Menomonie Water Supply Service Area Plan

City of Menomonie
Dunn County, WI
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EXECUTIVE SUMMARY

The City of Menomonie is the county seat of Dunn County, located in northwestern Wisconsin and between the Cities of Hudson and Eau Claire. The City of Menomonie is part of the Mississippi River Basin (Appendix A1). The Menomonie Water Utility receives drinking water from three groundwater wells, all withdrawing water from the Mount Simon Aquifer. The utility also consists of three water treatment facilities and three elevated storage reservoirs. The City of Menomonie does not supply water to other communities, except a small sanitary district located in the unincorporated area of Rusk due to a fertilizer spill that contaminated several wells. The City's water supply isn't meeting "firm supply" requirements according to the Wisconsin Department of Natural Resources (WDNR) for current demands. Continued population growth causes concern for meeting future demand "firm supply" requirements. A solution to meet the water demands is outlined in this report, which is planned for the design year 2045.

The WDNR requires a Water Supply Service Area Plan for communities serving populations of 10,000 or more and drawing water from the waters of the state, per NR 854.04(1). The City of Menomonie meets this definition and has an estimated 2024 population of 16,591. The purpose of this plan is to illustrate compliance with Section NR 854.05 of the Wisconsin Statutes as follows:

- Identify the City of Menomonie Service Area.
- Take inventory of existing sources of water supply.
- Estimate water demands forecasts over the study period.
- Recommend a water supply plan.
- Demonstrate the plan effectively utilizes existing infrastructure.
- Identify procedures for implementing and enforcing the plan.
- Identify both existing and future population and population density within the service area.
- Illustrate the plan supports and is consistent with comprehensive plans for the service area.

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CHAPTER 1 – EXISTING WATER SYSTEM

1.1 WATER DISTRIBUTION SYSTEM

The Menomonie Water Department's (Department) 2024 report to the Wisconsin Public Service Commission (2024 PSC Annual Report) shows that the City of Menomonie's (City) water distribution system consists of a total of 534,245 feet (101.2 miles) of distribution mains. Further, the report indicates the water distribution system includes approximately 39,204 feet of 4-inch watermain and 173,816 feet of 6-inch watermain, which equates to approximately 7% and 33%, respectively, of the total system.

The 2024 PSC Annual Report indicates the water distribution system contains 1,001 fire hydrants within the municipality and an additional 9 hydrants outside the municipality for a total of 1,010 hydrants as well as 1,402 distribution system valves.

Appendix A2 is a map of the existing Menomonie water system, showing the size and location of the various water mains, the three wells and water treatment facilities, Well #9 location to be constructed in 2026, the three elevated water storage tanks, and the overall water service area for the City.

1.2 CURRENT SUPPLY FACILITIES

1.2.1 EXISTING WELLS

The City does not purchase water from any other water system and does not plan to during the planning period. The City of Menomonie water system currently includes three active wells that are sourced from the Mount Simon Aquifer:

- Well #4 (BF732) is located at [redacted] and has a maximum capacity of 900 gpm.
- Well #6 (BF734) is located at [redacted] and has a maximum capacity of 1,100 gpm.
- Well #8 (YQ310) is located at [redacted] and has a maximum capacity of 1,100 gpm.
- The water system has a firm-well capacity of 2,000 gpm.

Table 1.1 Average Daily Withdrawal by Well (2015-2024).

	Average Daily Withdrawal (gal)			
Year	**Well #4 (BF732)**	**Well #6 (BF734)**	**Well #8 (YQ310)**	**Total**
2015	819,233	392,740	N/A	1,211,973
2016	685,397	352,932	N/A	1,038,329
2017	820,438	554,247	197,890	1,572,575
2018	607,644	911,534	480,548	1,999,726
2019	630,164	814,137	478,685	1,922,986
2020	479,973	673,798	592,896	1,746,667
2021	551,855	743,890	740,795	2,036,540
2022	624,466	664,493	713,000	2,001,959
2023	535,315	714,301	691,918	1,941,534
2024	551,995	624,536	785,273	1,961,803
5-yr Avg	548,721	684,204	704,776	1,937,701
10-yr Avg	630,648	644,661	585,126	1,860,434
5-yr %	**28.3%**	**35.3%**	**36.4%**	**100.0%**
10-yr %	**33.9%**	**34.7%**	**31.5%**	**100.0%**

From the data, it's shown that water pumpage has increased in the last five years compared to the last ten years. In general, each well withdraws about a third of the total withdrawal over the past ten years. Percentages were calculated by taking the average daily withdrawal for each well and dividing those by the total average daily withdrawal.

1.2.2 QUALITY AND TREATMENT

Menomonie's existing wells have contaminants including radium, radon, iron, and manganese. The Environmental Protection Agency (EPA) enforces a primary maximum contaminant level (MCL) for radium. Though radon is radioactive, it doesn't currently have an enforcement standard. However, an MCL has been proposed by multiple agencies in the past, which is why it's included as a contaminant of concern. Manganese and iron both have a secondary MCL due to aesthetic and technical effects.

Table 1.2 shows the raw water data for these contaminants, the post-filter data, and the percent removal based on the data for each well.

Table 1.2 Contaminants of Existing Wells.

	MCL	Well #4			Well #6			Well #8		
		Raw	Post Filter	% Removal	Raw	Post Filter	% Removal	Raw	Post Filter	% Removal
Radon (pCi/L)	N/A	473	464	2%	572	486	15%	595	168	72%
Manganese (mg/L)	0.05	0.085	0.05	41%	0.15	0.1	41%	0.1	0.03	70%
Iron (mg/L)	0.3	0.5	0.06	88%	1.25	0.23	84%	0.56	0.04	93%
Radium 226+228 (pCi/L)	5	7.67	2.63	66%	6.90	1.15	83%	7.54	3.02	60%

Wells #4, #6, and #8 each have a water treatment facility to remove radium, iron, and manganese. Each water treatment plant contains an aerator, clear well reservoir, two high-lift booster pumps, horizontal pressure filter, and chemical feed systems including gas chlorine, potassium permanganate, and fluoride. The treatment methods used at the wells are effective at lowering the contaminant levels to below their respective MCLs and secondary standards.

1.2.3 STORAGE

The City has three elevated water storage reservoirs and three concrete clear-well reservoirs. The three concrete clear-well reservoirs are located at each well treatment plant for detention after aeration. The three water towers are described below:

- Tower #1 (South Tower) is a Chicago Bridge and Iron Elevated storage tank, and it was originally constructed in 1974 with a capacity of 750,000 gallons. It is located [redacted]
- Tower #2 (North Tower) is Chicago Bridge and Iron Elevated storage tank, and it was originally constructed in 1985 with a capacity of 400,000 gallons. It is located [redacted]
- Tower #3 (Industrial Tower) is a PDM single pedestal spheroid elevated storage tank, and it was originally constructed in 1990 with a capacity of 750,000 gallons. It is located [redacted]

1.3 WATER USAGE

Historical water use in the City of Menomonie for the past 10 years is shown in **Table 1.3**. Over the past ten years, the City's average daily pumpage has been approximately 1,950,000 gallons per day based on PSC reports. In the same period, the maximum day pumpage was 3,580,000 gallons on August 7, 2020; this usage was attributed to irrigation and water sprinkling. The maximum day pumpage over the past ten years has consistently been attributed to irrigation and water sprinkling.

Table 1.3 Water Demands (2015-2024).

Year	Ave. Day Pumped (1,000 gal/day)	Max. Day Pumped (1,000 gal/day)	Peaking Factor	Cause of Max. Day Demand	Water Loss (%)
2015	1,979,000	2,990,000	1.5	Irrigation	13
2016	1,986,000	3,140,000	1.6	Irrigation	11
2017	2,037,000	3,160,000	1.6	Irrigation	6
2018	1,984,000	3,040,000	1.5	Irrigation	11
2019	1,903,000	2,950,000	1.6	Irrigation	8
2020	1,735,000	3,580,000	2.1	Irrigation	1
2021	2,024,000	3,130,000	1.5	Irrigation	2
2022	1,985,000	3,180,000	1.6	Irrigation	2
2023	1,921,000	2,890,000	1.5	Irrigation	1
2024	1,948,000	2,800,000	1.4	Irrigation	11
5-year Average	**1,923,000**	**3,116,000**	**1.6**	**-**	**3.4**
10-year Average	**1,950,000**	**3,086,000**	**1.6**	**-**	**6.6**

The percentage water loss metric has been variable over the past 10-year period. From 2015 to 2019, water loss was higher, ranging from 6% to 13%. In 2019, the City discovered and repaired three major leaks within the water distribution system. These leaks included a 4-inch lateral, a 4-inch lateral, and a 1-inch lateral. Between 2020 and 2023, water loss decreased to 1% to 2%. In 2024, the water loss was reported as 11%, which more closely reflects the water loss metrics from 2019 and prior.

The average and maximum day water usage in the past ten years is shown in **Figure 1.1** below:

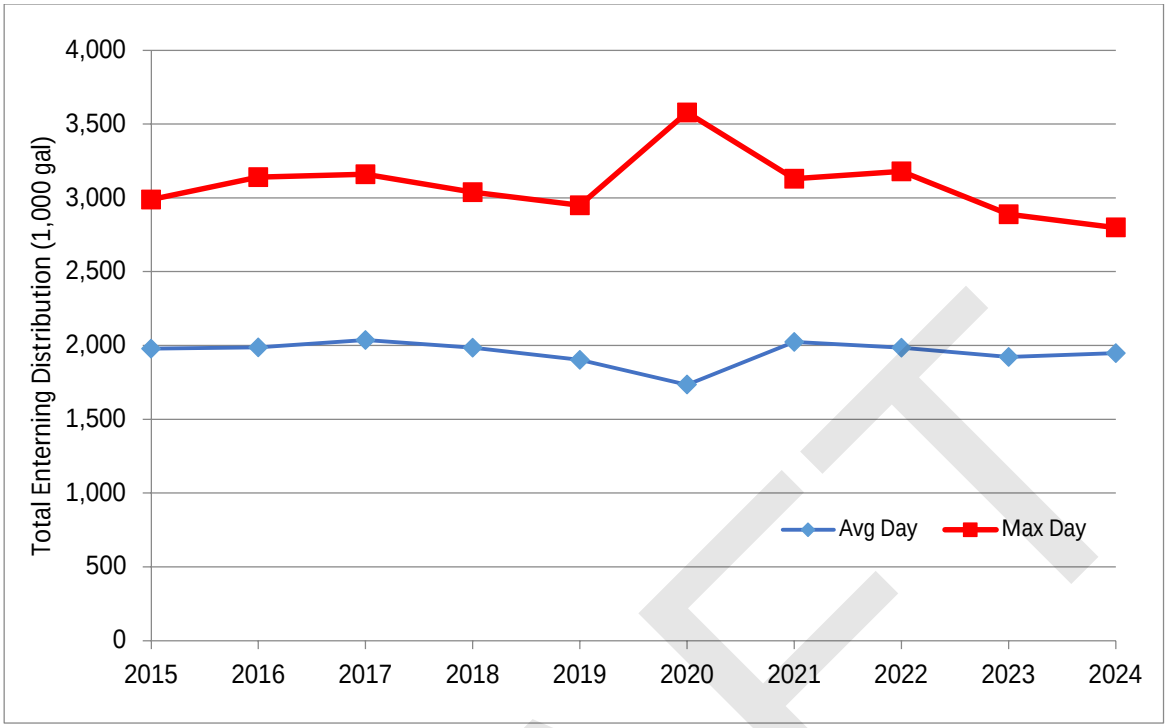

Figure 1.1 Average and Maximum Day Water Pumpage (2015-2024).

As shown, the year 2020 had a higher maximum day usage compared to the other years.

Table 1.4 shows a comparison of the top ten largest users for the Menomonie Water Utility. MSA Professional Services requested 2015-2024 data from the City of Menomonie, but all data preceding Fall 2018 could not be retrieved.

Table 1.4 Top Ten Largest Users in 1,000 Gallons (2019-2024).

Customer	# of meters	2019	2020	2021	2022	2023	2024
Cardinal Glass	1	54,065	53,147	53,513	49,636	50,045	52,664
UW Stout	43	36,568	24,555	29,351	32,873	31,451	37,747
Conagra	9	71,964	69,124	72,912	74,759	55,359	43,330
3M	2	39,027	40,665	43,459	46,131	44,868	44,377
Phillips	11	1,267	12,242	17,902	16,548	13,560	12,054
Ellsworth	1	0	0	0	7,857	14,201	15,585
City of Menomonie	40	11,542	10,075	13,956	14,006	15,412	16,560
Kwik Trip	12	5,740	10,029	11,171	11,128	12,239	12,755
Mayo	13	6,576	7,123	6,954	6,343	7,636	8,261
Dunn County	8	7,006	7,400	4,960	6,315	5,886	6,358
Total	**140**	**233,755**	**234,360**	**254,179**	**265,596**	**250,657**	**249,691**
NOTE: 3M second meter installed at the end of 2024; Ellsworth was a new customer in 2022.							

As shown, the top three largest users are Cardinal Glass, Conagra, and 3M. The comparison of their water usage with the total ten largest usage in 1,000 gallons are in **Figure 1.2** below:

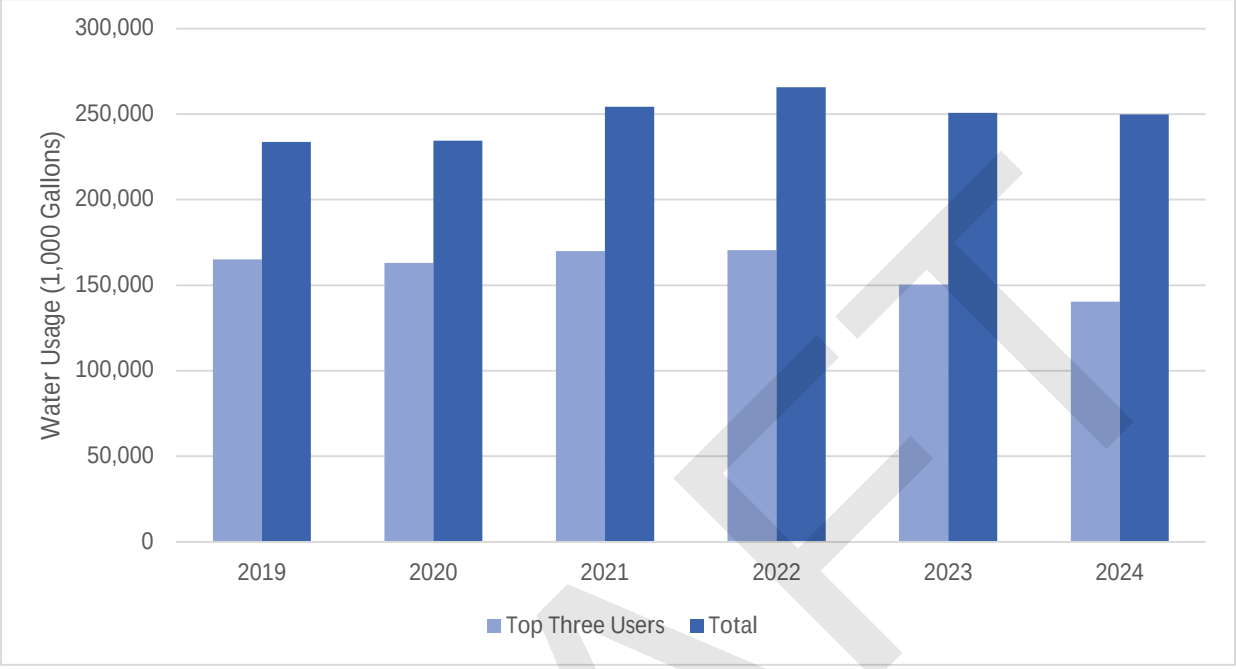

Figure 1.2 Top Three Largest vs. Top Ten Largest Water Usage (2019-2024).

This comparison shows that Cardinal Glass, Conagra, and 3M take up between 55% and 70% of the total top ten water usage.

1.4 POPULATION

The population reported by the 2010 and 2020 U.S. Census for the City of Menomonie was 16,264 and 16,843, respectively. The U.S. Census estimates the population density in people per square mile for 2010 and 2020 to be 1,230 and 1,188, respectively. The Census predicted the 2024 population of the City of Menomonie was 16,591.

According to the 2024 DOA population projections, the population of the City of Menomonie is expected to decline from 16,591 in 2024 to 15,125 in 2040 and 13,811 in 2050. This results in an approximate 17% decrease in population from 2024 to 2050.

Anecdotal evidence and current residential development trends indicate the City's population is increasing, which differs from the DOA projections. For a more conservative population projection and considering anecdotal evidence, it was assumed that the population would increase at a rate of 0.02% per year through 2045. This results in an estimated population of 16,661 in 2045. Historical U.S. Census population data and projected population estimates are included in **Table 1.5**.

Table 1.5 City of Menomonie Historical and Future Populations.

Year	Population	% Growth from Previous Year Listed	Source of Population Estimate
1970	11,112	-	U.S. Census
1980	12,769	14.9%	U.S. Census
1990	13,547	6.1%	U.S. Census
2000	14,937	10.3%	U.S. Census
2010	16,264	8.9%	U.S. Census
2020	16,843	3.6%	U.S. Census
2024	16,591	-1.5%	U.S. Census Estimate
2025	16,594	0.02%	Projection
2030	16,611	0.10%	Projection
2035	16,628	0.10%	Projection
2040	16,644	0.10%	Projection
2045	16,661	0.10%	Projection

For the purpose of this report, the population of Menomonie is projected to grow at an estimated rate of 0.02% per year from 2024 through 2045. This estimate differs from the DOA projections, but it is more conservative as it does not include a decline in population. Figure 1.3 shows the historical Census data, DOA population projections, and the proposed future design population projections.

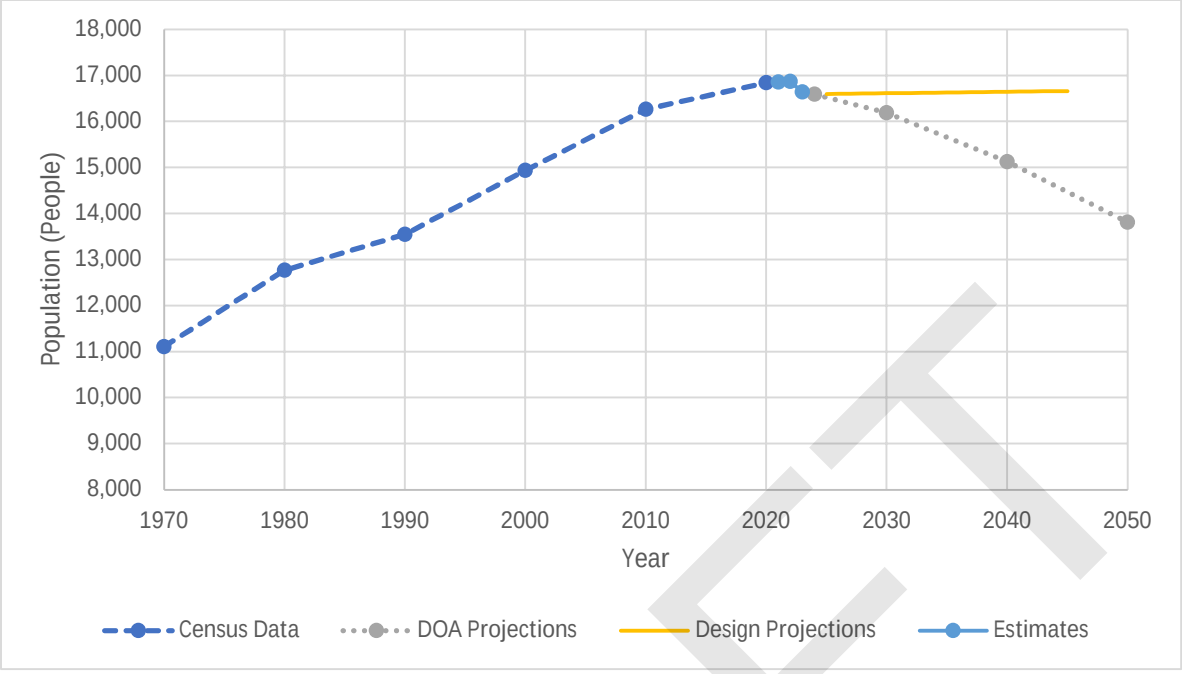

Figure 1.3 City of Menomonie Historical and Future Population Projections.

As shown and based on the proposed future growth rate, the population is projected to be approximately 16,661 by the design year of 2045.

1.5 CUSTOMER PROJECTIONS

The PSC annual reports include a breakdown of water sales by customer classification. Customer classifications include residential, commercial, industrial, public authority, and multifamily residential. **Figure 1.4** displays the 2024 sales of water by customer classification.

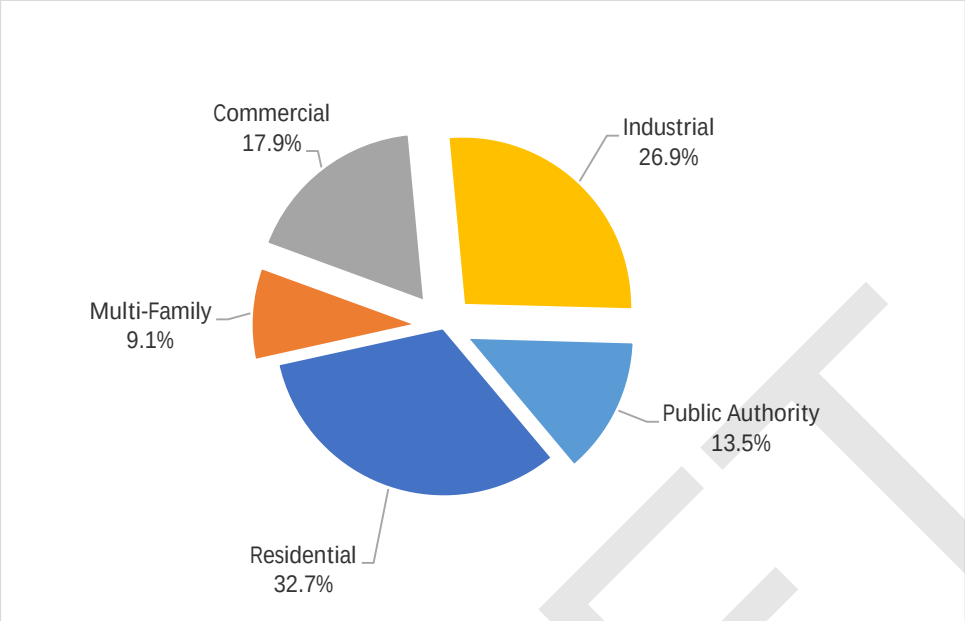

Figure 1.4 2024 Sales of Water by Customer Classification.

As shown, residential customers took up about 33% of the total sales of water in 2024 with industrial customers next taking up about 27%.

To project the number of future customers, historical PSC data was compiled to find patterns and verify linear fits for some customer categories. **Table 1.6** shows historical PSC water use customers. The 2016-2036 Comprehensive Plan was also reviewed to evaluate anticipated future growth areas. A map showing the future growth areas, per the 2016-2023 Comprehensive Plan, and proposed future watermain upgrades is shown in Appendix A3. These projections from the Comprehensive Plan and anecdotal evidence were considered when projecting future water use customers.

Table 1.6 City of Menomonie Retail Water Use Customers (2015-2024).

Year	Residential	Multi-Family	Commercial	Industrial	Public Authority
2015	4,245	143	537	33	159
2016	4,351	142	550	34	169
2017	4,394	141	552	34	167
2018	4,427	141	548	36	164
2019	4,468	142	550	36	176
2020	4,436	139	556	35	167
2021	4,549	142	565	36	177
2022	4,533	138	555	34	165
2023	4,456	132	550	35	163
2024	4,585	145	560	35	174
5-Year Avg	**4,512**	**139**	**557**	**35**	**169**
10-Year Avg	**4,444**	**141**	**552**	**35**	**168**

To project average water use per day (gcpd) of each five-year increment in the planning period, the five-year averages of the historical water usage was used. This best represents the recent usage to predict the future usage. The 10-year historical water usage is shown in **Table 1.7**.

Table 1.7 City of Menomonie Water Use Sales in 1,000 Gallons (2015-2024).

Year	Residential	Multi-Family	Commercial	Industrial	Public Authority
2015	169,936	42,382	88,294	139,533	73,958
2016	173,015	44,731	92,539	163,938	74,435
2017	164,700	43,287	88,773	192,251	68,855
2018	172,603	43,012	94,009	175,899	72,550
2019	166,182	44,902	88,809	181,893	68,340
2020	173,506	46,980	83,920	182,718	53,065
2021	181,683	57,515	94,499	193,903	61,870
2022	179,659	47,503	96,661	199,278	66,625
2023	177,065	57,479	96,151	183,101	64,526
2024	168,492	46,690	92,422	138,779	69,446
5-Year Avg	**176,081**	**51,233**	**92,731**	**179,556**	**63,106**
10-Year Avg	**172,684**	**47,448**	**91,608**	**175,129**	**67,367**

The number of residential and mutli-family residential customers were projected into the design year of 2045. Based on *census.gov*, it was estimated that there was 2.18 people per household in the City of Menomonie. The population estimate for the City was 16,591 in 2024 and there were 4,585 residential customers. The population in 'households' (residential + multifamily) was 13,407. This results in an estimate of 81% of the population of the City to be living in residential or multifamily households. Based on number of total households (residential + multifamily) and the corresponding number of customers for residential and multifamily, the resulting percentage of households that are residential and multifamily residential are 75% and 2%, respectively. Estimating an approximate future 2045 population of 16,661 would result in a projected estimate of 4,604 and 146 residential and multifamily residential water customers in 2045, respectively.

The number of commercial customers was projected to 2045 by assuming a linear projection based on the previous 10 years of data. This resulted in an estimate of 615 commercial customers.

The number of industrial customers does not necessarily correlate with the population changes in the City. Therefore, the number of industrial customers from the previous 10 years was evaluated along with anecdotal evidence of potential interest of new industries in the City. Over the last 10 years, the maximum and minimum number of industrial customers varied by three. For a conservative estimate, it is assumed that the number of industrial customers will increase by three every 10 years, so six new industrial customers are expected over the next 20-year period. This results in a projection of 42 industrial customers in 2045.

The number of public authority customers was evaluated over the previous 10 years to project the number of future customers. The previous 10 years have fluctuated in terms of public authority customers. A linear projection resulted in an estimate of 197 public authority customers in 2045.

Table 1.8 shows a summary of the 2024 and projected 2045 number of water customers by type for the City of Menomonie.

Table 1.8 Summary of Number of Current and Projected Water Customers.

Year	Residential	Commercial	Industrial	Public Authority	Multifamily Residential
2024	4,585	560	35	174	145
2045	4,604	615	42	197	146

As shown above, the number of residential customers are expected to be the largest water customer followed by commercial customers. The lowest number of customers is expected to be industrial customers.

1.6 CURRENT AND FUTURE DESIGN YEAR CONDITIONS

The current average day demand is assumed to be the average day demand in 2024 (1,948,900 gal/day). In 2023, the Menomonie City Council enacted restrictions to reduce peak water demand during the timeframe of June 1st to September 1st. The restrictions include "alternate side irrigation" which aims to minimize water usage during the summer months.

The current maximum day demand is assumed to be the highest maximum day demand in the last five years (3,180,000 gal/day in 2022). The maximum day pumpage values from the last five years were all attributed to actual usage (irrigation, high demand) as opposed to instantaneous/unplanned events (water main break or flushing).

The future design year (2045) average day pumpage was determined by summing the future projected water use by customer classification. Future projected water use by customer classification was determined by taking the average water use/customer/day (gpcd) times the number of customers for every five years within the planning period, summarized in **Table 1.9**. The average industrial water use was projected to increase due to anecdotal evidence of potential large industries coming to the City in the future. The average day water use was then increased by 20%**,** which is the five-year average that accounts for the total non-revenue water as a percentage of net water supplied to the system; this includes unbilled authorized water consumption and total water loss including apparent and real water losses. This resulted in the pumped average water demand, including revenue and non-revenue water which goes into the total water pumped to the system annually. The future design year average day pumpage is expected to be approximately 2,450,000 gpd.

The peaking factor, which is the ratio of maximum day pumpage and average day pumpage, was used to calculate the future design year maximum day pumpage. The five-year historical average peaking factor was 1.63, resulting in the future maximum day demand of approximately 4.0 million gpd.

Current and future estimated water demands as well as customer information used in calculations are included in **Table 1.9** below.

Table 1.9 Current and Future Water Demands

Year	Customer Type	Residential	Multifamily Residential	Commercial	Industrial	Public Authority	Total Avg. Water Use (gpd)	Pumped Avg. Day Water Demand (gpd)	Max Day Water Demand (gpd)
	Avg. Water Use/Customer/Day (gpcd)	106	988	443	22,600	979	-	-	-
Current (2024)	No. of Customers	4,585	145	560	35	174	-	-	-
	Avg. Water Use (gpd)	485,900	143,400	248,400	472,000	170,400	1,422,697	**1,984,900**	**3,180,000**
2025	No. of Customers	4,586	145	565	35	174	-	-	-
	Avg. Water Use (gpd)	486,000	143,400	250,600	796,700	170,200	1,846,900	**2,212,600**	**3,609,000**
2030	No. of Customers	4,591	145	578	37	179	-	-	-
	Avg. Water Use (gpd)	486,500	143,500	256,200	824,900	175,800	1,886,900	**2,260,600**	**3,687,300**
2035	No. of Customers	4,595	145	590	38	185	-	-	-
	Avg. Water Use (gpd)	487,000	143,700	261,700	857,900	181,300	1,931,600	**2,314,100**	**3,774,600**
2040	No. of Customers	4,600	145	603	40	191	-	-	-
	Avg. Water Use (gpd)	487,500	143,800	267,300	895,200	186,900	1,980,700	**2,372,900**	**3,870,500**
2045	No. of Customers	4,604	146	615	42	197	-	-	-
	Avg. Water Use (gpd)	487,900	144,000	272,900	948,000	192,500	2,045,300	**2,450,300**	**3,996,700**

The total average day water use is revenue water (sold to customers) and pumped average day water demand is revenue and non-revenue water (sold to customers plus events such as fire flow, for example), as per the PSC Annual Reports.

In summary, the design parameters for 2045 are as follows in **Table 1.10**.

Table 1.10 Summary of Design Parameters.

Design Parameter	Current (2024)	Design Year (2045)
Population	16,591	16,661
Average Day Demand	1,948,900 gallons (1,353 gpm)	2,450,000 gallons (1,702 gpm)
Maximum Day Demand	3,180,000 gallons (2,208 gpm)	3,997,000 gallons (2,775 gpm)

Using firm-well capacity and the current and future design year values for average day demand and maximum day demand, the firm-well run times were calculated and compared to the limits under Wisconsin DNR's Safe Drinking Water Loan (WDNR SDWL) values. The comparison of these values is shown in Figure 1.5.

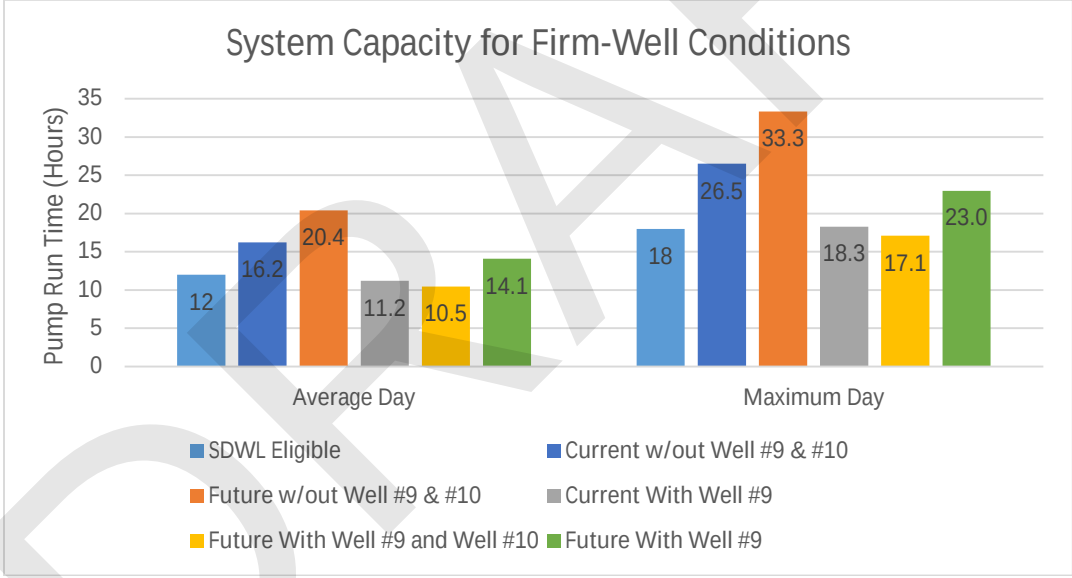

Figure 1.5 Firm-Well Pump Runtimes

The data shows that the City of Menomonie existing water system's capacity is not sufficient relative to WDNR SDWL values and additional water capacity is needed to meeting current and future demands. At the time of this report, new municipal Well #9 is in design and plans to be constructed in 2026. It is anticipated to achieve 900 gpm from Well #9. With Well #9, the City will barely be sufficient in firm-well average day demand pump runtimes, and will be just above the firm-well maximum day demand SDWL values. Therefore, future Well #10 is recommended to achieve additional water capacity for the City and be in compliance with WDNR SDWL values for firm-well average and maximum day conditions.

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CHAPTER 2 –WATER SUPPLY OPTIONS AND PLAN

2.1 CURRENT SYSTEM CAPACITY

- Well #4 (BF732) is located [redacted] and has a maximum capacity of 900 gpm.
- Well #6 (BF734) is located [redacted] and has a maximum capacity of 1,100 gpm.
- Well #8 (YQ310) is located [redacted] and has a maximum capacity of 1,100 gpm.
- The water system has a firm-well capacity of 2,000 gpm.

The WDNR Safe Drinking Water Loan Program limits the firm-well average day pump runtime to 12 hours, and the firm-well maximum day pump runtime to 18 hours.

To show that Menomonie's current average and maximum water demands are not being met, the following equations from the Wis. Admin. Code § PSC 184.04(3)(b) are used:

(1) SC = [FWC * (18 hours/24 hours)] – (MD / (24*60)) = -708 gpm

i. This equates to 26.5 hours of pump runtime.

(2) SC = [FWC * (12 hours/24 hours)] – (AD / (24*60)) = -353 gpm

i. This equates to 16.2 hours of pump runtime.

Where:

SC = spare capacity (gpm)
FWC = firm well (or source) capacity (gpm) = 2,000 gpm
MD = maximum day demand (gallons) = 3,180,000 gallons
AD = average day demand (gallons) = 1,948,000 gallons

As shown, the maximum day (1) and average day (2) spare capacities are negative, so therefore the demands are not currently being met for the City. Because of this, actions need to be taken to provide adequate water capacity to the City of Menomonie.

2.2 ALTERNATIVES

Four water supply alternatives were evaluated to fulfill the need of Menomonie's water supply for the planning period over the next twenty years:

- Alternative 1: Take no action.
- Alternative 2: Construct additional groundwater wells.
- Alternative 3: Increase the capacity of existing wells.
- Alternative 4: Seek service from neighboring community's water supply.

Alternative 1 does not address the concern that the City's water supply does not meet current or projected future demands under firm-well conditions. The City would need to continue to take action such as enforcing summer watering bans and over-using their existing well pumps and facilities. These options do not solve the issue over a long term.

Alternative 2 consists of constructing additional groundwater wells to meet current and future demands. As mentioned above, future Well #9 is currently in the design phase. This includes plans and specifications for Well #9 and corresponding treatment facility with the intention of bidding, constructing, and preparing the well to be online by the end of 2027 or beginning of 2028. The location of future Well #9 is at Wakanda Park in the City of Menomonie. Based on anticipated pumping capacity from the well (900 gpm), it is expected that the City will meet current average day demand, maximum day demand, and future average day demands under firm well conditions. However, additional source water is anticipated to be needed to meet future max day demands under firm well conditions. To meet future max day firm-well demands, an additional Well #10 would need to be constructed. If additional source water is still needed, additional groundwater wells would be an option.

Alternative 3 considers increasing the capacity of the existing wells, which is not feasible because the capacity of the wells is limited by the natural geology of the area.

Alternative 4 is seeking water supply from a neighboring community. A service line would need to be installed to transport water from this system's supply, which would span the distance to connect the neighboring community's and Menomonie's distribution systems. The nearest communities with public water systems include the Village of Knapp, Village of Elk Mound, Village of Colfax, and the City of Eau Claire. Due to the small size of the Village of Knapp, Village of Elk Mound, and Village of Colfax, compared to the size of the City of Menomonie, they were eliminated as a potential source of water supply for the City of Menomonie. Significant upgrades, likely to include additional water sources, and a transmission main would be needed for these municipalities to supply water to the City of Menomonie. The City of Eau Claire is approximately 21 miles from the City of Menomonie. At an assumed cost of $200 per linear foot for construction of a 10-inch water transmission main, the cost of the transmission water main alone would approach $22.25 million. Additional costs would be incurred for a booster station, flow metering/disinfection station, engineering, and permitting. The length and cost of a transmission main to interconnect the two cities does not make the City of Eau Claire an effective alternative for source water for the City of Menomonie. Overall, using a neighboring community's water supply is not feasible for Menomonie.

2.3 RECOMMENDATIONS

Alternative 1 (do nothing) and Alternative 3 (increase capacity of existing wells) are not recommended because they don't increase water capacity, a requirement to meet the City of Menomonie's needs, per DNR requirements of insufficient source capacity outline in the 2021 and 2024 DNR Sanitary Survey Reports.

Alternative 4, obtaining water supply from the City of Eau Claire, is not recommended from a cost perspective.

The recommended alternative for providing additional water capacity to the City of Menomonie is through the construction of additional municipal groundwater wells, described in Alternative 2. A

preliminary estimate for Well #9, Well #10, wellhouse for Well #10, raw water main to water treatment facility, and corresponding combined treatment facility for iron, manganese, and radium is approximately $15 million. This alternative is recommended with the understanding that the three existing municipal groundwater wells and corresponding treatment facilities would remain online and active, and the three existing elevated storage towers would be utilized for the new water produced from future Well #9 and Well #10. The location of Well #9 and water treatment facility in relation to the existing wells is shown in Appendix A2. Further, after Well #9 is constructed and online, the City is anticipating to move forward with the construction of future Well #10 and route a raw water transmission main to the treatment facility that houses Well #9. The design for future Well #9 and treatment facility considers optimizing space and equipment layout for a separate treatment train for future Well #10. The location of future Well #10 is yet to be determined. The goal is for Well #10 to achieve up to 1,200 gpm, but that is not guaranteed. For the purpose of this plan and report, it is assumed that Well #10 will achieve 1,000 gpm due to the existing well capacities. It was determined there is sufficient storage capacity to meet current and future demands in the City of Menomonie; additional storage is not expected to be required.

2.4 EXPECTED FUTURE SYSTEM CAPACITY

- Well #4 (BF732) has a maximum capacity of 900 gpm.
- Well #6 (BF734) has a maximum capacity of 1,100 gpm.
- Well #8 (YQ310) has a maximum capacity of 1,100 gpm.
- Well #9 has an expected maximum capacity of 900 gpm.
- Well #10 has an expected maximum capacity of 1,000 gpm.

The WDNR Safe Drinking Water Loan Program limits the firm-well average day pump runtime to 12 hours, and the firm-well maximum day pump runtime to 18 hours.

2.5 PROPOSED WELL #9

To show that Menomonie's projected future (2045) average and maximum water demands are still not met with only one additional well, Well #9, the following equations from the Wis. Admin. Code § PSC 184.04(3)(b) are used:

(1) SC = [FWC * (18 hours/24 hours)] – (MD / (24*60)) = -601 gpm

i. This equates to 23.0 hours of pump runtime.

(2) SC = [FWC * (12 hours/24 hours)] – (AD / (24*60)) = -251 gpm

i. This equates to 14.1 hours of pump runtime.

Where:

SC = spare capacity (gpm)
FWC = firm well (or source) capacity (gpm) = 2,900 gpm
MD = maximum day demand (gallons) = 3,250,000 gallons
AD = average day demand (gallons) = 1,992,000 gallons

As shown, the maximum day (1) spare capacity is negative and the average (2) spare capacity is negative, so the future demands would not be met if the City built only one additional well, assuming the well can achieve 900 gpm.

2.6 PROPOSED WELL #9 AND PLANNED WELL #10

To show that Menomonie's projected future (2045) average and maximum water demands are being met with proposed Well #9 and Well #10 added to the system, the following equations from the Wis. Admin. Code § PSC 184.04(3)(b) are used:

(3) SC = [FWC * (18 hours/24 hours)] – (MD / (24*60)) = +149 gpm

i. This equates to 17.1 hours of pump runtime.

(4) SC = [FWC * (12 hours/24 hours)] – (AD / (24*60)) = +249 gpm

i. This equates to 10.5 hours of pump runtime.

Where:

SC = spare capacity (gpm)
FWC = firm well (or source) capacity (gpm) = 3,900 gpm
MD = maximum day demand (gallons) = 3,250,000 gallons
AD = average day demand (gallons) = 1,992,000 gallons

As shown, the maximum day (1) and average (2) spare capacities are both positive, so the future demands would be met if the City builds the additional Well #9 and Well #10, assuming 900 gpm and 1,000 gpm, respectively.

2.7 POTENTIAL ENVIRONMENTAL IMPACTS

The City of Menomonie's geological formations include Cambrian bedrock, which is sandstone, shale, and dolomite. The local aquifer is of sandstone, and Menomonie is set in a location of "good" or better groundwater recharge. Modeling and calculations were completed for groundwater flow direction, zone of influence, and zone of contribution of the proposed Well #9 by the Wisconsin Rural Water Association (WRWA) Source Water Protection Program. The full report can be found in Appendix C1 and the ZOI Map found at Appendix C2.

It's not anticipated that any new municipal wells will affect the drawdown of existing wells. The following data shows the potential impact on the Mount Simon Sandstone Aquifer (Aquifer), of which all Menomonie's wells withdraw from. Much of this data was taken from the Well Construction Reports (WCR), Appendix B1 and Appendix B2. Geological predictions for proposed Well #9 were deduced from the geological logs of Wells #3, #5, and #6 in Appendix B3. From these mentioned documents and test well results, a final well detail was made for Well #9 and can be seen in Appendix B4. This detail was used for the anticipated values of the table below.

Table 2.1 Existing and Anticipated Well Data.

Well ID	Year Constructed	Well Casing Diameter (in)	Total Depth (ft)	Well Casing Depth (ft)	Specific Capacity (gpm/ft drawdown)	Static Water Level, Below Grade (ft)	Pumping Water Level, Below Grade (ft)	Pumping Capacity (gpm)
Menomonie 1 (ABD)	N/A	6.0	161	40	N/A	30	N/A	N/A
Menomonie 3 (ABD)	1932	16.0	396	165	31.37	53	104	1600
Menomonie 3-R (ABD)	1988	12.0	396	176	31.37	53	104	1600
Menomonie 4	1946	16.0	394	166	11.04	57	139	905
Menomonie 5 (ABD)	1954	16.0	475	260	8.00	149	262	900
Menomonie 6	1974	24.0	415	300	11.30	49	173	1400
Menomonie 7 (ABD)	N/A	24.0	265	265	N/A	60	N/A	N/A
Menomonie 8	2017	16.0	400	182	16.89	56	130	1250
Test Well #1 - Wakanda	2025	6.0	385	132	3.19	30	66	116
Test Well #2 - Phalen	2025	6.0	444	172	7.48	68	83	116
Proposed Well #9*	2026/27	16.0	365	150	10.59	30	115	900
NOTES: All data from date of construction.								**Operating Well**
ABD = Abandoned								Anticipated values*

The eight groundwater wells that have been previously constructed don't show a specific trend in specific capacity or static water level below grade, which would indicate the decreasing capacity of an aquifer. The Mount Simon Aquifer stretches across several states in the Midwest, including half of Wisconsin.

The Aquifer provides generally good quality water to its users and would be minimally affected by the construction of Well #9 and Well #10. The northwestern part of the state of Wisconsin commonly has groundwater that is high in iron, manganese, and radium. The three existing active wells have treatment for those contaminants, and it is anticipated to need treatment for Well #9 and Well #10 for iron, manganese, and radium. The water quality of the existing wells and the effectiveness of their respective treatments can be found in **Table 1.2**.

In the City of Menomonie, over half of the constructed wells have been properly abandoned. Therefore, contamination is not anticipated and no unexpected contamination has been found in well samples.

The surface water in the area includes Lake Menomin, the Red Cedar River, and Wilson, Gilbert, Irving, and Galloway Creeks. These are shown in relation to the City in Appendix A4. These water bodies are used for recreational purposes. There is minimal area of floodplains located in the Menomonie area. The endangered species of Menomonie are not located at the site of Well #9. The area of Well #9 is in a partially forested area of deciduous trees, which will minimally be affected by the construction of the well and water treatment facility. In conclusion, the construction

of a new municipal well and treatment facility will have a minimal negative impact on the environment of Menomonie.

Floodplains and flood risk areas in the City of Menomonie surround the surface water bodies, shown in Appendix A5. Well #9 site location is not impacted by floodplains, and future Well #10 will consider floodplains during the well siting process.

The Well #9 site location in Wakanda Park was evaluated for wetlands via a wetland delineation. The Wetland Determination Report can be found in Appendix C4 and a wetlands map created by the WDNR Surface Water Data Viewer is at Appendix A6.

The Wakanda Park site location is listed as “open space/natural areas/parks” in the City of Menomonie Comprehensive Plan 2016-2036. The site also houses the Ball Diamond #7 and the Menomonie City Park Maintenance building. The maintenance building was constructed between the 1990s to the early 2000s, and the ballpark was developed in the 2010s. Historical aerial images of this site indicate it has historically been used for agriculture and then an open park and ball field area. The actual proposed location of the well is southwest of the ball diamond and west of the maintenance building. While a final well location for future Well #10 has not been selected at the time of this report, it is anticipated that the location of the well will be on a City-owned parcel to have cost savings from not needing to purchase additional land. Impacts to environmentally sensitive areas will be evaluated during the well siting process for future Well #10.

2.8 Plan Consistency

In the Comprehensive Plan 2016-2036, the City of Menomonie outlines that the community may need an additional 400 acres of land for residential, commercial, and industrial uses. Both this Report and the Comprehensive Plan used the DOA projections to estimate growth, but this Report uses most recent data from 2024, whereas the Comprehensive Plan used 2013 projections. Therefore, these documents may vary on future water demand, but they agree on a general growth of the City’s water needs. The recommendation explained in this Report will provide the water demand that’s needed to reflect the growth in the Comprehensive Plan. Therefore, these documents include consistent ideas.

2.9 Public Participation

The City of Menomonie will publish a Notice of a Public Comment Opportunity on November 12, 2025 in the Colfax Messenger and on its webpage and will accept Public Comments via e-mail until December 12, 2025. The City of Menomonie will incorporate all Public Comments into the final plan document prior to submission to Wisconsin Department of Natural Resources.

2.10 Plan Implementation and Update Process

The City of Menomonie will monitor changes in water use and population and update the plan as needed based on discussions with professionals and as development continues.

CHAPTER 3 –SUMMARY AND RECOMMENDATIONS

3.1 SUMMARY AND RECOMMENDATIONS

As outlined in the report, the City of Menomonie has a need for additional water capacity to increase the reliability of its existing water system and to meet the current and future water demands. A new groundwater well is the recommended alternative for the City of Menomonie. A WSIR has been submitted to WDNR for approval prior to June 30, 2025 with a SDWLP application. It is recommended that the City proceed with the construction of a final Well #9 at the proposed site where the Wakanda Park test well was constructed. The final well should be tested and evaluated for water quantity and quality and associated treatment facilities should be designed and constructed to provide treated water to the distribution system. Future Well #10 is also recommended to be designed and constructed in the near future to meet future max day demands under firm well conditions.

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APPENDIX A

Maps

A1 – Wisconsin with Great Lakes Basins
A2 – Menomonie Water System Map
A3 – Water System Map Future Projections
A4 – Surface Water Map
A5 – Floodplain Map
A6 – Wetlands Map

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APPENDIX A1

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

State of WI with Great Lakes Basin

Legend: (some map layers may not be displayed)

Great Lakes and Mississippi Basins

- Lake Michigan Basin
- Lake Superior Basin
- Mississippi River Basin
- water
- State Boundaries
- County Boundaries
- Tribal Lands

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

Map: 0 212,000 424,000 Feet

0 60,000 120,000 Meters

Service Layer Credits:
Cities, Roads & Boundaries: , Surface Water (Cached): WiDNR, USGS, and other data

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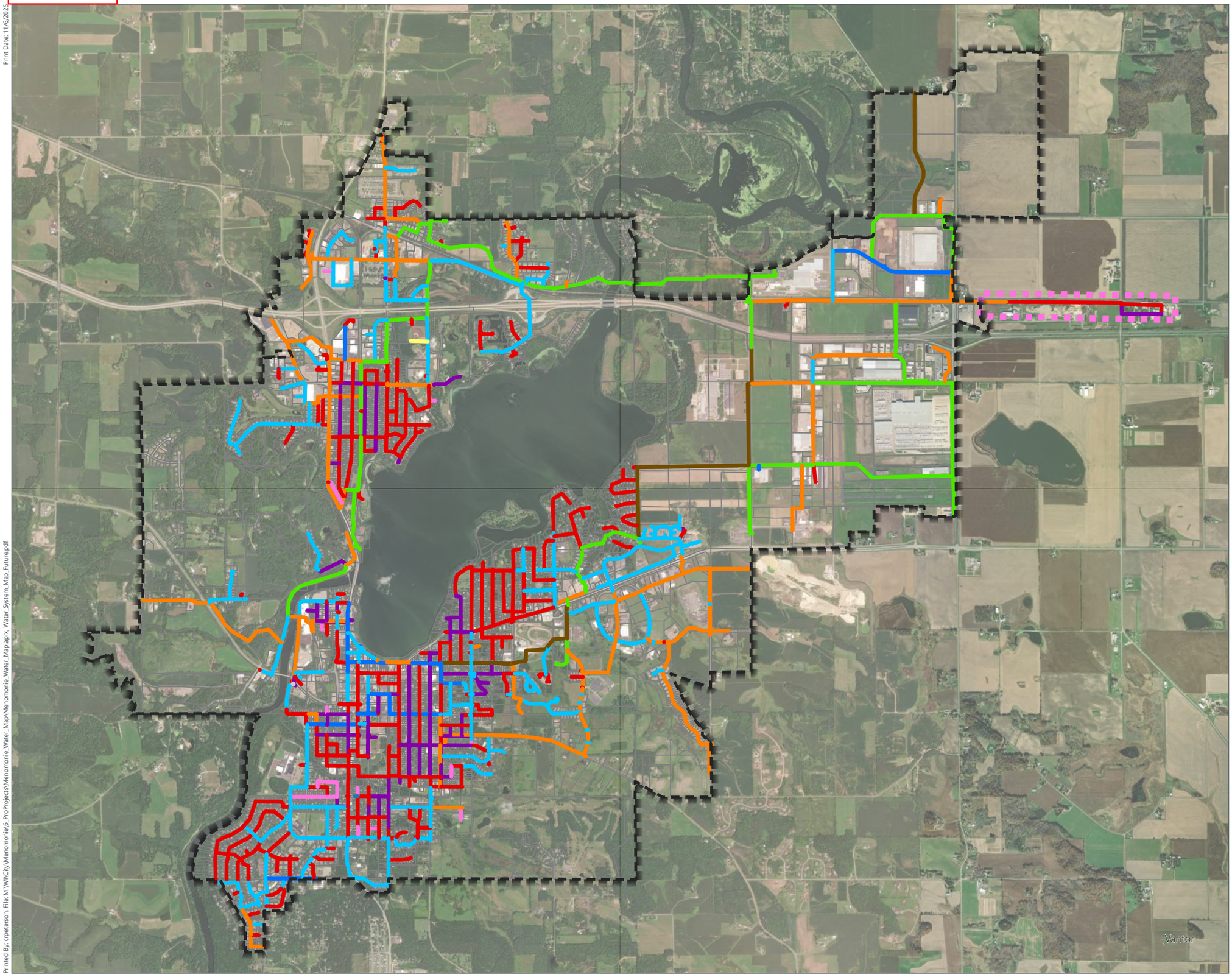
APPENDIX A2

Print Date: 11/6/2025



WATER SYSTEM MAP

REDACTED

CITY OF MENOMONIE,
DUNN COUNTY, WISCONSIN

- Municipal Boundary/Water Service Area
- Water Service Area Outside of Municipal Boundary

Water Mains

- Unknown
- 1 1/2"
- 2"
- 4"
- 6"
- 8"
- 10"
- 12"
- 14"
- 16"
- 20"

Data Sources:
MSA Professional Services, Dunn County, ESRI,
**Data Updated 2025*

MSA

0 1,000 2,000 Feet

N

Printed By: cpeterson, File: M:\WI\City\Menomonie\6_ProProjects\Menomonie_Water_Map\Menomonie_Water_Map.aprx, Water_System_Map_Future.pdf

APPENDIX A3

WATER SYSTEM MAP

PROPOSED UPGRADES AND GROWTH

CITY OF MENOMONIE, DUNN COUNTY, WISCONSIN

- Municipal Boundary/Water Service Area
- Water Service Area Outside of Municipal Boundary
- Water Mains
- Future Looping = New Main
- Future Upgrade 6" or 8"
- Future Upgrade Transmission Line
- Future Industrial Growth
- Future Commercial Growth
- Future Residential Growth
- Future Mixed-Use Growth

Notes:
1. Future Growth areas are from the 2016-2036 Comprehensive plan. Amended June 3rd, 2024.
2. Proposed Watermain upgrades are from the Water System Demand and Capacity Study, May 8, 2023.

Data Sources:
MSA Professional Services, Dunn County, ESRI,
**Data Updated 2025*

Vantor

MSA

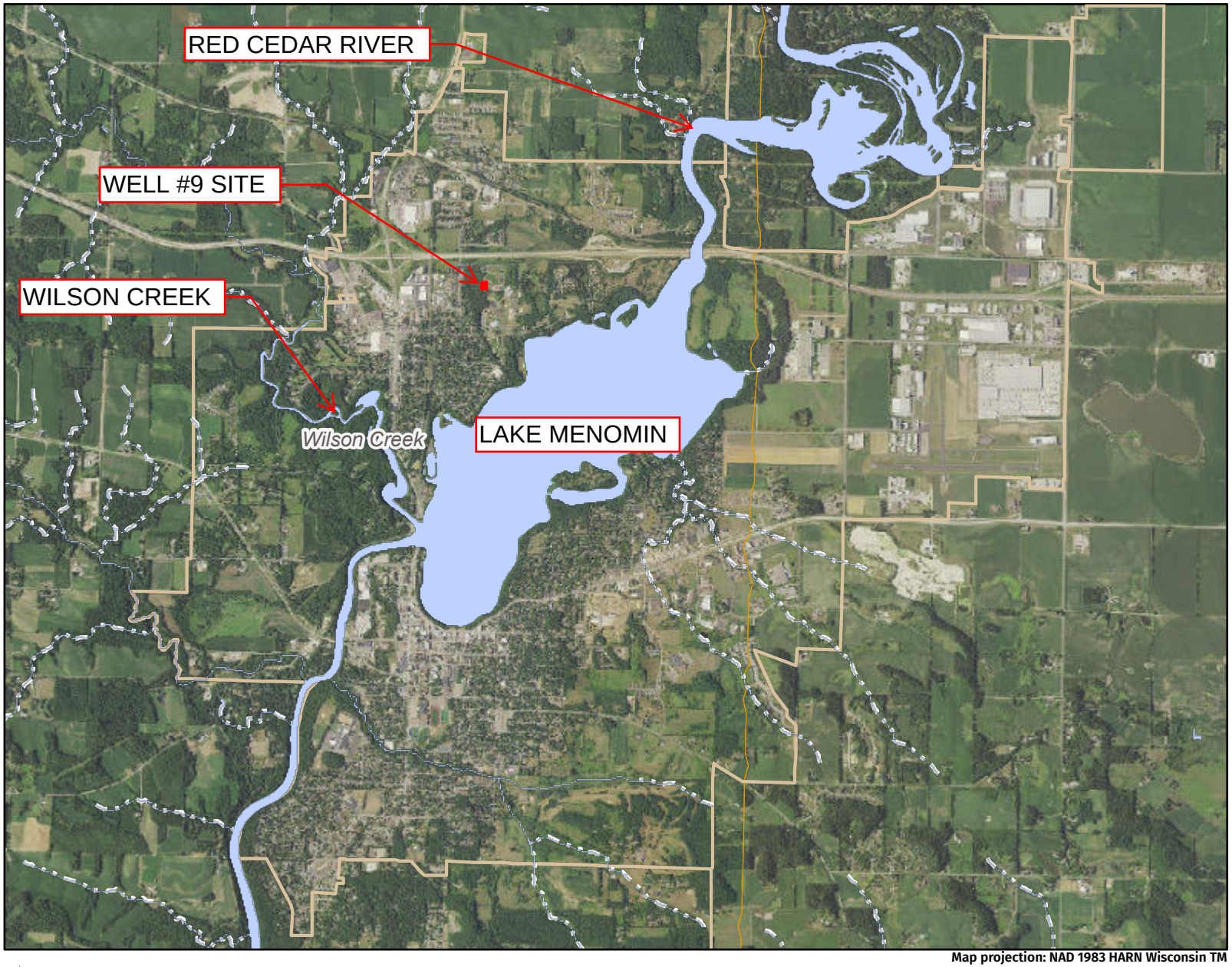
0 1,000 2,000 Feet

N

APPENDIX A4

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

City of Menomonie
Surface Water Map



Legend: (some map layers may not be displayed)

- Rivers and Streams
- Intermittent Streams
- Open Water
- 24K Intermittent Streams
- 24K Lakes and Open Water

Cities, Towns & Villages

- City
- Civil Town
- Latest Leaf On Index
- Latest Leaf On Imagery

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

Map: 0 4,000 8,000 Feet
0 1,000 2,000 Meters

Service Layer Credits:
Latest Leaf On: , DNR Basic Feature Vector Tile Layer WTM: , Surface Water (Cached): WiDNR, USGS, and other data

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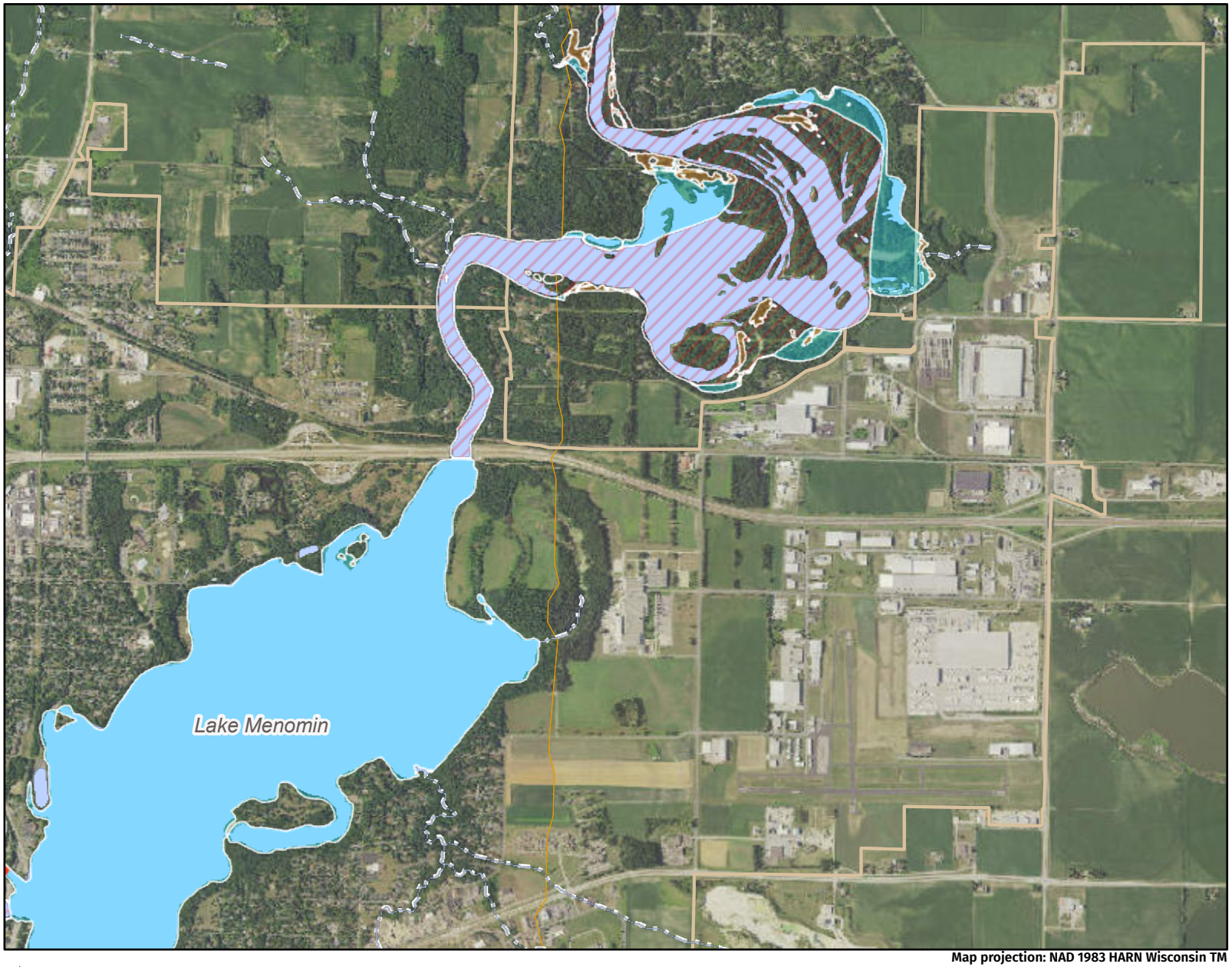
APPENDIX A5

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

City of Menomonie
NE Floodplains Map



Legend: (some map layers may not be displayed)

Flood Hazard Boundaries
- Limit Lines
- SFHA / Flood Zone Boundary

Flood Hazard Zones
- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- 0.2% Annual Chance Flood Hazard
- Rivers and Streams
- Intermittent Streams
- Open Water
- 24K Intermittent Streams
- 24K Lakes and Open Water

Cities, Towns & Villages
- City
- Civil Town
- Latest Leaf On Index
- Latest Leaf On Imagery

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

Map: 0 2,500 5,000 Feet
0 750 1,500 Meters

Service Layer Credits:
Digitial FEMA Floodplains (National Flood Hazard Layer)*: , Latest Leaf On: , DNR Basic Feature Vector Tile Layer WTM: , Surface Water (Cached): WiDNR, USGS, and other data

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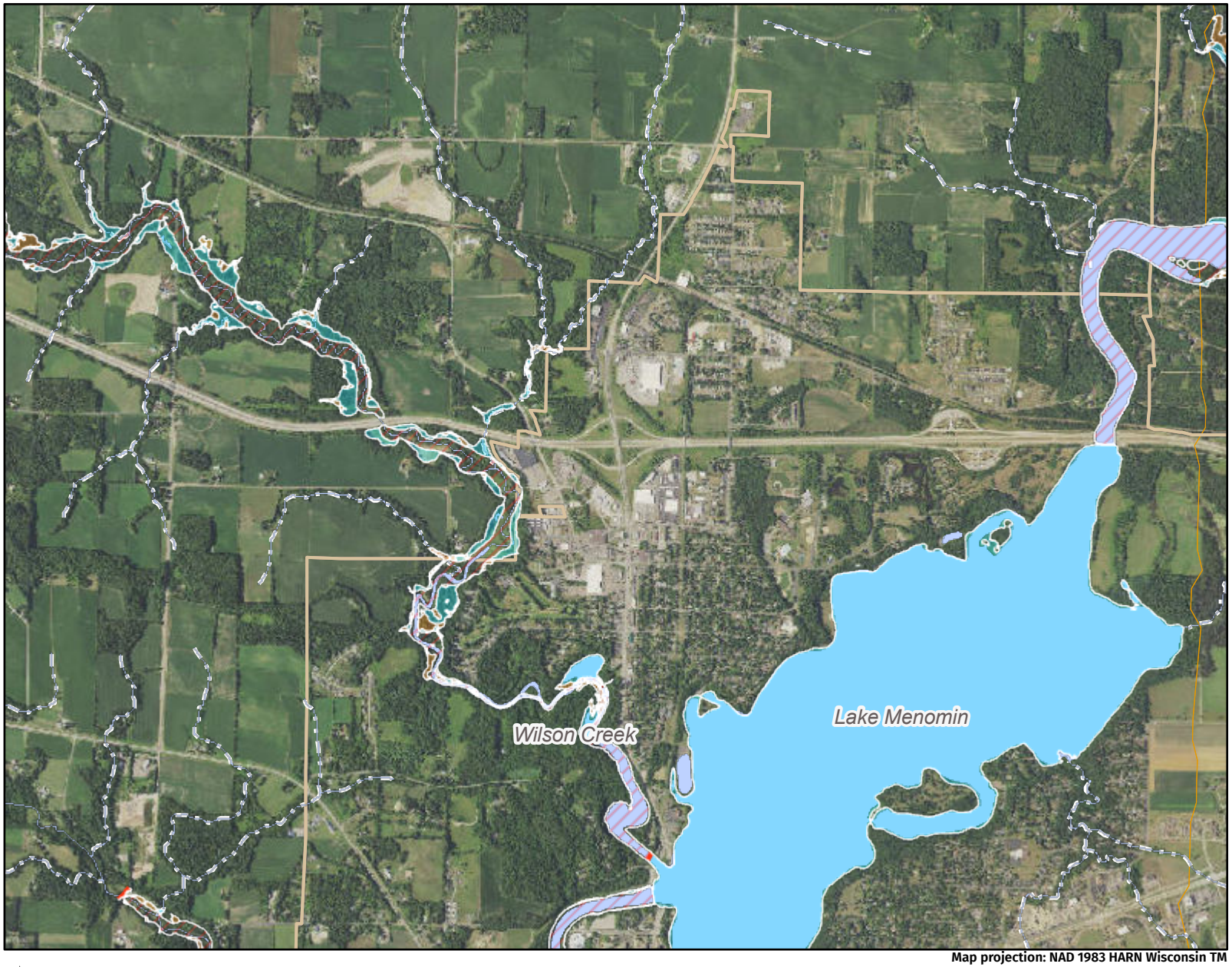
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

City of Menomonie
NW Floodplains Map



Legend: (some map layers may not be displayed)

Flood Hazard Boundaries
- Limit Lines
- SFHA / Flood Zone Boundary

Flood Hazard Zones
- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- 0.2% Annual Chance Flood Hazard
- Rivers and Streams
- Intermittent Streams
- Open Water
- 24K Intermittent Streams
- 24K Lakes and Open Water

Cities, Towns & Villages
- City
- Civil Town
- Latest Leaf On Index
- Latest Leaf On Imagery

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

Map: 0 2,500 5,000 Feet
0 750 1,500 Meters

Service Layer Credits:
Digitial FEMA Floodplains (National Flood Hazard Layer)*: , Latest Leaf On: , DNR Basic Feature Vector Tile Layer WTM: , Surface Water (Cached): WiDNR, USGS, and other data

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WISCONSIN DEPARTMENT OF NATURAL RESOURCES

City of Menomonie
S Floodplains Map

Legend: (some map layers may not be displayed)

Flood Hazard Boundaries
- Limit Lines
- SFHA / Flood Zone Boundary

Flood Hazard Zones
- 1% Annual Chance Flood Hazard
- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- 0.2% Annual Chance Flood Hazard
- Rivers and Streams
- Intermittent Streams
- Open Water
- 24K Intermittent Streams
- 24K Lakes and Open Water

Cities, Towns & Villages
- City
- Civil Town
- Latest Leaf On Index
- Latest Leaf On Imagery

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

Map: 0 2,500 5,000 Feet
0 750 1,500 Meters

Service Layer Credits:
Digitial FEMA Floodplains (National Flood Hazard Layer)*: , Latest Leaf On: , DNR Basic Feature Vector Tile Layer WTM: , Surface Water (Cached): WiDNR, USGS, and other data

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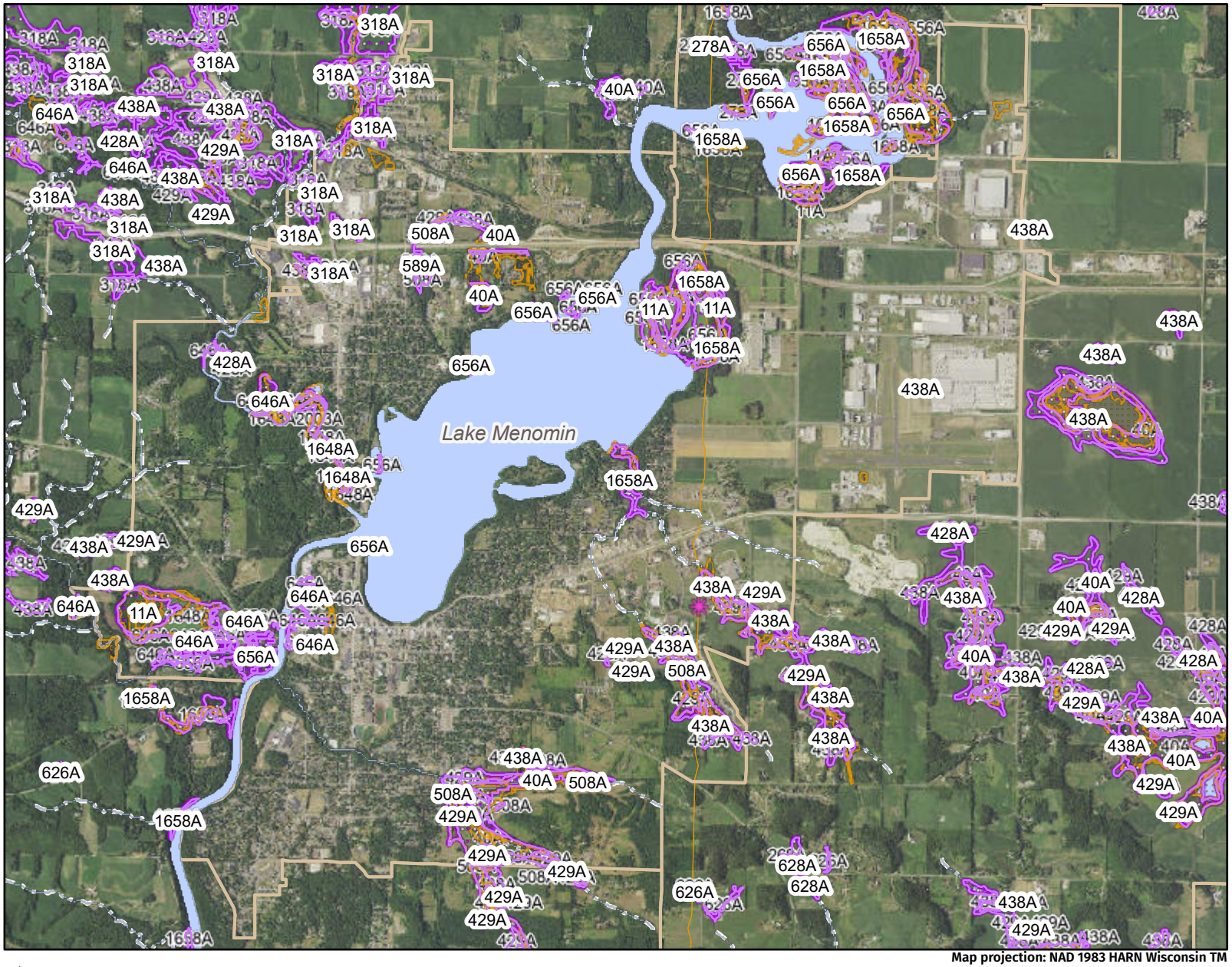
APPENDIX A6

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

City of Menomonie
Wetlands Map



Legend: (some map layers may not be displayed)

- Wetland Indicators

Wetland Class Points

- Dammed pond
- Excavated pond
- Wetland too small to delineate
- Wetland Class Areas
- USDA Wetspots
- Wetland Indicators
- Rivers and Streams
- Intermittent Streams
- Open Water
- 24K Intermittent Streams
- 24K Lakes and Open Water

Cities, Towns & Villages

- City
- Civil Town
- Latest Leaf On Index
- Latest Leaf On Imagery

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

Map: 0 3,000 6,000 Feet
0 1,000 2,000 Meters

Service Layer Credits:
Wetland Indicators & Soils^: Surface Water Data Viewer Team, Latest Leaf On: , DNR Basic Feature Vector Tile Layer WTM: , Wetland Inventory NWI (Cached): , Surface Water (Cached): WiDNR, USGS, and other data

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APPENDIX B

Existing Well Documents

B1 – Existing Well Construction Reports for Well #4, #6, #8
B2 – Test Well Construction Reports
B3 – Geological Logs for Wells #3, #4, #5, and #6

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APPENDIX B1

Well Construction Report
WISCONSIN UNIQUE WELL NUMBER BF732

Drinking Water and Groundwater - DG/5
Department of Natural Resources, Box 7921
Madison WI 53707

Form 3300-077A

Property Owner: MENOMONIE, CITY OF			Phone #: (715)235-0888
Mailing Address: 800 WILSON AVE			
City: MENOMONIE	State: WI	Zip Code: 54751	
County: Dunn	Co. Permit #:	Notification #:	Completed: 01-01-1947

1. Well Location: City of MENOMONIE

Fire # (if avail.):

Subdivision Name:

Lot #:

Block #:

Well Constructor (Business Name): KEYS WELL DRILLING CO	Lic. #: 338	Facility ID # (Public Wells): 617026850	Method Code: GPS008
Address: 413 N LEXINGTON AVE ST PAUL MN 55104		Well Plan Approval #:	
		Approval Date (mm-dd-yyyy): 10-18-1946	
Hicap Permanent Well #: 77852	Common Well #: 004	Specific Capacity: 11	

or Govt Lot #	Section	Township	Range
	23	28 N	13 W

2. Well Type New Well

of previous unique well # constructed in

Reason for replaced or reconstructed well ?

3. Well serves # of

Municipal/Community

Heat Exchange____# of drillholes

Hicap Well ?

Hicap Property ?

Hicap Potable ?

Construction Type: Drilled

4. Potential Contamination Sources - ON REVERSE SIDE

5. Drillhole Dimensions and Construction Method

Dia. (in.)	From (ft.)	To (ft.)
24	Surface	394

Upper Enlarged Drillhole / Lower Open Bedrock

- Rotary - Mud Circulation .....
- Rotary - Air .....
- Rotary - Air & Foam .....
- Drill-Through Casing Hammer
- Reverse Rotary
- Cable-tool Bit ____in. dia...
- Dual Rotary .....
- Temp. Outer Casing ____in. dia
  Removed? ____depth ft. (If NO explain on back side)

8. Geology

Geology Codes				8. Geology Type, Caving/Noncaving, Color, Hardness, etc...	From (ft.)	To (ft.)
		S		SAND	Surface	25
Y		N		SANDSTONE EAU CLAIRE	25	55
	H	N	M	SILTSTONE EC	55	60
G		H	M	SHALE EC	60	75
	H	N	M	SILTSTONE EC	75	125
G		N		SANDSTONE EC	125	130
	H	N	M	SILTSTONE @ SHALE EC	130	160
	H	N	M	SANDSTONE @ SILTSTONE MT SIMON	160	255
G		H	M	SHALE-MT SIMON	255	260
	H	N	M	SANDSTONE & SILTSTONE-MT SIMON	260	393
		A		CONGLOMERATE-MT SIMON	393	394

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
24		Surface	31.5
16		0	166.1
Dia. (in.)	Screen type, material & slot size	From (ft.)	To (ft.)

7. Grout or Other Sealing Material

Method

Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
CEMENT	Surface	166.1	

9. Static Water Level	11. Well Is
57 ft. below ground surface	0 in. _____ grade
10. Pump Test	Developed ?
Pumping level 139 ft. below surface	Disinfected ?
Pumping at 905 GP M for 24 Hrs.	Capped ?
Pumping Method ?	

12. Notified Owner of need to fill & seal ?

Filled & Sealed Well(s) as needed?

13. Constructor / Supervisory Driller	Lic #	Date Signed
Drill Rig Operator	Lic or Reg #	Date Signed

4a. Potential Contamination Sources Is the well located in floodplain ?

Comment:

Water Quality Text:

Water Quantity Text:

Difficulty Text:

Created On: 01-05-1999 Created by: HFRC LOAD Updated On: 10-24-2002 Updated by: WELL PROCESS

Well Construction Report
WISCONSIN UNIQUE WELL NUMBER BF734

Drinking Water and Groundwater - DG/5
Department of Natural Resources, Box 7921
Madison WI 53707
Form 3300-077A

Property Owner: MENOMONIE, CITY OF		Phone #: (715)235-0888
Mailing Address: 800 WILSON AVE		
City: MENOMONIE	State: WI	Zip Code: 54751

County	Co. Permit #	Notification #	Completed
Dunn			01-01-1975

Well Constructor (Business Name)	Lic. #	Facility ID # (Public Wells)
KEYS WELL DRILLING CO	338	617026850

Address: 413 N LEXINGTON AVE
ST PAUL MN 55104

Well Plan Approval #: 74-0713
Approval Date (mm-dd-yyyy): 08-26-1974

Hicap Permanent Well #	Common Well #	Specific Capacity
77854	006	13.6

3. Well serves # of
Municipal/Community
Heat Exchange____# of drillholes

Hicap Well ?
Hicap Property ?
Hicap Potable ?

1. Well Location
City of MENOMONIE

Fire # (if avail.)

Subdivision Name	Lot #	Block #

Method Code: GPS008

or Govt Lot #	Section	Township	Range
	26	28 N	13 W

2. Well Type New Well
of previous unique well # constructed in

Reason for replaced or reconstructed well ?

Construction Type: Drilled

4. Potential Contamination Sources - ON REVERSE SIDE

5. Drillhole Dimensions and Construction Method

Dia. (in.)	From (ft.)	To (ft.)
30	Surface	25
29	25	300
23	300	415

Upper Enlarged Drillhole
Lower Open Bedrock

- Rotary - Mud Circulation .....
- Rotary - Air .....
- Rotary - Air & Foam .....
- Drill-Through Casing Hammer
- Reverse Rotary
- Cable-tool Bit ____in. dia...
- Dual Rotary .....
- Temp. Outer Casing ____in. dia
  Removed? ____depth ft. (If NO explain on back side)

8. Geology

Geology Codes				8. Geology Type, Caving/Noncaving, Color, Hardness, etc...	From (ft.)	To (ft.)
Y		N		SANDSTONE WONEWOC	Surface	50
	N	N		SANDSTONE EAU CLAIRE	50	65
		H		SHALE EC	65	80
	N	N		SANDSTONE EC	80	165
		N		SANDSTONE MT SIMON	165	405
T		A		CONGLOMERATE MT SIMON	405	415

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
30	BLK STEEL PIPE 118 # PER FT	Surface	25
24	BLK STEEL PIPE 94# PER FT-2' ABOVE SURFACE	0	300
Dia. (in.)	Screen type, material & slot size	From (ft.)	To (ft.)

7. Grout or Other Sealing Material

Method

Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
NEAT CEMENT	Surface	300	

9. Static Water Level
69.9 ft. below ground surface

10. Pump Test
Pumping level 172.9 ft. below surface
Pumping at 1400 GP M for 24 Hrs.
Pumping Method ?

11. Well Is
0 in. _____ grade
Developed ?
Disinfected ?
Capped ?

12. Notified Owner of need to fill & seal ?

Filled & Sealed Well(s) as needed?

13. Constructor / Supervisory Driller	Lic #	Date Signed
Drill Rig Operator	Lic or Reg #	Date Signed

4a. Potential Contamination Sources Is the well located in floodplain ?

Comment:

Water Quality Text:

Water Quantity Text:

Difficulty Text:

Created On: 01-05-1999 Created by: HFRC LOAD Updated On: 10-24-2002 Updated by: WELL PROCESS

Well Construction Report
WISCONSIN UNIQUE WELL NUMBER YQ310

Drinking Water and Groundwater - DG/5
Department of Natural Resources, Box 7921
Madison WI 53707
Form 3300-077A

Property Owner: MENOMONIE, CITY OF			Phone #: (715)232-2395
Mailing Address: 800 WILSON AVE			
City: MENOMONIE	State: WI	Zip Code: 54751	
County: Dunn	Co. Permit #:	Notification #:	Completed: 09-08-2017

1. Well Location
City of MENOMONIE

Fire # (if avail.):

Subdivision Name | Lot # | Block #

Well Constructor (Business Name): MUNICIPAL WELL & PUMP/MIDWEST WELL	Lic. #: 13	Facility ID # (Public Wells): 617026850	Method Code: GPS008
Address: 1212 STORBECK DR, WAUPUN WI 53963		Well Plan Approval #: 2017-0135	
		Approval Date (mm-dd-yyyy): 05-22-2017	
Hicap Permanent Well #: 91687	Common Well #: 008	Specific Capacity: 16.9	

or Govt Lot #:	Section: 26	Township: 28 N	Range: 13 W

2. Well Type New Well
of previous unique well # constructed in

Reason for replaced or reconstructed well ?

3. Well serves # of MUNICIPALITY
Municipal/Community
Heat Exchange____# of drillholes

Hicap Well ? Yes
Hicap Property ? Yes
Hicap Potable ? No

Construction Type: Drilled

4. Potential Contamination Sources - ON REVERSE SIDE

5. Drillhole Dimensions and Construction Method

Dia. (in.)	From (ft.)	To (ft.)
24	Surface	62
19	62	182
15	182	400

Upper Enlarged Drillhole		Lower Open Bedrock
No	Rotary - Mud Circulation	No
No	Rotary - Air	No
No	Rotary - Air & Foam	No
No	Drill-Through Casing Hammer	
Yes	Reverse Rotary	
No	Cable-tool Bit ____in. dia...	No
No	Dual Rotary	No
Yes	Temp. Outer Casing 24in. dia	
Yes	Removed? 62depth ft. (If NO explain on back side)	

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
16	ASTM A53B, STEEL, .375 BEV/PE FOR WELDING	Surface	182

8. Geology

Geology Codes				8. Geology Type, Caving/Noncaving, Color, Hardness, etc...	From (ft.)	To (ft.)
-	-	S	G	SAND, W/GRAVEL/COBBLES/BOULDERS/STONES	Surface	3
-	-	I	W	SOIL-ORGANIC, W/WOOD	3	13
-	-	S	G	SAND, W/GRAVEL/COBBLES/BOULDERS/STONES	13	30
R	-	C	-	RED, CLAY	30	35
G	-	C	-	GRAY, CLAY	35	60
E	N	M	N	GREEN, FINE, SILT, W/SANDSTONE	60	115
T	-	N	-	TAN/BROWN, SANDSTONE	115	130
G	-	C	H	GRAY, CLAY, SHALEY	130	135
Y	B	N		YELLOW, BROKEN, SANDSTONE	135	151
I		N		WHITE, SANDSTONE	151	162
T		N		TAN/BROWN, SANDSTONE	162	182
T		N	H	TAN/BROWN, SANDSTONE, SHALEY	182	330
Y		N	H	YELLOW, SANDSTONE, SHALEY	330	350
I		N	H	WHITE, SANDSTONE, SHALEY	350	395
		Q		GRANITE	395	400

Dia. (in.)	Screen type, material & slot size	From (ft.)	To (ft.)

7. Grout or Other Sealing Material

Method

Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
NEAT CEMENT GROUT	Surface	182	420 S

9. Static Water Level

56 ft. below ground surface

10. Pump Test

Pumping level 130 ft. below surface

Pumping at 1250 GP M for 24 Hrs.

Pumping Method ?

11. Well Is

24 in. above grade

Developed ? Yes

Disinfected ? Yes

Capped ? Yes

12. Notified Owner of need to fill & seal ? No

Filled & Sealed Well(s) as needed? No

13. Constructor / Supervisory Driller	Lic #	Date Signed
TG		09-25-2017
Drill Rig Operator	**Lic or Reg #**	**Date Signed**
MR		09-25-2017

4a. Potential Contamination Sources Is the well located in floodplain ? No

Type	Qualifier	Distance	Type	Qualifier	Distance
Building Overhang		80	Shoreline/Pool		200

Comment:

Water Quality Text:

Water Quantity Text:

Difficulty Text:

Created On: 10-20-2017 Created by: WELL CONST LOAD Updated On: 06-29-2018 Updated by: giffojapua

APPENDIX B2

Well Construction Report
WISCONSIN UNIQUE WELL NUMBER: ACB844

Drinking Water and Groundwater - DG/5
Department of Natural Resources, Box 7921
Madison WI 53707
Form 3300-077A

Property Owner: CITY OF MENOMONIE	Phone #
Mailing Address: 621 11TH AVENUE WEST	
City: MENOMONIE	State: WI / Zip Code: 54751
County: Dunn	Co. Permit # / Notification # / Completed: 02-03-2025
Well Constructor (Business Name): CTW CORP	Lic. #: 364 / Facility ID # (Public Wells)
Address: 21500 W GOOD HOPE RD, LANNON WI 53046-9720	Well Plan Approval # / Approval Date (mm-dd-yyyy)
Hicap Permanent Well # / Common Well #	Specific Capacity: 7.5

1. Well Location

City of MENOMONIE — Fire # (if avail.)

Street Address or Road Name and Number: PHELAN STATE PARK

Subdivision Name / Lot # / Block #

Latitude / Longitude in Decimal Degree (DD): 44.859 °N -91.9174 °W — Method Code: GPS008

SE	SE	Section	Township	Range
or Govt Lot #		35	28 N	13 W

2. Well Type New Well

of previous unique well # — constructed in

Reason for replaced or reconstructed well ?

Construction Type: Drilled

3. Well serves 1 # of TEST WELL
Test Well

Heat Exchange____# of drillholes

Hicap Well ? No
Hicap Property ? No
Hicap Potable ? No

4. Potential Contamination Sources - ON REVERSE SIDE

5. Drillhole Dimensions and Construction Method

Dia. (in.)	From (ft.)	To (ft.)
10	Surface	172
6	172	444

Upper Enlarged Drillhole		Lower Open Bedrock
No	Rotary - Mud Circulation	No
No	Rotary - Air	Yes
No	Rotary - Air & Foam	No
No	Drill-Through Casing Hammer	
No	Reverse Rotary	
No	Cable-tool Bit ____in. dia...	No
Yes	Dual Rotary	No
Yes	Temp. Outer Casing 10in. dia	
Yes	Removed? 39depth ft. (If NO explain on back side)	

8. Geology

Geology Codes	Type, Caving/Noncaving, Color, Hardness, etc...	From (ft.)	To (ft.)
S	S-SAND	Surface	39
N	N-SANDSTONE	39	444

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
6	NEW PLN END BLACK STEEL NUCOR 18.97 .280 A53	Surface	172
Dia. (in.)	Screen type, material & slot size	From (ft.)	To (ft.)

9. Static Water Level

67.6 ft. below ground surface

10. Pump Test

Pumping level 83.1 ft. below surface
Pumping at 116 GP M for 24 Hrs.
Pumping Method ? Test Pump

11. Well Is

24 in. above grade
Developed ? Yes
Disinfected ? Yes
Capped ? Yes

7. Grout or Other Sealing Material

Method: TREMIE PIPE - PUMPED

Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
NEAT CEMENT GROUT	Surface	172	65 S

12. Notified Owner of need to fill & seal ? No

Filled & Sealed Well(s) as needed? No

13. Constructor / Supervisory Driller	Lic #	Date Signed
TS	6667	02-17-2025
Drill Rig Operator	**Lic or Reg #**	**Date Signed**
TB	6900	02-17-2025

4a. Potential Contamination Sources Is the well located in floodplain ? No

Comment:

Created On: 02-17-2025 Created by: TROYSIMONAR Updated On: 02-17-2025 Updated by: TROYSIMONAR

Well Construction Report
WISCONSIN UNIQUE WELL NUMBER ZZ262

Drinking Water and Groundwater - DG/5
Department of Natural Resources, Box 7921
Madison WI 53707
Form 3300-077A

Property Owner: CITY OF MENOMONIE			Phone #
Mailing Address: 621 11TH AVENUE WEST			
City: MENOMONIE	State: WI	Zip Code: 54751	
County: Dunn	Co. Permit #	Notification #	Completed: 02-03-2025

Well Constructor (Business Name): CTW CORP	Lic. #: 364	Facility ID # (Public Wells)	
Address: 21500 W GOOD HOPE RD LANNON WI 53046-9720		Well Plan Approval #	
		Approval Date (mm-dd-yyyy)	
Hicap Permanent Well #	Common Well #	Specific Capacity: 3.2	

3. Well serves 1 # of TEST WELL
Test Well
Heat Exchange____# of drillholes

Hicap Well ? No
Hicap Property ? No
Hicap Potable ? No

1. Well Location
City of MENOMONIE

Fire # (if avail.)

Street Address or Road Name and Number
WAKANDA PARK

Subdivision Name	Lot #	Block #

Latitude / Longitude in Decimal Degree (DD)				Method Code
44.9046 °N	-91.9217 °W			GPS008

NW	SE	Section	Township	Range
or Govt Lot #		14	28 N	13 W

2. Well Type New Well
of previous unique well # constructed in

Reason for replaced or reconstructed well ?

Construction Type: Drilled

4. Potential Contamination Sources - ON REVERSE SIDE

5. Drillhole Dimensions and Construction Method

Dia. (in.)	From (ft.)	To (ft.)
10	Surface	132
6	132	385

Upper Enlarged Drillhole		Lower Open Bedrock
No	Rotary - Mud Circulation	No
No	Rotary - Air	Yes
No	Rotary - Air & Foam	No
No	Drill-Through Casing Hammer	
No	Reverse Rotary	
No	Cable-tool Bit ____in. dia...	No
Yes	Dual Rotary	No
Yes	Temp. Outer Casing 10in. dia	
Yes	Removed? 30depth ft. (If NO explain on back side)	

8. Geology

Geology Codes				Type, Caving/Noncaving, Color, Hardness, etc...	From (ft.)	To (ft.)
		S		S-SAND	Surface	32
		N		N-SANDSTONE	32	385

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
6	NEW PLN END BLACK STEEL NUCOR 18.97 .280 A53	Surface	132
Dia. (in.)	Screen type, material & slot size	From (ft.)	To (ft.)

9. Static Water Level
29.7 ft. below ground surface

10. Pump Test
Pumping level 66.1 ft. below surface
Pumping at 116 GP M for 24 Hrs.
Pumping Method ? Test Pump

11. Well Is
24 in. above grade
Developed ? Yes
Disinfected ? Yes
Capped ? Yes

7. Grout or Other Sealing Material
Method TREMIE PIPE - PUMPED

Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
NEAT CEMENT GROUT	Surface	132	62 S

12. Notified Owner of need to fill & seal ? No

Filled & Sealed Well(s) as needed? No

13. Constructor / Supervisory Driller	Lic #	Date Signed
TS	6667	02-10-2025
Drill Rig Operator	**Lic or Reg #**	**Date Signed**
TB	6900	02-10-2025

4a. Potential Contamination Sources Is the well located in floodplain ? No

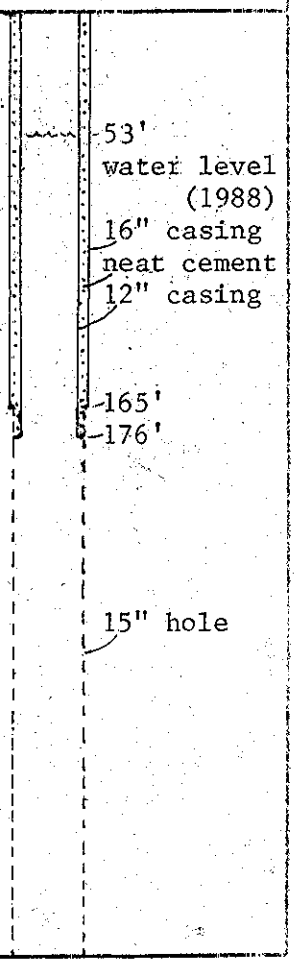
Comment:

Created On: 02-07-2025 Created by: TROYSIMONAR Updated On: 02-24-2025 Updated by: TROYSIMONAR

APPENDIX B3

CITY WELL NO. 3, MENOMONIE, WIS.
J. E. Johnson, Supt.
Drilled, 1932
Samples collected by A. C. Trowbridge
Samples examined by F. T. Thwaites, Nos. 89442-89450
SW¼, SE¼, NW¼, NE¼, SW¼, sec. 26, T. 28N., R. 13W.
860' ETM

DRIFTEAU CL.	46	0-46	46		No samples, drift?
		46-72	26		Shale, gray-green, dolomitic
		72-130	58		Shale, silty, greenish-gray, slightly dolomitic
	116	130-162	32		Shale, silty, gray and yellowish-gray
MT. SIMON		162-180	18		Sandstone, medium, gray and yellow-gray
		180-335	155		Sandstone, medium to coarse, white (only one sample)
		335-380	45		Sandstone, fine to coarse, pebbles up to ¼ inch, light yellowish-gray
	232	380-394	14		Sandstone, medium to coarse, white

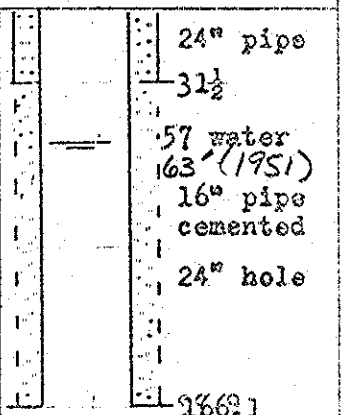


Well #3 is located on the lake side of Crescent between Second Street & Sixth Avenue.

1988: 12" 3/8" wall A53 Grade B 49.56#/ft steel casing installed from 0 to 176'
Neat cement added from 0 to 176'.
Well tested for 2 hours at 1600 GPM with 51 feet of drawdown.
Static water level = 53'.
Well reconstructed by Keys Well Drilling Co. and completed 6/6/88.
DNR Permanent Well #77851.

CITY WELL NO. 4, MENOMONIE, WIS. NW¼SW¼ sec. 23,
Tainter St. and Hopwood Ave., T. 28 N., R. 13 W.
Keys Well Drilling Co., Contractors, 1947
Samples examined by F. T. Thwaites, Nos. 132717-132796

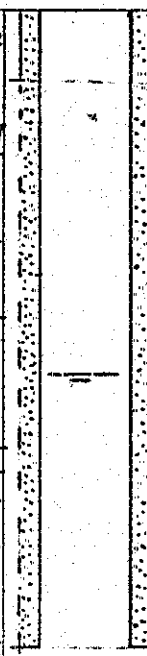
DR		0-10	10	Sand, pebbly to coarse, brown, glacial
	25	10-25	15	Sand, fine to medium, brown-gray
EAU CLAIRE		25-40	15	Sandstone, fine to medium, light yellow-gray
		40-55	15	Sandstone, fine, light yellow-gray
		55-60	5	Siltstone, light yellow-gray
		60-75	15	Shale, silty, micaceous, light gray
		75-125	50	Siltstone, light gray
		125-130	5	Sandstone, fine, silty, light gray
		130-145	15	Siltstone, light gray, glauconitic, slight-d.
		145-150	5	Shale, silty, light gray
	135	150-160	10	Siltstone, light gray
MT SIMON		160-165	5	Sandstone, fine, silty, light gray
		165-170	5	Sandstone, coarse to fine, light gray
		170-185	15	Sandstone, medium to fine, light gray
		185-200	15	Sandstone, fine, light gray
		200-210	10	Siltstone, light gray
		210-215	5	Siltstone, sandy, light gray
		215-230	15	Siltstone, light gray
		230-235	5	Siltstone, sandy, light gray
		235-250	15	Siltstone, light gray
		250-255	5	Siltstone, sandy, light gray
		255-260	5	Shale, silty, light gray
		260-265	5	Siltstone, light gray
		265-280	15	Siltstone, sandy, light gray
		280-295	15	Siltstone, light gray
		295-320	25	Siltstone, sandy, light gray
		320-330	10	Sandstone, fine, silty, light gray
		330-340	10	Siltstone, light gray
		340-345	5	Sandstone, fine, silty, light gray
		345-355	10	Sandstone, fine to medium, light gray
		355-360	5	Siltstone, sandy, gray
		360-365	5	Sandstone, fine to medium, light gray
		365-380	15	Sandstone, very coarse to fine, light gray
		380-393	13	Sandstone, fine to very fine, light gray
	234	393-394	1	Conglomerate, quartz pebbles



CITY WELL NO. 5, MENOMONIE, WIS.

Water tower, 9th Ave. and 12th St., Elevation 962 $SW\frac{1}{4}, SW\frac{1}{4}$, sec. 26, T. 28 N., R. 13 W.
J. R. Donaldson, Engineer Keys Well Drilling Co., Contractors, 1954
Samples examined by F. T. Thwaites, Wisconsin Geological Survey, Nos. 166039-166132

EAU CLAIRE	0-15	15		No sample 0-5; siltstone, pink-gray, yel.-gy.
	15-40	25		Siltstone, gray-yellow to pale olive, dolomitic
	40-60	20		Sandstone, fine to medium, light yel-gy, lt.gy
	60-85	25		Sandstone, fine to coarse, light gray
	85-95	10		Sandstone, medium to fine, yellow-orange
	95-125	30		Sandstone, fine to medium, yellow-gray
	125-135	10		Siltstone, sandy, light gray
	135-185	50		Sandstone, very fine to silty, light gray, glauconitic
	185-190	5		Siltstone, light gray
	190-200	10		Sandstone, very fine to silty, light gray
	200-210	10		Siltstone, sandy, medium-gray, dolomitic
	210-225	15		Sandstone, very fine, silty, light gray
	225-230	5		Siltstone, light gray
	230-245	15		Sandstone, very fine, silty, light gray
260	245-260	15		Siltstone, sandy, light gray
MT. SIMON	260-275	15		Sandstone, silty to medium, light gray
	275-295	20		Siltstone, light gray
	295-305	10		Sandstone, silty to medium, light gray
	305-315	10		Sandstone, fine to medium, light gray
	315-325	10		Sandstone, very fine to medium, light gray
	325-335	10		Sandstone, silty to fine, light gray
	335-340	5		Siltstone, light gray
	340-345	5		Sandstone, fine to medium, light gray
	345-350	5		Siltstone, light gray
	350-370	20		Sandstone, silty to coarse, light gray
	370-380	10		Sandstone, fine to coarse, light gray
	380-405	25		Siltstone, light gray
	405-410	5		Sandstone, coarse to fine, light gray
	410-415	5		Sandstone, silty to fine, very light gray
	415-420	5		Sandstone, fine to coarse, light brown-gray
	420-440	20		Sandstone, silty to fine, light g ray
	440-450	10		Sandstone, fine to medium, light gray
	450-460	10		Siltstone, light gray, gray-pink
215	460-475	15		Sandstone, fine to coarse, light gray
$\frac{1}{2}$	475-475½	$\frac{1}{2}$		Sandstone, very coarse to fine, light gray



Tested 11 24 hours at 900 g.p.m. specific capacity = 8.0 g.p.m./ft.
Additiona l copies may be secured from Wisconsin Geological Survey, Science Hall, Madison 6, Wis.

UNIVERSITY OF WISCONSIN GEOLOGICAL & NATURAL HISTORY SURVEY
1815 University Avenue, Madison, Wisconsin 53706

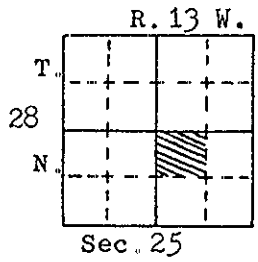
Log No. F96-Du-271

Well name Menomonie City Well #6

Owner.... City of Menomonie
Address.. City Hall
Menomonie, WI 54751
Driller... Keys Well Drilling Co.
Engineer. Owen Ayres & Associates
Menomonie, Wisconsin

County: Dunn

Completed... 1/75
Field check.
Altitude..... 885' ETM
Use..... Municipal
Static w.l... 69'10"
Spec. cap.... 14 GPM/ft.



Quad. Menomonie North 7½'

Drill Hole						Casing & Liner Pipe or Curbing							
Dia.	from	to	Dia.	from	to	Dia.	Wgt.& Kind	from	to	Dia.	Wgt.& Kind	from	to
29"	0	300'				30"	Bk. Steel Pipe - 118/ft.	0	25'	24"	Bk. Steel Pipe - 94/ft.	+2'	300'
23"	300'	425'											

Grout	from	to
Neat Cement	0	300'

Drilling method: Cable Tool
Samples from 0 to 415' Rec'd: 4/2/75

Studied by: Mary J. Hartman

Issued: 10/5/83

Formations: Wonewoc Formation, Eau Claire Formation, Mt. Simon Sandstone.

Remarks: Well tested for 24 hours at 1400 GPM with 103 feet of drawdown.
Driller reports total well depth of 425'.

LOG OF WELL:

	Depths	Graphic Section	Rock Type	Color	Grain Size Mode	Grain Size Range	Miscellaneous Characteristics
WONEWOC	0-5		Sandstone	Yellow	C	Vfn/VC	Rnd. Trace yl siliceous shale coating grains, mafic inclusions.
	5-10		"	"	"	"	Same.
	10-15		"	"	"	"	"
	15-20		"	"	"	"	"
	20-25		"	Bn yellow	"	"	Rounded. Trace very good silica cement, mafic inclusions.
	25-30		"	Ol yellow	"	"	Rounded. Trace yellow shale, mafic inclusions.
	30-35		"	"	"	"	Rounded. Trace v G sil cement, yellow shale, mafic inclusions.
	35-40		"	"	"	"	Same.
	40-45		"	"	"	"	"
50'	45-50		"	Bn yellow	M/C	"	"
EAU CLAIRE	50-55		"	"	Fn	"	Srnd. Tr v G sil cem, mfc incl. Mch silt. Ltl gry dolic shale.
	55-60		"	"	"	Vfn/C	Sang. Trace v G silica cement, gray shale, mafic inclusions.
	60-65		"	Olive gray	"	Vfn/M	Sang. Much P sil shale cement, silt, Trace mafic grains.
	65-70		Shale	"	—	—	Siliceous. Much Fn floating sand, silt.
	70-75		"	"	—	—	Same plus much Fn glauconite.
	75-80		"	"	—	—	Same.
	80-85		Sandstone	Olive	Fn	Vfn/C	Subangular. Much poor siliceous shale cement, Fn glauconite.
	85-90		"	"	Vfn	"	Subrounded. Much poor siliceous shale cement, Fn glauconite.
	90-95		"	"	Fn	"	Same.
	95-100		"	"	"	"	Srnd. Ltl P sil shale cement. Mch Fn glauconite. Tr bn shale.
	100-105		"	Olive gray	"	"	Same.
	105-110		"	Olive	"	Vfn/M	Srnd. Much P siliceous shale cement. Little Fn glauconite.
	110-115		"	"	"	"	Same.
	115-120		"	Olive gray	"	"	Srnd. Mch P to v G slgtly dolic sh cem. Tr gry sh, Fn glauc, pyr.
	120-125		"	"	"	"	Same but no pyrite.
	125-130		"	"	"	"	Same.
	130-135		"	"	"	"	"
	135-140		"	"	"	"	"
	140-145		"	"	"	"	"
	145-150		"	"	"	"	"
	150-155		"	"	"	"	"
	155-160		"	Gray	"	Vfn/C	Same plus trace pyrite.

UNIVERSITY OF WISCONSIN GEOLOGICAL & NATURAL HISTORY SURVEY
1815 University Avenue, Madison, Wisconsin 53706

Log No. F96-Du-271

Well name: Menomonie City Well #6

E.C.	Depths	Graphic Section	Rock Type	Color	Grain Size Mode	Grain Size Range	Miscellaneous Characteristics
115'	160-165	G	Sandstone	Gray	Fn	Vfn/C	Srnd. Mch P to v G slgtly dolic sh cem. Tr gry sh,Fn glauc,pyr.
	165-170		"	"	C	Vfn/VC	Rnd. Mch P dolic sh cem. Tr pyr fils on grns,gry sh,mfc incl.
	170-175		"	"	"	"	Same.
	175-180		"	"	"	"	"
	180-185		"	"	"	"	Rnd. Tr P dol cem,pyr fils on grns,bk sh,mfc incl. Well sorted.
	185-190		"	"	"	"	Rnd. Ltl P dolic sh cem. Tr pyrite,mfc incl. Poorly sorted.
	190-195		"	Gray brown	M	"	Same.
	195-200		"	"	"	"	Same but very poorly sorted.
	200-205		"	"	"	"	Same.
	205-210		"	Olive gray	"	"	Srnd. Mch P sil sh cement. Tr pyrite. Very poorly sorted.
	210-215		"	"	Fn	"	Srnd. Mch P sil sh cement. Tr gry shale. Very poorly sorted.
	215-220		"	Gray brown	"	"	Same.
	220-225		"	Lt bn gray	VC	"	Rnd. Tr P sil cem. pyr, mfc incl. Ltl fros. Few qtz grans.
	225-230		"	Gray brown	M	"	Srnd. Ltl P sil cement. Few quartz grans. Tr pyrite, frosting.
	230-235		"	"	VC	"	Rnd. Ltl P sil sh cem. Few quartz grans. Mch fros. Tr pyrite.
	235-240		"	Lt bn gray	Fn	"	Srnd. Mch P sil sh cement. Tr quartz grans(frosted). pyrite.
	240-245		"	Olive gray	VC	"	Rnd. Ltl P sil sh cem. Mch fros. Tr pyr,mfc incl,qtz grans.
	245-250		"	Lt ol gray	C	"	Srnd. Mch P sil sh cem. Tr mfc incl. frosting, quartz grans.
	250-255		"	Light gray	M	"	Srnd. Little P silica cement. Trace mafic inclusions, pyrite.
	255-260		"	Lt bn gray	"	"	Rounded. Trace poor silica cement, mafic grains, frosting.
	260-265		"	"	"	"	Same.
	265-270		"	"	C	"	"
	270-275		"	"	"	"	"
	275-280		"	Olive gray	M	"	Rnd. Ltl P sil sh cem. Few sec qtz grwths. Tr fros,mfc incl.
	280-285		"	Lt bn gray	C	"	Same. Poorly sorted.
	285-290		"	"	"	"	"
	290-295		"	"	M	"	"
	295-300		"	Pale olive	C	"	Rnd. Ltl P sil sh cem,fros. Mny sec qtz grwths. Tr pyr,mfc incl.
	300-305		"	"	"	"	Rnd. Mch P sil sh cem. Tr rd wl cem Fn ss,fros qtz grans,gn gry
	305-310		"	"	"	"	Rnd. Ltl P sil sh cem. Few sec qtz grwths. mic sh,mfc incl.
	310-315		"	"	Fn	"	Srnd. Mch P to v G sil sh cem. Tr pyr,mfc incl,zircon grns.
	315-320		"	Lt ol gray	"	"	Same but no pyrite. Tr pyrite,gry mic shale,mfc incl.
	320-325		"	Pale olive	C	"	Rnd. Mch P to v G sil sh cem. Tr gn gry mic sh,mfc incl,fros
	325-330		"	"	"	"	Rnd. Ltl P to v G sil sh cem. Tr zircon grns. qtz grans.
	330-335		"	V pl ol	"	"	Same. mfc incl,fros,mica.
	335-340		"	"	"	"	Rnd. Trace P to v G sil shale cement,mafic incl,frosting,mica.
	340-345		"	"	"	"	Same plus trace quartz granules. sh w/mch Fn fltg qtz snd.
	345-350		"	"	VC	"	Rnd. Tr P to v G sil sh cem,qtz grans,mfc incl. Ltl fros,gry
	350-355		"	Lt yl bn	C	"	Rnd. Tr P sil cem,mfc incl,zircon grns,pnk wl cem Fn ss,mica.
	355-360		"	Brown	"	"	Rnd. Mch P hemic sh cem,silt. Tr qtz grans. fros,qtz grans.
	360-365		"	Yl brown	VC	"	See end of log. mfc incl,mica,fros.
	365-370		"	Bn yellow	"	"	Rnd. Ltl P to v G sil sh cem,fros. Tr mfc incl,quartz grans.
	370-375		"	Pl yellow	C	"	Rnd. Tr v G sil cem,mfc incl,qtz grans,fros. Poorly sorted.
	375-380		"	"	M	"	Srnd. Tr P sil cem,mfc incl,pl yl sh,mica,fros. V poorly srtd.
	380-385		"	"	C	"	Rnd. Tr P to v G sil cem,mfc incl,qtz grans,mica. Mch fros. V
	385-390		"	Brown	VC	"	Srnd. Ltl P hemic sh cem. Tr v G sil cem,mfc poorly srtd.
	390-395		"	"	"	"	Same but no chert. incl,qtz grans,cht. Mch fros. V poorly srtd.
	395-400		"	Lt brown	"	"	Srnd. Ltl P to v G sil cem. Mch fros. Tr mfc incl,qtz grans. V
	400-405		"	Lt yl bn	"	"	Same but few quartz granules(many fractured). poorly srtd.
250'	405-410		Cong.	V pl brown	M peb	Gran/L peb	Srnd. Ltl P to v G sil cem. Mch qtz snd,fros. Mny frac grns.
	410-415		"	"	"	"	Subrounded. Little poor to very good Tr pyr & mfc incl. silica cement. Much quartz sand, frosting. Many fractured grains. Trace mafic inclusions, smoky quartz.
				END OF LOG			
	360-365		Sandstone	Yl brown	VC	Vfn/VC	Rounded. Little poor yellow shale cement (limonite?), frosting. Trace mafic inclusions, quartz granules.

MT. SIMON SANDSTONE

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APPENDIX C

Well #9 Supporting Documents

C1 – Groundwater Contour and Zone of Contribution/Recharge Map
C2 – Zone of Influence Map
C3 – Proposed Well #9 Detail
C4 – Well #9 Site Wetland Delineation Report

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APPENDIX C1

City of Menomonie, Proposed Well #9 Groundwater Flow Direction, Zone of Influence and Zone of Contribution (Recharge Area)

Modeling and ZOI Calculations done by WRWA Source Water Protection Program, A. Aslesen, June 2025.

GROUNDWATER FLOW DIRECTION

In a groundwater flow system, groundwater moves continuously from areas of recharge to areas of discharge. The direction of groundwater flow may be inferred from the regional topography and the slope of the water table. The water table is the upper limit of the aquifer and is measured in "head" or elevation above sea level. The water table is estimated by looking at water levels in wells that have a screened interval within the aquifer, which provides a point of measurement of water table elevation. The best available water table map for the area was developed by the Wisconsin Geological and Natural History Survey (Lippelt, 1988). A local portion of the water table map is shown in Figure 1. The water table is shown as contour lines of equal head with a 20 ft contour interval. Groundwater near the City of Menomonie generally flows from the topographically high area north of the city in a south/southeast direction towards the Red Cedar River and Lake Menomin.

ZONE OF INFLUENCE

The Theis Equation is used to calculate the Zone of Influence (ZOI), which is a circle around the proposed well that represents a cone of depression in the water table defined by a drawdown of 1 foot that would develop after 30 days of continuous pumping at full capacity, with no recharge to the groundwater. It assumes that the aquifer is homogeneous (the aquifer is equally permeable in all places and in all directions), the well fully penetrates the aquifer and drawdown is small compared to the saturated thickness. Transmissivity was calculated from the pump test conducted when the test well was constructed. A target pumping capacity of 900 gpm was used.

Theis Equation:

$$W(\mu) = \frac{sT}{114.6*Q}$$

$$r^2 = \frac{Tt\mu}{1.87S}$$

Where:

$W(\mu)$ = Well Function

s = Drawdown (1 ft)

Q = Maximum Pumping Capacity

T = Transmissivity (gpd/ft)

S = Storativity

μ = From lookup table based on *W(μ)*
t = 30 days continuous pumping
R = Radius of the cone of depression

Zone of Influence (ZOI) Calculations:

Test Well #9 $W(\mu) = \frac{1 \times 7{,}752}{114.6 \times 900}$ W(μ)= 0.0752

$r = \sqrt{\left(\frac{7{,}752 \times 30 \times 1.7}{1.87 \times 0.1} \right)}$ μ = 1.7

ZOI radius= 1,454 feet

ZONE OF CONTRIBUTION (RECHARGE AREA)

The land area that contributes water to a well is known as the "Zone of Contribution" (ZOC) or recharge area. Several methods can be used to delineate the recharge area, ranging from a simple fixed radius to the use of complex computer models. For this report, Wisconsin Rural Water Association developed a groundwater flow model using the analytical element modeling software GFLOW. The model uses reverse particle tracking to estimate groundwater flow lines from each well, backwards to their origination point. Assumptions used in the model were calculated from results of the pump test conducted when the test well was constructed along with pump tests form the city's existing municipal wells. Assumptions include a hydraulic conductivity (K) of 11 ft/day, porosity of 0.15, average aquifer thickness of 350 ft, average annual recharge of 9 inches/year (Gebert et. al., 2011) and a pumping rate equal to half of the proposed well's target maximum capacity of 900 gpm for a conservative ZOC estimate. Along with the full ZOC, a "capture zones" equal to the 5-year Time of Travel (TOT) was delineated. Water recharging the aquifer at the margin of the 5-year capture zones should take 5 years to reach the pumping well. The modeled ZOC is mapped in Figure 2.

References

Gebert, W.A., Walker, J.F., Kennedy, J.L., 2011. *Estimating 1970-99 average annual recharge in Wisconsin using streamflow data*: U.S. Geological Survey, Open-File Report 2009-1210.

Lippelt, I.D., 1988. *Generalized Water-Table Elevation Map of Dunn County, Wisconsin*: Wisconsin Geological and Natural History Survey, Miscellaneous Map 88-2.

Figure 1 – Groundwater Flow

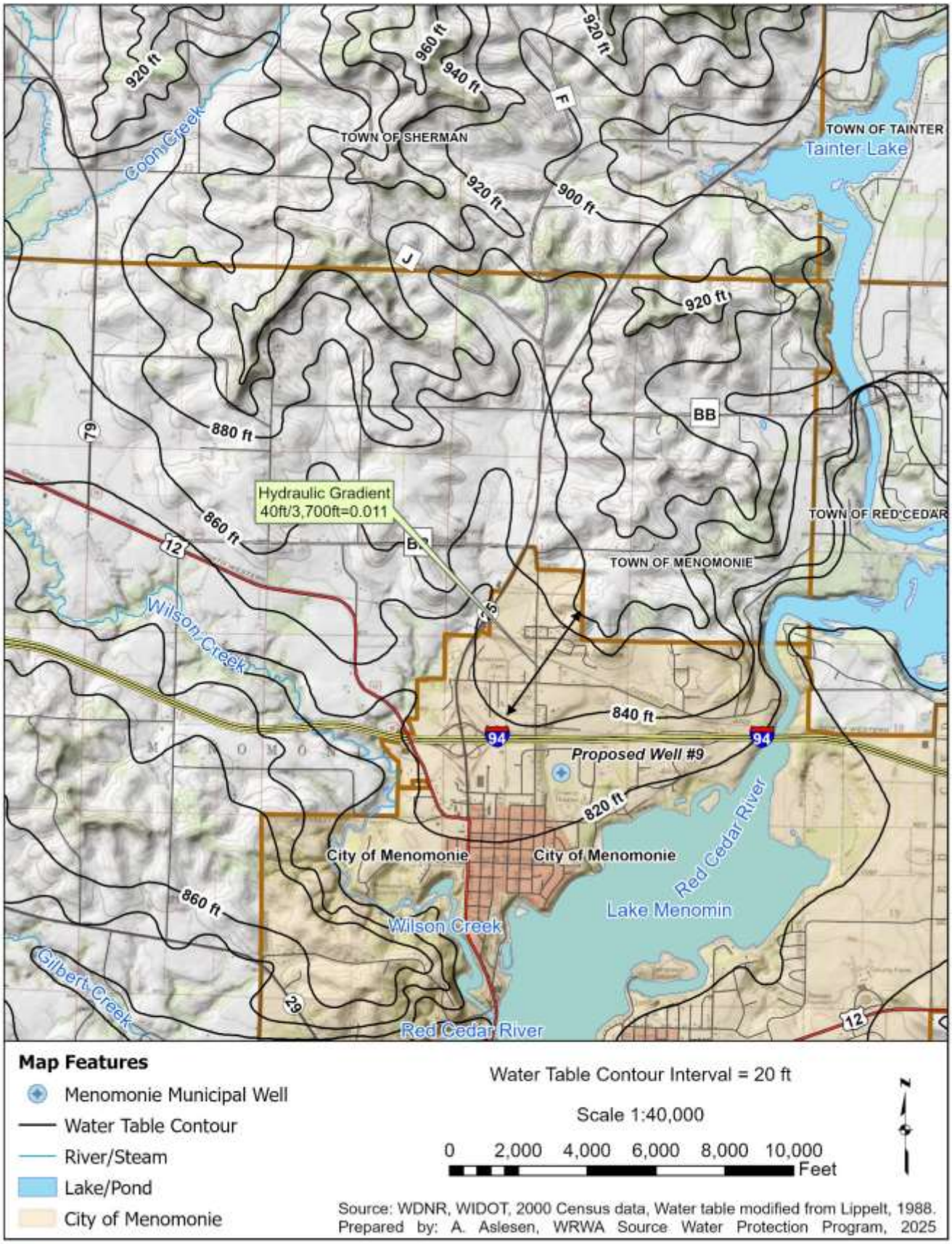
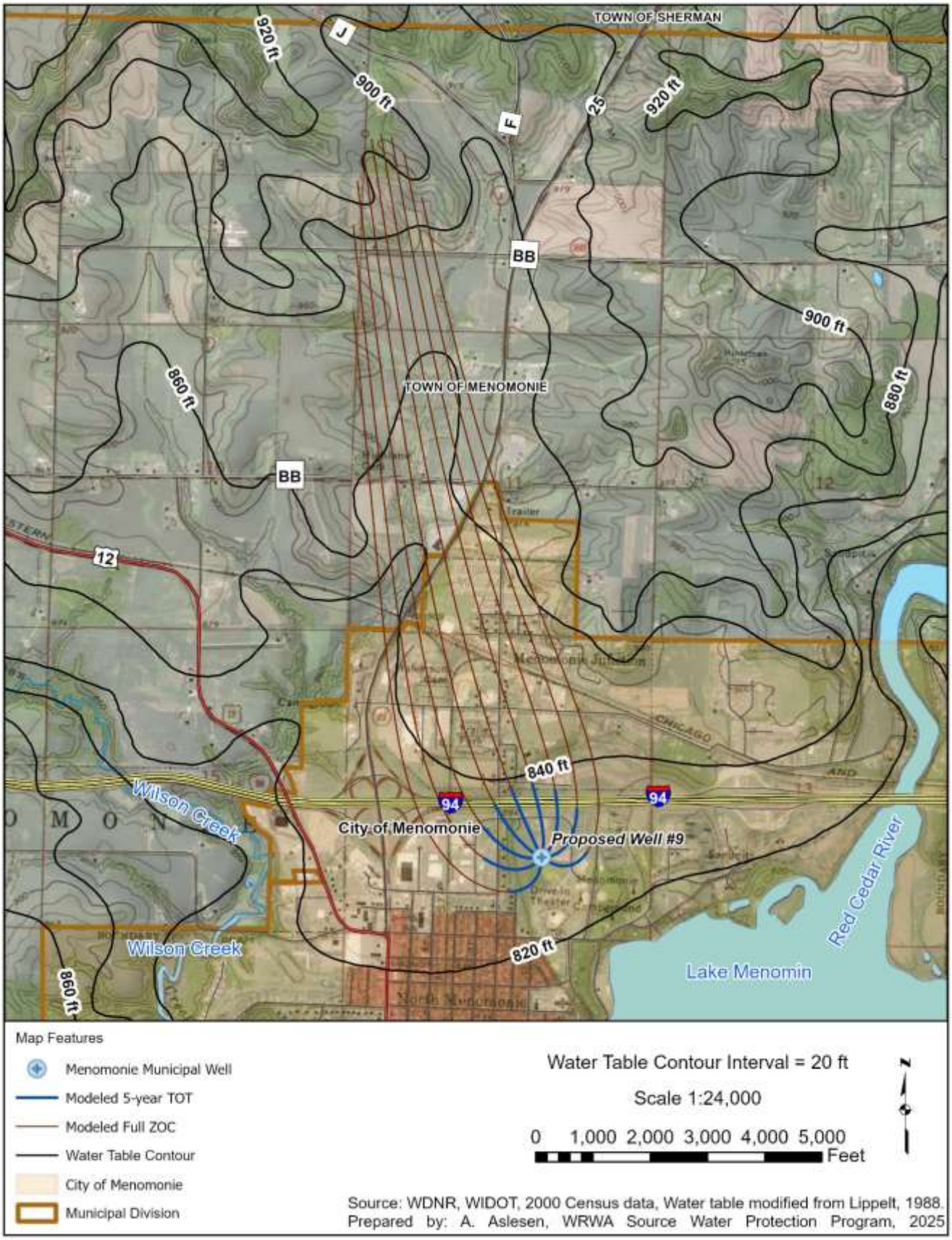


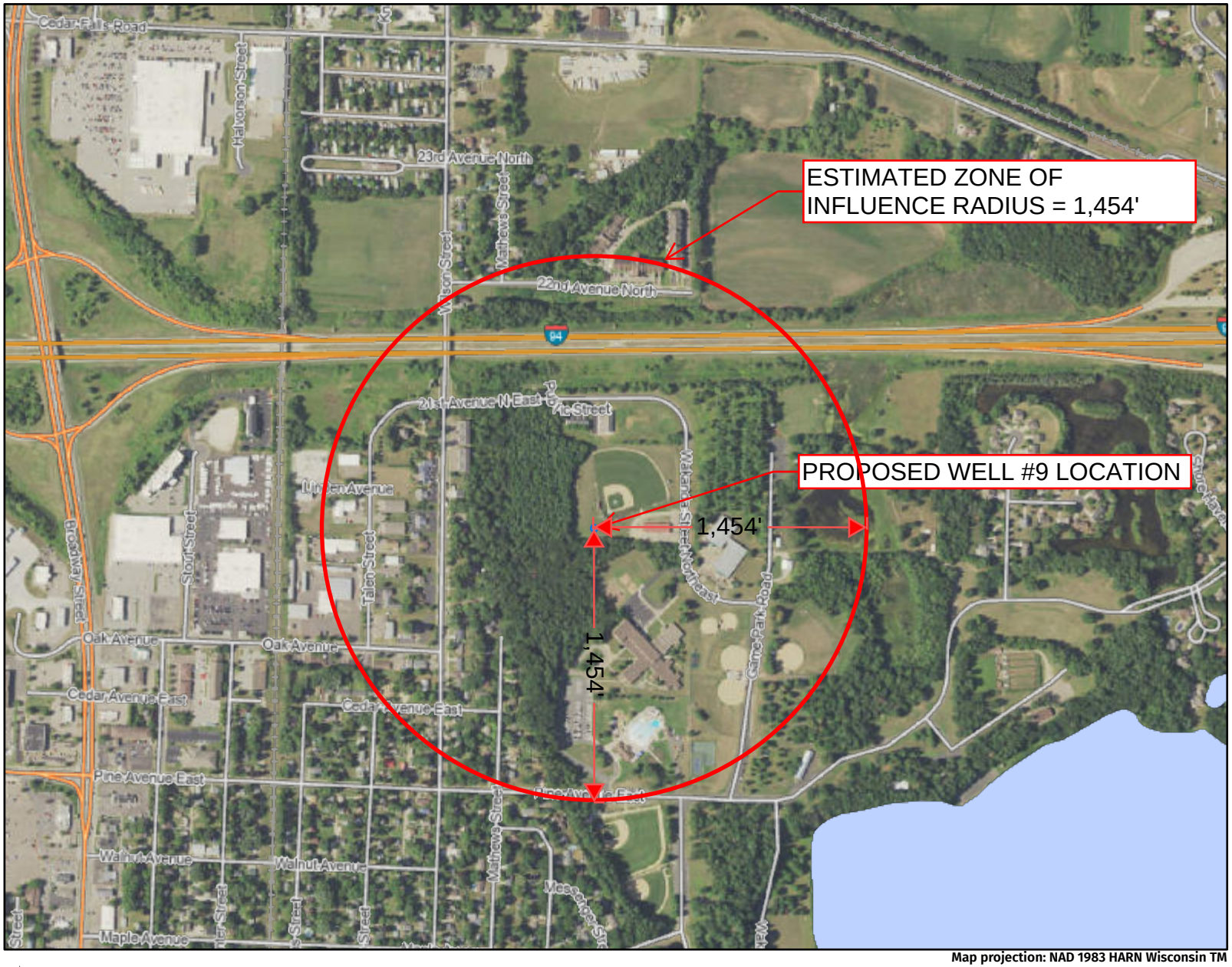
Figure 2 – Zone of Contribution (Recharge Area)



APPENDIX C2

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Estimated Zone of Influence
City of Menomonie, Well #9



Legend: (some map layers may not be displayed)

- Open Water
- 24K Lakes and Open Water
- City or Village
- County Boundaries

Major Roads

- Interstate Highway
- US Highway

County and Local Roads

- Local Road
- Railroads
- Latest Leaf On Imagery

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

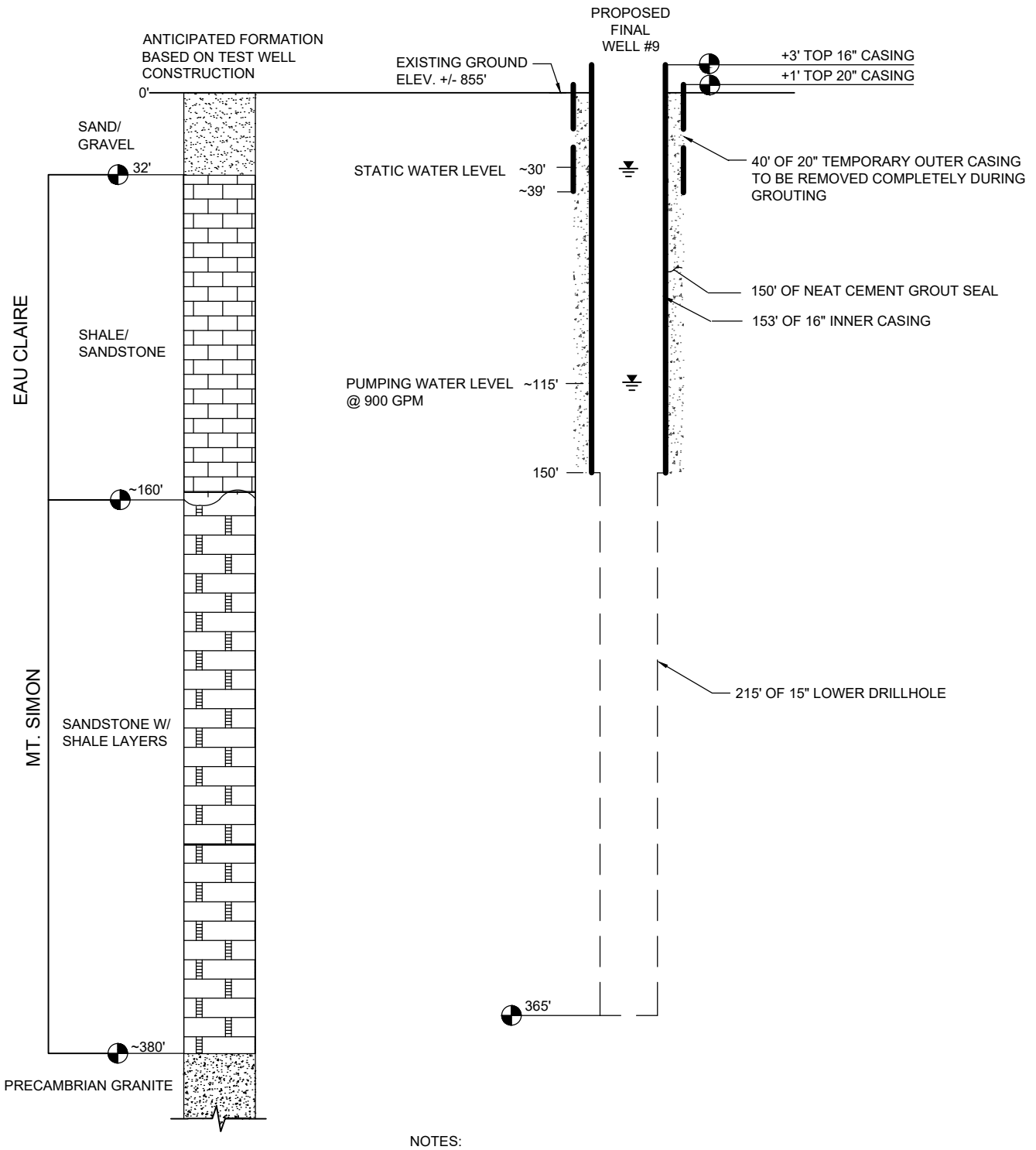
N

Map: 0 720 1,440 Feet
0 210 420 Meters

Service Layer Credits:
Latest Leaf On: , Cities, Roads & Boundaries: , Surface Water (Cached): WiDNR, USGS, and other data

Date Printed: 6/16/2025 10:45 AM

APPENDIX C3



NOTES:
1. ASSUMED SPECIFIC CAPACITY = 10.6 GPM/FT

MSA	WELL CONSTRUCTION DETAIL WAKANDA PARK	FINAL WELL #9 CITY OF MENOMONIE, WI DUNN COUNTY, WI	FILE NO. 05323007 FIGURE 1

File Name: \\msa-ps.com\fs\Projects\05\05323\05323007\CADD\Construction Documents\05323007 Final Well #9 Detail.dwg

APPENDIX C4

Menomonie Well #9
Wetland Determination Report

City of Menomonie
Dunn County, Wisconsin

Project No. 05323007

May 2025

MSA

Menomonie Well #9
Wetland Determination Report

City of Menomonie
Dunn County, Wisconsin

Project No. 05323007

Prepared by:

MSA Professional Services, Inc.
1702 Pankratz Street
Madison, WI 53704
Phone: (608) 242-6610

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QUALIFICATIONS

Jeff Felland is a DNR recognized 2023 Assured Delineator. Jeff graduated with Bachelor of Science degrees in Civil Engineering, and Zoology and Conservation, from the University of Wisconsin – Madison in 2007 and 1997, respectively. Jeff's additional training for wetland delineations includes the following courses:

- Critical Methods in Wetland Delineation - WDNR – Annually since 2018
- Basic Wetland Delineation – UW La Crosse - 2017
- Advanced Wetland Delineation – UW La Crosse - 2017
- Basic Plant Identification for Wetland Delineation – UW La Crosse - 2016
- Hydric Soils Identification – UW La Crosse - 2016

I. INTRODUCTION

On May 2, 2025, a site visit was made by MSA Professional Services, Inc. (MSA) to delineate wetlands on the Menomonie Well #9 site in the City of Menomonie. 2024 DNR Assured Wetland Delineator Jeff Felland conducted the field investigation and was the sole report author.

The approximately 1.99-acre project area includes portions of parcel Nos. 1725122813144200003, 1725122813144200012, 1725122813144200016 and 1725122813144200017 south of 21st Avenue NE and west of John Russell Road in the City of Menomonie, WI. The project area is located within the NW ¼ of the SE ¼ of Section 14, Township 28N, Range 13E, Dunn County, Wisconsin. Figure 1 shows the general location of the site.

No wetlands were present within the project area.

II. METHODS

The methods used for the wetland delineation were based on the US Army Corps of Engineers *Wetlands Delineation Manual* (Technical Report Y-87-1) and the January 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (Version 2.0). Vegetation was classified based on the Wisconsin Wetland Inventory classification systems. Plant names and hydrophytic status were determined by using the most recent version of the U.S. Army Corps of Engineers 2020 *Midwest Regional Wetland Plant List*. Hydric soils were classified according to the USDA-NRCS 2018 *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils*, (Version 8.2).

The vegetation, hydrology, and soil were documented at each Sample Plot, and assessed to determine if wetland criteria were met. The wetland boundary was considered the highest extent of the wetland. Areas below the boundary met the conditions suitable for a wetland environment, while areas above the boundary lacked one or more of the three criteria and were considered upland areas. The wetland boundary along each transect was determined based on changes in the vegetation, hydrology, soil and topography. The wetland boundary was surveyed using a mapping grade Trimble R2 GPS unit utilizing WISDOT's WISCORS Network real-time GNSS correction services. The data was then brought into a GIS (Geographic Information System) to produce Figure 6 and calculate data such as wetland areas.

OFFSITE REVIEW

Several sources of background information were obtained and reviewed prior to the on-site field verification. These sources include the following:

- Wisconsin Wetlands Inventory (WWI) Map, City of Menomonie, Wisconsin (Figure 2)
- National Wetlands Inventory (NWI) Map, City of Menomonie, Wisconsin (Figure 3)
- USDA Soil Resources Report and NRCS Soils Map, City of Menomonie, Wisconsin (Figure 4)
- Topographic Map City of Menomonie, Wisconsin (Figure 5)
- Aerial photo review - Photos from 1937, 2010, 2015, 2020 and 2022
- WETS weather stations (Appendix A)
- Palmer Drought Index

III. RESULTS AND DISCUSSION

ANTECEDENT HYDROLOGIC CONDITION ANALYSIS

Antecedent precipitation was calculated prior to the May 2 site visit using the US Army Corps of Engineer Antecedent Precipitation Tool. A score of 14 for the three prior month method for evaluating antecedent precipitation indicates the climatic/hydrologic conditions at the time of the site visit were normal. Approximately 0.60 inches of precipitation fell between April 28 to May 2. See Appendix A for precipitation data.

WISCONSIN AND NATIONAL WETLANDS INVENTORY MAPS

Figure 2 shows the WWI Map of the project area. No wetlands are mapped within the project area. Wetland indicators are present in the north and west portions of the project area.

Figure 3 shows the NWI Map of the project area. No wetlands are mapped within the project area.

SOILS MAP

Four (4) soil types are mapped within the project area and are detailed in Table 1 below. Figure 4 shows the NRCS soil map of the project area.

Hydric soil is formed under prolonged saturated conditions and is one of the three criteria assessed when considering an area to be a wetland. Soils are listed as wetland indicator soils based on being hydric or having hydric inclusions. Farrington loamy sand and Newson mucky loam soils are mapped as having hydric soils.

Table 1 - Soils

Map Unit Symbol	Map Unit Name	Parent Material	Landform Type	Hydric Soil Status
433A	Forkhorn sandy loam, 0 to 3 percent slopes	Loamy alluvium over sandy and gravelly outwash	Valley trains	No
508A	Farrington loamy sand, 0 to 3 percent slopes	Sandy outwash	Valley trains	Yes
516A	Aldo sand, 0 to 3 percent slopes	Sandy outwash	Valley trains	No
589A	Newson mucky loamy sand, valley train, 0 to 1 percent slopes	Sandy outwash	Depressions on valley trains	Yes

SITE SUMMARY

The approximately 1.99-acre project area includes portions of parcel Nos. 1725122813144200003, 1725122813144200012, 1725122813144200016 and

1725122813144200017 south of 21st Avenue NE and west of John Russell Road in the City of Menomonie, WI. The dominant land use in the general area is wooded green space directly to the west, a baseball field to the east and commercial properties to the south.

The majority of the site lies within a flat raised area for a baseball field. The north and south areas slope off site north and south, respectively. Figure 5 shows the topographic map of the project area.

WETLAND CHARACTERISTICS

No wetlands were present within the project area. Figure 6 shows the sample plot locations. The field data sheets are in Appendix B and site photos are in Appendix C.

IV. SUMMARY AND CONCLUSION

A site visit was made on May 2, 2025, during the wet climatic season to delineate any wetlands that are present within the project area. Vegetation, hydrology, and soils were documented at that time. Antecedent precipitation, aerial photos and the Palmer Drought Index were taken into consideration when making the site visit. At the time of the site visit normal circumstances were present for the project area and climatic/hydrologic conditions were normal.

No wetlands were present within the project area.

Should a body of water and/or associated wetlands be considered a water outlined in Section 404 of the Clean Water Act, then USACE may have jurisdiction of these wetlands under Section 404 of the Clean Water Act. WDNR may have jurisdiction over all waters of the state, and the final decision of jurisdiction over the delineated wetlands rests within these regulatory agencies.

This report and findings should be submitted to WDNR and/or the United States Army Corps of Engineers prior to any disturbance of this wetland. Additional state and local restrictions such as shore land zoning and other ordinances may apply to wetlands, lakes and other waterways. Wetlands can change over time via natural or human-made causes. This report represents the conditions of the site and the wetland boundaries at the time of the site visit.

V. REFERENCES

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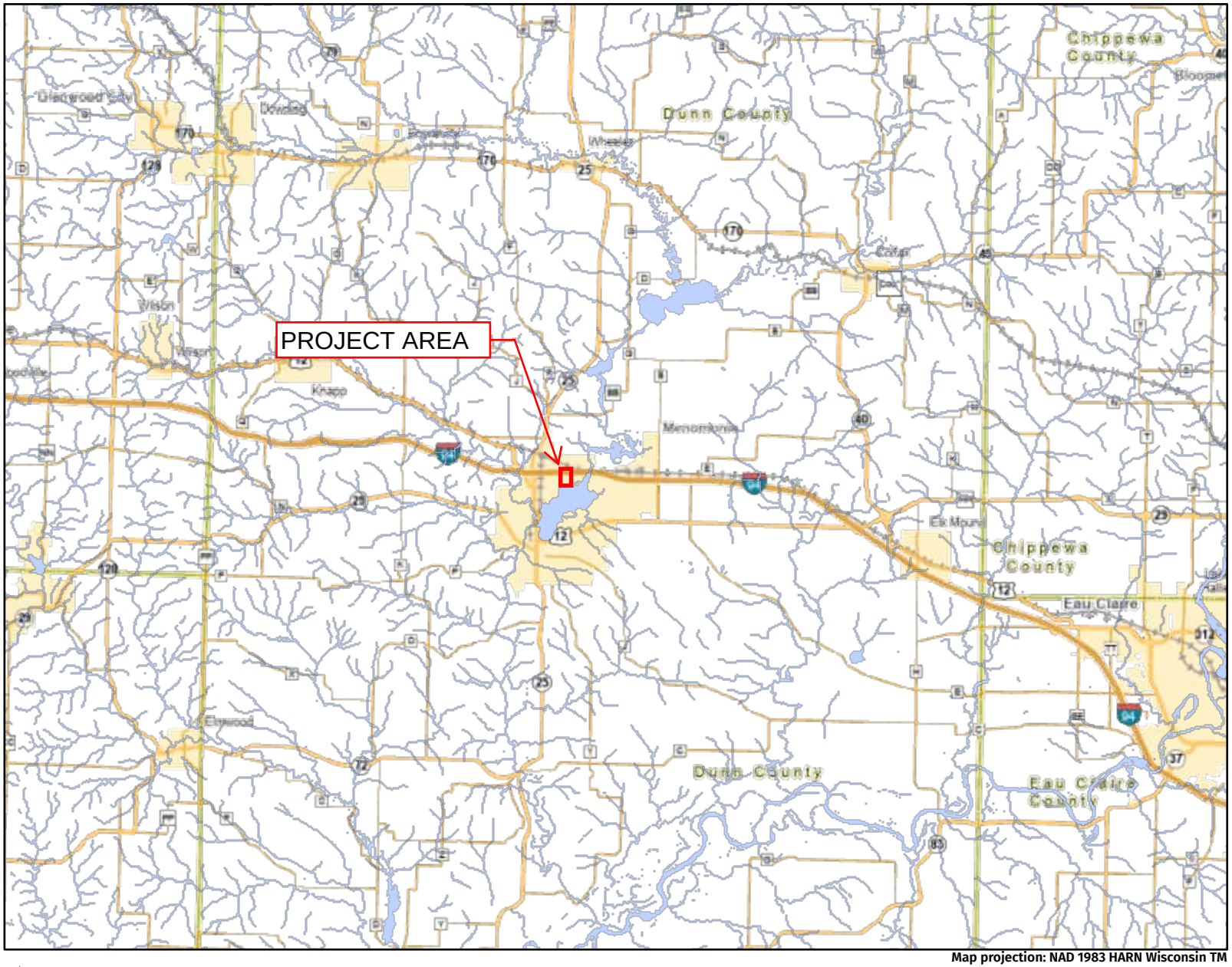
FIGURES

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Figure 1 - Location Map



Legend: (some map layers may not be displayed)

- Rivers and Streams
- Intermittent Streams
- Open Water
- City or Village
- County Boundaries

Major Roads

- Interstate Highway
- State Highway
- US Highway

County and Local Roads

- County HWY
- Local Road
- Railroads

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

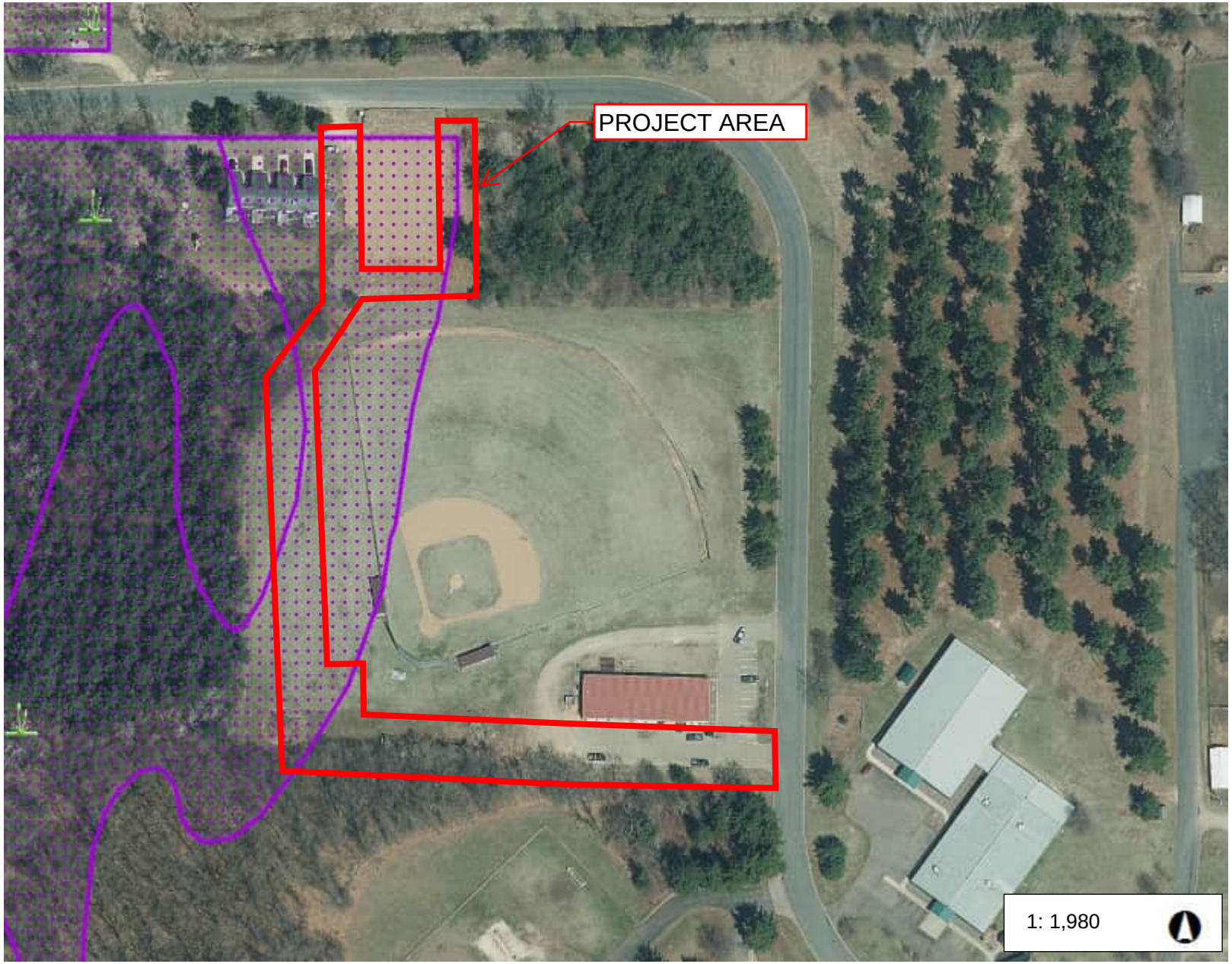
N

Map: 0 21,420 42,840 Feet
0 6,000 12,000 Meters

Service Layer Credits:
Cities, Roads & Boundaries: , Surface Water (Cached): WiDNR, USGS, and other data

Date Printed: 5/24/2025 8:30 AM

Figure 2 - WWI Map



Legend

- 24K Hydrography Streams and
- 24K Hydrography Lakes and C
- USDA Wetspots
- Maximum Extent Wetland Indic
- Ponds/Open Water
- Lake Class Areas
- Riverine/ditch Class Areas
- Wetland Class Areas
- Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled/drained wetland
  - Wetland too small to delineate
  - Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Major Roads
  - County Road
  - Interstate HWY
  - State HWY
  - US HWY
- Local Roads
- Railroads
- County Boundaries

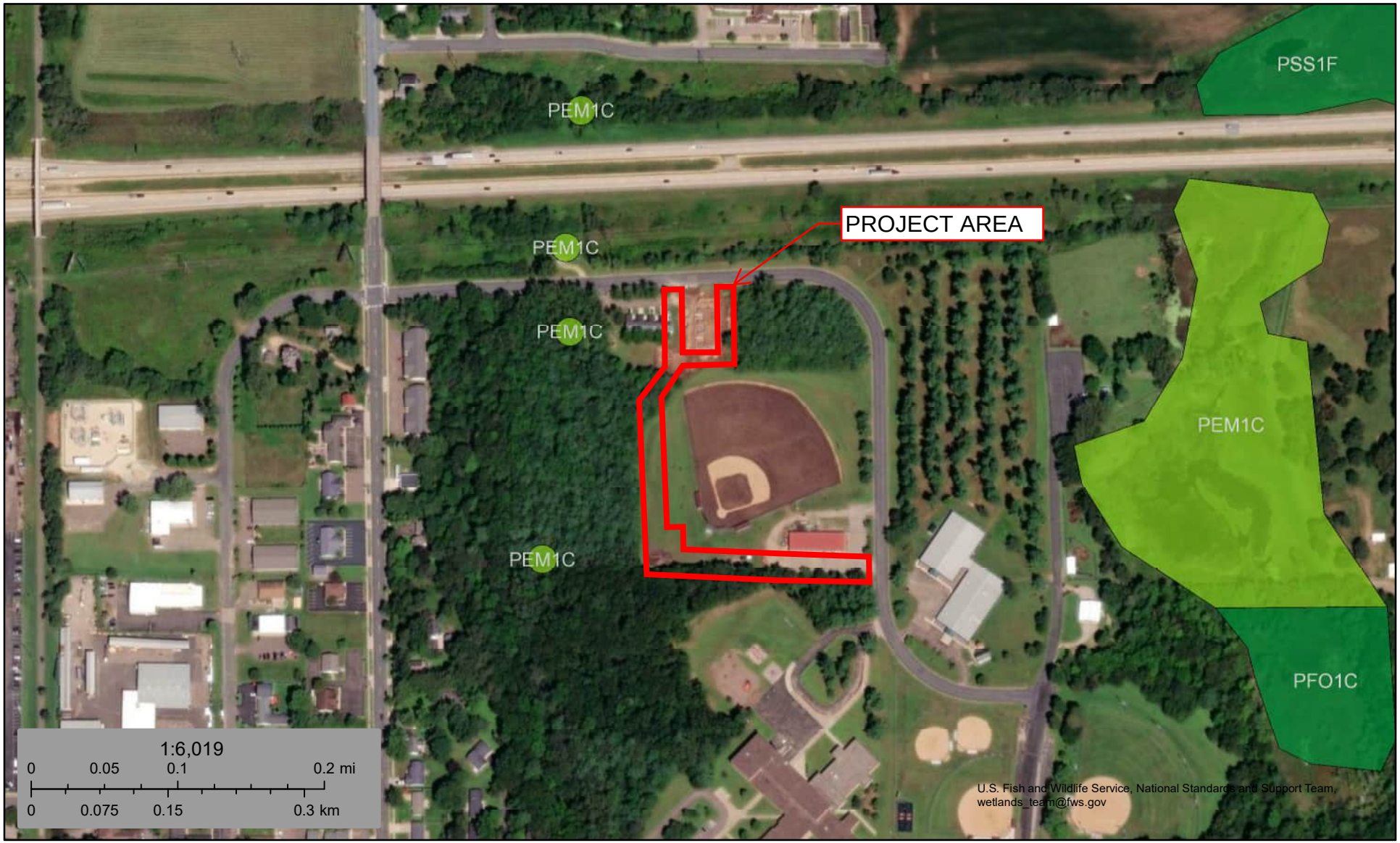
Notes

0.1 0 0.03 0.1 Miles

NAD_1983_HARN_Wisconsin_TM

U.S. Fish and Wildlife Service
National Wetlands Inventory

Figure 3 - NWI Map



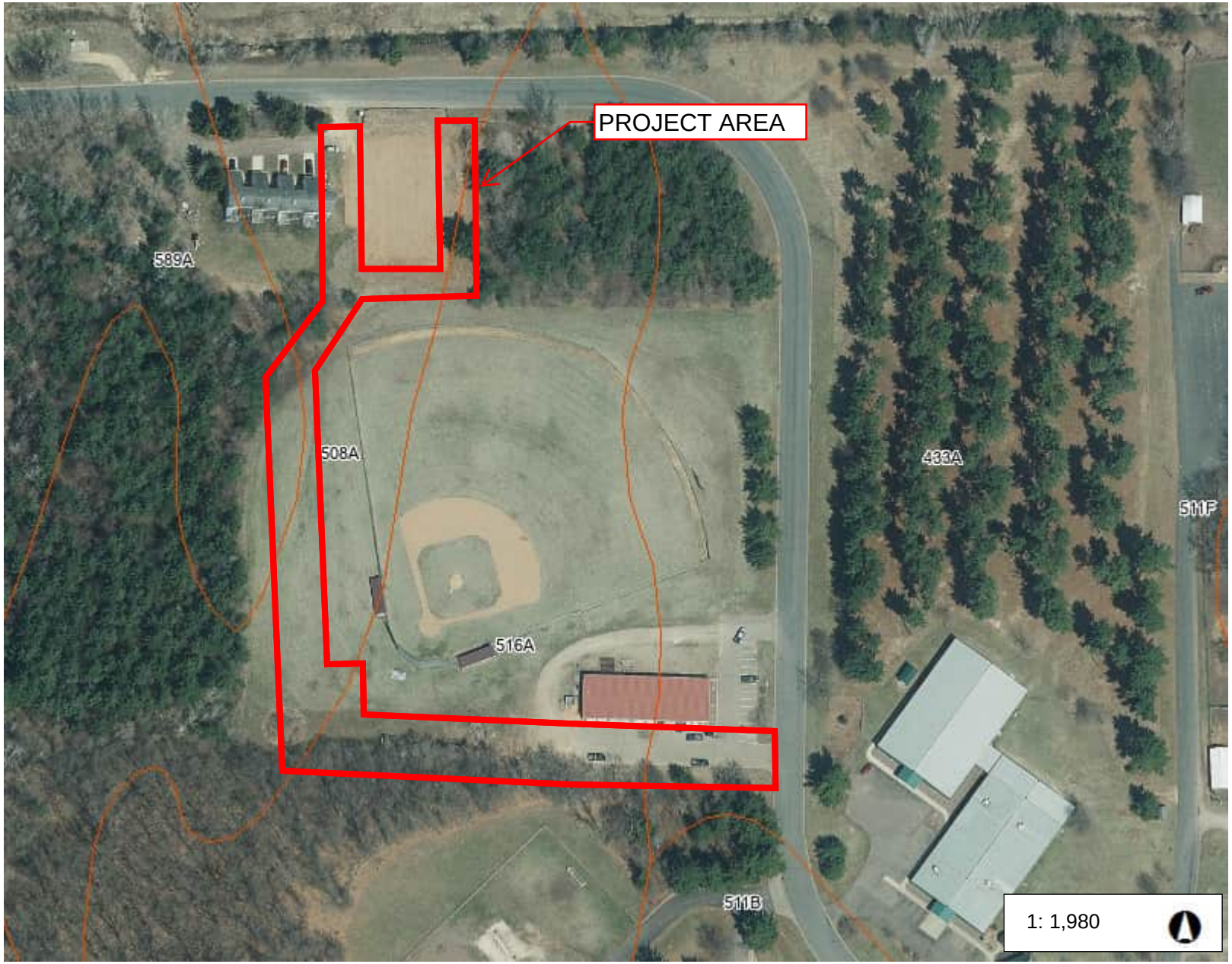
May 24, 2025

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Figure 4 - NRCS Soils Map



Legend

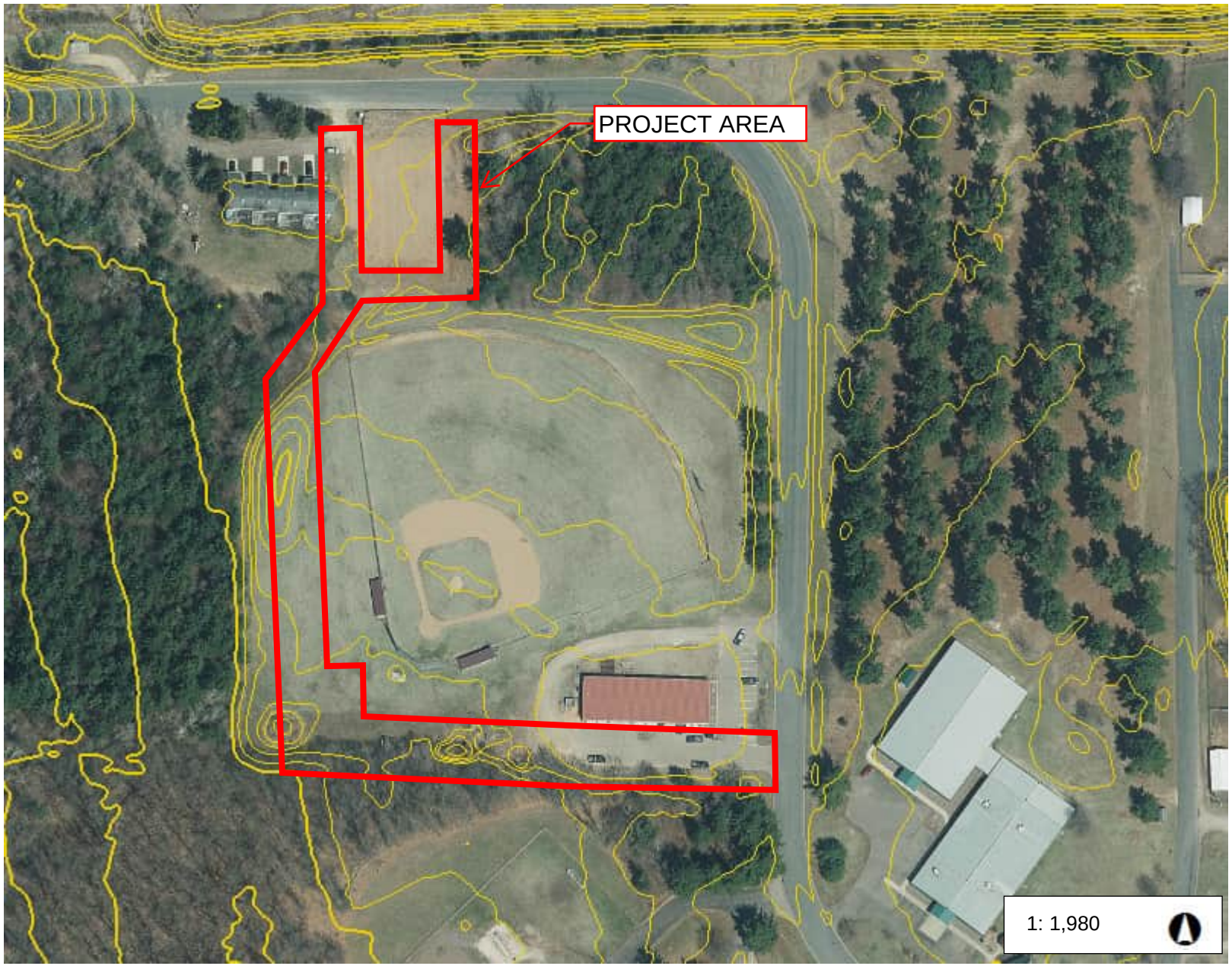
- 24K Hydrography Streams and
- 24K Hydrography Lakes and C
- Soil Mapping Unit
  - Soil Mapping Unit
  - Water
- Major Roads
  - County Road
  - Interstate HWY
  - State HWY
  - US HWY
- Local Roads
- Railroads
- County Boundaries
- Municipal Boundary
- State Boundary
- Tribal Lands

Notes

0.1 0 0.03 0.1 Miles

NAD_1983_HARN_Wisconsin_TM

Figure 5 - Topographic Map



Legend

- Elevation Points
- Elevation in Feet
- Contours
- Elevation Points
- Elevation in Feet
- Contours
- Major Roads
  - County Road
  - Interstate HWY
  - State HWY
  - US HWY
- Local Roads
- Railroads
- County Boundaries
- Municipal Boundary
- State Boundary
- Tribal Lands

Notes

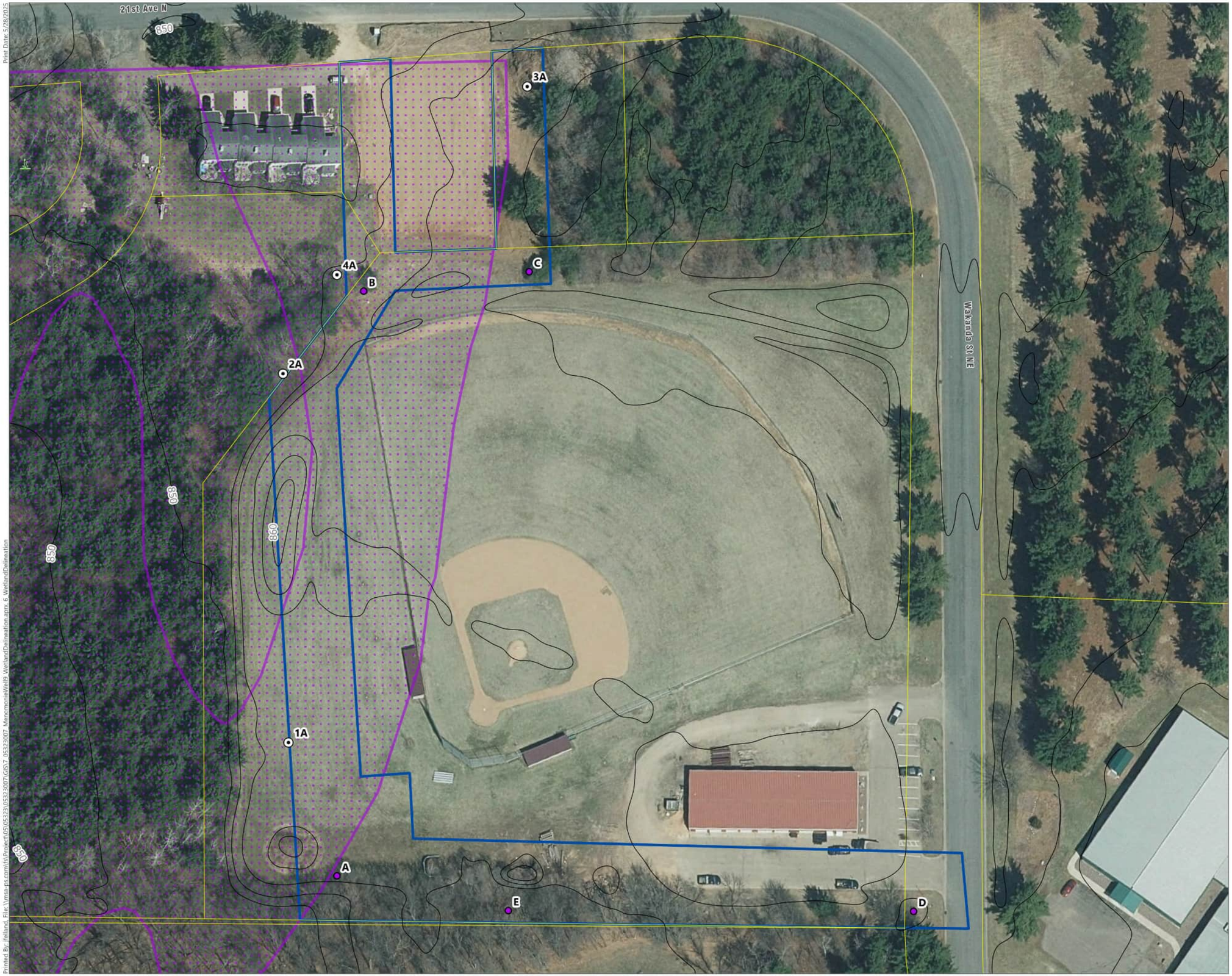
0.1 0 0.03 0.1 Miles

NAD_1983_HARN_Wisconsin_TM

FIGURE 6

Menomonie Well #9

City of Menomonie
Dunn Co, Wisconsin



- WETLAND DATA POINT
- PHOTO
- INVESTIGATION LIMITS
- PARCEL BOUNDARY
- 2-FT CONTOUR

All data shown in this exhibit is approximate for display purposes only and does not reflect actual survey data.

MSA

0 40 80Feet

N

APPENDIX A | PRECIPITATION DATA

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network

Coordinates	44.905751, -91.921991
Observation Date	2025-05-02
Elevation (ft)	853.25
Drought Index (PDSI)	Mild wetness (2025-04)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2025-05-02	1.980709	3.540551	3.279528	Normal	2	3	6
2025-04-02	1.388583	2.655512	4.031496	Wet	3	2	6
2025-03-03	0.633071	1.400787	0.720472	Normal	2	1	2
Result							Normal Conditions - 14

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
MENOMONIE	44.8742, -91.9364	785.105	2.291	68.145	1.187	11320	84
MENOMONIE 0.6 S	44.8801, -91.9161	881.89	1.074	96.785	0.587	2	0
MENOMONIE 0.9 SSE	44.8755, -91.9103	899.934	1.281	114.829	0.724	5	6
CEDAR FALLS HYDRO PLT	44.9356, -91.8886	830.053	4.845	44.948	2.398	13	0
MENOMONIE 6.5 NW	44.9444, -92.0201	913.058	6.348	127.953	3.669	3	0
ELK MOUND 1.3 NE	44.8863, -91.6668	974.081	13.226	188.976	8.451	1	0
SPRING VALLEY DWTN	44.8411, -92.2392	919.948	15.006	134.843	8.776	1	0
SPRING VALLEY	44.8411, -92.2456	915.026	15.316	129.921	8.882	3	0
DURAND	44.6197, -91.9794	705.053	17.71	80.052	9.387	5	0

Climatological Data for MENOMONIE, WI - April 2025

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2025-04-01	42	22	32.0	0	0	0.00	0.0	0
2025-04-02	42	21	31.5	0	0	0.14	1.0	1
2025-04-03	39	33	36.0	0	0	0.13	0.0	0
2025-04-04	48	25	36.5	0	0	0.00	0.0	0
2025-04-05	52	24	38.0	0	0	0.00	0.0	0
2025-04-06	44	22	33.0	0	0	0.00	0.0	0
2025-04-07	57	22	39.5	0	0	0.00	0.0	0
2025-04-08	37	16	26.5	0	0	0.00	0.0	0
2025-04-09	47	16	31.5	0	0	0.00	0.0	0
2025-04-10	M	M	M	M	M	M	M	M
2025-04-11	58	30	44.0	4	0	0.00	0.0	0
2025-04-12	54	27	40.5	1	0	0.00	0.0	0
2025-04-13	65	28	46.5	7	0	0.00	0.0	0
2025-04-14	65	46	55.5	16	6	0.00	0.0	0
2025-04-15	48	37	42.5	3	0	0.02	0.0	0
2025-04-16	51	25	38.0	0	0	0.00	0.0	0
2025-04-17	57	25	41.0	1	0	0.00	0.0	0
2025-04-18	62	41	51.5	12	2	0.52	0.0	0
2025-04-19	55	35	45.0	5	0	0.00	0.0	0
2025-04-20	53	28	40.5	1	0	0.00	0.0	0
2025-04-21	55	28	41.5	2	0	1.30	T	0
2025-04-22	56	33	44.5	5	0	0.06	0.0	0
2025-04-23	69	40	54.5	15	5	0.06	0.0	0
2025-04-24	72	42	57.0	17	7	0.00	0.0	0
2025-04-25	56	43	49.5	10	0	0.51	0.0	M
2025-04-26	53	30	41.5	2	0	0.10	0.0	0
2025-04-27	63	40	51.5	12	2	0.00	0.0	0
2025-04-28	66	50	58.0	18	8	0.04	0.0	0
2025-04-29	71	44	57.5	18	8	0.20	0.0	0
2025-04-30	59	30	44.5	5	0	0.00	0.0	0
Average|Sum	55.0	31.1	43.1	154	38	3.08	1.0	0.0

Climatological Data for MENOMONIE, WI - May 2025

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2025-05-01	67	30	48.5	9	0	0.00	0.0	0
2025-05-02	60	45	52.5	13	3	0.36	M	M
2025-05-03	47	37	42.0	2	0	0.02	M	M
2025-05-04	64	37	50.5	11	1	0.00	M	M
2025-05-05	80	38	59.0	19	9	0.00	M	M
2025-05-06	75	43	59.0	19	9	0.00	M	M
2025-05-07	82	46	64.0	24	14	0.00	M	M
2025-05-08	71	43	57.0	17	7	0.00	M	M
2025-05-09	71	35	53.0	13	3	0.00	M	M
2025-05-10	82	36	59.0	19	9	0.00	M	M
2025-05-11	73	46	59.5	20	10	0.00	M	M
2025-05-12	85	45	65.0	25	15	0.00	M	M
2025-05-13	M	M	M	M	M	M	M	M
2025-05-14	86	49	67.5	28	18	0.00	M	M
2025-05-15	M	M	M	M	M	M	M	M
2025-05-16	82	50	66.0	26	16	0.54	M	M
2025-05-17	68	46	57.0	17	7	0.14	M	M
2025-05-18	54	43	48.5	9	0	0.00	M	M
2025-05-19	56	38	47.0	7	0	0.00	M	M
2025-05-20	59	39	49.0	9	0	0.57	M	M
2025-05-21	44	42	43.0	3	0	1.61	M	M
2025-05-22	51	40	45.5	6	0	0.39	M	M
2025-05-23	66	36	51.0	11	1	0.00	M	M
2025-05-24	M	M	M	M	M	M	M	M
2025-05-25	M	M	M	M	M	M	M	M
2025-05-26	M	M	M	M	M	M	M	M
2025-05-27	M	M	M	M	M	M	M	M
2025-05-28	M	M	M	M	M	M	M	M
2025-05-29	M	M	M	M	M	M	M	M
2025-05-30	M	M	M	M	M	M	M	M
2025-05-31	M	M	M	M	M	M	M	M
Average|Sum	67.8	41.1	54.5	307	122	3.63	0.0	0.0

APPENDIX B | FIELD DATA SHEETS

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Menomonie Well #9 City/County: Menomonie/Dunn Sampling Date: 5/2/25

Applicant/Owner: City of Menomonie State: WI Sampling Point: 1A

Investigator(s): Jeff Felland Section, Township, Range: 1428N13W

Landform (hillside, terrace, etc.): Hillside Local relief (concave, convex, none): Linear/Linear

Slope (%): 2 Lat: 44.904865 Long: -91.922102 Datum: NAD 83

Soil Map Unit Name: 508A: Farrington loamy sand, 0 to 3 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Based on the NRCS weighted monthly method of evaluating antecedent precipitation for the months of February, March, and April, precipitation was found to be normal. SP is at S end of site on W side.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15' R)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5' R)			
1. *Poa pratensis*	55	Yes	FAC
2. *Trifolium repens*	15	No	FACU
3. *Taraxacum officinale*	5	No	FACU
4. *Elymus repens*	25	Yes	FACU
5. *Erigeron annuus*	2	No	FACU
6.			
7.			
8.			
9.			
10.			
	102	=Total Cover	
Woody Vine Stratum (Plot size: 30' R)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	55	x 3 =	165
FACU species	47	x 4 =	188
UPL species	0	x 5 =	0
Column Totals:	102 (A)		353 (B)

Prevalence Index = B/A = 3.46

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Mowed lawn.

SOIL

Sampling Point: 1A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10yr 2/2	100					Loamy/Clayey	
4-16	10yr 3/3	100					Loamy/Clayey	
16-24	10yr 2/2	95	7.5yr 4/4	5	C	M	Loamy/Clayey	Distinct redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Soil layer textures from top of the observed soil profile to bottom were SCL, SL and SL, respectively.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

None

Remarks:

No hydrology after 15 mins.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Menomonie Well #9 City/County: Menomonie/Dunn Sampling Date: 5/2/25

Applicant/Owner: City of Menomonie State: WI Sampling Point: 2A

Investigator(s): Jeff Felland Section, Township, Range: 1428N13W

Landform (hillside, terrace, etc.): Toeslope Local relief (concave, convex, none): Linear/Linear

Slope (%): 2 Lat: 44.905724 Long: -91.922121 Datum: NAD 83

Soil Map Unit Name: 508A: Farrington loamy sand, 0 to 3 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Based on the NRCS weighted monthly method of evaluating antecedent precipitation for the months of February, March, and April, precipitation was found to be normal. SP in northern portion of site along W boundary

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus strobus*	20	Yes	FACU
2. *Quercus ellipsoidalis*	10	No	UPL
3. *Carpinus caroliniana*	20	Yes	FAC
4. *Populus deltoides*	30	Yes	FAC
5.			
	80	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15' R)			
1. *Carpinus caroliniana*	35	Yes	FAC
2.			
3.			
4.			
5.			
	35	=Total Cover	
Herb Stratum (Plot size: 5' R)			
1. *Galium triflorum*	2	No	FACU
2. *Rhamnus cathartica*	2	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	4	=Total Cover	
Woody Vine Stratum (Plot size: 30' R)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	87	x 3 =	261
FACU species	22	x 4 =	88
UPL species	10	x 5 =	50
Column Totals:	119 (A)		399 (B)

Prevalence Index = B/A = 3.35

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 2A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10yr 2/2	100					Loamy/Clayey	
17-20	10yr 2/2	85	5yr 4/4	2	C	M	Loamy/Clayey	Prominent redox concentrations
	10yr 2/1	13						
20-24	7.5yr 4/3	70	5yr 4/6	30	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Soil layer textures from top of the observed soil profile to bottom were L, L and SL, respectively.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 24

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

None

Remarks:

Hydrology after 15 mins.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Menomonie Well #9 City/County: Menomonie/Dunn Sampling Date: 5/2/25

Applicant/Owner: City of Menomonie State: WI Sampling Point: 3A

Investigator(s): Jeff Felland Section, Township, Range: 1428N13W

Landform (hillside, terrace, etc.): Hillside Local relief (concave, convex, none): Linear/Linear

Slope (%): 2 Lat: 44.906392 Long: -91.921321 Datum: NAD 83

Soil Map Unit Name: 508A: Farrington loamy sand, 0 to 3 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Based on the NRCS weighted monthly method of evaluating antecedent precipitation for the months of February, March, and April, precipitation was found to be normal. SP at N end of site

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15' R)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5' R)			
1. *Erigeron annuus*	5	No	FACU
2. *Poa pratensis*	40	Yes	FAC
3. *Trifolium repens*	5	No	FACU
4. *Hypochaeris radicata*	5	No	FACU
5. *Verbascum thapsus*	2	No	UPL
6. *Erigeron canadensis*	2	No	FACU
7.			
8.			
9.			
10.			
	59 =Total Cover		
Woody Vine Stratum (Plot size: 30' R)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	17	x 4 =	68
UPL species	2	x 5 =	10
Column Totals:	59 (A)		198 (B)
Prevalence Index = B/A =			3.36

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 3A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10yr 2/2	100					Loamy/Clayey	
2-20	7.5yr 3/4	100					Loamy/Clayey	
20-24	10yr 2/1	30					Loamy/Clayey	
	7.5yr 2.5/2	70						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Soil layer textures from top of the observed soil profile to bottom were L, S and S, respectively.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

None

Remarks:

No hydrology after 15 mins.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Menomonie Well #9 City/County: Menomonie/Dunn Sampling Date: 5/2/25

Applicant/Owner: City of Menomonie State: WI Sampling Point: 4A

Investigator(s): Jeff Felland Section, Township, Range: 1428N13W

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 44.905954 Long: -91.921944 Datum: NAD 83

Soil Map Unit Name: 508A: Farrington loamy sand, 0 to 3 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Based on the NRCS weighted monthly method of evaluating antecedent precipitation for the months of February, March, and April, precipitation was found to be normal. SP near N end in what appears to be a stormwater management basin for the adjacent apartment buildings

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15' R)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5' R)			
1. *Rubus occidentalis*	2	No	UPL
2. *Centaurea stoebe*	15	Yes	UPL
3. *Rudbeckia hirta*	5	No	FACU
4. *Achillea millefolium*	5	No	FACU
5. *Oenothera biennis*	25	Yes	FACU
6. *Potentilla recta*	5	No	UPL
7. *Poa pratensis*	5	No	FAC
8.			
9.			
10.			
	62	=Total Cover	
Woody Vine Stratum (Plot size: 30' R)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	35	x 4 =	140
UPL species	22	x 5 =	110
Column Totals:	62 (A)		265 (B)

Prevalence Index = B/A = 4.27

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 4A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	7.5yr 2.5/2	100					Loamy/Clayey	
7-17	10yr 2/2	95	5yr 3/3	5	C	M	Loamy/Clayey	Distinct redox concentrations
17-24	7.5yr 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Soil layer textures from top of the observed soil profile to bottom were SL, SCL and LS, respectively.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 24

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

None

Remarks:

Hydrology after 20 mins.

APPENDIX C | SITE PHOTOGRAPHS

Sample Plot 1A

Sample Plot 2A

Sample Plot 3A

Sample Plot 4A

Photo Location A looking east

Photo Location A looking north

Photo Location B looking north

Photo Location B looking west at stormwater management basin

Photo Location C looking west

Photo Location D looking west

Photo Location E looking south