

**SITE INVESTIGATION WORK PLAN
WDNR BRRTS #02-36-292777**

**City of Two Rivers Property
1400 Washington Street
Two Rivers, WI 54241**

March 14, 2005



Robert E. Lee & Associates, Inc.
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March 14, 2005

Mr. Keld Lauridsen
WISCONSIN DEPARTMENT OF NATURAL RESOURCES
P.O. Box 10448
Green Bay, WI 54307-0448

RE: CITY OF TWO RIVERS PROPERTY
1400 Washington Street
Two Rivers, WI 54241
BRRTS # 02-36-292777

Dear Mr. Lauridsen:

Please find enclosed one copy of the "Site Investigation Work Plan" for the above-named site. The property was acquired by the WDOT in 1981 to widen the STH 42 right-of-way. Contamination was discovered in the right-of-way during an investigation performed on a neighboring property. Subsequently, on February 18, 2002, the Wisconsin Department of Natural Resources notified the City of their responsibility to investigate and clean up the contamination. Research indicates that the property was occupied by a gas station under various owners.

The work plan has been prepared in accordance with the "Guidance for Conducting Environmental Response Actions, Wisconsin Department of Natural Resources (WDNR), March, 1992." If you have any questions or comments regarding this matter, please contact this office.

Sincerely,

ROBERT E. LEE & ASSOCIATES, INC.

Karl A. Schuldes
Environmental Scientist II

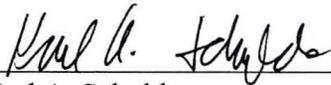
James P. Caine
Manager, Environmental Compliance

KAS/JPC/njm

ENC.

SUBMITTAL CERTIFICATION

"I, Karl A. Schuldes, hereby certify that I am a scientist as that term is defined in s. NR 712.03(3), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

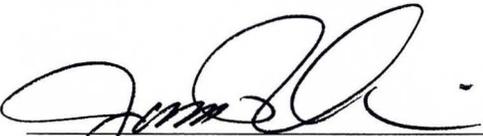


Karl A. Schuldes
Environmental Scientist II

3-14-05

Date

"I, James P. Caine, hereby certify that I am a scientist as that term is defined in s. NR 712.03(3), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."



James P. Caine
Manager, Environmental Compliance

3-14-05

Date

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INTRODUCTION

Robert E. Lee & Associates, Inc. has been retained by the City of Two Rivers to prepare this work plan. The plan addresses the suspected petroleum contamination in the right-of-way of the 1400 block of Washington Street (STH 42), Two Rivers, Wisconsin (Figure 1). The Wisconsin Department of Transportation (WDOT) now owns the site. Robert E. Lee & Associates has prepared this Site Investigation Work Plan in accordance with the "Guidance for Conducting Environmental Response Actions, WDNR, March 1992."

Site Location

Right-of-Way, Washington Street
1400 Washington Street
Two Rivers, WI 54241 (Figure 1, Appendix A)

Legal Location

Northwest ¼ of the Southeast ¼ of Section 1, Township 19North, Range 24 East, Town of Two Rivers, Manitowoc County, Wisconsin.

Responsible Party

City of Two Rivers
1717 East Park Street
Two Rivers, Wisconsin 54241
Attn: Mr. Scott Thoresen, Director of Public Works
Telephone: (920) 793-5539

Consultant

Robert E. Lee & Associates, Inc.
4664 Golden Pond Park Court
Oneida, WI 54155
Attn: James P. Caine / Karl A. Schuldes
Telephone: (920) 662-9641 / 800-986-6338

SCOPE OF WORK AND OBJECTIVES

The site investigation at 1400 Washington Street will include:

- the construction of at least eight soil borings;
- the collection of one soil sample and one groundwater sample for laboratory analysis from each boring;



- soil analysis for gasoline range organics (GRO), petroleum volatile organic compounds (PVOC), and total lead;
- groundwater analysis for volatile organic compounds (VOC), and dissolved lead.

BACKGROUND INFORMATION

A site investigation was performed at Brown's of Two Rivers, 1400 Washington Street, for the owner. The investigation (BRRTS #03-36-223946, now closed) was initiated following the discovery of contamination during a Phase II Site Investigation performed by GHD, Inc. There had been a waste oil tank at the site from before 1950 until 1987. During the investigation, high levels of VOC contamination were discovered in a boring/well in the Washington Street right-of-way (BA-MW11) on the eastern edge of the property. It was the conclusion of GHD that the source of the contamination was off-site to the east. Figure 2 shows the location of BA-MW11. Figure 3 is the isoconcentration map for trimethylbenzenes produced by GHD. The map indicates that VOC concentrations decrease in the westward direction. The groundwater map produced by GHD (Figure 4) is consistent with this distribution if the source is east of Brown's. Tables 1 and 2 in Appendix B, which are reproductions of the tables from GHD's site investigation report, summarize the laboratory results for BA-MW11.

A street plan that appears to be from 1952 (Figure 5) shows two pumps in the roadway in front of a garage approximately 40 feet north of BA-MW11. The pumps may be the source of contamination, either from leaking tanks below the pumps, or from leaking pumps. No information regarding the pumps has been found.

There is a UST site directly across Washington Street from Brown's. The site, the Former Charlie's Citgo (03-36-536567), 1405 Washington Street, identified gasoline and diesel fuel. There was a clean boring between Charlie's Citgo and 1400 Washington.

Based on the data presented by GHD to the WDNR in the "Site Investigation Report," dated February 28, 2000, the WDNR held the City of Two Rivers responsible for the investigation and cleanup. The Department informed the City of its responsibilities in a letter dated, February 18, 2002.

GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

The information in this section is taken from the aforementioned site investigation report produced by GHD for Brown's of Two Rivers.

Well constructor's reports show depth to bedrock at 85 to 100 feet within ¼ mile of the site. Copies of the well constructor's reports from the GHD report are found in Appendix C. The "Bedrock Geologic Map of Wisconsin" shows the bedrock to be Silurian-age Niagara dolomite.

The glacial geology consists of Glaciolacustrine silts, sands, and clay till with terminal end moraines. The soil boring data collected by GHD shows the area to be approximately four feet of sandy silt overlying fine sand to the bottoms of the borings.

The site is approximately 200 feet from the West Twin River, which flows into Lake Michigan. The site is approximately 1,200 feet from Lake Michigan. According to the groundwater contour map produced by GHD, the groundwater flows southwest toward the river (Figure 4). Depth to groundwater varied from 13 to 15 feet below grade. Drinking water in Two Rivers is pumped from Lake Michigan.

PLAN OF INVESTIGATION

Because Washington Street is being upgraded with new utilities and new pavement, we are attempting to complete the investigation as quickly as possible. It is the desire of the City of Two Rivers that we complete the borings before they begin the utility work in the investigation area. Therefore, we will collect water a sample from each soil boring, in addition to the soil sample.

Although it has not been determined what kind of tanks were at the site, the contamination in the boring/well in the right-of-way was predominantly VOCs. It appears that any PAH contamination is from the Brown's of Two Rivers site. Therefore, analysis will be performed only for VOC/PVOCs.



During boring construction, samples will be collected at two-foot intervals for screening with a portable VOC detector. Borings will be constructed to a depth of two feet below the first sample that does not identify contamination, or to four feet below the apparent water table. Samples will be collected and submitted to a certified laboratory for analysis to identify the degree of contamination. If contamination is identified at any of the initial borings, additional borings will be installed on a grid with an approximate 25-foot spacing to determining the extent of the contamination.

The investigation will be conducted in accordance with Robert E. Lee & Associates standard health and safety procedures. The investigation will commence when the owner has signed contracts with both a drilling service and a state certified laboratory. Drilling and laboratory services will be selected from a minimum of three bids to comply with COMM 47, Wisconsin Administrative Code.

BORING/WELL CONSTRUCTION PROCEDURES

Boreholes will be constructed in accordance with NR 141 and all other appropriate Wisconsin Administrative Codes. Soil borings are to be installed for the purposes of collecting stratigraphic samples, analytical samples, screening samples, and geotechnical samples; the borings will be constructed using a rotary drill or direct-push rig with solid or hollow stem augers in accordance with "Boreholes in Unconsolidated Geologic Formation and Boreholes in Bedrock Geologic Formations", NR 141.19, Wisconsin Administrative Code. To avoid the possibility of cross-contamination, the environmental drilling contractor will provide a hot water, high-pressure steam cleaner to decontaminate the equipment between borings. The sampling equipment will be cleaned between each use. Monitoring wells will be constructed in accordance with NR 141, Wisconsin Administrative Code.

INVESTIGATIVE WASTES

Petroleum contaminated soils generated from the construction of soil borings will be contained in Department of Transportation (DOT) 17E/H 55-gallon drums. The drums will be labeled to identify the contents and date generated.



The contaminated soil will be removed from the site after the WDNR approves an "Application to Treat or Dispose of Petroleum Contaminated Soil." The soil will be transported by a licensed solid waste hauler to a WDNR-approved treatment or disposal facility.

As necessary, groundwater from the development of monitoring wells will be contained in DOT 17E/H 55-gallon drums. If contaminated, the water will be disposed of at an approved facility.

SOIL SAMPLE COLLECTION PROCEDURES

Soil samples will be collected at two-foot intervals using a split spoon or direct-push sampling device in accordance with ASTM D1586.

During construction of the initial soil borings, the on-site monitor will be responsible for collecting soil samples for analysis with a portable VOC detector, either a photoionization detector (PID) or a flame ionization detector (FID). Each soil sample will be collected from the split spoon sampler and transferred directly into a clean glass sample jar with a Teflon-lined lid. Each sample jar will be filled approximately two-thirds full, and prior to sealing the lid on the jar, aluminum foil will be placed over the open end of the jar to facilitate field headspace analysis. Once sealed, the sample will be allowed to reach ambient temperature (60-70°F). After sample equilibration, the sample will be agitated for at least 30 seconds to break soil clods and increase the surface area of the soil particles exposed to air, allowing the soil to release vapors. The sample headspace will be analyzed by piercing the foil soil of the jar with the instrument probe and observing the PID/FID meter for the highest reading. This value will be recorded as the field PID/FID reading of the sample.

Samples collected for laboratory analysis will be determined from the field screening results. If the groundwater is within ten feet of the surface, one sample will be required for laboratory analysis. Samples will be collected at the depth of the highest field detect or, lacking instrument readings, at the depth of the apparent water table. If the depth to groundwater is greater than ten feet, two samples will be required. If two samples are required, a sample will be collected at the end of each boring and at the depth of highest field reading.

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Engineering, Surveying, Environmental Services

Once collected, laboratory samples will be field preserved in accordance with the "Site Assessments for USTs Technical Guidance, WDNR 9-92" and other applicable WDNR guidances. Upon preservation, the sample jars will be placed in a cooler containing ice and transported to the Robert E. Lee & Associates office, where they will be prepared for shipment. To comply with COMM 47, Wisconsin Administrative Code, the samples will be analyzed by a laboratory other than the Robert E. Lee & Associates laboratory. A Chain of Custody record will be prepared, identifying the project name and number, date and time of sample collection, sample description, number of containers, analytical requirements, and sampler name. Upon completion, the Chain of Custody record will be enclosed in a zip-lock plastic bag and placed into the cooler with the samples. A courier service will pick up the samples within 24 hours of collection and transport them to a state certified laboratory.

At the laboratory performing the analysis, the samples will be logged in and placed into a cooler for storage. The check-in process for the samples will include the completion of the Chain of Custody record, which includes assigning a unique sample identification number, sample status, name of individuals who had physical control of the samples, and when the samples were transferred from one individual to another.

GROUNDWATER SAMPLE COLLECTION PROCEDURES

The groundwater will be sampled and analyzed in accordance with the April 1992 WDNR Leaking Underground Storage Tank (LUST) Analytical Guidance, using the procedures detailed below.

As with soil samples, it is necessary to have groundwater samples analyzed at a laboratory other than the Robert E. Lee & Associates laboratory. Therefore, within 24 hours of sample collection, a courier will transport the samples from the Robert E. Lee & Associates office to a state certified laboratory. If necessary, the samples will be re-iced and/or repacked prior to transportation. Additionally, a Chain of Custody record will be prepared and enclosed in a zip-lock bag and placed in the cooler with the samples.



Groundwater samples collected for PVOC or VOC analysis will be dispensed into 40 mL borosilicate glass vials fitted with Teflon-lined caps. Sufficient sample vials will be filled from each sample location to ensure that there is adequate sample volume for duplicate analysis. Each vial will contain approximately 0.50 mL of a 50 percent hydrochloric acid solution as a preservative. The groundwater sample will be dispensed into each sample vial through a Teflon flow control valve to minimize sample agitation. Each vial will be filled to form a positive meniscus to eliminate air in the sample and each vial will be inverted to inspect for the presence of air bubbles to ensure sample integrity. The samples will then be placed into a cooler containing ice and transported to the Robert E. Lee & Associates office, where they will be prepared for shipment.

Groundwater samples collected for dissolved lead analysis are field filtered to remove particulate greater than 0.45 μm in size. After field filtration, the samples will be placed into a 250 mL virgin polyethylene sample bottle. Each bottle will contain 1 mL of concentrated ultra-pure nitric acid solution to prevent the precipitation of dissolved metals. The samples will then be placed into a cooler containing ice and transported to the Robert E. Lee & Associates office, where they will be prepared for shipment.

LABORATORY ANALYSIS PROCEDURES

Soil and groundwater samples will be analyzed at a Wisconsin state certified laboratory for GRO, DRO, VOC, PVOC, PAH, and lead. The methods of laboratory analysis for the soil and groundwater sample parameters, which are in conformance with the WDNR LUST Analytical Guidance, will be as follows:

Soil

- GRO analysis will be in conformance with WDNR Publication SW-140: Method for Determining Gasoline Range Organics;
- PVOC analysis will be in conformance with the EPA Test Methods for Evaluating Solid Waste, SW-846: Method 8020–Volatile Organic Compounds (aromatic) by Gas Chromatograph;



- Total lead analysis will be in conformance with the EPA Test Methods for Evaluating Solid Waste, SW-846: Method 7420–Flame Atomic Absorption Spectroscopy or Method 6010–Determination of Trace Metals by Inductively Coupled Plasma Spectrophotometer;

Groundwater

- VOC analysis will be in conformance with the EPA Test Methods for Evaluating Solid Waste, SW-846: Method 8021–Volatile Organic Compounds by Gas Chromatograph, or Method 8260–Volatile Organic Compounds by Gas Chromatograph with Mass Spectrophotometer confirmation;
- Dissolved lead analysis will be in conformance with the EPA Test Methods for Evaluating Solid Waste, SW-846: Method 7421–Graphite Furnace Atomic Absorption Spectroscopy or Method 6010–Determination of Trace Metals by Inductively Coupled Plasma Spectrophotometer;

QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance/quality control programs will be utilized throughout the investigation. The drilling procedures will be developed to minimize the possibility for cross-contamination between borings and wells or for introducing contamination into a boring or well. Drilling and sampling equipment will be decontaminated before the work begins and between borings using a high-pressure steam cleaner. Sampling equipment will be cleaned between uses in the same boring.

Once collected, the soil and groundwater samples will be cooled and transported to the Robert E. Lee & Associates' office where they will be prepared for shipment. As necessary, the samples will be re-iced and/or repacked to ensure sample integrity. Within 24 hours of sample collection, a courier will transport the samples to the appropriate state certified laboratory for analysis. At the laboratory performing the analysis, the samples will be logged in and placed into a cooler for storage. The check-in process for the samples will include the completion of a Chain of Custody record that includes assigning a unique sample identification number, sample



status, name of individuals who had physical control of the samples, and when the samples were transferred from one individual to another.

The laboratory performing the analysis will also be required to maintain quality control programs in accordance with NR 149.14, Wisconsin Administrative Code. The quality control program will include, but is not limited to, the analysis of trip blanks and matrix spikes. When quality control concerns are identified, the samples in question must be re-analyzed or qualified (flagged). The analysis of the trip blank is performed to determine the validity of the day's shipment. If the trip blank is contaminated, a question can be raised as to whether contaminants are truly present in the samples, if the samples were contaminated via reagent grade water used at the laboratory, or if the samples were contaminated by an outside source encountered during shipment or handling. A matrix spike is used to determine the recovery of a known amount of analyte spiked into the sample. The matrix spike recovery indicates the accuracy of the method to recover known concentrations of the target analyte(s).

As part of the quality control measures, laboratories are also required to prepare a standard curve and to perform calibration "check standards" to ensure that the standard curve is valid prior to and during the analysis of samples. The standard curve is a plot of known concentrations of analytes versus the analytical equipment's response to those analytes. The standard curve is calculated by the linear regression of the known analyte versus the instrument response. If the linear regression or calibration factor is not acceptable, an instrumentation or analytical problem likely occurred and the standard curve is not valid for that analyte. A check standard is analyzed prior to the analysis of a batch of samples and typically every 10th or 20th sample thereafter to verify that the standard curve is valid. The validity of the analytical system is dependent upon the percent recovery of the check standard to the standard curve. The recovery of the check standard for each analyte must be within method limits. In most cases, these method limits are plus or minus 10 to 15 percent. If the percent recovery is not within control limits, an instrument failure may have occurred and all samples within that run, back to the last acceptable calibration check, must be re-analyzed or qualified (flagged).

REPORT

Upon completion of the soil and groundwater analysis, the data will be evaluated and conclusions made as to the degree and extent of the contamination. Robert E. Lee & Associates will utilize the procedures described in this work plan for the complete investigation unless DCOMM and/or the WDNR establish new requirements. Because of bidding requirements and the need to minimize cost, it may be necessary to contract for additional mobilizations to the site.

An evaluation of potential remedial actions will be performed in accordance with the on-site conditions and standard actions permitted by the WDNR. These alternatives will be studied, and a cost for each alternative will be provided. A recommended action will be described, and a course of action will be detailed in the remedial action plan.

If, at the end of the site investigation, site conditions warrant closure, a site investigation and closure report will be submitted. The submittal will include a Form 4400-202 with the associated documentation and, if necessary, all GIS registry documentation.

CONCLUSION

Apparent gasoline contamination was discovered during a site investigation on the property adjacent to the roadway at 1400 Washington Street. That site investigation report suggested that the source of contamination was from at least one site to the east. The WDNR notified the responsible party of its responsibility to investigate. A site investigation at 1405 Washington Street determined that it was not the source. The investigation, which will take place in the roadway near 1400 Washington Street, will include the construction of at least eight soil borings for both soil and groundwater sampling. Based upon the results obtained from the investigation, a remedial plan will be developed selecting the most practical and cost-effective remedial option for this site.



EXCEPTION

This report has been developed from data obtained at a specific time and place. The scope of this report was limited to the specific project and location described herein. Our description of the project represented our understanding of the significant aspects of the project. Our assessment was performed using the degree of care and skill ordinarily exercised by professional consultants practicing in this or similar localities. No warranty, expressed or implied, has been made.

The findings of this report are valid as of the date of the assessment. However, changes in the conditions of a property can occur with the passage of time, whether due to natural processes or the work of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation, from the broadening of knowledge, or from other reasons. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control.

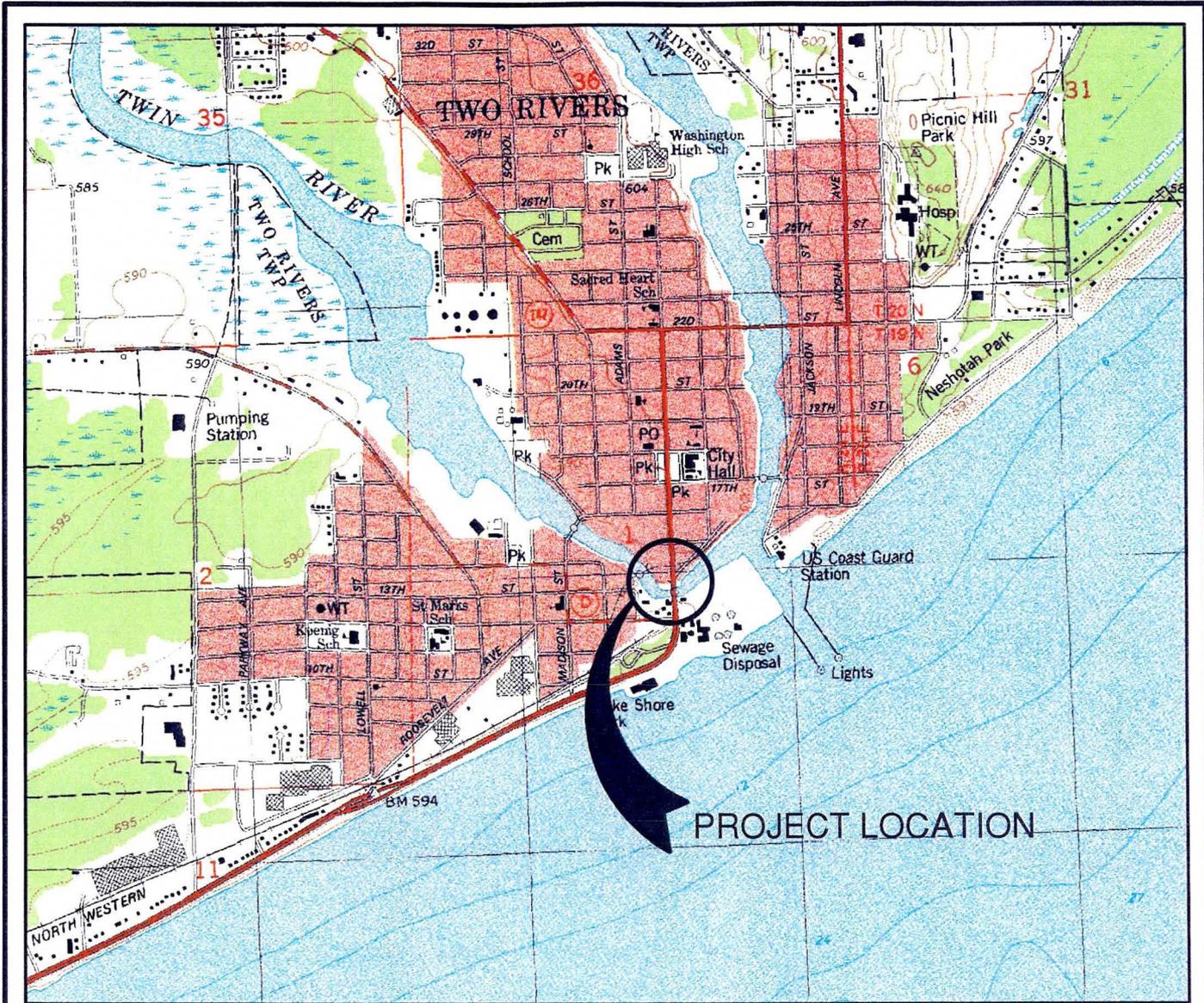


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A

APPENDIX A

MAPS



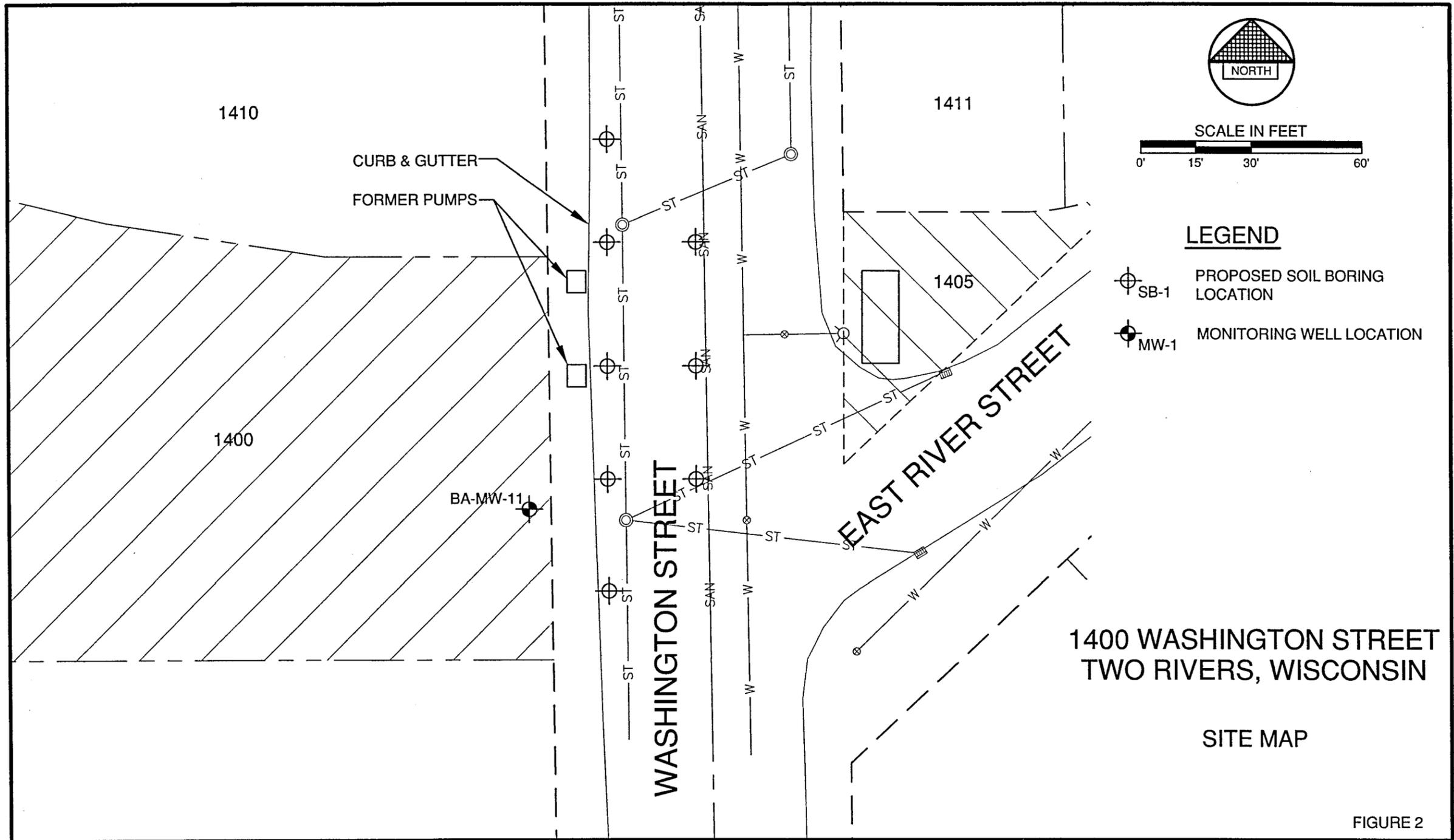
LOCATION MAP

1400 WASHINGTON STREET
TWO RIVERS, WISCONSIN



1" = 2000'

FIGURE 1



R:\2900\2957\2957013\dwg\1400_SITE.dwg - RAT - 03/11/05

FIGURE 2

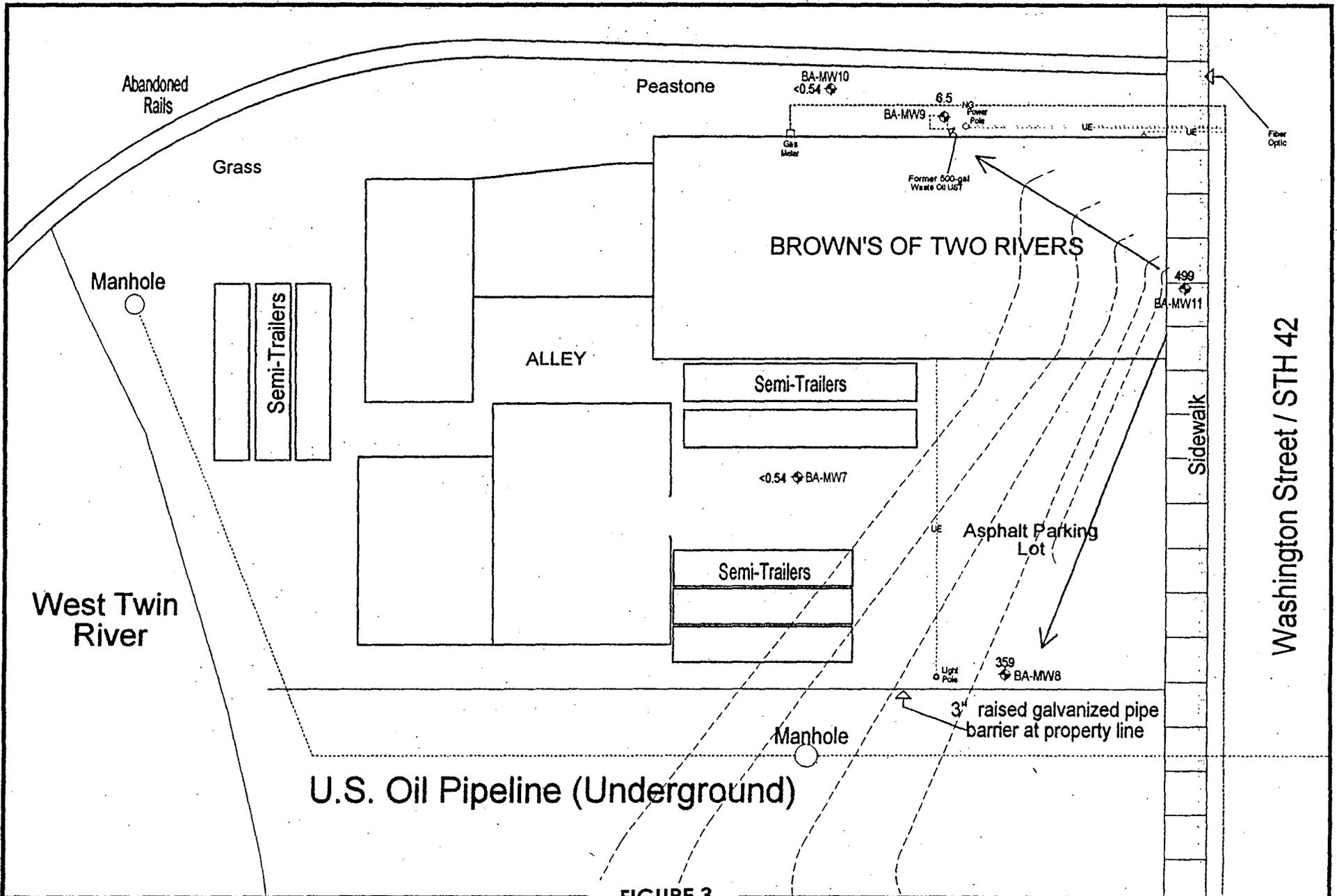


FIGURE 3

ISOCONCENTRATION MAP
FOR TRIMETHYLBENZENES
IN GROUNDWATER
DECEMBER 1999

Legend:

◆ MONITORING WELL

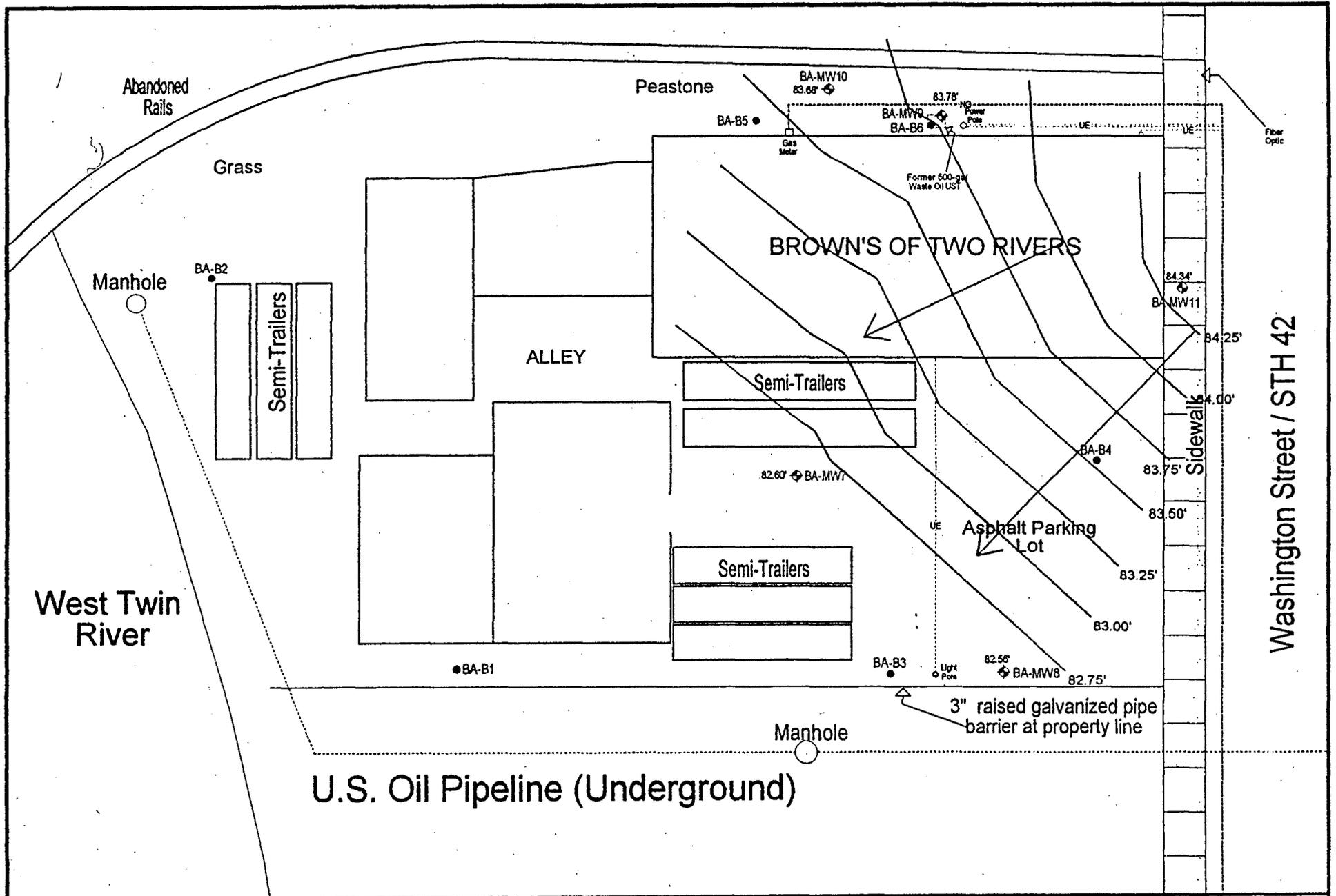


GHD Inc. Environmental Services
BROWN'S OF TWO RIVERS
1400 WASHINGTON STREET
TWO RIVERS, WI 54241

Prepared By: TIM OTT

Date: 01/04/00

Scale: 1" = 20'



GHD Inc. Environmental Services
 BROWN'S OF TWO RIVERS
 1400 WASHINGTON STREET
 TWO RIVERS, WI 54241

FIGURE 4
 GROUNDWATER FLOW MAP
 JANUARY 2000

Prepared By: TIM OTT

Legend:

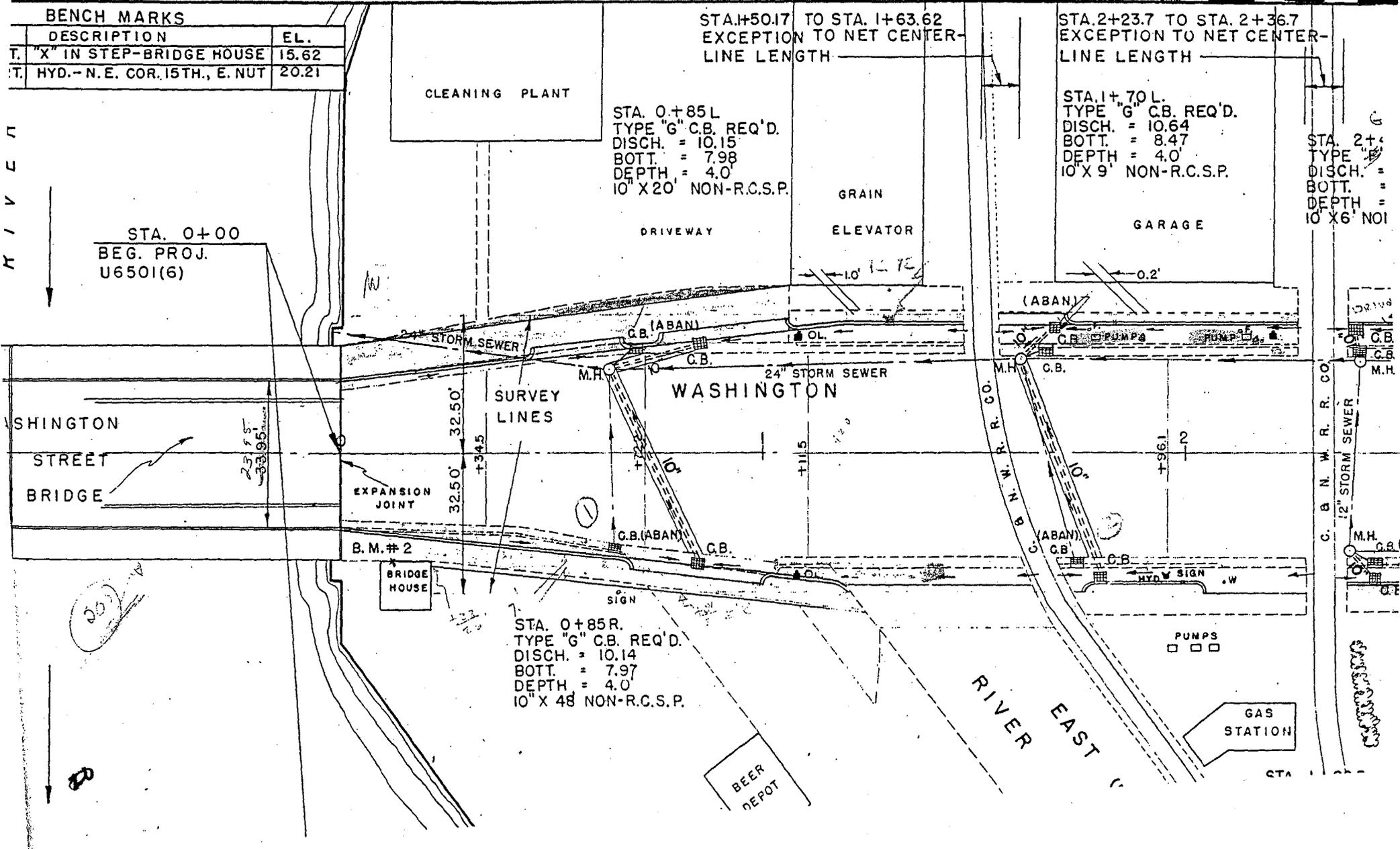
- BORING
- ⊕ MONITORING WELL

Date: 01/04/00

Scale: 1" = 30'

↑
N

BENCH MARKS	
DESCRIPTION	EL.
T. "X" IN STEP-BRIDGE HOUSE	15.62
T. HYD.- N.E. COR. 15TH., E. NUT	20.21



STA. 1+50.17 TO STA. 1+63.62
EXCEPTION TO NET CENTER-
LINE LENGTH

STA. 2+23.7 TO STA. 2+36.7
EXCEPTION TO NET CENTER-
LINE LENGTH

STA. 0+85L
TYPE "G" C.B. REQ'D.
DISCH. = 10.15
BOTT. = 7.98
DEPTH = 4.0'
10" X 20' NON-R.C.S.P.

STA. 1+70L
TYPE "G" C.B. REQ'D.
DISCH. = 10.64
BOTT. = 8.47
DEPTH = 4.0'
10" X 9' NON-R.C.S.P.

STA. 2+37
TYPE "G" C.B. REQ'D.
DISCH. = 10.64
BOTT. = 8.47
DEPTH = 4.0'
10" X 6' NOI

STA. 0+85R
TYPE "G" C.B. REQ'D.
DISCH. = 10.14
BOTT. = 7.97
DEPTH = 4.0'
10" X 48' NON-R.C.S.P.

PUMPS
□ □

GAS
STATION

FIGURE 5

B

APPENDIX B

TABLES

TABLE 1
Soil Analytical Results
Brown's of Two Rivers – Two Rivers, Wisconsin
SIR – February 2000

Parameter	NR 720 RCL's	BA-MW8 @ 17.5-19.5'	BA-MW9 @ 0-2'	BA-MW9 @ 12-14'	BA-MW10 @ 0-2'	BA-MW10 @ 10-12'	BA-MW10 @ 12.5-14.5'	BA-MW11 @ 0-2'	BA-MW11 @ 10-12'	BA-MW11 @ 12.5-14.5'	BA-MW11 @ 17.5-19.5'
GRO	100										
DRO	100	<2.6			26		<2.6			140	<2.6
Cadmium	8		<0.20		<0.22			1.7			
Lead	50		<3.6>		18			<4.0>			
Benzene	5.5	<24		<5.4		<5.4			<270		<98
Ethylbenzene	2,900	<24		<18>		<5.9			9,700		740
Toluene	1,500	<18		<19>		<5.9			5,500		440
Total TMBs	None	<49		1,480		<11.2			32,000		1,470
Total Xylenes	4,100	203		<23		<23			34,100		2,410
MTBE	None	<21		<11		<11			9,700		<85
Naphthalene	None			200		<10			9,700	570	
n-Butylbenzene	None			94		<6.5			12,000		
sec-Butylbenzene	None			160		<5.5			2,700		
tert-Butylbenzene	None			<6.1		<6.1			1,500		
Isopropylbenzene	None			<7.6>		<5.2			4,200		
p-Isopropyltoluene	None			<11		<11			2,100		
n-Propylbenzene	None			560		<5.1			3,200		
Isopropylether	None			<6.5		<6.5			<320		
Total PVOCs	None	339		1,556.4		<62.4			91,270	570	5,243
Total VOCs	None	339		2,601.6		<118.3			126,990	570	5,243
Acenaphthylene	None			<1.5			<2.0				41
Benzo (a) pyrene	None			<3.5>			<1.4			<1.4	
Benzo (b) flouranthene	None			<1.5			<1.5			<1.5	
Benzo (g,h,I) perylene	None			22			<1.9			<1.9	
Benzo (k) fluoranthene	None			<1.8>			<1.7			<1.7	
Chrysene	None			17			<1.7			<1.7	
Dibenzo (a,h) anthracene	None			11			<1.0			<1.0	
Fluoranthene	None			14			<1.6			<1.6	
Fluorine	None			9.3			<1.7				7.9
Indeno (1,2,3-cd) pyrene	None			13			<2.7			<2.7	
Methyl-1-Naphthalene	None			110			<2.1				200
Methyl-2-Naphthalene	None			160			<1.8				420
Phenanthrene	None			26			<1.6			<2.5>	
Pyrene	None			24			<1.8			<1.8	
Total PAHs				414.6			<24.5			684.9	

Notes: All concentrations are reported in parts per billion (ppb) unless otherwise noted
 VOCs stands for volatile organic compounds; PVOCs stands for petroleum volatile organic compounds
 *MP= 's fo thy=nes

MTBE stands for methyl tert-butyl ether
 ppm stands for parts per million
 and esid nta lev

TABLE 2

Groundwater Analytical Results
Brown's of Two Rivers - Two Rivers, Wisconsin
SIR - February 2000

PARAMETER	NR 140 ES / PAL Standards	BA-MW11	
		12/15/1999	1/18/2000
DRO (ppm)	none	1.4	
Cadmium	5 / 0.5	<21	
Dissolved Lead (ppm)	15 / 1.5	<1.4	
Benzene	5 / 0.5	<12	<24
Ethylbenzene	700 / 140	640	360
Toluene	343 / 68.6	380	480
Total Trimethylbenzenes	480 / 96	499	390
Total Xylenes	620 / 124	2,550	1,720
Methyl tert-butyl Ether	60 / 12	<21	<24
Naphthalene	40 / 8	240	210
Isopropylbenzene	none	<26>	
p-Isopropyltoluene	none	<28>	
n-Propylbenzene	none	<35>	
Isopropylether	none	44	
Total PVOCS	none	4,102	2,974
Total VOCs	none	4,475	3,154
Nitrogen, ammonia as N	9.7 / 1.9 ppm	0.35	0.095
Nitrogen N+N (mg/L)	10 / 2 ppm	<0.030	<0.042
Nitrogen, Kjeldahl (mg/L)	none	1.6	0.70
Sulfate (mg/L)	none	7.3	<5.0
Alkalinity (mg/L)	none	360	420
Iron (mg/L)	none	2.0	5.5
Conductivity (uS)	none	2,000+	2,740
pH (SU)	none	9.2	7.5
Dissolved Oxygen (mg/L)	none	2.44	0.47
Acenaphthene	none		7.4
Acenaphthylene	none		<3.1>
Anthracene	3,000 / 600		<0.038>
Benzo (a) anthracene	none		<0.042
Benzo (a) pyrene	0.2 / 0.02		<0.016
Benzo (g,h,i) perylene	none		<0.031
Benzo (k) fluoranthene	none		<0.028
Chrysene	0.2 / 0.02		<0.023
Dibenzo (a,h) anthracene	none		<0.022
Fluoranthene	400 / 80		<0.065>
Fluorene	400 / 80		<1.4>
Indeno (1,2,3-cd) pyrene	none		<0.090
Methyl-1-Naphthalene	none		59
Methyl-2-Naphthalene	none		17
Phenanthrene	none		<0.087>
Pyrene	250 / 50		<0.077>
Total Polynuclear Aromatic Hydrocarbons	none		88.42

Notes:

All results are reported in parts per billion (ppb) unless otherwise noted.
ppm stands for parts per million, GRO stands for Gasoline Range Organics

Results in E_____ R 14_____ and _____ unc_____ ex_____ NR 1_____ ALs_____

C

APPENDIX C

WELL CONSTRUCTION REPORTS



NOTE:

White Copy - Division's Copy
 Green Copy - Driller's Copy
 Yellow Copy - Owner's Copy

JUL 70 1986

1. COUNTY Manitowoc		CHECK (✓) ONE: <input checked="" type="checkbox"/> Town <input type="checkbox"/> Village <input checked="" type="checkbox"/> City		Name Two Rivers	
2. LOCATION OR - Grid or Street No. NE 1/4 SW 1/4 AND - If available subdivision name, lot & block No.		Section 1 Township 19N Range 24E		3. NAME <input checked="" type="checkbox"/> OWNER <input type="checkbox"/> AGENT AT TIME OF DRILLING CHECK (✓) ONE Leigh Stegeman	
4. Distance in feet from well to nearest: (Record answer in appropriate block)		Building 6		ADDRESS R. 3	
50		Sanitary Bldg. Drain C.I. Other		POST OFFICE Two Rivers, Wis.	
San. Storm C.I. Other		Sanitary Bldg. Sewer C.I. Other		ZIP CODE 54241	
Foundation Drain Connected to: Sewer Sewage Sump Clearwater Dr. Clearwater Sump		Floor Drain Connected To: C.I. Sewer Other Sewer		Storm Bldg. Drain C.I. Other	
50		Sewage Sump C.I. Other		Storm Bldg. Sewer C.I. Other	
Privy Pet Waste Pit: Nonconforming Existing Well Pump Tank		Sewage Absorption Unit Seepage Pit Seepage Bed Seepage Trench		Manure Hopper or Retention or Pneumatic Tank	
Subsurface Pumphouse Nonconforming Existing		Barn Gutter		Manure Storage Basin Concrete Floor Only Concrete Floor and Partial Concrete Walls	
Animal Barn Pen		Animal Yard		Other (Describe)	
Silo With Pit		Glass Lined Storage Facility		Earthen Silage Storage Trench Or Pit	
Silo w/o Pit		Earthen Silage Storage Trench		Earthen Manure Basin	
Temporary Manure Stack or Platform		Watertight Liquid Manure Tank or Basin		Manure Pressure Pipe	
Subsurface Gasoline or Oil Tank		Waste Pond or Land Disposal Unit (Specify Type)		Other (Describe)	

5. Well is intended to supply water for: Bait Shop					9. FORMATIONS		
					Kind		
					From (ft.)		
					To (ft.)		
6. DRILLHOLE					sand		
Dia. (in.) From (ft.) To (ft.) Dia. (in.) From (ft.) To (ft.)					Surface 28		
10 10 Surface 99 6 99 370					clay 28 86		
					hard pan 86 99		
7. CASING, LINER, CURBING AND SCREEN					limestone 99 370		
Material, Weight, Specification							
Dia. (in.) Mfg. & Method of Assembly From (ft.) To (ft.)							
6 ASTM A-53 Surface 99							
Sumitomo							
Welded joint							
Wt. 18.97 per ft.							
8. GROUT OR OTHER SEALING MATERIAL					10. TYPE OF DRILLING MACHINE USED		
Kind From (ft.) To (ft.)					<input type="checkbox"/> Cable Tool <input checked="" type="checkbox"/> Rotary-hammer w/drilling mud & air <input type="checkbox"/> Jetting with <input type="checkbox"/> Rotary-air w/drilling mud <input type="checkbox"/> Rotary-hammer & air <input type="checkbox"/> Air <input type="checkbox"/> Rotary-w/drilling mud <input type="checkbox"/> Reverse Rotary <input type="checkbox"/> Water		
Drilling mud Surface 99							
11. MISCELLANEOUS DATA					Well construction completed on May 30, 1986		
Yield Test: 4 Hrs. at 20 GPM					Well is terminated 8 inches <input checked="" type="checkbox"/> above final grade <input type="checkbox"/> below		
Depth from surface to normal water level 100 Ft.					Well disinfected upon completion <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Depth of water level when pumping 100 Ft. Stabilized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					Well sealed watertight upon completion <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Water sample sent to Madison laboratory on June 12, 1986							

Signature
Leonard J. Willems
 Registered Well Driller

Business Name and Complete Mailing Address
Willems Well Drilling
R. 1 Greenleaf, Wis. 54126

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, method of finishing the well, amount of cement used in grouting, blasting, etc., should be given on reverse side.

1. County Manitowoc } Town
 Village Two Rivers, Wis. }
 City } Check one and give name

2. Location 15th Street - 400' south of Washington Street
Name of street and number of premise or Section, Town and Range number

3. Owner or Agent Mirro Aluminum Company
Name of individual, partnership or firm

4. Mail Address Manitowoc, Wis.
Complete address required

5. From well to nearest: Building _____ ft; sewer _____ ft; drain _____ ft; septic tank _____ ft;
 dry well or filter bed _____ ft; abandoned well _____ ft.

6. Well is intended to supply water for: Industrial

7. DRILLHOLE:

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
16	0	45			
10	45	371			

8. CASING AND LINER PIPE OR CURBING:

Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
16	Steel 3/8" Wall	0	45'
10	Steel .307" Wall	+2'	87'

9. GROUT:

Kind	From (ft.)	To (ft.)
Neat Cement	0	45'

11. MISCELLANEOUS DATA:

Yield test: 7-1/2 Hrs. at 300 GPM.
 Depth from surface to water-level: 7 ft.
 Water-level when pumping: 350 ft.
 Water sample was sent to the state laboratory at:
 _____ on _____ 19____
 City

10. FORMATIONS:

Kind	From (ft.)	To (ft.)
Drift	0	86
Limestone	86	371
<u>Manitowoc Co. Ind # 7</u>		
<u>Well # 1 Perm Well No 52812</u>		
<u>SPRNG # 24 Sec 1 T19N, R24E</u>		
<u>TOWN OF TWO RIVERS</u>		

Construction of the well was completed on:

May 3 1965

The well is terminated 24 inches
 above, below the permanent ground surface.

Was the well disinfected upon completion?

Yes No _____

Was the well sealed watertight upon completion?

Yes No _____

Signature W. A. Cramer EGERER-GALZOWAY WELL CORP.
 Registered Well Driller

7136 West State St.
 Milwaukee, Wis. 53213
 Complete Mail Address

Please do not write in space below

Rec'd _____ No. _____
 Ans'd _____
 Interpretation cc: M.E. Ostrom
State Geo. Survey
9/2/65

10 ml 10 ml 10 ml 10 ml 10 ml
 Gas—24 hrs. _____
 48 hrs. _____
 Confirm _____
 B. Coll _____
 Examiner _____

High Capacity Well Approval 2-1-65 File: Two Rivers

RECEIVED
 SANITARY ENGINEERING

County: Manitowoc

Well name Mirro Aluminum Company, Two Rivers, Wis.

Located 15th St., 400' S. of Washington St. Completed... 5/3/65

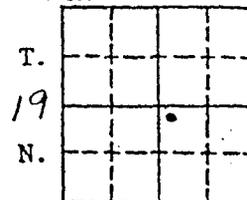
Owner... Mirro Aluminum Co. Field check.

Address. Manitowoc, Wisconsin Altitude.... 595' C.M.

Driller.. Egerer-Galloway Well Corp. Static w. l. = 7'

Engineer. Spec. cap... = 0.9

R. 24E



Quad. Manitowoc 15'

Drill Hole			Casing & Liner Pipe or Curbing										
Dia.	from	to	Dia.	from	to	Dia.	Wgt. & Kind	from	to	Dia.	Wgt. & Kind	from	to
16"	0	45'				16"	steel 3/8" wall	0	45'				
10"	45	371'				10"	steel .307" wall	+2'	87'				

Grout: Kind	from	to
Neat cement	0	45'

Samples from 0 to 370' Date received: 9/16/65
 Sample Nos. 257899 to 257972 Examined by: Janet Olmstead Date: 2/11/66
 Formations: Drift, Silurian

Remarks: Well tested for 7½ hours at 300 gpm with 343 feet of drawdown.

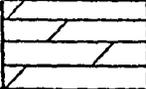
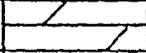
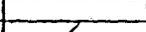
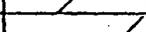
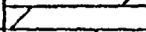
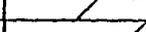
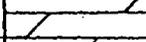
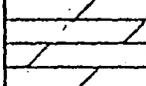
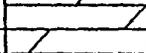
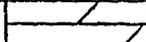
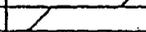
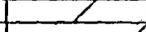
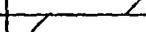
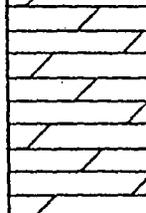
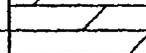
LOG OF WELL:

Depth (ft)	Interval (ft)	Stratigraphic Unit / Lithology
0-10	10	Top soil, mxd clr, mxd lithology
10-15	5	Snd, mxd clr, M&C, Srd, P srtg, tr fn, VC; mch cl, tr Vfn & fn gvl & soil
15-20	5	Snd, mxd clr, M&C, Srd, P srtg, tr VC; ltl Vfn & fn gvl & cong
20-25	5	Cl, lt rd bn, dolic; ltl Vfn, fn gvl, tr snd
25-30	5	Cl, lt rd bn, dolic; mch st, tr snd, & Vfn gvl
30-35	5	Cl, Vlt rd bn, dolic; mch st, tr snd & Vfn gvl
35-40	5	St & Cl, lt yl gry bn; mch Vfn & fn snd
40-55	15	Cl, lt rd, dolic; mch st, tr snd
55-80	25	Cl, lt rd bn, dolic; mch st, tr snd
80-85	5	Snd, mxd clr, C & VC, ang, P srtg, tr M, fn; ltl Vfn, fn gvl, cl
85-90	5	Dol, lt gry bn, M & fn, dns; mch cvd snd, tr sh & pyr
90-95	5	Dol, lt grv, M & fn, dns; tr pyr & sh
95-100	5	Dol, lt yl gry bn, M & fn, dns; tr pyr & sh
100-105	5	Dol, lt yl rd bn mot lt gry, M & fn, dns; tr pyr & sh
105-110	5	Dol, lt yl rd bn mot lt gry, M & fn, dns; tr pyr, sh, oolic dol
110-140	30	Dol, lt yl rd bn mot lt gry, M & fn, dns; tr pyr & sh
140-145	5	Dol, lt yl rd bn, M & fn, dns;
145-150	5	Dol, Vlt yl gry, M & fn, dns; tr pyr
150-170	20	Dol, Vlt yl gry, M & fn, dns; tr pyr & sh

Well name Mirro Aluminum Co., Two Rivers, Wis.

Sample Nos. 257899 to 257972

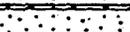
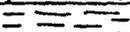
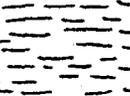
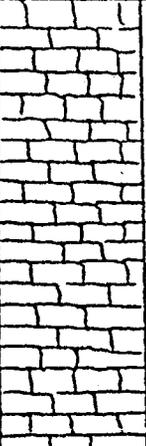
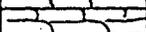
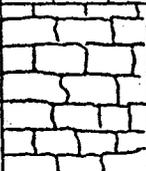
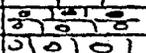
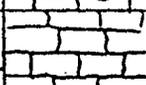
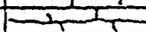
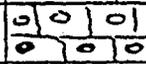
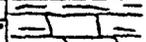
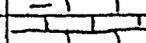
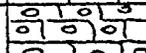
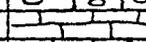
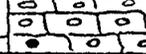
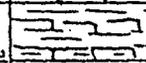
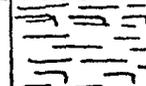
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170-210	40		Dol, Vlt vl pnk bn, M & fn, dns; tr sugary dol, sh & pyr
210-220	10		Dol, Vlt or pnk, M, dns, tr C; tr pyr & sh
220-225	5		Dol, lt vl rd bn, M, dns; tr sh & gypsum
225-230	5		Dol, lt vl rd bn, M, dns; tr qtz
230-240	10		Dol, lt vl rd bn, M, dns; tr qtz & stnd pyr
240-245	5		Dol, lt vl rd bn, M, dns; tr qtz, stnd pyr & sh
245-255	10		Dol, lt vl rd bn, M & C, dns; tr stnd pyr
255-280	25		Dol, Vlt gry, M & C, dns; tr sh
280-285	5		Dol, Vlt gry, M & C, dns; tr sh & pyr
285-295	10		Dol, Vlt gry, M & C, dns;
295-300	5		Dol, lt vl bn, M & fn, dns;
300-305	5		Dol, lt vl bn mot Vlt gry, M & fn, dns; tr pyr & sh
305-310	5		Dol, wh, M & fn, dns;
310-365	55		Dol, Vlt gry, M & fn, dns, tr C; tr pyr & calc
365-370	5		Dol, lt gry, M & fn, dns; ltl stnd Fe, tr pyr

END OF WELL

CITY TEST WELL NO. 2, TWO RIVERS, WIS.
 1750' E of Well No. 1. Sec. 1, T. 19, R. 24 E. NE 1/4, SE 1/4, SW 1/4
 W. H. Gray Bros, Drillers, 1914
 Samples sent by G. H. Wehausen
 " examined by F. T. Thwaites, U. W. Nos. 16717-16819
 Elevation of curb 587

1" = 100

DRIFT	100	0-15		"Lake sand" no sample
		15-17		"Hard pan"
		17-32		"Quick sand"
		32-100		Clay, red, dry " "
NIAGARA	670 570	100-335		Limestone, magnesian, light gray
		335-350		Limestone, magnesian, yellowish
		350-440		Limestone, magnesian, light gray
		440-470		Limestone, magnesian, light gray, white flint
		470-515		Limestone, magnesian, light gray
		515-545		Limestone, magnesian, light gray, white flint
		545-560		Limestone, light gray, magnesian
		560-590		Limestone, magnesian, dark gray, flinty
		590-620		Limestone, magnesian, gray, shaley
		620-635		Limestone, magnesian, light gray
		635-665		Limestone, magnesian, gray, flinty
		665-680		Limestone, magnesian, yellowish gray
		680-710		Limestone, magnesian, gray, flinty
		710-770		Limestone, magnesian, dark gray
		770-800		Shale, gray, limy and limestone, magnesian, gray, very shaley
800-860		Shale, gray, limy with some shaley limestone at top.		

TWO RIVERS 2

Mn-4

RICHMOND:	330	860-875		Limestone, magnesian, bluish-gray, very shaley
		875-1100		Shale, bluish-gray, limy
GALENA-BLACK RIVER	195	1100-1250		Limestone, bluish-gray, magnesian
		1250-1265		Limestone, magnesian, brownish-gray
		1265-1280		Limestone, magnesian, bluish-gray
		1280-1295		Limestone, magnesian, brownish-gray
ST. PETER:	45	1295-1340		Sandstone, fine to medium, gray & yellow, little lime
LAKE SUPERIOR?	270	1340-1400		Sandstone, fine, yellowish and brownish red, grains not well rounded, no lime
		1400-1445		Sandstone, fine, red, grains fairly well rounded, no lime
		1445-1460		Sandstone, medium, yellowish-brown, angular grains
		1460-1475		Sandstone, fine, red, well rounded
		1475-1490		Shale, sandy, reddish-gray, no lime
		1490-1550		Sandstone, fine, yellowish red and gray, grains poorly rounded
		1550-1580		Sandstone, fine, light red, grains poorly rounded
		1580-1595		Sandstone, fine, dark yellowish-brown, well rounded
PRE-CAMBRIAN	30	1595-1610		Shale, sandy, dark red, no lime
		1610-1640		Quartzite, light gray to brown, glassy

1300

JUL 5 1983

1. COUNTY Manitowoc CHECK (✓) ONE: Town Village City Name Two Rivers

2. LOCATION Lot 1-2-3-4-5-6 Section 1 Township 19N Range 24E 3. NAME OWNER AGENT AT TIME OF DRILLING CHECK (✓) ONE
James Van Lanen

OR - Grid or Street No. 1515 Street or Road Name Memorial Drive ADDRESS LIGHTHOUSE INN - WELL #1
1515 Memorial Drive #81604-81604

AND - If available subdivision name, lot & block No. Block 103 POST OFFICE PERMAN. WELL ZIP CODE 54241
Two Rivers, Wis.

4. Distance in feet from well to nearest: (Record answer in appropriate block)

Building		Sanitary Bldg. Drain		Sanitary Bldg. Sewer		Floor Drain Connected To:		Storm Bldg. Drain		Storm Bldg. S	
5		C.I.	Other	C.I.	Other	C.I. Sewer	Other Sewer	C.I.	Other	C.I.	Other
-		-		-		-		-		-	

Street Sewer		Other Sewers		Foundation Drain Connected to		Sewage Sump		Clearwater Sump	Septic Tank	Holding Tank	Sewage Absorption Unit		Manure Hopper Retention or Pneumatic Tank
San.	Storm	C.I.	Other	Sewer	Sewage Sump	C.I.	Other				Seepage Pit	Seepage Bed	
100	-	-	-	-	-	-	-	-	-	-	-	-	-

Privy	Pet Waste Pit	Plt: Nonconforming Existing Well Pump Tank	Subsurface Pumphoom Nonconforming Existing	Barn Gutter	Animal Barn Pen	Animal Yard	Silo With Pit	Glass Lined Storage Facility	Silo w/o Pit	Earthen Silage Storage Trench Or Pit	Earthen Manure Ba
-	-	-	-	-	-	-	-	-	-	-	-

MANITOWOC Co. MISC. #6

Temporary Manure Stack or Platform	Watertight Liquid Manure Tank or Basin	Manure Pressure Pipe	Subsurface Gasoline or Oil Tank	Waste Pond or Land Disposal Unit (Specify Type)	Manure Storage Basin Concrete Floor Only Concrete Floor and Partial Concrete Walls	Other (Describe)
-	-	-	-	-	-	-

5. Well is intended to supply water for: Heat pump

6. DRILLHOLE

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
10	Surface	20	6	20	124

7. CASING, LINER, CURBING AND SCREEN

Dia. (in.)	Material, Weight, Specification Mfg. & Method of Assembly	From (ft.)	To (ft.)
6	ASTM-A53	Surface	86
	Republic		
	T & C		
	Wt. 19.45 per ft.		

9. FORMATIONS

Kind	From (ft.)	To (ft.)
sand	Surface	20
sandy clay	20	35
clay	35	86
limestone	86	124

APPROVAL DATE: FEBR. 8, 1984
FILE LOCATION: TWO RIVERS
CC: TO STATE GEOLOGIST

8. GROUT OR OTHER SEALING MATERIAL

Kind	From (ft.)	To (ft.)
Puddled clay	Surface	20

10. TYPE OF DRILLING MACHINE USED

<input checked="" type="checkbox"/> Cable Tool	<input type="checkbox"/> Rotary-hammer w/drilling mud & air	<input type="checkbox"/> Jetting with
<input type="checkbox"/> Rotary-air w/drilling mud	<input type="checkbox"/> Rotary-hammer & air	<input type="checkbox"/> Air
<input type="checkbox"/> Rotary-w/drilling mud	<input type="checkbox"/> Reverse Rotary	<input type="checkbox"/> Water

11. MISCELLANEOUS DATA

Well construction completed on February 25, 1978

Yield Test: 4 hrs. at 75 GPM

Well is terminated 8 inches above final grade below

Depth from surface to normal water level 25 Ft.

Well disinfected upon completion Yes No

Depth of water level when pumping 25 Ft. Stabilized Yes No

Well sealed watertight upon completion Yes No

Water sample sent to Spec. Cap. = 2 laboratory on 19

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, method of finishing the well, amount of cement used in grouting, blasting, etc., should be given on reverse side.

Signature Leonard J. Willems Registered Well Driller

Business Name and Complete Mailing Address
Willems Well Drilling
R. 1 Greenleaf, Wis. 54126

JAN 13 1988

State of Wisconsin
Department of Natural Resources
Private Water Supply
Box 7921
Madison, Wisconsin 53707

NOTE:
White Copy - Division's Copy
Green Copy - Driller's Copy
Yellow Copy - Owner's Copy

WELL CONSTRUCTOR'S REPORT
Form 3300-15 Rev. 5-85

1. COUNTY MANITOWOC CHECK (✓) ONE: Town Village City Name TWO RIVERS

2. LOCATION 1/4 Section or Gov't. Lot 1 Section 19W2E Township: Range 1 3. NAME OWNER AGENT AT TIME OF DRILLING CHECK (✓) ONE Light house Inn WELL #3

OR - Grid or Street No. MEMORIAL DR Street or Road Name 1215 Memorial Dr ADDRESS 1215 Memorial Dr POST OFFICE TWO RIVERS WI 54241 ZIP CODE 54241

4. Distance in feet from well to nearest: (Record answer in appropriate block)

Building		Sanitary Bldg. Drain		Sanitary Bldg. Sewer		Floor Drain Connected To:		Storm Bldg. Drain		Storm Bldg. Sewer	
		C.I.	Other	C.I.	Other	C.I. Sewer	Other Sewer	C.I.	Other	C.I.	Other

Street Sewer		Other Sewers		Foundation Drain Connected to:		Sewage Sump		Clearwater Sump		Septic Tank		Holding Tank		Sewage Absorption Unit		Manure Hopper or Retention or Pneumatic Tank	
San.	Storm	C.I.	Other	Sewer	Clearwater Dr.	Sewage Sump	Clearwater Sump							Seepage Pit	Seepage Bed	Seepage Trench	

Private Pot Waste Pit		Pit: Nonconforming Existing		Subsurface Pump Room		Barn Gutter		Animal Barn Pen		Animal Yard		Silo With Pit		Glass Lined Storage Facility		Silo w/o Pit		Earthen Silage Storage Trench Or Pit		Earthen Manure Basin	

Temporary Manure Stack or Platform		Watertight Liquid Manure Tank or Basin		Manure Pressure Pipe		Subsurface Gasoline or Oil Tank		Waste Pond or Land Disposal Unit (Specify Type)		Manure Storage Basin		Other (Describe)	
										Concrete Floor Only	Concrete Floor and Partial Concrete Walls		PERM. WELL # 81606

5. Well is intended to supply water for: Motel - Non-Potable for Heat

6. DRILLHOLE

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)	Kind	From (ft.)	To (ft.)
9	Surface	89				GRAVEL	Surface	10
6	89	545				Sandy-clay	10	85
						GRAVEL	85	89

Dia. (in.)	Material, Weight, Specification	From (ft.)	To (ft.)	Kind	From (ft.)	To (ft.)
6	New bl. STL	Surface	91	Limestone	89	400
	Plan welded			Limestone	400	545

ASING, LINER, CURBING AND SCREEN

Dia. (in.)	Mfg. & Method of Assembly	From (ft.)	To (ft.)
6	New bl. STL	Surface	91

8. GROUT OR OTHER SEALING MATERIAL

Kind	From (ft.)	To (ft.)
DRILL SLURRY	Surface	89

9. FORMATIONS

MANITOWOC CO. MISC. #6
FILE LOC: TWO RIVERS
APPROVAL DATE: FEB 19, 1988

10. TYPE OF DRILLING MACHINE USED

<input type="checkbox"/> Cable Tool	<input checked="" type="checkbox"/> Rotary-hammer w/drilling mud & air	<input type="checkbox"/> Jetting with
<input type="checkbox"/> Rotary-air w/drilling mud	<input type="checkbox"/> Rotary-hammer & air	<input type="checkbox"/> Air
<input type="checkbox"/> Rotary-w/drilling mud	<input type="checkbox"/> Reverse Rotary	<input type="checkbox"/> Water

Well construction completed on 12-10 1987

11. MISCELLANEOUS DATA

Yield Test: 2 Hrs. at 60 GPM Well is terminated 24 inches above final grade below

Depth from surface to normal water level 125 Ft. Well disinfected upon completion Yes No

Depth of water level when pumping 208 Ft. Stabilized Yes No Well sealed watertight upon completion Yes No

Water sample sent to GREENBAY SC = 0.7 GPM/Hr. laboratory on 12-28 1987

Dr opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, method of finishing the well, amount of cement used in grouting, blasting, etc., should be given on reverse side.

Signature Tom Vander Gucht Registered Well Driller Business Name and Complete Mailing Address BILL VANDER GUCHT WATER WELL INC P.O. 24081 GR. BAY 54324

No samples

NOTE:

White Copy - Division's Copy
 Green Copy - Driller's Copy
 Yellow Copy - Owner's Copy

WELL CONSTRUCTOR'S REPORT
 Form 3300-15
 Rev. 3-87

MAR 3 1988

1. COUNTY MANITOWOC		CHECK (✓) ONE: <input checked="" type="checkbox"/> Town <input type="checkbox"/> Village <input checked="" type="checkbox"/> City Name TWO RIVERS											
2. LOCATION 1/4 Section or Gov't. Lot ✓ SW 1/4 SW 1/4		Section 1	Township 19 N.	Range 24 E.	3. NAME <input checked="" type="checkbox"/> OWNER <input type="checkbox"/> AGENT AT TIME OF DRILLING CHECK (✓) ONE JAMES VANLANEN Well # 2								
OR - Grid or Street No. 1515		Street or Road Name MEMORIAL DR.		ADDRESS 1515 MEMORIAL DR. PERM # 81605									
AND - If available subdivision name, lot & block No.		POST OFFICE TWO RIVERS, WIS.		ZIP CODE 54241									
4. Distance in feet from well to nearest: (Record answer in appropriate block) 6		Building	Sanitary Bldg. Drain C.I. Other	Sanitary Bldg. Sewer C.I. Other	Floor Drain Connected To: C.I. Sewer Other Sewer	Storm Bldg. Drain C.I. Other	Storm Bldg. Sewer C.I. Other						
Street Sewer		Other Sewers		Foundation Drain Connected to		Sewage Sump		Clearwater Sump	Septic Tank	Holding Tank	Sewage Absorption Unit Seepage Pit Seepage Bed Seepage Trench		Manure Hopper or Retention or Pneumatic Tank
San.	Storm	C.I.	Other	Sewer	Clearwater Dr.	Clearwater Sump	C.I.	Other					
100	-	-	-										
Privy	Pat Waste Pit	PIT: Nonconforming Existing		Subsurface Pumproom		Barn Gutter	Animal Barn Pen	Animal Yard	Silo With Pit	Glass Lined Storage Facility	Silo w/o Pit	Earthen Silage Storage Trench Or Pit	Earthen Manure Basin
-	-												
Temporary Manure Stack or Platform	Watertight Liquid Manure Tank or Basin	Manure Pressure Pipe	Subsurface Gasoline or Oil Tank	Waste Pond or Land Disposal Unit (Specify Type)	Manure Storage Basin Concrete Floor Only Concrete Floor and Partial Concrete Walls		Other (Describe) -lake-75'						
-	-	-	-	-									
5. Well is intended to supply water for: Heat Pump					9. FORMATIONS								
6. DRILLHOLE													
Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)	Kind	From (ft.)	To (ft.)					
10	Surface	91	6	91	622	sand	Surface	35					
						clay	35	91					
						limestone	91	622					
7. CASING, LINER, CURBING AND SCREEN													
Material, Weight, Specification	Mfg. & Method of Assembly		From (ft.)	To (ft.)									
6	API -5A		Surface	91		Manitowoc Co. Misc # 6							
Jones & laughlin					Approval Date: Feb 8, 1984								
Welded joint					File location: Two Rivers								
Wt. 18.97 per ft.					cc: State Geologist								
8. GROUT OR OTHER SEALING MATERIAL													
Kind		From (ft.)	To (ft.)										
Cement		Surface	60		<input type="checkbox"/> Cable Tool <input checked="" type="checkbox"/> Rotary-hammer w/drilling mud & air <input type="checkbox"/> Jetting with <input type="checkbox"/> Rotary-air w/drilling mud <input type="checkbox"/> Rotary-hammer & air <input type="checkbox"/> Air <input type="checkbox"/> Rotary-w/drilling mud <input type="checkbox"/> Reverse Rotary <input type="checkbox"/> Water								
Drilling mud		60	91		Well construction completed on <u>JULY 7, 1983</u>								
11. MISCELLANEOUS DATA													
Yield Test:		8 Hrs. at		110 GPM		Well is terminated <u>8</u> inches		<input checked="" type="checkbox"/> above final grade		<input type="checkbox"/> below			
Depth from surface to normal water level		40 Ft.		Well disinfected upon completion		<input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No					
Depth of water level when pumping		40 Ft.		Stabilized		<input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No		Well sealed watertight upon completion		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Water sample sent to _____ laboratory on _____ 19__													

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, method of finishing the well, amount of cement used in grouting, blasting, etc., should be given on reverse side.

Signature <i>Edward J. Willem</i>	Business Name and Complete Mailing Address WILLEMS WELL DRILLING Rt 1 GREENLEAF, WIS. 54126
Registered Well Driller	