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CITY OF MILACA
WELLHEAD PROTECTION PLAN
PART 2 (AMENDMENT)

OCTOBER 8, 2025

Stantec Project No. 193807329

Stantec

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PUBLIC WATER SUPPLY

NAME: City of Milaca

ADDRESS: 255 First Street East
Milaca, MN 56353

TELEPHONE NUMBER: (320) 983-3141

WELLHEAD PROTECTION MANAGER

NAME: Gary Kirkeby, Public Works Supervisor

ADDRESS: 255 First Street East
Milaca, MN 56353

TELEPHONE NUMBER: (320) 983-6547

E-MAIL: gkirkeby@milacacity.com

CONSULTANT/TECHNICAL ASSISTANCE

NAME: Mark Janovec, Stantec

ADDRESS: 733 Marquette Avenue, Suite 1000
Minneapolis, MN 55125

TELEPHONE NUMBER: (651) 775-6532

E-MAIL: mark.janovec@stantec.com

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PUBLIC WATER SUPPLY WELL INFORMATION

Well Number	Unique Number	Aquifer	Casing Depth (ft)	Well Depth (ft)	Date Constructed	Vulnerability*
3	578707	Confined Sand and Gravel	115	147	1996	Vulnerable
4	738390	Confined Sand and Gravel	105	135	2006	Vulnerable

*See the Amendment to the Wellhead Protection Plan, Part 1 (Minnesota Department of Health, 2023) for an explanation of the well vulnerability assessments.

PART 2 EXECUTIVE SUMMARY

This report represents the amendments to the Part 2 Wellhead Protection Plan, originally created in December 2012. An amendment to the plan is required every ten years by Minnesota Rules. Prior to creating this amended Part 2 plan, the Minnesota Department of Health amended the Part 1 portion of the plan.

The amendment to the Part 1 portion of the wellhead protection plan updated the 1) delineation of the wellhead protection area (WHPA) and the drinking water supply management area (DWSMA) and 2) the vulnerability assessments for the system's wells and the aquifer within the DWSMA. Part 1 of the WHP plan was prepared by the Minnesota Department of Health (MDH, March 2023). See Appendix H for a summary report of this amended plan. The boundaries of the WHPA/DWSMA are shown in Figure 1.

The *vulnerability assessment* for the aquifers within the DWSMA was performed using available information and indicates that the vulnerability of the aquifers used by the system varies from high to moderate.

- In the highly vulnerable areas, some potential contaminants would be expected to reach the aquifer system within a few years of release at the surface.
- In the moderate vulnerability areas of the DWSMA, the aquifers are partially protected by confining layers of sediment that restrict (or slow down) vertical movement of contaminants. However, it is believed that the confining layers may still allow some contaminants to infiltrate over time.

The *principle potential sources of contamination* to the aquifer vary with the vulnerability rating:

- Moderate vulnerability areas - other wells that reach or penetrate confining layers, high concentration point sources such as storage tanks containing chemicals that could break down confining units, and non-point sources in areas that drain to high vulnerability areas.
- High vulnerability areas - All land uses and potential contaminant sources, including tanks, septic systems, hazardous waste generators, feedlots, etc.

Because vulnerability of the aquifers in the Milaca area was a mix between moderate and high vulnerability, the MDH specified that the inventory of potential contamination sources include all potential sources of contamination.

This portion (Part 2) of the Wellhead Protection Plan (WHP) for the City of Milaca includes:

- The results of the Potential Contaminant Source Inventory,
- The Potential Contaminant Source Management Strategy,
- The Alternative Water Supply Contingency Plan, and
- The Wellhead Protection Program Evaluation Plan.

Sections 4-7 of this part of the Part 2 WHP plan (hereafter referred to as Plan) provide data and analysis in support the approaches taken to address potential contamination sources. Section 8 of this report describes the approaches taken in terms of goals, objectives, and actions to be taken.

In Section 4, the required *data elements* indicated by MDH in the Scoping 2 Decision Notice are addressed. Pertinent data elements include information about hydrology, geology, water quality, and water quantity

A *potential contaminant source inventory* and general *land use* information is given in Section 5. The potential contaminant source and land use inventory reflects the vulnerability of the aquifer in each land parcel and what is known about the data elements in Section 4.

Section 6 addresses the possible impacts that *changes in the physical environment, land use, and water resources* may have on the public water supply. Continued land development and increases in groundwater appropriations within the DWSMA are anticipated within the next ten-year period. The City of Milaca will update its Wellhead Protection Plan if new public water supply wells are added, as required by the Minnesota Wellhead Protection Rules.

The *problems and opportunities* concerning land use issues relating to the aquifer, well water, and the DWSMA are addressed in Section 7. The major concerns addressed in the plan are 1) other wells located within the DWSMA that could become pathways for contamination to enter the aquifer; 2) the pumping effects of high-capacity wells that may alter the boundaries of the delineated WHPA or cause the movement of contamination toward public water supply well(s) and 3) the potential sources of contamination identified in Section 5 of this plan.

The drinking water protection *goals* that the public water supplier (PWS) would like to achieve with this plan are listed in Section 8. In essence, the PWS would like to:

- Maintain the current drinking water quality
- Increase public awareness of groundwater protection issues
- Protect the aquifer
- Continue to collect data on water quality
- Practice water conservation

The *objectives and action plans* for managing potential sources of contamination are also contained in Section 8. Actions aimed toward educating the public about groundwater and land use issues, gathering information about other wells and potential contaminant sources, using the collected data in water supply and land use planning, and collecting data relevant to wellhead protection planning are the general focus.

Section 9 contains a *guide to evaluate the implementation* of the identified management strategies of Section 8. The wellhead protection program for Milaca will be evaluated every two years.

Section 10 references the *Contingency Plan* developed by the City to address water supply emergencies.

Finally, Section 11 discusses the *review process* and addresses any comments brought by local units of government and the public.

1.0 INTRODUCTION

Wellhead protection is a means of safeguarding public water supply wells by preventing contaminants from entering the area that contributes water to the well or well field over a period of time. This program has been required in Minnesota since the Minnesota Department of Health (MDH) implemented its Wellhead Protection Rules in November 1997. The MDH initiated its Wellhead Protection Program in response to the 1986 Amendments to the Safe Drinking Water Act and MDH's statutory authority is granted in the Minnesota Groundwater Protection Act of 1989. The City of Milaca created its original Wellhead Protection Plan in December 2012. This report is an amendment to that plan, updated to reflect the current delineation boundaries of the City's wells, the current knowledge of aquifer vulnerability, and the current inventory of potential contamination sources within the delineated Drinking Water Supply Management Area (DWSMA) for the City's wells. The plan is required to be amended every ten years to remain current.

The City of Milaca obtains its drinking water supply from two wells screened in a glacially deposited sand and gravel aquifer. Detailed descriptions of the geologic and hydrogeologic setting of the water supply system, the delineation of the Wellhead Protection Area and Drinking Water Supply Area, and the well and aquifer vulnerability assessments are presented in *Wellhead Protection Plan, Part I* (MDH, 2010) which was approved by MDH in September 2010. An amendment to that report was created by the MDH in March 2023 using the latest information available. That amendment is included in Appendix H of this report.

This plan is designed to address issues related to the vulnerability of the aquifer that supplies Milaca's wells, along with potential sources of contamination that may pose a threat to the aquifer. Problems and opportunities are identified that relate to how the DWSMA may be managed. Goals have been identified for the next ten years and an implementation plan has been developed to help Milaca meet those goals.

2.0 WELLHEAD PROTECTION AREA AND DRINKING WATER SUPPLY MANAGEMENT AREA

The wellhead protection area (WHPA) and drinking water supply management area (DWSMA) delineation analyses were conducted in accordance with Minnesota Rules. As a result, the following criteria were considered in making the delineation analysis: 1) Aquifer transmissivity, 2) groundwater flow directions, 3) the maximum average daily pumping rate for each of the wells, 4) hydrogeologic boundaries, and 5) time of travel. Each of these criteria was factored into the development of a groundwater flow model that was used to conduct the delineation analyses. The results of these analyses (the WHPA and DWSMA) are presented in Figure 1. Additional details on the delineation analysis were presented in *Wellhead Protection Plan, Part I*, prepared by Minnesota Department of Health (MDH) and approved by MDH in September 2010. This was followed up with an Amendment to the Wellhead Protection Plan, Part 1 (MDH, March 2023) which summarizes changes made to both the WHPA and DWSMA delineations and vulnerability analysis. See Appendix H for this amended summary.

3.0 VULNERABILITY ASSESSMENT

Two separate vulnerability assessments were undertaken as part of the Part 1 Plan. The first assessment consisted of an assessment of the vulnerability to contamination of the aquifer within the identified DWSMA. This assessment was completed according to MDH guidelines and recommended methodology. The second assessment was a well vulnerability assessment for each of the Milaca public water supply wells. The well vulnerability assessment was also completed using MDH guidelines. A description of the two assessments is presented in *Wellhead Protection Plan, Part I*, prepared by the Minnesota Department of Health (approved September 2010) and revised in Amendment to the Wellhead Protection Plan, Part 1 (MDH, March 2023).

The DWSMA has a vulnerability ranking ranging from "moderate" vulnerability to "high" vulnerability (Figure 1). This indicates that there is not enough geologic protection between the land surface and the aquifer to effectively isolate spills from reaching the aquifer. A moderate vulnerability indicates that some geologic protection is believed to be present, but it may not be sufficient to fully protect the aquifer over a long period of time. A high vulnerability indicates that very little geologic protection is present and that spills may rapidly infiltrate to the aquifer over a period of weeks or months if left unchecked.

Each of the two public water supply wells was also ranked as "vulnerable" during the well vulnerability assessment. Analysis of the tritium samples in these wells indicates that a portion of water in these wells is "modern" in age, meaning that the water was in contact with the atmosphere sometime in the past 70 years.

The results of these vulnerability assessments drove the need for a detailed evaluation of potential contaminant sources, which is presented later in this report.

4.0 DATA ELEMENTS

The state rules relating to wellhead protection require that wellhead protection plans include specific data elements. The required physical environment, water quantity and water quality data elements were addressed in the Part 1 Plan (*Wellhead Protection Plan – Part I*, MDH, 2010) and were revisited during the amendment to the Part 1 Plan (MDH, March 2023), included here in Appendix H. The Part 1 Plan also includes an assessment of the impact of these data elements on 1) the use of the wells, 2) the wellhead protection area delineation criteria and 3) the quality and quantity of water supplying the public water supply wells. Each of these elements was discussed specifically in the second scoping meeting with MDH and are presented briefly here.

4.1 Precipitation

Monthly and annual precipitation averages for Mille Lacs County are provided below, based on a compilation of gridded observation networks in Mille Lacs County as provided by the Minnesota Climatology Working Group online database. Average annual precipitation during the period from 2020-2024 was 29.2 inches, less than the 32.7 inches observed in the 2007-2011 period noted in the original Part 2 plan. The groundwater flow model developed to delineate the wellhead protection areas addresses the approximate rate at which recharge occurs within the aquifer.

Average Precipitation (in inches) for Mille Lacs County

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
2024	0.18	0.82	1.92	4.30	4.69	5.56	3.59	6.68	0.70	1.12	2.84	0.56	32.96
2023	1.51	2.00	2.24	5.95	0.71	1.77	1.65	3.50	3.63	4.09	0.15	3.72	30.92
2022	0.39	1.12	1.32	3.14	6.89	2.57	3.45	3.28	2.21	0.62	2.47	2.29	29.75
2021	0.64	0.61	1.94	3.96	1.97	1.78	1.24	4.34	4.09	2.08	1.16	1.94	25.75
2020	1.00	0.20	2.12	1.77	1.64	4.74	3.14	5.81	1.35	2.31	2.10	0.62	26.80
AVG	0.74	0.95	1.91	3.82	3.18	3.28	2.61	4.72	2.40	2.04	1.74	1.83	29.24

Since there appears to be some connection between the aquifer and the surface, there exists a potential that precipitation could impact the water quality through storm-water runoff and precipitation infiltration. Periods of higher precipitation could impact the transport of contaminants through the DWSMA.

4.2 Geology

A description of geologic conditions in the wellhead protection area was provided in the Part 1 report (see Appendix H). The municipal wells are completed in unconsolidated buried glacial deposits. The glacial geology of the area is complex, and the permeability and thickness of the aquifers and low permeability materials are highly variable.

The degree of geologic protection was an important factor in the DWSMA vulnerability assessment described in the Part 1 report. The level of vulnerability, in turn, determines the types of potential

contaminants and land uses of concern and the appropriate level of management.

4.3 Soil Conditions

Because there is not a consistent protective layer of low permeability sediments throughout the DWSMA, local soil conditions and soil infiltration characteristics may impact groundwater quality. Soil survey data for Mille Lacs County are maintained by the Natural Resource Conservation Service of the USDA as a SSURGO version 2 database. These data include Geographic Information System (GIS) mapping data (Figure 2). It should be noted that disturbance or scalping of soils, particularly in developed areas, may have occurred since the soil survey was completed.

The infiltration characteristics of soils are controlled primarily by soil texture, land cover/vegetation and other factors that affect soil structure, and land slope. In addition to soil infiltration characteristics, the potential rate of recharge to the water table is also controlled by the vertical permeability of the underlying sediments and the permeability and hydraulic gradient of the water table aquifer.

Drainage characteristics are summarized by the soil Hydrologic Group classifications. Descriptions of the classifications are as follows:

> Hydrologic Group A soils have a high infiltration potential when thoroughly wet and consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
>
> Hydrologic Group B soils have a moderate infiltration rate when thoroughly wet and consist of moderately deep or deep, moderately-well-drained or well-drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
>
> Hydrologic Group C soils have a slow infiltration rate when thoroughly wet and consist chiefly of soils that have a layer impedes the downward movement of water or have moderately fine to fine texture. These soils have a slow rate of water transmission.
>
> Hydrologic Group D soils have a very slow infiltration rate when thoroughly wet. These soils consist of clays, soils that have a claypan or clay layer near the surface, or soils that have a permanently high water table. These soils have a very slow rate of water transmission.

Soil types in the DWSMA fall under the following Hydrologic Groups:

Hydrologic Group	Mapped Soil Types (See Figure 2)
A	C118C, C16B, C16C, C16E
B	1003B, 1026A, C17B, C17C, C23B, C35A
C	C10B, C11B, C130B, C1B, C24A, C5C, C8A, C91B, C91C, C91E
D	1020A, 1025A, C102A, C110A, C125A, C139A, C14A, C28A,C2A, C4A, C97A

Within the DWSMA for the City of Milaca, the most prevalent soil types are classified in Hydrologic

Groups C and D. This implies that soils within the DWSMA have a relatively low rate of water infiltration where they are wet. However, the northern edge of the DWSMA and the highly vulnerable northeastern corner of the DWSMA have a mix of soils, with greater amounts of soils in Groups A and B, suggesting a higher infiltration rate where the soils are well drained.

Figure 9 shows soil erodibility across the DWSMA. While the composition of the soils makes them more susceptible to erosion, actual erosion is believed to be somewhat low due to relatively flat topography across the DWSMA.

4.4 Water Resources

The City of Milaca wells withdraw from a relatively shallow groundwater flow system. This system has a direct or indirect hydraulic connection to surface water features, and this connection is reflected in the pattern of observed static water levels in wells completed in the shallow aquifer(s). Therefore, surface waters may have some impact on the quantity and quality of groundwater within the DWSMA.

Figure 3 shows wetlands in the National Wetlands Inventory designated by wetland class and water regime. Minnesota Department of Natural Resources (DNR) designated public waters within the area include the Rum River bordering the eastern edge of the DWSMA and Chase Brook, a tributary of the Run River which intersects the northern portion of the DWSMA.

The largest water features within the DWSMA are the sewage disposal ponds in the northeastern edge of the DWSMA, where Milaca's treated wastewater is discharged

Stormwater runoff in the DWSMA generally follows local topography and County ditches. Water that is not captured by the Rum River or Chase Brook tends to collect in localized wetlands and ponds or is infiltrated into the soil.

4.5 Groundwater Quality

Routine monitoring data collected for the Public Water Supply Program are in the files of the Minnesota Department of Health. Routine monitoring by the Public Water Supply Program shows no contamination above existing water quality standards. A summary of the system's finished water quality is provided in the annual Consumer Confidence Report (Appendix B). Future changes in water chemistry reflected in routine monitoring results would be an indication that groundwater quality was affected by changes in the hydrologic system.

The highest nitrate concentration detected in 2024 was 3.1 mg/L, which is well below the established maximum contaminant level (MCL) of 10.4 mg/L. The City operates monitoring wells around the sewage treatment ponds to ensure that the ponds do not significantly elevate nitrates levels in groundwater. To date, average nitrate concentration of the effluent water has been at 2.0mg/L or lower.

4.6 Groundwater Quantity

Other than the Milaca water supply wells, there are no wells in the immediate surrounding area which are covered by state groundwater appropriation permits. There are no known well interference problems in or around the Milaca DWSMA. Therefore, existing high-capacity wells or groundwater use conflicts do not need to be addressed in the management plan at this time.

4.7 Surface-Water Quality

There is very little available data to address the quality of surface water within the DWMSA, other than sampling of effluent discharged to the sewage treatment ponds in the northeastern portion of the DWSMA. It is not expected that any of the surface water features outside the DWSMA will impact the quality of groundwater within the 10-year capture zone for the City's water supply well. The largest water body immediately outside of the DWSMA, the Rum River, tends to receive groundwater flow and be a discharge point for the aquifer. In the event of a major flood, it is possible that floods waters could temporarily reverse this flow direction in the area immediately surrounding the river. However, the effects would likely not be far-reaching and would not impact Milaca's two active municipal wells.

A review of FEMA floodplain maps indicates that no part of the DWMSA is within a designated special flood hazard area.

4.8 Surface-Water Quantity

Because there are no significant surface water features within the DWSMA, other than wetlands and a small portion of Chase Brook, surface water quantity is not a significant issue for the management of the Milaca wellhead protection area. Chase Brook and the Rum River are both DNR-protected waterways and fall under the jurisdiction of the State for management of water quality and quantity.

5.0 CONTAMINANT SOURCE INVENTORY

As part of the City of Milaca wellhead protection planning process, an inventory of potential contaminant sources was conducted within the delineated Drinking Water Supply Management Area (DWSMA). The purpose behind this inventory was to develop a database listing potential sources of contamination that may affect the public water supply wells. Wellhead protection planning strategies can be directed in a manner that will deal with any potential sites before they become a problem or a threat to the drinking water supply.

5.1 Land Use

Understanding land use is important in determining key areas for concern in managing a wellhead protection area. For example, knowledge about the location of future development in relation to the DWSMA may reveal a need to closely manage the activity within more sensitive areas. Additionally, any land uses that currently pose a potential threat to the City's water supply need to be highlighted to increase awareness of any concerns. An existing land use map is provided as Figure 4. The major zoning designations within the DWSMA are agricultural, residential (single family and 1-2 family), general business district, and conservation. Agricultural land use the largest of these areas, comprising over half of the DWSMA.

Following the scoping meeting held with Minnesota Department of Health (MDH), Stantec and Milaca staff proceeded to locate information about land and water use within the delineated DWSMA for the Milaca wells. Any data which was relevant to the public water supply wells, the quality of the water being drawn in to the wells, or land and groundwater uses around the wells was considered important in determining any potential threat to the water supply.

Each of these elements is described separately below. Figure 4 shows existing land use in the DWSMA, and Figure 5 shows future planned land uses. Figure 6 shows the locations of wells. Figure 7 shows identified potential point sources of contamination. Figure 8 shows the locations of septic systems. The wells, potential contamination sources, and septic systems are listed by parcel in Appendix A.

5.2 Shallow Disposal Wells

Disposal wells are potential sources of contamination that must be inventoried for the entire DWSMA. The USEPA regulates shallow disposal wells (Class V injection wells). Automotive disposal wells have been banned in groundwater protection areas and cesspools have been banned throughout Minnesota. Furthermore, the Code of Federal Regulations (Title 40, Chapter I, Part 144.12(a)) states that "no owner or operator [of an injection well] shall construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR part 142 or may otherwise adversely affect the health of persons."

No known shallow disposal well sites were identified within the DWSMA. Continued vigilance will occur for identifying and reporting shallow disposal wells if any are discovered.

5.3 Wells

An important component of the potential contaminant source inventory was the location of any known wells within the groundwater capture zones. Since wells may penetrate confining layers that protect an aquifer, they are potential pathways for contaminants to rapidly enter the aquifer. A search for active and unsealed abandoned wells was undertaken for the DWSMA.

The following sources were used to identify wells in the DWSMA:

1. Minnesota Geological Survey's Minnesota Well Index (MWI)
2. Milaca staff knowledge about current and historical land uses.
3. Aerial photographs.
4. Drive-by surveys.

The identified wells are plotted on the map in Figure 6, and listed in Appendix A. The results of the well search indicated that there are 45 wells known to be in the DWSMA in addition to the two municipal supply wells. Known sealed wells were omitted from the inventory, as they are thought to no longer pose any threat to the DWSMA. There may be additional wells within the DWSMA that are not part of the current databases, including both active wells and abandoned wells that were never properly sealed.

The accuracy of the locations of the wells as mapped in Figure 6 varies. Whenever possible, wells were mapped using coordinates obtained by the MGS or MDH. When accurate coordinates were not available, all wells were mapped on the correct land parcel using an ortho-rectified digital air photo base map. For the purposes of this planning effort, this level of accuracy was deemed sufficient.

The majority of wells identified in the inventory are private (domestic) water supply wells, serving areas that are not currently served by the City of Milaca water supply system. Some test/monitoring wells were also identified in the inventory. The current database lists all wells as "active" in status, but well status is regularly updated in the database.

5.4 Point Sources

An important component of the potential contaminant source inventory was to look for any potential point sources within the DWSMA that might be a threat to the quality of the public water supply. An example of a point source would be an underground storage tank or any facility that stores, handles, or disposes of materials that, if introduced into the environment, might degrade the quality of the water pumped from the aquifer. A listing of potential point sources by land parcel is presented in Appendix A. GIS data files containing the point source data are also available electronically. The locations are mapped in Figure 7.

Items located within the DWSMA were identified and inventoried according to the required criteria. Data points were located by the address information provided in the databases and by Milaca staff. Field reconnaissance of certain sites was used to verify locations of mapped contaminant sources. Only four parcels were identified within the DWSMA as potential point sources, not including sites with septic systems. Of these sites, two are listed as being "active" while the other two are listed as "inactive" in status.

The two "active" sites include the Milaca Water Treatment Plant, which has an Industrial SDS Wastewater Permit and Milaca Public Schools, which is listed as a minimal quantity hazardous waste generator along with containing one underground and two aboveground storage tanks.

The two "inactive" sites include A Car and Mr. Ed's Auto Salvage, both of which are recorded as hazardous waste generators. In addition, an investigation and cleanup was initiated for Mr. Ed's Auto Salvage in 1987, with the investigation closed in 1997.

The majority of the DWSMA is currently not served by a sanitary sewer system, necessitating that residential and commercial properties construct and maintain septic systems, otherwise known as subsurface sewage treatments systems (SSTS). A total of 15 septic systems were identified from Mille Lacs County databases, which are displayed in Figure 8 and in Appendix A. Of these 15 septic systems, only two were identified within the highly-vulnerable portion of the DWSMA. However, it is believed that the County's database may not be complete, as several more residential properties exist within the DWSMA that are not served by Milaca sewer. Is it believed that these properties may have septic systems, so further efforts will be undertaken to identify all properties with active septic systems where appropriate.

Poorly maintained or failing septic systems may be a threat to aquifer water quality, particularly in high vulnerability areas. Nitrate is a contaminant of particular concern that may derive from septic systems. The Minnesota Pollution Control Agency (MPCA) has developed technical standards and criteria for septic systems, which are contained in MN Rules Chapter 7080. MPCA standards, or more restrictive local standards, must be followed in wellhead protection areas.

5.5 Non-Point Potential Contaminant Sources

Non-point sources of contamination are associated with land use not specific to a particular point or small area. Non-point sources are a concern throughout highly vulnerable areas of the DWSMA because contaminants released at the surface may infiltrate into highly permeable soils and eventually

migrate into the groundwater supply.

Agricultural areas are often one of the largest sources of concern for non-point sources. Currently, Mille Lacs County has zoned the entire portion of the DWSMA located outside of the City of Milaca as agricultural (Figure 4). A large portion of this land would be more accurately described as rural or single family residential. Portions of actively farmed land do still exist, including some parcels in the vicinity of Milaca's municipal wells. Much of this area falls within the moderate vulnerability areas of the DWSMA, though small amounts of high vulnerability DWSMA are also included. Future land use (Figure 5) designations indicate that agricultural land uses will be eliminated east of 130th Avenue. Agricultural areas in the highly-vulnerability DWSMA will be replaced by residential land uses as the City expands.

Roads and impervious surfaces may also be potential non-point sources of contamination to the aquifer if they drain to high vulnerability areas. Transportation corridors are discussed further below. The land use maps provide a guide to areas that may be non-point sources (Figures 4 and 5).

Finally, the Forest Hill Cemetery is located on the eastern edge of the DWSMA, next to the Rum River. Cemeteries are sometimes included as non-point sources, particularly if there is concern of the cemetery leeching embalming chemicals into groundwater that may be intercepted by the municipal wells. At present, there does not appear to be any concern that this cemetery is degrading local groundwater supplies. Also, any leeched chemicals would be expected to drain eastward and be discharged into the Rum River before being intercepted by water supply wells.

5.6 Public Utility Services

Infrastructure-related accidents are another potential contaminant source. Roadways, railways and oil pipelines are examples of transportation routes that may be the site of a leakage or spill that could threaten the aquifers.

Highway 23 is the major transportation corridor that intersects the DWSMA. A former railway also intersected the DWSMA. Milaca Wells 3 and 4 are located on this former railway alignment. While railways are sometimes the source for pollutants, there is no evidence of railway spills or contamination within Milaca's DWSMA.

There is one identified pipeline in the Milaca DWSMA, which is the Viking Gas Pipeline. While natural gas pipelines can pose a threat to public safety is leaks or ruptures develop, they generally do not pose a threat to groundwater quality, as any leaked gas is expected to migrate upwards and be dissipated into the atmosphere.

Public water supply wells are also components of the public utility infrastructure. The locations of the active wells are shown on Figure 1. At present, all active public water supply wells appear to meet the required setbacks set forth for the 200-foot radius around each well. The City maintains records of well construction and maintenance for both wells currently in service. These records can be viewed at the City's offices by personnel approved to review this material.

There are no water distribution lines within the DWSMA, other than the raw water mains that connect

the City's wells with the distribution system to the east. There are also no storm or sanitary sewers lines located within the DWSMA.

5.7 Active Sites of Contamination

There are currently no listed active sites of contamination (spills, leaks, etc.) within the DWSMA. A former site for investigation and cleanup was identified in the DWSMA at Mr. Ed's Auto Salvage, but the investigation was closed in 1997.

Should any contamination sites be identified within the DWSMA, they will be prioritized in order of the threat they pose to the municipal wells. Site specific soil conditions, geology, surface runoff, and estimated time of travel to the public supply wells will be investigated to assess the level of threat to the City's water supply.

5.8 Summary

Proactive management of potential point sources of contamination within the 1-year groundwater capture zones, or Emergency Response Areas, in high vulnerability areas are of most immediate concern. These items would pose the greatest potential risk to the quality of water drawn from the public water supply wells.

Type of Potential Contaminant Source	Known Active Contamination Sources within DWSMA	Known Removed/Closed Contamination Sources within DWSMA	Total Known Active Sources Within the Emergency Response Area	Total Known Active Sources Within the High Vulnerability DWSMA
Groundwater Wells	48	Not quantified	6 (including municipal wells)	Not quantified
Registered Storage Tank Permit	1	Not quantified	1	1
Aboveground Storage Tank	2	0	2	2
Underground Storage Tank	1	0	1	1
Leaking Underground Storage Tank	0	0	0	0
Suspected Spill/Leak Site	0	1	0	0
Dump	0	1 (inactive)	0	0
Hazardous Waste Generator Permit	1	2	0	1
Septic Systems (SSTS)*	15	Not quantified	0	2
Class V wells	None identified	None identified	None identified	None identified
Large sewer system	None identified	None identified	None identified	None identified
Transportation routes	State Highway and local roads	Railroad	Local roads	State Highway and local roads

*actual number is likely higher, since County database appears to be incomplete

The land use map (Figures 4) provides a tool for understanding the scope of land uses in the DWSMA. The inventory was made as complete as practicable at the time of the development of this Plan. Further data collection issues and the other problems and opportunities associated with land uses are addressed in Chapter 7. Plan goals, objectives, and actions are addressed in Chapter 8.

6.0 PROJECTED CHANGES TO THE ENVIRONMENT, LAND USE, AND SURFACE AND GROUNDWATER

General land uses within the DWSMA are expected to change in the coming years. Figure 5 shows projected future land uses. Areas currently zoned as agricultural by the County will be converted to residential and business uses. Future land use projections for areas outside of the City of Milaca were not currently available. It is assumed this area will continue to be zoned as agricultural until the County updates its land use plan.

As the City expands west of the Rum River, expansion of the current water supply system and sanitary sewer system is expected to eventually occur. The current system is expected to have sufficient capacity to supply the City's needs for the ten-year time frame of this Wellhead Protection Plan, however.

7.0 PROBLEMS AND OPPORTUNITIES

An identification of potential problems helps the City of Milaca realize the main challenges to successfully developing and implementing their wellhead protection plan. An identification of opportunities outlines circumstances which Milaca can use to their benefit while planning the management of their DWSMA.

7.1 Problems

1. Portions of the DWSMA for the City of Milaca are vulnerable to contamination.
2. Portions of the Emergency Response Area are classified as highly vulnerable to contamination.
3. Portions of the DWSMA are outside of the jurisdiction of the City of Milaca
4. The DWSMA is not currently served by City water or sewer services, which results in a large number of domestic wells and septic systems within the DWMSA.
5. The Highway 23 corridors runs through the center of the DWSMA, creating the possible threat of accidental spills.
6. Residential areas of the DWSMA represent potential non-point sources to which the water supply system may be susceptible if and lawn and garden chemicals are misused.

7.2 Opportunities

1. Planned expansion will result in a larger portion of the DWSMA being inside of the City of Milaca boundary.
2. Changing land uses within the DWSMA offer the opportunity to potentially avoid or restrict the introduction of potential contamination sources in highly vulnerable areas.
3. The most highly agricultural areas fall mostly within the moderate vulnerability portions of the DWSMA.
4. The majority of the identified point-source potential contamination sources do not appear represent significant threats to the groundwater.
5. An opportunity exists to work with local units of government, including Mille Lacs County, in planning land uses in order to protect the area's groundwater resources.

7.3 Status of Existing Governmental Controls Concerning Water and Related Land Use

City of Milaca

Zoning ordinances and special use permits are the primary means by which the City of Milaca controls water and land use within the city.

Mille Lacs County

The Mille Lacs County Land Services Office provides services relating to property records, land use regulation and construction permitting. Staff is responsible for administering local ordinances such as the Development Code and the Subsurface Sewage Treatment System (septic system) ordinance and state laws such as the Wetland Conservation Act and State Building Code. The Land Services Office administers the County's Comprehensive Plan, Ordinances that regulate the use and subdivision of land and Zoning Maps. Two advisory committees, the Planning Commission and Board of Adjustment, assist staff in the administration.

The Mille Lacs County Soil and Water Conservation District (SWCD) is a local unit of government that manages and directs conservation programs within Mille Lacs County. The SWCD's function is to assist land users in both rural and urban settings to protect soil and water resources. The SWCD receives its authority from Chapter 103C of Minnesota Statutes.

The SWCD implements erosion and pollution control practices with financial assistance to land occupiers, urban land users and local governmental units in Mille Lacs County in the management, conservation, and protection of the County's soil and water resources. The SWCD also provides educational programs and materials on conservation and soil stewardship.

The SWCD created and adopted a Local Water Resource Management Plan, with the current version of the plan in place from 2018 through 2030. The next amendment to this plan will likely occur during the lifetime of this Wellhead Protection Plan.

Rum River Watershed Partnership

The Rum River Watershed Partnership (RRWP) is a group of local and tribal government units within the watershed, as well as their partners from state and federal agencies, non-profits, citizens, and other stakeholders. The Partnership works together to unify strategy for water management in the watershed through the Rum River Comprehensive Management Plan. The current Rum River Comprehensive Watershed Management Plan was approved in May 2022. This management plan incorporates groundwater management as a major component of the plan. Therefore, goals and objectives in this Wellhead Protection Plan may benefit by working with RRWP in implementing management strategies in partnership with each other.

State and Federal Regulations

Many of the state and federal regulations for potential sources of pollution are design and operation standards. Examples are regulations concerning on-site sewer systems, large storage tanks, and wells. It

should be noted that the state's design and operation standards would be adequate for most contaminant sources within the Milaca DWSMA.

Land use authority that addresses the location of potential sources of contamination within the Milaca DWSMA rests with local units of government according to Minnesota law. The Milaca DWSMA falls within the jurisdiction of the City of Milaca and Mille Lacs County.

State and federal governmental units regulate:

- Well construction – MDH;
- Well sealing – MDH;
- State groundwater appropriation permits – DNR;
- Public water supply quality – MDH;
- Setbacks for specific contaminant sources from a well – MDH and local governments through conditional use permitting;
- Tank control program – MPCA, MDA
- Shallow disposal wells - U.S. EPA.

Any of the permitted activities which have the potential to affect the wellhead protection area and/or the quality or quantity of the Milaca water supply should be reviewed by the respective state agency before a permit can be approved.

The wellhead protection planning team recommends that no additional regulations be imposed at this time and are confident that local issues may be adequately addressed through existing processes.

8.0 WELLHEAD PROTECTION GOALS, OBJECTIVES AND IMPLEMENTATION PLAN

Goals and objectives have been developed based on the results of the vulnerability analysis, the results of the potential contaminant source inventory, and the projected changes to the environment, land use, and surface and ground water. In general, goals and objectives are ranked in order of priority.

8.1 Goals

The following goals form the framework within which the information generated during delineation and source inventory activities is evaluated and upon which the planning activities are based:

1. To continue to provide high quality water that meets state and federal drinking water standards.
2. Practice prevention strategies and best management practices for properties containing potential contaminant sources to avoid adversely impacting the quality of the water drawn from the aquifer.
3. To work cooperatively with County and State government on aquifer protection actions.
4. To work cooperatively with Mille Lacs County to ensure land use planning and zoning considers protection of the aquifer.
5. Build awareness of wellhead protection goals among property owners within the DWSMA.

8.2 Objectives

Considering the problems and opportunities listed in Chapter 7 and the goals listed above, a strategy of objectives and specific actions aimed toward meeting those objectives was developed. Because the system water meets all state and federal drinking water standards, and contamination from human sources has not been a problem to date, the plan will focus on preventing acute point source releases, particularly in the Emergency Response Areas. To meet the stated goals, the following specific objectives were developed:

1. Monitor the 200-foot Inner Wellhead Management Zones and one-year time of travel delineations to prevent contamination in the areas immediately surrounding the wellheads.
2. Locate wells within the DWSMA that were not previously identified during the creation of the potential contamination source inventory
3. Seal abandoned or unused wells located in the groundwater DWSMA and encourage proper well maintenance
4. Collect water quality information for the aquifer supplying the City's wells.
5. Identify new spills or potential contamination sources within the DWSMA.
6. Manage risks of possible contamination of groundwater from accidental spills along highways and county roads.
7. Manage hazardous waste within the DWSMA.
8. Include Wellhead Protection overlays in future land use planning and comprehensive planning.
9. Develop public support and understanding for the wellhead protection plan through the use of newsletters, press releases, handouts, and participation in special events.
10. Locate and inventory additional septic systems not currently in the Mille Lacs County database. Educate property owners about the need for complying on-site sewage treatment

systems in the DWSMA.

11. Explore potential sites for a third municipal water supply well.
12. Identify and seal any Class V injection wells identified within the DWSMA.
13. Review system security and contingency strategies.

8.3 Implementation Plan

Objective 1: Monitor the 200-foot Inner Wellhead Management Zones and one-year time of travel delineations to prevent contamination in the areas immediately surrounding the wellheads. (See Inner Wellhead Management Zones in Appendix D.)

Action 1A:	Continue to monitor setbacks for all potential sources of contamination located within Inner Wellhead Management Zones and Emergency Response Area.
Who:	Milaca Wellhead Protection Manager, Milaca Public Works Staff
When:	Annual review
Cost:	City staff time
How:	The wellhead protection manager will ensure that any new regulated activities will meet the required setbacks. The Inner Wellhead Management Zone will be examined to determine if any changes necessitate additional implementation measures.
Status:	Ongoing.

Action 1B:	Assist MDH with amending Inner Wellhead Management Zone Inventories.
Who:	Milaca Wellhead Protection Manager, Milaca Public Works Staff
Cooperators:	Minnesota Department of Health
When:	Review as needed
Cost:	City staff time
How:	The wellhead protection manager will work with MDH staff to update the inventories at the required time(s).
Status:	Ongoing.

Action 1C:	Implement recommendations within Inner Wellhead Management Zone reports.
Who:	Milaca Wellhead Protection Manager, Milaca Public Works Staff
Cooperators:	Minnesota Department of Health
When:	2030
Cost:	City staff time
How:	The wellhead protection manager will work with MDH staff to implement the recommended activities identified in the Inner Wellhead Management Zone reports (included in Appendix D.)
Status:	Ongoing.

Objective 2: Locate wells within the DWSMA that were not previously identified during the creation of the potential contamination source inventory.

Action 2A:	Make direct contact with well owners in the DWSMA to determine the number of wells and status of each well on their property.
Who:	Milaca Wellhead Protection Manager
When:	2027
Cost:	City staff time, printing and postage costs
How:	Milaca will conduct mail survey to determine the number and status of wells at each property. Wells without accurate location information may be GPS-surveyed to better define well coordinates. Attempt to identify unused wells through the survey. Any unused wells discovered during the survey may trigger Actions 3A, 3B, and 3C (below). Educational materials and well sealing grant opportunities will be provided to well owners at the same time as part of Action 3D (below).
Status:	Not currently implemented.

Action 2B:	Field verify locations of any new wells constructed within one mile of the Milaca municipal wells.
Who:	Milaca Wellhead Protection Manager
Cooperators:	Minnesota Department of Health
When:	Review in 2030 and 2033 or as new wells are discovered.
Cost:	City staff time, printing and postage costs
How:	Milaca will field verify the locations of any new wells constructed within one mile of the municipal wells. Field verification will include collection of GPS coordinates for new wells. This data will be used to update well maps for future amendments to the Wellhead Protection Plan.
Status:	Not currently implemented

Action 2C:	Identify if any abandoned municipal wells may not sealing. Seal any unused wells discovered,
Who:	Milaca Wellhead Protection Manager
Cooperators:	Minnesota Department of Health
When:	Review by 2030.
Cost:	City staff time, survey time, sealing costs
How:	Milaca will research locations of old municipal wells and determine if any exist that haven't been properly sealed. If wells are found that need sealing, apply for MDH grant funding to assist with well sealing.
Status:	Not currently implemented

Objective 3: Seal abandoned or unused wells located in the groundwater DWSMA and encourage proper well maintenance.

Action 3A:	Provide MDH with a list of abandoned and unsealed well locations as Milaca personnel discover them.
Who:	Milaca Wellhead Protection Manager
Cooperators:	MDH, Mille Lacs SWCD
When:	Annual review and as needed
Cost:	City staff time
How:	Prepare written report for distribution to MDH as wells are discovered. Include Mille Lacs County SWCD in communications.
Status:	Ongoing.

Action 3B:	Make property owners aware of financial and technical resources available to assist in securing grant funding for properly sealing wells.
Who:	Milaca Wellhead Protection Manager
Cooperators:	MDH, Mille Lacs County SWCD
When:	Funding needs to be reviewed as abandoned wells are identified
Cost:	Staff time
How:	Research types of grants and loans available for permanent well sealing and distribute this information to appropriate well owners, as requested.
Status:	Ongoing.

Action 3C:	If wells are identified that require sealing, pursue grant funding to assist with well sealing activity.
Who:	Milaca Wellhead Protection Manager, Milaca City Manager, MDH
Cooperators:	Mille Lacs Soil and Water Conservation District (SWCD)
When:	Funding needs and grant opportunities to be reviewed as abandoned wells are identified
Cost:	Staff time
How:	Determine the availability of grant money from MDH for well sealing activities. Apply for grants to seal wells that are identified to no longer being used and/or are not properly maintained. Identify available County funds for well sealing.
Status:	Ongoing.

Action 3D:	Send educational information to well owners informing them of proper well maintenance and potential well sealing grant opportunities.
Who:	Milaca Wellhead Protection Manager
Cooperators:	Soil and Water Conservation District (SWCD), Minnesota Rural Water Association (MRWA), MDH
When:	2028 and 2032
Cost:	Staff time, printing and postage costs
How:	Work with SWCD, MWRA, and MDH to generate mailing to educate well owners about the importance of sealing unused wells. Notify well owners of opportunities to obtain grant funding to seal unused wells. Activity will take place at the same time Action 2A is implemented.
Status:	Not currently implemented.

Objective 4: Collect water quality information for the aquifer supplying the City's wells.

Action 4A:	Continue nitrates monitoring program to determine if the sewage treatment system is having a degrading impact on local groundwater resources
Who:	Milaca Public Works Staff
Cooperators:	MDH, MPCA
When:	Annually
Cost:	Staff time
How:	Continue collecting samples from monitoring wells, as directed by state agencies, in order to assess the potential impact of the sewage treatment ponds on groundwater.
Status:	Ongoing.

Action 4B:	Work with MDH to identify trends in chlorides. Collect samples to determine if levels are changing over time.
Who:	Milaca Public Works Staff
Cooperators:	MDH, MPCA
When:	Annually
Cost:	Staff time
How:	Collect samples from municipal wells and any selected nearby wells which may show changing trends over time.
Status:	Ongoing.

Action 4C:	Assist MDH with collection of standard water parameters required before next plan amendment
Who:	Milaca Public Works Staff
Cooperators:	MDH
When:	2034
Cost:	Staff time
How:	Provide assistance to MDH staff to collect water quality samples during the 8th year of plan implementation. These samples are used to identify changes in water chemistry that may indicate the age of the water and the potential vulnerability of the aquifer serving the wells.
Status:	Ongoing.

Action 4D:	Review nitrates and chlorides trends with MDH Hydrologist to determine if additional study is required to determine nitrates sources.
Who:	Milaca Wellhead Protection Manager
Cooperators:	MDH
When:	2029 and 2032.
Cost:	Staff time
How:	Provide nitrates and chlorides data to MDH Hydrologist for review. Discuss trends and determine if there is a need for additional study or additional monitoring. If additional study is needed to determine the source of nitrates or chlorides, pursue available grant funding to help fund a study.
Status:	Not currently implemented.

Objective 5: Identify new spills or potential contaminant sources within the DWSMA..

Action 5A:	Determine if state agencies or local services have knowledge of new spills or potential contaminant sources in the DWSMA. Determine if the status of any existing spill/leak sites has changed.
Who:	Milaca Wellhead Protection Manager
Cooperators:	MPCA, Department of Agriculture, Local emergency response services
When:	2028, 2032, and 2035.
Cost:	Staff time
How:	Contact designated Point Of Contact staff at MPCA and MDA acting as a liaison to the wellhead protection program. Contact local emergency response teams. Provide map coverage of DWSMA to cooperators, along with current known PCSI inventory. Request updates on any new or existing spills/leaks or possible contamination sources. Update PCSI coverage based on information provided by cooperators.
Status:	Ongoing.

Objective 6: Manage risks of possible contamination of groundwater from accidental spills along highways and county roads.

Action 6A:	Work with emergency management teams to raise awareness of wellhead protection goals and aquifer vulnerability
Who:	Milaca Wellhead Protection Manager
Cooperators:	MPCA, MDA, Mille Lacs County, MNDOT, Local emergency response services, Minnesota Rural Water Association
When:	2029
Cost:	Staff time
How:	Meet with cooperators to discuss wellhead protection goals. Identify keys issues and responsibilities for each party and outline roles and responses following an identified spill. Raise awareness of aquifer vulnerability among cooperators.
Status:	Not currently implemented

Action 6B:	Develop a spill response plan to have a strategy in place if a spill occurs within the DWSMA.
Who:	Milaca Wellhead Protection Manager
Cooperators:	MPCA, MDA, Mille Lacs County, MNDOT, Local emergency response services, Minnesota Rural Water Association
When:	2030
Cost:	Staff time
How:	Identify measures to take following the identification of a spill. Outline measures to take to protect the public water supply wells. Identify alternatives if aquifer is contaminated.
Status:	Not currently implemented

Objective 7: Manage hazardous waste within the DWSMA.

Action 7A:	Use education materials to encourage property owners to use hazardous waste collection programs.
Who:	Milaca Wellhead Protection Manager, Milaca City Manager
Cooperators:	Mille Lacs County
When:	2026
Cost:	Staff time
How:	Include information about wellhead protection and the importance of proper disposal of household hazardous waste in education materials (newsletter, brochure, or website). Provide facility address, operational hours, and contact information.
Status:	Not currently implemented

Action 7B:	Provide information to identified hazardous waste generators in highly-vulnerable portion of DWSMA.
Who:	Milaca Wellhead Protection Manager
Cooperators:	MPCA
When:	2027
Cost:	Staff time
How:	Provide information to businesses about the Minnesota Technical Assistance Program's hazardous waste services.
Status:	Not currently implemented

Objective 8: Include Wellhead Protection overlays in future land use planning and comprehensive planning.

Action 8A:	Provide wellhead protection maps and overlays for land use planning, zoning, and comprehensive planning.
Who:	Milaca Wellhead Protection Manager, Milaca City Manager, Milaca Planning Commission
Cooperators:	Mille Lacs County Planning Commission
When:	Ongoing, as needed
Cost:	Staff time
How:	Provide DWSMA information to planning departments. Identify issues in land use, zoning, and comprehensive planning that could impact the groundwater quality within the DWSMA. Review possible impacts of converting land uses from agricultural to business and residential. Consider changes or controls that would help maintain or improve groundwater quality within or near the DWSMA.
Status:	Ongoing.

Objective 9: Develop public support and understanding for the wellhead protection plan through the use of education materials. These materials may include newsletter articles, handouts, the Consumer Confidence Report, and the City's website.

Action 9A:	Include information about wellhead protection in annual Consumer Confidence report. Include information about the Wellhead Protection Plan on City's website. Develop brochures for public.
Who:	Milaca Wellhead Protection Manager, Public Works Staff
Cooperators:	MDH, Minnesota Rural Water Association
When:	Annually
Cost:	Staff time
How:	Create articles relating to wellhead protection goals and implementation. Include in CCR and on City's website. Make brochures available at City Hall.
Status:	Ongoing.

Action 9B:	Send letter to potential contamination source property owners (other than well and ISTS properties) within the high vulnerability portion of the DWSMA, notifying them of their placement in a wellhead protection area.
Who:	Milaca Wellhead Protection Manager
Cooperators:	MDH
When:	2026
Cost:	Staff time
How:	Send letter to property owners with identified potential contaminations sources (other than wells and ISTS systems). Educate property owners on wellhead protection goals and aquifer vulnerability. Provide best management practices for property owners to follow.
Status:	Not currently implemented.

Objective 10: Locate and inventory additional septic systems not currently in the Mille Lacs County database. Educate property owners about the need for having complying on-site sewage treatment systems in the DWSMA.

Action 10A:	Work with Mille Lacs County to identify additional septic systems in the DWSMA that are not currently part of the County's inventory.
Who:	Milaca Wellhead Protection Manager
Cooperators:	Mille Lacs County
When:	2030
Cost:	Staff time
How:	Work with Mille Lacs County staff to obtain current list of all SSTS systems in DWSMA. Updates to the inventory will be made to reflect the most current conditions of each system.
Status:	Not currently implemented

Action 10B:	Provide information to SSTS owners in the highly vulnerable portion of the DWSMA identifying wellhead protection as a concern and provide information pertaining to proper SSTS maintenance.
Who:	Mille Lacs County
Cooperators:	Milaca Wellhead Protection Manager, U of M Extension
When:	2031
Cost:	Staff time. Purchase price per packet plus postage.
How:	Request that Mille Lacs County notify SSTS owners within the highly vulnerable portion of the DWSMA about proper system maintenance. Obtain packets from the U of M Extension Service that provide information on septic system maintenance. Make SSTS owners within the DWSMA aware of these packets and provide them upon request.
Status:	Not currently implemented.

Objective 11: Explore potential sites for a third municipal water supply well.

Action 11A:	If a new well is determined to be needed in the next 10-20 years, identify potential sites that may be suitable for a new municipal well.
Who:	Milaca Wellhead Protection Manager
Cooperators:	Milaca City Administration, MDH, DNR
When:	2032
Cost:	Staff time
How:	Review available properties that may allow for the addition of a third well. Explore options to purchase properties if the site is deemed suitable for further exploration. Confirm site suitability with MDH and DNR staff.
Status:	Not currently implemented

Action 11B:	If a potential site for a new well is identified, conduct testing to verify the suitability of that site.
Who:	Milaca Wellhead Protection Manager
Cooperators:	MDH, DNR
When:	As needed
Cost:	Staff time
How:	Drill a test well to determine geology of the proposed site. Conduct test pumping to determine potential yield of the aquifer. Collect water quality samples to determine if the proposed site is impacted by contamination or other water quality concerns. Apply for available grant funding to assist with these activities.
Status:	Not currently implemented

Objective 12: Identify and seal any Class V injection wells found within the DWSMA.

Action 12A:	Maintain vigilance for any potential Class V injection wells. Work with MDH and property owner to seal any non-compliant Class V wells.
Who:	Milaca Wellhead Protection Manager
Cooperators:	MDH
When:	Annually
Cost:	Staff time
How:	Notify MDH if any suspected Class V injection wells are discovered within the DWSMA. Ask MDH to provide property owner with information regarding regulations for Class V wells. If well is in need of sealing, work with MDH to obtain grant funding to seal the well.
Status:	Ongoing

Objective 13: Review system security and contingency strategies.

Action 13A:	Review security of wells and pumping infrastructure to determine if additional security measures are required.
Who:	Milaca Wellhead Protection Manager
Cooperators:	MDH
When:	Annually
Cost:	Staff time
How:	Review status of security features (locks, fences, doors, windows, security cameras, etc.) to determine if additional measures are required to maintain security. Apply for MDH grant if additional security systems are needed or require updating.
Status:	Ongoing

Action 13B:	Review contingency strategies when amending DNR water supply plan and AWIA emergency response plan.
Who:	Milaca Wellhead Protection Manager
Cooperators:	MDH
When:	As DNR and AWIA plans are amended
Cost:	Staff time
How:	Review existing contingency strategies to determine if additional measures are needed to respond to potential outages or interruptions. Determine if additional equipment is needed (spill response equipment, emergency generators, etc.) and apply for grant funding to obtain needed equipment.
Status:	Ongoing

9.0 PROGRAM EVALUATION

The City of Milaca will evaluate the progress of the implementation plan every two years. The Wellhead Protection Manager will prepare a progress report to be completed by December 31st on odd-numbered years while this Plan is in effect. The evaluation report will briefly discuss the actions implemented by the City or any cooperators during the previous two years, and actions that will be completed in the next two years. The progress report will be distributed to the Milaca City Council for their review after which it will be submitted to MDH.

According to Minnesota wellhead protection rules, this wellhead protection plan will be updated every 10 years from date of adoption or with the installation of any new municipal well to the water supply system. The plan amendment process is initiated by the MDH, typically in the eighth year of plan implementation to allow time to amend the plan before the current plan expires.

10.0 EMERGENCY PREPAREDNESS AND CONTINGENCY PLAN

Milaca's interim Public Water Supply Plan was submitted to the Department of Natural Resources and was approved on June 20, 2025. Notice of the plan approval is provided in Appendix E. This plan fulfills the Wellhead Protection Rule requirements for an emergency preparedness and contingency plan. The plan may be reviewed at City Hall in Milaca, MN.

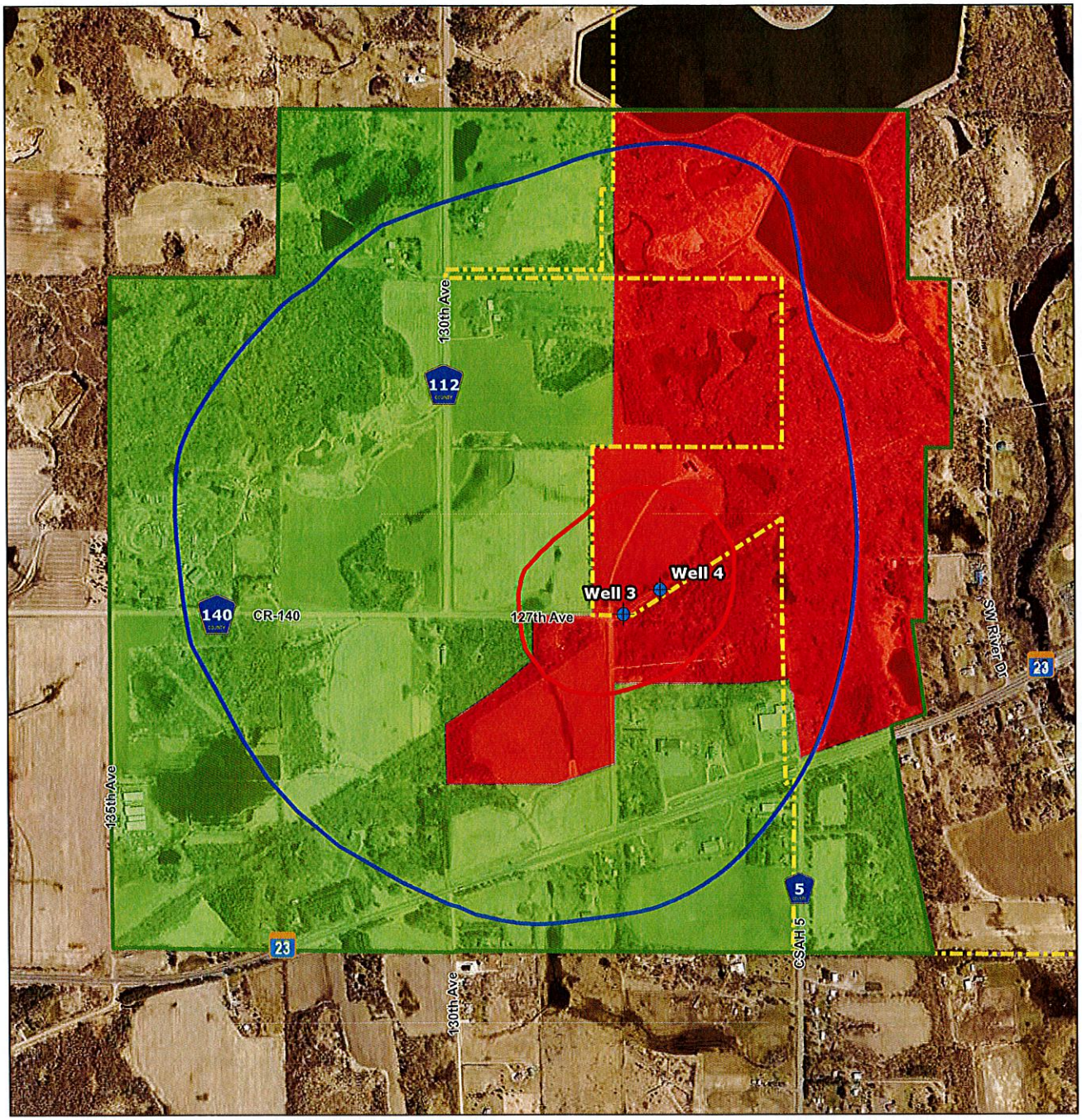
11.0 LOCAL GOVERNMENT REVIEW AND PUBLIC HEARING

Note: This section will be completed once the schedule review period and public hearing have been completed.

The draft Milaca wellhead protection plan was submitted to local units of government for their review and comments on _____. The required 60-day review period ended on _____. Comments received during this period included the following: _____.

Milaca held a public hearing on the Wellhead Protection Plan on _____. Documentation from the public hearing is included in Appendix G. Comments or questions received include the following: _____.

FIGURES



Morrison County	Mille Lacs County	Kanabec County
Benton County		Isanti County

Legend
- Municipal Boundary
- Drinking Water Supply Management Area
- Wellhead Protection Area
- Emergency Response Area
- High Vulnerability Area
- Moderate Vulnerability Area
- Municipal Wells

0 600 1,200 Feet
(At original document size of 8.5x11)
1:14,400

N

Notes
1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: City of Milaca, Minnesota Department of Health
3. Background: Mille Lacs County, 2023

Stantec

Project Location
T38N, R27W, S26
Milaca, Mille Lacs Co., MN

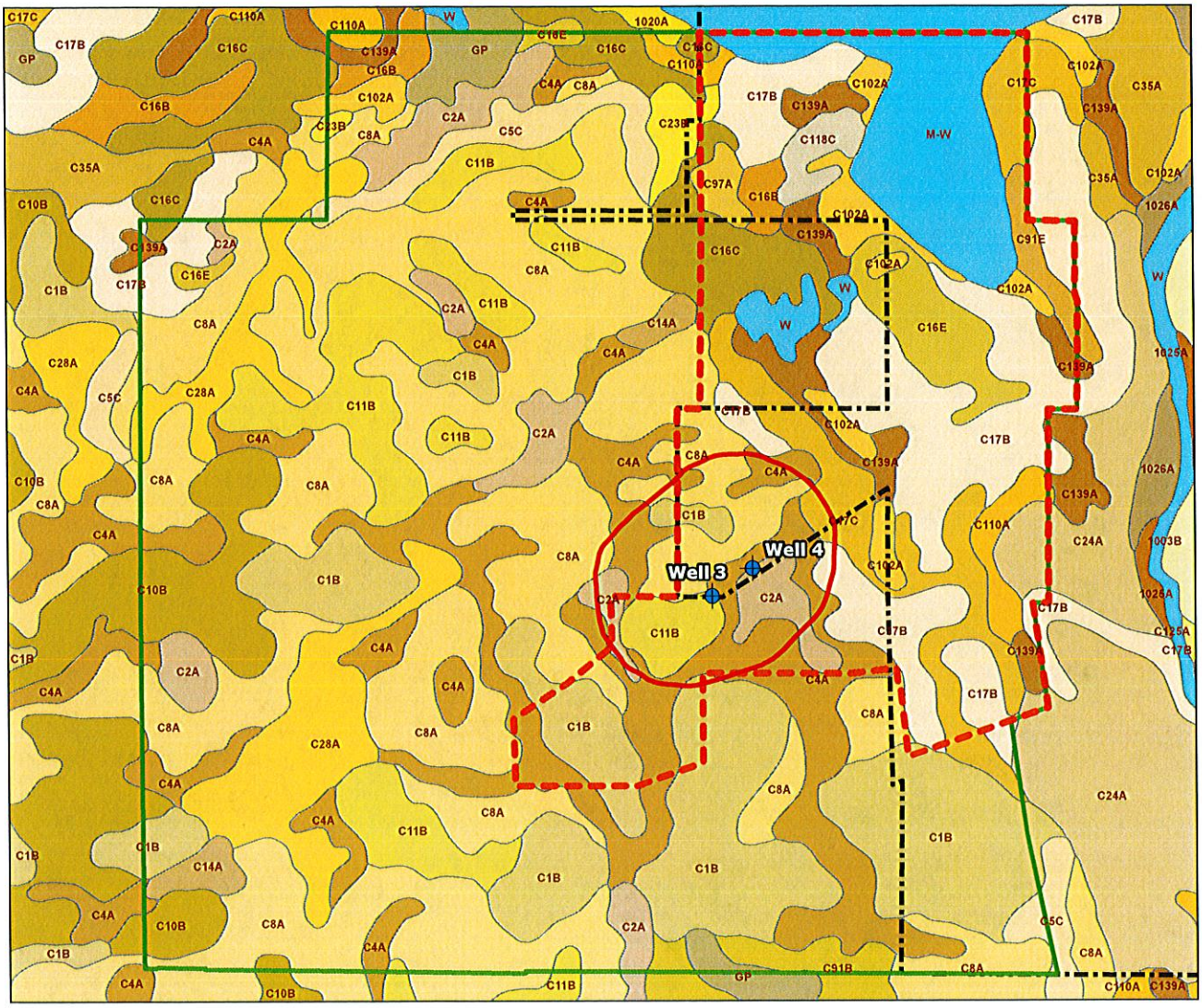
Prepared by TAW on 2025-02-21

Client/Project
City of Milaca
Wellhead Protection Plan

193807324

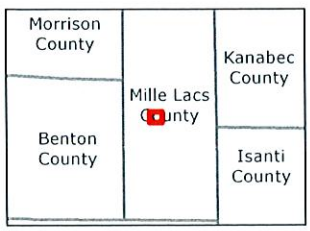
Figure No.
1

Title
Wellhead Protection Area and Drinking Water Supply Management Area



MuSys	Description
1003B	Udorthents, loamy (cut and fill land), 0-6% slope
1020A	Bowstring muck and Fluvaquents, loamy, 0-1% slope, frequently flooded
1025A	Fluvaquents and Udifluvents, loamy 0-2% slope, frequently flooded
1026A	Udifluvents and Fluvaquents, loamy, 0-2% slope, occasionally flooded
C102A	Cathro, sandy substratum, and Seelyville soils, ponded, 0-1% slope
C10B	Brennyville complex, 1-6% slope, stoney
C110A	Annriver silt loam, 0-2% slope
C118C	Chetek-Emmert complex, 8-15% slope
C11B	Mora-Brennyville, wet, complex, 1-6% slope, stoney
C125A	Hulligan loam, depressional, 0-1% slope
C130B	Mora, stoney-Chetek, complex, 2-6% slope
C139A	Minocqua silt loam, depressional, thick solum, 0-1% slope
C14A	Cathro, Twig, and Adolph soils, ponded, 0-1% slope
C16B	Mahtomedi-Chetek complex, 1-8% slope
C16C	Mahtomedi-Chetek complex, 8-15% slope
C16E	Mahtomedi-Chetek complex, 15-30% slope% slope
C17B	Rosholt-Chetek complex, 2-8% slope

MuSys	Description
C17C	Rosholt-Chetek complex, 8-15% slope
C1B	Milaca-Brennyville complex, 3-8% slope
C23B	Antigo-Chetek complex, 2-8% slope
C24A	Billyboy-Ossmer complex, 0-3% slope
C28A	Cartho & Twig soils, depressional, 0-1% slope
C2A	Adolph mucky silty clay loam, depressional, 0-1% slope
C35A	Ossmer-Bilyboy complex, 0-3% slope
C4A	Cebana silt loam, 0-1% slope, stony
C5C	Millaca fine sandy loam, 8-15% slope, stony
C8A	Brennyville, wet-Cebana complex, 0-3% slope, stony
C91B	Milaca, stony-Chetek complex, 3-8% slope
C91C	Milaca, stony-Chetek complex, 8-15%% slope
C91E	Milaca, stony-Chetek complex, 15-30%% slope
C97A	Cathro, sandy substratum, and Seelyeville soils, depressional, 0-1% slope
GP	Pits, gravel-Udipsamments complex
M-W	Water, misscellaneous
W	Water



Legend
- Municipal Boundary
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- Emergency Response Area
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- Municipal Wells

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T38N, R27W, S26
Milaca, Mille Lacs Co., MN

Prepared by TAW on 2025-03-20

Client/Project
City of Milaca
Wellhead Protection Plan

193807324

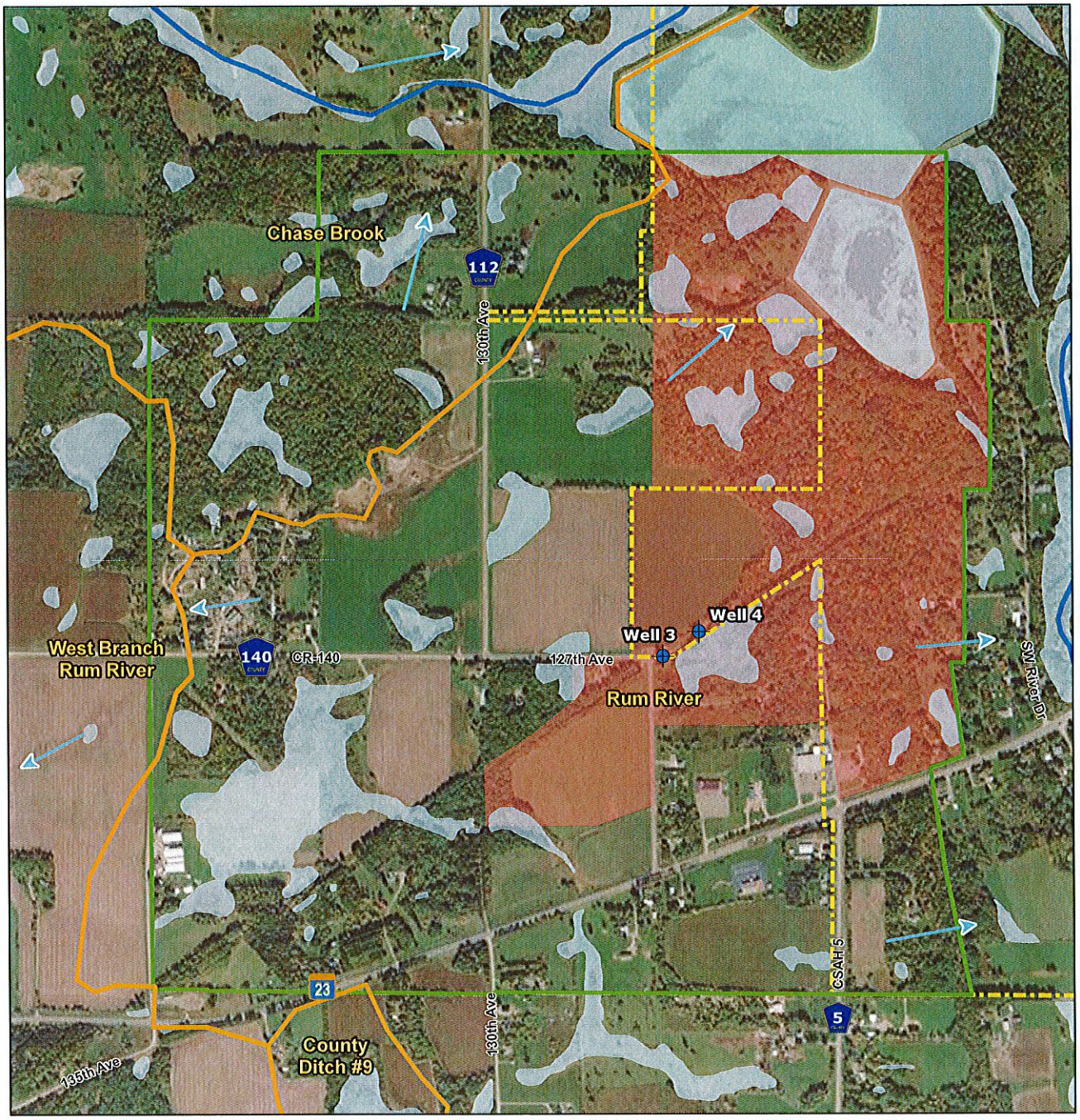
Title
Figure No.
2

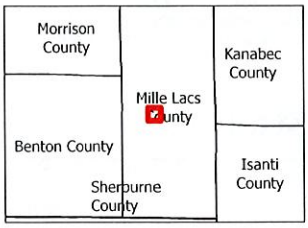
Soils Map

Page 1 of 1

Notes
1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: City of Milaca, Minnesota Department of Health
3. Background:

V:\193807\Clients\Milaca\Projects\Proj\Milaca_Wellhead\Milaca_Wellhead.aprx Revised: 2025-02-21 By: twynn





Legend

- Municipal Boundary
- Drinking Water Supply Management Area
- High Vulnerability Area
- Municipal Wells
- Minor Watershed Boundary
- DNR Protected Watercourse
- National Wetland Inventory
- Flow Direction

0 600 1,200 Feet

(At original document size of 8.5x11)
1:14,400

N

Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: City of Milaca, Minnesota Department of Health, MN DNR
3. Background: Mille Lacs County, 2023

Stantec

Project Location
T38N, R27W, S26
Milaca, Mille Lacs Co., MN

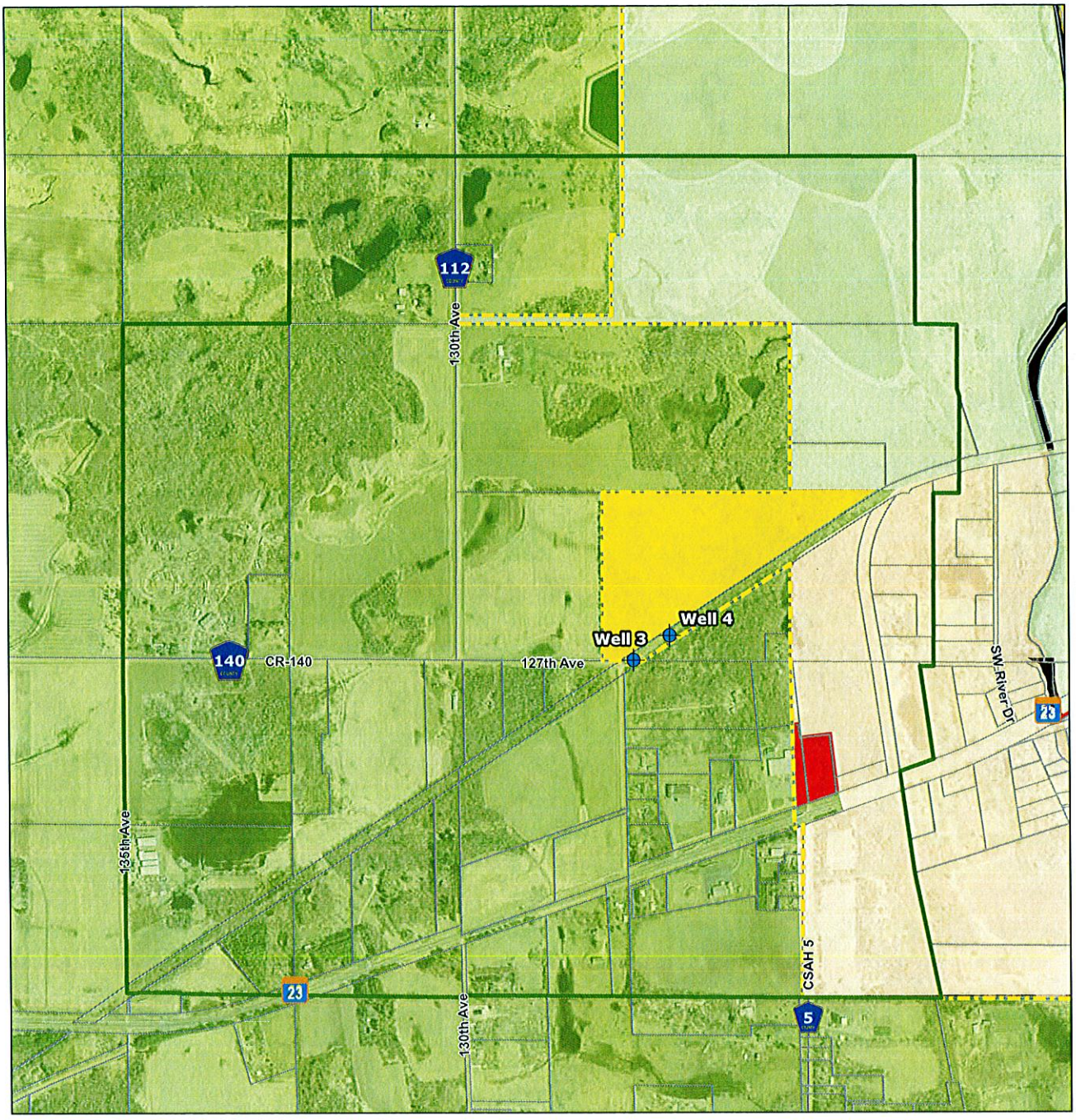
Prepared by TAW on 2025-10-03

Client/Project
City of Milaca
Wellhead Protection Plan

193807324

Figure No.
3

Title
Water Resources



Morrison County		Kanabec County
	Mille Lacs County	
Benton County		Isanti County

Notes
1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: City of Milaca, Minnesota Department of Health, MN DNR, Milaca County
3. Background: Mille Lacs County Aerial, 2023

Legend
- Municipal Boundary
- Drinking Water Supply Management Area
- Municipal Wells
- Parcels
- County Agricultural Residential Zone

Existing City Land Use
- Single Family Residential
- 1 and 2 Family Residential
- General Business District
- Conservation

0 600 1,200 Feet
(At original document size of 8.5x11)
1:14,400

N

Stantec

Project Location
T38N, R27W, S26
Milaca, Mille Lacs Co., MN

Prepared by TAW on 2025-02-21

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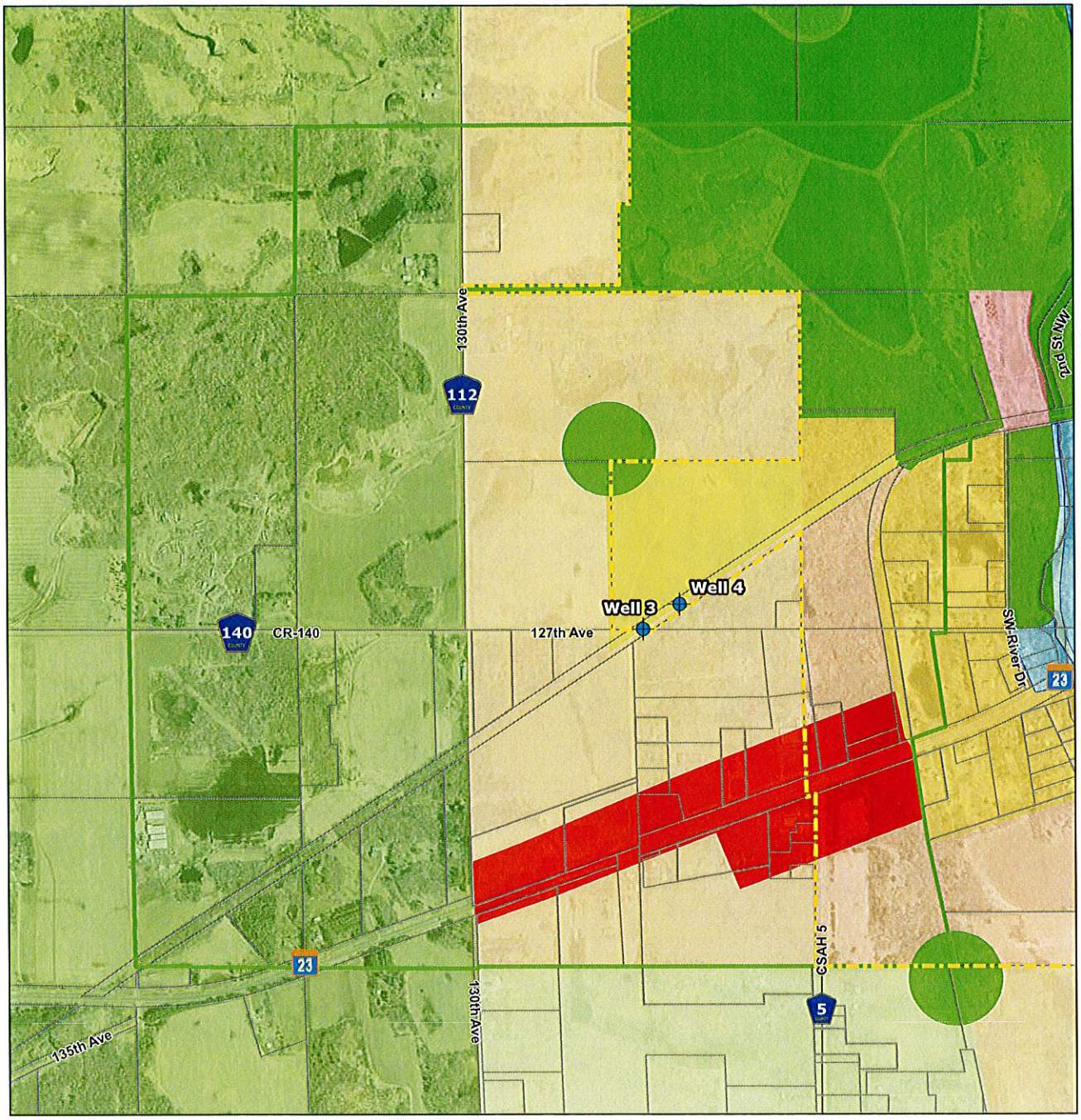
City of Milaca
Wellhead Protection Plan

193807324

Figure No.
4

Title
Existing Land Use



Morrison County	Mille Lacs County	Kanabec County
Benton County		Isanti County

Legend
- Municipal Boundary
- Drinking Water Supply Management Area
- Municipal Wells
- Parcels
- County Agricultural Residential Zone

Future City Land Use
- Business
- Cemetery
- Future Neighborhood
- Low Density Residential
- Park
- Rural
- School District
- Wetland - Floodplain

0 600 1,200 Feet
(At original document size of 8.5x11)
1:14,400

N

Stantec

Project Location
T38N, R27W, S26
Milaca, Mille Lacs Co., MN

Prepared by TAW on 2025-02-21

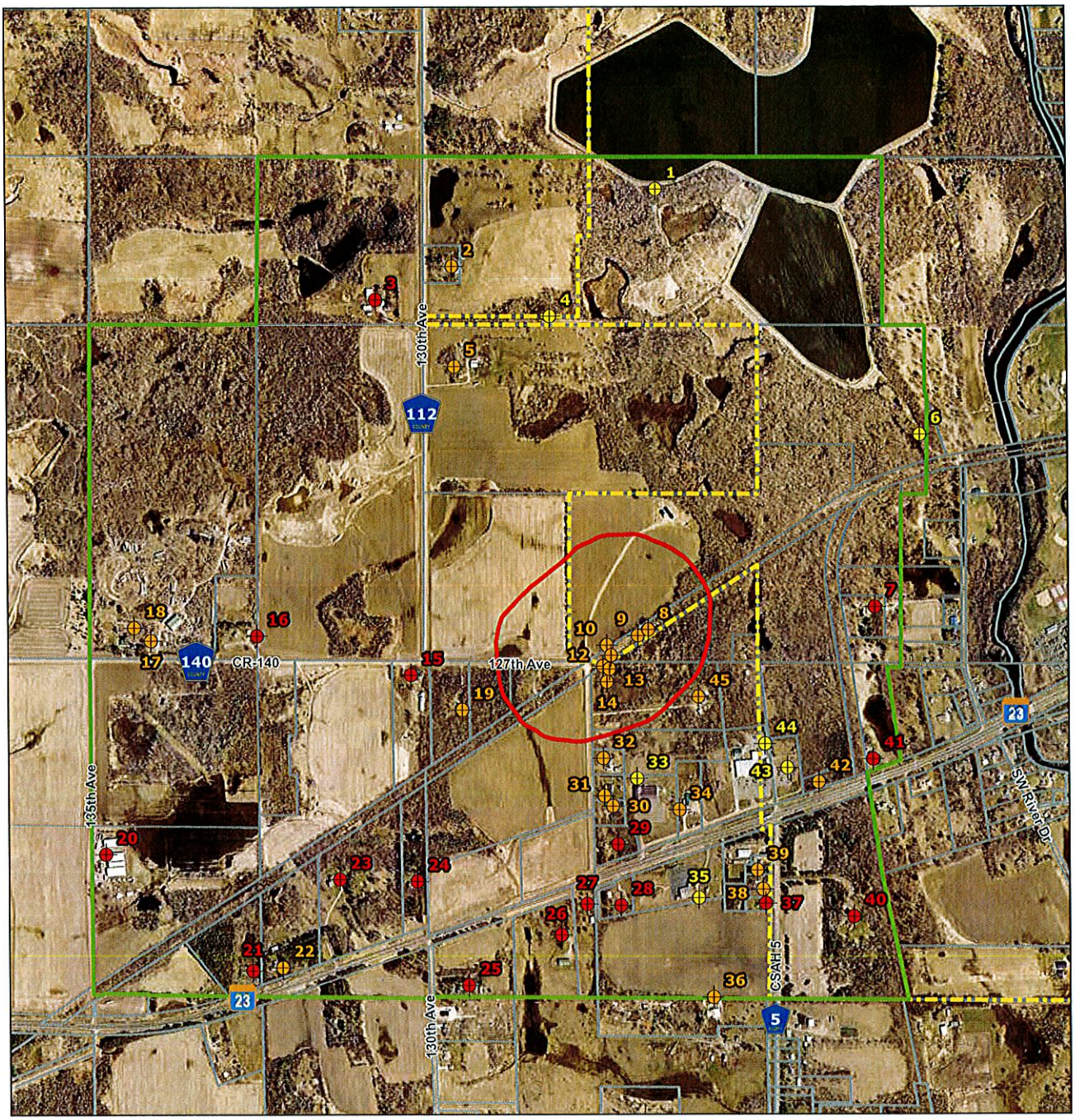
Client/Project
City of Milaca
Wellhead Protection Plan

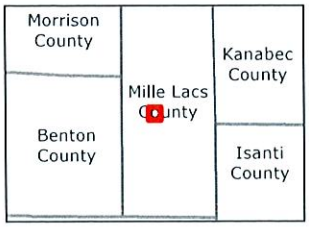
193807324

Figure No.
5

Title
Future Land Use

Notes
1. Coordinate System: NAD 1983 HARN Adj MN Mille Lacs Feet
2. Data Sources: City of Milaca, Minnesota Department of Health, MN DNR, Milaca County
3. Background: Mille Lacs County Aerial, 2023





Legend

- Minnesota Well Index
- Coordinate-located Well
- Parcel-located Well
- Drinking Water Supply Management Area
- Emergency Response Area
- Parcels
- Municipal Boundary

0 600 1,200 Feet
(At original document size of 8.5x11)
1:14,400

N

Stantec

Project Location
T38N, R27W, S26
Milaca, Mille Lacs Co., MN

Prepared by TAW on 2025-04-03

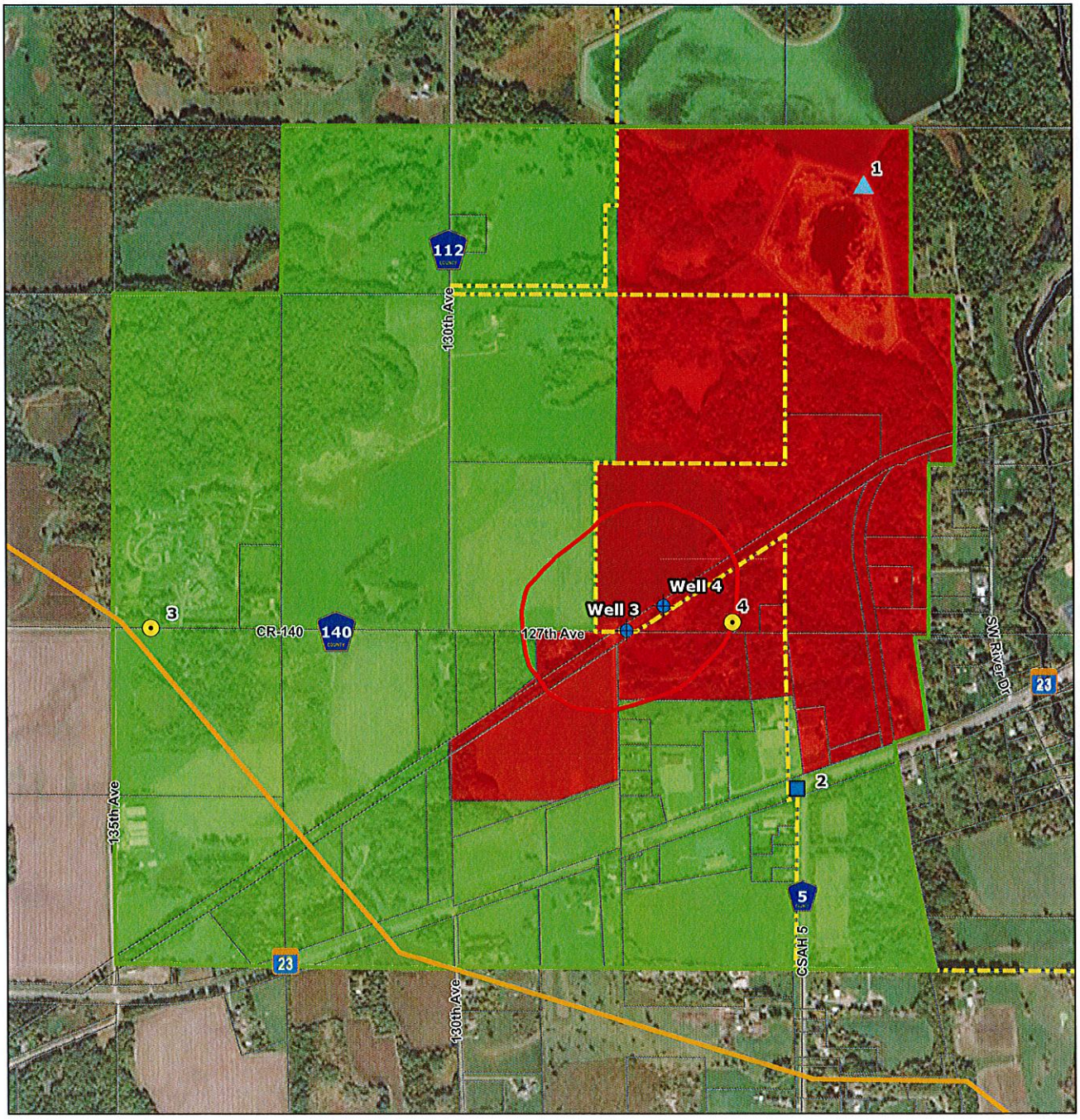
Client/Project
City of Milaca
Wellhead Protection Plan

193807324

Figure No
6

Title
Wells

Notes
1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: City of Milaca, Minnesota Department of Health, MN CWI
3. Background: Mille Lacs County Aerial, 2023



Morrison County		Kanabec County
Benton County	Mille Lacs County	Isanti County

Legend

- Municipal Boundary
- Drinking Water Supply Management Area
- Emergency Response Area
- High Vulnerability Area
- Moderate Vulnerability Area
- Municipal Wells
- Parcels
- Hazardous Waste
- Multiple Programs
- Water Quality
- Pipeline

0 600 1,200 Feet

(At original document size of 8.5x11)
1:14,400

N

Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: City of Milaca, Minnesota Department of Health, MNDA, MPCA
3. Background: Mille Lacs County Aerial, 2023

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Project Location
T38N, R27W, S26
Milaca, Mille Lacs Co., MN

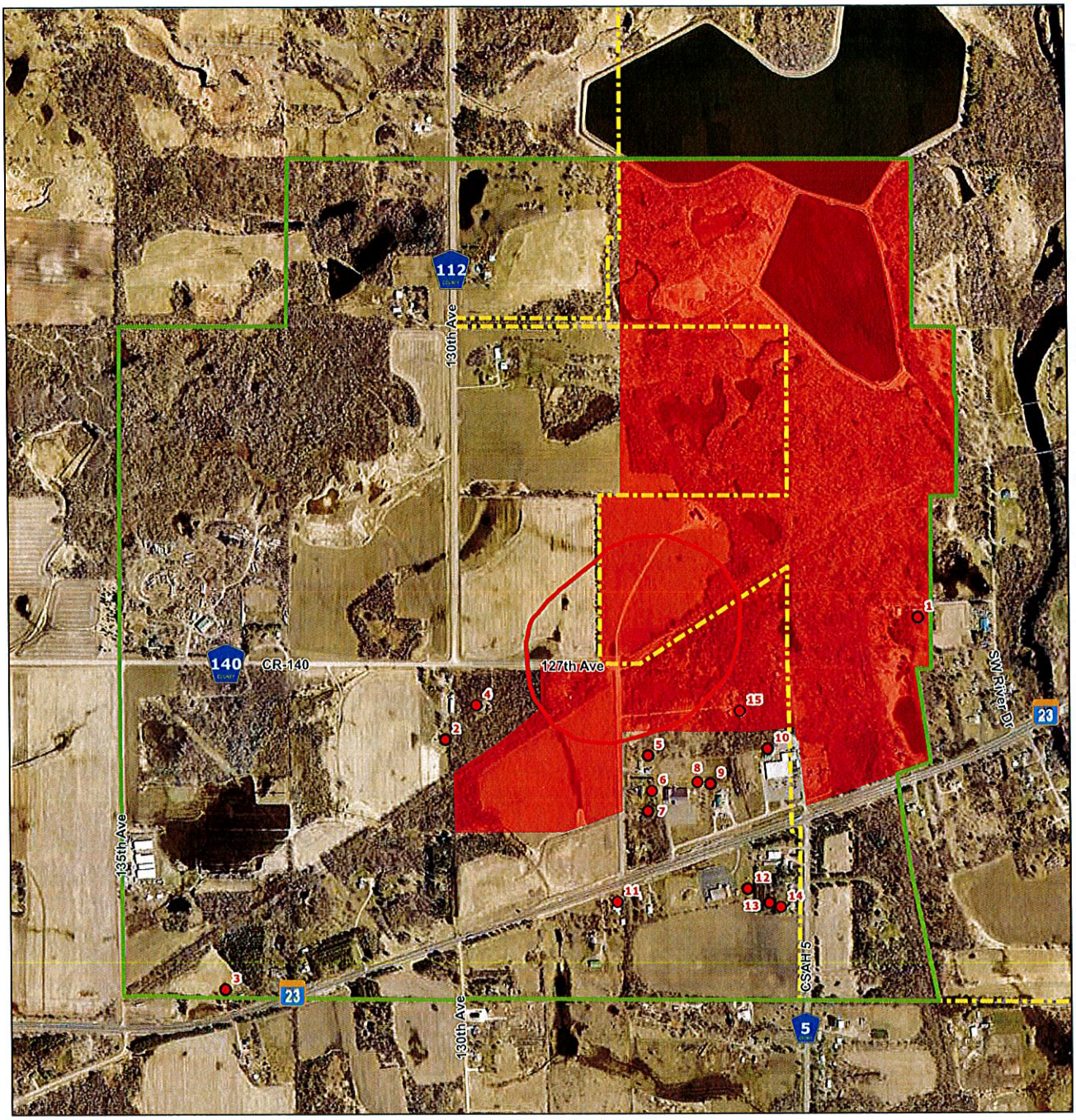
Prepared by TAW on 2025-10-03

Client/Project
City of Milaca
Wellhead Protection Plan

193807324

Figure No.
7

Title
Potential Contamination Sources



Morrison County	Mille Lacs County	Kanabec County
Benton County		Isanti County

Legend
- Municipal Boundary
- Drinking Water Supply Management Area
- Emergency Response Area
- High Vulnerability Area
- Septics

0 600 1,200 Feet
(At original document size of 8.5x11)
1:14,400

N

Notes
1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: City of Milaca, Minnesota Department of Health
3. Background: Mille Lacs County Aerial, 2023

Stantec

Project Location
T38N, R27W, S26
Milaca, Mille Lacs Co., MN

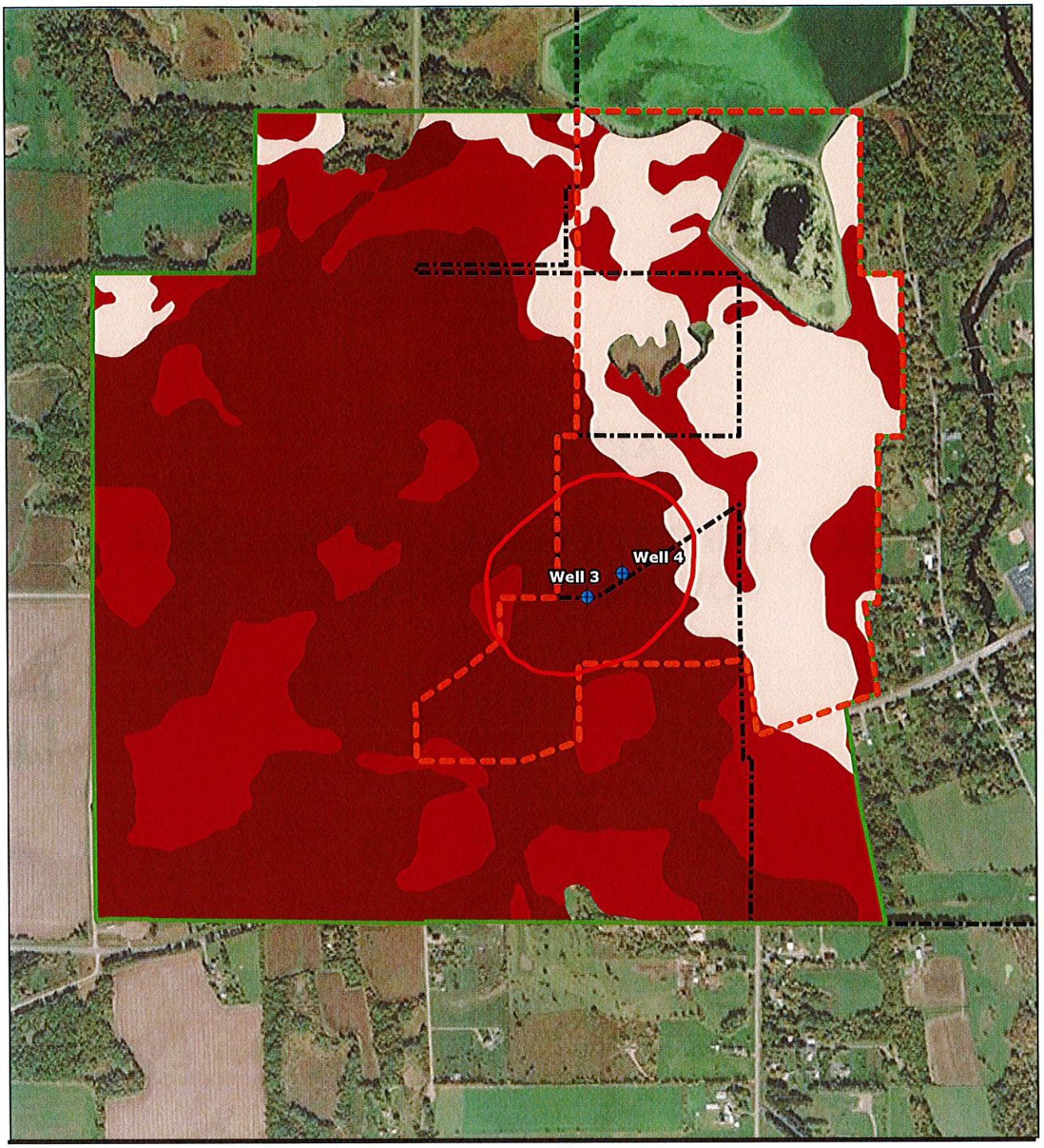
Prepared by TAW on 2025-04-02

Client/Project
City of Milaca
Wellhead Protection Plan

193807324

Figure No.
8

Title
Septic Systems



Morrison County	Mille Lacs County	Kanabec County
Benton County		Isanti County

Legend
- Municipal Boundary
- Drinking Water Supply Management Area
- Emergency Response Area
- High Vulnerability Area
- Municipal Wells

USA Soils Erodibility Factor
- 0-0.2 (Low)
- 0.2-0.4 (Medium)
- >0.4 (High)

0 600 1,200 Feet

(At original document size of 8.5x11)
1:14,400

N

Stantec

Project Location
T38N, R27W, S26
Milaca, Mille Lacs Co., MN

Prepared by TAW on 2025-10-03

Client/Project
City of Milaca
Wellhead Protection Plan

193807324

Figure No.
9

Title
Eroding Lands

Page 1 of 1

Notes
1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: City of Milaca, Minnesota Department of Health, USDA NRCS
3. Background: Mille Lacs County Aerial, 2023

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APPENDIX A

WELLS AND POTENTIAL CONTAMINANT SOURCES INVENTORY

TABLE A-1: WELLS IDENTIFIED WITHIN THE MILACA DWSMA

Map ID*	Unique Number	Well Name	Adress	PCSI Code	Township	Range	Section	Subsection	Well Status	Depth Completed (Ft)	Casing Depth (Ft)	Aquifer	Location Accuracy	Known UTM E Coordinate	Known UTM N Coordinate
1				WEL					Active				Parcel		
2	184741	SANDERSON, DEAN	14495 130TH AVENUE	WEL	38	27	26	BCCBAC	Active	80	74	QBAA	Coordinate	447283	5067403
3		KEVIN JOHNSON	14495 130TH AVENUE	WEL					Active				Parcel		
4				WEL					Active				Parcel		
5	675835	FRANSEN, GENE & JOHN	14382 130TH AVENUE	WEL	38	27	26	CBBBDC	Active	68	60		Coordinate	447288	5067162
6				WEL					Active				Parcel		
7		JAMES OTTEN	320 SW RIVER DRIVE	WEL					Active				Parcel		
8	561471	TW-5-95		WEL	38	27	26	CDCDBA	Active	140	130	QBAA	Coordinate	447753	5066533
9	561470	TW-4-95		WEL	38	27	26	CDCDBB	Active	132	112	QBAA	Coordinate	447728	5066519
10	558029	TW-3-95		WEL	38	27	26	CDCCBD	Active	131	117	QBAA	Coordinate	447653	5066496
11	737037	MILACA MW		WEL	38	27	26	CDCCCA	Active	133	118	QBUA	Coordinate	447663	5066472
12	328982	CITY OF MILACA #1-06		WEL	38	27	26	CDCCCC	Active	150	0		Coordinate	447643	5066445
13	558025	TW-1-95		WEL	38	27	35	BABBBA	Active	126	106	QBAA	Coordinate	447659	5066439
14	558024	TW-2-95		WEL	38	27	35	BABBBD	Active	120	110	QBAA	Coordinate	447653	5066408
15			13031 140TH STREET	WEL					Active				Parcel		
16		HENRY DEETS JR.	13284 140TH STREET	WEL					Active				Parcel		
17	619425	FREYHOLTZ, DAN	13436 140TH STREET	WEL	38	27	27	DCCDBD	Active	85	77		Coordinate	446551	5066508
18	118089	PATNODE, DON		WEL	38	27	27	DCCDBC	Active	81	81	QBAA	Coordinate	446511	5066539
19	699639	STEER CONSTRUCTION	12945 140TH STREET	WEL	38	27	35	BBBCAA	Active	70	60		Coordinate	447303	5066341
20		PETERSON FARMS	13668 140TH AVENUE	WEL					Active				Parcel		
21		JIM MARUDAS	13258 HIGHWAY 23	WEL					Active				Parcel		
22	592525	NARVESON, KEN	13226 HIGHWAY 23	WEL	38	27	34	ADCCBA	Active	76	72		Coordinate	446865	5065725
23		BEMBOOM	13144 HIGHWAY 23	WEL					Active				Parcel		
24		STEVE WILKENS	13012 HIGHWAY 23	WEL					Active				Parcel		
25		DON MATHIESON	13526 130TH AVENUE	WEL					Active				Parcel		
26		MARK THORESBACHEN	12797 HIGHWAY 23	WEL					Active				Parcel		
27			12795 HIGHWAY 23	WEL					Active				Parcel		
28		JOHNSON	12723 HIGHWAY 23	WEL					Active				Parcel		
29			13734 127TH AVENUE	WEL					Active				Parcel		
30	556489	MIKE LARSEN CONST	13754 127TH AVENUE	WEL	38	27	35	BACCBD	Active	79	75		Coordinate	447665	5066110
31	578734	LAR-SUN CONSTRUCTION CO.	13792 127TH AVENUE	WEL	38	27	35	BACCBA	Active	86	82		Coordinate	447645	5066135
32	607377	LARSON, MIKE	13816 127TH AVENUE	WEL	38	27	35	BACBBA	Active	85	81		Coordinate	447643	5066225
33		ST PAULS LUTHERAN CHURC	12662 HIGHWAY 23	WEL					Active				Parcel		
34	699111	MILACA GENERAL RENTAL	12590 HIGHWAY 23	WEL	38	27	35	BADCBC	Active	66	62		Coordinate	447826	5066101
35		MILACA ALLIANCE CHURCH	12543 HIGHWAY 23	WEL					Active				Parcel		
36	698896	KOOIMAN, GLENN	13487 125TH AVENUE	WEL	38	27	35	BDDCDD	Active	75	66		Coordinate	447906	5065653
37			13637 125TH AVENUE	WEL					Active				Parcel		
38	594233	BURNS, KATHY	13669 125TH AVENUE	WEL	38	27	35	ACBCBC	Active	68	64		Coordinate	448027	5065911
39	721705	SCHREUR, KIM	13721 125TH AVENUE	WEL	38	27	35	BDAADD	Active	78	74		Coordinate	448013	5065956
40		MIKE DOTY	13725 125TH AVENUE	WEL					Active				Parcel		
41		RICHARD AHLBERG	860 HIGHWAY 23	WEL					Active				Parcel		
42	219481	FARMERS CO-OP CREAMERY		WEL	38	27	35	ABCACA	Active	84	68	QBAA	Coordinate	448162	5066167
43		MILLE LACS COUNTY USDA S	12500 HIGHWAY 23	WEL					Active				Parcel		
44		KOCHS HARDWARE HANK 1	12502 HIGHWAY 23	WEL					Active				Parcel		
45	667742	LAR-SUN CONSTRUCTION	13922 127TH AVENUE	WEL	38	27	35	BAABDB	Active	71	65		Coordinate	447873	5066372

*See Figure 6 for mapped well locations.

TABLE A-2: POTENTIAL CONTAMINATION SOURCES IDENTIFIED IN MILACA DWSMA

Map ID*	Site Name	Address	City	Zip Code	Activity	MPCA Site ID	Latitude	Longitude	Site ID	Site Status
1	Milaca WTP	145 River Dr SW	Milaca	56353	Wastewater Industrial SDS Permit, Construction Stormwater	Multiple IDs	45.753161	-93.662148	98203	Active
2	A Car	330 River Dr W	Milaca	56353-1006	Hazardous Waste	WCERT1001251	45.750709	-93.661956	24057	Inactive
3	ISD912 Milaca Public Schools	500 Highway 23 W	Milaca	56353	Hazardous Waste, Underground Storage Tank (10000gal, Fuel Oil), Aboveground Storage Tanks (750gal and 1000gal, Diesel)	Multiple IDs	45.748927	-93.65961	5899	Active
4	Mr Eds Auto Salvage	13436 140th St	Milaca	56353-3729	Hazardous Waste, Investigation and Cleanup	Multiple IDs	45.749743	-93.687603	16286	Inactive

*See Figure 7 for mapped locations.

TABLE A-3: SEPTIC SYSTEMS IDENTIFIED IN MILACA DWSMA

Map ID*	Property Name	Address	SSTS Status	PCSI Code	Location Accuracy	Approx UTM E Coordinate	Approx UTM N Coordinate
1	HERBST/BRYAN M	320 RIVER DR W	Active	SSTS	Parcel	488859.883	169959.5323
2	SCHUMACHER/DANIEL F/&	13031 140TH ST	Active	SSTS	Parcel	485115.0214	168978.1104
3	OSBURN/BONNIE	13332 STATE HWY 23	Active	SSTS	Parcel	483374.3747	167005.5697
4	EVENSON/CHRISTINA K & AARON R	12945 140TH ST	Active	SSTS	Parcel	485362.0774	169248.9002
5	GERADS/MARVIN A & MARY JO C	13816 127TH AVE	Active	SSTS	Parcel	486721.4739	168861.0965
6	MARTINSEN/CHRISTOPHER L/ &	13792 127TH AVE	Active	SSTS	Parcel	486752.7239	168583.3188
7	ANDERSON/ROSEANNE M &DAVID J	13754 127TH AVE	Active	SSTS	Parcel	486721.5464	168424.2473
8	ST PAUL'S LUTHERAN CHURCH/		Active	SSTS	Parcel	487113.2566	168654.4991
9	BROSCHOFSKY/KRIS & JOLINE	12590 STATE HWY 23	Active	SSTS	Parcel	487215.6872	168642.3466
10	NCL LAND COMPANY LLC	12500 STATE HWY 23	Active	SSTS	Parcel	487668.87	168919.4993
11	THORSBAKKEN/MARK A & LYNN M	12795 STATE HWY 23	Active	SSTS	Parcel	486477.7458	167710.4616
12	ALLIANCE CHURCH OF CHRISTIAN	12543 STATE HWY 23	Active	SSTS	Parcel	487513.1912	167818.3896
13	VECHES/DANIEL J	13669 125TH AVE	Active	SSTS	Parcel	487685.9343	167709.0145
14	JELEN/PENNY	13637 125TH AVE	Active	SSTS	Parcel	487777.0804	167676.4624
15	LARSEN/NEIL C	13922 127TH AVE	Active	SSTS	Parcel	487448.792	169215.854

*See Figure 8 for mapped septic system locations.

APPENDIX B

CITY OF MILACA
CONSUMER CONFIDENCE REPORT

Milaca 2024 Drinking Water Report

Making Safe Drinking Water

Your drinking water comes from a groundwater source: two wells ranging from 135 to 147 feet deep, that draw water from the Quaternary Buried Unconfined aquifer.

Milaca works hard to provide you with safe and reliable drinking water that meets federal and state water quality requirements. The purpose of this report is to provide you with information on your drinking water and how to protect our precious water resources.

Contact Gary Kirkeby, Public Works Superintendent, at 320-983-6547 or gkirkeby@milacacity.com if you have questions about Milaca's drinking water. You can also ask for information about how you can take part in decisions that may affect water quality.

The U.S. Environmental Protection Agency sets safe drinking water standards. These standards limit the amounts of specific contaminants allowed in drinking water. This ensures that tap water is safe to drink for most people. The U.S. Food and Drug Administration regulates the amount of certain contaminants in bottled water. Bottled water must provide the same public health protection as public tap water.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

Milaca Monitoring Results

This report contains our monitoring results from January 1 to December 31, 2024.

We work with the Minnesota Department of Health to test drinking water for more than 100 contaminants. It is not unusual to detect contaminants in small amounts. No water supply is ever completely free of contaminants. Drinking water standards protect Minnesotans from substances that may be harmful to their health.

Learn more by visiting the Minnesota Department of Health's webpage Basics of Monitoring and testing of Drinking Water in Minnesota (https://www.health.state.mn.us/communities/environment/water/factsheet/sampling.html).

How to Read the Water Quality Data Tables

The tables below show the contaminants we found last year or the most recent time we sampled for that contaminant. They also show the levels of those contaminants and the Environmental Protection Agency's limits. Substances that we tested for but did not find are not included in the tables.

We sample for some contaminants less than once a year because their levels in water are not expected to change from year to year. If we found any of these contaminants the last time we sampled for them, we included them in the tables below with the detection date.

We may have done additional monitoring for contaminants that are not included in the Safe Drinking Water Act. To request a copy of these results, call the Minnesota Department of Health at 651-201-4700 between 8:00 a.m. and 4:30 p.m., Monday through Friday.

Some contaminants are monitored regularly throughout the year, and rolling (or moving) annual averages are used to manage compliance. Because of this averaging, there are times where the Range of Detected Test Results for the calendar year is lower than the Highest Average or Highest Single Test Result, because it occurred in the previous calendar year.

Definitions

- **AL (Action Level)**: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- **EPA:** Environmental Protection Agency
- **MCL (Maximum contaminant level)**: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
- **MCLG (Maximum contaminant level goal)**: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- **MRDL (Maximum residual disinfectant level):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **MRDLG (Maximum residual disinfectant level goal)**: The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- **N/A (Not applicable)**: Does not apply.
- **ppt (parts per trillion)**: One part per trillion is like one drop in one trillion drops of water, or about one drop in an Olympic sized swimming pool. ppt is the same as nanograms per liter (ng/l).
- **ppb (parts per billion)**: One part per billion in water is like one drop in one billion drops of water, or about one drop in a swimming pool. ppb is the same as micrograms per liter (µg/l).
- **ppm (parts per million)**: One part per million is like one drop in one million drops of water, or about one cup in a swimming pool. ppm is the same as milligrams per liter (mg/l).
- **PWSID**: Public water system identification.

Monitoring Results – Regulated Substances

LEAD AND COPPER – Tested at customer taps.

Contaminant (Date, if sampled in previous year)	**EPA's Ideal Goal** (MCLG)	**EPA's Action Level**	**90% of Results Were Less Than**	**Number of Homes with High Levels**	**Range of Detected Test Results**	**Violation**	**Typical Sources**
Lead (09/01/23)	0 ppb	90% of homes less than 15 ppb	<2 ppb	0 out of 10	0 - 3.0 ppb	NO	Corrosion of household plumbing.
Copper (09/01/23)	0 ppm	90% of homes less than 1.3 ppm	0.45 ppm	0 out of 10	0 - 0.51 ppm	NO	Corrosion of household plumbing.

INORGANIC & ORGANIC CONTAMINANTS – Tested in drinking water.

Contaminant (Date, if sampled in previous year)	**EPA's Ideal Goal** (MCLG)	**EPA's Limit** (MCL)	**Highest Average or Highest Single Test Result**	**Range of Detected Test Results**	**Violation**	**Typical Sources**
Nitrate	10 ppm	10 ppm	3.1 ppm	N/A	NO	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.

CONTAMINANTS RELATED TO DISINFECTION – Tested in drinking water.						
Substance (Date, if sampled in previous year)	**EPA's Ideal Goal** (MCLG or MRDLG)	**EPA's Limit** (MCL or MRDL)	**Highest Average or Highest Single Test Result**	**Range of Detected Test Results**	**Violation**	**Typical Sources**
Total Trihalomethanes (TTHMs)	N/A	80 ppb	17.7 ppb	N/A	NO	By-product of drinking water disinfection.
Total Haloacetic Acids (HAA)	N/A	60 ppb	7.8 ppb	N/A	NO	By-product of drinking water disinfection.
Total Chlorine	4.0 ppm	4.0 ppm	1.06 ppm	0.46 - 1.19 ppm	NO	Water additive used to control microbes.

Total HAA refers to HAA5

OTHER SUBSTANCES – Tested in drinking water.						
Substance (Date, if sampled in previous year)	**EPA's Ideal Goal** (MCLG)	**EPA's Limit** (MCL)	**Highest Average or Highest Single Test Result**	**Range of Detected Test Results**	**Violation**	**Typical Sources**
Fluoride	4.0 ppm	4.0 ppm	0.6 ppm	0.48 - 0.62 ppm	NO	Erosion of natural deposits; Water additive to promote strong teeth.

Potential Health Effects and Corrective Actions (If Applicable)

Fluoride: If your drinking water fluoride levels are below the optimal concentration range of 0.5 to 0.9 ppm, please talk with your dentist about how you can protect your teeth and your family's teeth from tooth decay and cavities. For more information, visit: MDH Drinking Water Fluoridation (https://www.health.state.mn.us/communities/environment/water/com/fluoride.html). Fluoride is nature's cavity fighter, with small amounts present naturally in many drinking water sources. There is an overwhelming weight of credible, peer-reviewed, scientific evidence that fluoridation reduces tooth decay and cavities in children and adults, even when there is availability of fluoride from other sources, such as fluoride toothpaste and mouth rinses. Since studies show that optimal fluoride levels in drinking water benefit public health, municipal community water systems adjust the level of fluoride in the water to an optimal concentration between 0.5 to 0.9 parts per million (ppm) to protect your teeth. Fluoride

levels below 2.0 ppm are not expected to increase the risk of a cosmetic condition known as enamel fluorosis.

Monitoring Results – Unregulated Substances/Emerging Contaminants

In addition to testing drinking water for contaminants regulated under the Safe Drinking Water Act, we sometimes also monitor for contaminants that are not regulated. Unregulated contaminants do not have legal limits for drinking water. MDH, EPA, and other health agencies may have developed comparison values for some of these compounds. Some of these comparison values are based solely on potential health impacts and do not consider our ability to measure contaminants at very low concentrations nor the cost and technology of prevention and/or treatment. These values may be set at levels that are costly, challenging, or impractical for a water system to meet (for example, large-scale treatment technology may not exist for a given contaminant). Sample data are listed along with comparison values in the table below; it is important to note that these comparison values are not enforceable.

Detection alone of a regulated or unregulated contaminant should not cause concern. The significance of a detection should be determined considering current health effects information. We are often still learning about the health effects, so this information can change over time.

A person drinking water with a contaminant at or below the comparison value would be at little to no risk for harmful health effects. If the level of a contaminant is above the comparison value, people of a certain age or with special health conditions-like a fetus, infants, children, elderly, and people with impaired immunity—may need to take extra precautions. We are notifying you of the unregulated/emerging contaminants we have detected as a public education opportunity.

Unregulated contaminant monitoring helps EPA to determine where certain contaminants occur and whether the Agency should consider regulating those contaminants in the future.

- More information is available on MDH's A-Z List of Contaminants in Water (https://www.health.state.mn.us/communities/environment/water/contaminants/index.html)
- Fourth Unregulated Contaminant Monitoring Rule (UCMR 4) (https://www.health.state.mn.us/communities/environment/water/com/ucmr4.html)
- Fifth Unregulated Contaminant Monitoring Rule (https://www.epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule)
- EPA has developed a UCMR5 Program Overview Factsheet (https://www.epa.gov/system/files/documents/2022-02/ucmr5-factsheet.pdf) describing UCMR 5 contaminants and standards.

In the past year, your drinking water may have tested for additional unregulated contaminants as part of the Fifth Unregulated Contaminant Monitoring Rule (https://www.epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule) and results are still being processed. The Unregulated Contaminant Monitoring Rule 5 (UCMR 5) Data finder allows people to easily search for, summarize, and download the available UCMR 5 analytical results (https://www.epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule-data-finder).

UNREGULATED/EMERGING CONTAMINANTS – Tested in drinking water.			
Contaminant	**Comparison Value**	**Highest Average Result or Highest Single Test Result**	**Range of Detected Test Results**
Sodium*	20 ppm	6.78 ppm	N/A
Sulfate	500 ppm	14.8 ppm	N/A
Perfluorobutanoic acid (PFBA) (2021)	7000 ppt	1.6 ppt	0.00 - 1.60 ppt

*Note that home water softening can increase the level of sodium in your water.

Some People Are More Vulnerable to Contaminants in Drinking Water

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. The developing fetus and therefore pregnant women may also be more vulnerable to contaminants in drinking water. These people or their caregivers should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.

Learn More about Your Drinking Water

Drinking Water Sources

Groundwater supplies 75 percent of Minnesota's drinking water, and found in aquifers beneath the surface of the land. Surface water supplies 25 percent of Minnesota's drinking water, and is the water in lakes, rivers, and streams above the surface of the land.

Contaminants can get in drinking water sources from the natural environment and from people's daily activities. There are five main types of contaminants in drinking water sources.

- **Microbial contaminants,** such as viruses, bacteria, and parasites. Sources include sewage treatment plants, septic systems, agricultural livestock operations, pets, and wildlife.
- **Inorganic contaminants** include salts and metals from natural sources (e.g. rock and soil), oil and gas production, mining and farming operations, urban stormwater runoff, and wastewater discharges.
- **Pesticides and herbicides** are chemicals used to reduce or kill unwanted plants and pests. Sources include agriculture, urban stormwater runoff, and commercial and residential properties.
- **Organic chemical contaminants** include synthetic and volatile organic compounds. Sources include industrial processes and petroleum production, gas stations, urban stormwater runoff, and septic systems.

- **Radioactive contaminants** such as radium, thorium, and uranium isotopes come from natural sources (e.g. radon gas from soils and rock), mining operations, and oil and gas production.

The Minnesota Department of Health provides information about your drinking water source(s) in a source water assessment, including:

- How Milaca is protecting your drinking water source(s);
- Nearby threats to your drinking water sources;
- How easily water and pollution can move from the surface of the land into drinking water sources, based on natural geology and the way wells are constructed.

Find your source water assessment at Source Water Assessments (https://www.health.state.mn.us/communities/environment/water/swp/swa) or call 651-201-4700 between 8:00 a.m. and 4:30 p.m., Monday through Friday.

Lead in Drinking Water

Lead can cause serious health problems, babies, children under six years, and pregnant women are at the highest risk. You may be in contact with lead through paint, water, dust, soil, food, hobbies, or your job. There is no safe level of lead.

Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Our water system is responsible for proving high quality drinking water and removing lead pipes from service lines but cannot control the variety of materials used in plumbing components in your home. You can take responsibility by identifying and removing lead materials within your home plumbing and taking steps to reduce your family's risk.

Read below to learn how you can protect yourself from lead in drinking water.

1. **Let the water run** before drinking tap water flush your pipes for several minutes by running your tap. If you have a lead service line, you may need to let the water run longer. A service line is the underground pipe that brings water from the main water pipe under the street to your home.
    - Activities such as taking a shower, doing laundry or dishes help keep water moving in your home system but are not a replacement for running the tap before you drink if it has not been used for a long period of time.
    - The only way to know if lead has been reduced by letting it run is to check with a test. If letting the water run does not reduce lead, consider other options to reduce your exposure.
2. **Know your service line materials by** contacting your public water system, or you can search for your address online at the Minnesota Lead Inventory Tracking Tool (https://maps.umn.edu/LSL/).
    - Protect Your Tap: A quick check for lead (https://www.epa.gov/ground-water-and-drinking-water/protect-your-tap-quick-check-lead) is EPA's step by step guide to learn how to find lead pipes in your home.
3. **Use cold water** for drinking, making food, and making baby formula. Hot water releases more lead from pipes than cold water.

4. **Test your water.** In most cases, letting the water run and using cold water for drinking and cooking should keep lead levels low in your drinking water. If you are still concerned about lead, arrange with a laboratory to test your tap water. Testing your water is important if young children or pregnant women drink your tap water.
    - Contact a Minnesota Department of Health accredited laboratory to purchase a sample container and instructions on how to submit a sample:
      Environmental Laboratory Accreditation Program
      (https://eldo.web.health.state.mn.us/public/accreditedlabs/labsearch.seam)
      The Minnesota Department of Health can help you understand your test results.
5. **Treat your water** if a test shows your water has high levels of lead after you let the water run. You can use a filter certified with ANSI/NSF standards 53 and 42 for lead reduction.
    - Read about water treatment units:
      Point-of-Use Water Treatment Units for Lead Reduction
      (https://www.health.state.mn.us/communities/environment/water/factsheet/poulead.html)

Information on lead in drinking water, testing methods, and other steps you can take to minimize exposure are available at:

- Visit EPA Basic Information about Lead in Drinking Water (http://www.epa.gov/safewater/lead)
- Visit the Minnesota department of Health Lead in Drinking Water
  (https://www.health.state.mn.us/communities/environment/water/contaminants/lead.html)
- To learn about how to reduce your contact with lead from sources other than your drinking water, visit Lead Poisoning Prevention: Common Sources
  (https://www.health.state.mn.us/communities/environment/lead/fs/common.html)

6. **Be Aware:** Head Start Programs, Child Care Centers, Public and Charter Schools all have requirements to test for lead in drinking water. These programs can learn more about requirements and resources for testing and remediation at MDH Drinking Water in Schools and Child Cares
   (https://www.web.health.state.mn.us/communities/environment/water/schools/index.html)

Service Line Material Inventory

Milaca has completed and submitted our service line materials inventory to the Minnesota Department of Health. The service line inventory is publicly available, and you can check the materials for your service line by visiting the Lead Inventory Tracking Tool (LITT) (https://maps.umn.edu/LSL/). You may also contact us at <Insert Contact Information>. To complete the service line inventory, our system <insert a general description of how the system determined the status of service lines>. As of 09/26/2024, our inventory contains 2 lead, 98 galvanized requiring replacement, 844 unknown material, and 78 non-lead service lines.

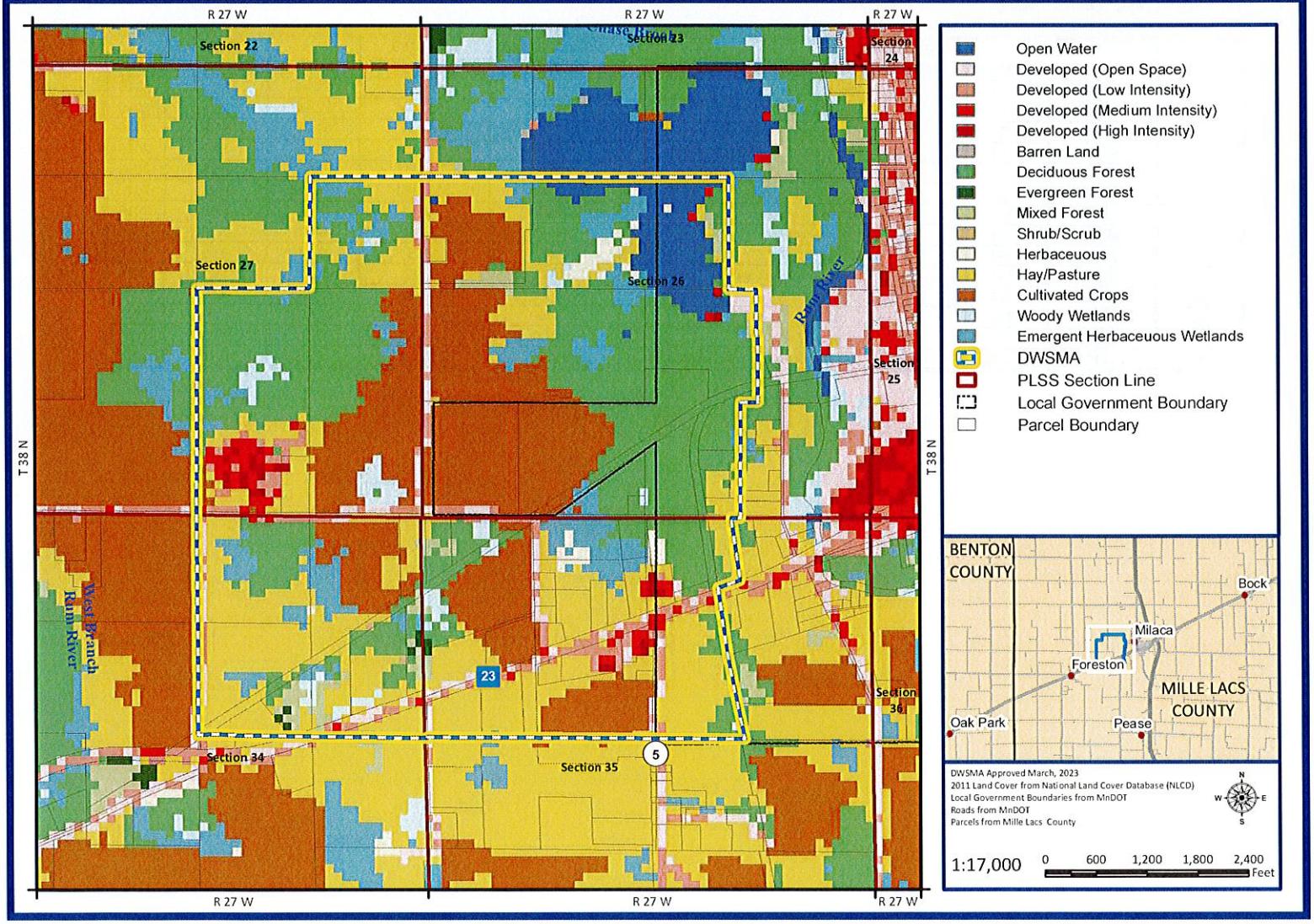
APPENDIX C

LAND COVER MAP

Milaca
Mille Lacs County
Minnesota

Milaca Drinking Water Supply Management Area (DWSMA) MN-01334 - Land Cover 2016

DEPARTMENT OF HEALTH



LAND COVER TABLE - MILACA DWSMA

VALUE	DWS_I_0	DWSMA ID	LAND COVER CODE	LAND_COVER	ORIGINAL SQUARE METERS	ADJUSTED SQUARE METERS	ACRES	PERCENTAGE OF DWSMA	YEAR
11	135000	1334	11	Open Water	135000	135401	33.46	3.60	2016
21	95400	1334	21	Developed, Open Space	95400	95683	23.64	2.55	2016
22	130500	1334	22	Developed, Low Intensity	130500	130887	32.35	3.48	2016
23	54900	1334	23	Developed, Medium Intensity	54900	55063	13.61	1.47	2016
24	21600	1334	24	Developed, High Intensity	21600	21664	5.36	0.58	2016
41	1109700	1334	41	Deciduous Forest	1109700	1112994	275.02	29.62	2016
42	7200	1334	42	Evergreen Forest	7200	7221	1.79	0.19	2016
43	58500	1334	43	Mixed Forest	58500	58674	14.50	1.56	2016
52	1800	1334	52	Shrub/Scrub	1800	1805	0.44	0.05	2016
71	37800	1334	71	Grassland/Herbaceous	37800	37912	9.37	1.01	2016
81	903600	1334	81	Pasture/Hay	903600	906282	223.94	24.12	2016
82	875700	1334	82	Cultivated Crops	875700	878299	217.03	23.37	2016
90	63900	1334	90	Woody Wetlands	63900	64090	15.84	1.71	2016
95	251100	1334	95	Emergent Herbaceous Wetlands	251100	251845	62.23	6.70	2016

APPENDIX D

INNER WELLHEAD MANAGEMENT ZONE INVENTORIES

Environmental Health Division
Drinking Water Protection Section
DEPARTMENT OF HEALTH P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1480002 **COMMUNITY**
NAME	Milaca
ADDRESS	Milaca Water Superintendent, City of Milaca, 255 First Street East, Milaca, MN 56353

FACILITY (WELL) INFORMATION

NAME	Well #3
SAMPLE POINT ID	S05
UNIQUE WELL NO.	578707
COUNTY	Mille Lacs

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

☐ YES (Please attach a copy)
☐ NO ☐ UNDETERMINED

PWS ID / SAMPLE POINT ID	1480002 S05	UNIQUE WELL NO.	578707

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		

PWS ID / SAMPLE POINT ID	1480002 S05	UNIQUE WELL NO.	578707

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	145	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	2	N
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		

PWS ID / SAMPLE POINT ID	1480002 S05	UNIQUE WELL NO.	578707

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

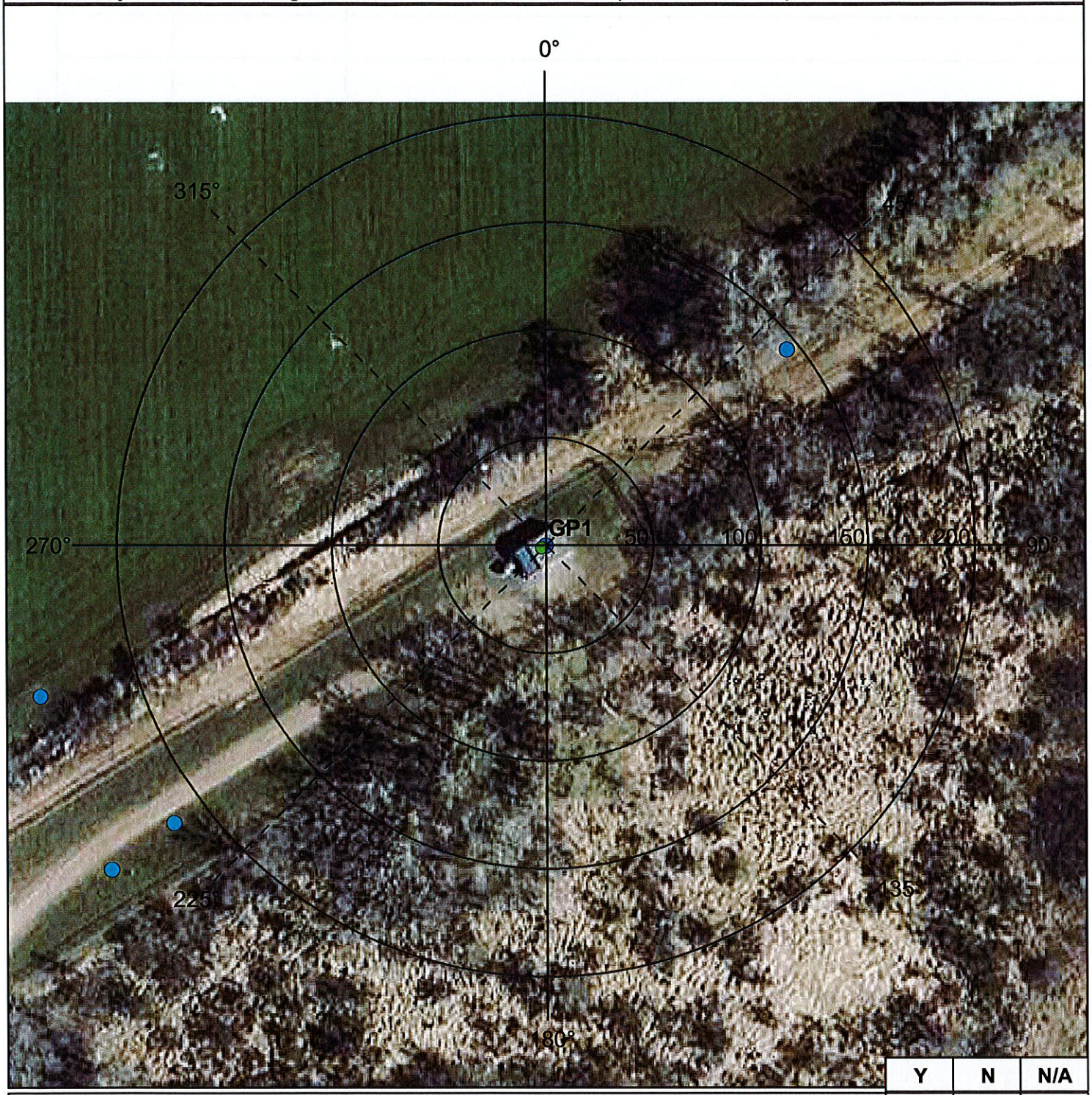
[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / SAMPLE POINT ID	1480002 S05	UNIQUE WELL NO.	578707
SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.		

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Anderson, Chad	DATE	7 - 7 - 2023

PWS ID / SAMPLE POINT ID	1480002 S05	UNIQUE WELL NO.	578707

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

DEPARTMENT OF HEALTH
Environmental Health Division
Drinking Water Protection Section
P.O. Box 64975
St. Paul, Minnesota 55164-0975

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1480002 **COMMUNITY**
NAME	Milaca
ADDRESS	Milaca Water Superintendent, City of Milaca, 255 First Street East, Milaca, MN 56353

FACILITY (WELL) INFORMATION

NAME	Well #4
SAMPLE POINT ID	S06
UNIQUE WELL NO.	738390
COUNTY	Mille Lacs

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

☐ YES (Please attach a copy)
☐ NO ☐ UNDETERMINED

PWS ID / SAMPLE POINT ID	1480002 S06	UNIQUE WELL NO.	738390

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		

PWS ID / SAMPLE POINT ID	1480002 S06	UNIQUE WELL NO.	738390

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		Y	95	
MON	Monitoring well	record dist.	record dist.		Y	134	
MON	Monitoring well	record dist.	record dist.		Y	173	
WEL	Operating well	record dist.	record dist.		Y	131	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	2	N
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		

PWS ID / SAMPLE POINT ID	1480002 S06	UNIQUE WELL NO.	738390

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

[1] A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

[2] These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

[3] These sources are classified as illegal by Minnesota Rules, Chapter 4725.

[4] Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

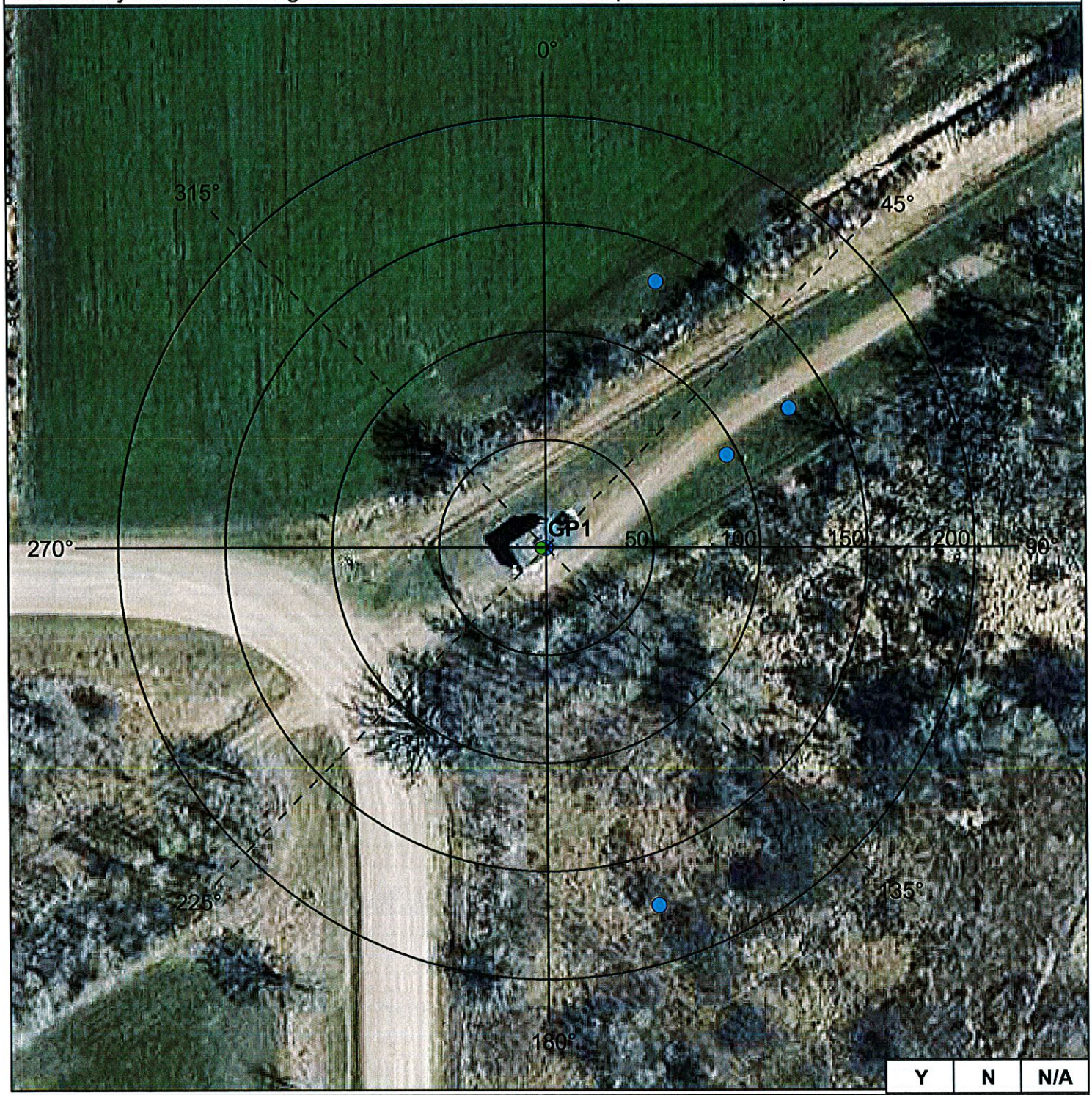
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / SAMPLE POINT ID	1480002 S06	UNIQUE WELL NO.	738390

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			
Is the system monitoring existing nonconforming sources of contamination?			

Reminder Question: Were the wellhead protection measure(s) implemented?			
INSPECTOR	Soltys, Jennifer	DATE	11 - 16 - 2020

PWS ID / SAMPLE POINT ID	1480002 S06	UNIQUE WELL NO.	738390

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

APPENDIX E

NOTICE OF APPROVAL OF EMERGENCY PREPAREDNESS PLAN

DEPARTMENT OF NATURAL RESOURCES

Ecological and Water Resources
16543 Haven Road
Little Falls, MN 56345

June 20, 2025

Gary Kirkeby
Public Works Superintendent
255 1st Street East
Milaca, MN 56353

RE: Approval of Interim Water Supply Plan, City of Milaca, Mille Lacs County

Dear Mr. Kirkeby,

Our office has completed the review of your 2025 Interim Water Supply Plan (WSP) for public water supply authorized under MNDNR permit 1972-0092. I am pleased to advise you that in accordance with Minnesota Statutes, Section 103G.291, Subdivision 3, and on behalf of the Commissioner of Natural Resources, I hereby approve your interim plan, effective immediately.

The City of Milaca submitted an updated plan in 2017 during the last WSP update cycle. This 2017 plan was reviewed, however it was never finalized nor adopted, to the best of our knowledge. This interim plan is intended to span the gap and **please be aware the City of Milaca will be required to provide a complete plan update, as in 2017, at the onset of the new WSP cycle to start in the next few years.**

The DNR and Minnesota Rural Water Association encourage the city to educate its customers on how they can reduce household water use. As mentioned at the Water Supply Planning Workshops, the DNR will be contacting you periodically about progress the city has made on their water conservation goals. We encourage you to keep records of your success.

Thank you for efforts in planning for the future of the City of Milaca water supply and for conserving the water resources of the State of Minnesota. If you have any questions or need additional assistance with your water appropriation permit, please contact me at 320-232-1078 or at mark.anderson@state.mn.us.

Sincerely,

Mark Anderson
Area Hydrologist

Cc: Tim Crocker – MN DNR EWR R3 North District Manager
Claudia Hochstein – MN DNR Water Conservation Consultant
MPARS Permit File 1972-0092

APPENDIX F

CORRESPONDENCE

SCOPING 2 DECISION NOTICE – HIGH VULNERABILITY DWSMA

Date: August 2, 2023

Name of Public Water Supply: City of Milaca

PWSID: 1480002

Name of the Wellhead Protection Manager: Gary Kirkeby, Public Works Supervisor

Address: 255 First Street East

City: Milaca

Zip: 56353

Phone: 320-983-3141

Primary Unique Well Numbers: 578707 (Well #3), 738390 (Well #4)

DWSMA Vulnerability: ☐ Low ☐Moderate ☒ High

The purpose for the second scoping meeting, as required by Minnesota Rules, part 4720.5340, is to discuss the information necessary for preparing Part 2 of a Wellhead Protection Plan. The Part 1 Plan identifies the area that provides the source of drinking water for the public water supply (PWS) and assesses how vulnerable that area is to contamination. The PWS can utilize that information to develop land use and management practices that protects their groundwater resource from contamination.

The wellhead rule (Minnesota Rules, part 4720.5340) refers to the information required for wellhead planning as data elements. This notice lists the data elements that are stated in Minnesota Rules, part 4750.5400 and are selected for the PWS because of the vulnerability of the drinking water supply management area (DWSMA) as determined in Part 1.

Scoping 2 Data Elements Needed for the Part 2

Data Elements are pieces of information in the form of a map, a list, records, tables and inventories. Where appropriate, they should be reviewed and assessed in terms of their present and/or future implications on the 1) use of the well(s), 2) quality and quantity of water supplying the public water supply wells(s), and 3) land and groundwater uses in the DWSMA. It is important to discuss the relevance of the data elements to management of the DWSMA. Check the technical assistance comments for guidance on reviewing the data elements and conducting these assessments. Clearly identify in the plan which data elements are associated with which tables/figures. If a data element does not exist, state that in the narrative.

Submit –

The following information, highlighted with an asterisk* with blue text, MUST be submitted in the Part 2 by including it in the plan narrative and/or appendix.

- ☐ *A map that indicates the vulnerability and includes the DWSMA, WHP Area, and Emergency Response Area must be included in the Part 2. This map with vulnerability is a product of the Part 1 and provides a basis for planning activities in Part 2. SWP Planner can provide the DWSMA figure.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT –

Soils

- ☐ *Existing maps of the soils and a description of soil infiltration characteristics.
- ☐ *A description or an existing map of known eroding lands that are causing sedimentation problems.

Technical Assistance Comments: Infiltration characteristics and active erosion sites, along with land cover/land use and potential contaminant source information, should be assessed to determine the potential for the transport of contaminants into vulnerable areas of a DWSMA. The review of soils, infiltration, and erosion characteristics may identify opportunities for management strategies or targeted practices that reduce contaminant migration into groundwater.

DATA ELEMENTS ABOUT THE LAND USE –

Land Use

- ☐ *An existing map of political boundaries.
- ☐ *An existing map of public land surveys including township, range, and section.

Technical Assistance Comments: A map or maps showing updated political boundaries and township, range, section with labels is required for determining land use authorities for the land within the DWSMA. DWSMA figure map provided by SWP Planner will also contain political boundaries with township, range, and section. Determine and discuss how the various land use authorities may affect the management of the DWSMA.

- A map and an inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources.
  - ☐ *The Potential Contaminant Source Inventory (PCSI) data in both a table and a map format must be created and included in the Part 2. Include potential contaminant sources as listed on the PCSI attachment provided for each existing vulnerability within the DWSMA.
    - If DWSMA contains moderate and/or high vulnerability inventory all wells.
    - The inventory should include your community wells but not include any wells that are known to have been sealed according to the Minnesota Well Code (MN Rules 4725).
  - ☐ *A land use/land cover map and table. SWP Planner can provide a land cover map and data/table from federal sources. This data set should be used unless an alternative electronic data set that is more current and detailed is available. Assess and discuss changes in land use that could impact management of the DWSMA.
  - ☐ *An inventory of the Inner Wellhead Management Zone (IWMZ). A recent IWMZ inventory (within six years) for each primary well with management recommendations on the MDH form, or a table that summarizes the number and type of contaminant sources with the management recommendations must be included. Incorporate or reference the recommendation(s) from the IWMZ into the Part 2. IWMZ will be completed by the SWP Planner with assistance from the PWS staff. A copy will be provided to the PWS.

Technical Assistance Comments: This section encompasses the Potential Contaminant Source Inventory known as the PCSI. See the Scoping 2 Decision Notice Potential Contaminant Source Inventory Requirement Attachment(s) and endorsement procedures/fact sheets for further information. Utilize the PCSI geodatabase attribute template provided by SWP Planner. Management strategies must be developed for potential sources of contamination that pose a risk to the drinking water supply.

- ☐ *An existing comprehensive land-use map.
- ☐ *An existing zoning map.

Technical Assistance Comments: This information can indicate areas in the DWSMA where growth or the addition of potential contaminant sources is likely to occur. Furthermore, the review of local zoning and comprehensive land-use maps facilitates the evaluation of the degree of compatibility current and future land uses have with the PWS goals of protecting the drinking water wells and aquifer.

DATA ELEMENTS ABOUT THE LAND USE –

Public Utility Services

☐ *An existing map of transportation routes or corridors.

Technical Assistance Comments: Highway and railroad corridors can be used to move hazardous materials. These corridors should be evaluated to determine the level of risk they pose for spills in the DWSMA, considering their proximity to the wells, the local topography, and geologic conditions.

☐ *An existing map of storm sewers, sanitary sewers, and public water supply systems.

Technical Assistance Comments: Storm sewer systems and sanitary systems can be sources of contamination. Storm sewers are generally considered a public utility element designed to convey storm water runoff and use constructed features such as pipes and ponds. Evaluate the integrity and condition (age, type of material, any investigative work, etc.) of these systems in the DWSMA, noting the location of the water supply system and public water supply wells in relation to these potential contaminant sources. It is not necessary to include a map of your public water supply system in the Part 2 if you believe it would pose a threat to the security of your system.

☐ *An existing map of the gas and oil pipelines used by gas and oil suppliers.

Technical Assistance Comments: Petroleum pipelines can be sources of contamination (excluding liquefied natural gas pipelines). If possible, describe what is generally known about the condition of these pipelines in the DWSMA, and the readiness of the PWS to respond to an emergency. It is not necessary to include a map in the Part 2 if you believe it would pose a security threat.

☐ *An existing map or list of public drainage systems.

Technical Assistance Comments: Public drainage systems can help mobilize and transport contaminants. Use the Department of Natural Resources Buffer Protection Map and/or other available maps of ditches that have been publicly recorded (county/judicial ditches). These public drainage systems should be assessed to determine the level of risk they pose in the DWSMA. Identify land uses that could contribute contaminants to the public drainage system and identify any ongoing remediation activities.

Required to be discussed in the plan-

The following information (if existing) MUST be reviewed and discussed in the development of the Part 2. The Part 2 narrative must contain a description identifying whether/how the information may influence the management of the DWSMA. The data element may be located in the public domain. While the map or document reviewed is not required to be included in the Part 2, the source of the data element must be provided in the plan narrative by indicating a web address or reference to its location. Provide a statement in the plan narrative if the data element does not apply or does not exist.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT –

Water Resources

- An existing map of the boundaries and flow directions of major watershed units and minor watershed units.

Technical Assistance Comments: Identify/list the major and minor watershed(s) in the Part 2 in order to become aware of local water planning efforts such as One Watershed One Plan (1W1P), Watershed Restoration and Protection Strategies (WRAPS), and/or Groundwater Restoration and Protection Strategies (GRAPS).

- An existing map showing those areas delineated as floodplain by existing local ordinances.

Technical Assistance Comments: Assess and describe any issues and management needed in the DWSMA based on the Federal Emergency Management Agency (FEMA) Floodplain 100-year FIRM (Flood Insurance Rate Map) and (or) other State and local floodplain or flooding information. Consult with the WHP Manager to evaluate any potential or historical flooding impacts on the public water supply wells or aquifer. The Inner Well Management Zone report and Sanitary Survey may be used to identify flooding issues and impacts.

DATA ELEMENTS ABOUT THE LAND USE –

Land Use

- An existing map of parcel boundaries.

Technical Assistance Comments: Parcel boundaries may have been used for delineation of the DWSMA in Part 1. In Part 2, parcel identification information must be included or linked and must be used for education or targeting activities or practices in addressing potential contaminants. In the narrative, indicate if parcel data is available from the public domain (i.e., county GIS or associated website such as Beacon).

Part 1 -

The following information was reviewed and assessed in developing the Part 1. Some data elements may be in the public domain or non-existent, and others may have been determined by MDH hydrogeologist to be not applicable to the physical setting, so discussion was not included in the Part 1. The Part 1 should be used as a data source for the Part 2. The technical assistance comments provide the requirements for how this information must be discussed and/or included in the Part 2. Include relevant excerpts or summaries from the Part 1 where indicated.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT –

- An existing geologic map and a description of the geology, including aquifers, confining layers, recharge areas, discharge areas, sensitive areas as defined in Minnesota Statutes, section 103H.005, subdivision 13, and groundwater flow characteristics.
- Existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department.
- Existing borehole geophysical records from wells, borings, and exploration test holes.
- Existing surface geophysical studies.

Technical Assistance Comments: Provide a summary in the plan narrative (few sentences/paragraph) of the Description of the Hydrologic Setting from Part 1. Provide the conclusions regarding the Well and DWSMA Vulnerabilities related to the geologic conditions and how these conditions influence the management of the DWSMA.

DATA ELEMENTS ABOUT THE LAND USE –

Public Utility Services

- An existing record of construction, maintenance, and use of the public water supply well and other wells within the DWSMA.

Technical Assistance Comments: Well construction records indicate what is known about the well(s) and can indicate if the well(s) have structural integrity or groundwater protection issues. Briefly summarize in the plan narrative what is discussed about each well from the Assessment of Well Vulnerability in Part 1.

DATA ELEMENTS ABOUT WATER QUANTITY –

Surface Water Quantity

- An existing description of known water-use conflicts, including those caused by groundwater pumping.

Technical Assistance Comments: Provide a summary from Part 1 in the plan narrative about the interactions between surface water features and the groundwater and if there are water use or pumping conflicts. Contact MDH hydro if need additional technical assistance.

Groundwater Quantity

- An existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source.
- An existing description of known well interference problems and water use conflicts.
- An existing list of state environmental bore holes, including unique well number, aquifer measured, years of record, and average monthly levels.

Technical Assistance Comments: This information, if known, was incorporated into the Part 1 and was used to assist in determining hydrologic boundary conditions and area static water levels. In Part 2, information about Department of Natural Resources appropriation permit holders and any known well interference problems or water use conflicts must be discussed, including how this information could affect the management of the DWSMA.

DATA ELEMENTS ABOUT WATER QUALITY –

Groundwater Quality

- An existing summary of water quality data, including: 1. bacteriological contamination indicators; 2. inorganic chemicals; and 3. organic chemicals.
- An existing list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points.
- An existing report of groundwater tracer studies.

Technical Assistance Comments: This information, if known, was incorporated into the Part 1. Provide a summary of the assessment of well vulnerability and/or any relevant chemistry and isotopic composition data available from PWS wells and other wells/sources.

- An existing site study and well water analysis of known areas of groundwater contamination.
- An existing property audit identifying contamination.
- An existing report to the Minnesota Department of Agriculture and the Minnesota Pollution Control Agency of contaminant spills and releases.

Technical Assistance Comments: This information, if known, was incorporated into the Part 1. Discuss whether there are groundwater contamination areas that could pose a risk to the public water supply well(s) now or in the future. Include any relevant data and how this information may affect the management of the DWSMA.

Revised: 01/2022

DEPARTMENT OF HEALTH

City of Milaca Scoping 2 Meeting
Wellhead Protection (WHP) Plan Amendment
Summary of Planning Issues

This planning issues summary is intended to guide plan writers and WHP teams when developing their amendment. It highlights key issues identified to date that you should consider and discuss. It should not be considered a list of complete requirements for the amendment.

Public Water Supplier: City of Milaca ("Milaca", or "City")

Summarize the management implications from minor changes in DWSMA or vulnerability:

- The western half of Milaca's DWSMA vulnerability was changed from low in the previous WHP Plan to moderate in the current WHP Plan due to some area wells with low geologic sensitivity ratings showing elevated nitrates, indicating a connection between land use activities and the groundwater aquifer.
- A reduction in the size of the DWSMA and the WHPA (10-year time of travel) has minor management implications.

Community changes and implications for management:

- Milaca has experienced some population growth, with 2,552 residents in 2000, 2,955 in 2010, and a population of 3,022 in 2020. Assuming the growth rate of approximately 18% from 2000 to 2020 remains the same, the population over the next 10 years will grow to 3,566.

Key management activities to carry forward:

- An evaluation of the activities proposed in the WHP Plan of Action from the 2012 WHP Plan (Section 8.3) suggests that nine of the activities proposed were either not completed, not *fully* completed, or not applicable as of the time the evaluation was conducted (November 24, 2021). These activities include Measures 3A, 4C, 4D, 6A, 7A, 12A, 12C, 13A, and 13B. MDH recommends that Milaca review each Measure to confirm that the management strategy was not completed or is indeed not applicable, and to determine whether each Measure should be a part of the next WHP Plan of Action.
- The May 2022 evaluation of the activities proposed in the 2012 WHP Plan indicates that Measures 1A, 2A, 4A, 4B, 5A, 5B, 8A, 9A, 10A, 11A and 12B were all completed. The nature of some of these actions is such that once they are complete, they may be eliminated, while the amended WHP Plan may be better with the continuation of several of the measures. MDH recommends that Milaca analyze the management strategies that were written/included previously to determine which should be carried over to the new WHP Plan and if the language should be refined to fall in line more closely with the city's experience with implementing the measure and their success/lack thereof with it.

New management strategies to consider (not all are new but should be included):

- Due to the proximity of the wells to each other, include a measure in the Plan to explore locations for a third well.
- Assist with the standard assessment monitoring package, to be collected between years five-eight.
- If any new wells are constructed within one mile of the DWSMA, their locations should be field verified. This information may allow a better understanding of the geologic boundary conditions for the buried sand aquifer and could result in a more refined WHPA.
- MDH recommends that the amended Part 2 contain a study (with MDH) that monitors nitrates as well as chloride levels to determine trends and potentially, likely sources.
- Not a requirement, but MDH Planner is suggesting the inclusion of a/some measure(s) to address water conservation. Planner would be happy to provide examples.
- MDH wants to highlight to Milaca's consultant that several changes took place throughout the DWSMA when compared to the previous Part 2. Changes include not only the size, but vulnerability changes as well (low to moderate, small parts from low to high, small parts from high to moderate).

Old municipal wells that need to be sealed:

The Old Municipal Well report for Milaca suggests there may be some old municipal wells that if located, could be sealed. Recommended management strategy moving forward.

Important partnerships to maintain or establish:

- Mille Lacs County/Mille Lacs SWCD.
- Pertinent townships.
- MDH, DNR, MNDOT, MPCA, MRWA.

Water quantity issues and implications:

- Existing data does not suggest water quantity issues.

Water quality issues and implications:

- Well #3 and Well #4 are considered vulnerable to contamination, based on local geology and tritium results that show the presence of young water. This is reinforced by the nitrate and chloride concentrations and chloride/bromide ratios detected. Elevated concentrations or concentration ratios indicate human-impacted water quality from activities at the land surface such as road salt or wastewater.

Sanborn Maps:

☒ Sanborn Maps are not available for this area.

Scoping 2 Decision Notice Attachment
Potential Contaminant Source Inventory Requirements

Highly and Very Highly Vulnerable DWSMA

The following current and historical potential contaminant sources and related codes, materials and related codes, and activity status and related codes are required to be included in the potential contaminant source inventory. In cases where a materials identification is required, a materials designation and code must be assigned. All potential contaminant sources must be assigned an activity status and related code using state program descriptors or local knowledge.

Potential Contaminant Sources (PCS) Material	PCS Codes Material Codes
Above-Ground Storage Tank	AST
Chemicals	C000
Fertilizers	A050
Fuels, gases, and oils	F000
Hazardous substances	C001
Solvents and coatings	S000
Waste	W000
Agricultural Drainage Well (potential Class V)	ADW
Animal Burial Site	ABS
Animal Feedlot	AFL
Ash Disposal Site	ASHD
Disposal Well (potential Class V)	DISWLL
Drainage Ditch (non-public, non-roadway)	DITCH
Dump (unpermitted)	DMP
Grave(s)	GRV
Hazardous Waste Generator	HWG
Hazardous Waste Handler	HWH
Industrial Drainage Well (potential Class V)	INDW
Land Application	LAPP
Agricultural chemicals	C010
Chemicals (unspecified)	C000
Fertilizers	A050
Minerals and metals (unspecified)	M000
Waste (used unless one of the materials listed below apply)	W000
Solid waste	W100
Animal manure	W520
Biolsolids	W200
Septage	W720
Industrial	W740

Large Capacity Cesspool (potential Class V)	CVLCC
Large Capacity Waste Water Disposal Site (potential Class V)	CVWWD
Leaking Underground Storage Tank	LUST
Misc. Injection Well (potential Class V)	INJWLL
Motor Vehicle Waste Disposal Well (potential Class V)	CVMVW
Nuclear Reactor	NR
Pipeline Crossing Over Water	PIPEX
Pipeline Facility	PLFAC
Pit (aggregate)	PIT
Potential Contamination Site[1]	PCS
Rail Crossing Over Water	RAILX
Recharge Well (potential Class V)	RWLL
Reinjection Well (potential Class V)	RIWLL
Road Crossing Over Water	ROADX
Sinkhole	SINK
Sludge Disposal Site	SLDG
Solid Waste Management Site	SWMS
Special Drainage Well (potential Class V)	SPDW
Spills	SPL
Storage or Preparation Area	STOR
Agricultural chemicals	C010
Chemicals (include RMP facilities here)	C000
Fertilizers	A050
Fuels, gases, and oils	F000
Hazardous substances (include TRIS facilities here)	C001
Road salt	C020
Solvents and coatings	S000
Pressure-treated wood	C220
Waste (used unless one of the materials listed below apply)	W000
Solid waste	W100
Animal manure	W520
Waste oils	W700
Motor vehicle waste	W710
Tires	W120
Stormwater Basin	SWB
Stormwater Injection Well (potential Class V)	SWI
Stormwater Outlet	SROUT
Subsurface Sewage Treatment System	SSTS
Suspected Contaminant of Concern	SCC
Chemical	C000
Food, agricultural, and consumer products	A000
Fuels, gases, and oils	F000

Materials and minerals	M000
Pathogens	P000
Solvents and coatings	S000
Waste	W000
Underground Storage Tank	UST
Chemicals	C000
Fertilizers	A050
Fuels, gases, and oils	F000
Hazardous substances	C001
Solvents and coatings	S000
Waste	W000
Waste - Metro Area	IWS
Wastewater Disposal Site[2]	WWDS
Wastewater Stabilization Pond	WSP
Wastewater Treatment Pond	WWTD
Wells	WEL

Footnotes:

[1]Potential Contamination Sites (PCS) include the following:

Brownfields (BMS)
Delisted State Superfund Sites (DPLP)
Federal Superfund Sites (NPL)
Hazardous Waste Investigative/cleanup (HWIC)
No Further Remedial Action Planned (NFRAP)
State Superfund Sites (PLP)
Suspected Hazardous Waste Site (CERCL)
Voluntary Investigative Cleanup (VIC)
State Assessment Site (SAS)

[2]Wastewater Disposal Sites (WWDS) include the following:

National Pollutant Discharge Elimination System (NDPES)
State Disposal System Permit (SDS)

Activity Status; Codes; and Descriptions

Status	Code	Description
Active	A	PCS is operative or in use. Examples: Animal feedlot is active. Well is in use or has maintenance permit.
Closed	C	PCS is inactive and is not open from a regulatory viewpoint. Example: Leaking storage tank site or landfill is closed.
Inactive	I	PCS is present but not currently active. Examples: Gravel pit is inactive. Well is un-used.
Removed	R	PCS has been removed. Example: Underground storage tank has been removed.
Unknown	U	Activity status of the PCS is not known definitely or has not been evaluated. Examples: Class V site status unknown. Well is thought to be sealed, but no official sealing record has been identified.

Revised: December 1, 2015

Scoping 2 Decision Notice Attachment
Potential Contaminant Source Inventory Requirements

Moderately Vulnerable DWSMA

The following current and historical potential contaminant sources and related codes, materials and related codes, and activity status and related codes are required to be included in the potential contaminant source inventory. In cases where a materials identification is required, a materials designation and code must be assigned. All potential contaminant sources must be assigned an activity status and related code using state program descriptors or local knowledge.

Potential Contaminant Sources (PCS) Material	PCS Codes Material Codes
Above-Ground Storage Tank - Greater than 1100 gallons	AST
Chemicals	C000
Fertilizers	A050
Fuels, gases, and oils	F000
Hazardous substances	C001
Solvents and coatings	S000
Waste	W000
Agricultural Drainage Well (potential Class V)	ADW
Disposal Well (potential Class V)	DISWLL
Industrial Drainage Well (potential Class V)	INDW
Large Capacity Cesspool (potential Class V)	CVLCC
Large Capacity Waste Water Disposal Site (potential Class V)	CVWWD
Leaking Underground Storage Tank	LUST
Misc. Injection Well (potential Class V)	INJWLL
Motor Vehicle Waste Disposal Well (potential Class V)	CVMVW
Pipeline Facility	PLFAC
Potential Contamination Site[1]	PCS
Recharge Well (potential Class V)	RWLL
Reinjection Well (potential Class V)	RIWLL
Solid Waste Management Site	SWMS
Special Drainage Well (potential Class V)	SPDW
Spills	SPL
Storage or Preparation Area	STOR
Chemicals (include RMP facilities here)	C000
Fertilizers	A050
Fuels, gases, and oils	F000
Hazardous substances (include TRIS facilities here)	C001
Solvents and coatings	S000
Waste	W000

(Effective April 1, 2015)

Potential Contaminant Sources (PCS) **Material**	**PCS Codes** **Material Codes**
Stormwater Injection Well (potential Class V)	SWI
Suspected Contaminant of Concern	SCC
Chemical	C000
Food, agricultural, and consumer products	A000
Fuels, gases, and oils	F000
Materials and minerals	M000
Pathogens	P000
Solvents and coatings	S000
Waste	W000
Underground Storage Tank	UST
Chemicals	C000
Fertilizers	A050
Fuels, gases, and oils	F000
Hazardous substances	C001
Solvents and coatings	S000
Waste	W000
Wells	WEL

Footnotes:

[1]Potential Contamination Sites (PCS) include the following:

Brownfields (BMS)
Delisted State Superfund Sites (DPLP)
Federal Superfund Sites (NPL)
Hazardous Waste Investigative/cleanup (HWIC)
No Further Remedial Action Planned (NFRAP)
State Superfund Sites (PLP)
Suspected Hazardous Waste Site (CERCL)
Voluntary Investigative Cleanup (VIC)

Activity Status; Codes; and Descriptions

Status	Code	Description
Active	A	PCS is operative or in use. Examples: Animal feedlot is active. Well is in use or has maintenance permit.
Closed	C	PCS is inactive and is not open from a regulatory viewpoint. Example: Leaking storage tank site or landfill is closed.
Inactive	I	PCS is present but not currently active. Examples: Gravel pit is inactive. Well is un-used.
Removed	R	PCS has been removed. Example: Underground storage tank has been removed.
Unknown	U	Activity status of the PCS is not known definitely or has not been evaluated. Examples: Class V site status unknown. Well is thought to be sealed, but no official sealing record has been identified.

APPENDIX G

PUBLIC HEARING DOCUMENTATION

(NOT INCLUDED IN THIS DRAFT)

APPENDIX H

PART 1 WELLHEAD PROTECTION PLAN AMENDMENT

Amendment to the Wellhead Protection Plan

Part I

Wellhead Protection Area Delineation
Drinking Water Supply Management Area Delineation
Well and Drinking Water Supply Management Area Vulnerability Assessments

For the City of Milaca

March 2023

DEPARTMENT OF HEALTH

CLEAN WATER LAND & LEGACY AMENDMENT

Gail Haglund, P.G. Hydrologist, Minnesota Department of Health
Chad Anderson, Planner, Minnesota Department of Health

Introduction

This summary documents the amended delineation of the wellhead protection area (WHPA), drinking water supply management area (DWSMA), emergency response area (ERA), and the vulnerability assessments for the city of Milaca's drinking water supply wells and DWSMA (PWSID 1480002). These were initially prepared in June of 2010 and must now be amended as the public water supply's wellhead plan has nearly expired. The amended plan covers the wells listed in Table 1.

Table 1 – Water Supply Well Information

Local Well ID	Unique Number	Use/ Status	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Aquifer[1]	Well Vulnerability
West Well #1 (S04)	241014	Emergency	12	80	98	1972	QUUU	Vulnerable
Well #3 (S05)	578707	Primary	12	115	147	02/29/1996	QBUA	Vulnerable
Well #4 (S06)	738390	Primary	12	105	135	06/06/2006	QBUA	Vulnerable

Note: 1. QUUU – Quaternary Undifferentiated; QBUA – Quaternary Buried Unconfined Aquifer (MGS)

Protection Area Boundaries

The city of Milaca's ERA, WHPA, and DWSMA have been updated (Figure 1). The projected amount of water pumped by the city's wells has decreased significantly (greater than 45%) compared to annual pumping projections used for the 2010 WHP Plan. As a result, all the protection areas are smaller. Figure 2 shows a comparison of the previous protection areas to the new areas. Note that the WHPA for emergency wells consists solely of a 200-foot radius around the well.

Vulnerability Assessments and Management Implications

The city wells are considered vulnerable to contamination, based primarily on their tritium results that show the presence of young water (Table 2). In addition, several general chemistry parameters, such as nitrate, chloride and chloride/bromide also indicate that the wells are vulnerable to activities occurring at the land surface.

The vulnerability of the city's aquifer throughout the DWSMA is based on the geologic sensitivity ratings of wells and available monitoring data (Table 2). The geologic materials in the east half of the DWSMA are comprised of glacial outwash and alluvial sediments associated with the Rum River. The level of natural protection provided by sand and gravel materials is

considered low and therefore this area has been assigned a high vulnerability rating, which is confirmed by the high geologic sensitivity ratings of area wells. On the west side of the DWSMA, the surficial geologic materials are largely comprised of glacial till, which provides a greater degree of geologic protection to the aquifer serving the city's wells. Glacial till materials are often comprised of a mix of clay and patchy silt and sand. For this reason, the west half of the DWSMA has been assigned a moderate vulnerability.

It is noted that in the 2010 Part 1 WHP Plan, the DWSMA was assigned a mixed vulnerability of low and high. At the time, this decision was primarily based on the geologic sensitivity ratings of existing wells. With this amendment, however, the low vulnerability rating of the west half of the DWSMA is raised to moderate. The reason for this change is because several of the wells having low geologic sensitivity ratings are observed to also have elevated nitrates. The presence of nitrate-nitrogen at certain locations indicates a connection between land-use activities and the groundwater aquifer, regardless of the low geologic sensitivities of area wells. With the addition of groundwater monitoring information, the decision was made to raise the vulnerability from low to moderate.

In high vulnerability areas, water and contaminants may travel from the land surface to the city's aquifer within a time span of weeks to years. Highly vulnerable aquifers are prone to a variety of contaminant threats, including chemical storage tanks, road salt, septic waste, and chemical application to the land surface. With respect to moderate vulnerability areas, pathways exist where water and contaminants may travel from the land surface to the aquifer within a time span of years to decades. Moderately vulnerable aquifers are prone to a variety of contaminant threats, including chemical storage tanks and abandoned wells. The remainder of the city's wellhead protection plan will outline strategies for effectively managing potential contaminant sources within both the high and moderate vulnerability areas in the DWSMA.

Table 2 - Isotope and Water Quality Results

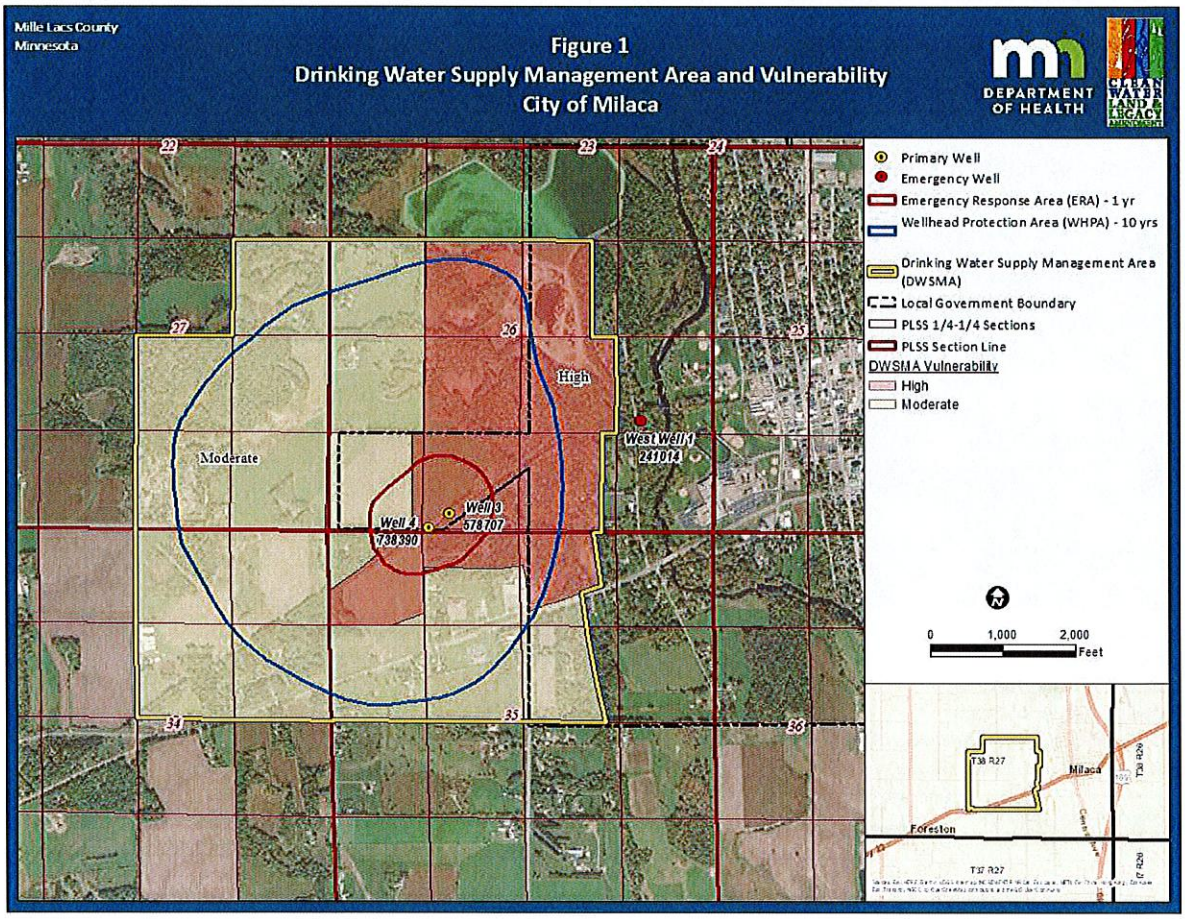
Water Samples Collected on **05/25/2021** (unless otherwise noted)

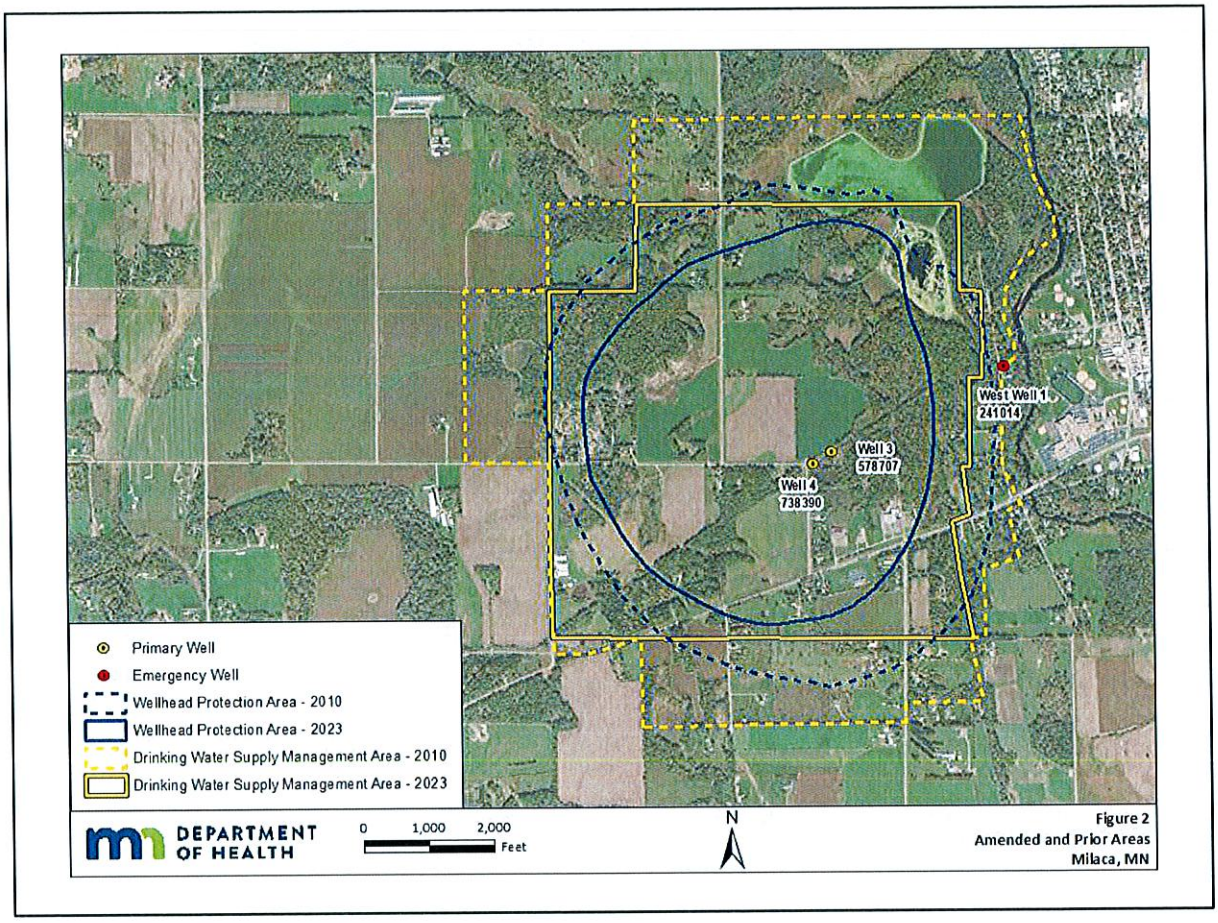
Well Name/ Unique Number	Tritium[1] (TU)	Nitrate (mg/L)	Chloride/ Bromide Ratio	Chloride (mg/L)	Bromide (mg/L)	Arsenic (µg/L)
Well #3 578707	5.9 **Modern Age**	1.6	642	15.6	0.0243	<1 (9/15/2016)
Well 4 738390	5.4 (avg.) **Modern Age**	4.4	746	19.8	0.0287	<1 (9/15/2016)

Notes: 1. Tritium age reference: DNR-MDH, 2020

Documentation

MDH rule criteria and guidelines were used to assess the adequacy of the existing delineations and vulnerability assessments and evaluate the impact of newer data. The results of this assessment showed that a full update of the Part 1 plan is not necessary and instead this brief synopsis is adequate to amend the Part 1 plan. The documentation of this assessment is available from MDH upon request.


Mille Lacs County
Minnesota
Figure 1
Drinking Water Supply Management Area and Vulnerability
City of Milaca
DEPARTMENT OF HEALTH
CLEAN WATER LAND & LEGACY AMENDMENT
22
23
24
27
26
25
34
35
36
High
Moderate
West Well 1
241014
Well 3
578707
Well 4
738390
Primary Well
Emergency Well
Emergency Response Area (ERA) - 1 yr
Wellhead Protection Area (WHPA) - 10 yrs
Drinking Water Supply Management Area (DWSMA)
Local Government Boundary
PLSS 1/4-1/4 Sections
PLSS Section Line
DWSMA Vulnerability
High
Moderate
0
1,000
2,000
Feet
T38 R27
Milaca
Foreston
T37 R27
T36 R26
R26


West Well 1
241014
Well 3
578707
Well 4
738390
Primary Well
Emergency Well
Wellhead Protection Area - 2010
Wellhead Protection Area - 2023
Drinking Water Supply Management Area - 2010
Drinking Water Supply Management Area - 2023
DEPARTMENT OF HEALTH
0 1,000 2,000
Feet
N
Figure 2
Amended and Prior Areas
Milaca, MN