CONESTOGA-ROVERS
& ASSOCIATES

1801 Old Highway 8 Northwest, Suite 114, St. Paul, Minnesota 55112
Telephone: 651-639-0913 Facsimile: 651-639-0923
www.CRAworld.com

April 24, 2012

Reference No. 003978

Ms. Sheri Bianchin
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY
77 West Jackson
Chicago, Illinois 60604

Ms. Erin Endsley
WISCONSIN DEPARTMENT OF
NATURAL RESOURCES
DNR Service Center
1701 N. 4th Street
Superior, WI 54880

Dear Ms. Bianchin and Ms. Endsley:

Re: 2011 Annual Monitoring Report
Wausau Water Supply NPL Site

On behalf of the Wausau Water Supply PRP Group, Conestoga-Rovers and Associates (CRA) is pleased to submit this 2011 Annual Monitoring Report for the Wausau Water Supply NPL Site. This Report has been prepared as required by the Groundwater Monitoring Plan for the Wausau Water Supply NPL Site.

Please contact me if you have any questions or comments.

Sincerely,

CONESTOGA-ROVERS & ASSOCIATES

Charles Ahrens

CEA/sb/17
Encl.

cc: Dave Erickson, City of Wausau
Lee Bergmann, Regal Beloit (via email)
Art Flashinski, Wausau Chemical (via email)

2011 ANNUAL MONITORING REPORT

WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

2011 ANNUAL MONITORING REPORT

WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Prepared by:
Conestoga-Rovers & Associates

1801 Old Highway 8 Northwest, Suite 114
St. Paul, Minnesota 55112

Office: 651-639-0913
Fax: 651-639-0923

APRIL 2012
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1.0 INTRODUCTION

Conestoga-Rovers and Associates (CRA) has prepared this 2011 Annual Monitoring Report (Report) for the Wausau Water Supply NPL Site (Site) in Wausau, Wisconsin, on behalf of the Wausau Potential Responsible Party (PRP) Group. This Report presents the results of groundwater and extraction well monitoring at the Site during 2011. This Report also presents operational data for the groundwater remediation systems.

1.1 HISTORY

The Wausau PRP Group initiated remedial action at the Site in the early 1990s in accordance with the September 29, 1990, Record of Decision (ROD) and the Consent Decree (CD) entered with the court on January 24, 1991. The final remedial action at the Site consisted of two soil vapor extraction (SVE) systems to address the source areas and groundwater extraction and treatment, utilizing existing municipal production wells and an extraction well. The Site location is shown on Figure 1.1 and a Site plan is presented on Figure 1.2.

Source area remediation was accomplished by the installation of SVE systems at Marathon Electric (West Bank) and Wausau Chemical (East Bank) in January 1994. The SVE system at Marathon Electric operated until April 1996, when the West Bank source remediation was approved as complete. The East Bank SVE system was modified in 1996 and continued to operate. In January 2001 the East Bank system was shut down while evaluation for final closure occurred. The East Bank source remediation was approved as complete in 2007.

Groundwater remediation is provided through two existing municipal production wells (CW3 and CW6) and one extraction well installed at Marathon Electric (EW1). Air strippers, located at the Wausau water treatment plant, treat water from the municipal supply wells. Water from EW1 is also treated by air stripping (over riprap on the riverbank) before being discharged to the Wisconsin River.

The pumping rates for the three extraction wells were originally defined in the CD. In the Groundwater Flow Model report (CRA, May 1993), CRA established a range of pumping rates that would maintain capture of the groundwater plume. Subsequently, in an August 4, 1995 letter, the United States Environmental Protection Agency (USEPA) approved a pumping configuration range for the three extraction wells. Those pumping rates were:

- CW3: 65 hours per week at 1,200 gallons per minute (gpm) to 100 hours per week at 1,100 gpm
- CW6: 85 hours to 100 hours per week at 1,400 gpm
- EW1: 800 to 900 gpm continuously

Additional groundwater remediation was provided by an extraction system operated by Wausau Chemical between 1985 and 1996 as an interim remediation measure. The extraction system at Wausau Chemical consisted of a series of shallow wells at the south end of the Wausau Chemical property. Groundwater was treated by air stripping. This system was in addition to the requirements of the ROD or the CD and operation ceased in 1996.

From 1993 through 2000 groundwater monitoring was conducted according to the Monitoring Program Plan (CRA, 1994). The Monitoring Program Plan consisted of a complex system of monthly, quarterly, semiannual, and annual monitoring. In June 2000, the Groundwater Monitoring Plan replaced the Monitoring Program Plan as the approved groundwater monitoring program. The Groundwater Monitoring Plan consists of annual monitoring well sampling and quarterly sampling of EW1.

The Groundwater Monitoring Plan requires an annual report on the activities occurring the previous calendar year. This Report fulfills the requirement for 2011.

1.2 MONITORING BACKGROUND

Groundwater monitoring at this Site is a combination of hydraulic and water quality monitoring designed to verify that the groundwater extraction wells are containing the contaminant plume and that groundwater quality is improving as a result of past source remedial actions and ongoing volatile organic compound (VOC) removal from the aquifer.

Groundwater remediation at the Wausau Site is a long-term process that cannot be readily measured on a short-term basis using water quality data alone. Accordingly, water quality data is measured annually on a long-term basis to show the downward trend of VOC concentrations in groundwater. Because of the time necessary to achieve groundwater remediation, containment of contaminated groundwater is the primary measurable and achievable short-term objective.

For the purpose of evaluation, groundwater monitoring at Wausau has been divided into two areas, the East Bank and the West Bank of the Wisconsin River, corresponding to the two original source areas. The river forms a natural hydraulic division of the Site. There are three active groundwater extraction wells that contain and remove VOC contaminated groundwater. Two of the extraction wells are on the West Bank, (CW6 and EW1) and one is on the East Bank (CW3) (see Figure 1.2).

1.3 SITE GEOLOGY

The Site is underlain by glacial outwash and alluvial sediments that have filled in the preglacial stream valley in which the Wisconsin River now flows. This alluvial aquifer ranges from 0 to 160 feet thick and has an irregular base and lateral boundaries. The relatively impermeable bedrock that underlies the aquifer, and forms its lateral boundaries within the preglacial valley, defines the boundaries of the aquifer. Six production wells in the Site area provide drinking water for the City of Wausau. These wells are screened in the glacial outwash and alluvial sand and gravel deposits that underlie and are adjacent to the Wisconsin River.

1.4 GROUNDWATER CLEANUP STANDARDS

The Groundwater Monitoring Plan was developed to monitor compliance with cleanup standards for the groundwater at the Site. The groundwater cleanup standards for the Site are the United States Environmental Protection Agency (USEPA) maximum drinking water contaminant levels (MCLs). The MCLs for the primary VOC contaminants of concern at the Site are:

- Trichloroethylene (TCE) 5 µg/L
- Tetrachloroethylene (PCE) 5 µg/L
- cis-1,2-Dichloroethylene (DCE) 70 µg/L
- Vinyl chloride 2 µg/L

2.0 2011 MONITORING

Groundwater monitoring during 2011, which included water level measurements and water sampling, was conducted in late October and early November in accordance with the Groundwater Monitoring Plan, with the following exceptions:

- As reported in the 2000 Annual Monitoring Report, two monitoring wells (WC2 and W51A) are no longer monitored and they were abandoned in 2000.
- Also, as approved by the USEPA and Wisconsin Department of Natural Resources (WDNR) through the 2002 Annual Monitoring Report, the analysis of bis(2-ethylhexyl)phthalate at C4S and W53A was discontinued in 2003.

Monitoring of EW1 was conducted on a quarterly schedule in May, August, and December, 2011. Due to pump failure and well rehabilitation work conducted in early 2011, the first quarter discharge monitoring was not performed.

2.1 WATER LEVEL MONITORING

Table 2.1 presents the groundwater elevation data measured on November 1st and 2nd, 2011. Water table contours based on these measurements are presented on Figure 2.1. Field staff measured water levels on the East Bank on November 1st, while CW-3, the East Bank remediation well, was pumping. West Bank water levels were measured on November 2nd while EW-1 and CW-6, the West Bank remediation wells, EW-1 and CW-6, were operating. Water levels in the City production wells were measured with the assistance of the City staff.

The East Bank and West Bank contours are consistent with flow patterns observed in previous years. The flow patterns are controlled by the operation of EW1 and the City production wells. Under natural conditions, groundwater would flow toward and discharge to the Wisconsin River and its tributary, Bos Creek. Under existing conditions however, groundwater flows toward EW1 and the production wells. The operation of EW1 has created groundwater flow divides between the west and east City well fields and has isolated the former landfill source of contaminated groundwater, south of EW1, from the production wells.

2.2 GROUNDWATER SAMPLING

Annual groundwater sampling was conducted from October 31 through November 2, 2011, according to the Groundwater Monitoring Plan. Monitoring well samples were analyzed for the Site specific VOC list (see Table 2.2) by EPA Method 8260. A summary of the groundwater sampling event, including field parameter measurements, is presented in Table 2.3.

Groundwater sampling was conducted according to the Quality Assurance Project Plan, (CRA, February 1994) as amended by a June 11, 1999, letter to the USEPA. TestAmerica Laboratories, Inc. in North Canton, Ohio, analyzed all samples. Laboratory results are being submitted electronically in the Region V Electronic Data Deliverable (EDD) format for inclusion in the Region V EPA database. Copies of the Data Quality Validation memoranda for the 2011 data are included in Appendix A.

2.3 EXTRACTION WELL (EW1) SAMPLING

The monitoring program for EW1 was designed to measure long-term water quality improvement in the groundwater and to measure the effectiveness of the EW1 groundwater treatment system. These data are also used to monitor the contaminant levels discharged to the Wisconsin River from the treatment system. The discharge concentrations must meet the substantive requirements of the Wisconsin Pollutant Discharge Elimination System (WPDES).

Influent and Effluent samples were collected from the EW1 treatment system on a quarterly basis in May, August, and December, 2011. Due to pump failure and well rehabilitation work conducted in early 2011, the first quarter discharge monitoring was not performed. Both the influent and effluent samples were analyzed by EPA Method 8260 for the Site specific VOCs (Table 2.2).

Each quarterly sample was analyzed by TestAmerica. Laboratory results are being submitted electronically in the Region V EDD format for inclusion in the Region V EPA database. Copies of the Data Quality Validation memoranda for the 2011 data are included in Appendix A.

3.0 OPERATION AND MAINTENANCE

Operation and maintenance activities reported in this section cover EW1, the City production wells, the groundwater monitoring wells, and the annual inspection of the paved surfaces in the East Bank source area.

3.1 MONITORING WELL INSPECTION

All Site monitoring wells were inspected during the November monitoring round. An inspection form was used to document the following well conditions:

- Total depth
- Well ID
- Casing and grout condition
- Well cap condition
- Lock condition
- Concrete seal condition
- Ground condition (subsidence)

Table 3.1 presents the results of the inspection. The inspection indicated that all wells were in satisfactory condition and no maintenance is required at this time. Approximately 14 wells did not have visible identification marks or tags. These wells were marked with proper identification during the 2011 monitoring event.

3.2 EW1 OPERATION

In 2011, approximately 210,000,000 gallons of water were extracted and treated by the West Bank extraction well (EW1) at RBC Manufacturing (formerly Marathon Electric). The extraction well pumped at an average flow rate of 402 gallons per minute during 2011. Table 3.2 summarizes EW1 operational data for 2011, including the number of gallons pumped per month and average flow rates.

EW1 was not operating for 68 days in January, March, and April due to pump failure/replacement, well rehabilitation, and associated troubleshooting. The pump has operated continuously since April 28, 2011.

Pump replacement and extensive rehabilitation was performed on EW1 during the first two quarters of 2011. Pump replacement and initial well rehabilitation was conducted through most of January. The new pump was started up on January 26, 2011, but the pumping rate could not be maintained above 500 gallons per minute (gpm). The new pump was removed on March 16, 2011, to televise the well screen and perform double disk surging of the screen. The pump was reinstalled and began operating on April 28, 2011. The pumping rate has slowly improved since April and averaged close to 600 gpm over the last four months of 2011.

In a letter dated September 7, 2010, the PRP Group submitted a request for a reduction in the pumping rate performance standard for EW-1. Due to declining pumping capacity, a new lower limit of 500 gpm for the EW1 pumping rate was requested. In the interim, EW-1 will be pumped at the rate that can be maintained with the existing well conditions.

3.3 CITY PRODUCTION WELLS

CW3 and CW6 operated as required in 2011 with minimal shutdowns or repairs. Table 3.3 presents 2011 pumping data for the six City wells. While only CW3 and CW6 are part of the remediation system, data for all City wells are presented, consistent with previous reports. The table shows, by month, the number of hours each well was operated, the number of gallons pumped from each well, and the average pumping rate while the pump was operating.

CW3 and CW6 operated on alternate schedules at rates that exceeded the operating requirements established by the USEPA approval letter dated August 4, 1995. CW3 operated for an average of 79.7 hours per week with an average pumping rate of 1,607 gpm, exceeding the requirements of 65 hours per week at 1,200 gpm.

CW6 operated for an average of 87.4 hours per week with an average pumping rate of 1,631 gpm, exceeding the requirement of 85 hours per week at 1,400 gpm.

3.4 EAST BANK SOURCE AREA PAVEMENT INSPECTION

The USEPA and WDNR approved final closure of the East Bank source remediation system in September 2007. A requirement of the closure was an annual inspection of the paved areas surrounding the Wausau Chemical property, as described in the Pavement

Cover and Building Maintenance Plan. The purpose of the inspection is to monitor the integrity of the paved areas of the property and make recommendations to minimize rainwater infiltration and prevent direct human contact with soils. In August 2009 the entire pavement area was repaved with new asphalt and the street adjacent to the west side of the property, North River Drive, was repaved by the City of Wausau. Also, an approximately 2,800 square foot addition, with concrete floor and roof, was added to the south end of the building in 2009-2010. Inspections conducted during 2011 found the pavement to be in good condition. Three minor cracks that have not fully penetrated the pavement were observed in the fall and will be monitored during 2012. A copy of the pavement inspection report is contained in Appendix B.

4.0 EVALUATION OF GROUNDWATER DATA

The objectives of groundwater monitoring at the Site are to monitor the containment of the contaminant plume and the long-term improvement in groundwater quality.

Table 4.1 presents the laboratory results for monitoring well samples collected in late October and early November 2011. The data indicate that, in general, the plumes are stable or decreasing in size and concentration. Figure 4.1 presents the total chlorinated VOC (CVOC) data and total CVOC concentration contours that illustrate the plume configuration based on the October/November 2011 data.

4.1 WEST BANK

The primary CVOC found in the West Bank groundwater is trichloroethene (TCE), which was detected at 9 of the 13 West Bank monitoring wells. The degradation product, cis-1,2-dichloroethene (C12DCE), was detected at four locations with relatively low concentrations. Vinyl chloride was not detected on the West Bank. Monitoring wells with TCE concentrations greater than the MCL of 5 µg/L included R2D, R3D, R4D, and W53A. The MCL for TCE was also exceeded in the sample from extraction well EW1 (7.3 µg/L), but the concentration at City Well CW6 was below the MCL (see Tables 4.1 and 4.2).

In the portion of the plume north of EW1, CVOCs are located in the deeper portions of the aquifer. Wells north of EW1 that exceeded the MCL for TCE included R2D, R3D, and R4D. In the southern portion of the plume, in the vicinity of the old landfill, CVOCs are located in the shallower portions of the aquifer. MW53A is the only location south of EW1 that exceeded the MCL for TCE. TCE concentrations have fluctuated from 2 to 31 µg/L at MW53A historically, with no clear upward or downward trend. Carbon tetrachloride was detected at MW53A with a concentration of 5.9 µg/L, which slightly exceeded its MCL of 5 µg/L. Carbon tetrachloride has been detected sporadically at MW53A in the past, but concentrations were typically less than 1 µg/L. No other CVOC concentrations exceeded the MCL on the West Bank.

The 2011 West Bank plume concentrations were stable relative to 2010 concentrations, with the exception of MW53A, where concentrations of TCE and carbon tetrachloride increased. The areal extent of the contaminant plume did not change significantly relative to 2010.

Previous Annual Monitoring Reports have described the migration of a relatively high concentration slug of CVOCs towards extraction well EW1. The slug of CVOCs began in the vicinity of R2D, near the flow divide between EW1 and CW6, in 1993, and has been slowly moving towards EW1. The 2011 CVOC data do not provide a clear indication that this contaminant slug continued moving through the R3D area toward EW1 (see Figure 4.1). This is probably due to the lower pumping volume at EW1 during 2011, which was due to the pump replacement and maintenance issues. The historical data for R2D, R3D, and R4D are presented below.

Total CVOCs (µg/L)

Year	*R2D*	*R3D*	*R4D*
1993	3635	4	1016
1994	2130	11	1019
1995	152	5	720
1996	1600	2	540
1997	720	5	65/65
1998	320	580	52/58
1999	110	1200	33
2000	45	1800	58
2001	17	1500	13/13
2002	15	1200	36
2003	10	980	39/37
2004	11	899	51
2005	7.5	400	56/57
2006	8.2	480/500	42
2007	9.9	280	1.3
2008	6.5	180	13
2009	7.2/7.4	92	22.4/23.4
2010	6.2	195.7	25.7
2011	11	203.1	27.6

As shown above, R4D, which is closer to EW1, continued to show a slight increase in concentration, indicating that the slug of higher concentrations is passing through that area as it is contained and removed by EW1.

In the far north portion of the plume, within the capture area of City well CW6 (see Figure 4.1), the only detected VOC is TCE and the concentrations reported for CW6 and W55 have steadily declined since 2000. Concentrations of TCE at both of these wells are below the MCL and are essentially unchanged from 2010. This area of the plume appears to be stable with gradually decreasing TCE concentrations.

4.2 EAST BANK

East Bank well data are presented in Table 4.1. While tetrachloroethene (PCE) was the original contaminant on the East Bank, the presence of TCE, C12DCE, and vinyl chloride at concentrations that equal or exceed the PCE concentration in many wells indicates an active natural biodegradation process. For example, at E37A the C12DCE concentration was higher than the PCE and TCE concentrations combined.

PCE was detected at 8 of the 12 East Bank monitoring wells. Three of those eight wells had concentrations that exceeded the MCL of 5 µg/L. The highest PCE concentration was 63 µg/L at E23A. At E37A, the concentrations of PCE, TCE, C12DCE, and vinyl chloride all exceeded their respective MCLs. The MCLs for PCE and vinyl chloride were also exceeded at WW6, and PCE and TCE exceeded their MCL at E23A.

The areal extent of the East Bank contaminant plume remained steady compared to 2010 (see Figure 4.1). However, significant increases were reported for E23A and E37A. Total CVOC concentrations from 2005 through 2011 for key East Bank wells are shown below:

Total CVOCs (µg/L)

Well	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
WC3B	1.4	18	4.2	1.5	1,460/565.2[1]	1.24	2.26
WC5A	12	8.4	1.8	2.8	12.1	9.86	4.6
E24A	1.6	3.7	1.1	1	13	20	1.4
E22A	ND	14	10	ND	231.9	5.03	3.2
E37A	17	8.5	34	460	77.35	7.0	140.19
E23A	66	47	130	260	154	30.94	115.7
WW6	28	78	35	12	29.97	46.34	17.6

[1] WC3B was resampled on January 12, 2010, to confirm the October, 2009 result.

	Total CVOCs (µg/L)						
Well	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
CW3	6.4	4.6	4.8	6.4	4.48	4.36	4.03
IWD	6.6	13	11	4.4	7.3	4.67	5.7

Significant decreases in CVOC concentrations occurred at E24A, and WW6, while increases were reported for E23A and E37A. These fluctuations are consistent with the migration of a higher concentration slug that has moved from the WC3B area and through the E37A/E23A area as it migrates toward CW3 and removal.

CVOC concentrations at the island well, IWD, have been stable to decreasing over the last seven years. Statistical analysis of IWD data, using the Mann Kendall method, indicates a decreasing trend (see Appendix C). No VOC concentrations exceeded MCLs in samples from IWD in three out of the last four years, including the last two. The aquifer at IWD appears to have been impacted by West Bank contaminants based on the depth of the plume and the plume composition (TCE only). Prior to operation of EW1, CW3 captured some groundwater from the West Bank and caused it to migrate beneath the river towards the east side. There is a low concentration remnant of the West Bank contaminants in a relatively stagnant area between the capture zones of EW1 and CW3. This remnant will move slowly toward one side or the other, depending on the pumping rates and pumping patterns of EW1 and CW3.

Since IWD is on an island that is only accessible by boat, sampling of this well can be hazardous due to potential boating mishaps, high winds, and cold temperatures in October. The data provided by this well is not critical to the ongoing characterization of the plume and, due to the boating safety risks, we propose that IWD be removed from the Site monitoring plan. Upon approval, the well will be abandoned by a licensed well driller.

The 2011 concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) at monitoring well FVD5 were consistent with historical data. The aromatic compounds found in this well are related to the Wausau Energy property and are independent of the Wausau NPL site remediation process.

4.3 EW1

The 2011 influent and effluent laboratory results for EW1 are presented in Table 4.2. The first quarter 2011 sample was not collected because EW1 was not operating due to the pump replacement and well rehabilitation activities. Quarterly samples were collected in May, August, and December. TCE was the primary CVOC detected. C12DCE was also detected in the May and August samples, but the concentrations were less than 1 µg/L.

Influent concentrations of TCE declined slightly from 8.6 µg/L in May to 7.3 µg/L in December. The effluent concentrations indicate that the EW1 treatment system removes about 50 percent of the CVOCs in the extracted groundwater.

The results of the effluent samples were compared to surface water discharge limits for discharge to the Wisconsin River, as calculated by the WDNR. Those discharge limits were presented in the "Remedial Action Plan, Groundwater Extraction, Treatment, and Discharge System", (CRA, 1990). None of the discharge limits were exceeded during 2011 (see Table 4.2). EW1 influent and effluent sampling results were also reported quarterly for the last three quarters of 2011.

4.4 HYDRAULIC CAPTURE

Hydraulic capture of the contaminant plume is demonstrated by the water table contours illustrated on Figure 2.1. The water table contours indicate that groundwater flow at the Site is toward the three extraction wells (CW3, CW6, and EW1), which is supported by the analytical data as discussed in Sections 4.1 and 4.2. At nested well locations, the water table elevations for shallow and deeper wells were similar, indicating horizontal flow and hydraulic containment of the shallow and deeper portions of the aquifer. Figures 4.1 and 4.2 also demonstrate that hydraulic containment of the contaminant plume was maintained through 2011.

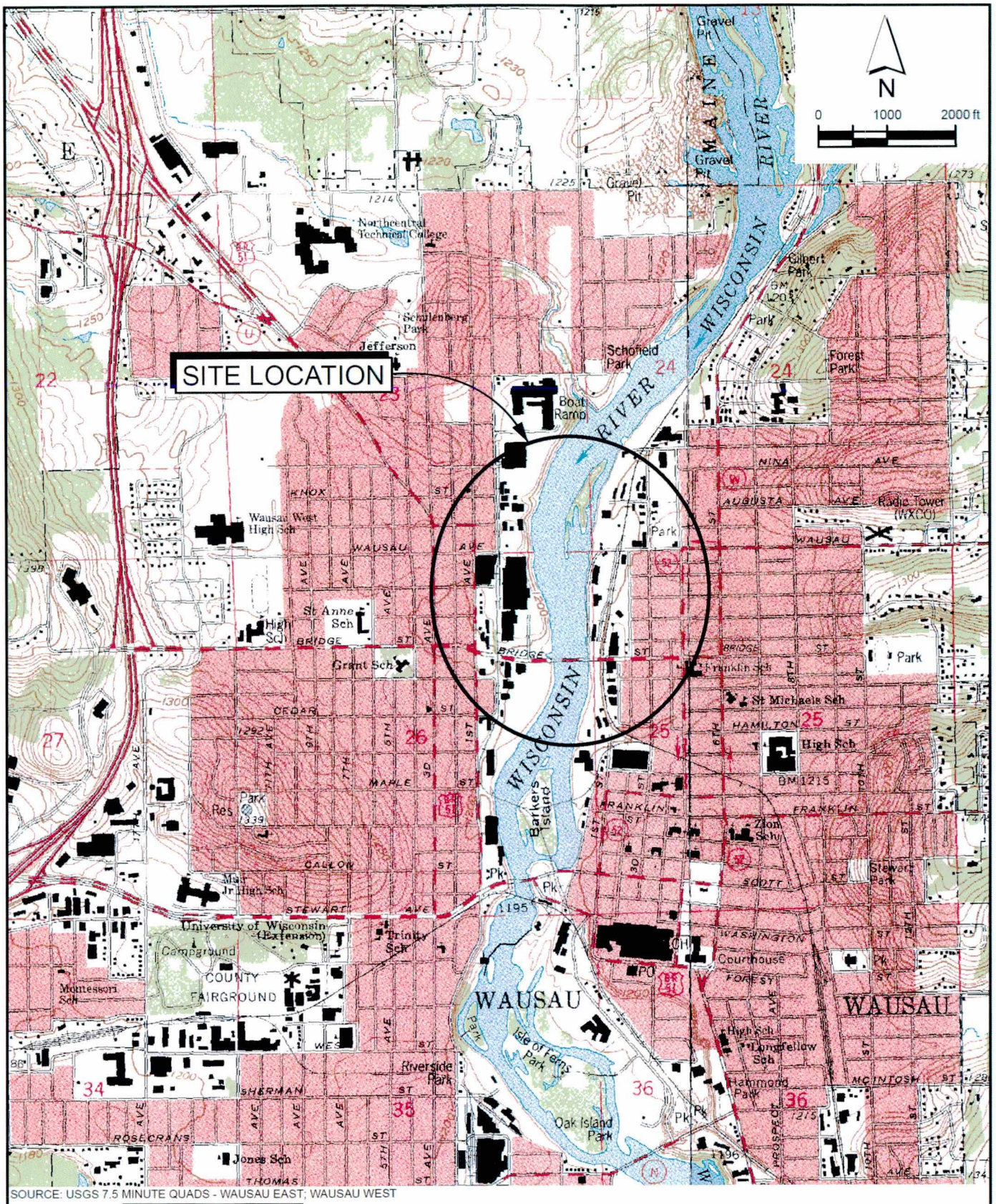
5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

- The RBC Manufacturing (formerly Marathon Electric) extraction well, EW1, and the two City production wells, CW3 and CW6, continue to capture the CVOC plume as demonstrated by the hydraulic and chemical data.
- The East Bank CVOC plume exhibited concentration patterns consistent with continued migration of a higher concentration slug toward CW3. The areal extent of the plume was stable. The presence of PCE daughter products provides evidence of natural attenuation of the East Bank plume.
- The CVOC plume on the West Bank remained stable in its areal extent and concentrations were also stable relative to 2010 data, with the exception of W53A, which exhibited an increase.
- Four West Bank monitoring wells (R2D, R3D, R4D, and W53A) and EW1 had TCE concentrations greater than the MCL of 5 µg/L.
- Three East Bank wells had PCE concentrations that exceeded the MCL of 5 µg/L. Two wells, WW6 and E37A, had a vinyl chloride concentration that exceeded the MCL of 2 µg/L. The MCL for TCE was exceeded at E37A and E23A. The MCL for C12DCE was also exceeded at E37A.
- EW1 removed approximately 210,000,000 gallons of water in 2011 at an average pumping rate of 402 gallons per minute. The well was not operating for a long period during the first quarter of 2011 for pump replacement and rehabilitation. The average pumping rate over the last three quarters of 2011 was 520 gpm.
- The EW1 treatment system removed approximately 50 percent of the CVOCs from the extracted groundwater. The effluent concentrations from the treatment system were far below the established discharge limits.
- The City production wells operated within the requirements established by USEPA.
- The annual inspection of the pavement and building barrier at Wausau Chemical found the pavement to be in good condition. No cracks were observed that required immediate attention.

5.2 RECOMMENDATIONS

- Monitoring in 2012 should continue as described in the Groundwater Monitoring Plan with the minor modifications discussed in previous reports.
- A new lower limit of 500 gpm for the EW1 pumping rate was requested in CRA's September 7, 2010, letter to USEPA and WDNR. EW1 will continue to be pumped at that rate, or higher, under the assumption that the 500 gpm lower limit is approved.
- Abandon monitoring well IWD. Since IWD is on an island that is only accessible by boat, sampling of this well can be hazardous due to potential boating mishaps, high winds, and cold temperatures in October. The data provided by this well is not critical to the ongoing characterization of the plume and, due to the boating safety risks, we propose that IWD be removed from the Site monitoring plan. Upon approval, the well will be abandoned by a licensed well driller.

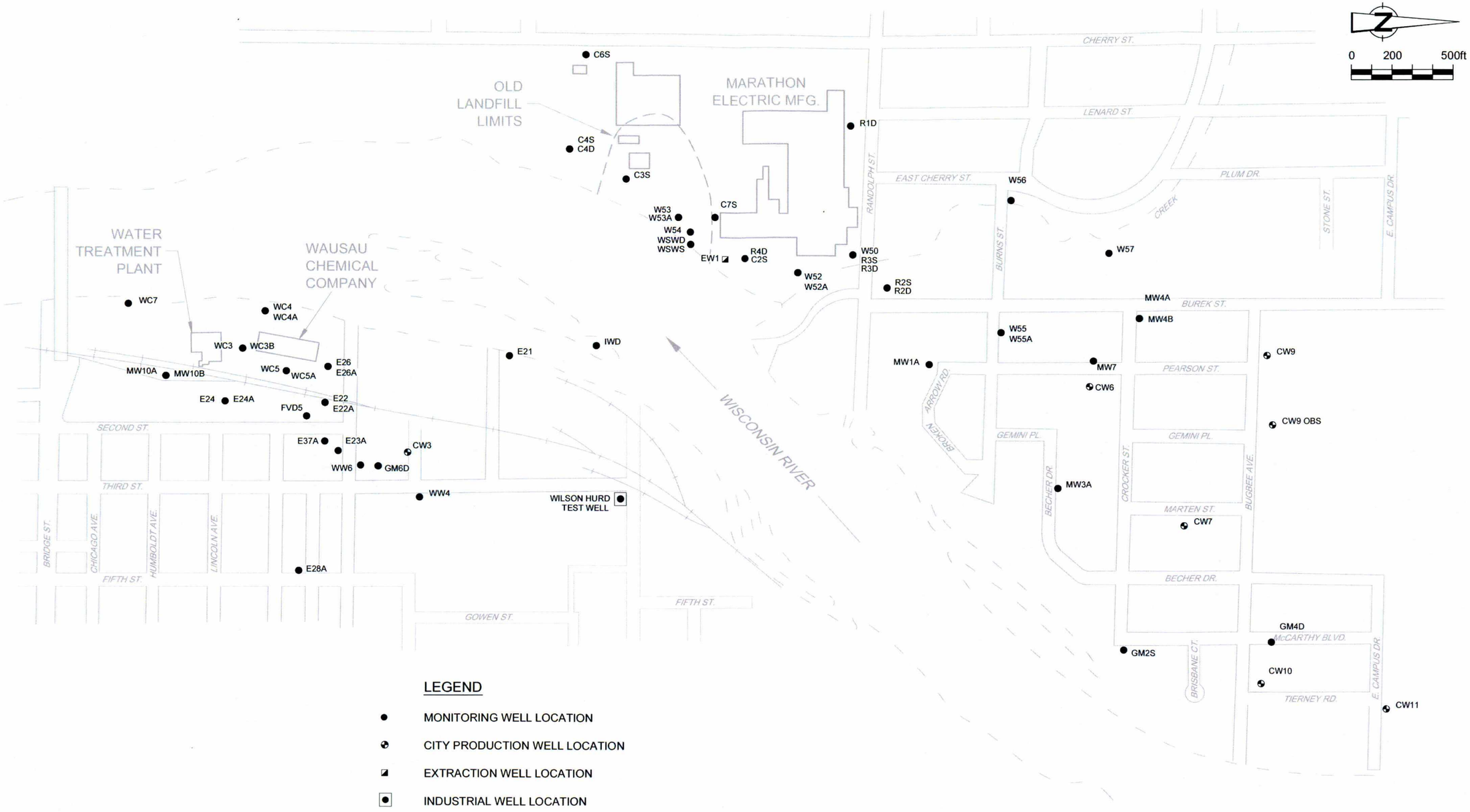


SOURCE: USGS 7.5 MINUTE QUADS - WAUSAU EAST; WAUSAU WEST

figure 1.1

SITE LOCATION
WAUSAU WATER SUPPLY NPL LOCATION
Wausau, Wisconsin

003978-00(030)GIS-SP001 MAR 20/2012



LEGEND

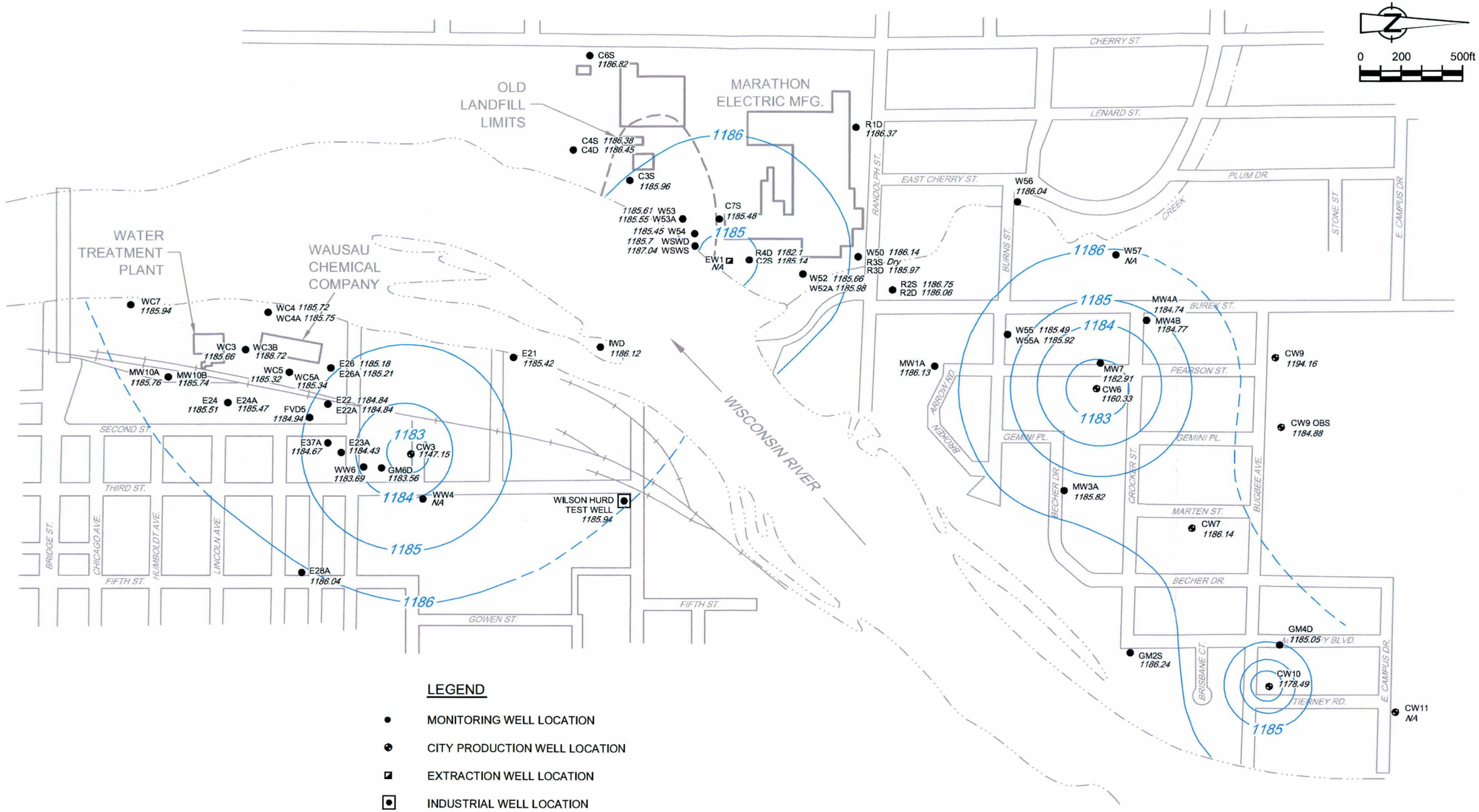
- MONITORING WELL LOCATION
- CITY PRODUCTION WELL LOCATION
- EXTRACTION WELL LOCATION
- INDUSTRIAL WELL LOCATION

SOURCE: RMT INC. FIGURE 1, 5/14/87.

figure 1.2

SITE PLAN
WAUSAU WATER SUPPLY NPL SITE
Wausau, Wisconsin

003978-00(030)GN-SP001 MAR 20/2012



LEGEND

- MONITORING WELL LOCATION
- CITY PRODUCTION WELL LOCATION
- EXTRACTION WELL LOCATION
- INDUSTRIAL WELL LOCATION
- 1185.65 GROUNDWATER ELEVATION (NGVD)
- 1185 GROUNDWATER CONTOUR (NGVD)
- 1186 GROUNDWATER CONTOUR (NGVD) ASSUMED

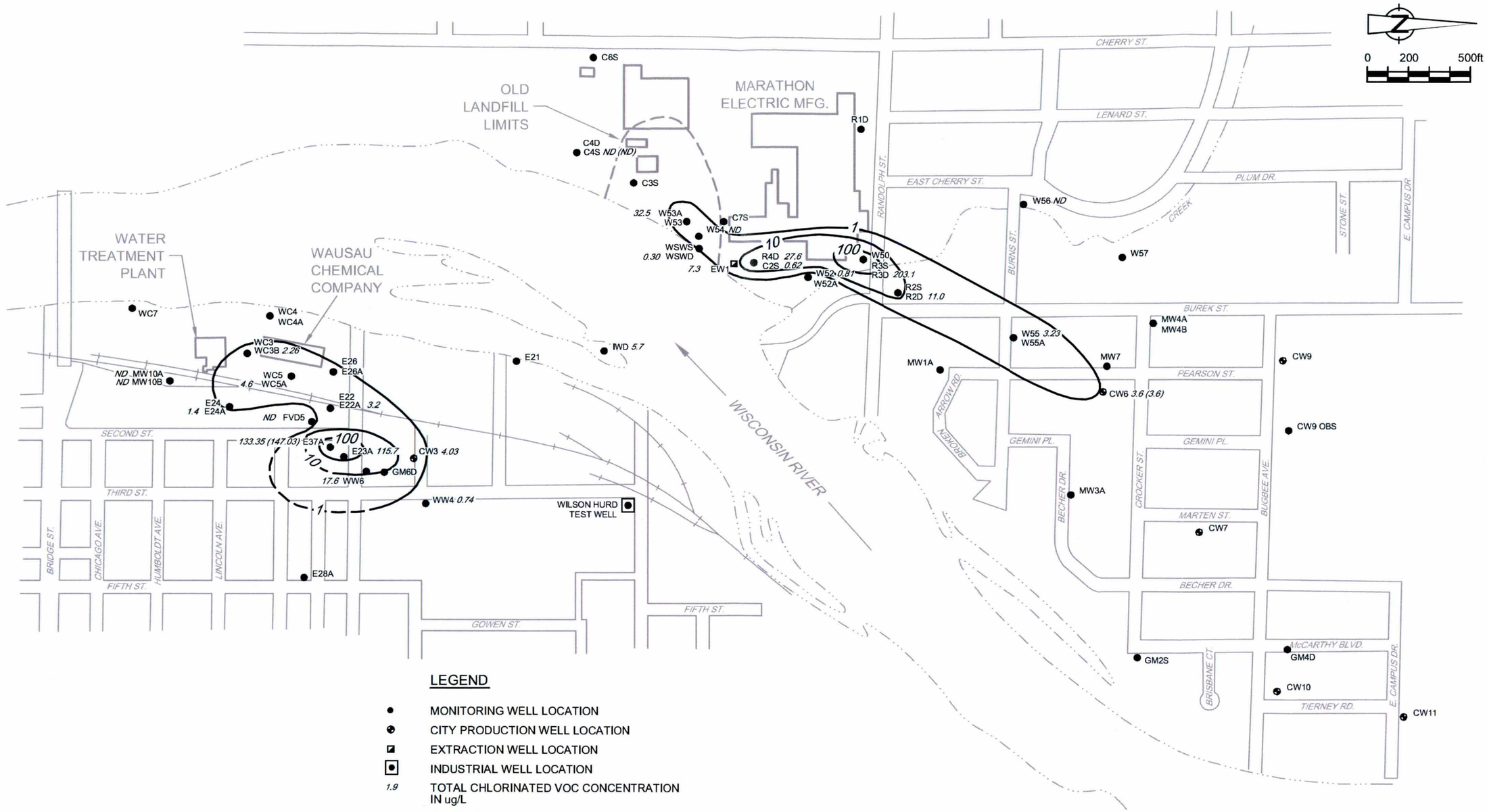
NOTE: EAST BANK WATER LEVELS MEASURED ON NOVEMBER 1, 2011.
WEST BANK WATER LEVELS MEASURED ON NOVEMBER 2, 2011.

SOURCE: RMT INC. FIGURE 1, 5/14/87.

003978-00(030)GN-WA001 JAN 9/2012

figure 2.1

2011 WATER TABLE CONTOURS
WAUSAU WATER SUPPLY NPL SITE
Wausau, Wisconsin



LEGEND

- MONITORING WELL LOCATION
- CITY PRODUCTION WELL LOCATION
- EXTRACTION WELL LOCATION
- INDUSTRIAL WELL LOCATION
- 1.9 TOTAL CHLORINATED VOC CONCENTRATION IN ug/L
- ND NOT DETECTED
- ( ) DUPLICATE SAMPLE
- 10 TOTAL CHLORINATED VOC CONTOUR

WHERE NO VALUE IS SHOWN, WELL WAS NOT SAMPLED

SOURCE: RMT INC. FIGURE 1, 5/14/87.

figure 4.1

TOTAL CHLORINATED VOCs IN GROUNDWATER (OCTOBER-NOVEMBER 2011)
WAUSAU WATER SUPPLY NPL SITE
Wausau, Wisconsin

003978-00(030)GN-WA002 JAN 9/2012

TABLE 2.1

GROUNDWATER ELEVATIONS - 2011
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

East Bank	*Reference Elevation*		*Water Level 11/1/2011*	*Water Table Elevation 11/1/2011*
CW3	1202.15		55.00	1147.15
E21	1197.51		12.09	1185.42
E22	1195.47		10.63	1184.84
E22A	1195.88		11.04	1184.84
E23A	1197.61		13.18	1184.43
E24	1210.01		24.50	1185.51
E24A	1211.07		25.60	1185.47
E26	1199.02		13.84	1185.18
E26A	1199.13		13.92	1185.21
E28A	1211.60		25.56	1186.04
E37A	1197.84		13.17	1184.67
FVD5	1198.89		13.95	1184.94
GM6D	1198.57		15.01	1183.56
W. HURD	1200.23		14.29	1185.94
IWD	1192.10	(1)	5.98	1186.12
MW10A	1210.67		24.91	1185.76
MW10B	1210.37		24.63	1185.74
WC3	1198.26		12.60	1185.66
WC3B	1198.04		9.32	1188.72
WC4	1196.74		11.02	1185.72
WC4A	1196.57		10.82	1185.75
WC5	1196.62		11.30	1185.32
WC5A	1196.66		11.32	1185.34
WC7	1196.77		10.83	1185.94
WW4	(3)	(3)	16.71	NA
WW6	1200.53		16.84	1183.69

TABLE 2.1

GROUNDWATER ELEVATIONS - 2011
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

	Reference Elevation		*Water Level*	*Water Table Elevation*
West Bank			11/2/2011	11/2/2011
EW1	NA		NA	NA
CW6	1220.33		60.00	1160.33
CW7	1224.14		38.00	1186.14
CW9	1226.16		32.00	1194.16
CW9 OBS	1224.24		39.36	1184.88
CW10	1218.49		40.00	1178.49
CW11	1216.51		NA	NA
C2S	1219.05		33.91	1185.14
C3S	1220.58		34.62	1185.96
C4S	1216.70		30.32	1186.38
C4D	1216.16		29.71	1186.45
C6S	1221.58		34.76	1186.82
C7S	1220.87		35.39	1185.48
GM2S	1211.78		25.54	1186.24
GM4D	1216.35		31.30	1185.05
MW1A	1215.69		29.56	1186.13
MW3A	1220.87	(2)	35.05	1185.82
MW4A	1215.48		30.74	1184.74
MW4B	1215.10		30.33	1184.77
MW7	1218.53		35.62	1182.91
R1D	1222.24		35.87	1186.37
R2S	1209.70		22.95	1186.75
R2D	1209.42		23.36	1186.06
R3S	1215.17		Dry	Dry
R3D	1215.42		29.45	1185.97
R4D	1218.90		36.80	1182.10
W50	1215.54		29.40	1186.14
W52	1219.16		33.50	1185.66
W52A	1218.95		32.97	1185.98
W53	1216.67		31.06	1185.61
W53A	1216.90		31.35	1185.55
W54	1216.19		30.74	1185.45
W55	1217.04		31.55	1185.49
W55A	1217.31		31.39	1185.92
W56	1200.01		13.97	1186.04
W57	(3)	(3)	16.57	NA
WSWS	1193.04		6.00	1187.04
WSWD	1193.02		7.32	1185.70

Notes:

Elevations relative to National Geodetic Vertical Datum.

(1) All reference elevations based on 2003 survey data except IWD, which was last surveyed in 1993.

(2) Well MW3A was converted to a flush mount in 2006 and the reference elevation was resurveyed.

(3) Well was converted to a flush mount in 2011 and the reference elevation was not yet resurveyed.

TABLE 2.2

SITE SPECIFIC VOC LIST
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Acetone

Benzene

Carbon tetrachloride

Chloroform

1,1-Dichloroethene

cis-1,2-Dichloroethene

Ethylbenzene

Methylene chloride

Tetrachloroethene

Toluene

1,1,2-Trichloroethane

Trichloroethene

Vinyl chloride

Xylenes

TABLE 2.3

GROUNDWATER SAMPLING SUMMARY - NOVEMBER 2011
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Well	*pH*	*Conductivity (us/cm)*	*Temperature (°C)*	*Water Clarity*	*Gallons Removed*	*Sample ID Number*	*QA/QC*
EAST BANK							
CW3	5.67	281	10.9	Clear	Grab	W-111101-NE-06	
FVD 5	6.55	206	12.9	Sl. black tint	4.5	W-111101-NE-10	
E37A	6.57	383	14.1	Cloudy, rusty	7.0	W-111101-NE-12	
E37A	--	--	--	--	--	W-111101-NE-13	Dup
E22A	6.40	458	13.0	Sl. cloudy, rusty	5.4	W-111101-NE-11	
E23A	6.62	349	12.6	Black tint, suspended particles	3.8	W-111101-NE-14	
WW6	6.75	229	11.0	Clear	12.0	W-111101-NE-15	
WW4	6.69	580	9.0	Clear	10.5	W-111101-NE-17	
						W-111101-NE-16	RB
WC5A	6.66	298	14.2	Cloudy, rusty	3.0	W-111101-NE-18	
WC3B	6.66	245	12.9	Turbid	6.0	W-111101-NE-19	
MW-10B	6.69	219	11.2	Clear	7.3	W-111101-NE-20	
MW-10A	6.79	176	11.4	Clear	27.0	W-111101-NE-21	
E24A	6.72	267	10.9	Cloudy, rusty	6.0	W-111101-NE-22	
IWD	7.01	141	12.4	Clear	4.0	W-111101-NE-23	

TABLE 2.3

GROUNDWATER SAMPLING SUMMARY - NOVEMBER 2011
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Well	*pH*	*Conductivity (us/cm)*	*Temperature (°C)*	*Water Clarity*	*Gallons Removed*	*Sample ID Number*	*QA/QC*
WEST BANK							
R3D	7.08	256	9.6	Clear	67.0	W-111102-NE-31	
						W-111102-NE-30	RB
C4S	6.23	1659	11.4	Clear	2.4	W-111031-01	
C4S	--	--	--	--	--	W-111031-02	Dup
R4D	6.30	398	10.8	Clear	3.5	W-111031-NE-03	
C2S	6.29	327	11.6	Clear	2.8	W-111031-NE-04	
						W-111031-NE-05	FB
W53A	6.83	604	12.3	Silty	3.0	W-111101-NE-07	MS/MSD
W54	6.81	166	12.3	Sl. Cloudy	2.8	W-111101-NE-08	
WSWD	6.94	165	14.0	Clear	3.1	W-111101-NE-09	
CW6	7.07	223	11.1	Clear	Grab	W-111102-NE-26	
CW6	--	--	--	--	--	W-111102-NE-27	Dup
W56	6.48	604	10.0	Clear	25.5	W-111102-NE-24	
W55	7.14	163	10.4	Clear	3.3	W-111102-NE-25	
MW-1A	9.61	156	10.4	Sl. Cloudy	4.5	W-111102-NE-28	MS/MSD
R2D	7.75	142	11.1	Clear	3.0	W-111102-NE-29	
W52	7.05	145	11.2	Sl Cloudy	3.5	W-111102-NE-32	

TABLE 3.1

MONITORING WELL INSPECTION - 2011
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Well Name	Total Depth from TOC/Stickup (ft.)	Well ID/Tag Visible?	Casing & Grout Condition	Well Cap Condition (inner/outer)	Lock Condition	Concrete Seal Condition	Ground Condition (subsidence?)	Flush Mount	Notes	Maintenance Completed
East Bank										
E21	132.9/2.3	Yes	Good	None/OK	OK	Good	Okay		No room for J-Plug	
E22	90.40/-0.6	Yes	Good	OK/OK	OK	Good	Okay	FM		Labeled w/ paint pen 11/1/2011
E22A	22.1/-0.3	Yes	Good	OK/OK	OK	Good	Okay	FM		Labeled w/ paint pen 11/1/2011
E23A	21.00/-0.5	Yes	Good	Good/Good	Good	Good	Okay	FM		Labeled w/ paint pen 11/1/2011
E24	87.7/1.7	Yes	Good	None/ Good	Good	Good	Okay			
E24A	37.4/2.3	Yes	Good	None/ Good	Good	Good	Okay			
E26	94.70/2.70	Yes	Good	see note/OK	OK	OK	Okay		Inner cap is not tight fitting, no room for j-plug	
E26A	26.00/2.70	Yes	Good	see note/OK	OK	OK	Okay		Inner cap is not tight fitting, no room for j-plug	
E28A	35.1/-0.3	Yes	Good/OK	Good/Good	Good	Good	Okay	FM	White evaporate on inner well	Labeled w/ paint pen 11/1/2011
E37A	25.4/-0.5	Yes	OK	OK/OK	Rusty	OK	Okay	FM	Lock looks newer, but is rusty	Labeled w/ paint pen 11/1/2011
FVD5	22.6/1.7	Yes	OK	None/OK	OK	OK	Okay		No room for J-Plug	
GM6D	109.4/-0.4	Yes	Good	OK/OK	Good	Good	Okay	FM		Labeled w/ paint pen 11/1/2011
W. HURD	102.1/1.4	Yes	Good	NA/Good	Good	Good	Okay		Lock is rusty	
IWD	NM/2.2	Yes	OK	None/Good	OK	Good	Okay		No inner cap, bladder pump	
MW10A	80.9/2.5	Yes	Good	None/ Good	Good	Good	Okay		No room for J-Plug	
MW10B	40.7/2.9	Yes	Good	None/Good	Good	Good	Okay		No room for J-Plug	
WC3	164.1/2.1	Yes	Good	Good/Good	Good	Good	Okay			
WC3B	22.2/-0.3	Yes	Good	Good/Good	See note	Good	Okay			No lock, added lock 11/1/2011
WC4	55.8/1.7	Yes	Good	None/OK	Good	Good	Okay		No room for J-Plug	
WC4A	20.7/1.6	Yes	Good	Good/OK	Good	Good	Okay			
WC5	55.8/1.4	Yes	Good	None/OK	OK	Good	Okay		No inner cap, bladder pump	
WC5A	16.1/1.5	Yes	Good	None/OK	OK	Good	Okay		No inner cap, bladder pump	
WC7	55.0/1.6	Yes	Good	None/Good	Good	Good	Okay		No room for J-Plug	
WW4	34.9/-0.3	Yes	OK	OK/OK	Good	OK	Okay	FM	Well converted to flush mount	Above-grade well converted to flush-mount
WW6	40.1/1.5	Yes	OK	None/OK	OK	Good	Okay		No inner cap, bladder pump	

MONITORING WELL INSPECTION - 2011
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Well Name	Total Depth from TOC/Stickup (ft.)	Well ID/Tag Visible?	Casing & Grout Condition	Well Cap Condition (inner/outer)	Lock Condition	Concrete Seal Condition	Ground Condition (subsidence?)	Flush Mount	Notes	Maintenance Completed
West Bank										
C2S	36.1/2.9	Yes	OK	BP/OK	Good	Good	Okay			
C3S	40.7/3.2	Yes	OK	OK/OK	OK	Good	Okay			
C4S	35.1/3.1	Yes	OK	OK/OK	Good	Good	Okay			
C4D	100/3.1	Yes	OK	OK/OK	Good	Good	Okay			
C6S	41.4/2.5	Yes	OK	None/OK	Good	Good	Okay		No room for J-plug	
C7S	40.2/2.7	Yes	OK	OK/OK	OK	Good	Okay			
GM2S	34.5/-0.5	Yes	OK	Good/OK	Good	Good	Okay	FM	No weephole	Labeled w/ paint pen 11/1/2011
GM4D	54.1/1.6	Yes	OK	None/OK	Good	Good	Okay		No room for J-plug	
MW1A	126.1/1.6	Yes	OK	BP - OK/OK	Good	Good	Okay			
MW3A	74.5/-0.3	Yes	OK	Good/OK	Good	Good	Okay	FM		Labeled w/ paint pen 11/1/2011
MW4A	100.1/-0.2	Yes	OK	OK/OK	See note	Good	Okay	FM	No room for lock on J-Plug	Labeled w/ paint pen 11/2/2011, had to cut off lock to get top on
MW4B	58.7/-0.4	Yes	OK	OK/OK	OK	Good	Okay	FM		Labeled w/ paint pen 11/2/2011
MW7	44.2/-0.4	Yes	OK	Good/OK	Good	Good	Okay	FM		Labeled w/ paint pen 11/1/2011
R1D	125.1/2.1	Yes	OK	None/OK	OK	Good	Okay			
R2S	30.7/1.4	Yes	OK	Loose/OK	Good	Good	Okay		Inner cap does not fit	
R2D	124.8/1.8	Yes	OK	BP - OK/OK	Good	Good	Okay			
R3S	26.8/2.6	Yes	OK	OK/OK	Good	Good	Okay			
R3D	139.2/2.6	Yes	OK	OK/OK	Good	Good	Okay			
R4D	124.6/2.6	Yes	OK	BP - OK/OK	Good	Good	Okay			
W50	85.4/2.5	Yes	OK	None/OK	Good	Good	Okay			
W52	116.15/2.5	Yes	OK	BP - OK/OK	OK	Good	Okay			
W52A	38.24/2.5	Yes	OK	OK/OK	OK	Good	Okay			
W53	124.7/-0.6	Yes	OK	BP - OK/OK	None	Good	Okay	FM		Labeled w/ paint pen 11/1/2011
W53A	36.2/-0.4	Yes	OK	BP-Good/OK	Good	Good	Okay	FM		Labeled w/ paint pen 11/1/2011
W54	60.00/-0.2	Yes	OK	Good/OK	Good	Good	Okay	FM		
W55	115.2/-0.9	Yes	OK	OK/OK	Good	Good	Okay	FM		
W55A	43.3/-0.7	Yes	OK	OK/OK	Good	Good	Okay	FM		
W56	66.9/1.4	Yes	OK	Good/Good	Good	Good	Okay	FM		
W57	74.8/-0.2	Yes	OK	Good/Good	Good	Good	Okay	FM	Well converted to flush mount	Labeled w/ paint pen 11/2/2011
WSWS	15.7/3.9	Yes	OK	Good/Good	Good	Good	Okay			
WSWD	140.9/2.8	Yes	OK	BP-Good/OK	Good	Good	Okay			

TABLE 3.2

EXTRACTION WELL EW1 PUMPING RATES 2011
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Date	*Elapsed Time (minutes)*	*Meter Reading*	*Total Flow (gallons)*	*Average Flow Rate (gpm)*
01/01/11		348,850,000	--	
01/26/11	31,605	348,850,000	0	0
02/24/11	42,305	363,876,000	15,026,000	355
03/16/11	28,360	373,968,000	10,092,000	356
04/28/11	40,320	373,968,000	0	0
05/26/11	40,416	393,985,000	20,017,000	495
06/22/11	38,004	414,272,000	20,287,000	534
07/19/11	38,880	425,506,000	17,558,000	452
08/03/11	22,284	436,681,000	11,175,000	501
08/29/11	37,423	456,975,000	20,294,000	542
09/30/11	46,238	484,873,000	27,898,000	603
10/10/11	14,355	492,783,000	7,910,000	551
11/15/11	51,712	522,705,000	29,922,000	579
12/20/11	50,318	550,353,000	27,648,000	549
01/06/12	24,705	563,211,000	12,858,000	520
	Total Gallons 2011	**214,361,000**	**Average Flow 2011**	**402**

Notes:

Pump failure discovered 1/4/2011. Estimate pump stoppage @ noon on 12/28/2010
Pump back on-line 1/26/2011. Pumping rate less than 400 gpm.
Pump removed 3/16/2011 to televise screen interval and for additional troubleshooting.
Pump reinstalled 4/28/2011 following double disc surge blocking to increase production.

TABLE 3.3

CITY SUPPLY WELL PUMPING SUMMARY - 2011
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

		Well #3	*Well #6*	*Well #7*	*Well #9*	*Well #10*	*Well #11*
January	Hours	438.5	302.9	246.4	162.8	113.4	164.2
	Gallons	46.003	30.241	30.744	9.824	21.024	34.003
	gpm	1748	1664	2080	1006	3090	3451
February	Hours	293.3	371.9	227.3	129.8	135.6	123
	Gallons	31.491	36.799	28.427	7.542	25.276	25.539
	gpm	1789	1649	2084	968	3107	3461
March	Hours	307.5	454.1	233.8	162.5	186.9	117.1
	Gallons	33.22	41.611	29.471	8.927	37.727	24.14
	gpm	1801	1527	2101	916	3364	3436
April	Hours	356.6	359.8	300	147.3	134.4	115.7
	Gallons	29.066	34.408	37.318	7.8	25.237	26.958
	gpm	1358	1594	2073	883	3130	3883
May	Hours	365.9	374.4	320.9	156.6	274.6	51.4
	Gallons	33.101	43.869	39.846	7.218	50.24	10.446
	gpm	1508	1953	2069	768	3049	3387
June	Hours	307.1	408.8	317.3	208.7	395	62.2
	Gallons	28.919	39.485	38.07	8.866	69.301	9.238
	gpm	1569	1610	2000	708	2924	2475
July	Hours	382.8	358	367.9	321.5	347.1	131.5
	Gallons	36.54	34.589	45.239	13.639	58.307	20.746
	gpm	1591	1610	2049	707	2800	2629
August	Hours	311.8	428.4	276.7	211.8	191.2	283.4
	Gallons	29.85	41.726	34.764	9.003	32.81	49.681
	gpm	1596	1623	2094	708	2860	2922
September	Hours	354.9	361.3	299.9	214.1	148.1	215.4
	Gallons	34.075	35.094	36.31	9.01	24.319	38.056
	gpm	1600	1619	2018	701	2737	2945
October	Hours	385.1	352.8	300.6	192.3	139.4	149.8
	Gallons	36.264	33.939	38.113	8.345	24.071	26.157
	gpm	1569	1603	2113	723	2878	2910
November	Hours	289.7	426.5	233.3	88.3	139.8	125.7
	Gallons	27.213	40.718	29.188	3.754	24.571	21.889
	gpm	1566	1591	2085	709	2929	2902
December	Hours	366.6	356.5	326.2	166.4	104.8	132.8
	Gallons	35.368	33.347	38.523	6.683	18.692	23.152
	gpm	1608	1559	1968	669	2973	2906
Average gpm:		1607	1631	2058	776	2969	3090

Note:

Hours indicate total hours pumped per month. Gallons indicates millions of gallons pumped per month.

TABLE 4.1

MONITORING WELL LABORATORY RESULTS - 2011
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Location	Date		Acetone	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Chloroform	Carbon tetrachloride	Methylene chloride	1,1-Dichloroethene	1,1,2-Trichloroethane	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl chloride	Total Chlorinated VOCs
		MCL	-	5	700	1000	10000	80	5	5	7	5	5	5	70	2	-
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
West Bank																	
C2S	10/31/2011		< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.62 J	< 1.0	< 1.0	0.62
C4S	10/31/2011		< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
C4S	10/31/2011	D	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
MW1A	11/2/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
R2D	11/2/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	11	< 1.0	< 1.0	11
R3D	11/2/2011		10 U	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	200	3.1 J	< 10	203.1
R4D	10/31/2011		< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	26	1.6	< 1.0	27.6
W52	11/2/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.81 J	< 1.0	< 1.0	0.81
W53A	11/1/2011		< 10	< 1.0	< 1.0	< 1.0	< 1.0	2	5.9	< 1.0	< 1.0	< 1.0	< 1.0	20	4.6	< 1.0	32.5
W54	11/1/2011		< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
W55	11/2/2011		< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3	0.23 J	< 1.0	3.23
W56	11/2/2011		< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
WSWD	11/1/2011		< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.30 J	< 1.0	< 1.0	0.30
EW1	12/20/2011		< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	7.3	< 1.0	< 1.0	7.3
CW6	11/2/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.6	< 1.0	< 1.0	3.6
CW6	11/2/2011	D	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.6	< 1.0	< 1.0	3.6

TABLE 4.1

MONITORING WELL LABORATORY RESULTS - 2011
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Location	Date		Acetone	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Chloroform	Carbon tetrachloride	Methylene chloride	1,1-Dichloroethene	1,1,2-Trichloroethane	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl chloride	Total Chlorinated VOCs
		MCL	-	5	700	1000	10000	80	5	5	7	5	5	5	70	2	-
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
East Bank																	
CW3	11/1/2011		< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.1	0.73 J	1.2	< 1.0	4.03
E22A	11/1/2011		< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.2	< 1.0	< 1.0	< 1.0	3.2
E23A	11/1/2011		33 U	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	63	7.7	45	< 3.3	115.7
E24A	11/1/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.4	< 1.0	< 1.0	< 1.0	1.4
E37A	11/1/2011		< 25	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	0.75 J	< 2.5	49	9.5	67	7.1	133.35
E37A	11/1/2011	D	< 33	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	0.83 J	< 3.3	47	11	79	9.2	147.03
FVD5	11/1/2011		< 100	47	170	12	610	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
IWD	11/1/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4	1.7	< 1.0	5.7
MW10A	11/1/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
MW10B	11/1/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
WC3B	11/1/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.78 J	0.26 J	0.67 J	0.55 J	2.26
WC5A	11/1/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3	1.6	< 1.0	< 1.0	4.6
WW4	11/1/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	0.74 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.74
WW6	11/1/2011		10 U	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	5.9	2	6.8	2.9	17.6

Notes:

Units = ug/L
MCL - Maximum Contaminant Levels for drinking water published by the United States Environmental Protection Agency
VOCs - Volatile organic compounds
D - Duplicate Sample
J - Estimated value, below the reporting limit
ND - All VOCs were less than the reporting limit.
Shaded values exceed the MCL.

TABLE 4.2

EW1 LABORATORY RESULTS - 2011
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Location	Date	Acetone	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Carbon tetrachloride	Chloroform	1,1-Dichloroethene	Methylene chloride	1,1,2-Trichloroethane	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl chloride
	MCL	--	5	700	1,000	10,000	5	80 (1)	7	5	5	5	5	70	2
Influent	05/12/11	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	8.6	0.52 J	< 1
Influent	08/03/11	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	8.4	0.52 J	< 1
Influent	12/20/11	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7.3	< 1	< 1
Effluent	05/12/11	< 10	< 1	< 1	< 1	< 1	< 1	0.20 J	< 1	< 1	< 1	< 1	4.3	0.32 J	< 1
Effluent	08/03/11	< 10	< 1	< 1	< 1	< 1	< 1	0.18 J	< 1	< 1	< 1	< 1	4.2	< 1	< 1
Effluent	12/20/11	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	3.3	< 1	< 1
Surface Water Discharge Limit								*29,000*					*41,000*	*none*	

Notes:

Units = ug/L
MCL - USEPA Maximum Contaminant Level for drinking water.
U - Estimated detection limit
J - Estimated value, below the reporting limit and above the detection limit
(1) MCL for total trihalomethanes
Influent and effluent samples not collected in 1st quarter 2011

APPENDIX A

DATA QUALITY VALIDATION MEMORANDA

CONESTOGA-ROVERS & ASSOCIATES

1801 Old Highway 8 NW, Suite #114
St. Paul, Minnesota 55112
Telephone: (651) 639-0913 Fax: (651) 639-0923
www.CRAworld.com

MEMORANDUM

TO: Chuck Ahrens, CRA

REF. NO.: 003978

FROM: Ruth Mickle/sb/12

DATE: November 23, 2011

CC: Analytical Data File

RE: **Data Quality Assessment**
October 31-November 2, 2011, Annual Sampling Event
Wausau Superfund Site - Wausau, Wisconsin

The following details a data quality assessment for water samples collected October 31-November 2, 2011, at the Wausau Superfund Site in Wausau, Wisconsin. The samples identified in Table 1 were analyzed for Site list volatile organic compounds (VOCs)[1]. The analyses were performed by TestAmerica Laboratories, Inc. (TestAmerica) in North Canton, Ohio. The quality assurance criteria were established in the Quality Assurance Project Plan (QAPP)[2].

HOLDING TIME PERIODS

The holding time period for VOC analyses is 14 days from sample collection to analysis.

On the basis of sample collection dates on the chain-of-custody forms and the analytical report provided by TestAmerica, the analyses were completed within the specified holding time period.

METHOD BLANK SAMPLES

Contamination of the samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analyses of method blank samples. With the exception of acetone, the method blank samples were free of target analytes. One method blank (batch 22885) yielded a low level acetone detection. The associated acetone detections presented in Table 2 should be qualified as nondetect (U).

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1 VOC Method 8260B was derived from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW 846, Third Edition, November 1986 and updates.

2 Application of relevant quality assurance criteria was consistent with "National Functional Guidelines for Organic Data Review", October 1999.

SURROGATE COMPOUND PERCENT RECOVERIES (SURROGATE RECOVERIES)

Individual sample performance for the analyses was monitored by surrogate recoveries. The surrogate recoveries were within acceptance criteria, indicating that individual sample performance was adequate.

LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE (LCS/LCSD)

Overall performance for the analyses was monitored by means of a LCS/LCSD. The percent recoveries were within acceptance criteria.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) RESULTS

To assess the long-term accuracy and precision of the analytical method on various matrices, matrix spike percent recoveries and relative percent difference (RPD) of the spike recoveries were determined for the analyses. The percent recovery and RPD data for project samples were within acceptance criteria.

FIELD QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) SAMPLES

The field QA/QC associated with the sampling event consisted of one trip blank sample, two rinsate blanks, one field blank and three field duplicate sets.

To evaluate the possibility of contamination arising from sample transport, the environment, and/or shipping, a trip blank sample was submitted to the laboratory for VOC analysis. The trip blank yielded an acetone detection. Since the associated acetone detections were previously qualified based on method blank results, no qualification was required based on trip blank results.

As a check for cleanliness of sampling equipment, two rinsate blanks were collected as authentic samples for labeling and submission to the lab. The rinsate samples are identified in Table 1. The rinsate blank samples yielded acetone detections. However, since the associated results were previously qualified based on method blank results, no qualification was required based on rinsate blank results.

As a check for cleanliness of overall sampling conditions, one field blank was collected as an authentic sample for labeling and submission to the lab. The field blank sample is identified in Table 1. The field blank sample yielded an acetone detection. However, since the associated results were previously qualified based on method blank results, no qualification was required based on field blank results.

Overall precision for the sampling event was monitored using field duplicate samples identified in Table 1. The RPD values for positive parameter results were found to be acceptable (RPD values less than or equal to 25 where both results are 5+ times the reporting limit), indicating an adequate level of precision was achieved.

OVERALL ASSESSMENT

The data were found to exhibit acceptable levels of accuracy and precision pertaining to the above criteria, and may be used with the qualifications noted above.

TABLE 1

SAMPLE IDENTIFICATION NUMBERS
WAUSAU SUPERFUND SITE
OCTOBER 31-NOVEMBER 2, 2011 SAMPLING EVENT

Sample ID	*Sample Location*
W-111031-NE-01	C4S
W-111031-NE-02	C4S dup
W-111031-NE-03	R4D
W-111031-NE-04	C2S
W-111031-NE-05	C2S field blk
W-111101-NE-06	CW3
W-111101-NE-07	W53A
W-111101-NE-08	W54
W-111101-NE-09	WSWD
W-111101-NE-10	FVD5
W-111101-NE-11	E22A
W-111101-NE-12	E37A
W-111101-NE-13	E37A dup
W-111101-NE-14	E23A
W-111101-NE-15	WW6
W-111101-NE-16	WW4 rinsate blk
W-111101-NE-17	WW4
W-111101-NE-18	WC5A
W-111101-NE-19	WC3B
W-111101-NE-20	MW10B
W-111101-NE-21	MW10A
W-111101-NE-22	E24A
W-111101-NE-23	IWD
W-111102-NE-24	W56
W-111102-NE-25	W55
W-111102-NE-26	CW6
W-111102-NE-27	CW6 dup
W-111102-NE-28	MW1A
W-111102-NE-29	R2D
W-111102-NE-30	R3D rinsate blk
W-111102-NE-31	R3D
W-111102-NE-32	W52

TABLE 2

SAMPLE RESULTS QUALIFIED BASED ON METHOD BLANK DATA
WAUSAU SUPERFUND SITE
OCTOBER 31-NOVEMBER 2, 2011 SAMPLING EVENT

Analysis	*Batch*	*Analyte*	*Blank Concentration (ug/l)*	*Associated Samples*	*Qualifier*[1]
VOC	22885	Acetone	1.76	W-111101-NE-14	33U
				W-111101-NE-15	10U
				W-111101-NE-17	10U
				W-111101-NE-18	10U
				W-111101-NE-19	10U
				W-111101-NE-20	10U
				W-111101-NE-21	10U
				W-111101-NE-22	10U
				W-111101-NE-23	10U
				W-111102-NE-26	10U
				W-111102-NE-28	10U
				W-111102-NE-29	10U
				W-111102-NE-31	10U
				W-111102-NE-32	10U

Notes:

[1] Sample results should be qualified as:

U - Not present at or above the associated value.

APPENDIX B

WAUSAU CHEMICAL PAVEMENT INSPECTION REPORT

APPENDIX B

PAVEMENT BARRIER INSPECTION LOG
WAUSAU CHEMCIAL CORP.

Inspection Date	*Inspector*	*Condition of Cap*	*Recommendations*	*Have Recommendations From Previous Inspection Been Implemented?*
8/29/2011	Rob Flashinski	Pavement was completely replaced in 2009. Three cracks starting to form, but have not penatrated.	No action required.	Yes.

APPENDIX C

MONITORING WELL IWM MANN KENDALL RESULT

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

Notice: This form is the DNR supplied spreadsheet referenced in Appendices A of Comm 46 and NR 746, Wis. Adm. Code. It is provided to consultants as an optional tool for groundwater contaminant trend analysis to support site closure requests under s. Comm 46.07, Comm 46.08, NR 746.07, NR 746.08, Wis. Adm. Code. Use this form or a manual method when seeking case closure under those rules. Earlier versions of this form should not be used.

Instructions: Do not change formulas or other information in cells with a blue background, only cells with a yellow background are used for data entry. To use the spreadsheet, provide at least four rounds and not more than ten rounds of data that is not seasonally affected. Use consistent units. The spreadsheet contains several error checks, and a data entry error may cause "DATA ERR" or "DATE ERR" to be displayed. Dates that are not consecutive will show an error message and will not display the test results. The spreadsheet tests the data for both increasing and decreasing trends at both 80 percent and 90 percent confidence levels. If a declining trend is present at 80 percent but not at 90 percent, a site is still eligible for closure under Comm 46 and NR 746 provided that other conditions in those rules are met. If an increasing or decreasing trend is not present, an additional coefficient of variation test is used to test for stability, as proposed by Wiedemeier et al, 1999. For additional information, refer to the Interim Guidance on Natural Attenuation for Petroleum Releases, dated October 1999. Refer to the guidance for recommendations on data entry for non-detect values.

Site Name : Wausau NPL			BRRTS No. =			Well Number = IWD	
	Compound ->	TCE					
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	10/25/05	6.60					
2	10/11/06	13.00					
3	10/8/07	11.00					
4	10/14/08	4.40					
5	10/27/09	7.30					
6	10/20/10	4.67					
7	11/1/11	5.70					
8							
9							
10							
	Mann Kendall Statistic (S) =	-7.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	7	0	0	0	0	0
	Average =	7.52	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	3.271	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.435	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected			n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		**DECREASING**	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		No Trend	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		NA	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4
	Data Entry By =		Date =		Checked By =		