTOGRAPHS ☐ STATEMENTS OF WITNESSES
☐ SAMPLES ☐ OTHER

LIST HUMAN HAZARDS OR CASUALTIES
☐ REAL ☒ POTENTIAL ☐ NONE

ENVIRONMENTAL HAZARD/DAMAGE
☐ REAL ☒ POTENTIAL
☐ VEGETATION
☒ FISH
☒ WILDLIFE
☐ BIRDS
☐ OTHER
☐ NONE
COMMENTS: Substance did not leave spill ar

OTHER AGENCIES ON SCENE
LOCAL Emergency Gov't'd City Water Works
STATE
FEDERAL

PERSON FILING THIS REPORT (PRINT NAME) Donald H. Meze:
SIGNATURE Donald H Meze — DATE SIGNED 1-10-84

ADDITIONAL COMMENTS:

cc: Kroul, W(1) ATTACHMENT B

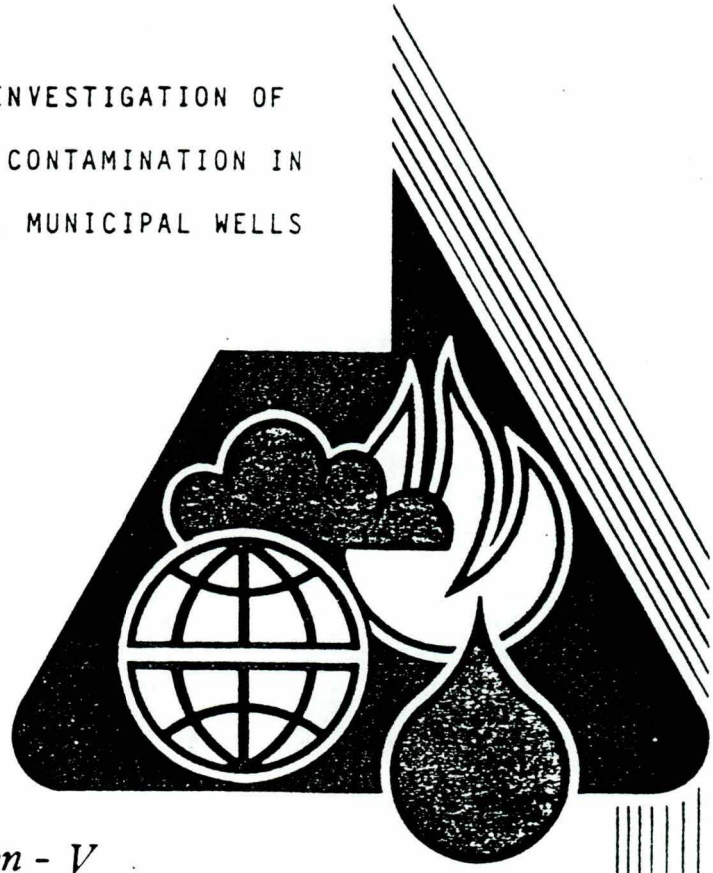
Contract No. 68-01-6669

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

# TECHNICAL ASSISTANCE TEAM

## HYDROGEOLOGICAL INVESTIGATION OF VOLATILE ORGANIC CONTAMINATION IN WAUSAU, WISCONSIN, MUNICIPAL WELLS



*Region - V*


**ROY F. WESTON, INC.**
Spill Prevention & Emergency Response Division
In Association with Jacobs Engineering Group Inc. Tetra Tech Inc.
and ICF Incorporated


WESTON
DESIGNERS CONSULTANTS

ATTACHMENT C

# HYDROGEOLOGICAL INVESTIGATION OF VOLATILE ORGANIC CONTAMINATION IN WAUSAU, WISCONSIN, MUNICIPAL WELLS

Prepared For:

U.S. Environmental Protection Agency
Region V
230 S. Dearborn Street
Chicago, Illinois

CONTRACT NO. 68-95-0017

TAT-05-F-00594

TDD# 5-8410-24

Prepared by:

WESTON-SPER
Technical Assistance Team
Region V

September 1985

WESTON

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# 1.0 INTRODUCTION

## 1.1 Purpose and Scope

This report presents a detailed description of actions taken by Region V of the U.S. EPA, in Wausau, Wisconsin, to mitigate public health threats associated with the city's contaminated public water supply. The mitigative and investigative activities described herein were undertaken under the authorization of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). This report was prepared by the ROY F. WESTON, INC. Technical Assistance Team (TAT), that provides support to the U.S. EPA Emergency Response and Removal Program under contract #68-01-6669.

The purpose of this action was to secure a safe and potable water supply for the City of Wausau, Wisconsin, and to characterize the extent of ground water contamination. In order to achieve these objectives, the scope of work included the following key elements:

- Design and oversee the installation of a large scale granular activated carbon (GAC) filtration system that was capable of treating 1.8 million gallons per day of water.
- Support and monitor the GAC system to assure effective contaminant removal.
- Characterize the nature and extent of contamination at each well field, define the site geology and hydrogeologic characteristics, and identify potential source areas.
- Recommend remedial alternatives.

This report addresses only the hydrogeologic investigation and includes a description of all methods utilized, presentation of the results of this investigation and provides recommendations for future studies.

## 1.2 Background

The City of Wausau, located in north-central Wisconsin, provides potable water to a consumptive population equivalent to approximately 60,000 people from six municipal wells. A location map showing the study area and City Well locations are shown on Figures 1 & 2, respectively. The high-yield (500 - 1900 gpm) wells (wells #3, 4, 6, 7, 8, and 9) are positioned in alluvial deposits of the Wisconsin River flood plain.

WESTON

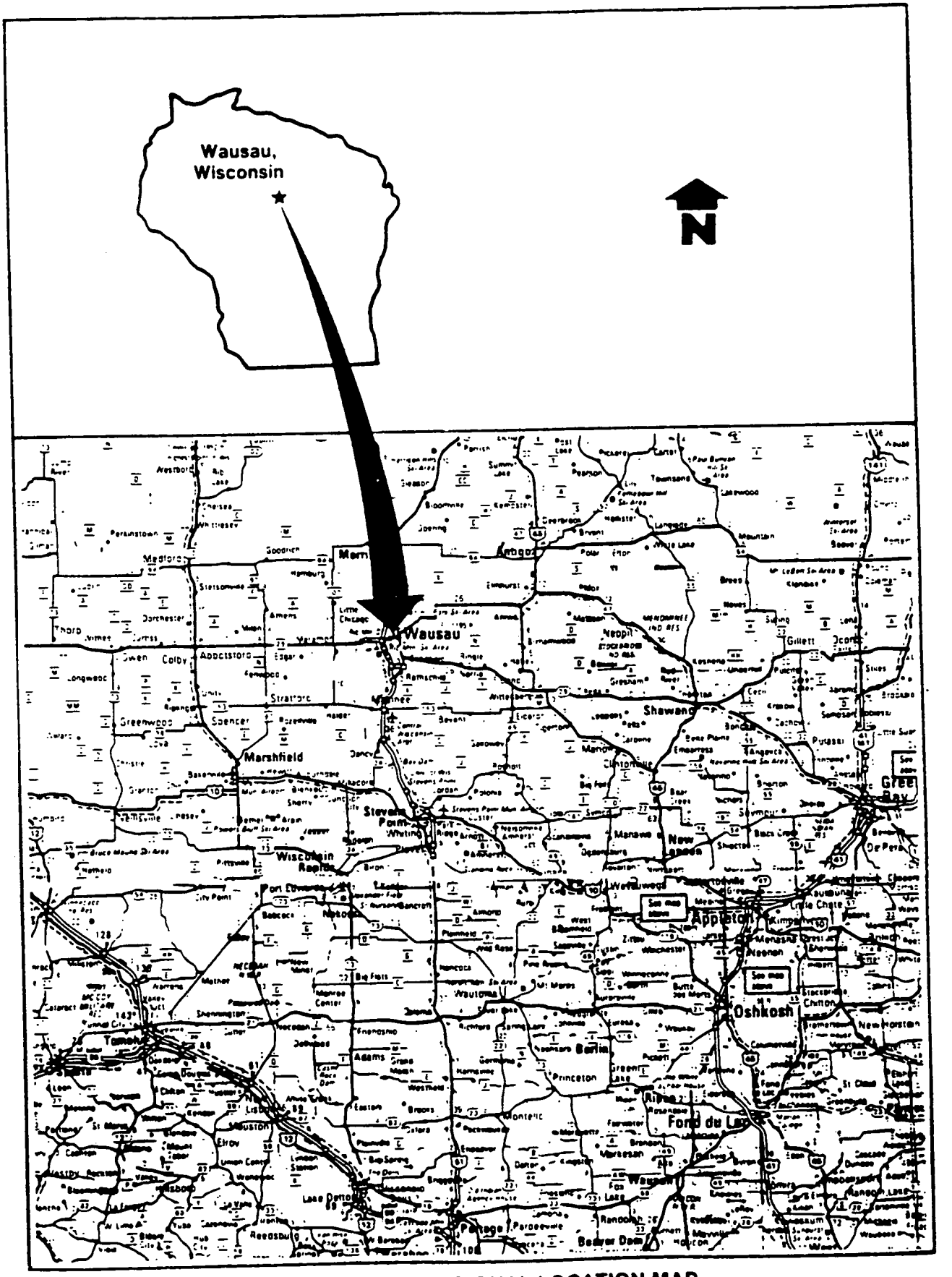


FIGURE 1 REGIONAL LOCATION MAP

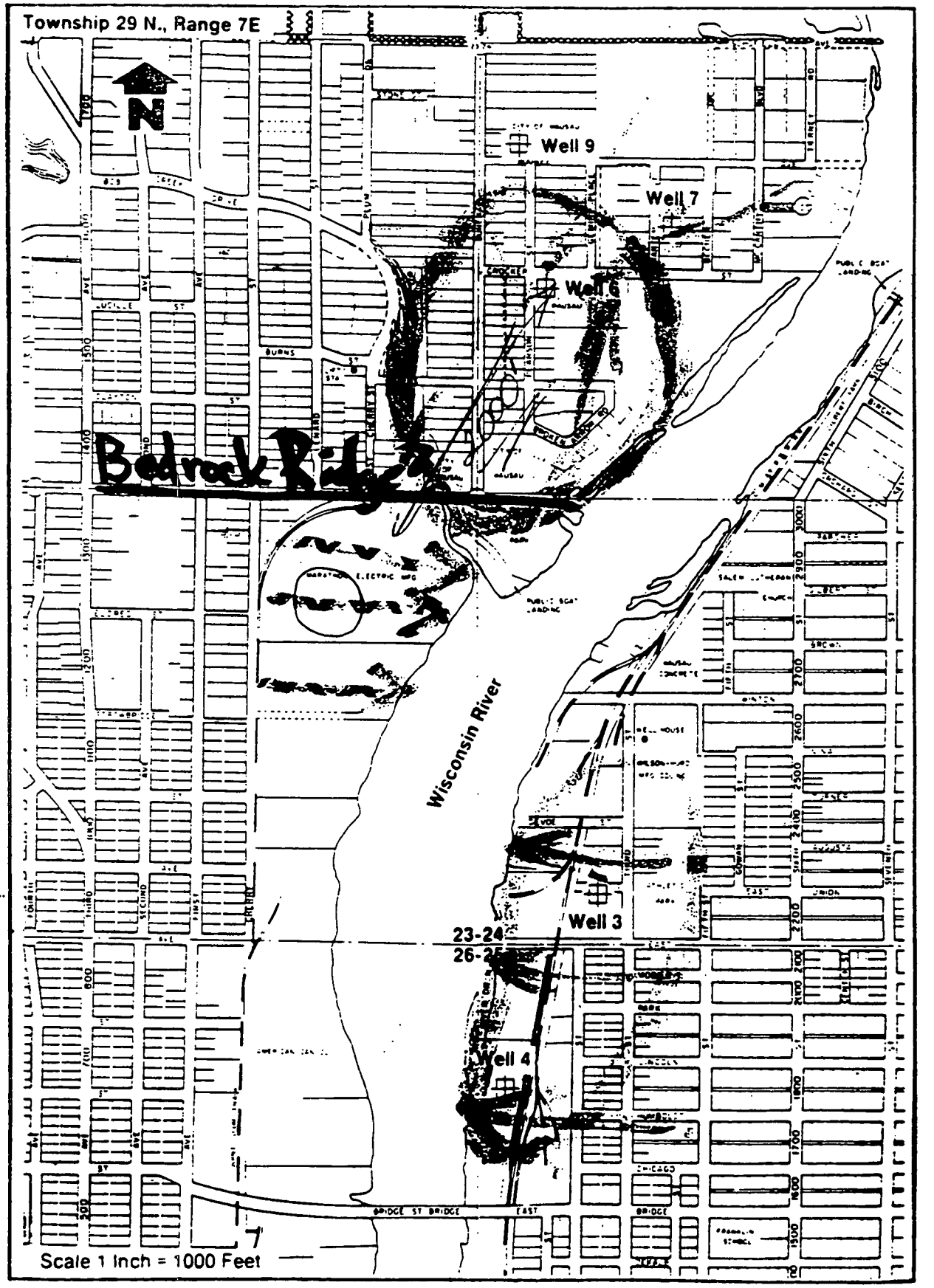


FIGURE 2 CITY WELL LOCATION MAP

Wells 6, 7 and 9 are located on the west side of the Wisconsin River. Wells 3, 4, 8 and the Wergin Well occur approximately 1.5 miles to the southeast of City Well #6 on the east side of the river.

Contamination of the municipal water supply was inadvertently discovered by personnel of Zimpro, Inc., a local analytical laboratory in early 1982. During start-up and testing of new laboratory instrumentation, analysis of a Zimpro employee's residential water documented the occurrence of volatile organic contaminants (VOCs). The City of Wausau was notified and in March of 1982, the City initiated laboratory testing of the six municipal wells for volatile organic compounds. In March of 1982, three volatile organic compounds were detected in City wells #3 and #6 (Tables 1 and 2). Well #3 was found to contain 100 parts per billion (ppb) tetrachloroethylene (PCE), 100 ppb trichloroethylene (TCE), and 40-50 ppb trans-1,2-dichloroethylene (DCE). Well #6 yielded only one compound, TCE, at concentrations of 75 ppb. The City continued bi-weekly monitoring of the municipal wells and in October of 1982, well #4 was found to be contaminated with PCE (50 ppb), TCE (55 ppb), and DCE (339 ppb) (Table 3). Each of the volatile organic compounds detected are considered carcinogens.

In response to the documented contamination levels, City well #4 was taken off-line and municipal water demand was met by blending water from uncontaminated wells #7 and #9 with contaminated water from wells #3 and #6. Well #8 was used only as a backup source because of historically high iron content.

In late 1982 and early 1983, the City undertook several investigative and mitigative studies. First, the City contracted for the installation of seven monitoring wells near well #3 and for a survey of commercial firms to establish possible contaminant sources. As a result of the City's actions, it became apparent that additional investigative efforts would be required. The City also modified, on a pilot basis, one of their water treatment plant aerators in an attempt to volatilize the contaminants. Aeration proved ineffective in removing VOCs from the municipal supply and was consequently abandoned.

During 1983, contamination in City wells #3, #4 and #6 was unabated. Concentration of TCE in well #3 remained at approximately 100 ppb, while PCE and DCE concentrations decreased to insignificant levels. Well #4 remained contaminated with significant concentrations of PCE, TCE, DCE and

TABLE 1

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANT
CONCENTRATIONS IN CITY WELL #3
MARCH 1982 - NOVEMBER 1984

| Collection Date | Concentration-ppb* | | |
|---|---|---|---|
| | PCE | TCE | DCE |
| 3-16-82 | 100 | 100 | 50 |
| 4-07-82 | 90 | 140 | 110 |
| 4-15-82 | 80 | 130 | 90 |
| 6-14-82 | 40 | 80 | - |
| 6-14-82 | 50 | 20 | 80 |
| 6-14-82 | 60 | 120 | 40 |
| 6-16-82 | 50 | 70 | 60 |
| 7-13-82 | 60 | 110 | 70 |
| 8-09-82 | 60 | 90 | 50 |
| 9-09-82 | 20 | 190 | 20 |
| 9-24-82 | 30 | 130 | 20 |
| 9-27-82 | 20 | 140 | 30 |
| 9-28-82 | 30 | 100 | 30 |
| 10-28-82 | 20 | 90 | 10 |
| 2-07-83 | 10 | 80 | 10 |
| 5-03-83 | 10 | 100 | 10 |
| 6-30-83 | 10 | 80 | 10 |
| 6-30-83 | 10 | 70 | 10 |
| 7-06-83 | 10 | 70 | 10 |
| 11-30-83 | 10 | 120 | 10 |
| 1-10-84 | 10 | 90 | 10 |
| 1-17-84 | 10 | 100 | 10 |
| 2-06-84 | 10 | 130 | 10 |
| 2-20-84 | 10 | 150 | 10 |
| 5-07-84 | <10 | 140 | <10 |
| 9-17-84 | 10 | 150 | 20 |
| 10-01-84 | 0 | 150 | 10 |
| 10-03-84 | <10 | 160 | 10 |
| 10-17-84 | 0 | 110 | 0 |
| 11-08-84 | 0 | 210 | 10 |

* Reported values have been rounded to two significant figures
- Non-Detectable Concentration
+ Less than 10 ppb

WESTON

TABLE 2

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANT
CONCENTRATIONS IN CITY WELL #6
MARCH 1982 - OCTOBER 1984

| Collection Date | Concentration-ppb* | | |
|---|---|---|---|
| | PCE | TCE | DCE |
| 3-16-82 | - | 80 | - |
| 4-07-82 | - | 110 | - |
| 4-15-82 | - | 110 | + |
| 6-14-82 | - | 120 | + |
| 6-14-82 | - | 70 | + |
| 6-14-82 | - | 140 | + |
| 6-16-82 | - | 110 | + |
| 8-09-82 | - | 120 | + |
| 11-15-82 | - | 190 | - |
| 2-07-83 | - | 120 | - |
| 5-03-83 | + | 150 | + |
| 11-30-83 | + | 180 | + |
| 2-20-84 | + | 210 | + |
| 5-07-84 | + | 140 | + |
| 6-30-84 | - | 210 | + |
| 7-03-84 | - | 220 | + |
| 7-04-84 | - | 220 | + |
| 7-05-84 | - | 220 | + |
| 7-06-84 | - | 220 | + |
| 7-07-84 | - | 220 | + |
| 7-08-84 | - | 230 | + |
| 7-11-84 | - | 190 | + |
| 7-18-84 | - | 80 | + |
| 7-26-84 | - | 160 | + |
| 8-02-84 | - | 180 | + |
| 8-08-84 | - | 170 | - |
| 8-15-84 | - | 190 | + |
| 8-22-84 | - | 220 | + |
| 8-30-84 | - | 260 | + |
| 9-05-84 | - | 220 | + |
| 9-12-84 | - | 200 | - |
| 9-17-84 | - | 140 | - |
| 9-19-84 | - | 170 | - |
| 9-25-84 | - | 170 | - |
| 9-26-84 | - | 190 | - |
| 10-01-84 | - | 110 | - |
| 10-17-84 | - | 190 | - |
| 10-24-84 | - | 150 | - |

* Reported values have been rounded to two significant figures
- Non-Detectable Concentration
+ Less than 10 ppb

TABLE 3

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANT
CONCENTRATIONS IN CITY WELL #4
MARCH 1982 - JANUARY 1985

| Collection Date | Concentration-ppb* | | | | |
|---|---|---|---|---|---|
| | PCE | TCE | DCE | Toluene | Xylene |
| 3-16-82 | - | - | - | - | # |
| 4-15-82 | - | - | - | - | # |
| 6-14-82 | - | + | - | - | # |
| 6-14-82 | - | - | - | - | # |
| 6-16-82 | - | - | - | - | # |
| 10-28-82 | 50 | 60 | 340 | - | # |
| 11-02-82 | 30 | 10 | 300 | - | # |
| 6-30-83 | 20 | + | 160 | - | # |
| 6-30-83 | 20 | + | 200 | - | # |
| 7-06-83 | 10 | + | 200 | - | # |
| 10-30-83 | 20 | + | 80 | 10 | # |
| 11-30-83 | 130 | 80 | 500 | 120 | # |
| 1-10-84 | 110 | 180 | 410 | - | # |
| 1-17-84 | 90 | 170 | 340 | 90 | # |
| 2-20-84 | 80 | 190 | 210 | - | # |
| 2-27-84 | 150 | 320 | 380 | 100 | # |
| 5-07-84 | 80 | 90 | 80 | 30 | # |
| 9-17-84 | 50 | 70 | 80 | 30 | # |
| 10-01-84 | 40 | 60 | 90 | 30 | # |
| 10-17-84 | 40 | 60 | 70 | - | # |
| 10-29-84 | 60 | 70 | 70 | 30 | # |
| 11-08-84 | 40 | 80 | 70 | - | # |
| 12-11-84 | 40 | 60 | 80 | 20 | # |
| 12-19-84 | 30 | 70 | 110 | 20 | # |
| 1-02-85 | 30 | 40 | 80 | 10 | # |

* Reported values have been rounded to two significant figures
- Non-Detectable Concentration
+ Less than 10 ppb
# Less than 20 ppb

toluene. TCE contamination in well #6 exhibited a slight increase in concentration to the range of 150-200 ppb.

The City, in an effort to develop a long-term resolution to the problem, applied for and was awarded a U.S. Environmental Protection Agency (U.S. EPA) Cooperative Agreement (#CR81150) where U.S. EPA would fund 90% and the City of Wausau would fund the remaining 10% of the costs to design a VOC treatment system. The Cooperative Agreement coordinated by Ben Lykins, U.S. EPA, Drinking Water Research Division, Cincinnati, Ohio, awarded Michigan Technical University (MTU), Houghton, Michigan, the contract to conduct pilot studies and design a treatment system under the supervision of Dr. John Crittenden. The research schedule specified that pilot scale testing would commence in May of 1984 and, if successful, ultimate construction of a large-scale stripper would be completed by late summer of 1984.

In early 1984, no adequate means to treat the contamination of Wausau's water supply had been installed. The city continued to blend contaminated water from wells #3 and #6 with clean water from wells #7 and #9 to meet demand (Table 4). The existing water treatment facilities provided a marginal level of VOC reduction but not consistently to keep VOC levels in the distribution safely below health advisory levels at all times. Recognizing that the high summer demand and the increased contaminante level in well #3 would very likely reduce the chance of keeping the VOC level below health advisory levels, and also during the same time frame, findings of the National Academy of Sciences Carcinogen Assessment Group (CAG) established a draft health advisory concentration of 28 ppb ($10^{-5}$ excess cancer risk rate) in potable water, it was now apparent that emergency action was necessary.

As of the spring of 1984, the City of Wausau, therefore, was faced with the prospect of meeting water demands by continuing to blend contaminated water with uncontaminated water to dilute concentrations. Prospects of successfully meeting demands during mid-summer demand using only the uncontaminated wells #7 and #9 was entirely dependent upon actual use and it was anticipated that contaminated wells would have to be frequently employed to meet demand. However, the pumping system of clean well #7 appeared to be in a deteriorated state and would likely require repair. This activity would require that the entire city water demand be met by uncontaminated well #9 blended with contaminated wells #3 and #6.

TABLE 4

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANT CONCENTRATIONS IN THE CITY DISTRIBUTION SYSTEM USING BLENDED WATERS

All Results in ppb*

| Date of Sample | Location | PCE in ug/l | TCE in ug/l | DCE in ug/l |
|---|---|---|---|---|
| 03-02-82 | Water Treatment Plant | + | 60 | 30 |
| 03-16-82 | WTP - Effluent | 60 | 100 | 30 |
| 04-07-82 | City Hall | 20 | 30 | 30 |
| 04-15-82 | Mary Gardens Apt. | + | 10 | + |
| 04-15-82 | Art Museum | 20 | 20 | 20 |
| 04-15-82 | City Hall | + | + | + |
| 04-15-82 | WWTP | + | 10 | 10 |
| 04-15-82 | UW Marathon | 10 | 30 | 10 |
| 04-15-82 | Mount View Manor | + | 50 | 10 |
| 04-15-82 | Employers Regional | + | 50 | + |
| 04-15-82 | Ground Reservoir | 10 | 40 | 10 |
| 04-15-82 | NCTI | 10 | 20 | 10 |
| 05-03-82 | WTP - Effluent | - | 10 | - |
| 05-03-82 | City Hall | - | 20 | - |
| 05-03-82 | Airport | - | + | - |
| 05-06-82 | Water Treatment Plant | - | 30 | - |
| 05-06-82 | Water Treatment Plant | - | 20 | - |
| 05-06-82 | Water Treatment Plant | - | 40 | - |
| 06-14-82 | City Hall | - | 20 | - |
| 06-14-82 | City Hall | - | 20 | - |
| 06-14-82 | Airport | - | + | - |
| 06-14-82 | Airport | - | + | - |
| 10-28-82 | City Hall | + | 70[1] | 60[1] |
| 10-28-82 | Airport | + | 60[1] | 70[1] |
| 12-30-82 | Water Treatment Plant | 10 | 50 | - |
| 02-07-83 | Fire Station | + | 30 | + |
| 02-07-83 | Bob Johnson's Chevy | + | 40 | + |
| 05-03-83 | Holiday Inn | + | 50 | + |
| 05-03-83 | City Hall | + | 30 | + |

[1] Values the result of city well #4's contamination and was immediately taken off line.

TABLE 4 (Continued)

| Date of Sample | Location | PCE in ug/l | TCE in ug/l | DCE in ug/l |
|---|---|---|---|---|
| 06-13-83 | Marathon County Health Care | - | 70 | - |
| 06-13-83 | Holiday Inn | - | 80 | - |
| 06-13-83 | Central Fire Station | - | 80 | - |
| 06-13-83 | City Hall | - | 80 | - |
| 11-14-83 | Holiday Inn | - | + | - |
| 12-28-83 | City Hall | + | 60 | - |
| 12-28-83 | Marathon County Health Care | + | 30 | - |
| 01-25-84 | Health Care Center | + | 50 | + |
| 01-25-84 | City Hall | + | 20 | + |
| 02-06-84 | McDonalds | + | 50 | - |
| 02-13-84 | Holiday Inn | + | 30 | - |
| 02-13-84 | Health Care Center | + | 20 | - |
| 02-13-84 | City Hall | - | 10 | - |
| 04-02-84 | Health Care Center | + | 40 | - |
| 04-02-84 | City Hall | + | 30 | - |

TABLE 4 (Continued)

| Date of Sample | Location | PCE in ug/l | TCE in ug/l | DCE in ug/l |
|---|---|---|---|---|
| 05-07-84 | Water Treatment Plant | - | 40 | - |
| 05-07-84 | City Hall | + | 60 | - |
| 05-07-84 | North Central Health Care | + | 50 | - |
| 05-07-84 | Holiday Inn | + | 50 | - |
| 05-07-84 | Central Fire Station | + | 50 | - |
| 05-30-84 | Wausau Child Care Center | + | 30 | - |
| 05-30-84 | John Muir Middle School | + | 10 | - |
| 05-30-84 | North Central Technical Institute | + | + | - |

All results are from the Wisconsin State Laboratory.

* Reported values have been rounded to two significant figures
- Non-Detectable Concentration
+ Less than 10 ppb

The U.S. EPA, Region V, was informed of the water supply problem in May of 1984. The U.S. EPA through the Technical Assistance Team (TAT) contractor, Roy F. Weston Inc., Northbrook, Illinois, immediately conducted an assessment of the situation. The TAT site assessment confirmed a potential threat to residents dependent upon the Wausau water supply and as a result, the U.S. EPA initiated an Immediate Removal under CERCLA. U.S. EPA's objectives in the emergency action were two-fold. The first and foremost objective was to implement measures that would assure an uninterrupted supply of uncontaminated water to the residents of Wausau until the air stripper was designed, tested, and on-line at the Wausau water treatment plant. Toward this end, U.S. EPA, through CERCLA funding, installed a granular activated carbon (GAC) treatment system on municipal well #6. City Well #6 was selected because of its high yield capacity needed to supplement demand and accessibility for GAC Retrofitting. The filtration system consisted of four contact vessels, each containing 20,000 lbs of granular activated carbon. Carbon vessels operated in parallel and were capable of treating 1.8 mgd for a period of six months. This activity was undertaken on June 20, 1984, and the units were on-line by July 2, 1984. The GAC units successfully operated until October 29, 1984, when the air stripper began operation in August 1984. Complete documentation of the GAC installation activity is available in the EPA's On-Scene Coordinator's (OSC) Phase VII report. (see ATTACHMENT A)

The EPA's second objective under the CERCLA Immediate Removal was to characterize the extent of the ground water contamination, identify potential contamination sources, and evaluate ground water rehabilitation alternatives. The EPA tasked the TAT to develop and implement a hydrogeologic investigation of the Wausau ground water problem in June of 1984. This study, initiated on June 20, 1984, was undertaken in several phases, as follows:

Phase I

- Initiate an investigative study.
- Conduct a seismic refraction survey to map the bedrock configuration and characterize the aquifer configuration.

Phase II

- Conduct an industrial survey to identify potential users and/or source areas.
- Survey past and present landfills.

- o Identify possible source areas using monitoring wells.
- o Sample river sediments for VOCs.
- o Monitor contaminant concentrations in ground water.

## 1.3 Contaminant Characteristics

Before studying the results of this investigation it will be helpful to review certain physical properties that influence contaminent behavior in ground water. The following summary shows several selected characteristics of the compounds that have impacted the municipal supply.

| Contaminant | Mol.Wt. | Sp.Gravity | Solubility |
|---|---|---|---|
| Tetrachloroethylene (PCE) | 166 | 1.63 | 150 mg/l |
| Trichloroethylene (TCE) | 131 | 1.46 | 160 mg/l |
| Dichloroethylene (DCE) | 97 | (1.26 to 1.28) | 350 to 630 mg/l |
| Xylene | 106 | .86 | 0.1 mg/l |
| Toluene | 92 | .87 | 470 mg/l |

The summary table identifies the contaminant's specific gravity and solubility. These parameters influence the compound's transport behavior. The higher specific gravity greater than 1 and low solubility would tend to sink toward the bottom of the aquifer. Conversely, the specific gravity values that are less than one would tend to float on the water surface. However, this phenomenon may be inhibited by the low concentration and the vertical gradients suspending the compounds in the upper aquifer zone.

It is also important to review the biodegradation of chlorinated volatile compounds. That is, the parent contaminant PCE or TCE may undergo a biodegradational transformation after entering the anaerobic subsurface environment. The anaerobic degradation of chlorinated ethenes has been investigated by Parsons et.al., (1982, 1984). The chlorinated ethene series begins with PCE as a parent compound, which degrades to TCE. TCE subsequently degrades to the cis and trans isomers of 1,2-dichloroethylene (DCE) and eventually vinyl chloride as the end product. Proportionately more of the cis isomer than the trans isomer of DCE is generated. The significance of this degradation process is that even though TCE and DCE are found as contaminants in some wells, each may be derived from a single parent compound.

## 2.0 METHODS AND MATERIALS

### 2.1 Phase I -- Test Well Installation and Bedrock Mapping

The investigation was initiated with the drilling and installation of a test well (MW-1A) to bedrock (Figure 3). The test well was initially proposed to fulfill the following objectives:

- Due to the fact that all City wells were partially penetrating the aquifer, a confirmation of the actual depth to bedrock was required
- Bedrock depth measurement for seismic calibration
- Measurement of the water table surface elevation.
- Supplementation of stratigraphic control.
- Definition of the vertical stratification of the contamination, if detected

Exploration Technology, Inc., of Madison, Wisconsin, was contracted by Roy F. Weston, Inc., to perform the drilling and installation of the test well. Soil samples were collected using a split-spoon sampler at 5 foot intervals from the surface to bedrock to supplement geologic control in the west study area. Vertical water samples and soil samples were obtained as the boring was advanced.

A galvanized well point was initially employed as a vertical sampling point; however, the subsoils were extremely well consolidated, (penetration values, N, generally greater than 25) made advancement and retrieval of the well point impossible. Consequently, a section of NW gauge hollow drill stem was substituted as a well point by slotting the stem with a band saw and fitting one end with a heavy duty steel point. The heavy-duty slotted drill stem was easily driven and was removed without difficulty. The slots in the stem allowed for recharge into the stem with relative ease after development. It was necessary to develop the slotted drill stem well following each installation event to remove fines which entered the slotted stem. Water samples were taken at 10 foot intervals from the water table down to bedrock. The well point was developed at each level by jetting the well using filtered compressed air. The use of compressed air worked successfully in removing the sediment and providing

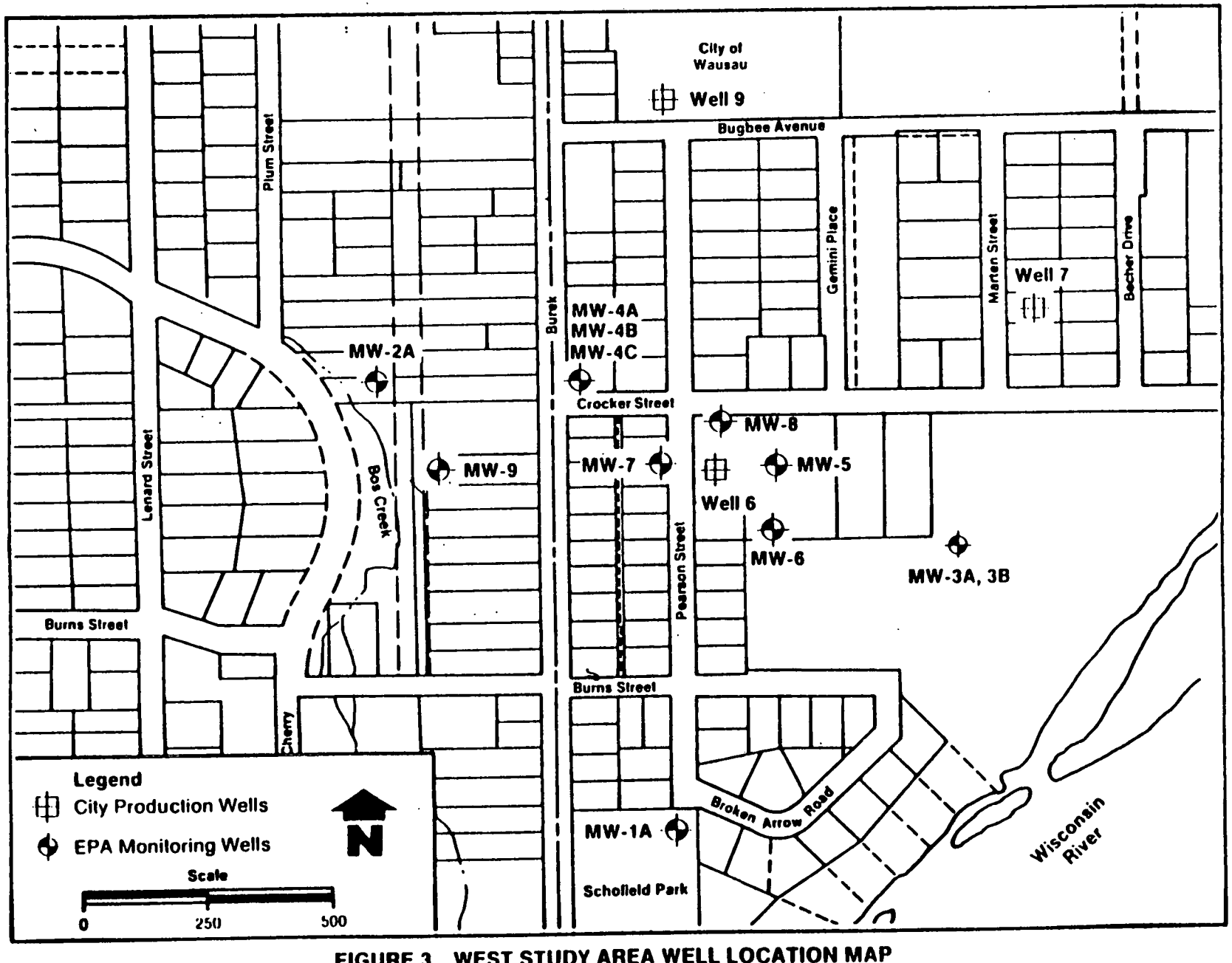


FIGURE 3 WEST STUDY AREA WELL LOCATION MAP

hydraulic connection between the well and aquifer prior to bailing the well for sampling purposes. Following the jetting procedure, the well was bailed to remove a minimum of two casing volumes before water samples were taken. The actual volume removed was dependent upon the depth. At depths of less than 70 feet, four case volumes were removed before VOC samples were taken. In the intermediate sample zone, 70 to 100 feet, three volumes were removed and at depths greater than 100 feet, two casing volumes were removed before sample collection. This was done by employing a stainless steel bailer. Samples were placed in precleaned, 40 ml septum vials and analyzed for volatile organics. Zimpro Laboratories of Rothschild, Wisconsin, was subcontracted to perform all sample analysis.

Bedrock Mapping

A seismic refraction study was undertaken to provide a data base for the mapping of the bedrock configuration. The purpose of the survey was to assist in characterizing the configuration of the aquifer sufficiently to allow strategic placement of monitoring wells for a comprehensive monitoring program. The survey also identified bedrock features that may affect contaminant distribution and movement. The data would also facilitate the City of Wausau's search for another water well field by providing pertinent hydrogeologic information which would optimize the placement and yield of future production wells.

The seismic refraction technique was the most applicable method for this residential setting. The technique proved to be extremely accurate in producing reliable data and remained cost-effective. The seismic survey was conducted by the TAT and E.A. Hickok and Associates, Inc., of Wayzata, Minnesota, from July 15 to August 2, 1984. Seismic data was gathered using a single geophone Bison Signal Enhancement Seismograph, Model 1570B. A total of 56 sounding sites were used during the survey. The majority of the sounding points required 300 foot traverses to determine the depth to bedrock. The remainder of the sounding points used 400 foot traverses with one point requiring a 500 foot traverse. The offset hammer stations were located at 10 and 20 foot intervals along a 300-500 foot measuring tape originating at the geophone. The energy source used to generate the compressional waves was a 10 pound sledge hammer with an inertia closing switch. The energy was detected by the geophone and amplified and recorded on the seismograph as a wave form. The raw data consisted of travel times and distances which were converted into the format of seismic velocity variations with depths (Table 5). Data points were collected until a trend of

TABLE 5

WAUSAU WISCONSIN - SEISMIC SOUNDING DATA

| Seismic Sounding No. | Velocity Range ft/sec | ft/sec | ft/sec | Depth to 1st Layer (ft) | Surface Elevation (1) | 1st Layer Elevation (1) | Depth to Bedrock (ft) | Surface Elevation (1) | Bedrock Elevation (1) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1450 | 2500 | - | 17 | 1213 | 1196 | - | 1213 | - |
| 2 | 1600 | 2600 | 20,500 | 16 | 1213 | 1197 | 167 | 1213 | 1046 |
| 3 | 1350 | 3850 | 22,500 | 10 | 1193 | 1183 | 136 | 1193 | 1058 |
| 4 | 900 | 4250 | 22,500(2) | 10 | 1195 | 1185 | 158 | 1195 | 1037 |
| 5 | 1200 | 3000 | 35,000 | 6 | 1217 | 1211 | 80 | 1217 | 1137 |
| 6 | 1450 | 3750 | 15,000 | 45 | 1221 | 1176 | 121 | 1221 | 1111 |
| 7 | 1600 | 2800 | 30,000 | 9 | 1219 | 1210 | 158 | 1219 | 1061 |
| 8 | 1025 | 3900 | 25,000(2) | 11 | 1199 | 1188 | 180 | 1199 | 1019 |
| 9 | 1100 | 20,000 | -- | 15 | 1121 | 1206 | 15 | 1221 | 1204 |
| 10 | 1250 | 6150 | 26,000 | 14 | 1209 | 1195 | 124 | 1209 | 1085 |
| 11 | 1500 | 3500 | 30,000 | 21 | 1214 | 1193 | 137 | 1214 | 1077 |
| 12 | 1100 | 25,000 | -- | 12 | 1255 | 1243 | 12 | 1255 | 1243 |
| 13 | 1250 | 2650 | 10,000 | 12 | 1215 | 1203 | 95 | 1215 | 1120 |
| 14 | 1450 | 5750 | 25,000(2) | 40 | 1220 | 1180 | 120 | 1220 | 990 |
| 15 | 1425 | 7950 | -- | 23 | 1223 | 1200 | 23 | 1223 | 1200 (3) |
| 16 | 1200 | 4250 | 21,250 | 9 | -- | -- | 53 | -- | -- |
| 17 | 1250 | 5500 | 25,000 | 11 | 1224 | 1213 | 74 | 1224 | 1121 |
| 18 | 1400 | 20,000 | -- | 7 | 1242 | 1235 | 7 | 1242 | 1235 |
| 19 | 950 | 13,000 | -- | 80 | 1196 | 1116 | 80 | 1196 | 1116 |
| 20 | 1350 | 18,250 | -- | 17 | 1200 | 1183 | 17 | 1200 | 1182 |
| 21 | 1300 | 4350 | 16,500 | 6 | 1212 | 1206 | 75 | 1212 | 1137 |
| 22 | 1250 | 3750 | 19,000 | 12 | 1206 | 1194 | 68 | 1206 | 1138 |
| 23 | In landfill; very slow velocities, questionable data | | | | | | | | |
| 24 | 1450 | 13,500 | -- | 30 | 1225 | 1195 | 30 | 1225 | 1195 |
| 25 | 1475 | 12,500 | -- | 14 | 1202 | 1188 | 14 | 1202 | 1188 |
| 26 | 1450 | 25,000 | -- | 15 | 1246 | 1231 | 15 | 1246 | 1231 |

TABLE 5 (Continued)

| Seismic Sounding No. | Velocity Range ft/sec | ft/sec | ft/sec | Depth to 1st Layer (ft) | Surface Elevation (1) | 1st Layer Elevation (1) | Depth to Bedrock (ft) | Surface Elevation (1) | Bedrock Elevation (1) |
|---|---|---|---|---|---|---|---|---|---|
| 27 | 1400 | 15,000 | -- | 26 | 1216 | 1190 | 26 | 1216 | 1190 |
| 28 | 1800 | 21,000 | -- | 85 | 1219 | 1134 | 85 | 1219 | 1134 |
| 29 | 1350 | 2240 | 17,000 | 5 | 1218 | 1213 | 104 | 1218 | 1114 |
| 30 | 1450 | 2050 | 7,000 | 6 | 1220 | 1214 | 80 | 1220 | 1140 |
| 31 | 1400 | 2950 | 17,000 | 14 | 1215 | 1201 | 117 | 1215 | 1098 |
| 32 | 1360 | 2250 | 13,000 | 4 | 1218 | 1214 | 94 | 1218 | 1124 |
| 33 | 1625 | 25,000 | -- | 85 | 1220 | 1135 | 85 | 1220 | 1135 |
| 34 | 1500 | 2800 | 11,000 | 17 | 1208 | 1191 | 95 | 1208 | 1113 |
| 35 | 1150 | 22,500 | -- | 20 | 1224 | 1204 | 140 | 1224 | 1084 |
| 36 | 1325 | 2825 | 12,000 | 8 | 1216 | 1208 | 49 | 1216 | 1167 |
| 37 | 1200 | 3250 | 12,000 | 9 | 1216 | 1207 | 83 | 1216 | 1133 |
| 38 | 1075 | 2125 | 12,000 | 7 | 1220 | 1213 | 85 | 1220 | 1135 |
| 39 | 1175 | 4500 | 23,500 | 11 | 1199 | 1188 | 65 | 1199 | 1134 |
| 40 | 1225 | 3650 | 16,000 | 14 | 1196 | 1182 | 101 | 1196 | 1095 |
| 41 | 1075 | 3250 | 17,500 | 5 | 1199 | 1194 | 103 | 1199 | 1086 |
| 42 | 1175 | 2725 | 15,000 | 5 | 1213 | 1208 | 59 | 1213 | 1154 |
| 43 | 1150 | 2262 | 21,000 | 15 | 1216 | 1201 | 97 | 1216 | 1119 |
| 44 | 1188 | 3125 | 16,500 | 8 | 1200 | 1192 | 40 | 1200 | 1160 |
| 45 | 1250 | 5850 | 20,000 | 13 | 1214 | 1201 | 105 | 1214 | 1109 |
| 46 | 1050 | 4250 | 17,500 | 7 | 1216 | 1209 | 78 | 1216 | 1138 |
| 47 | 1375 | 4500 | 11,500 | 42 | 1195 | 1153 | 115 | 1195 | 1080 |
| 48 | 1300 | 2750 | 20,000 | 6 | 1216 | 1210 | 125 | 1216 | 1091 |
| 49 | 1650 | 20,000 | -- | 15 | 1262 | 1247 | 15 | 1262 | 1247 |
| 50 | 1350 | 3250 | 15,000 | 10 | 1195 | 1185 | 118 | 1195 | 1077 |
| 51 | 1410 | 2625 | 18,500 | 9 | 1210 | 1201 | 88 | 1210 | 1122 |
| 52 | 1125 | 2200 | 20,000 | 35(2) | 1217 | 1182 | 200 | 1217 | 1017 |
| 53 | 1550 | 3725 | 20,000 | 13 | 1202 | 1189 | 82 | 1202 | 1120 |

TABLE 5 (Continued)

| Seismic Sounding No. | Velocity Range ft/sec | ft/sec | ft/sec | Depth to 1st Layer (ft) | Surface Elevation (1) | 1st Layer Elevation (1) | Depth to Bedrock (ft) | Surface Elevation (1) | Bedrock Elevation (1) |
|---|---|---|---|---|---|---|---|---|---|
| 54 | 1350 | 2850 | 20,000 | 5 | 1209 | 1204 | 99 | 1209 | 1110 |
| 55 | 1200 | 3250 | 25,000 | 15 | 1208 | 1193 | 66 | 1208 | 1142 |
| 56 | 1750 | 5250 | 20,000 | 30 | 1217 | 1187 | 85 | 1217 | 1132 |

(1) Elevations above mean sea level
(2) Assumed bedrock velocity
(3) Probable error in depth determination due to profile crossing deep and narrow alluvial valley

refracted primary wave interval times indicated seismic velocities characteristic of bedrock.

At 2 of the 56 sounding locations, bedrock depths exceeded 125 feet, generally considered to be the depth limitation of the equipment used. Two of the deep seismic traverses used to evaluate the bedrock topography proved extremely accurate when correlated with nearby boring records. Seismic Station #2 indicated bedrock to be 167 feet below land surface. Monitoring well #1A, located 200 feet up-dip of the seismic station, encountered bedrock at 159.5 feet below land surface. Seismic Station #7 indicated bedrock to be 158 feet below land surface. Monitoring well #3A was drilled less than 30 feet from seismic Station #7 and confirmed bedrock at 151 feet below land surface. The above data indicates the seismic approach was valid for the mapping of the bedrock surface at the site.

The majority of the 56 sounding stations identified three separate velocity layers. The first and second velocity layers were typical of unconsolidated sand and gravel outwash deposits with the two layers indicating a change in consolidation. Generally the first velocity layer was less than 1500 ft/second and the second layer was less than 6000 ft/second. The third layer was significantly higher and indicated a much greater density. This radical difference indicated the bedrock velocities to be generally greater than 15,000 ft/second. Based on the calculated velocities and hammer station distances, the depth to variation in velocity was determined. A reverse profile was conducted at each sounding station to check accuracy. At the sounding stations where the arrival times were equal, an averaging of the data was used to determine a representation of true bedrock depth. At sounding locations where the reverse profiles did not have equal arrival times, depth determinations were made averaging the profiles and correlating the values with other nearby profiles.

Based on monitoring wells completed to bedrock and structural boring records, the seismic refraction method proved to be very accurate in characterizing bedrock topography and was extremely cost effective compared to conventional drilling methods.

## 2.2 Phase II Monitoring Well Installation

### Monitoring Well Installation

A total of 20 monitoring wells were constructed and installed in Wausau as Phase II of the investigation. The drilling was initiated on September 13, 1984, and completed on December 1, 1984. The monitoring well investigation was divided into two study areas; the western side of the Wisconsin River (West Well Field) and the eastern side of the River (East Well Field). Twelve monitoring wells were located in the West Well Field and eight monitoring wells were installed in the Eastern Well Field.

The monitoring wells were installed by Exploration Technology, Inc., of Madison, Wisconsin. To expedite the drilling program, Exploration Technology subcontracted Wisconsin Test Drill of Schofield, Wisconsin.

The bore holes were advanced with a truck mounted Central Mine Equipment 55 or 750 drilling rig. Four inch Hollow Stem Augers were used to drill monitoring wells to depths less than 75 feet. NW Gauge Drill stem fitted with a 3 7/8" tri-cone bit, was employed to construct monitoring wells at depths greater than 75 feet. The monitoring wells were constructed of 2 inch (I.D.) flush threaded joint PVC (Schedule 40) with a wall thickness of .154 inches. Most of the well casings terminated with a 10 foot continuous wrap screen (#60 slot size) except for MW 12 and MW 9 which utilized 20 foot and 15 foot screens, respectively. The annular space around the screens was packed with Number 30 flint filter sand. The filter sand was emplaced with a 3/4 inch PVC drop pipe to approximately two feet above the top of the screen. A two foot seal of bentonite pellets was placed atop the sand; the remainder of the annular space was backfilled with a 6:1 bentonite/cement grout mixture.

To provide security for each well, a three inch nominal diameter steel protector pipe with locking cap was set around the well casing. Case-hardened steel padlocks were attached to each well. The protector pipe was sunk three feet into the cement mixture with a two foot extension of pipe above the surface. At the surface, a mounded concrete pad was constructed around the riser pipe to inhibit infiltration and enhance run-off (Figure 4). Protective wooden posts were installed around several of the wells in areas where vehicular traffic threatened the well. Several monitoring wells were located on the parkways of private citizens. To minimize the visibility of the monitoring wells a water-tight valve box

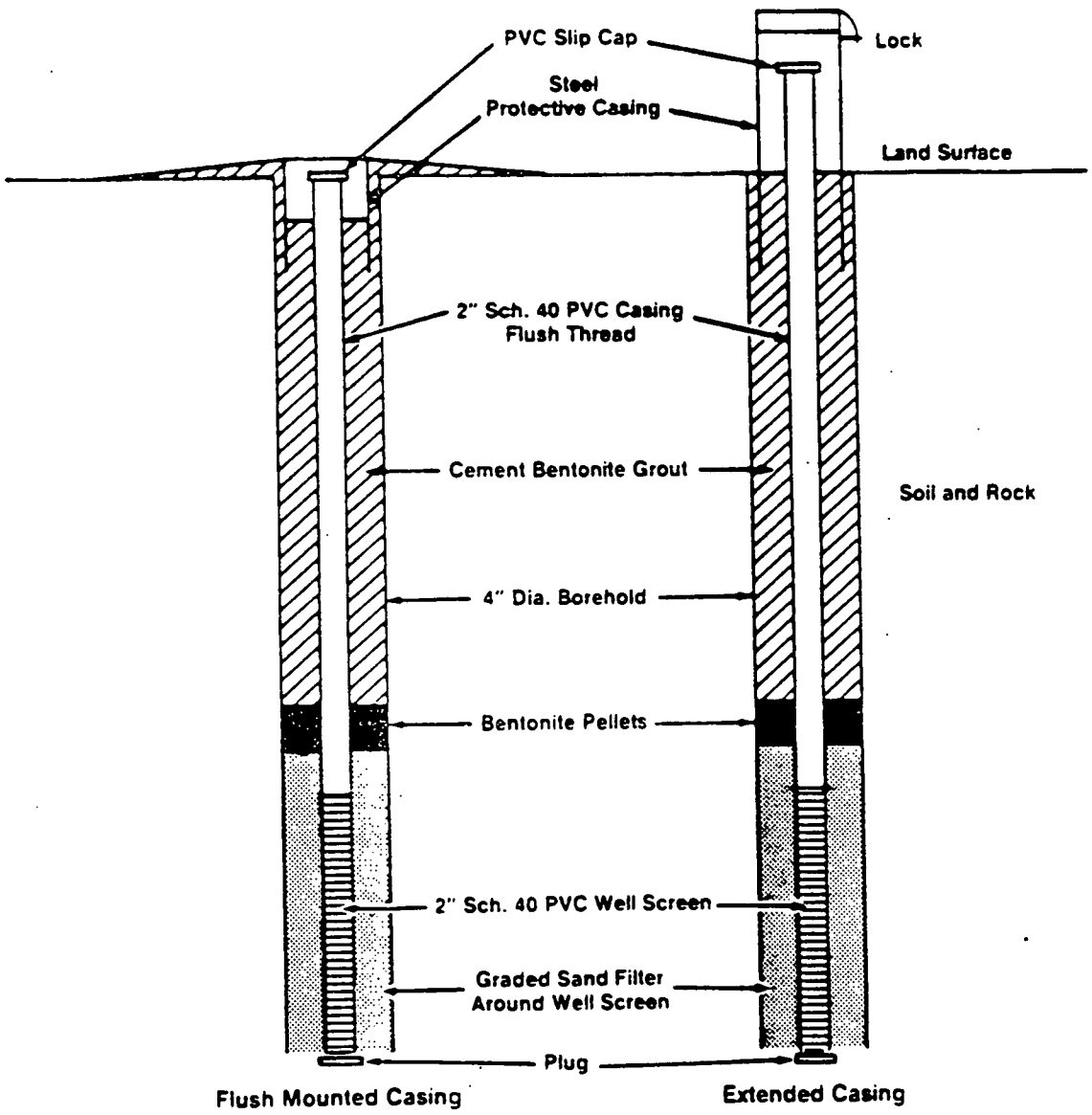


FIGURE 4 SCHEMATIC OF MONITORING WELL CONSTRUCTION

cover was used to complete the well at land surface. Tables 6 & 7 provide a summary of monitoring well measurements.

In order to minimize cross-contamination or introduction of contamination during well installation, rigorous decontamination procedures were employed to remove surface grease, oil, gasoline and/or organic contaminants from all equipment and machinery. Prior to all drilling activities, a high pressure steam cleaner was utilized to decontaminate the drill rig, including flight augers, equipment, and well construction materials. In addition to steam cleaning, the drill rig, well construction materials and split-spoon barrels were cleaned with a methanol wash, followed by several clear water rinses. This procedure was conducted at every well site prior to any drilling activity.

Soil Borings

Split-spoon sampling was conducted during installation of six of the monitoring wells. The sampling was undertaken in accordance with ASTM D-1586 protocols. A two inch (O.D.) split-spoon sampler was driven by a 140 pound weight, free falling approximately 30 inches. Blow counts were recorded for each sample location and used to determine penetration resistance. All soil samples were placed in 8-oz glass jars and used for lithologic descriptions.

A 4.5 foot carbide core barrel was utilized at monitoring well 2A for the recovery of a bedrock sample. The sample was identified in the field by TAT Geologists and then was shipped to the University of Wisconsin-Oshkosh for detailed lithologic identification and research purposes.

Survey

The City of Wausau's Engineering Department surveyed all the monitoring wells after the completion of the drilling program. Elevations were taken at the land surface and top of the well casing. The elevation of four river gauging stations were also measured by the City's engineering department.

Sampling and Analysis

Ground water sampling was conducted at all monitoring wells installed by the TAT and also wells installed by the City of Wausau. A dedicated permanent evacuation pipe was fitted on each well. The evacuation pipe consisted of a 3/4 inch check valve attached to a portion of Schedule 80 PVC pipe. The

TABLE 6

SUMMARY OF WEST SIDE MONITORING WELL ELEVATIONS AND DEPTHS

| Monitoring Well | Elevation and Land Surface | Elevation of Top of Casing | Well Depth | Screen |
|---|---|---|---|---|
| 1A | 1214.15 | 1215.92 | 141.0 | 10.0 |
| 2A | 1200.10 | 1202.59 | 48.0 | 10.0 |
| 3A | 1221.14 | 1223.67 | 141.0 | 10.0 |
| 3B | 1221.16 | 1223.37 | 75.0 | 10.0 |
| 4A | 1215.63 | 1215.63 | 100.0 | 10.0 |
| 4B | 1215.53 | 1215.53 | 60.5 | 10.0 |
| 4C | 1215.50 | 1215.50 | 40.0 | 10.0 |
| 5 | 1219.08 | 1219.08 | 45.0 | 10.0 |
| 6 | 1218.93 | 1218.93 | 45.0 | 10.0 |
| 7 | 1219.10 | 1219.10 | 45.0 | 10.0 |
| 8 | 1217.55 | 1217.55 | 45.0 | 10.0 |
| 9 | 1201.98 | 1201.98 | 50.0 | 15.0 |
| Cty Wl 6 | N/A | 1221.00 | | |
| Cty Wl 7 | N/A | 1225.66 | | |
| Cty Wl 9 | N/A | 1224.56 | | |

TABLE 7

SUMMARY OF EAST SIDE MONITORING WELL ELEVATIONS AND DEPTHS

| Monitoring Well | Elevation and Land Surface | Elevation of Top of Casing | Well Depth | Screen |
|---|---|---|---|---|
| EPA 7A | 1198.90 | I201.11 | 69.5 | 10.0 |
| EPA 9A | 1194.25 | 1196.82 | 141.0 | 10.0 |
| EPA 10A | 1204.50 | 1206.63 | 76.5 | 10.0 |
| EPA 10B | 1204.50 | 1206.41 | 35.0 | 10.0 |
| EPA 11 | 1209.92 | 1209.92 | 35.0 | 10.0 |
| EPA 12 | 1200.06 | 1200.06 | 70.0 | 20.0 |
| EPA 13 | 1211.10 | 1211.10 | 45.0 | 10.0 |
| EPA 14 | 1197.40 | 1197.40 | 45.0 | 10.0 |
| W.Chem.B1 | 1195.03 | 1197.03 | 23.0 | 10.0 |
| W.Chem.B2 | 1195.94 | 1197.94 | 24.0 | 10.0 |
| W.Chem.B3 | 1196.16 | 1198.16 | 161.0 | 3.0 |
| W.Chem.B3A | 1195.81 | 1197.81 | 65.0 | 3.0 |
| W.Chem.B3B | 1195.94 | 1197.94 | 24.0 | 10.0 |
| W.Chem.B3C | N/A | 1198.94 | 29.0 | 10.0 |
| W.Chem.B4 | N/A | 1196.56 | 60.0 | 3.0 |
| W.Chem.B4A | N/A | 1196.39 | 30.0 | 10.0 |
| W.Chem.B5 | N/A | 1196.53 | 70.0 | 3.0 |
| W.Chem.B5A | N/A | 1196.49 | 30.0 | 10.0 |
| W.Chem.B6 | N/A | 1198.00 | 70.0 | 3.0 |
| W.Chem.B6A | N/A | 1198.48 | 30.0 | 10.0 |
| W.Chem.B7 | N/A | 1196.79 | 60.0 | 3.0 |
| W.Chem.B7A | N/A | 1196.60 | 30.0 | 10.0 |
| City MW 1 | N/A | 1198.32 | 40.0 | 5.0 |
| City MW 2 | N/A | 1202.97 | 40.0 | 5.0 |
| City MW 3 | N/A | 1201.61 | 40.0 | 5.0 |
| City MW 4 | N/A | 1202.06 | 40.0 | 5.0 |
| City MW 5 | N/A | 1210.02 | 37.0 | 5.0 |
| City MW 6 | N/A | 1200.37 | 41.0 | 5.0 |
| City MW 7 | N/A | 1200.61 | 48.0 | 5.0 |
| City MW 8 | N/A | 1198.66 | 23.5 | 10.5 |
| Cty Wl 3 | N/A | 1203.40 | 91.0 | 41.0 |
| Cty Wl 4 | N/A | 1200.79 | 132.0 | 40.0 |

length of the pipe was determined by the depth to the water table. The monitoring wells that had water levels less than 30 feet were evacuated by a 3/4 horsepower pump connected to a 90° elbowed nipple which was attached to the evacuation pipe.

Following the evacuation, a minimum of six volumes of standing water in the well were retrieved using a stainless steel or Teflon bailer prior to sampling. The bailers were decontaminated between samples with laboratory grade methanol and several clean water rinses. Samples were placed in 40 ml septum vials and preserved with ice in coolers for transport to Zimpro Laboratories in Rothschild, Wisconsin, or shipment to the U.S. EPA Environmental Response Team (ERT) mobile laboratory in Niles, Michigan. Chain of custody was maintained on all samples (Appendix A). All samples were analyzed for PCE, TCE and DCE (Table 8). Duplicate blank and spike samples were used for quality control and quality assurance (Appendix B).

## 3.0 RESULTS OF INVESTIGATION

### 3.1 Geologic Setting

#### 3.1.1 Surficial Geology

Wausau is situated in a complex array of Pleistocene glacial deposits overlying bedrock that is predominantly Precambrian igneous and metamorphic rock. The topography is typified by gently rolling plains. Localized areas exhibit a marked increase in relief which are the result of downcutting of the Wisconsin River and its tributaries. The gently sloping topography that dominates the Wausau study area are the remnant deposits of outwash sand and gravel carried into the Wisconsin River valley by the Rib and Eau Claire rivers. The Pleistocene outwash deposits are of particular importance because they provide the major source of ground water in the area. Present knowledge of the surficial geology has indicated that the area has been inundated three and possibly four times by glacial advances in the Pleistocene epoch.

#### 3.1.2 Bedrock Geology

The bedrock geology was studied extensively by LaBerge and Myers (1983) to determine the potential for mineral exploration of the Precambrian rock. Two major lithic units that are volcanic in origin dominate the regional bedrock geology. Two syenite plutons exist in the Wausau area on the western side of the Wisconsin River. The syenite plutons are

TABLE 8

ANALYTICAL RESULTS FOR THE SIMULTANEOUS SAMPLING PROGRAM
WAUSAU, WISCONSIN

All results in ppb*

| MW #1 | PCE | TCE | DCE |
|---|---|---|---|
| 07-13-82 | - | - | - |
| 07-21-82 | - | - | - |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **MW #2** | | | |
| 07-13-82 | - | - | - |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **MW #3** | | | |
| 07-13-82 | - | - | - |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | |
| 11-08-84 | - | - | - |
| **MW #4** | | | |
| 07-13-82 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **City MW #5** | | | |
| 10-28-82 | + | + | + |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |

TABLE 8 (Continued)

| City MW #6 | PCE | TCE | DCE |
|---|---|---|---|
| 09-09-82 | 190 | 150 | 440 |
| 09-27-82 | 230 | 240 | 2910 |
| 10-28-82 | 280 | 260 | 140 |
| 09-17-84 | + | - | + |
| 10-01-84 | 20 | - | + |
| 10-17-84 | 20 | + | + |
| 11-08-84 | + | + | + |
| **City MW #7** | | | |
| 09-09-82 | 310 | 110 | 370 |
| 09-27-82 | 790 | 220 | 1140 |
| 10-28-82 | 220 | 120 | 520 |
| 09-17-84 | 20 | + | + |
| 10-01-84 | + | + | + |
| 10-17-84 | 30 | + | + |
| **Wergin Well** | | | |
| 07-13-82 | 110 | 230 | 2100 |
| 07-21-82 | 130 | 200 | 1260 |
| 09-09-82 | 800 | 150 | 620 |
| 09-24-82 | 530 | 90 | 520 |
| 09-27-82 | 390 | 110 | 2020 |
| 10-28-82 | 520 | 130 | 960 |
| 05-03-83 | 370 | 60 | 550 |
| 02-20-84 | 270 | 20 | 80 |
| **City #3** | | | |
| 09-17-84 | + | 150 | 20 |
| 10-01-84 | + | 150 | + |
| 10-17-84 | - | 110 | + |
| 11-08-84 | - | 210 | + |
| **City #4** | | | |
| 09-17-84 | 50 | 70 | 80 |
| 10-01-84 | 40 | 60 | 90 |
| 10-17-84 | 40 | 60 | 70 |
| 11-08-84 | 40 | 80 | 70 |
| **City #6** | | | |
| 09-17-84 | - | 140 | + |
| 09-25-84 | - | 170 | - |
| 10-01-84 | - | 150 | + |
| 10-17-84 | - | 180 | - |
| 11-08-84 | - | 130 | - |

TABLE 8 (Continued)

| City #7 | PCE | TCE | DCE |
|---|---|---|---|
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **City #8** | | | |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **City #9** | | | |
| 09-17-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **EPA MW #1A** | | | |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| 11-29-84 | - | - | - |
| **EPA MW #2A** | | | |
| 09-25-84 | - | - | - |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| 11-29-84 | - | - | - |
| **EPA MW #3A** | | | |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| 11-29-84 | - | - | - |
| **EPA MW #3B** | | | |
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| 11-29-84 | - | - | - |

TABLE 8 (Continued)

| EPA MW #4B | PCE | TCE | DCE |
|---|---|---|---|
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| 11-29-84 | + | - | - |
| **EPA MW #4C** | | | |
| 10-31-84 | + | + | - |
| 11-01-84 | - | + | - |
| 11-08-84 | - | - | - |
| 11-29-84 | - | - | - |
| **EPA MW #5** | | | |
| 11-08-84 | - | - | - |
| 11-09-84 | - | - | - |
| 11-29-84 | - | - | - |
| **EPA MW #6** | | | |
| 11-08-84 | - | + | - |
| 11-09-84 | + | + | + |
| 11-29-84 | - | - | - |
| **EPA MW #7** | | | |
| 11-28-84 | - | + | - |
| **EPA MW #7A** | | | |
| 10-01-84 | + | - | - |
| 10-17-84 | + | - | - |
| 11-08-84 | - | - | - |
| **EPA MW #8** | | | |
| 11-29-84 | - | - | - |
| **EPA MW #9** | | | |
| 12-03-84 | - | + | - |

TABLE 8 (Continued)

| EPA MW #9A | PCE | TCE | DCE |
|---|---|---|---|
| 10-01-84 | - | + | - |
| 10-17-84 | - | + | + |
| 11-08-84 | - | + | - |
| **EPA MW #10A** | | | |
| 10-01-84 | 40 | + | + |
| 10-17-84 | 60 | + | - |
| 11-08-84 | + | + | 30 |
| **EPA MW #10B** | | | |
| 10-01-84 | 120 | 70 | 580 |
| 10-17-84 | 120 | 70 | 480 |
| 11-08-84 | 70 | 50 | 380 |
| **EPA MW #11** | | | |
| 10-31-84 | + | + | - |
| 11-01-84 | + | + | + |
| 11-08-84 | + | + | + |
| **EPA MW #12** | | | |
| 11-05-84 | - | - | - |
| 11-08-84 | - | - | - |
| **EPA MW #13** | | | |
| 11-29-84 | 50 | 20 | 30 |
| **EPA MW #14** | | | |
| 10-30-84 | + | + | - |

* Reported values have been rounded to two significant figures.
- Non-Detectable Concentration
+ Less than 10 ppb

concentric ovals that consist mainly of syenite, quartz syenite and a semi-circular ring of large quartzite xenoliths. The east side of the Wisconsin River exhibits a regionally extensive metavolcanic pluton that is dominated in composition by felsic volcanic rock. The felsic igneous rock is referred to as rhyolite and is composed chiefly of feldspar and quartz minerals.

The contact between these two lithic bodies in the Wausau area is believed to be beneath the Wisconsin River. The region, being highly faulted, has led geologists to surmise that a buried fault exists beneath the Wisconsin River and, for a short distance, is believed to have influenced the direction of the river. In the Wausau study area, the river exhibits an unusually linear reach which is attributed to the fault line between the two lithic bodies (LaBerge, Klasner, Personal Comm., July 16, 1984).

The topographic expression of the bedrock surface appears to be controlled by the bedrock's ability to resist erosion. The less resistive syenite (the West Well Field), expressed dramatic relief changes. The more resistive rhyolite bedrock, found in the East Well Field, expressed subtle relief features. This relief contrast is attributed to the mineralogy of the two bedrock types.

3.1.3 Hydrogeology

Ground water in the Wausau area is contained within two distinct lithologies. The upper lithologic unit occurs in the unconsolidated Pleistocene glacial outwash deposits and the lower zone is in the underlying bedrock. The outwash deposits are quite extensive and exhibit excellent hydrogeologic properties for yielding large quantities of water. The water-bearing character of the deposits are, in part, a function of the depositional regime and location within the buried bedrock valleys. The highest yields within the deposits are generally found in the deep valley axis where coarser sediments occur. All of the municipal wells in Wausau are screened in the outwash deposits, but do not extend to the bedrock surface. Yields range from 500 to 2,000 gallons per minute (gpm). These yields are sufficient to provide the City with an adequate water supply.

The ground water in the glacial deposits receives recharge from direct infiltration through the land surface and discharges as base flow to the Wisconsin River and its tributaries. Bedrock may also contribute somewhat to the recharge of the overlying deposits. Induced infiltration from the Wisconsin River has occurred in isolated areas as a direct result of pumping from the municipal wells. The resulting

gradient reversal is a function of the pumping scheme employed by the City of Wausau.

Outside the alluvial filled valley the bedrock aquifer is utilized, to a limited extent, as a potable water source for residential wells where glacial desposits are thin. These wells are generally greater than 75 feet in depth and yields are usually less than 50 gpm. Ground water movement in the bedrock is controlled by fracture planes, and actual ground water yields in wells are a function of intersection of the fracture and fracture density.

## 3.2 Phase I - Test Well Installation

The test well, monitoring well (MW) #1, was positioned in the northeast corner of Marathon County's Schofield Park (Figure 3). The site was selected for several reasons. First, the location was expected to be within the radial cone of influence of city well #6. Second, the site had previously been the location of a lumber company disposal area, where the company had landfilled wood and production wastes. The site had also been noted by several senior citizens as a neighborhood dump. The actual volume and content of the landfilled material is unknown. In addition, a nearby industry, Marathon Electric Manufacturing Company, had been identified as a potential contaminant source. The company was suspected to have used trichloroethylene in the manufacture of various electrical components.

This test well was designed to provide stratigraphic information, water table elevations, actual depth to bedrock for seismic calibration, and, possibly, data on the depth and concentration of the VOC plume. Detailed well stratigraphy encountered is presented in Appendix C. Penetration values recorded during the sampling generally ranged between 25 and 50 blows for the final 12 inches of the sample recovery. Water table elevation was determined to be at 1,186.81 feet above Mean Sea Level (27 feet below land surface). The water level was monitored under various municipal pumping regimes and measurements indicated a static water level fluctuation of 6 to 12 inches directly attributed to the pumping of city well #6. Water level fluctuations occurred within one hour of city well #6 pumping.

The bedrock surface was encountered at 159.5 feet below land surface. With knowledge of the bedrock surface and the degree of consolidation of overlying sediments, the seismic survey was extremely useful in mapping the bedrock topography.

Water samples were collected at ten foot intervals and analyzed for VOCs. Laboratory analysis found no significant

levels of volatile organic compounds at any of the intervals sampled.(Table 9).

## 3.3 Bedrock Topography

Figures 5 and 6 present the bedrock contour maps constructed from the geophysical survey and well borings. The contour maps depict the effects of differential erosion rates attributed to differences in lithology. The harder, erosion-resistant rhyolite east of the river exhibited subtle, uniform erosional surface. In contrast, the west side of the Wisconsin River expressed a sharply contrasting relief indicative of less resistant syenite bedrock.

### 3.3.1 West Well Field

Several noteworthy bedrock features were determined in the western study area where two buried bedrock valleys were delineated. One valley originating near the intersection of Campus Drive and Schofield Avenue trends northwest to southeast to City Well #6. This bedrock valley parallels Bos Creek and appears to be very narrow and deep (approximately 100 ft). The second buried valley generally trends east-west in the vicinity of Bugbee Avenue. City Well #9 is situated within the confines of this valley.

The second buried valley appears to extend from Campus Drive at Fourth Avenue to City Well #9. City well #7 is believed to be located upon the axis of a buried ridge that divides the two valleys. The ridge appears to be sloping towards the Wisconsin River where the alluvial deposits increase in thickness.

An elongated ridge was observed on Burek Avenue and trends northwest-southeast. The ridge expressed significant relief and created the eastern half of a saddle feature. It appeared as if Bos Creek has been rerouted along the axis of this saddle feature indicating the possibility of a ground water and surface water divide.

### 3.3.2 East Well Field

The eastern study area's bedrock topography expressed subtle relief changes with little direct influence on the city production wells. A gently sloping valley trends in a general east-west direction, parallel to Lincoln Avenue. This valley was more apparent outside of the alluvial deposits where it outcrops on east Wausau Avenue.

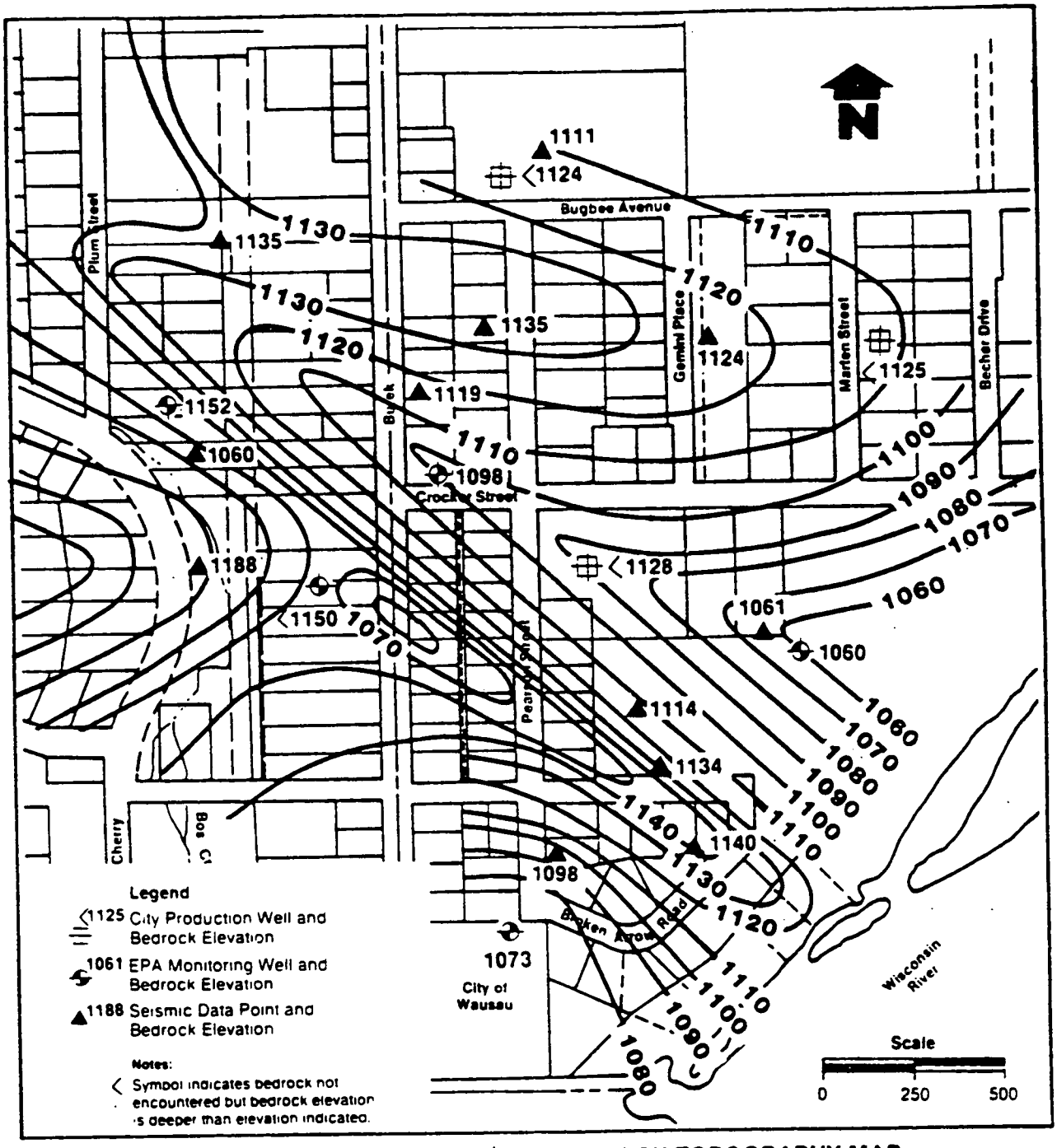


**FIGURE 5 WEST STUDY AREA - BEDROCK TOPOGRAPHY MAP**

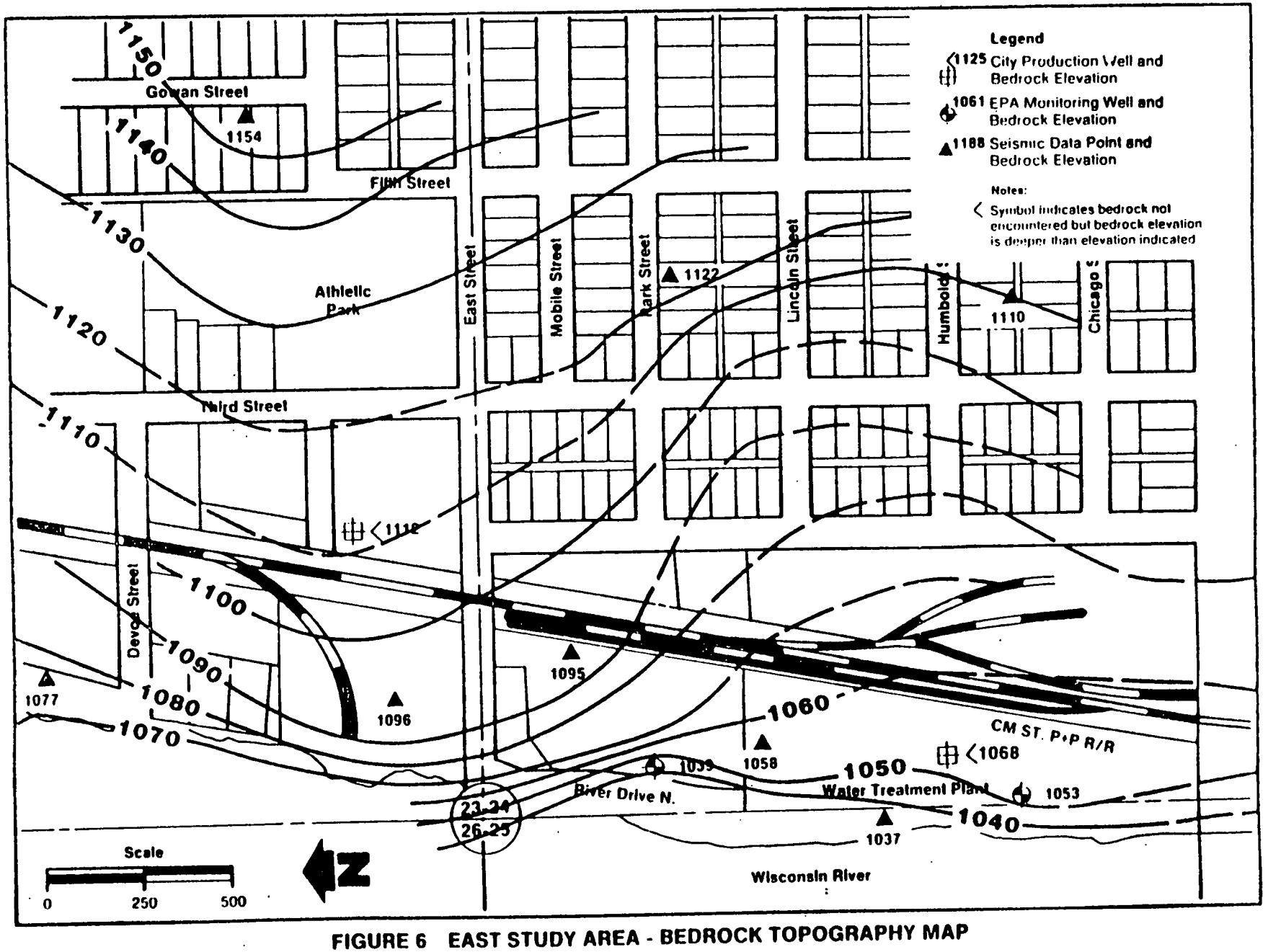


FIGURE 6 EAST STUDY AREA - BEDROCK TOPOGRAPHY MAP

TABLE 9

SUMMARY OF VOLATILE ORGANIC CONTAMINANT CONCENTRATIONS
FROM THE VERTICAL SAMPLING OF
U.S. EPA MONITORING WELL #1A

| | 35-40 ft | 45-50 ft | 55-60 ft | 64.5-69.5 ft | 73.5-78.5 ft | 83.5-88.5 ft | 93.5-98.5 ft | 103.5-108.5 ft | 113.5-118.5 ft | Blank H2O | 123.5-128.5 ft | 133.5-138.5 ft |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | + | + | + | + | + | + | - | - | + | - | + | + |
| Bromoform | - | - | - | - | - | - | - | - | - | - | - | - |
| Bromomethane | - | - | - | - | - | - | - | - | - | - | - | - |
| Carbon Tetrachloride | - | - | - | - | - | - | - | - | - | - | - | + |
| Chlorobenzene | - | - | - | - | - | - | - | - | - | + | - | - |
| Chloroethane | - | - | - | - | - | - | - | - | - | - | - | - |
| 2-Chloroethylvinyl Ether | - | - | - | - | - | - | - | - | - | - | - | - |
| Chloroform | - | - | - | - | - | - | - | - | - | + | + | + |
| Chloromethane | - | - | - | - | - | - | - | - | - | - | - | - |
| Dibromochloromethane | - | - | - | - | - | - | - | - | - | - | - | + |
| 1,2-Dichlorobenzene | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,3-Dichlorobenzene | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,4-Dichlorobenzene | - | - | - | - | - | - | - | - | - | - | - | - |
| Dichlorobromomethane | - | - | - | - | - | - | - | - | - | - | - | + |
| 1,1-Dichloroethane | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,2-Dichloroethane | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1-Dichloroethylene | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,2-Dichloroethylene | - | - | - | - | - | - | - | - | - | - | - | - |
| Dichloromethane | - | - | - | - | - | + | - | - | - | - | - | - |
| 1,2-Dichloropropane | - | - | - | - | - | - | - | - | - | - | - | - |
| Cis-1,3-Dichloropropene | - | - | - | - | - | - | - | - | - | - | - | - |
| Trans-1,3-Dichloropropene | - | - | - | - | - | - | - | - | - | - | - | - |

TABLE 9 (Continued)

| | 35-40 ft | 45-50 ft | 55-60 ft | 64.5-69.5 ft | 73.5-78.5 ft | 83.5-88.5 ft | 93.5-98.5 ft | 103.5-108.5 ft | 113.5-118.5 ft | Blank $H_2O$ | 123.5-128.5 ft | 133.5-138.5 ft |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ethylbenzene | + | + | + | + | + | - | - | - | - | - | - | - |
| 1,1,2,2-Tetrachloroethane | - | - | - | - | - | - | - | - | - | - | + | - |
| Tetrachloroethylene | - | - | - | - | - | - | - | - | - | - | - | + |
| Toluene | + | + | + | + | + | + | + | + | + | - | - | - |
| 1,1,1-Trichloroethane | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1,2-Trichloroethane | - | - | - | - | - | - | - | - | - | - | - | - |
| Trichloroethylene | - | - | - | - | - | - | - | - | - | - | - | - |
| Vinyl Chloride | - | - | - | - | - | - | - | - | - | - | - | - |
| EPA Tag No. | 545151 | 545152 | 545154 | 545155 | 544853 | 544854 | 544855 | 545156 | 545157 | 545163 | 545164 | 545167 |
| Zinpro Analytical No. | 4867 | 4868 | 4892 | 4893 | 4896 | 4946 | 4947 | 4948 | 4950 | 4967 | 4968 | 5007 |

- Not detected (less than 0.1 ppb)
+ Less than 10 ppb

## 3.4 Contaminant Source Investigation

### 3.4.1 East Well Field

#### 3.4.1.1 City Well #4

Background

City Well #4 was constructed in July of 1966 and was intended as a supplemental supply well to accommodate seasonal demand. The well is located approximately 100 feet east from the Wisconsin River and 200 feet south of Wausau's water treatment plant (Figure 7). The well was completed at 132 feet below land surface and was sized with a 40 foot section of stainless steel shutter screen. The casing diameter is 30 inches and the screen diameter is 20 inches. After construction, the well was tested at 2,000 gpm for a duration of 12 hours. The well had 36 feet of drawdown and has a specific capacity of 55.6 gpm/ft (Layne-Northwestern, 1966). Due to the well's proximity to the river, a significant proportion of its recharge is from induced infiltration from the river.

Historical well chemistry data indicate relatively low concentrations of tetrachloroethylene (PCE), and trichloroethylene (TCE), but significant levels of dichloroethylene (DCE) (Table 3, Figure 8). Since the original detection of VOCs in October, 1982, results have also indicated trace levels of toluene and xylene. During 1982 and 1983, concentrations fluctuated dramatically. Since May of 1984, individual contaminant levels were under 110 ppb (Table 3).

Potential Contaminant Sources

During the early stages of the investigation, there appeared to be several potential sources warranting evaluation. Potential sources that were identified include:

- Wausau Chemical Company,
- Marathon Box Company,
- A strip of property owned by the Chicago, Milwaukee, St. Paul and Pacific (C.M.St.P.&P.) Railroad located between City Well #4 and Marathon Box Company,
- The Wisconsin River, and
- An unidentified upgradient source (east of Marathon Box).

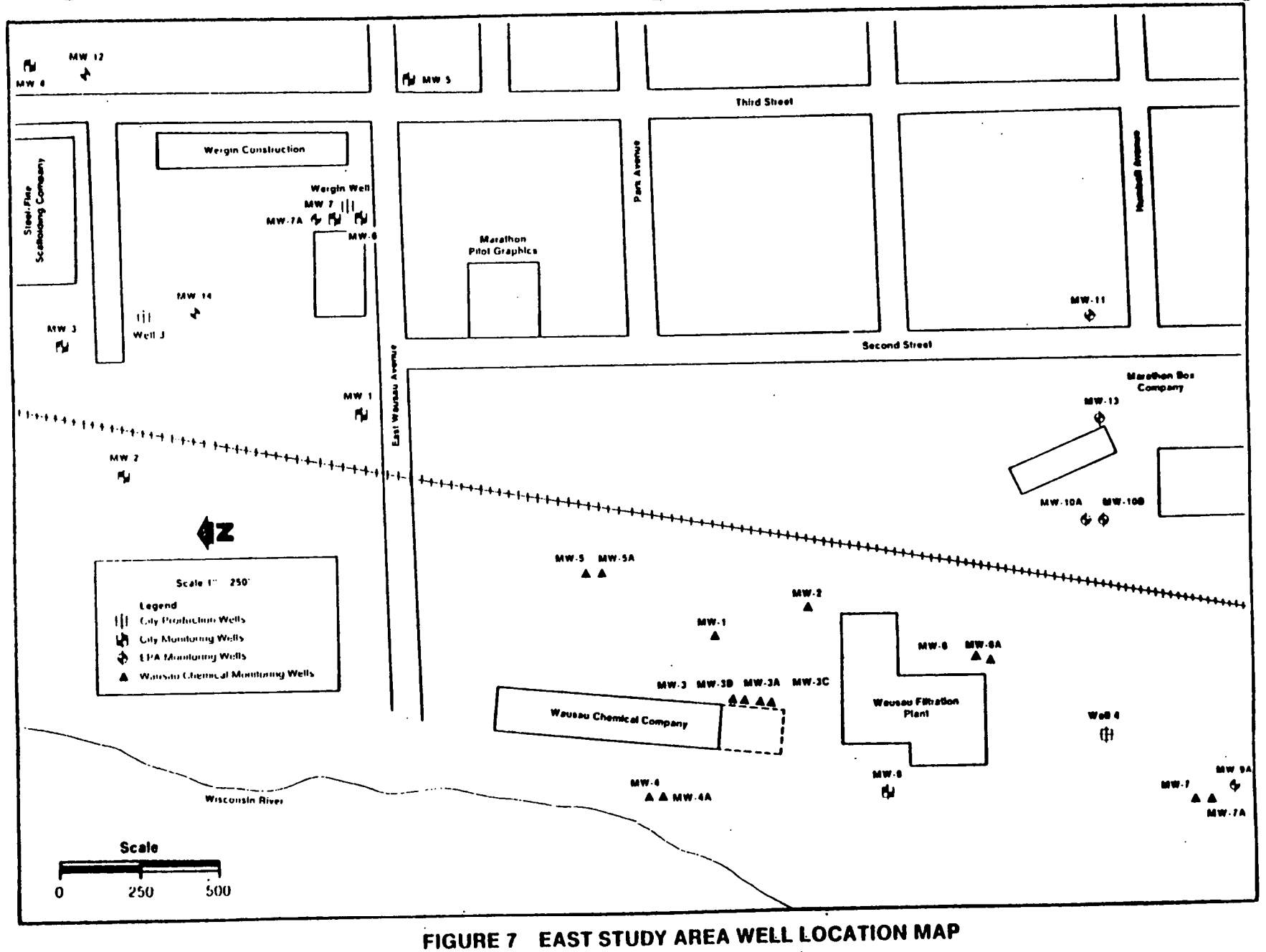


**FIGURE 7 EAST STUDY AREA WELL LOCATION MAP**

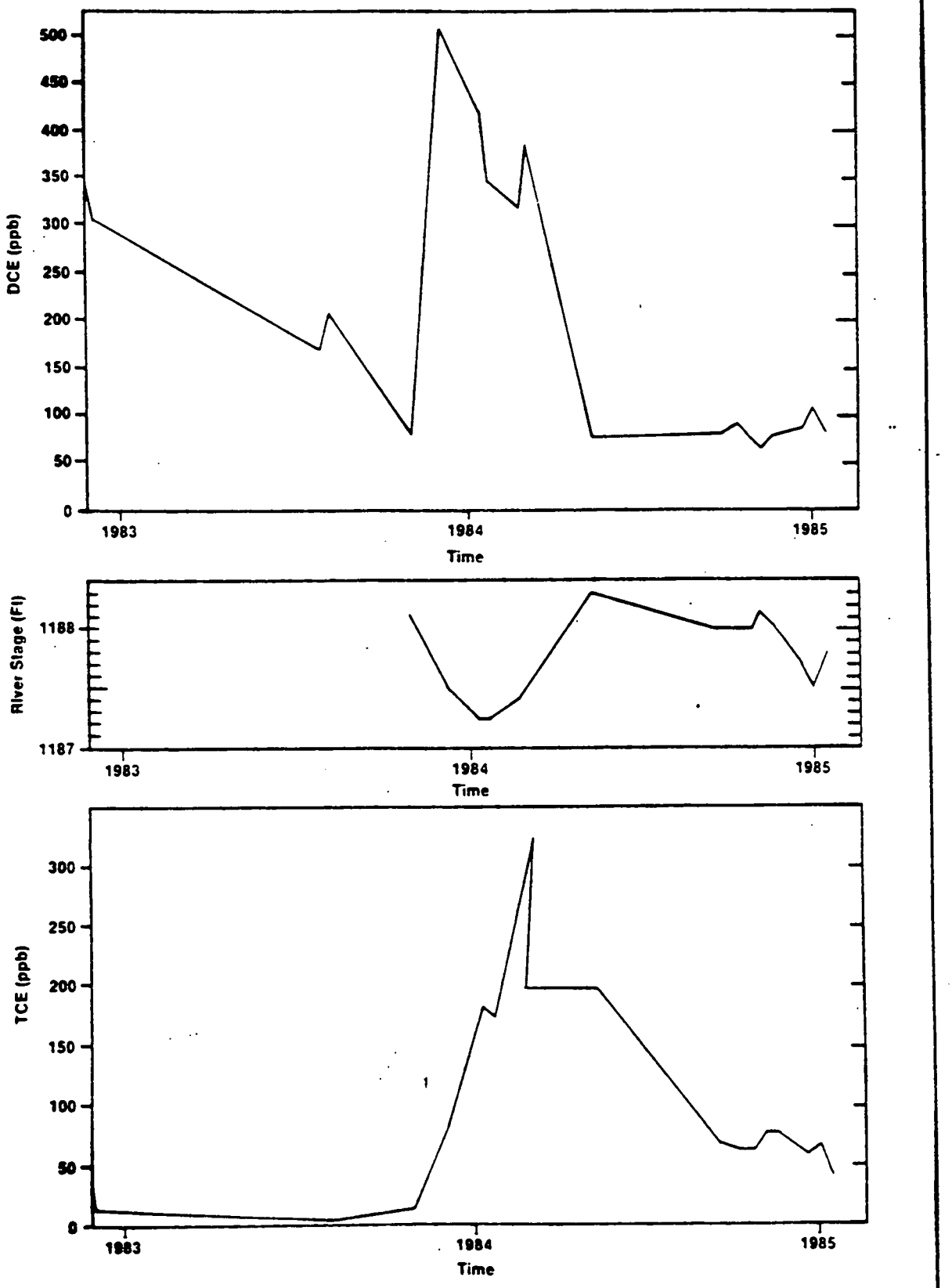


FIGURE 8 HISTORIC VARIATION IN RIVER STAGE AND CONTAMINANT CONCENTRATIONS IN CITY WELL 4

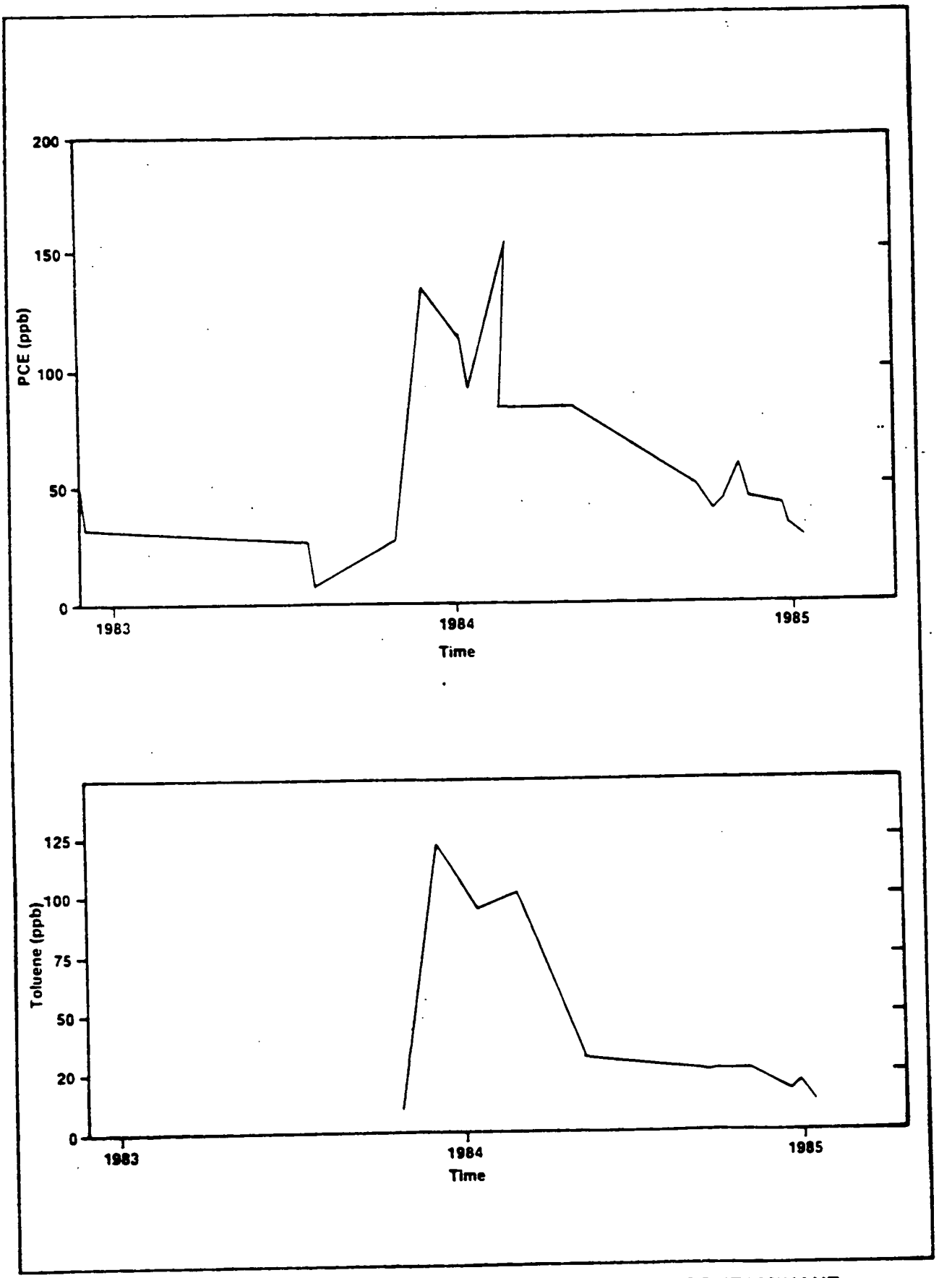


FIGURE 8 HISTORIC VARIATION IN RIVER STAGE AND CONTAMINANT CONCENTRATIONS IN CITY WELL 4 (CONTINUED)

Wausau Chemical Company, because of its business (bulk solvents for the dry cleaning industry), location, and history of solvent spills, was identified as a probable source. In May of 1975, during the expansion of Wausau's water treatment facility, strong odors were emanating from the excavated ground. Soil samples were taken to Zimpro for laboratory analysis. The soil analyses identified 31.5 ppm PCE, 25.6 ppm TCE, 247 ppm toluene, and 7.1 ppm xylene. Within a month, the Wisconsin Department of Natural Resources (WDNR) ordered Wausau Chemical to remove the contaminated soil from the property and implement a ground water surveillance program. Shortly thereafter, Wausau Chemical was given an amendment to this WDNR order. The amendment called for the installation of a forty foot monitoring well to define the lateral extent of contamination. The monitoring well was installed but there is no known record of monitoring efforts and the soil removal was never undertaken.

More recently, Wausau Chemical Company had two reported spills of tetrachloroethylene (PCE). The first spill occurred on February 15, 1983, when a valve broke on a 285 gallon delivery truck during off-loading. Approximately 135 gallons was discharged from this incident based on information gathered from the TAT SPCC inspection report. On December 19, 1983, a second PCE spill occurred, releasing approximately 500 gallons. Following each incident, remedial measures were taken to limit the environmental impact of the 1983 spills. These measures consisted of absorbing the spilled liquid with absorbant materials and excavating the contaminated soil. In addition to these spills, the facility's bulk storage tanks and diked perimeter appeared to be structurally inadequate. Visual observations by the TAT identified stained soils from a drum storage area located behind the facility.

Because of their documented spills in 1983, Wausau Chemical Company installed 14 monitoring wells at the request of WDNR. Wausau Chemical contracted Soil Testing Services, Inc., (STS) to install the wells and to interpret the results. A copy of this report is included in Appendix D.

Ground water analysis of the Wausau Chemical monitoring wells indicated significant contaminant levels in wells #1, 2, 3A, #3C, 5A, and 6A (Figure 7). It is apparent that a majority of the contamination is concentrated at the southern end of the facility. However, monitoring well #5A located at the north end has increased in PCE concentrations. This would indicate contaminant movement toward City Well #3, emanating from a southern point source. The contaminant appears to be concentrated in the upper part of the aquifer.

A second suspected industrial source, Marathon Box Company, warranted investigation because of its upgradient location and usage of various chemicals in wood treatment and common cleaning solvent used to clean machinery.

Contaminant sources upgradient to the east of City Well #4 were investigated by installation of four U.S. EPA monitoring wells MW#10A, MW#10B, MW#11, and MW#13 (Figure 7). Samples from the nested well set (#10A, #10B), located at the western half of the Marathon Box property, contained concentrations of VOCs in proportions similar to VOCs in City Well #4. Monitoring well #10A, screened at 60-70 ft, contained concentrations of PCE and TCE that ranged from less than 10 ppb to 60 ppb and DCE ranged from less than 10 ppb to 30 ppb (Table 10). Well #10B, screened from 25 ft to 35 ft, exhibited much greater DCE concentrations (580 ppb) than the MW10A (less than 10 ppb) and suggested a nearby surface soil contamination source.

To define the eastern boundary of the contamination, a shallow 35 ft monitoring well (MW #11) was constructed further upgradient near the corner of Second Street and Humboldt Avenue (Figure 7). This well contained only trace to nondetectable levels of contamination, indicating that the loading source was at some point between wells #10A and #10B, and well #11. As a result, a fourth well, MW #13, was constructed between the two wells and confirmed ground water contamination with DCE, TCE and PCE at concentrations of 30 ppb, 20 ppb and 50 ppb, respectively on the Marathon Box property (Table 11).

As noted previously, the strip of property owned by the C.M.St.P & P. Railroad was also considered a possible source area. Wausau Chemical Company has received bulk shipments of chemical solvents from railroad tank cars and it is quite possible that spillage or leakage may have occurred in this area during transfer of materials. No data was collected in the present study to either confirm or refute this property as a source and would merit investigation in any future studies. Furthermore, based on the data collected, it was not possible to segregate potential source areas on the railroad right-of-way from contamination documented on Wausau Chemical and Marathon Box properties.

Potential contaminant sources between the Wisconsin River and City Well #4 were investigated through installation of U.S. EPA monitoring well #9A and by sampling Wausau Chemical's monitoring wells #7 and #7A (Figure 7). Monitoring wells located between the Wisconsin River and City Well #4 documented that contaminants were neither migrating westward past

WESTON

TABLE 10

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANTS
AT THE WAUSAU CHEMICAL COMPANY

All results in ppb*

| MW #B-1 | PCE | TCE | DCE |
|---|---|---|---|
| 05-16-84 | 180 | 30 | 20 |
| 10-01-84 | 200 | 150 | 90 |
| 10-17-84 | 120 | 70 | 80 |
| 11-08-84 | 30 | 20 | 30 |
| **MW #B-2** | | | |
| 05-04-84 | 490 | 50 | 20 |
| 09-17-84 | 540 | 170 | 70 |
| 10-01-84 | 330 | 210 | 100 |
| 10-17-84 | 170 | 90 | 70 |
| 11-09-84 | 80 | 80 | 30 |
| **MW #B-3** | | | |
| 05-16-84 | + | + | + |
| 05-31-84 | + | + | + |
| 09-17-84 | - | + | - |
| 10-01-84 | + | + | + |
| 10-17-84 | - | + | + |
| 11-08-84 | - | + | + |
| **MW #B-3A** | | | |
| 05-16-84 | 3200 | 2600 | 630 |
| 05-31-84 | 4300 | 4800 | 680 |
| 09-17-84 | 2300 | 2700 | 3100 |
| 10-01-84 | 6480 | 4860 | 3300 |
| 10-17-84 | 870 | 1502 | 2100 |
| 11-08-84 | 1260 | 1120 | 920 |
| **MW #B3-C** | | | |
| 10-17-84 | - | 3330 | 750 |
| 11-08-84 | + | 100 | - |
| **MW #B-4** | | | |
| 10-01-84 | + | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |

TABLE 10 (Continued)

| MW #B4-A | PCE | TCE | DCE |
|---|---|---|---|
| 10-01-84 | - | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **MW #B-5** | | | |
| 10-01-84 | + | - | - |
| 10-17-84 | - | - | - |
| 11-08-84 | + | - | - |
| **MW #B5-A** | | | |
| 10-01-84 | 170 | + | - |
| 10-17-84 | 380 | 10 | + |
| 11-08-84 | 2600 | 40 | + |
| **MW #B-6** | | | |
| 10-01-84 | - | - | + |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | + |
| **MW #B6-A** | | | |
| 10-01-84 | 1920 | 880 | 310 |
| 10-17-84 | 790 | 1100 | 570 |
| 11-08-84 | 3930 | 2040 | 730 |

Table 10 (Continued)

| MW #B-7 | PCE | TCE | DCE |
|---|---|---|---|
| 10-01-84 | 10 | + | - |
| 10-17-84 | - | - | - |
| 11-08-84 | + | - | - |
| **MW #B7-A** | | | |
| 10-01-84 | + | + | - |
| 10-17-84 | - | - | - |
| 11-08-84 | - | - | - |
| **EPA MW #9** | | | |
| 10-01-84 | - | + | - |
| 10-17-84 | - | + | + |
| 11-08-84 | - | + | - |
| **CITY MW #8** | | | |
| 05-16-84 | 30 | + | + |
| 09-17-84 | 40 | + | - |
| 10-01-84 | 30 | + | - |
| 10-17-84 | + | - | - |
| 11-08-84 | + | - | - |

* Reported values have been rounded to two significant figures.
- Non-Detectable Concentration
+ Less than 10 ppb

TABLE 11

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANTS
AT THE MARATHON BOX FACILITY

All Results Reported in ppb*

| EPA MW #10A | PCE | TCE | DCE |
|---|---|---|---|
| 10-01-84 | 40 | + | + |
| 10-17-84 | 60 | + | - |
| 11-08-84 | + | + | 30 |
| **EPA MW #10B** | | | |
| 10-01-84 | 120 | 70 | 580 |
| 10-17-84 | 120 | 70 | 480 |
| 11-08-84 | 70 | 50 | 380 |
| **EPA MW #11** | | | |
| 10-31-84 | + | + | - |
| 11-01-84 | + | + | + |
| **EPA MW #13** | | | |
| 11-29-84 | 50 | 20 | 30 |

* Reported values have been rounded to two significant figures.
- Non-Detectable Concentrations
+ Less than 10 ppb

City Well #4 nor derived from the Wisconsin River through induced infiltration. Furthermore, a comprehensive Wisconsin River sediment sampling program was conducted by the WDNR and samples analyzed by the TAT. The results indicated nondetectable levels of VOCs in the reach of the Wisconsin River in the Wausau study area (Appendix E).

Actual ground water movement in the eastern study area was observed to be greatly altered due to the drawdown during the pumping of city wells #3 and #4. Under static conditions (i.e., no pumping), ground water flows west towards the Wisconsin River, contributing to base river flow. Pumping of well #3 and #4, however, reversed this flow direction along the river recharge zone (Figure 9). City well #4's cone of influence extends west to the Wisconsin River where it receives a significant portion of its recharge. The cone also extends eastward, upgradient, possibly encompassing the entire Marathon Box property and extends further east to a point beyond Second Street.

The size of City Well #4's cone of influence is a function of river stage and pumping regime. An inverse relationship exists between the elevation of the recharge boundary and the size of the cone of influence. As the river stage declines, the size of the cone of influence increases to maintain hydraulic equilibrium. The interaction between pumping rates and the fluctuating elevation of the river recharge boundary is believed to be a major factor affecting ground water contaminant concentrations and contaminant movement in the eastern study area wells. Specifically, when the Wisconsin River stage is increased, the hydraulic head along the recharge boundry is increased. Under these conditions the volume extracted from the river is increased. As a result of this increased recharge, contaminants are diluted within City Well #4's cone of influence. Conversely, a decrease in river stage reduces the hydraulic head along the recharge boundry and the volume extracted from the river is decreased. The net result of this inverse relationship is an increase in contaminant concentration when the river stage is lowered.

Based on results of analysis of water samples collected from the Wausau Chemical wells, city monitoring wells, and newly installed U.S. EPA wells, it is apparent that at least two sources have impacted City Well #4. Monitoring wells upgradient to the east of City Well #4 indicated that a source area exists either along the railroad tracks adjacent to Marathon Box, or on Marathon Box property proper. It is also apparent that Wausau Chemical Company is contributing to the contamination in city well #4. Monitoring wells installed on and around Wausau Chemical Company have clearly demonstrated high contaminant concentrations in the ground water, particularly in the shallower monitoring wells, which also occur in

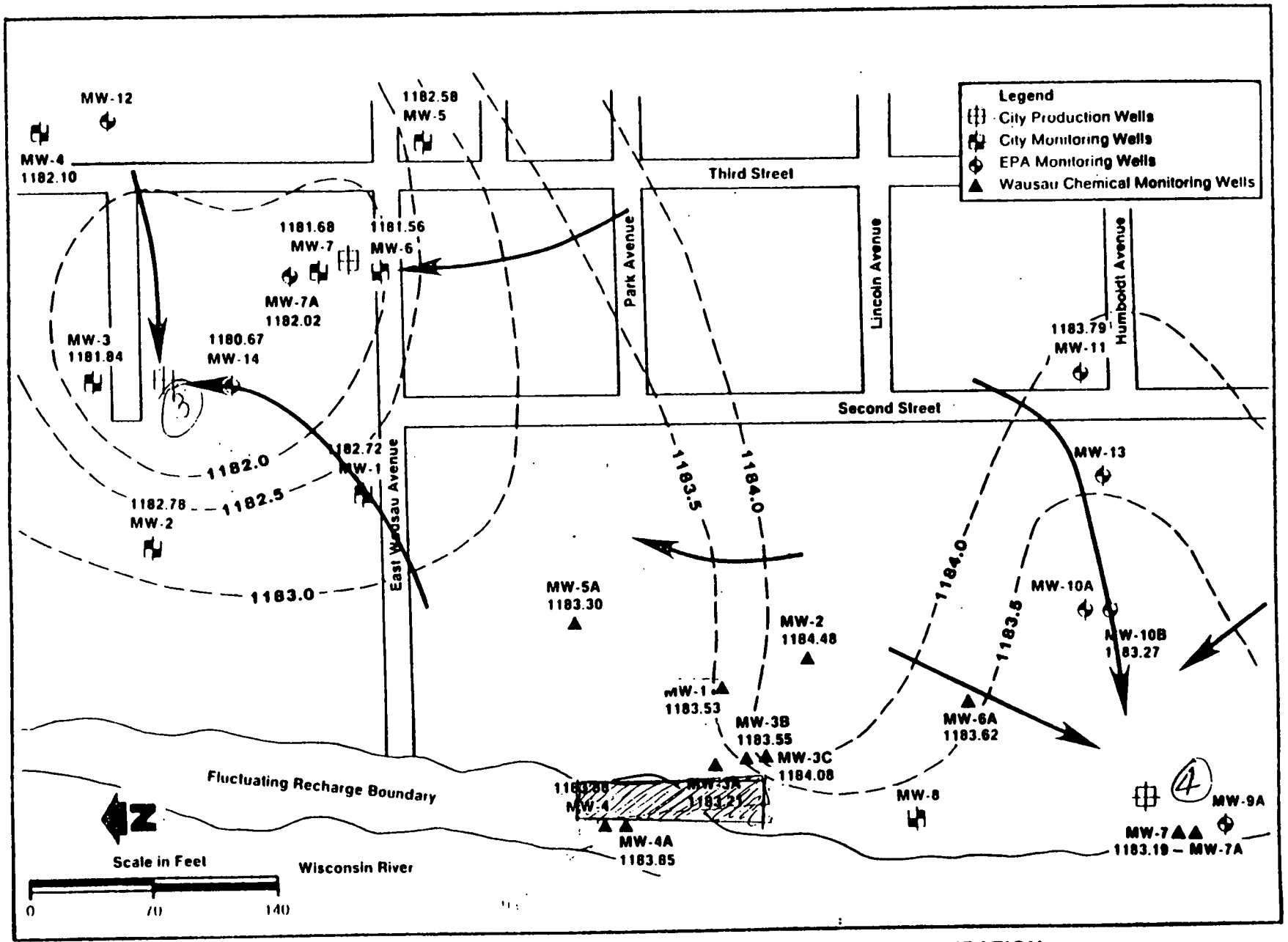


FIGURE 9 EAST STUDY AREA WATER TABLE CONFIGURATION

City Well #4. Total VOC's on the order of several thousand ppb are also found in ground water between Wausau Chemical and City Well #4 confirming migration toward the City Well. In addition to the high levels of chlorinated organics observed in the ground water, soil samples obtained from the Wausau Chemical property indicated significant levels of PCE, TCE, DCE, toluene and xylene. Again, these contaminants are being detected at City Well #4.

The cones of depression attributed to City Well #4 and City Well #3 both appear to extend to the Wausau Chemical property. As depicted on Figure 9, ground water within the southern boundary of the property tends to flow toward city well #4 whereas within the northern confines of the property, ground water tends to flow northeast as influenced by City Well #3, when the City wells are operational. Flow directions are further influenced by the variation in river recharge as affected by fluctuations in base river flow.

3.4.1.2 City Well #3

Background

City well #3 was drilled and completed in the spring of 1961. The well is located approximately 300 ft north of East Wausau Avenue and 250 ft south of Third Street (Figure 7). It is 91 ft deep and 18 inches in diameter with an initial boring of 48 inches. The well's construction is consistent with standard methods. Pump tests have not been documented and they are not on file with any state or local agency. The well's maximum yield is 1500 gpm and it draws its recharge from upgradient sources and the Wisconsin River. Trichloroethylene has been the persistent contaminant at about 100 to 200 ppb. PCE and DCE that previously occurred in high concentrations have diminished to only trace levels of less than or equal to 10 ppb (Table 1).

The Wergin Construction Company's well is located approximately 280 feet southeast of city well #3 (Figure 7). The well is 70 feet deep and 6 inches in diameter. It yields approximately 75 gpm and is designed for nonconsumptive use in noncontact cooling water which is subsequently discharged to the municipal sewer system. The well was initially tested in July of 1982. Analysis identified 2100 ppb DCE, 230 ppb TCE, and 110 ppb PCE in the ground water samples. Since October, 1982, total VOC concentrations have steadily declined to the order of 100 ppb (Table 12).

Potential Contaminant Sources

At the onset of the investigation, City Well #3 was one of the City's main supply wells. The well was first shut down

WESTON

TABLE 12

SUMMARY OF SELECTED VOLATILE ORGANIC CONTAMINANT CONCENTRATIONS
IN THE WERGIN CONSTRUCTION COMPANY WELL
JULY 1982 - OCTOBER 1984

| Collection Date | Concentration-ppb* | | |
|---|---|---|---|
| | PCE | TCE | DCE |
| 7-13-82 | 110 | 230 | 2090 |
| 7-21-82 | 130 | 200 | 1260 |
| 9-09-82 | 800 | 150 | 620 |
| 9-24-82 | 530 | 90 | 520 |
| 9-27-82 | 390 | 110 | 2020 |
| 10-28-82 | 520 | 130 | 960 |
| 5-03-83 | 370 | 60 | 550 |
| 2-20-84 | 270 | 20 | 80 |
| 8-23-84 | 70 | + | + |
| 9-17-84 | 70 | + | 10 |
| 10-01-84 | 50 | + | 10 |
| 10-17-84 | 110 | + | 40 |
| 11-08-84 | 70 | + | 40 |

* Reported values have been rounded to two significant figures.
+ Less than 10 ppb

on April 22, 1982, due to the contaminant concentrations. Several suspected sources exist in the vicinity of the well. Again, Wausau Chemical Company, for the historical reasons noted earlier, was believed to be a likely source area.

Water levels indicated that City Well #3's cone of depression extends over a large area (Figure 9). This City well draws recharge from the Wisconsin River and from upgradient areas. As previously described in relation to City Well #4, the size of City Well #3's cone of depression, rate of ground water movement, and dilutional effects are a function of river stage and pumping scheme. During low base river flow periods, the cone of influence from City Well #3 extends south and west into the Wausau Chemical Company property. This relationship appears to be controlling the ground water movement on the northern half of the Wausau Chemical property. As a result, the native gradient has been reversed and is enhancing contaminant movement as indicated by the increasing levels of PCE at Wausau Chemical MW-#5A.

The TAT and the WDNR, however, conducted an industrial survey to identify any additional potential sources. A copy of this report is included in Appendix F. The surveys identified three facilities as potential source areas: Wilson-Hurd; Steel-Flite Scaffolding; and Marathon Pilot Graphics.

Wilson-Hurd is a manufacturer of name plates, located approximately 1,000 ft northeast of City Well #3. The plant engineer, Bill Siebecker, supplied the TAT with their material safety data sheets which listed the use of aromatic hydrocarbons. The engineer indicated that they used approximately 165 gallons of unspecified aromatic hydrocarbons per month and the residual wastes are collected and transported by Wausau Chemical Company to Waste Research and Reclamation in Eau Claire, Wisconsin, for disposal. Based on this information, it appears possible that Wilson-Hurd may be considered a low potential source of contamination.

Steel Flite Scaffolding Company, located directly north of City Well #3, was identified as another possible source. The industrial survey indicated that the products in question were not used on site and all wastewater was discharged to the city sanitary sewer system. Based on the above and the fact that Steel Flite does not utilize large quantities of solvent in their manufacturing process, they are considered to represent a low potential source of contaminants.

Marathon Pilot Graphics (Marathon Press Company, Inc.), located directly south of well #3, was also identified as a possible source. During the industrial survey, the president of the company was interviewed and he indicated that they use several solvents and cleaners but had no material safety data

sheets. He agreed to contact the manufacturers and forward data sheets; however, to date, no reply has been received. The firm disposed of used solvents in the city sanitary sewer. The survey also noted that press cleaners were applied with rags and that no excess liquid was generated. Due to the limited information on the industry's disposal methods and in-house products, they remain a possible source area.

The property upon which City Well #3 was constructed was also a suspected source due to previous land use. Records and conversations with local residents indicated that the property was used as a maintenance garage by the City of Wausau prior to the early 1960's. Actual documentation of the products used and disposal practices are not known to exist. It is, however, possible that chlorinated hydrocarbons were used as degreasing/cleaning agents.

Prior to this investigation, seven monitoring wells were constructed by the City (Figure 7). These wells were intended to define the direction from which contamination was migrating to City Well #3. In addition, monitoring wells installed by Wausau Chemical Company aided study efforts (Figure 7). To further augment the City of Wausau and the Wausau Chemical Company's wells, U.S. EPA installed three monitoring wells in an attempt to find the contaminant source. Two wells (MW-#7A and MW-#12) were installed as piezometers adjacent to existing City of Wausau Monitoring Wells MW-7 and MW-4, respectively (Figure 7). Due to the past land use near the city production well, monitoring well #14 was also constructed. This well was located in the equipment yard, 60 ft south of City Well #3. This well was intended to either intercept the plume or document on-site loading.

Monitoring wells #1 and #14, positioned between City Well #3 and Wausau Chemical Company, did not detect any contamination that would indicate a plume in the shallow ground water attributable to Wausau Chemical Company. Monitoring well #1, installed by the City of Wausau, was screened at a depth of 40 ft, and quite possibly was too shallow to detect the contaminant plume. Monitoring well #14 was installed close to City Well #3 to document local contaminant loading, and was, therefore, screened at a shallow depth (35 to 45 ft). This well also was possibly too shallow to detect a plume from Wausau Chemical Company. To confirm the existance of a possible plume of contaminants from Wausau Chemical Company, it would be necessary to install and sample well(s) screened at depths of greater than 50 feet.

The contaminant trends observed at City Well #3 indicate PCE and DCE concentrations have diminished. This would suggest a one-time spill or loading episode. Consistent occurrence of

TCE at 150-210 ppb range, suggests continual loading and therefore indicates an additional source(s). To date, an additional source area(s) is unknown and upgradient sources north of City Well #3 should be investigated.

In addition to the increasing PCE levels observed at Wausau Chemical's MW#5A, it appears that City Well #3's cone of influence is enhancing contaminant movement emanating from the Wausau Chemical facility. As previously mentioned, a second plume that impacted the Wergin Well may have had some influence on City Well #3. This plume was first detected in city monitoring wells #5 and #6 and in the Wergin well in September and October of 1982 (Figure 7). Since the 1982 analysis, concentration trends suggest that a plume has migrated past city monitoring well #5 and has been intercepted and/or drawn to the Wergin well. Current analysis has indicated a decrease in contaminant levels (Tables 8 and 12). Therefore, it is believed that VOC levels once observed in the aforementioned wells, were a result of a one-time load episode which migrated as a slug. Furthermore, the Wergin well may have acted as a barrier well, minimizing the impact of the plume on City Well #3.

3.4.2 West Well Field

3.4.2.1 City Well #6

Background

City well #6 is located on the west side of the Wisconsin River at the corner of Pierson Street and Crocker Avenue (Figure 2). The well was drilled by Lane Northwestern in 1951 and was completed at 100 ft below land surface. The well was fitted with a 38.5 ft of 24 inch diameter well screen and packed gravel. The well tested at 3600 gpm, yielding a specific capacity of 130 gpm/ft. Maximum pumping units are 2000 gpm; however, the city usually pumps the well at 1550 gpm. The well yields large volumes of low iron water and it has been desirable to use this well to its fullest potential.

Contamination was first detected in Well #6 in March of 1982 when 75 ppb of TCE was reported. Since the initial detection, TCE concentrations have been fluctuating between 100 ppb and 250 ppb (Figure 10 and Table 2). Trace levels of DCE have also been observed and may be attributable to biodegradation of the TCE source.

Potential Contaminant Sources

Due to the residential setting, lack of historical information, and absence of industries in the immediate vicinity,

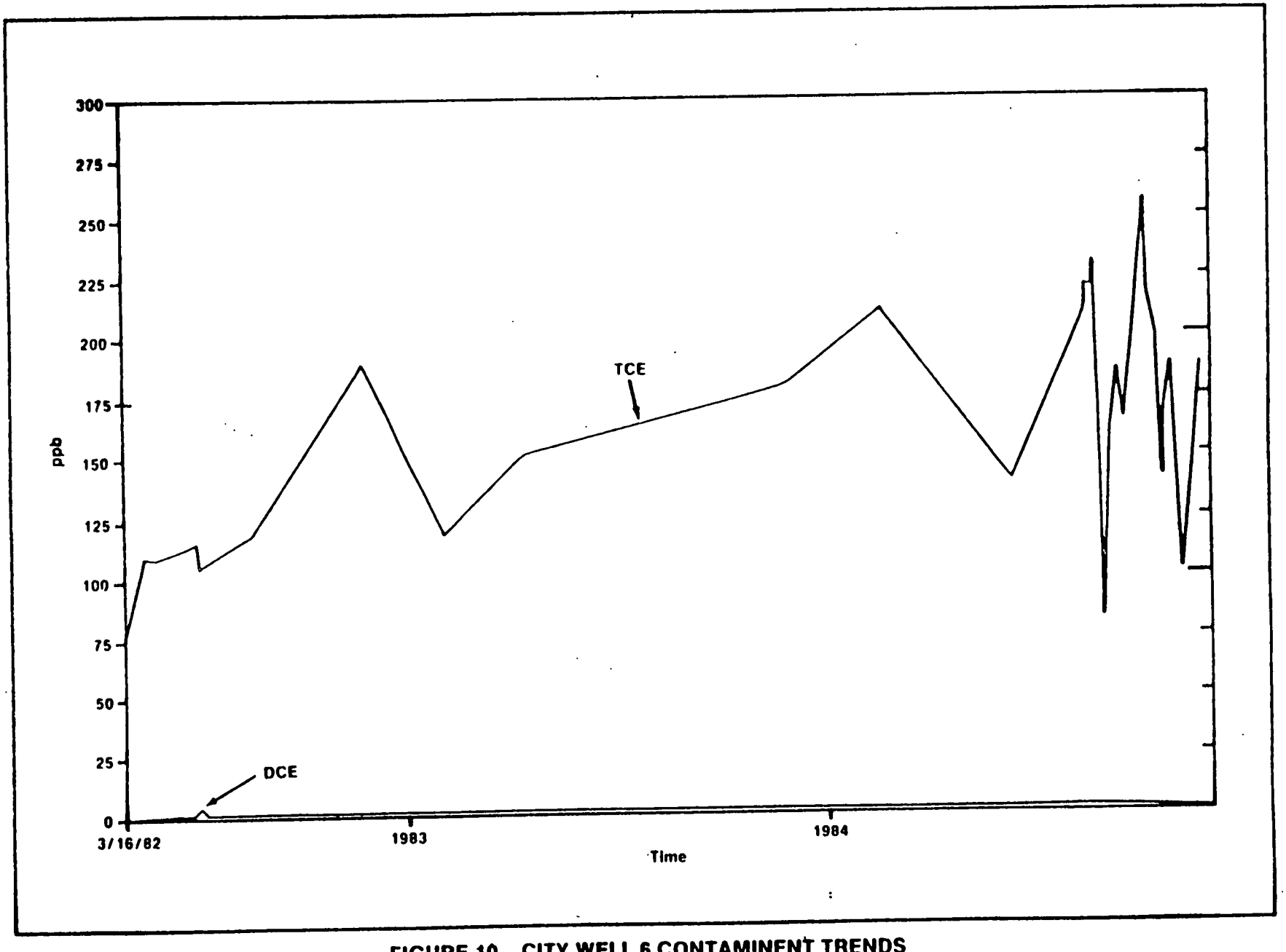


FIGURE 10 CITY WELL 6 CONTAMINENT TRENDS

potential contamination source(s) at Well #6 were not immediately apparent. Three potential sources were identified early in the study:

- o Marathon Electric Company;
- o Fill material along Bos Creek;
- o Marathon County Park.

Marathon Electric Company and the Schofield Park are situated on adjoining parcels of land, 1,500 ft southwest of City Well #6 (Figure 2). As noted previously, Marathon Electric Company reported they had used chlorinated organics in their manufacturing process until approximately seven years ago.

Earthen backfill lines the east and west banks of Bos Creek from Plum Drive to Burns Avenue. The source(s) and chemistry of the fill material was unknown.

Schofield Park was reported to be the site of a lumber company's former disposal area based on conversations with City employees and neighboring residents, but no details about area of disposal or waste materials are available. Monitoring Well MW-1A is located between these potential sources and City Well #6. Ground water was sampled at 10 ft intervals during drilling in an attempt to detect any VOC contamination. Chlroinate volatile organic contaminants were not detected at significant levels in any of the 11 samples from monitoring well MW-1A when analyzed for the full Volatile Priority Pollutant scan by GC/MS. However, trace levels of other VOC contaminants were detected. These contaminants are attributed to residual internal lubricants commonly associated with drilling equipment and pumps.

Following installation of monitoring well MW-1A, the seismic survey was conducted as a means of identifying aquifer morphometry in positioning additional well sites. The survey suggested City Well #6 was situated within a buried bedrock valley trending approximately east-west (Figure 5). Monitoring well MW-2A was constructed in this bedrock valley approximately 750 ft west of City Well #6. The well was situated near the backfilled area adjacent to Bos Creek.

This well further refined our understanding of bedrock morphometry and allowed positioning of two additional nested well sets within the bedrock valley. Nested wells MW-4A, 4B, and 4C were located directly upgradient in the axis of the bedrock valley containing City Well #6 (Table 6 and Figure 3). Nested wells MW-3A and MW-3B were located east of City Well #6 in the same bedrock valley. No volatile organics were found in water samples collected from any of these wells (Table 8). Monitoring Wells MW-2A, 3A, 3B, 4A, 4B, and 4C were all positioned to detect potential contaminant sources within the bedrock valley. Because no contaminants were

found in these wells, the positioning of additional wells concentrated on detection of sources in the immediate vicinity of City Well #6. Monitoring wells MW-5, 6, 7, and 8 were thus installed and screened at shallow depths to detect potential nearby sources. These four monitoring wells proximal to City Well #6 were located approximately north, south, east and west and ranged from 110 to 150 ft from City Well #6. The monitoring wells were initially constructed to shallow depths with the intention of drilling nested well sets if deemed necessary. Again, sample analysis of these shallow wells failed to detect any volatile organics (Table 8). As a final step, monitoring well #9 was installed approximately 650 ft west of well #6, in an area that had been backfilled with unknown materials along Bos Creek. Samples from this well contained no detectable levels of volatile organic contaminants (Table 8).

The cone of depression from City Well #6 is believed to extend over 1,000 ft radially away from the well (Figure 11). The combined pumping of City Wells #6, #7, and #9 depresses a much greater area. The actual area is unknown due to lack of water level data around the uncontaminated City wells. Ground water movement and flow velocity are controlled by the pumping schedule of the City wells. Under static conditions, ground water movement is toward the Wisconsin River (east) where it is discharged as base flow. When City Wells #7 and #9 are pumped and City Well #6 is off, flow is to the north and east (Figure 12). City well #6 creates a large cone of depression and intersects the cones generated by wells #7 and #9. Using field data collected at City Well #6 and U.S. EPA monitoring wells, maximum ground water velocity has been estimated to be on the order of 1 ft/day. Measurement of water levels in well nests indicates the flow is nearly horizontal.

A bedrock high was suggested by the seismic survey in the area southwest of City Well #6. This bedrock high may be influencing groundwater flow in that the horizontal gradient in this vicinity appears significantly less than the horizontal gradient observed northeast of City Well #6. Data gathered herein suggests several possible explanations for the contaminants documented in City Well #6. The contaminant concentration and continued persistence suggests a large volume source. It is estimated that since the discovery of contamination an excess of 300 gal of TCE have been pumped from Well #6. The estimate is based on an average production volume (1.8 MGD), and assumed a concentration of 200 ppb. The estimation does not include TCE lost, dispersion, attenuation and volatilization. This estimate is based on the data collected at City Well #6 since its contamination was discovered in March of 1982. Due to high flow velocities in the

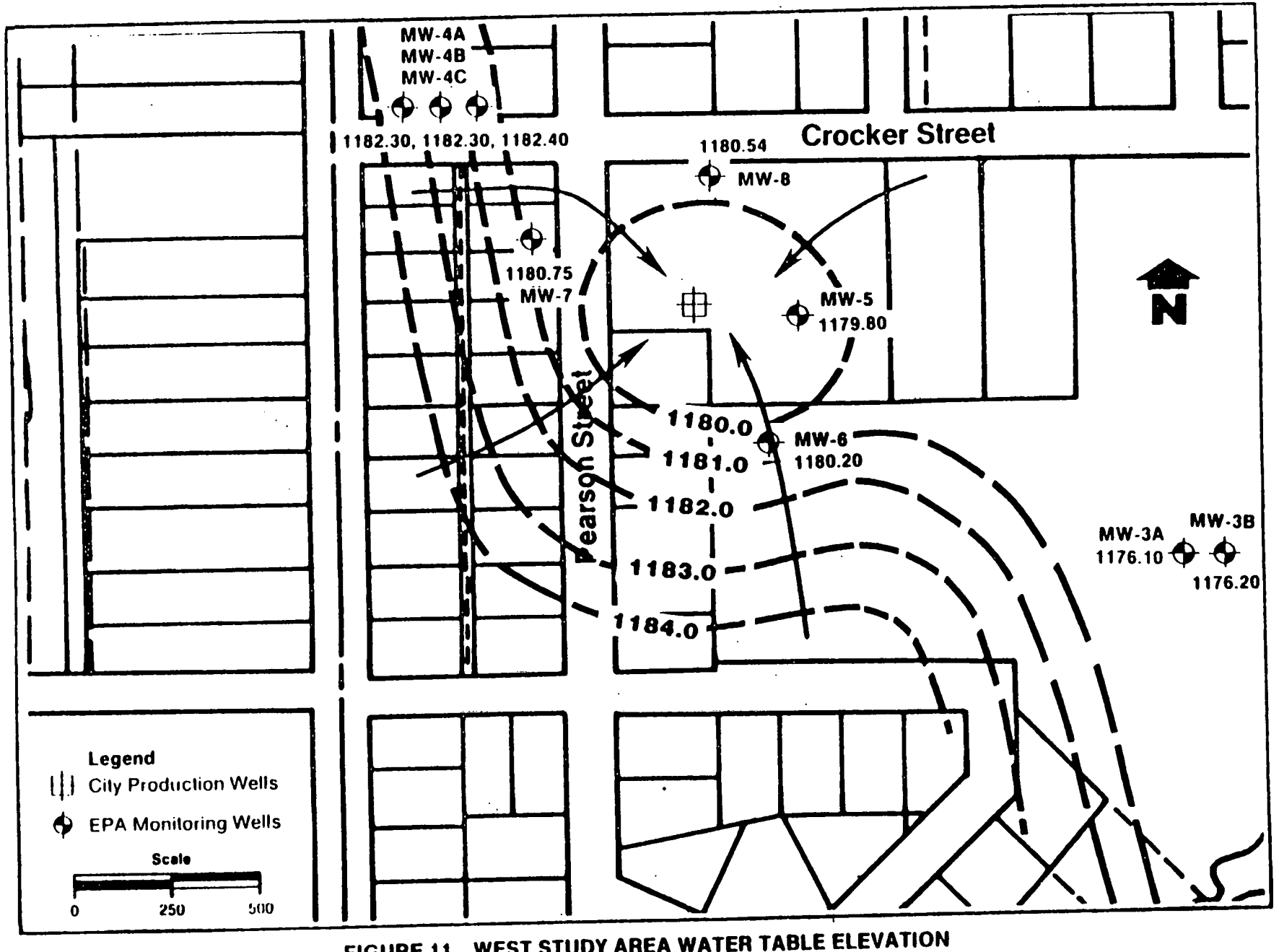


FIGURE 11 WEST STUDY AREA WATER TABLE ELEVATION WITH CITY WELL PUMPING

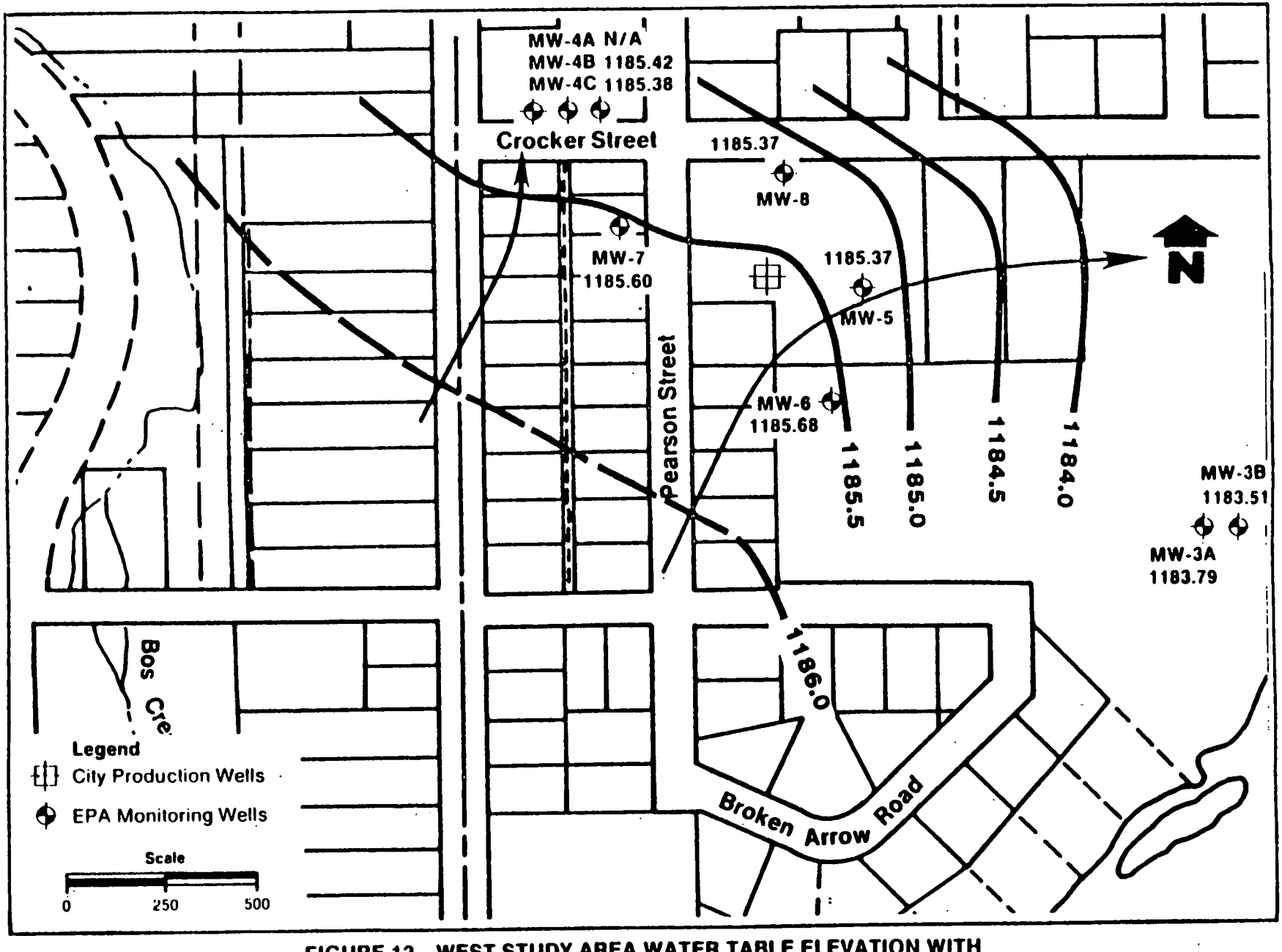


FIGURE 12 WEST STUDY AREA WATER TABLE ELEVATION WITH CITY WELL 6 NOT PUMPING

study area, the plume configuration may be very narrow and may have been missed by the U.S. EPA monitoring wells. If the contaminant is loaded within relatively close proximity of City Well #6, dispersion may be limited and the plume narrow due to convergence of flow lines toward the City Well, making source detection through monitoring wells difficult. As a cost effective consideration, the proximal monitoring wells (MW-5, 6, 7 and 8) were completed at shallow depths, with the possibility of drilling deeper wells at a later date. The deeper wells were contingent upon the analytical results. Therefore, if study efforts continue, nested monitoring wells should be considered at this location to evaluate the presence of contaminants entering the City Well at depth.

Finally, it is conceivable that the TCE source could be the result of contaminated soil tainted with significant TCE concentrations and/or bulk volumes. Furthermore, it is possible that a small leak on the order of a half gallon of pure product per day, could go unnoticed and cause the contamination observed at Well #6. It is apparent that such a volume and persistence would merit further investigation.

## 4.0 CONCLUSIONS

The Wausau emergency removal action consisted of two major objectives. First, to secure a safe and potable water supply in sufficient quantities to satisfy public demand. Second, to conduct a hydrogeologic investigation to characterize the ground water contamination problem.

The first objective was accomplished by the installation of four large, granular activated carbon units on City Well #6. These units successfully secured a safe and potable water supply for the City of Wausau.

The hydrogeologic investigation objectives, methods and results have been presented in detail. As a result of the investigation the following conclusions may be made.

### 4.1 Eastern Study Area

#### 4.1.1 City Well #4

- Regional ground water movement is toward the Wisconsin River where it is discharged as base flow. City Well #4 extracts a majority of its recharge from the Wisconsin River by induced infiltration. Consequently, the flow direction and velocity of ground water movement has been reversed in the well vicinity. The

vicinity. The effect of the river stage appears to influence the contaminant concentrations observed in the eastern study area. An inverse relationship has been identified between the contaminant concentrations at City Well #4 and the stage of the Wisconsin River. This inverse relationship reflects dilution of contaminants as a result of increased recharge from the Wisconsin River at increased stage height.

- City Well #4 is being contaminated by two, possibly three different sources. Wausau Chemical, Marathon Box Company, C.M.St.P.and P. Railroad. Monitoring wells have clearly indicated a contamination plume is emanating from the Wausau Chemical Company's property to City Well #4. Concentrations observed in the Wausau Chemical wells indicate the compounds are restricted to the upper portion of the aquifer.

- Ground water samples taken from monitoring wells located on the Marathon Box Company property indicate ground water contamination. It appears that the contaminated ground water emanating from this property is adversely impacting City Well #4. The C.M.St.P. and P. Railroad adjoins the Marathon Box property and may have been an area of historic spill. Without additional data it was not possible to determine if the Railroad is an additional contaminant source.

4.1.2 City Well #3

- City Well #3 and the Wergin well have been contaminated by more than one source. It was apparent that a short-term release of VOC contaminant occurred upgradient of these wells. The release produced a pulse type of contaminant slug and appears to have emanated from a source upgradient in a easterly direction from the property. The Wergin well may have acted as a barrier well and minimized the impact of the contamination event on City well #3 by intercepting the majority of the plume.

- Wausau Chemical Company may be partially responsible for the ground water contamination impacting City well #3 and the Wergin well as indicated by the increasing contaminate concentrations at MW 5A.

- The Wergin well may be receiving contamination from a source south and/or southwest of the well. Possibly the Marathon Pilot Graphic facility and/or Wausau

Chemical Company; however this plume has not been characterized.

- Due to the persistence in TCE concentrations observed at City Well #3, it is apparent that a fairly large source(s) is loading the system at consistent rate.

- A significant portion of City Well #3 recharge is derived from the Wisconsin River. The size of the cone of influence is believed to encompass a large radial area and is believed to include the Wausau Chemical property.

## 4.2 Western Study Area

### 4.2.1 City Well 6

- Due to the presence of only one contaminant and the consistent nature of the TCE concentrations, it is believed that City Well #6 has been contaminated by persistent source(s). The source of ground water contamination was not positively identified. Two scenerios have been presented. First, if a distal source exists, it is possible that the TCE may be emanating from a bulk storage tank that has a slow leak. This distal source may also be the earthen landfilled materials along Bos Creek that may be tainted with TCE. It is possible that the plume is very narrow and has bypassed the monitoring well configuration due to the convergence of the flow lines. Second, if a local source exists, it is intensely localized in nature and it is improbable that the contamination is the result of a one-time spill.

- The continual pumping of the city wells appears to have limited contaminant migration.

## 5.0 RECOMMENDATIONS

The following recommendations have been provided to facilitate future study efforts.

- Ground water samples should be taken periodically from all monitoring wells. Sample collection should continue and the results should be evaluated by a hydrogeologist to monitor contaminant transport and fate.

- The City of Wausau should consider siting another production well. Consideration should be given to locating a new well near the corner of Bugbee and Tierney Avenue, possibly 100 ft north of this intersection. A second possible location would be near the north corner of Plum Dr. and Stone St. The alluvial deposits at these two locations are estimated to be over 120 feet thick and may yield sufficient quantities to justify the exploration expenditure. It is important to note that past land use should be thoroughly researched.

- The expansion of monitoring well control in the two study areas is required to further identify suspected sources impacting the east and west study area. To this end, an expansion of western monitoring wells 5, 6, 7 and 8, to nested sets may facilitate plume identification. In the eastern study area a nested well site is suggested to delineate the impact of the railroad property, Wausau Chemical Company, Steel Flite Scaffolding and Marathon Pilot Graphics. To do this task at least four nested well sets would be required.

- Locate and delineate plume migration from Wausau Chemical toward City Well 3 by locating several wells at or near East Wausau Avenue and the north end of the Chemical facility. Furthermore, the clustering of City Monitoring Well MW-1 may identify a plume at a depth greater than the present monitoring well is capable of intercepting.

- Due to the impact that the Wausau Chemical facility has had on City Wells 4 and, possibly, Well 3, Federal, State, and Local officials should remove and restrict the drum storage area. Furthermore, surface water runoff from the facility should be strictly controlled and operational practices should be monitored closely.

- Define the three dimensional extent of soil contamination on the Wausau Chemical facility, Marathon Box, and the railroad property. Following the areal definition of contaminated soils, treatment or removal should be evaluated as a remedial action.

- The railroad's handling procedures of the hazardous substances should be evaluated to prevent the possibility of a hazardous substance spill.

- The Wausau sewer tiles should be selectively checked for leaks in the vicinity of suspected contaminant sources and contaminated wells.

WESTON

# REFERENCES CITED


LaBerge, L.G., and S.J. Klasner. Personal Communication, July 16, 1984, Wausau, Wisconsin.

LaBerge, L.G., and E.P. Meyers, 1983. Precambrian Geology of Marathon County, Wisconsin. Information Circular Number 45. University of Wisconsin Extension, Geological and Natural History Survey.

NIOSH/OSHA Pocket Guide to Chemical Hazards. R.A. Taft Laboratories, Cincinnati, Ohio.

Parsons, F., G. Lage, R. Rice, M. Astraskis and R. Nassar, 1982. Behavior and Fate of Hazardous Organic Chemicals in Contaminated Ground Water - Final Report. State of Florida STAR GRANT 81-022, Dr. R. DeHan, Project Officer, Florida Dept. Environ. Regulation.

Parsons, F., P.R. Wood and J. DeMarco, 1984. Transformations of Tetrachloroethene and Trichloroethene in Microcosms and Ground Water. Journal American Water Works Association, February, pp. 56-59.

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION V**

**DATE:** JUL 31 1987

**SUBJECT:** Information Requsted re: Wausau Groundwater Contamination

**FROM:** Frank Rollins, CES

**TO:** Timothy Conway, ORC

In response to the information you requested re: Wausau Site, I have assimilated the following:

1) The date of discovery of VOC contamination in Wausau?
March 1982; samples analyzed by Zimpro Labs for WDNR.

2) The date the removal action started?
In May 1984 the Pilot Studies for the Air-Stripper were initiated.
In June 1984 the actual removal started, this was the installation of the Carbon Filters (GAC filters).

3) Date the removal was completed?
August 1984; the Air-Stripper went on-line.
October 1984; the GAC filters were taken off-line.
December 1984; the last well was drilled.
I would use the latest date as the demobilization date.

A little something for you before you leave - enjoy. 6463

4) Costs at completion?

| | | |
|---|---|---|
| Regional Salary FY 84-574.5hrs | | $ 9,151.79 * |
| Indirect charges FY84 | 67.00/hr.x574.5hrs | 38,491.50 |
| Travel/per diem/subsidence | | 5,608.03 ** |

| Contracts | | |
|---|---|---|
| 68-01-6894 | PEDCo ENV. Inc. | 215,160.00 |
| 05-8406-S2 | Test Well- install and sample- | 8,551.00 |
| 05-8406-S3 | Zimpro- Analytical | 7,090.00 |
| 05-8409-S1 | Monitoring Wells | 27,185.00 |
| 05-8409-S2 | Well analyses | 4,128.00 |
| 05-8404-11 | Investigate Contamination | 13,035.00 |
| 05-8406-04 | OSC Asst. Monitor GAC's | 28,027.00 |
| 05-8407-01 | Investigate Industries | 305.00 |
| 05-8410-16 | (ext. 05-8404-11) | 4,581.80 |
| 05-8410-24 | (ext. 05-8406-04) | 40,391.69 |
| 05-8410-25 | (ext. 05-8407-01) | 2,915.13 |
| 05-8401-11 | SPCC Inspection | 3,159.00 |
| 05-8410-07 | (ext. 05-8401-11) | 2,772.68 |
| 05-8408-12 | Contamination Investigation | 3,159.00 |
| 05-8410-35 | (ext. 05-8408-12) | 181.00 |
| | Total expended as shown: | $413,893.00 |

* assumes avg. rate $15.93
** assumes all travel etc. was during FY84

Conway

OCT 2 7 1987

Superfund Site #N8
Wausau, WI

Ivars P. Antens, Chief
Financial Management Branch

John Oaks
Regional Cost Recovery Coordinator
5HE

Attached are summaries and computer reports listing travel and other costs, payroll and fringe benefit expenses and indirect costs for the Superfund site of Wausau.

Based on adjustments recommended by the Office of Inspector General's Superfund audit for Fiscal Years 83 through 86, final indirect cost rates will be $71.00 (FY 83), $61.00 (FY 84), $53.00 (FY 85) and $51.00 (FY 86). A provisional rate of $51.00 will be used in FY 87 and 88 until Fiscal Audit for those years is conducted and an indirect cost rate recommendation has been made.

If timesheets were not available for any hours listed by the computer, the hours and related dollars were deleted from our summary.

Please review the reports carefully. If you feel that there are additional legitimate costs which should be charged to the site or have any other comments, please feel free to contact Richard Hackley at 3-8838.

In the event of disclosure outside of U.S. EPA, the Office of Regional Counsel (ORC) is responsible for ensuring that cost recovery documentation is reviewed for information entitled to protection under the Privacy Act and the Agency's confidential business information (CBI) regulations and that appropriate measures are taken to protect such information. Attached you will find EPA Form for Accounting for Disclosures of Privacy Act Information in which the ORC will record each disclosure on the Record of Disclosure portion of the form. Upon completion of cost recovery actions, the form should be returned to the Financial Management Officer to be retained in our files. A copy of the form must be retained in the ORC case history file. (For further information refer to Section I Redacting, of the U.S. EPA, Financial Management Procedures for Documenting Superfund Costs manual).

Attachments (6)

RECEIVED: _____

DATE: _____

bcc: George Alapas

A. James/mla/disk #2/10-14-87/

ATTACHMENT 5

US EPA REGION V PERSONNEL COST - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| EMPLOYEE NAME | FISCAL YEAR | PAY PERIOD | OFFICE CODE | PAYROLL HOURS | PAYROLL AMOUNT |
|---|---|---|---|---|---|
| BECK, SHARON J. | 85 | 05 | F | 5.0 | 65.32 |
| BOWDEN, ROBERT J | 84 | 20 | Z | 20.0 | 578.45 |
| | 84 | 21 | Z | 3.0 | 106.52 |
| | 84 | 22 | Z | 3.0 | 79.41 |
| | 84 | 23 | Z | 4.0 | 114.00 |
| | 84 | 25 | Z | 10.0 | 268.01 |
| | 84 | 26 | Z | 4.0 | 107.20 |
| | 84 | 27 | Z | 4.0 | 107.20 |
| | 85 | 01 | F | 2.0 | 53.59 |
| | 85 | 02 | F | 3.0 | 80.39 |
| | 85 | 05 | F | 3.0 | 80.39 |
| | 85 | 09 | F | 2.0 | 54.29 |
| | 85 | 18 | F | 8.0 | 217.16 |
| | | | | 66.0 | 1,846.61 |
| CARTER, BARABARA J. | 84 | 20 | Z | 16.0 | 154.71 |
| | 84 | 24 | Z | 8.0 | 77.35 |
| | 84 | 25 | Z | 8.0 | 77.35 |
| | 84 | 26 | Z | 6.0 | 58.02 |
| | | | | 38.0 | 367.43 |
| FAGIOLO, JOHN V. | 84 | 25 | Z | 16.0 | 92.13 |
| | 84 | 27 | Z | 12.0 | 69.11 |
| | | | | 28.0 | 161.24 |
| JACKSON, LATRENDA | 85 | 07 | F | 2.0 | 11.94 |
| | 85 | 09 | F | 5.0 | 31.24 |
| | | | | 7.0 | 43.18 |
| JOHNSON, GLYNDA V. | 84 | 20 | Z | 6.0 | 47.93 |
| NEUBERGER, BABETTE J | 84 | 20 | B | 1.5 | 29.66 |
| | 84 | 22 | B | 1.0 | 19.76 |
| | 85 | 08 | B | 0.5 | 10.14 |
| | | | | 3.0 | 59.56 |
| REGAN, GERALD F. | 84 | 20 | Z | 7.0 | 184.83 |
| | 84 | 21 | Z | 3.0 | 79.20 |
| | 84 | 24 | Z | 2.0 | 52.81 |
| | | | | 12.0 | 316.84 |

US EPA REGION V PERSONNEL COST - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| EMPLOYEE NAME | FISCAL YEAR | PAY PERIOD | OFFICE CODE | PAYROLL HOURS | PAYROLL AMOUNT |
|---|---|---|---|---|---|
| STEURER, DENISE MARY | 85 | 08 | F | 2.5 | 30.63 |
| STRIMBU , MICHAEL J. | 85 | 07 | F | 7.0 | 135.46 |
| | 85 | 08 | F | 15.0 | 300.76 |
| | 85 | 09 | F | 4.0 | 80.23 |
| | | | | 26.0 | 516.45 |
| VENDL, MARK A. | 85 | 18 | F | 13.0 | 238.49 |
| WEHLING, MARK A. | 84 | 26 | Z | 17.0 | 97.91 |
| WHITE, VALJEANNE | 85 | 09 | F | 3.0 | 24.90 |
| WU, BRIAND C. | * 84 | 20 | Z | 75.0 | 1146.23 |
| | 84 | 21 | Z | 72.0 | 1092.57 |
| | ** 84 | 22 | Z | 88.0 | 1348.40 |
| | *** 84 | 23 | Z | 71.0 | 1098.61 |
| | 84 | 24 | Z | 13.0 | 197.27 |
| | 84 | 25 | Z | 21.0 | 356.53 |
| | ** 84 | 26 | Z | 54.0 | 916.15 |
| | 84 | 27 | Z | 68.0 | 1155.21 |
| | 85 | 01 | F | 54.0 | 909.86 |
| | 85 | 02 | F | 28.0 | 471.76 |
| | 85 | 03 | F | 40.0 | 741.66 |
| | 85 | 04 | F | 10.0 | 168.48 |
| | 85 | 06 | F | 12.0 | 202.17 |
| | 85 | 07 | F | 14.0 | 235.98 |
| | 85 | 08 | F | 30.0 | 575.83 |
| | 85 | 09 | F | 22.0 | 422.28 |
| | 85 | 17 | F | 7.0 | 134.36 |
| | 85 | 18 | F | 22.0 | 422.28 |
| | 85 | 20 | F | 11.0 | 211.14 |
| | 86 | 13 | F | 5.0 | 98.93 |
| | 87 | 01 | F | 24.0 | 473.48 |
| | 87 | 02 | F | 18.0 | 365.08 |
| | | | | 759.0 | 12,744.26 |
| | | | | 985.5 | 16,560.75 |

* 5.0 overtime hours paid.
** 8.0 overtime hours paid.
*** 13.0 out of 19.0 overtime hours paid charged to site.

REGION V INDIRECT COST (IDC) ALLOCATION - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| ACCOUNTING PERIOD | FISCAL YEAR | PAYROLL HOURS | INDIRECT RATE | INDIRECT COSTS |
|---|---|---|---|---|
| FISCAL YEAR | 84 | 611.0 | 61.00 | 37,271.00 |
| FISCAL YEAR | 85 | 324.5 | 53.00 | 17,198.50 |
| FISCAL YEAR | 86 | 5.0 | 51.00 | 255.00 |
| FISCAL YEAR | 87 | 42.0 | 51.00 | 2,142.00 |
| | | 982.5 | | 56,866.50 |

US EPA REGION V INDIRECT COST (IDC) ALLOCATION - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| EMPLOYEE NAME | FISCAL YEAR | OFFICE CODE | PAY PERIOD | PAYROLL HOURS | INDIRECT RATES | INDIRECT COSTS |
|---|---|---|---|---|---|---|
| BOWDEN, ROBERT J | 84 | Z | 20 | 20.0 | 61.00 | 1,220.00 |
| | | Z | 21 | 3.0 | 61.00 | 183.00 |
| | | Z | 22 | 3.0 | 61.00 | 183.00 |
| | | Z | 23 | 4.0 | 61.00 | 244.00 |
| | | Z | 25 | 10.0 | 61.00 | 610.00 |
| | | Z | 26 | 4.0 | 61.00 | 244.00 |
| | | Z | 27 | 4.0 | 61.00 | 244.00 |
| BOWDEN, ROBERT J | | | | 48.0 | | 2,928.00 |
| CARTER, BARABARA J. | 84 | Z | 20 | 16.0 | 61.00 | 976.00 |
| | | Z | 24 | 8.0 | 61.00 | 488.00 |
| | | Z | 25 | 8.0 | 61.00 | 488.00 |
| | | Z | 26 | 6.0 | 61.00 | 366.00 |
| CARTER, BARABARA J. | | | | 38.0 | | 2,318.00 |
| FAGIOLO, JOHN V. | 84 | Z | 25 | 16.0 | 61.00 | 976.00 |
| | | Z | 27 | 12.0 | 61.00 | 732.00 |
| FAGIOLO, JOHN V. | | | | 28.0 | | 1,708.00 |
| JOHNSON, GLYNDA V. | 84 | Z | 20 | 6.0 | 61.00 | 366.00 |
| REGAN, GERALD F. | 84 | Z | 20 | 7.0 | 61.00 | 427.00 |
| | | Z | 21 | 3.0 | 61.00 | 183.00 |
| | | Z | 24 | 2.0 | 61.00 | 122.00 |
| REGAN, GERALD F. | | | | 12.0 | | 732.00 |
| WEHLING, MARK A. | 84 | Z | 26 | 17.0 | 61.00 | 1,037.00 |
| WU, BRIAND C. | 84 | Z | 20 | 75.0 | 61.00 | 4,575.00 |
| | | Z | 21 | 72.0 | 61.00 | 4,392.00 |
| | | Z | 22 | 88.0 | 61.00 | 5,368.00 |
| | | Z | 23 | 71.0 | 61.00 | 4,331.00 |
| | | Z | 24 | 13.0 | 61.00 | 793.00 |
| | | Z | 25 | 21.0 | 61.00 | 1,281.00 |
| | | Z | 26 | 54.0 | 61.00 | 3,294.00 |
| | | Z | 27 | 68.0 | 61.00 | 4,148.00 |
| WU, BRIAND C. | | | | 462.0 | | 28,182.00 |
| TOTAL PER FISCAL YEAR | 84 | | | 611.0 | | 37,271.00 |
| BECK, SHARON J. | 85 | F | 05 | 5.0 | 53.00 | 265.00 |

US EPA REGION V INDIRECT COST (IDC) ALLOCATION - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| EMPLOYEE NAME | FISCAL YEAR | OFFICE CODE | PAY PERIOD | PAYROLL HOURS | INDIRECT RATES | INDIRECT COSTS |
|---|---|---|---|---|---|---|
| BOWDEN, ROBERT J | 85 | F | 01 | 2.0 | 53.00 | 106.00 |
| | | F | 02 | 3.0 | 53.00 | 159.00 |
| | | F | 05 | 3.0 | 53.00 | 159.00 |
| | | F | 09 | 2.0 | 53.00 | 106.00 |
| | | F | 18 | 8.0 | 53.00 | 424.00 |
| BOWDEN, ROBERT J | | | | 18.0 | | 954.00 |
| JACKSON, LATRENDA | 85 | F | 07 | 2.0 | 53.00 | 106.00 |
| | | F | 09 | 5.0 | 53.00 | 265.00 |
| JACKSON, LATRENDA | | | | 7.0 | | 371.00 |
| STEURER, DENISE MARY | 85 | F | 08 | 2.5 | 53.00 | 132.50 |
| STRIMBU , MICHAEL J. | 85 | F | 07 | 7.0 | 53.00 | 371.00 |
| | | F | 08 | 15.0 | 53.00 | 795.00 |
| | | F | 09 | 4.0 | 53.00 | 212.00 |
| STRIMBU , MICHAEL J. | | | | 26.0 | | 1,378.00 |
| VENDL, MARK A. | 85 | F | 18 | 13.0 | 53.00 | 689.00 |
| WHITE, VALJEANNE | 85 | F | 09 | 3.0 | 53.00 | 159.00 |
| WU, BRIAND C. | 85 | F | 01 | 54.0 | 53.00 | 2,862.00 |
| | | F | 02 | 28.0 | 53.00 | 1,484.00 |
| | | F | 03 | 40.0 | 53.00 | 2,120.00 |
| | | F | 04 | 10.0 | 53.00 | 530.00 |
| | | F | 06 | 12.0 | 53.00 | 636.00 |
| | | F | 07 | 14.0 | 53.00 | 742.00 |
| | | F | 08 | 30.0 | 53.00 | 1,590.00 |
| | | F | 09 | 22.0 | 53.00 | 1,166.00 |
| | | F | 17 | 7.0 | 53.00 | 371.00 |
| | | F | 18 | 22.0 | 53.00 | 1,166.00 |
| | | F | 20 | 11.0 | 53.00 | 583.00 |
| WU, BRIAND C. | | | | 250.0 | | 13,250.00 |
| TOTAL PER FISCAL YEAR | 85 | | | 324.5 | | 17,198.50 |
| WU, BRIAND C. | 86 | F | 13 | 5.0 | 51.00 | 255.00 |
| WU, BRIAND C. | 87 | F | 01 | 24.0 | 51.00 | 1,224.00 |
| | | F | 02 | 18.0 | 51.00 | 918.00 |
| WU, BRIAND C. | | | | 42.0 | | 2,142.00 |

US EPA REGION V INDIRECT COST (IDC) ALLOCATION - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| EMPLOYEE NAME | FISCAL YEAR | OFFICE CODE | PAY PERIOD | PAYROLL HOURS | INDIRECT RATES | INDIRECT COSTS |
|---|---|---|---|---|---|---|
| TOTAL PER FISCAL YEAR | 87 | | | 42.0 | | 2,142.00 |
| | | | | 982.5 | | 56,866.50 |

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

09 NOV 1987

REPLY TO THE ATTENTION OF:
5HE-12

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Wausau Chemical Company
c/o Mr. James Cherwinka
2001 North River Drive
Wausau, Wisconsin 54401

Re: Wausau Groundwater Contamination

Dear Mr. Cherwinka:

In June of 1984, the United States Environmental Protection Agency (U.S. EPA) commenced an immediate removal response action to halt the release or threatened release of hazardous substances from the Wausau Chemical Company, 2001 North River Drive, Wausau, WI. U.S. EPA took this action under authority of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, 42 U.S.C. §9601 et seq CERCLA as subsequently amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, Pub. L. 99-499. The removal action was completed in December, 1984.

Prior to undertaking the immediate removal action, U.S. EPA determined that the release or threatened release of hazardous substances from the Wausau Chemical Co. Site constituted an imminent and substantial endangerment to the public health, welfare or the environment under Section 106 of CERCLA as amended, 42 U.S.C. §9696. The U.S. EPA undertook the immediate removal response action using monies authorized by CERCLA.

The purpose of this action was to secure a safe and potable water supply for the City of Wausau, Wisconsin, and to characterize the extent of ground water contamination. In order to achieve these objectives, the scope of work included the following key elements.

- Design and installation of a large scale granular activated carbon (GAC) filtration system that was capable of treating 1.8 million gallons of water per day.
- Support and monitoring of the GAC system to assure effective contaminant removal.
- Characterization of the nature and extent of contamination at each well field, definition of the site geology and hydrogeologic characteristics, and identification of potential source areas.

ATTACHMENT E

U.S. EPA REGION V TRAVEL COSTS - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 09 OF FISCAL YEAR 1987

| TRAVELER NAME | TRAVEL VOUCHER NUMBER | TREASURY SCHEDULE NUMBER | TRAVE COS |
|---|---|---|---|
| BOWDEN, ROBERT J | 44053 | V0312 | 174.7 |
| | 44217 | V0326 | 17.2 |
| | | | 192.0 |
| FAGIOLO, JOHN V. | 45474 | V0045 | 250.0 |
| WU, BRIAND C. | 44052 | V0316 | 141.0 |
| | 44101 | V0316 | 300.6 |
| | 44177 | V0384 | 2030.6 |
| | 44986 | V0023 | 879.9 |
| | 45079 | V0010 | 262.5 |
| | 51025 | V0097 | 128.5 |
| | | | 3,743.2 |
| | | | 4,185.2 |

U.S. EPA Region V - Other cost, Original Summary (Removal Only)
Hazardous Sbustance Response Site (N8) Wausau, WI
As of 9/14/87 Thru P.P. 9

| Name | Document Control Number | Obligation Document Number | Schedule Number | Total |
|---|---|---|---|---|
| Wu, Briand | FC0001 | 0000050001 | I0080 | $ 9.17 |
| | FC0002 | 0000050001 | I0080 | 6.02 |
| Total other Cost for Site N8 | | | | $ 15.19 |

Removal costs associated with this site have been incurred by U.S. EPA. The total U.S. EPA removal cost incurred for the above referenced removal is $459,718.14 and a summary is enclosed.

Information available to U.S. EPA indicates among other things that you are responsible for the release, or threat of release of hazardous substances from the site. Pursuant to the provisions of Section 107(a) of CERCLA, we believe that you are liable for the payment of all costs incurred by U.S. EPA in connection with the site. Such payment must be made to the U.S. EPA Hazardous Substance Superfund established pursuant to Section 221 of CERCLA, which is administered by U.S. EPA. Please send your check to P. O. Box 371003M, Pittsburgh, PA 15251. Also, please submit a copy of your check to the U.S. EPA Region V Office at 230 S. Dearborn Street, Chicago, IL 60604, Attn: Ms. Isalee Colemen, 5CS-TUB.

We hereby request that you make restitution by payment of the amount in this letter plus interest, together with any sums hereafter expended by the Agency in connection with the site pursuant to authority of CERCLA. Pursuant to Section 107(e)(4)(D) of CERCLA, interest shall begin accruing as of the date of this demand of payment. If you to wish to discuss your liability with U.S. EPA, please contact Timothy Conway, Assistant Regional Counsel, in writing not later than 30 days after the date of this letter. Mr. Conway may also be reached by phone at (312) 886-6733. If we do not receive a response from you within this time frame, the U.S. EPA will assume that you have declined to reimburse the Fund for the site expenditures, and pursuant to CERCLA, U.S. EPA may pursue civil litigation against you.

Sincerely,

Basil G. Constantelos, Director
Waste Management Division

Enclosure

cc: Mr. Raymond Krueger, Esquire
Charne, Glassner, Tehan, Claney & Taitelman
211 West Wisconsin Avenue
Milwaukee Wisconsin

COST SUMMARY
Wausau/Rothchild, Wisc.
Prepared: 02/06/86
Revised: 10/27/87

EPA EXPENDITURES

| | |
|---|---|
| EPA PAYROLL -- Regional | $ 16,560.75 |
| EPA TRAVEL -- Regional | 4,185.26 |
| EPA INDIRECT COSTS -- Regional | 56,866.50 |
| EPA MISCELLANEOUS COSTS | 15.19 |
| ERCS CONTRACT -- PEI | 215,160.00 |
| TAT CONTRACT -- Weston (68-01-6669) | 149,408.00 |
| EERU CONTRACT -- IT | 17,522.44 |
| *NATIONAL LAB CONTRACT | -0- |
| TOTAL EPA EXPENDITURES | $459,718.14 |

*No dollars expended

This cost summary reflects only costs related to the emergency removal activity.

US EPA REGION V PERSONNEL COST - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| EMPLOYEE NAME | FISCAL YEAR | PAY PERIOD | OFFICE CODE | PAYROLL HOURS | PAYROLL AMOUNT |
|---|---|---|---|---|---|
| BECK, SHARON J. | 85 | 05 | F | 5.0 | 65.32 |
| BOWDEN, ROBERT J | 84 | 20 | Z | 20.0 | 578.45 |
| | 84 | 21 | Z | 3.0 | 106.52 |
| | 84 | 22 | Z | 3.0 | 79.41 |
| | 84 | 23 | Z | 4.0 | 114.00 |
| | 84 | 25 | Z | 10.0 | 268.01 |
| | 84 | 26 | Z | 4.0 | 107.20 |
| | 84 | 27 | Z | 4.0 | 107.20 |
| | 85 | 01 | F | 2.0 | 53.59 |
| | 85 | 02 | F | 3.0 | 80.39 |
| | 85 | 05 | F | 3.0 | 80.39 |
| | 85 | 09 | F | 2.0 | 54.29 |
| | 85 | 18 | F | 8.0 | 217.16 |
| | | | | 66.0 | 1,846.61 |
| CARTER, BARABARA J. | 84 | 20 | Z | 16.0 | 154.71 |
| | 84 | 24 | Z | 8.0 | 77.35 |
| | 84 | 25 | Z | 8.0 | 77.35 |
| | 84 | 26 | Z | 6.0 | 58.02 |
| | | | | 38.0 | 367.43 |
| FAGIOLO, JOHN V. | 84 | 25 | Z | 16.0 | 92.13 |
| | 84 | 27 | Z | 12.0 | 69.11 |
| | | | | 28.0 | 161.24 |
| JACKSON, LATRENDA | 85 | 07 | F | 2.0 | 11.94 |
| | 85 | 09 | F | 5.0 | 31.24 |
| | | | | 7.0 | 43.18 |
| JOHNSON, GLYNDA V. | 84 | 20 | Z | 6.0 | 47.93 |
| NEUBERGER, BABETTE J | 84 | 20 | B | 1.5 | 29.66 |
| | 84 | 22 | B | 1.0 | 19.76 |
| | 85 | 08 | B | 0.5 | 10.14 |
| | | | | 3.0 | 59.56 |
| REGAN, GERALD F. | 84 | 20 | Z | 7.0 | 184.83 |
| | 84 | 21 | Z | 3.0 | 79.20 |
| | 84 | 24 | Z | 2.0 | 52.81 |
| | | | | 12.0 | 316.84 |

US EPA REGION V PERSONNEL COST - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| EMPLOYEE NAME | FISCAL YEAR | PAY PERIOD | OFFICE CODE | PAYROLL HOURS | PAYROLL AMOUNT |
|---|---|---|---|---|---|
| STEURER, DENISE MARY | 85 | 08 | F | 2.5 | 30.63 |
| STRIMBU , MICHAEL J. | 85 | 07 | F | 7.0 | 135.46 |
| | 85 | 08 | F | 15.0 | 300.76 |
| | 85 | 09 | F | 4.0 | 80.23 |
| | | | | 26.0 | 516.45 |
| VENDL, MARK A. | 85 | 18 | F | 13.0 | 238.49 |
| WEHLING, MARK A. | 84 | 26 | Z | 17.0 | 97.91 |
| WHITE, VALJEANNE | 85 | 09 | F | 3.0 | 24.90 |
| WU, BRIAND C. | * 84 | 20 | Z | 75.0 | 1146.23 |
| | 84 | 21 | Z | 72.0 | 1092.57 |
| | ** 84 | 22 | Z | 88.0 | 1348.40 |
| | *** 84 | 23 | Z | 71.0 | 1098.61 |
| | 84 | 24 | Z | 13.0 | 197.27 |
| | 84 | 25 | Z | 21.0 | 356.53 |
| | ** 84 | 26 | Z | 54.0 | 916.15 |
| | 84 | 27 | Z | 68.0 | 1155.21 |
| | 85 | 01 | F | 54.0 | 909.86 |
| | 85 | 02 | F | 28.0 | 471.76 |
| | 85 | 03 | F | 40.0 | 741.66 |
| | 85 | 04 | F | 10.0 | 168.48 |
| | 85 | 06 | F | 12.0 | 202.17 |
| | 85 | 07 | F | 14.0 | 235.98 |
| | 85 | 08 | F | 30.0 | 575.83 |
| | 85 | 09 | F | 22.0 | 422.28 |
| | 85 | 17 | F | 7.0 | 134.36 |
| | 85 | 18 | F | 22.0 | 422.28 |
| | 85 | 20 | F | 11.0 | 211.14 |
| | 86 | 13 | F | 5.0 | 98.93 |
| | 87 | 01 | F | 24.0 | 473.48 |
| | 87 | 02 | F | 18.0 | 365.08 |
| | | | | 759.0 | 12,744.26 |
| | | | | 985.5 | 16,560.75 |

* 5.0 overtime hours paid.
** 8.0 overtime hours paid.
*** 13.0 out of 19.0 overtime hours paid charged to site.

U.S. EPA REGION V TRAVEL COSTS - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 09 OF FISCAL YEAR 1987

| TRAVELER NAME | TRAVEL VOUCHER NUMBER | TREASURY SCHEDULE NUMBER | TRAVE COS |
|---|---|---|---|
| BOWDEN, ROBERT J | 44053 | V0312 | 174.7 |
| | 44217 | V0326 | 17.2 |
| | | | 192.0 |
| FAGIOLO, JOHN V. | 45474 | V0045 | 250.0 |
| WU, BRIAND C. | 44052 | V0316 | 141.0 |
| | 44101 | V0316 | 300.6 |
| | 44177 | V0384 | 2030.6 |
| | 44986 | V0023 | 879.9 |
| | 45079 | V0010 | 262.5 |
| | 51025 | V0097 | 128.5 |
| | | | 3,743.2 |
| | | | 4,185.2 |

REGION V INDIRECT COST (IDC) ALLOCATION - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| ACCOUNTING PERIOD | FISCAL YEAR | PAYROLL HOURS | INDIRECT RATE | INDIRECT COSTS |
|---|---|---|---|---|
| FISCAL YEAR | 84 | 611.0 | 61.00 | 37,271.00 |
| FISCAL YEAR | 85 | 324.5 | 53.00 | 17,198.50 |
| FISCAL YEAR | 86 | 5.0 | 51.00 | 255.00 |
| FISCAL YEAR | 87 | 42.0 | 51.00 | 2,142.00 |
| | | 982.5 | | 56,866.50 |

US EPA REGION V INDIRECT COST (IDC) ALLOCATION - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| EMPLOYEE NAME | FISCAL YEAR | OFFICE CODE | PAY PERIOD | PAYROLL HOURS | INDIRECT RATES | INDIRECT COSTS |
|---|---|---|---|---|---|---|
| BOWDEN, ROBERT J | 84 | Z | 20 | 20.0 | 61.00 | 1,220.00 |
| | | Z | 21 | 3.0 | 61.00 | 183.00 |
| | | Z | 22 | 3.0 | 61.00 | 183.00 |
| | | Z | 23 | 4.0 | 61.00 | 244.00 |
| | | Z | 25 | 10.0 | 61.00 | 610.00 |
| | | Z | 26 | 4.0 | 61.00 | 244.00 |
| | | Z | 27 | 4.0 | 61.00 | 244.00 |
| BOWDEN, ROBERT J | | | | 48.0 | | 2,928.00 |
| CARTER, BARABARA J. | 84 | Z | 20 | 16.0 | 61.00 | 976.00 |
| | | Z | 24 | 8.0 | 61.00 | 488.00 |
| | | Z | 25 | 8.0 | 61.00 | 488.00 |
| | | Z | 26 | 6.0 | 61.00 | 366.00 |
| CARTER, BARABARA J. | | | | 38.0 | | 2,318.00 |
| FAGIOLO, JOHN V. | 84 | Z | 25 | 16.0 | 61.00 | 976.00 |
| | | Z | 27 | 12.0 | 61.00 | 732.00 |
| FAGIOLO, JOHN V. | | | | 28.0 | | 1,708.00 |
| JOHNSON, GLYNDA V. | 84 | Z | 20 | 6.0 | 61.00 | 366.00 |
| REGAN, GERALD F. | 84 | Z | 20 | 7.0 | 61.00 | 427.00 |
| | | Z | 21 | 3.0 | 61.00 | 183.00 |
| | | Z | 24 | 2.0 | 61.00 | 122.00 |
| REGAN, GERALD F. | | | | 12.0 | | 732.00 |
| WEHLING, MARK A. | 84 | Z | 26 | 17.0 | 61.00 | 1,037.00 |
| WU, BRIAND C. | 84 | Z | 20 | 75.0 | 61.00 | 4,575.00 |
| | | Z | 21 | 72.0 | 61.00 | 4,392.00 |
| | | Z | 22 | 88.0 | 61.00 | 5,368.00 |
| | | Z | 23 | 71.0 | 61.00 | 4,331.00 |
| | | Z | 24 | 13.0 | 61.00 | 793.00 |
| | | Z | 25 | 21.0 | 61.00 | 1,281.00 |
| | | Z | 26 | 54.0 | 61.00 | 3,294.00 |
| | | Z | 27 | 68.0 | 61.00 | 4,148.00 |
| WU, BRIAND C. | | | | 462.0 | | 28,182.00 |
| TOTAL PER FISCAL YEAR | 84 | | | 611.0 | | 37,271.00 |
| BECK, SHARON J. | 85 | F | 05 | 5.0 | 53.00 | 265.00 |

US EPA REGION V INDIRECT COST (IDC) ALLOCATION - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| EMPLOYEE NAME | FISCAL YEAR | OFFICE CODE | PAY PERIOD | PAYROLL HOURS | INDIRECT RATES | INDIRECT COSTS |
|---|---|---|---|---|---|---|
| BOWDEN, ROBERT J | 85 | F | 01 | 2.0 | 53.00 | 106.00 |
| | | F | 02 | 3.0 | 53.00 | 159.00 |
| | | F | 05 | 3.0 | 53.00 | 159.00 |
| | | F | 09 | 2.0 | 53.00 | 106.00 |
| | | F | 18 | 8.0 | 53.00 | 424.00 |
| BOWDEN, ROBERT J | | | | 18.0 | | 954.00 |
| JACKSON, LATRENDA | 85 | F | 07 | 2.0 | 53.00 | 106.00 |
| | | F | 09 | 5.0 | 53.00 | 265.00 |
| JACKSON, LATRENDA | | | | 7.0 | | 371.00 |
| STEURER, DENISE MARY | 85 | F | 08 | 2.5 | 53.00 | 132.50 |
| STRIMBU , MICHAEL J. | 85 | F | 07 | 7.0 | 53.00 | 371.00 |
| | | F | 08 | 15.0 | 53.00 | 795.00 |
| | | F | 09 | 4.0 | 53.00 | 212.00 |
| STRIMBU , MICHAEL J. | | | | 26.0 | | 1,378.00 |
| VENDL, MARK A. | 85 | F | 18 | 13.0 | 53.00 | 689.00 |
| WHITE, VALJEANNE | 85 | F | 09 | 3.0 | 53.00 | 159.00 |
| WU, BRIAND C. | 85 | F | 01 | 54.0 | 53.00 | 2,862.00 |
| | | F | 02 | 28.0 | 53.00 | 1,484.00 |
| | | F | 03 | 40.0 | 53.00 | 2,120.00 |
| | | F | 04 | 10.0 | 53.00 | 530.00 |
| | | F | 06 | 12.0 | 53.00 | 636.00 |
| | | F | 07 | 14.0 | 53.00 | 742.00 |
| | | F | 08 | 30.0 | 53.00 | 1,590.00 |
| | | F | 09 | 22.0 | 53.00 | 1,166.00 |
| | | F | 17 | 7.0 | 53.00 | 371.00 |
| | | F | 18 | 22.0 | 53.00 | 1,166.00 |
| | | F | 20 | 11.0 | 53.00 | 583.00 |
| WU, BRIAND C. | | | | 250.0 | | 13,250.00 |
| TOTAL PER FISCAL YEAR | 85 | | | 324.5 | | 17,198.50 |
| WU, BRIAND C. | 86 | F | 13 | 5.0 | 51.00 | 255.00 |
| WU, BRIAND C. | 87 | F | 01 | 24.0 | 51.00 | 1,224.00 |
| | | F | 02 | 18.0 | 51.00 | 918.00 |
| WU, BRIAND C. | | | | 42.0 | | 2,142.00 |

US EPA REGION V INDIRECT COST (IDC) ALLOCATION - ORIGINAL SUMMARY
HAZARDOUS SUBSTANCE RESPONSE SITE # N8
WAUSAW , WI
THROUGH PAY PERIOD 22 OF FISCAL YEAR 1987

| EMPLOYEE NAME | FISCAL YEAR | OFFICE CODE | PAY PERIOD | PAYROLL HOURS | INDIRECT RATES | INDIRECT COSTS |
|---|---|---|---|---|---|---|
| TOTAL PER FISCAL YEAR | 87 | | | 42.0 | | 2,142.00 |
| | | | | 982.5 | | 56,866.50 |

U.S. EPA Region V - Other cost, Original Summary (Removal Only)
Hazardous Sbustance Response Site (N8) Wausau, WI
As of 9/14/87 Thru P.P. 9

| Name | Document Control Number | Obligation Document Number | Schedule Number | Total |
|---|---|---|---|---|
| Wu, Briand | FC0001 | 0000050001 | I0080 | $ 9.17 |
| | FC0002 | 0000050001 | I0080 | 6.02 |

Total other Cost for Site N8 $ 15.19

COST SUMMARY
Wausau/Rothchild, Wisc.
Prepared: 02/06/86

ERCS CONTRACT

CONTRACTOR: PEDCO Environmental, Inc. (PEI)

CONTRACT NO: 68-01-6894

ORDER NO: 6894-05-015

DATES OF SERVICE: 6/19/84 - 7/20/84 and 1/4/85

SUMMARY OF SERVICE: Assisted OSC with removal at site.

DOCUMENTATION: FMD SPUR Report dated 12/31/85
Copies of Applicable Paid Vouchers and Treasury Schedules

| VOUCHER NUMBER | VOUCHER DATE | VOUCHER AMOUNT | TREASURY SCHEDULE NUMBER AND DATE | |
|---|---|---|---|---|
| 1015-1 | 08/26/84 | 174,283.41 | 227563 | 09/27/84 |
| [redacted]5-2 | 01/27/85 | 40,876.59 | 227263 | 03/21/85 |
| TOTAL ERCS CONTRACT: | | $ 215,160.00 | | |

COST SUMMARY
Wausau/Rothchild, Wisc.
Prepared: 02/06/86
Revised: 03/12/86

TAT CONTRACT

CONTRACTOR: Weston

CONTRACT NO: 68-01-6669

PROJECT OFFICER: Jack Jojokian

DATES OF SERVICE: 1/25/84 - 1/2/86

SUMMARY OF SERVICE: SPCC Inspection; investigate contamination of municipal waters supply; provide monitoring support to OSC during emergency action; investigate industrial sources of VOC contamination;

TOTAL CONTRACTOR COST: $ 149,408.00

DOCUMENTATION: Contractor Cost Summary dated 2/26/86
Copies of Applicable Paid Vouchers and Treasury Schedules
Copies of Applicable TDDs & AOCs

| VOUCHER NUMBER | VOUCHER DATE | VOUCHER AMOUNT | TREASURY SCHEDULE NUMBER AND DATE | |
|---|---|---|---|---|
| 22 | 2/2/84 | 1,049,493.68 | 227211 | 3/12/84 |
| 23 | 3/2/84 | 676,684.42 | 227255 | 4/6/84 |
| 24 | 4/5/84 | 972,905.43 | 227316 | 5/9/84 |
| 25 | 5/2/84 | 714,805.03 | 227365 | 6/8/84 |
| 26 | 5/31/84 | 727,854.17 | 227401 | 6/29/84 |
| 27 | 6/11/84 | 67,249.00 | 227427 | 7/16/84 |
| 28 | 7/6/84 | 960,277.30 | 227474 | 8/10/84 |
| 29 | 8/7/84 | 941,932.39 | 227515 | 9/11/84 |
| 30 | 8/7/84 | 91,258.00 | 227515 | 9/11/84 |
| 31 | 9/4/84 | 1,070,099.89 | 227000 | 10/5/84 |
| 32 | 10/2/84 | 1,619,755.68 | 227045 | 10/29/84 |
| 33 | 10/30/84 | 1,198,938.59 | 227091 | 12/3/84 |
| 34 | 11/28/84 | 1,349,224.11 | 227150 | 1/16/85 |

COST SUMMARY
Wausau/Rothchild, Wisc.
Prepared: 02/06/86

EERU CONTRACT

CONTRACTOR: IT Corporation

CONTRACT NO: 68-03-3069

PROJECT OFFICER: Steve Dorrler/Jo Wilder

REF. NO. 9661.18

DATES OF SERVICE: 9/84 - 1/85 - 4/85 - 5/85

SUMMARY OF SERVICE: Use of specialized monitoring equipment during response activity

TOTAL CONTRACTOR COST: $ 17,522.44

DOCUMENTATION: Contractor Letter Report dated 6/17/85 & 6/28/85
Copies of Applicable Invoices

| INVOICE NUMBER | INVOICE DATE | INVOICE AMOUNT | TREASURY SCHEDULE NUMBER AND DATE | |
|---|---|---|---|---|
| 49 | 10/17/84 | 779,317.23 | 227115 | 10/10/24 |
| 50 | 12/17/84 | 834,766.47 | 227230 | 03/04/85 |
| 52 | 01/10/85 | 738,126.63 | 227255 | 03/13/85 |
| 53 | 01/17/85 | 728,836.32 | 227301 | 04/04/85 |
| 54 | 02/20/85 | 1,514,294.00 | 227303 | 04/04/85 |
| 57 | 04/16/85 | 994,972.00 | 227458 | 07/05/85 |
| 58 | 06/15/85 | 637,623.93 | 227502 | 07/26/85 |

NOTE: Vouchers are lump sum payments to individual contractors for work performed during a certain period of time.

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

| | | |
|---|---|---|
| UNITED STATES OF AMERICA,<br><br>Plaintiff,<br><br>v.<br><br>WAUSAU CHEMICAL CORPORATION,<br><br>and<br><br>JAMES CHERWINKA,<br><br>Defendants. | ) | CIVIL ACTION NO. |

COMPLAINT

The United States of America, by and through the undersigned attorneys, by authority of the Attorney General of the United States and acting at the request of and on behalf of the Administrator of the United States Environmental Protection Agency ("EPA"), files this Complaint and alleges as follows:

## NATURE OF ACTION

1. This is a civil action brought pursuant to Section 107 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601 et seq., (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 Pub. L. No. 99-499 100 Stat. 1613 (1986)(SARA). This action seeks to recover costs incurred by plaintiff under Section 104 of CERCLA 42 U.S.C. § 9604, in the implementation of certain response measures at a site known as the Wausau Ground Water Contamination Site located in Wausau Wisconsin.

## JURISDICTION AND VENUE

2. This court has jurisdiction over this action pursuant to 28 U.S.C. § 1331 and 1345, and 42 U.S.C. § 9607(a) and (c), and § 9613(b).

3 Venue is proper in this district pursuant to 28 U.S.C. § 1391(b) and (c) and 42 U.S.C. § 9613(b), as the actual and threatened releases of hazardous substances that gave rise to this claim occurred in this district.

## GENERAL ALLEGATIONS

4. Section 104 of CERCLA, 42 U.S.C. § 9604, provides in part (a)(1):

> Whenever (A) any hazardous substance is released or there is a substantial threat of such a release into the environment, or (B) there is a release or substantial threat of release into the environment of any pollutant or contaminant which may present an imminent and substantial danger to the public health or welfare, the President is authorized to act, consistent

with the National Contingency Plan, to remove or arrange for the removal of, and provide for remedial acton relating to such hazardous substance, pollutant, or contaminant at any time ..., or take any other response measure consistent with the National Contingency Plan which the President deems necessary to protect the public health or welfare or the environment. When the President determines that such action will be done properly and promptly by the owner or operator of a facility or vessel or by any other responsible party, the President may allow such person to carry out the action, conduct the remedial investigation, or conduct the feasibility study in accordance with Section 122.

(B)(1) Whenever the President is authorized to act pursuant to subsection (a) of this section, or whenever the President has reason to believe that a release has occurred or is about to occur, or that illness, disease, or complaints thereof may be attributable to exposure to a hazardous substance, pollutant, or contaminant and that a release may have occurred or be occurring, he may undertake such investigations, monitoring, surveys, testing, and other information gathering as he may deem necessary or appropriate to identify the existence and extent of the release or threat thereof, the source and nature of the hazardous substance, pollutants, or contaminants involved, and the extent of danger to the public health or welfare or the environment. In addition, the President may undertake such planning legal, fiscal, economic, engineering, architectural, and other studies or investigations as he may deem necessary or appropriate to plan and direct response actions, to recover the costs thereof, and to enforce the provisions of this Act.

5. Presidential authority under Section 104 was delegated to the Administrator of the EPA by Executive Order 12316, 46 Fed. Reg. 42237 (August 14, 1981). by Executive Order , Fed. Reg. ( 1987)

6. Section 107(a) of CERCLA, 42 U.S.C. § 9607(a) provides in part:

> (a) Nothwithstanding any other provision or rule of law, and subject only to the defenses set forth in subsection (b) of this section --
>
> (1) the owner and operator of .... a facility.
>
> (2) any person who at the time of disposal of any hazardous substance owned or operated any facility at which such hazardous substances were disposed of,
>
> (3) any person who by contract agreement, or otherwise arranged for disposal or treatment, or arranged with a transporter for transport for disposal or treatment, of hazardous substances owned or possessed by such person, by any other party or entity, at any facility owned or operated by another party or entity and containing such hazardous substances, and
>
> (4) any person who accepts or accepted any hazardous substances for transport to disposal or treatment facilities ... or sites selected by such person, from which there is a release, or a threatened release which causes the incurrence of response costs, of a hazardous substance, shall be liable for -
>
> (A) all costs of removal or remedial action incurred by the United States Government or a state ... not inconsistent with the national contingency plan; ...

7. The term "hazardous substance" is defined in Section 101(14), of CERCLA, 42 U.S.C. § 9601(14), as:

> (A) any substance designated pursuant to Section 311(b)(2)(A) of the Federal Water Pollution Control Act, (B) any element, compound, mixture, solution or substance designated pursuant to Section 102 of this Act, (C) any hazardous waste having the characteristics identified under or listed pursuant to

> Section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by Act of Congress), (D) any toxic pollutant listed under Section 307(a) of the Federal Water Pollution Control Act, (E) any hazardous air pollutant listed under Section 112 of the Clean Air Act, and (F) any imminently hazardous chemical substance or mixture with respect to which the Administrator has taken actin pursuant to Section 7 of the Toxic Substances Control Act...

8. The term "release" is defined in Section 101(22) of CERCLA, 42 U.S.C. § 9606(22), as:

> any spilling, leaking, pumping pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment...

9. The term "facility" is defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9), as

> (A) any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), wells, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft, or (B) any site or area where a hazardous substance has been deposited, stored, disposed of, or placed or otherwise come to be located; but does not include any consumer product in consumer use or any vessel.

10. The term "disposal", as defined in Section 101(29) of CERCLA, 42 U.S.C. § 9601(29), has the same meaning as provided in Section 1004 of the Solid Waste Disposal Act, 42 U.S.C. § 6903, which states:

> (3) The term "disposal" means the discharge, deposit, injection, dumping, spilling, leaking or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous wast or any consistuent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwaters.

11. The term "owner" and "operator", as defined in Section 101(20)(A) of CERCLA. 42 U.S C. § 9601(20)(A), mean

> (ii) in the case of an onshore facility...any person owning or operating such facility, and (iii) in the case of any facility, title or control of which was conveyed due to bankruptcy foreclosure, tax delinquency, abandonment, or similar means to a unit of state or local government, any person who owned, operated or otherwise controlled activities at such facility immediately beforehand.

12. The term "person" is defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21), as:

> an individual, firm, corporation, association, partnership, consortium, joint venture, commercial entity, United States Government, State, municipality, commission, political subdivision of a State, or any interstate body.

13. The term "facility" is defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9) as:

> any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft.

14. The Wausau Chemical Corporation, formerly known as Wausau Chemical Company, operates a plant in the County of Marathon, at 2001 North River Drive, Wausau, Wisconsin

15. The Wausau Chemical Corporation is a "person" within the meaning of Section 101(21) of CERCLA, 42 U.S.C. § 9601(9).

16. The Wausau Chemical Corporation is a "facility" within the meaning of Section 101(2) of CERCLA, 42 U.S.C. § 9601(2).

17. The Wausau Ground Water Contamination site is located in Marathon County, City of Wausau, Wisconsin. The population of the Wausau metropolitan area was approximately

36,000 at the time of the immediate removal.

18. Upon information and belief Wausau Chemical Corporation, located at 2001 North River Drive, Wausau, Wisconsin, was engaged in the business of bulk sale and reclamation of solvents from 1962 to present within the boundary the Site.

19 Upon information and belief, Wausau Chemical Corporation distributed and handled materials including Tetrachloroethylene (PCE), Xylene and Toluene from 1962 to present.

20. On or about February 15, 1983, a release of approximately 135 gallons of Tetrachloroethylene (PCE) occurred at the Wausau Chemical Corporation facility located at 2001 North River Drive, Wausau, Illinois.

21. On or about February 16, 1983, James Cherwinka reported the February 15, 1983 release of Tetrachloroethylene (PCE) at the Wausau Chemical Corporation facility to the Wisconsin Department of Natural Resources.

22. On or about December 19, 1983, a release of approximately 800 gallons of Tetrachloroetylene (PCE) occurred at the Wausau Chemical Corporation facility located at 2001 North River Drive, Wausau, Wisconsin.

23. On or about December 19, 1983, Wausau Chemical Corporation reported the December 19, 1983 release of Tetrachloroethylene at the Wausau Chemical Corporation facility to the Wisconsin Department of Natural Resources.

24. Monitoring wells installed by Wausau Chemical Corporation at the Wausau Chemical Corporation facility have, at various times from 1983 to present, detected hazardous substances, including

Tetrachloroethlyene (PCE) in the groundwater beneath the facility located at 2001 North River Drive, Wausau Wisconsin.

25. Analysis of soil samples taken from the Wausau Chemical Corporation premises at various times since 1983 have shown evidence of contamination with hazadous substances, including Tetrachloroethylene (PCE).

26. Analysis of water samples taken from groundwater beneath the Wausau Groundwater Contamination Site at various times since 1983 has shown evidence that groundwater is contaminated with hazardous substances, including Tetrachloroethylene.

27. Analysis of water samples taken from the city of Wausau wells numbers 3, 4, and 6, at various times since 1983 show evidence of contamination with hazardous substances, including Tetrachloroethylene (PCE).

28. Analysis of water samples taken directly from various taps within the city of Wausau at various times since 1983 show evidence that the tap water was contaminated with hazardous substances, including Tetrachloroethylene (PCE).

29. Upon information and belief, James Cherwinka was president of Wausau Chemical Corporation at the time of the February 15, 1983 and December 19, 1983 releases of Tetrachloroetylene at the Wausau Chemical Corporation facility.

30. Upon information and belief, James Cherwinka was the owner of Wausau Chemical Corporation at the time of the February 15, 1983 and December 19, 1983 releases of Tetrachloroethylene at the Wausua Chemical Corporation facility.

31. Upon information and belief, James Cherwinka was the

operator of the Wausau Chemical Corporation facility at the time of the February 15, 1983 and December 19, 1983 releases of Tetrachloroetylene at the Wausau Chemical Corporation facility.

32. Upon information and belief, James Cherwinka was President, owner and operator of Wausau Chemical Corporation from 1962 to present.

33. Upon information and belief, James Cherwinka is currently president, sole owner and operator of Wausau Chemical Corporation.

34. In early 1984, the U.S. EPA determined that the releases and threatened releases of hazardous substances, including Tetrachloroethylene (PCE), into the environment, into the ground water and into the Wausau municipal drinking water supply presented an imminent and substantial endangerment to the public health, welfare and environment.

35. In June 1984, U.S. EPA officials, as authorized representatives of the President pursuant to Section 115 of CERCLA, 42 U.S.C. § 9615, and pursuant to 42 U.S.C. § 9604(a), initiated the removal of hazardous substances, including Tetrachloroethylene (PCE), from the Wausau Ground Water Contamination Site in a manner not inconsistent with the National Contingency Plan, 40 C.F.R. §300.00 et. seq.

36. On or about June, 1984, a removal action was commenced at the Wausau Ground Water Contamination Site. The removal action consisted of installation of a Granular Activated Carbon (GAC) system, installation of an air stripper,

and performance of investigatory and evaluatory tasks to define the threat to the environment. The removal action was completed in December, 1984.

37. The cost of the removal action incurred by the United States was $459,718.14.

38. The costs of the removal action at the Wausau Ground Water Contamination Site were incurred in a manner not inconsistent with the National Contingency Plan, 40 C.F.R. §300.00 et. seq.

39. The named defendants in this action are jointly and severally liable for all costs incurred by the United States related to the described removal action at the Wausau Ground Water Contamination Site.

## PRAYER FOR RELIEF

WHEREFORE, Plaintiff prays this Court:

1. Enter judgment against the defendants in favor of the United States for all response costs incurred by the United States at and in conjunction with the response activities at Wausua Groundwater Contamination Site plus interest.

2. Award Plaintiff's attorney's fee and costs. and;

3. Grant such other relief as is deemed appropriate.

Dated this _____ day of _____, 19

Respectfully submitted,

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