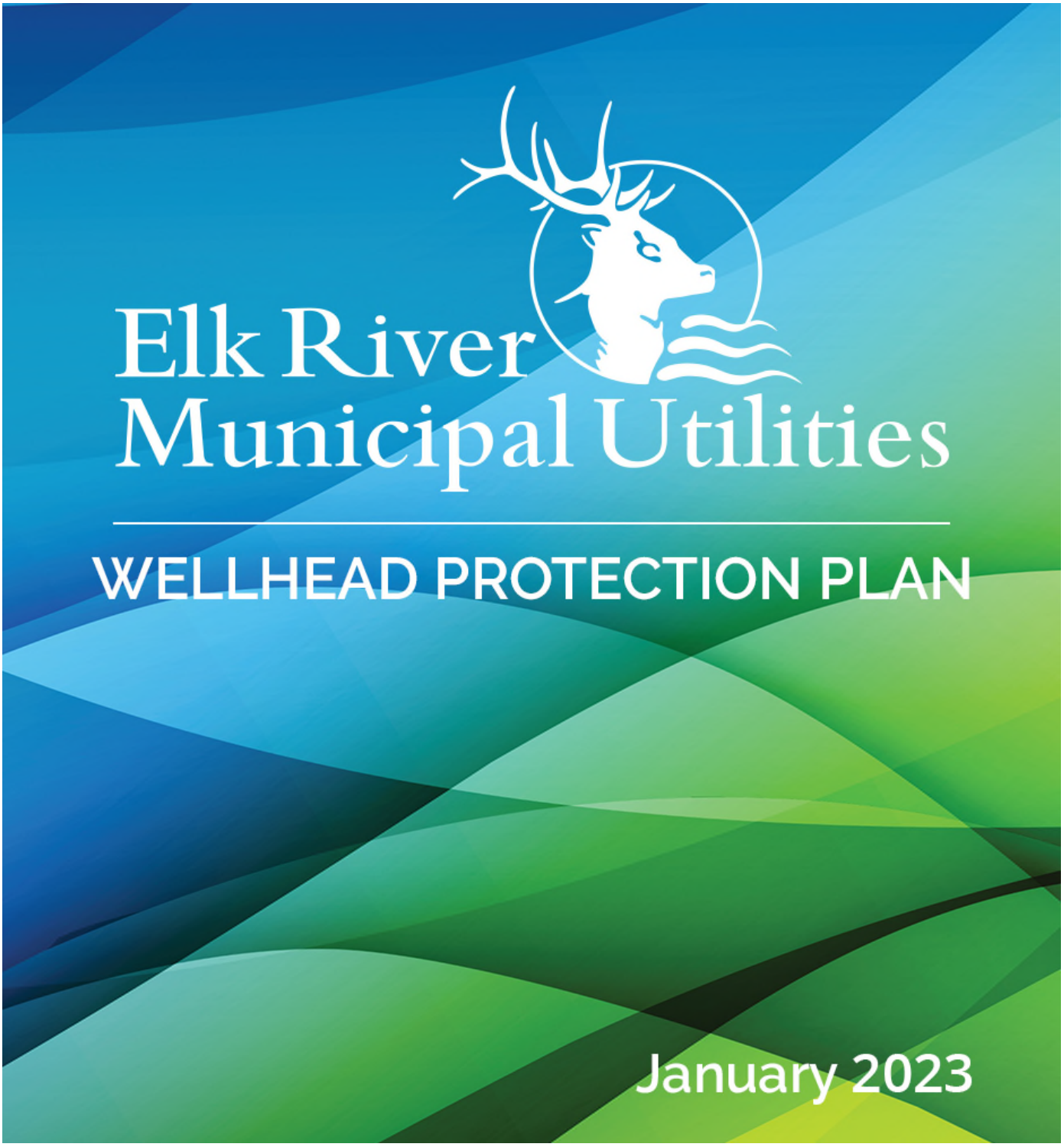
Elk River
Municipal Utilities
WELLHEAD PROTECTION PLAN
January 2023

Forward

This document presents an amended, comprehensive wellhead protection plan for Elk River Municipal Utilities (ERMU) that will help provide for an adequate and safe drinking water supply for community residents.

ERMU has made good progress in implementing the current wellhead protection (WHP) plan and continues in efforts to protect the City of Elk River's source water. This amendment reflects relatively minor amendments to the boundaries of the emergency response areas, wellhead protection areas and the drinking water supply management area (DWSMA) since the previous WHP plan. The moderately vulnerable area within the DWSMA has been refined. The vulnerability status of Well #3 changed from nonvulnerable to vulnerable due to results of recent water sampling. This amended WHP plan includes addressing important issues of expected growth in population and associated increase demands on the sole-source aquifer used to supply potable water for the City of Elk River and many other public and private well owners in the region. The City and ERMU will continue to work with citizens and local and state partners in implementation of the WHP plan.

MDH wellhead protection rules require a review and assessment of various data elements as determined by DWSMA vulnerability that must be completed for the DWSMA. This process must address existing and historical aspects of the 1) physical environment, 2) land uses, 3) water quantity and 4) water quality. The data assessment process conducted by the ERMU wellhead protection team supports both the delineation and vulnerability reports (Part 1) and assists in the identification of potential impacts the data elements may have on the source water and how the water supplier can address potential impacts (Part 2). Appendix A contains detailed assessments of all applicable data elements for the DWSMA.

Eight wells contribute source water to the ERMU system. Each well has undergone an extensive groundwater modeling process as part of wellhead protection planning. The modeling results are presented in the Part 1 report. The Part 1 report is located in Appendix B which contains the 1) delineation of the wellhead protection area, 2) delineation of the DWSMA, and 3) the assessments of well and drinking water supply management area vulnerability. The Part 1 report was approved by the Minnesota Department of Health (MDH) before the second part of the plan was prepared.

The remainder of the wellhead protection plan is referred to as 'Part 2' and contains procedures followed for conducting an potential contaminant source inventory (PCSI) and the development of goals, objectives and measures that ERMU will take to offset the risk that potential contamination sources present to the public water supply system.

The identification of potential contaminant sources within the DWSMA is a fundamental element of wellhead protection. A PCSI is needed to assign meaningful priorities to management measures and to effectively monitor the effectiveness of implementation of the WHP plan. This is an ongoing process that entails inventorying present and past land uses and periodically updating the PCSI as land uses change within the DWSMA. The extent of potential contaminant inventory conducted within a DWSMA is determined by the vulnerability of the public water supply wells and the DWSMA. The ERMU wellhead protection team has conducted an inventory of potential contaminant sources within the DWSMA which are discussed in Chapter 4 and shown on maps and tables in Appendix C.

The wellhead protection team discussed and listed any expected changes to the physical environment, land use, surface and groundwater that may impact the aquifer serving the public water supply wells in the DWSMA. Chapter 5 discusses this subject in greater detail to clarify expected changes and how those changes may impact the source water used by ERMU.

A WHP plan must identify water use, land use issues, problems and opportunities related to the aquifer serving the public water supply wells, the well water and each DWSMA. The wellhead protection team utilizes this process to define the nature and magnitude of contaminant source management issues within each DWSMA. The identification of issues, problems and opportunities that may exist in the DWSMA enables ERMU to 1) take advantage of opportunities that may be available to make effective use of existing resources, 2) set priorities for management of contaminants listed, and 3) request support for implementing specific management strategies. Chapter 6 provides further discussion and tables of issues, problems and opportunities identified by the ERMU wellhead protection team.

Finally, the core of a WHP plan is the identification and implementation of effective management strategies that will protect the public water supply wells from contamination. These management strategies or measures, may range from nonregulatory activities such as public education, to regulatory activities such as adoption by federal, state or local units of government to control specific types of contaminant sources. The ERMU wellhead protection team has selected measures and prioritized each measure that should effectively address local land and water uses as well as resource needs.

Factors the team considered in this process include:

- contamination of a public water supply well;
- quantities of potential contaminant sources and their proximity to a public water supply well;
- capability of the geologic material to absorb a contaminant;
- existence and effectiveness of existing official controls;
- time required to obtain cooperation; and
- administrative, legal, technical and financial resources needed.

The long range goals, objectives and measures assigned to the DWSMA by the ERMU wellhead team is discussed and itemized in Chapters 8 and Appendix D.

When both parts of the plan are approved by the MDH, the Public Water Supplier has met all requirements that are contained in Minnesota Rules Chapter 4720, parts 4720.5100 to 4720.5590 for preparing an amended wellhead protection plan.

Wellhead Protection Plan Manager

Dave Ninow – ERMU Water Superintendent

WHP Team Members	Technical Assistance Provided by:
ERMU Staff: Dave Ninow, Angela Hauge, Tom Sagstetter, Tony Mauren and Mark Hanson	Gail Haglund (MDH) – Part 1
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Glossary of Terms

Drinking Water Supply Management Area (DWSMA) means the surface and subsurface areas surrounding a public water supply well, including the WHP area, that must be managed by the entity identified in the WHP plan. (MR4720.5 100, subpart 13). This area is delineated using identifiable landmarks that reflect the scientifically calculated WHPA boundaries as closely as possible.

Emergency Response Area (ERA) means the part of the WHP area that is defined by a one- year time of travel within the aquifer that is used by the public water supply well (MR4720.5250, Subpart 3). It is used to set priorities for managing potential contamination sources within the DWSMA.

Inner Wellhead Management Zone (IWMZ) means the land that is within 200 feet of a public water supply well (MR4720.5100, subpart 19). The public water supplier must manage the IWMZ to help protect it from sources of pathogen sources or chemical contamination that may cause an acute health effect.

Primary Water Supply Well means a well that is regularly pumped by a public water supply system to provide drinking water.

Vulnerability refers to the likelihood that one or more contaminants of human origin may enter either 1) a water supply well that is used by the public water supplier or 2) an aquifer that is a source of public drinking water. Very high or high vulnerability indicates that vertical recharge to the source water aquifer occurs over a time period of weeks to years. Low vulnerability indicates that vertical recharge to the source water aquifer occurs over a time period of several decades to a century.

Wellhead Protection (WHP) – Wellhead Protection means a method of preventing well contamination by effectively managing potential contaminant sources in all or a portion of the well's recharge area.

Wellhead Protection Area (WHPA) is the surface and subsurface area surrounding a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well or well field (Minnesota Statutes, Part 103I.005, Subdivision 24).

WHP Plan Goal means an overall outcome of implementing the WHP plan, e.g., ensuring a safe and adequate drinking water supply.

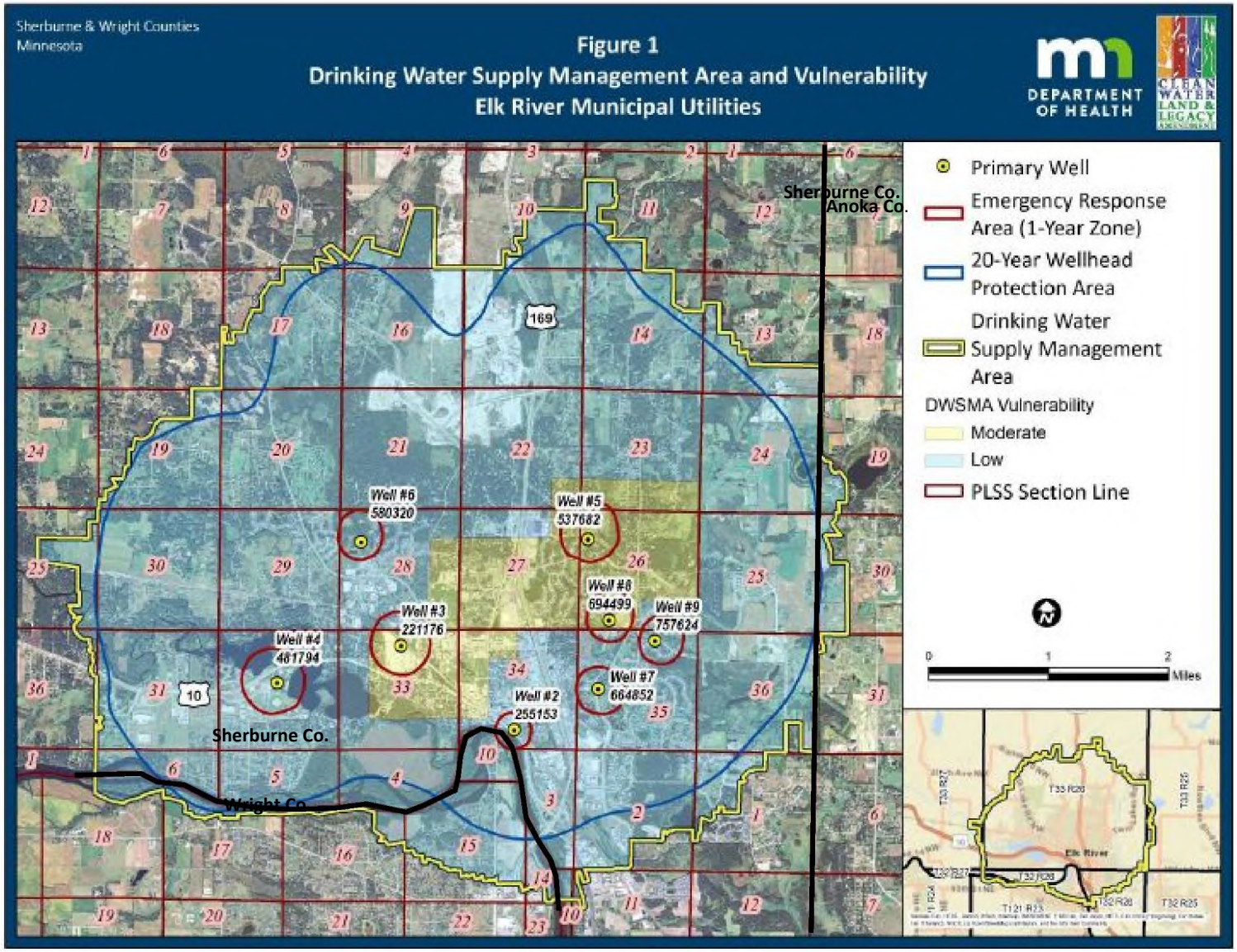
WHP Measure means a method adopted and implemented by a public water supplier to prevent contamination of a public water supply, and approved by the Minnesota Department of Health under Minnesota Rules parts 4720.5110 to 4720.5590.

WHP Plan Objective means what the public water supplier intends to do to achieve the related WHP goals, e.g., implementing WHP measures to address high priority potential contamination sources within 8 years.

Acronyms

BWSR - Board of Water and Soil Resources
DNR - Minnesota Department of Natural Resources
ERMU - Elk River Municipal Utilities
MDH - Minnesota Department of Health
MPCA - Minnesota Pollution Control Agency
MRWA- Minnesota Rural Water Association
SWCD - Sherburne Soil and Water Conservation District
USEPA- United States Environmental Protection Agency

Figure 1-1
Elk River Municipal Utilities Drinking Water Supply Management Area and Vulnerability Assessment



Chapter 1: Introduction

1.1 Background

This amended wellhead protection (WHP) plan for the Elk River Municipal Utilities (ERMU) was prepared in cooperation with the ERMU and the Minnesota Department of Health (MDH). Wellhead protection is an ongoing process and WHP plans need to be periodically reviewed and updated. Land and groundwater uses within a drinking water supply management area (DWSMA) are likely to change over time and the WHP plan must be modified to reflect those changes. A public water supplier is required to review and update an approved WHP plan every ten years to ensure the plan reflects current conditions with the DWSMA. The original ERMU WHP plan was approved by MDH on June 12, 2002 with an MDH-approved WHP amendment completed on May 6, 2013. This document represents the second amended WHP plan.

The WHP plan contains specific actions that ERMU will take to fulfill WHP requirements that are specified under Minnesota Rules, part 4720.5100 to 4720.5590. Also, the support that Minnesota state agencies, federal agencies, and county agencies will provide is presented to identify their roles in protecting ERMU's drinking water supply. ERMU is responsible for implementing its WHP plan of action as described in Chapter 8 and Appendix D of this plan. Furthermore, ERMU will evaluate the status of plan implementation at least every two and one half years to identify whether its WHP plan is being implemented on schedule.

1.2 General Description of ERMU Public Water Supply

ERMU is located within the City of Elk River, Minnesota in Sherburne County and serves drinking water to approximately 18,495 residents through 5,581 service connections. Water storage consists of four water towers with total capacity of 4,000,000 gallons. The following provides a summary of characteristics of the ERMU DWSMA and source water system.

- The ERMU DWSMA covers approximately 17,268 acres (~27 square miles) with about 15,360 acres classified as low vulnerability and 1,908 acres classified as moderately vulnerable – see Chapter 3 for details. Also, approximately 800 acres of the DWSMA are within Wright County and 180 acres in Anoka County. The DWSMA is located within the Mississippi River Headwaters Basin, Mississippi River-St. Cloud watershed (catchment #1702700) which drains the majority of southern Sherburne County (Appendix A).
- The DWSMA (Figure 1-1) contains eight ERMU production wells (Table 1-1) which produce on a five-year average about 854.2 million gallons per year (2017-2021) from a deep, sandstone bedrock aquifer. Chapter 3 provides a detailed discussion regarding vulnerability of ERMU public wells and DWSMA.
- ERMU filters iron and manganese from the source water.

At present, none of the human-caused contaminants for which the Safe Drinking Water Act has established health-based standards is found above maximum allowable levels in the city's water supply, nor are any present at one-half of those levels. Drinking water delivered to consumers meet all state and federal drinking water standards. See Appendix A for the current Consumer Confidence Report.

Table 1-1
ERMU Water Supply Well Information

Local Well ID	Unique Number	Use/ Status[1]	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Aquifer
Well 2	255153	Primary	16	136	290	08/1948	Mt. Simon
Well 3	221176	Primary	20 x 16	201	315	10/1974	Mt. Simon
Well 4	481794	Primary	24 x 18	197	225	12/1992	Mt. Simon
Well 5	537682	Primary	30 x 24 x 18	316	406	8/1994	Mt. Simon
Well 6	580320	Primary	24 x 18	212	300	2/1999	Mt. Simon
Well 7	664852	Primary	24 x 18	240	341	7/2001	Mt. Simon
Well 8	694499	Primary	30 x 24 x 18	264	390	6/2004	Mt. Simon
Well 9	757624	Primary	24 x 18	296	454	1/2008	Mt. Simon - Hinckley

[1] Denotes Primary Well

Additional information regarding the physical geologic setting and how the ERMU DWSMA delineation and vulnerability assessments were determined are found in the *Wellhead Protection Plan Part 1 Elk River Municipal Utilities* (Bolton & Menk - 2013) and MDH *Amendment to the Wellhead Protection Plan, March 2021* (Appendix B).

The ERMU water system does not have any agreements to share drinking water supplies with other public water systems.

1.3 Plan Appendices

Much of the technical information that was used to prepare this plan is contained in the appendices but is summarized in the main body of this plan. In particular:

- Appendix A contains documents and discussion regarding the data elements used for this plan as specified in the MDH Second Scoping Decision Notice (Sept. 29, 2021). This part of the plan is summarized in Chapter 2.
- Appendix B contains the first part of the WHP plan (as amended in 2011) consisting of the delineation of the emergency response area (ERA), wellhead protection area (WHPA) and the DWSMA for the eight wells and the vulnerability assessments for each primary ERMU public water supply well in the DWSMA. This part of the plan is summarized in Chapter 3.
- Appendix C contains the potential contamination sources inventory (PCSI) for the DWSMA. This inventory is discussed in Chapter 4 in terms of how the inventory was completed and the process of assigning a level of risk that various potential contaminant sources in the DWSMA may pose to ERMU's source water supply.
- Appendix D contains the wellhead protection measures the WHP team has identified for implementation over the ten year period that its WHP plan is in effect. It also provides detail on how action items are determined by the wellhead protection team and identifies potential partners in implementation efforts.
- Appendix E contains documents that support the WHP plan.

Chapter 2: Identification and Assessment of the Data Elements Used to Prepare the Plan

The data elements included in this amended wellhead protection plan document the need for WHP measures that will be implemented to help protect the ERMU water supply from potential sources of contamination. ERMU met with representatives from MDH on two occasions to discuss the data elements that are specified in Minnesota Rules, part 4720.5400, for preparing a WHP plan.

A Scoping 1 meeting held on February 5, 2021 identified the data elements required to support the delineation and vulnerability assessment of the WHPA and the DWSMA (Part 1 of the WHP plan) for the ERMU. The amended (2013) Part 1 plan for the ERMU DWSMA was approved by the MDH in March 2021.

A second scoping meeting (Scoping 2) held on September 20, 2021 discussed the data elements required to complete the second amendment of the WHP plan for the ERMU DWSMA. The second scoping meeting utilizes the completed Part 1 delineation and vulnerability reports to select additional data elements which 1) identify potential risks to the public water supply and 2) develop effective management strategies to protect the public water supply relative to each well and DWSMA vulnerability. This becomes the basis for the "remainder of the amended WHP plan". The results of the Scoping 2 meeting were communicated to ERMU by MDH through a formal scoping decision notice and are included in Appendix A.

Appendix A also contains an assessment of each data element identified in the MDH Scoping 2 document for its present and future impact on:

- The use of the public water supply wells,
- Delineation of the WHPA,
- The quality and quantity of water supplying the public water supply wells, and
- Land and groundwater uses within the DWSMA.

Availability of information relating to each data element that is used in this plan was evaluated by staff from the MDH and ERMU. If the evaluation process determines that information pertaining to a particular data element may be considered an issue, concern or opportunity, ERMU can then address identified issues, concerns and opportunities in this plan. In Chapter 6, Table 6-1 lists the issues, concerns and opportunities identified by the ERMU WHP team. Measures identified to address deficiencies found during the data element assessment process in either the quality or quantity of data are included in the plan of action (Chapter 8 and Appendix D).

Appendices A and E also contain supporting documents (maps, tables, exhibits, etc.) that are required by the MDH Scoping 2 document to be included in the WHP plan.

Chapter 3: Delineation of the Wellhead Protection Area, Drinking Water Supply Management Area and Vulnerability Assessments

3.1 WHPA and DWSMA Delineation

The WHP amendment process requires review of the previously state-approved ERMU WHPA and DWSMA delineations and assessments (2013) based on changes in water use, new geologic or groundwater data, updated modeling processes, revised scoping requirements or a combination of these factors. This review process concluded that due to changes in pumping rates in several primary wells, greater accuracy in well locations and use of an updated groundwater model resulted in minor changes to the boundaries of ERAs, WHPAs and overall DWSMA shape and size.

The process used for delineating each ERA, WHPA and DWSMA and preparing the vulnerability assessment for the DWSMA is presented in Appendix B. See the Glossary for definitions of the DWSMA, ERA and WHPA acronyms.

Figure 1 shows the boundaries of the ERA, WHPA, DWSMA and vulnerability assessments of the DWSMA, and locations of the ERMU water supply wells. The hydrogeologic work was performed by a State of Minnesota-licensed geoscientist employed by Bolton & Menk Engineering (2013) and MDH staff (2021).

The DWSMA boundaries were designated using the following criteria:

- Center-lines of streets and road right-of-ways,
- Parcel boundaries, and
- Public Land Survey coordinates.

3.2 Description of the Geology and Hydrogeologic Setting

The following are excerpts from the *Wellhead Protection Plan Part 1 Elk River Municipal Utilities* (Bolton & Menk - 2013). See Appendix B for the complete Part 1 report.

Geology

'The majority of unconsolidated deposits overlying bedrock in the ERMU DWSMA consist of glacier-derived or glacier-related sediments. These surficial sediments are typically comprised of clay-rich tills, sand and gravel terrace deposits, lake and organic deposits, and sandy river deposits. Generally, the depth to bedrock in the Elk River area ranges from 100-200 feet.'

'Generally, the uppermost bedrock in the Elk River area is the Eau Claire Formation, comprised mostly of siltstone and shale which have low permeability characteristics and overlay the Mount Simon sandstone. This shale-rich layer is generally present throughout most of the Elk River area. However, there appear to be areas in this area where buried bedrock valleys are present. In these valleys the Eau Claire Formation is likely thinner or may be absent.'

'Mt. Simon sandstone contains varying amounts of siltstone and shale in the upper third of the formation, but the remainder is mostly of friable, medium to very coarse-grained sandstone. The underlying Hinckley sandstone is a separate bedrock formation, but similar to the Mt. Simon sandstone.'

Hydrogeology

'In the Elk River area there are interpreted to be three aquifers - 1) a unconfined, shallow water table aquifer, 2) confined, buried aquifer system consisting of saturated sand and gravel deposits within glacial deposits above the bedrock, but hydrologically separated from the water table aquifer and the Mt. Simon-

Hinckley bedrock aquifer and, 3) the Mt. Simon-Hinckley bedrock aquifer. These aquifers are hydrologically separated from each other by varying degrees.'

'Typically, groundwater in the water table aquifer is strongly influenced by local surface water bodies and recharged by direct precipitation and runoff. The Mt. Simon-Hinckley aquifer appears to be present throughout the Elk River area. Although comprised of two distinct bedrock formations, this aquifer is regionally defined as a single hydrogeologic unit. It is hydrologically separated from the overlying water table aquifer by the fine-grained Eau Claire Formation. The Mt. Simon-Hinckley aquifer is interpreted to not be in direct hydrologic connection with surface waters in the Elk River area. However, water from these features will infiltrate the subsurface and recharge the aquifer slowly over time.'

The Mt. Simon-Hinckley aquifer is the only source of water for the ERMU public water supply system.

3.3 Well Vulnerability Assessment

The Part 1 report for the DWSMA (Appendix B) include vulnerability assessments for the primary wells used by ERMU. These vulnerability assessments are used to help define what types of potential contaminant sources within the DWSMA that require inventorying and to select appropriate measures to reduce the risk a potential contaminant may present to the public drinking water supply. The MDH has produced guidance in determining well vulnerability based on 1) well construction details (casing integrity, casing depth, pumping rate, etc.) and conformance with standards required by the state well code, 2) geologic sensitivity of the aquifer, and 3) past monitoring results including isolation distance from any known contaminant source and chemical and isotopic information.

The following is a summary of ERMU primary well vulnerability assessments. See *Amendment to the Wellhead Protection Plan Part 1* – MDH, March 2021 in Appendix B for additional details.

- Six of the eight ERMU wells are considered not vulnerable to contamination, while Wells #3 and #5 are classed as vulnerable. Well vulnerability is confirmed by groundwater age data and other water chemistry characteristics.
- Water sampled from the six non-vulnerable wells is of pre-modern age, as determined by the lack of the tritium isotope in the well water. Low level tritium was measured in Well #3, which is characteristic of mixed age water. A moderate level of tritium and other indicators of human impact (low level nitrate and chloride) confirms the vulnerable nature of Well #5.
- Based on the well vulnerability assessments, ERMU Wells 2, 4, 6, 7, 8, and 9 are ranked as non-vulnerable to land surface activities whereas, Wells 3 and 5 are classified as vulnerable.

3.4 DWSMA Vulnerability Assessment

The Part 1 report for the DWSMA (Appendix B) include a vulnerability assessment for the ERMU DWSMA (Figure 1). DWSMA vulnerability was determined by using geologic, soils, and groundwater chemistry information. Review of geologic information and groundwater quality data for the aquifer within the DWSMA indicate the following:

- The geologic conditions within the DWSMA delineated for the ERMU public water supply wells were assessed to determine the sensitivity and vulnerability of the Mount Simon-Hinckley Aquifer to land use activities. Surficial geology and bedrock maps available from the Minnesota Geological Survey (MGS) were used to identify the types and characteristics of the uppermost geologic deposits in the DWSMA.
- DWSMA vulnerability is unchanged from the prior plan, ranging from low to moderate. Nearly 90 percent of the DWSMA is classified as low vulnerability. In the low vulnerable area geologic materials composed of clay-rich glacial sediments and the Eau Claire formation provide

protection to the Mount Simon-Hinckley aquifer. Due to the protective clay and shale layers, surface water and contaminants are impeded and travel from the land surface to the city's aquifer likely occurs over a time span of decades or longer.

- Within the low vulnerability areas, the primary threats to the city's aquifer are other wells that reach or penetrate it.
- Where the DWSMA vulnerability is classified as moderate, pathways exist where water and contaminants may travel from the land surface to the aquifer within a time span of years to decades. Information gained from the Sherburne County Geologic Atlas (Lusardi, B.A., 2013) was used to identify locations near Wells #3 and #5 where there is less natural geologic protection overlying the aquifer.
- Moderate vulnerability aquifers are susceptible to several types of contaminant threats, including chemical/petroleum storage tanks and unused or unsealed wells which can provide conduits for contaminants to quickly reach the city's aquifer.
- The boundaries of the moderate vulnerability area were refined using geographic features, such as public land survey data, for this amendment.

Therefore, given the information currently available, it is prudent to assign a mixed, low, and moderate vulnerability rating to the DWSMA, in accordance with the Minnesota Wellhead Protection Rule (parts 4720.5100 to 4720.5590).

Generally, the higher the vulnerability rating, the greater the risk that a released contaminant may result in contaminating source water used for drinking water. It is important to consider what types of potential contaminant sources can be carried by surface water runoff to groundwater recharge areas where infiltration to an aquifer may occur at a greater rate than in an area rated as low vulnerability.

Moderate vulnerability aquifers are prone to a variety of contaminant threats, including petroleum and chemical storage tanks and abandoned wells which can provide conduits for a contaminant to quickly reach the aquifer used by ERMU. Therefore, land uses within the moderate vulnerability portion of the DWSMA that may contribute pollutants via surface water recharge to the aquifer is a management concern.

See Appendix B for additional information regarding the hydrogeology of the DWSMA.

Chapter 4: Inventory of Potential Contamination Sources, Establishing Priorities and Assigning Risk to Potential Contamination Sources

The ERMU DWSMA covers over 17,000 acres within the southern and central portion of the City of Elk River, including the majority of commercial and industrial areas in the city and small areas in Wright and Anoka counties (Figure 1). The DWSMA has mixed vulnerabilities – low and moderate. All eight (8) ERMU primary water supply wells are constructed in the Mount Simon-Hinckley aquifer. Six wells are classified as not vulnerable and two wells are classified as vulnerable.

4.1 Potential Contaminant Source Inventory Requirements

Scoping documents contained in Appendix A provide details of the various categories of PCS required by MDH to be inventoried in the DWSMA based on geologic vulnerability and well water quality sampling. Further, the data element assessment process as described in Appendix A was used in assigning what impact or level of risk the various potential sources of contamination that are inventoried in the DWSMA may have on ERMU's drinking water supply.

Low Vulnerability

About eighty nine (89) percent of the ERMU DWSMA has been assigned a low vulnerability ranking because groundwater age data and other water chemistry characteristics for six wells (Wells #2, #4, #6, #7, #8 and #9) indicate premodern-age water (Appendix B).

The PCSI within the low vulnerable portion of the DWSMA must include:

a) Wells greater than 100 feet deep.
b) Large capacity waste water disposal sites (Class V wells), and
c) Motor vehicle waste disposal wells (Class V wells).

Moderate Vulnerability

About eleven (11) percent of the ERMU DWSMA has been assigned a moderate vulnerability ranking due to low levels of tritium in the source water from Well #3 which is a characteristic of mixed-age water. Well #5 contains moderate levels of tritium plus low levels of nitrate-nitrogen and chloride – both indicators of human impact. The majority of land cover in the moderately vulnerable area is a mix of residential, commercial and industrial development interspersed with parks and other forms of vegetative cover.

The majority of roads in the DWSMA are small arterial roads and residential streets, however, two major highways and a railroad right-of-way traverse the DWSMA. Linear features like roads or railroads are not required to be inventoried. However, petroleum-based products or liquid forms of potential contaminants that may accidentally spill could impact groundwater via infiltration or runoff to storm sewers or surface waters, specifically in the moderately vulnerable area. These linear features are illustrated in Appendix A.

The PCSI within the moderately vulnerable portion of the DWSMA must include:

a) Above ground and underground storage tanks and current or past leaking tank sites,
b) Spill sites (current or historical),
c) Storage or preparation areas (fertilizers, chemicals, wastes, solvents, etc.),
d) Potential contaminant sites (brownfields, superfund sites, etc.),
e) Suspected contaminant of concern,
f) Pipeline facility,
g) Solid waste management site,
h) Stormwater basins and outlets,

i) Class V wells (large capacity waste water disposal and/or motor vehicle waste disposal wells), and
j) Wells.

A complete listing of all the PCSI requirements and potential contaminant categories assigned to the low and moderate rankings in the DWSMA is contained in the MDH scoping documents in Appendix A.

MDH WHP rules require a PCSI must address all land parcels within a DWSMA and land use information must be included in the inventory. Parcel data for the DWSMA and each PCS is collected and formatted as geographic information system (GIS)-based data as required by the MDH. Parcel data for Sherburne County is available via the county's website that provides public access to parcel information. The complete PCSI is displayed in Appendix C in maps and table format.

4.2 Conducting the Potential Contaminant Sources Inventory

Conducting the PCSI is a multi-phased process. Various local, state and federal data bases are reviewed to determine 1) if the types of PCS as listed in MDH scoping documents for the DWSMA may be present and 2) verification of the location of each PCS. GIS-based mapping techniques are used to display preliminary PCS data on an aerial photo base map and an associated PCSI spreadsheet for the DWSMA. The WHP team then reviews the data to determine if the location and associated information for each PCS is accurate. This data review process described above allows the WHP team to expand or reduce the initial PCS list.

As a start point in the inventory process, the MDH and DNR provided ERMU with information about wells with known locations from the Minnesota Well Index and other data bases. These data sources were systematically reviewed by the WHP team to determine if any of the documented wells were located within the DWSMA. The WHP team also reviewed public water supply well data provided by the MDH to determine 1) the location of ERMU public wells within the DWSMA, and 2) what the current status of any unused public wells may be (active, inactive, sealed or unknown – Appendix C).

The well inventory process is not complete. The large size of the DWSMA includes extensive residential areas which rely on private, individual water supply wells. Many of these wells are not compiled in the Minnesota Well Index or do not have accurate locations verified and subsequently, were not included in the current inventory of wells. Another source of historic information regarding older wells (1894 – 1928) is Sanborn Fire Insurance maps which are available for portions of the city. Additional efforts to utilize these well-related data sources, combined with conducting a thorough mapping effort should be completed to establish location, aquifer use and current status of wells within the entire DWSMA.

State, federal and local data bases were examined for listings of other types of potential contaminant sources (storage tanks, leak sites, etc.) listed in the MDH scoping documents for the ERMU DWSMA (Appendix A). The same data review procedures as described previously were employed by the WHP team to expand or reduce the PCS list. Tanks with a capacity of less than 1100 gallons are not required to be inventoried.

4.3 Contaminants of Concern

The 'Amendment to the Wellhead Protection Plan, Part 1, March 2021' (Appendix B) states "At present, none of the contaminants for which the Safe Drinking Water Act has established health-based standards is found above maximum allowable levels in the city's water supply, nor are any present at one-half of those levels." However, low levels of nitrate-nitrogen and chloride have been detected in Well #5 – indicating aquifer recharge from younger, or 'modern-age' water. Water quality monitoring at Well #3 shows chloride is present, but no nitrates, which indicates water of 'mixed-age' (premodern age mixed with modern age). Testing of all other ERMU primary wells indicate no nitrates or chlorides present, therefore, these wells do not appear to be susceptible to impacts caused by human activities.

All water distributed by ERMU is disinfected with chlorine to ensure potability and meets all state and federal drinking water standards. See the 2021 Consumer Confidence Report (Appendix A – Exhibit E) for additional details regarding source water quality for the ERMU public water system.

4.4 Prioritization Process, Risk Assessment and Inventory Results

Prioritizing Potential Contaminant Sources

Wells

A thorough search for wells was completed by referencing information from the Minnesota Well Index (MWI), a MDH public well disclosure database, MDH Old Municipal Well Inventory report, DNR water appropriation data, city records and local knowledge. As stated earlier in this chapter, the well inventory has not been completed due to the large number of private wells in the DWSMA without sufficient information to determine depth, type of construction, or location. Nevertheless, because the DWSMA 1) is of mixed vulnerability, 2) contains a large number of wells of varying depths and 3) ERMU is dependent upon a single-source aquifer, the WHP team developed a process to classify wells and determine what level of risk wells may pose to the city's source water.

The classification system used by the WHP team is a continuation from the 2013 WHP plan and is based on known well depth and an assigned, designated aquifer each well is likely using. Using well data from the Minnesota Well Index queries were developed by MDH staff to sort wells by 1) aquifer codes as determined by geologic formations and 2) depth of the well and construction details. Three levels of priority are the result of this process:

- High Priority – wells completed in the Eau Claire - Mt. Simon or deeper aquifer; wells designated as 'multiple aquifer' (Ironton-Galesville-Mt. Simon); and any well noted as 'aquifer unknown'.
- Intermediate Priority – wells completed in the Eau Claire formation only; wells completed in the 'multiple aquifer' and Eau Claire formation.
- Low Priority – wells completed in glacial drift or in bedrock aquifers (Ironton-Galesville) overlying the Eau Claire formation.

The MDH scoping documents (appendix A) state that in the low vulnerability portions of the DWSMA only those wells greater than 100 feet in depth are to be inventoried. However, in the moderately vulnerable portion of the DWSMA, all wells with known locations were inventoried.

The WHP team also reviewed existing U.S. Environmental Protection Agency (US EPA) records to determine if any US EPA-designated Class V injection wells are present within the DWSMA. Information regarding Class V injection wells is available on US EPA websites.

Other Potential Contaminant Sources

In the moderate vulnerability portion of the DWSMA the WHP team reviewed the PCSI and considered wells, above ground and underground storage tanks, leaky tank sites and other potential contaminated sites as presenting a greater possible risk to groundwater quality from petroleum, chemicals or other potential contaminants. All of the underground fuel tanks determined by the MPCA to be leaking have been excavated as a result of mitigation efforts on a site. However, these sites remain on the PCSI denoted as a historical leaky underground tank site.

Assigning Risk

Potential contaminant sources were assessed by the WHP team and assigned a level of risk the various PCS categories may have on the Mt. Simon-Hinckley aquifer used by the ERMU. The level of risk

assigned to each type of PCS addresses 1) the number of units inventoried, 2) its proximity to a public water supply well, 3) the capability of local geologic conditions to absorb a contaminant (geologic vulnerability), 4) the effectiveness of existing regulatory controls, 5) the areal extent of a land use, and 6) the time required for the ERMU to obtain cooperation from governmental agencies that regulate a potential contaminant.

Assigned risk categories are defined by the WHP team to mean the following:

- A **high (H)** risk potential implies that the potential source type has the greatest likelihood to negatively impact ERMU's water supply and should receive highest priority for management.
- A **moderate (M)** risk potential implies that the potential source type has a moderate likelihood to negatively impact the ERMU's water supply and should receive a medium priority for management.
- A **low (L)** risk potential implies that a potential source type may have a marginal or negligible impact on the ERMU's water supply and should receive a low priority for management.

Tables are used to present the PCSI and land cover data and associated assigned risk of each PCS and land cover category within the DWSMA.

Results of Inventorying Potential Point Sources of Contamination

The following Table 4-1 lists:

- The type of potential contaminant sources located within the DWSMA.
- Where the potential contaminant is located - sorted by vulnerability, ERA and WHPA.
- Activity status (active, unknown, etc.).
- Assigned risk a potential contaminant source may have on the Mt. Simon-Hinckley aquifer.

The inventory conducted in the DWSMA reflects private and public wells with known locations. However, not all of the wells inventoried have complete data regarding depth or type of construction, nor have all the wells within the DWSMA been located at this time and consequently, are not included in the inventory. Nevertheless, 1,081 wells have been inventoried in the DWSMA. A small number of other types of potential contaminants (tanks, large capacity septic systems, etc.) located in the moderately vulnerable area of the DWSMA have also been inventoried per MDH requirements.

The descriptors used (AST, UST, etc.) associated with potential contaminant types in Table 4-1 are those listed in the MDH Scoping 2 Decision Notice Attachment for a low and moderately vulnerable DWSMA (Appendix A). The wells were classified by the WHP team as either a high, intermediate or low priority as described previously in this subsection.

Table 4-1
Potential Contamination Sources and Assigned Risk

Potential Contaminant Type	Assigned Risk of PCS in Moderately Vulnerable Area and DWSMA (including ERA[1] and WHPA[2])						
	Moderate Vulnerability	ERA	WHPA	Remainder of DWSMA (Low Vulnerability)	DWSMA Total	Activity[3] Status	Risk
Wells - ERMU	3	-	-	5	8	A	L
Wells – High Priority (excluding ERMU wells)	24	22	283	36	365	A = 342 U = 22 I = 1	H
Wells – Intermediate Priority	2	0	46	27	75	A = 72 U = 3	M
Wells – Low Priority	150	7	428	40	625	A = 607 U = 18	L
Above Ground Storage Tank (AST)	5	2	NA	NA	7	A = 7	M
Underground Storage Tank (UST)	11	1	NA	NA	12	A = 12	M
Leaking Underground Storage Tank (LUST)	11	3	NA	NA	14	I = 13 C = 1	L
Investigation & Cleanup site (VIC)	1	0	NA	NA	1	I = 1	L
Potential Contaminant Site (PCS)	1	0	NA	NA	1	A = 1	M
Large Capacity Septic System (CVWWD)	0	1	2	0	3	A = 3	M
Totals	208	36	759	108	1111	-	-

1. Emergency Response Area (1 year time of travel area).
2. Wellhead Protection Area (10 year time of travel area).
3. A = Active; I = Inactive; C = Closed; U = Unknown

Within the DWSMA, there are 1,065 private wells that are listed in the MDH's Minnesota Well Index (MWI) as 'located' wells.

- About a third (365) of the wells inventoried to date are using the same aquifer as the ERMU primary wells. The WHP team classified these wells as a high priority for implementation measures that inform well owners about the importance of utilizing opportunities to conserve groundwater and protection of the shared aquifer.
- About 7 percent (75) of the wells are classified as intermediate priority.
- Nearly 60 percent (625) of the wells are classified as low priority.

The following is additional information regarding potential contaminants inventoried within the DWSMA.

- MPCA records indicate there are seven (7) above ground storage tanks and twelve (12) underground storage tanks located within the moderately vulnerable portion of the DWSMA. The MPCA regulates storage tanks with 1100 gallons or more capacity. All tanks are considered to be a moderate risk to the aquifer by the WHP team.
- MPCA records indicate there had been eleven (11) sites with underground storage tanks (petroleum) within the moderate vulnerability portion of the DWSMA. All of those sites where classified as 'leaky tank sites (leaking underground storage tanks – LUST) and all of the sites have under gone remediation and are now considered "inactive or closed" sites. These eleven "LUST' sites are considered a low risk to the aquifer but remain on the PCSI as a precaution to any party planning on constructing a new well on or near these old contaminated sites.
- There are three verified US EPA-classified Class V wells located within the DWSMA. All three are active, large capacity sewage treatment systems (Code 5W32 - CVWWD). These types of wells are regulated by the MPCA. One is within the ERA of Well #7 – see Appendix C, Figure C1-1. The WHP team assigned a moderate risk to these large septic systems.
- There are two (2) MPCA regulated contaminated sites within the moderately vulnerable area of the DWSMA. One site has undergone remediation and is classified by the MPCA as "Inactive" (low risk – WHP team) with the other site classified as 'Active' therefore, a moderate risk as assigned by the WHP team.
- DNR records indicate there are currently 29 active groundwater and surface water appropriation permits located within the DWSMA. The permits are in the following categories:
  a) 25 permits utilize wells for groundwater withdrawal of which - 9 are for public water supplies, 10 are for non-crop irrigation for landscaping/athletic fields, 5 are for industrial processing and 1 is for agricultural crop irrigation.
  b) Of the additional four permits - one permit is used for highway construction dewatering (temporary); one permit is for surface water power generation, and two permits are for dust control which use two permitted wells for industrial processes).
  c) Of the 25 water wells listed, at least 18 are using the Mt. Simon-Hinckley aquifer.

  See Appendix A - Exhibit E for map illustrating permit locations and additional information.

Maps and table describing the types and locations of potential contaminant sources (wells, tanks, etc.) located within the DWSMA is presented in Appendix C. Specific maps illustrate each well priority category (low, intermediate, high), the potential contaminant sources in the moderate vulnerability portion of the DWSMA and a composite DWSMA map showing all potential contaminant sources. Due to the large quantity of wells, no identifier label is shown adjacent to each PCS, only a map symbol. GIS software provides a link to each PCS on a map and PCS properties.

Assigning a risk level to the various PCS aids the WHP team in determining implementation measures that are 1) the most effective best management practices to limit the impact a PCS may have on the aquifer used by ERMU, and 2) a timeline to implement the selected measures.

ERMU DWSMA Land Cover

The ERMU DWSMA covers approximately 17,268 acres (~27 square miles) with about 15,360 acres classified as low vulnerability and 1,908 acres classified as moderately vulnerable. Each land cover type has been assessed and assigned a risk level by the WHP team based on 1) geologic vulnerability, and 2) the potential of contaminating the aquifer with accidental spills or leakage from tanks, sanitary sewers or stormwater control systems that may be associated with each land cover category.

The following table lists the various categories of land cover (acreage and percentage) in the low and moderately vulnerable portions of the DWSMA and the assigned risk these categories may pose to the aquifer used by ERMU. See Appendix A – Exhibit C for a map illustrating ERMU DWSMA land cover and a description of land cover categories.

Table 4-2
Approximate DWSMA Land Cover
and Assigned Risk of
Potential Contamination from Land Cover

Land Cover Categories	DWSMA Acres	Low Vulnerable Acres	Low Vulnerable Percent	Moderately Vulnerable Acres	Moderately Vulnerable Percent	Assigned Risk
Open Water	854.0	829.5	5.4	24.5	1.3	L
Developed, Open Space	2,115.8	1,736.9	11.3	378.9	19.9	L
Developed, Low Intensity	2,009.5	1,643.1	10.7	366.5	19.2	L
Developed, Medium Intensity	1,973.2	1,569.9	10.2	403.3	21.1	M
Developed, High Intensity	782.8	541.9	3.5	240.9	12.6	H
Barren Land (Rock/Sand/Clay)	288.7	288.7	1.9	0.0	0.0	L
Deciduous Forest	3,164.8	2,963.4	19.3	201.4	10.6	L
Evergreen Forest	36.9	36.6	0.2	0.2	<0.1	L
Mixed Forest	135.0	124.2	0.8	10.9	0.6	L
Shrub/Scrub	37.1	37.1	0.2	0.00	0.0	L
Grassland/Herbaceous	226.1	217.3	1.4	8.8	0.5	L
Pasture/Hay	2,376.3	2,224.9	14.5	151.4	7.9	L
Cultivated Crops	1,322.9	1,319.6	8.6	3.4	0.2	L
Emergent Herbaceous Wetlands	1,258.1	1,177.8	7.7	80.4	4.2	L
Woody Wetlands	686.9	649.3	4.2	37.6	2.0	L
Total Acres (DWSMA, Low and Moderately Vulnerable areas)	17,268	15,360	-	1908	-	-

Source: National Land Cover Database (NLCD) 2019 Products (ver. 2.0, June 2021), U.S.G.S, 2021.

Table 4-2 Summary - About 40 percent of the entire DWSMA is designated low, medium and high intensity cover and developed open space (parks, etc.); these land cover categories comprise nearly 73 percent of the moderately vulnerable area. These types of land cover are described by the amount of impervious surface within an area – the higher the impervious cover, the higher the intensity ranking.

Single-family homes are considered low or medium intensity with apartment complexes and commercial/industrial areas ranking as high intensity. About 37 percent of the DWSMA is open water, woodlands, wetlands and areas with permanent vegetative cover. These categories also cover about 19 percent of the moderately vulnerable area. Within the DWSMA, agricultural land cover categories (cultivated crops, pasture/ hay land) comprise about 22 percent of the land cover with only about 150 acres within the moderately vulnerable area.

Inner Well Management Zone

A survey was conducted to identify specific categories of PCS that may occur within 200 feet of each primary public water supply well. This area is referred to as the inner well management zone (IWMZ). The Minnesota State Well Code, administered by the MDH, defines the various categories of contaminants inventoried and establishes required setbacks from public water supply wells for each category of PCS. The IWMZ inventory was conducted by MDH Source Water Protection and ERMU staff with risk prioritization assigned by the MDH.

The following table identifies the type of PCS that may be located within 200 feet of each ERMU production well.

Table 4-3
Potential Contaminant Source Inventory within the
Inner Well Management Zone for ERMU Production Wells

ERMU Well No.	Unique Number	Potential Contaminants Within IWMZ
Well #2	255153	1 floor drain; 2 buried sanitary sewers; 1 stormwater drain pipes; 1 surface water body; 1 potential pollutant source (rail ROW).
Well #3	221176	1 water treatment backwater flush area; 1 potential pollutant source (rail ROW).
Well #4	481794	2 buried sanitary sewers; 2 stormwater drain pipes; 1 monitoring well; 1 water treatment backwater flush area.
Well #5	537682	4 buried sanitary sewers; 1 stormwater drain pipe; 2 petroleum tanks; 1 water treatment backwater flush area.
Well #6	580320	1 buried sanitary sewer; 1 surface water body; 1 petroleum tank; 1 water treatment backwater flush area.
Well #7	664852	1 floor drain; 9 buried sanitary sewers; 3 stormwater drain pipes; 1 surface water body.
Well #8	694499	2 surface water bodies.
Well #9	757624	6 buried sanitary sewers; 2 stormwater drain pipes; 2 surface water bodies.

To summarize the inventory of the inner well management zone, at Well #2 a floor drain and a buried sanitary sewer pipe do not meet state well code setbacks nor does a small petroleum tank meet setback at Well #6. All other potential contaminant sources located within the Well #2 and Well #6 IWMZ meet MDH state well code setback requirements – as does all potential contaminant sources noted within the IWMZ of the remainder of ERMU primary wells.

The MDH IWMZ inventory forms for each production well contain measures to address potential contaminant sources observed and recorded (Appendix C – Exhibit C2). The MDH and ERMU staff review and update as needed the IWMZ form for each production well on a regularly scheduled basis.

Summary of PCSI and Land Cover

ERMU's source water is from the Mt. Simon-Hinckley sandstone aquifer. This aquifer system underlying the DWSMA is generally classified as having sufficient geological protection from human activities at the surface. However, there is an area where the protective geologic layers vary in thickness or ability to retard downward infiltration from the surface. This area is shown in Figure 1 as having moderate vulnerability to human-based activities. ERMU Well #3 and Well #5 both have chlorides and tritium present, with Well #5 also having low levels of nitrate-nitrogen present. Therefore, both wells are considered vulnerable.

The following is a summary of the potential contaminant source inventory and land cover determinations conducted in the ERMU DWSMA.

- Within the low vulnerable area of the DWSMA about 36 percent of the cover is large lot single family homes, parks, golf courses and medium to higher density categories of residential, commercial and industrial developments. Nearly 40 percent of the land cover in the low vulnerable area is wetlands, water bodies, woodlands or other forms of permanent vegetative cover. About 23 percent of the low vulnerable area is used for agriculture, with only about 9 percent as cropland.
- About 73 percent of the moderately vulnerable portion of the DWSMA can be characterized as largely developed with residential, commercial and industrial lands uses dominating. Another 19 percent of the moderately vulnerable land cover is different forms of permanent vegetative cover (woodlands, wetlands, open water. Agriculturally-related land uses amount to about 8 percent – almost all as hay or pasture land.
- The PCSI conducted for this amended WHP plan has resulted in over 1,000 private wells within the DWSMA. There remains an unknown number of private wells to be inventoried in the DWSMA. Completion of the well inventory is a high priority.
- Nearly 35 percent of these wells use the same aquifer as the ERMU wells and consequently are assigned as a high priority by the WHP team.
- With the exception of a minor number of wells located in Sherburne County's Big Lake Township (~9), Wright County's City of Otsego (~25) and Anoka County's City of Nowthen (3), all remaining potential contaminant sources are within the City of Elk River municipal boundaries.
- There are 27 DNR-regulated groundwater withdrawal permits within the DWSMA. These permits are required for high capacity wells that use more than 10,000 gallons per day or 1 million gallons per year. Of these 27 permits, 9 wells are for public drinking water, 10 wells are used for landscape/athletic field irrigation, 7 for industrial uses or dust control and 1 for irrigating agricultural crops – 18 of these wells use the Mt. Simon-Hinckley aquifer.
- The MDH required the PCSI in the moderate vulnerability area to include tanks, and other forms of potential contaminants. MPCA data was used to locate and compile this information. Fourteen (14) underground storage tanks had been sites of leaky petroleum tanks. These sites have undergone remediation efforts and are either considered to be inactive or closed. There are nineteen (19) above ground storage tanks or underground storage tanks – all listed as 'active'. Of five (5) other potential contaminant sites, three (3) are active large capacity sewage treatment systems, one (1) is an 'inactive' cleanup site and one (1) is an active (air release) site. The MPCA regulates and tracks these types of potential contaminant sources.
- An extensive stormwater management system is within the moderately vulnerable portion of the DWSMA. Stormwater basins and sewer infrastructure maintenance is important to reduce possible impact on groundwater.
- Linear-shaped features such as major and minor roads and railroad tracks are present in the DWSMA. These transportation features are considered a potential contaminant source due to

possible accidental releases of petroleum or chemicals within the moderately vulnerable area. There are no petroleum pipelines within the DWSMA but there are natural gas pipelines.

Conclusions

The following excerpts are from the Amendment to the Wellhead Protection Plan, Part 1 (Appendix B).

'Six of the eight ERMU wells are considered not vulnerable to contamination, while Wells #3 and #5 are classed as vulnerable. Water sampled from the six non-vulnerable wells is of pre-modern age, as determined by the lack of the tritium isotope in the well water. Low level tritium was measured in Well #3, which is characteristic of mixed age water. A moderate level of tritium and other indicators of human impact (such as low level nitrate and chloride) confirms the vulnerable nature of Well #5.'

'…the majority of the DWSMA is considered to have a low vulnerability; in these areas, natural geologic protection is provided to the aquifer...' "…surface water and contaminants are impeded and travel from the land surface to the city's aquifer likely occurs over a time span of decades or longer. Within the low vulnerability areas, the primary threats to the city's aquifer are other wells that reach or penetrate it."

"Where the DWSMA vulnerability is classed as moderate, 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 several types of contaminant threats, including chemical storage tanks and abandoned wells which can provide conduits for contaminants to quickly reach the city's aquifer."

Water quality data collected and reported by MDH indicate: At present, none of the human-caused contaminants for which the Safe Drinking Water Act has established health-based standards is found above maximum allowable levels in the city's water supply, nor are any present at one-half of those levels (Part 1 Report – Appendix B).

The vulnerable ranking of two ERMU production wells within the moderately vulnerable portion of the DWSMA is of concern.

The substantial number of 'high priority' wells within the DWSMA are of concern. The Mt. Simon-Hinckley aquifer is a common link between ERMU and commercial/industrial interests and residents in the DWSMA. However, there are many other public water suppliers and private water well users beyond the ERMU DWSMA also dependent upon the Mt. Simon-Hinckley aquifer to supply a sustainable drinking water supply.

Implementation measures that provide ERMU with a path to meet current and future public water demands makes economic sense to maintain the current good water quality and quantity of this highly valued aquifer.

Chapter 5: Impact of Land and Water Use Changes on the Public Water Supply Wells

ERMU estimates that the following changes to the physical environment, land use, surface water, and groundwater may occur over the ten-year period that this amended WHP plan is in effect. This exercise is necessary to determine whether new potential sources of contamination may be introduced in the future and to identify future actions for addressing these anticipated sources. Land and water use changes may introduce new contamination sources or result in changes to groundwater use and quality. Any anticipated changes would likely occur within the City of Elk River municipal boundaries. ERMU will communicate with the City of Elk River regarding how land use polices may impact drinking water resources. The City of Elk River enforces any applicable land use ordinances within the DWSMA. ERMU will also request assistance from state and local agencies in managing the aquifer providing potable water to city residents and businesses.

Day to day administrative duties will be the responsibility of the wellhead protection manager.

The following table describes the anticipated changes to the physical environment, land use, and surface water or groundwater in relationship to 1) the influence that existing governmental land and water programs and regulations may have on the anticipated change, and 2) the administrative, technical, and financial considerations of ERMU and property owners within the DWSMA.

Table 5-1
Expected Land and Water Use Changes

Expected Change	Impact of the Expected Change on the Source Water Aquifer	Influence of Existing Government Programs & Regulations on the Expected Changes	Administrative, Technical & Financial Considerations Due to Expected Changes
Physical Environment No major changes are anticipated.	Increased precipitation should not impact Low Vulnerability areas of DWSMA, but may in the Moderately Vulnerable area due to increased stormwater runoff. Long-term drought conditions may impact aquifer used by ERMU.	No changes anticipated regarding existing programs and/or regulations. However, the state groundwater appropriation program may be revised in response to drought.	No changes anticipated at this time. Future management of stormwater infrastructure and facilities will likely require increased expenses.
Land Use The City of Elk River is expecting considerable growth in population by 2035.	Increased demand for potable water is likely within nearly all zoning districts due to expanded development and/or redevelopment in: a) Commercial and industrial districts adjacent to major transportation corridors; and b) Established and/or new residential subdivisions.	The existing City of Elk River comprehensive plan and zoning regulations can provide guidance for development.	The City of Elk river and the ERMU can coordinate review of existing policies, regulations and budgets to address the rate or direction that new development or redevelopment may take. Expansion of public water services may be required.
Surface Water Long-term improvement is expected in the Elk River and associated Orono Lake (reservoir) located within the Low and Moderately Vulnerable portions of the DWSMA.	MDH reports no strong connection between these surface water bodies and the aquifer used by ERMU.	City of Elk River administers type of development, density and environmental rules in shoreland zones. Continuing surface water improvement programs are having a positive impact on water quality.	City has received past funding for surface water quality improvement projects and is eligible for future funding to continue current or expanded water quality projects.
Groundwater 1. Increased demand on groundwater due to population growth and related residential and commercial/industrial development will likely occur. 2. The potential of periodic, long-term drought conditions could limit production from wells using the Mt. Simon-Hinckley aquifer.	1a. Additional groundwater use within the DWSMA is a concern regarding long-term sustainability of the Mt. Simon-Hinckley aquifer. 1b. New production well(s) may be required. 2. Long-term drought could reduce ERMU's ability to supply adequate potable water for drinking and/or emergencies.	1a. ERMU, City and state officials could establish an aquifer management plan to address demands on the Mt. Simon-Hinckley aquifer. 1b. MDH can require ERMU to amend its WHP plan and DNR would require ERMU to amend its water appropriation permit from the DNR. 2. MNDNR can control pump rates of high capacity wells to address negative impact on public water supply wells.	1. Adequate water supply is vital to public health, safety and the economy of the City of Elk River. Therefore, City and ERMU would have to determine technically and financially if and/or when public water can be supplied to new development. 2. Conservation policies that encourage sustainable water uses and other aquifer protection measures could be adopted by the City of Elk River, ERNU and other groundwater users.

5.1 Summary of Expected Land and Water Use Changes in the ERMU DWSMA

- There are no major changes in the physical environment within the DWSMA. However, increased precipitation may result in increased stormwater runoff which may impact the aquifer in the moderately vulnerable portion of the DWSMA. Periodic drought conditions could reduce the capability of the Mt. Simon-Hinckley aquifer to meet demand.

- The City of Elk River population will increase over the next ten years resulting in increased demand for potable water. Additional development of residential, commercial or industrial zones within the DWSMA can also increase pressure on water supplies and increase need for stormwater management.

- Three major transportation corridors (two highways and a railroad) intersect the moderately vulnerable portion of the DWSMA. These transportation features represent a potential for accidental release of liquid products that could impact the source water used by the city – especially in the moderately vulnerable portion of the DWSMA.

- Periodic drought conditions combined with increased demand of groundwater usage in the region may lead to changes in management of the Mt. Simon-Hinckley aquifer.

- ERMU may need to add a new well(s) to meet future demand.

Chapter 6: Issues, Problems, and Opportunities

6.1 Identification of Issues, Problems and Opportunities

As required by MN Rule 4720.5230, ERMU has identified water and land use issues, problems and opportunities related to 1) the aquifer used by ERMU water supply wells, 2) the quality of the well water, or 3) land or water use within the DWSMA. ERMU assessed 1) input from public meetings and written comments that it received, 2) the data elements identified by MDH during the scoping meetings, and 3) and the status and adequacy of local units of government official controls and plans on land use and water uses, as well as those of local, state, and federal government programs. The results of this effort are presented in the following table which defines the nature and magnitude of contaminant source management issues in the ERMU DWSMA.

Identifying the issues, problems and opportunities as well as resource needs enables ERMU to: 1) take advantage of opportunities that may be available to make effective use of existing resources, 2) set meaningful priorities for source management and 3) solicit support for implementing specific source management strategies.

Table 6-1 contain the issues, problems and opportunities identified by the WHP team for the ERMU vulnerable DWSMA.

Table 6-1
Issues, Problems and Opportunities

Issue Identified	Impacted Feature	Problem Associated with Identified Issue	Opportunities Associated with Identified Issue	Adequacy of Existing Controls to Address the Issue
1. Population is expected to increase in the next decade with additional demand for water.	Aquifer, Well Water quality and quantity, DWSMA.	The ERMU water service area will likely be expanded to meet growth demands. The current public water infrastructure will likely need costly revisions to continue provide a sustainable water supply for citizens.	City and ERMU can determine the benefits and costs of new public wells and infrastructure needed to expand the ERMU service area. ERMU and the City can emphasize greater water conservation. measures	The City could review land use policies to manage potential growth with ability to supply adequate water supplies. City has the authority to implement water conservation plans.
2. The ERMU DWSMA boundary is within multiple local unit of government jurisdictions.	Aquifer, Well Water quality and quantity, DWSMA	ERMU relies on cities of Nowthen and Otsego and Sherburne County to administer land uses policies and potential contaminant sources in those areas of the DWSMA that are outside Elk River municipal boundaries.	City of Elk River and ERMU can continue to communicate with county and other cities regarding land uses within those portions of the DWSMA outside Elk River municipal boundaries.	Sherburne County and the cities of Nowthen and Otsego regulate land uses in those areas of the DWSMA that are outside the City of Elk River municipal boundaries.
3. It is important to educate the citizens within the DWSMA and newly-elected city officials and other local or state agencies about ERMU's WHP plan.	Aquifer, Well water quality and quantity, DWSMA	Periodic turnover in elected officials and staff from various local units of government and agencies can be a challenge to maintain continuity and momentum in future WHP plan implementation efforts.	ERMU staff can work with MDH SWP or MRWA staff to provide WHP-related information to elected officials, citizens and other local or state technical staff. This keeps decision-makers informed of the importance and need for effective WHP plan implementation.	ERMU can formally request assistance from MDH, MRWA or other local agency staff to provide appropriate educational materials for citizens and land owners related to WHP.
4. There are likely unidentified, unlocated, unused or poorly maintained wells within the DWSMA.	Aquifer, Well water quality, DWSMA.	Unidentified or unlocated wells may be using the same aquifer as ERMU. Unused/unsealed or poorly maintained wells may provide a direct route for contaminants to reach the aquifer ERMU and others use for water supply.	ERMU can continue to work with MDH to refine well data within the DWSMA. Wells using the Mt. Simon-Hinckley aquifer is a high priority. ERMU can apply for a MDH-SWP grant to improve well data in the DWSMA. MDH-SWP and SWCD funding is also available for identifying priority wells for sealing that may be abandoned or unused in the DWSMA.	ERMU will need to work with citizens, MDH, cities and county agencies to promote sealing of any abandoned or unused wells located within the DWSMA.
5. ERMU has limited resources and funds to implement the wellhead protection plan.	DWSMA	With limited resources implementing the WHP plan will be a challenge for ERMU.	Continue partnerships with other cities, county and state or federal agencies with regulatory authority or programs applicable in the DWSMA. ERMU can apply for MDH-SWP grants to implement measures of an approved WHP plan.	ERMU and City of Elk River can budget for WHP implementation efforts. Also, other funding sources may assist in implementing WHP plan measures.

Table 6-1 (continued)

Issue Identified	Impacted Feature	Problem Associated with Identified Issue	Opportunities Associated with Identified Issue	Adequacy of Existing Controls to Address the Issue
6. There are more than 1000 wells currently inventoried within the DWSMA.	Aquifer, Water well quality and quantity.	The large number of private wells identified, combined with multiple jurisdictions and the lack of resources presents a challenge to ERMU in addressing this issue.	ERMU will continue to prioritize wells based on which aquifer the wells are using. Emphasis will be directed toward those known, high-priority wells (365) using the Mt. Simon-Hinckley aquifer. Nearly all of the high priority wells are within the Elk River municipal boundary.	ERMU and the City can develop plans and allocate funding to address high priority wells within city limits.
7. ERMU will likely need to replace or add primary wells in the future.	Aquifer, Water well quality and quantity, DWSMA	Well #2 may be decommissioned and sealed. Wells #3 and #5 are vulnerable to activities occurring at the land surface. DNR can impose restrictions on groundwater appropriation permits.	ERMU can conduct an assessment of all city wells. Study can include current and future capabilities of water supply services to meet expected increase in pubic water supplies. ERMU could apply for state revolving funds to design and construct a new well(s) and infrastructure.	ERMU and the City has the authority to determine benefits, costs and financing of new water supply infrastructure.
8. Increased groundwater use in the DWSMA and nearby areas is a concern regarding the long-term sustainability of the Mt. Simon-Hinckley aquifer.	Aquifer, Water well quality and quantity, DWSMA	The Mt. Simon-Hinckley aquifer is the sole source of public drinking water for the City of Elk River and other municipalities in the area. New high capacity wells completed in the Mt. Simon-Hinckley may impact the ERMU WHPAs. Population growth in the region increases demand on the Mt. Simon-Hinckley aquifer. Currently, there is no organized effort among public water suppliers, private parties and state agencies to discuss the use and sustainability of the Mt. Simon-Hinckley aquifer.	ERMU could partner with state agencies and other public/private users of the Mt. Simon-Hinckley aquifer to develop a regional, sustainable use aquifer plan. The city can request assistance from the MDH and other state agencies to support a regional effort to protect the Mt. Simon-Hinckley aquifer.	ERMU and the City can develop partnerships with other entities.

6.2 Summary of Issues, Opportunities and Problems associated with ERMU DWSMA

Identified issues within ERMU DWSMA include the following:

- The population of Elk River is expected to increase in the next decade.
- Both Well #3 and Well #5 have tritium detected in the well water. Detectable tritium indicates the presence of young (post-1953) water. These two wells are located in the moderately vulnerable portion of the DWSMA.
- Various types of point and nonpoint sources of potential contaminant sources - abandoned wells, storage tanks and stormwater can pose a threat to the aquifer if not properly managed.
- There are over 1,000 wells located within the DWSMA with over 30 percent using the same aquifer as ERMU public water supply wells.
- There may be unused or abandoned wells located in the DWSMA that may pose a threat to the aquifer.
- ERMU will likely need additional wells or replace primary wells to address increased water demand.
- New high capacity wells may impact ERMU wells and/or size or shape of the DWSMA.
- The Mt. Simon-Hinckley aquifer is the sole-source of drinking water for Elk River and other entities in the region.
- Increased usage of the Mt. Simon-Hinckley aquifer to meet regional water demand is a concern.
- It is important to provide information for citizens, elected officials and other local and state technical staff about the ERMU WHP plan.
- The ERMU DWSMA extends into neighboring cities and township jurisdictions.

The WHP team has considered all of the issues, problems and opportunities presented in Table 6-1 resulting in a variety of goals, objectives and implementation actions (Chapter 8 and Appendix D) to address these concerns.

6.3 Comments Received

There have been several occasions for local governments, state agencies and the general public to identify issues and comment on ERMU's WHP plan. At the beginning of the planning process, local units of government were notified that ERMU was going to develop its WHP plan and were given the opportunity to identify issues, as well as to comment. A public information meeting was held to review the results of the delineation of the WHP areas, DWSMAs and the vulnerability assessments. A public hearing was held before the completed WHP plan was sent to the MDH for state agency review and approval. The city did not receive any written or verbal comments at the public hearing.

Chapter 7: Existing Authority and Support Provided by Local, State and Federal Governments

ERMU, as a component of City of Elk River government, works with the City to develop and implement regulatory programs addressing public water systems within municipal boundaries. ERMU will rely upon the City to administer land use policies and regulations within municipal boundaries. Cooperative partnerships with local units of government will continue in the administration of land uses in those areas of the DWSMA outside City of Elk River municipal boundaries. State and federal agencies with regulatory controls or resource management programs in place may also provide assistance in the implementation of the ERMU WHP plan. The level of support that a local, state, and federal agency can provide to help offset the risk that is presented by a potential contamination source will depend up on its legal authority as well as the resources that are available to local governments.

7.1 Existing Controls and Programs of ERMU and City of Elk River

Table 7-1 lists various controls and/or programs in-place that can be used to support the management of potential contamination sources within the ERMU DWSMA.

Table 7-1
ERMU and City of Elk River Controls and Programs

Type of Control or Program	Program Description
The City of Elk River controls land uses and environmental issues within municipal boundaries via City of Elk River, Minnesota Codified through Ordinance No. 22-19, enacted August 15, 2022.	Chapter 30 – Land Development Regulations: State Building Code (includes plumbing); Subdivisions; Zoning; Overlay Districts - Floodplains, shoreland, wetlands, mining, solid waste Chapter 58 – Solid Waste
ERMU has the authority to adopt rules and regulations for operation and use of the public water system for the City of Elk River.	Chapter 78 – Utilities, Article II, Water Systems: Connection to Water System; Private well usage; Backflow prevention; Water use restrictions; Water conservation; Rates and charges for access and usage of public water system.
City of Elk River Stormwater Utility administers applicable stormwater rules and infrastructure.	Chapter 78 – Utilities, Article V, Stormwater Utility: regulatory mechanism to control stormwater pollution, illegal discharges and sets minimum requirements for stormwater management.
City of Elk River Fire Department	Emergency Management - respond to hazardous material emergencies (fuel, chemical, or other hazardous substances) that are released due to transportation accidents.
ERMU as a part of City of Elk River government and in partnership with others, can apply for grants or loans from federal or state agencies and/or private organizations to assist in funding drinking water protection efforts.	Most grants are typically targeted toward mitigating identified environmental issues impacting groundwater. Grants may also be available to assist in developing efficient data management practices. Federal or state loans may be available to address infrastructure needs (water supply, distribution, etc.)

7.2 Local Government Controls and Programs

The following local governmental units that have jurisdiction within portions of the ERMU DWSMA may be able to assist ERMU with issues relating to potential contamination sources that 1) have been inventoried or 2) may result from changes in land and water use within the DWSMA.

Table 7-2
Support Provided by Local Agencies

Government Unit	Type of Program	Program Description
Sherburne County	1) Planning and Zoning 2) Sheriff's Office	1) Sets forth the basic guiding principles for Sherburne County future needs and growth, including: Zoning; Building permits; Shoreland, Floodplains and wetlands; Solid waste and household hazardous waste program. 2) Emergency Management.
City of Otsego (Wright County)	Controls land uses; Building regulations.	Comprehensive land use planning; Zoning; Subdivisions; Water conservation. Adopted state building code.
City of Nowthen (Anoka County)	Controls land uses; Building regulations.	Subdivision and zoning ordinances. Adopted state building code.
Sherburne Soil and Water Conservation District	Agricultural BMPs; Wetland management; Water planning Well sealing; State Cost-Share programs; assists in administration of various state and federal soil and water conservation programs and associated grant opportunities.	SWCD promotes the protection of water and soil resources in Sherburne County through educational programs and providing technical and financial assistance to property owners via cost-sharing and collaboration with other local, state and federal natural resource agencies. Partner with the development of the Mississippi River-St. Cloud One Watershed – One Plan.

7.3 State Agency and Federal Agency Support

MDH will serve as the contact for enlisting the support of other state agencies on a case-by-case basis regarding technical or regulatory support that may be applied to the management of potential contamination sources. Participation by other state agencies and the federal government is based on legal authority granted to them and resource availability.

Table 7-3 identifies specific regulatory programs or technical assistance that state and federal agencies may provide to the ERMU to support implementation of its WHP plan. It is likely that other opportunities for assistance may be available over the ten-year period that the plan is in effect due to changes in legal authority or increases in funding granted to state and federal agencies. Therefore, the table references opportunities available when ERMU's WHP plan amendment is approved by MDH.

7.4 Support Provided by Nonprofit Organizations

The Minnesota Rural Water Association will assist ERMU with implementing its WHP plan by providing a) reference education and outreach materials for landowners, b) technical support for implementing specific individual WHP action items listed in the plan, and c) assisting ERMU with assessing the results of plan implementation.

Table 7-3
State and Federal Agency Controls and Programs
Supporting WHP Plan Implementation

Government Unit	Type of Program	Program Description
MN Dept. of Health (MDH)	State Well Code Source Water Protection	MDH has authority over the construction of new wells and sealing of wells. MDH staff in the Well Management Program offers technical assistance for enforcing well construction, maintaining setback distances for certain contamination sources, and well sealing. MDH can provide technical and financial assistance to ERMU for WHP activities and also help identify technical and financial support that other governmental agencies can provide.
MN Dept. of Natural Resources (DNR)	Water Appropriation Permitting Public Waters (Shoreland zoning, streams & buffer requirements)	DNR controls permitting of new high capacity wells and requests to increase pumping rates for an existing groundwater or surface water appropriation permit. Establishes special requirements for land uses, vegetative cover and soil disturbances within shore land areas adjacent to protected waters.
MN Pollution Control Agency (MPCA)	Feedlot Rules; Registered Storage Tank; Storm water management; Subsurface Soil Treatment Systems	MPCA regulates minimum state-wide standards for county feedlot regulations and regulates feedlots >1000 animal units and manure storage facilities. Also administers programs addressing liquid storage tanks, septic systems and storm water management.
MN Dept. of Agriculture (MDA)	Nitrogen Management; Chemical Storage and Preparation facilities; Chemical and fertilizer spills	MDA administers programs which regulate the storage and application of nutrients (fertilizers) and chemicals (pesticides and herbicides) and provide financial and technical assistance programs to farmers.
MN Board of Water and Soil Resources (BWSR)	1 Watershed, 1 Plan; Local Water Planning; Conservation Implementation; Wetland Programs; Partner Protection Grants	BWSR programs provide financial and technical assistance to county soil and water districts to implement local conservation programs. Also promotes local and regional watershed planning and wetland reestablishment/restoration efforts.
U.S. Dept. of Agriculture (USDA)	FSA - Federal Farm Bill Programs (EQIP, CRP, CSP, CGP, etc.); NRCS - Soil and water conservation BMP programs; Wetland restoration; Rural Development - Funding for clean and reliable drinking water systems.	The local USDA Service Center (FSA and NRCS) can provide technical and financial support for qualifying individual property owners and farmers through the current federal Farm Bill programs. Long term, low interest loans for drinking water sourcing, treatment, storage and distribution.
U.S. Environmental Protection Agency (EPA)	Shallow Disposal Well Program	EPA has regulatory authority over Class V Injection Wells, also known as Shallow Disposal Wells.

Chapter 8: Goals, Objectives and Measures

8.1 Goals

Goals define the overall purpose for the WHP plan, as well as the end points for implementing objectives and their corresponding actions. The WHP team identified the following goals after considering the impacts that 1) changing land and water uses have presented to drinking water quality over time and 2) future changes that need to be addressed to protect the community's drinking water:

1. **Improve public water supply system resilience and the ability to provide a safe and adequate water supply.**

2. **Protect the aquifer ERMU uses for drinking water.**

3. **Educate public officials, land owners and the general public about the importance of protecting public drinking water supplies.**

4. **Collaborate on a regional basis with other Mt. Simon-Hinckley aquifer users.**

8.2 Objectives

Objectives provide the focus for ensuring that the goals of the WHP plan are met and that priority is given to specific actions that support multiple outcomes of plan implementation. Both the objectives and the wellhead protection measures (actions) that support them are based on assessing 1) the data elements (Chapter 2 and Appendix A); 2) the potential contaminant source inventory (Chapter 4 and Appendix C); 3) the impacts that changes in land and water use present (Chapter 5); and 4) issues, problems, and opportunities referenced to administrative, financial, and technical considerations (Chapter 6).

The following objectives have been identified to support the goals of the WHP plan for ERMU:

1. Communicate with the public about wellhead protection.
2. Utilize community involvement to protect drinking water.
3. Identify and engage with partners in aquifer preservation efforts.
4. Effectively manage public water infrastructure that ERMU owns and operates.
5. Provide guidance to private property owners to properly manage potential contaminant sources.
6. Collect, monitor and evaluate data necessary to support WHP Plan implementation.

8.3 WHP Plan Measures

The identification and implementation of WHP 'measures' or management strategies, is a significant part of a WHP plan and is the key to preventing contamination of a public water supply source or well. The process and factors considered by the ERMU WHP team that influenced the selection of WHP measures to be implemented over the course of this WHP plan, and a complete listing of the measures are detailed in Appendix D.

When a water supplier has completed all **measures** contained within a specific **objectives** statement, a portion of the overall **goals** of the WHP Plan will have been accomplished.

Chapter 9: Evaluation Program

Evaluation is used to support plan implementation and is required under Minnesota Rules, part 4720.5270 prior to amending ERMU's WHP plan. Plan evaluation is specified under Chapter 8.2, Objective 6 and provides the mechanism for determining whether WHP action items are achieving the intended result or whether they need to be modified to address changing administrative, technical, or financial resource conditions within the DWSMAs. ERMU has identified the following procedures that it will use to evaluate the success with implementing its WHP plan.

1. The WHP team will meet, at a minimum, every two-and-one-half years to assess the status of plan implementation and to identify issues that impact the implementation of action steps throughout the DWSMAs; and
2. ERMU will prepare a written report that documents how it has assessed plan implementation and the action items that were carried out over the life of this WHP plan. The report will be presented to MDH at the first scoping meeting held with ERMU to begin the process of amending this WHP plan.

Chapter 10: Contingency Strategy

The WHP plan includes a contingency strategy that addresses disruption of the water supply caused by either contamination or mechanical failure. ERMU has a DNR-approved water supply plan which fulfills the WHP rule requirement to have alternate water supply plan. A copy of this contingency plan is available for public review during regular business hours at the ERMU office and is referenced in this section. Appendix E contains the DNR approval letter.

APPENDICES

Appendix A
DWSMA Scoping Documents and Assessment of Data Elements

Appendix B
WHPA and DWSMA Delineation/Vulnerability Report
(Part 1 of the WHP Plan)

Appendix C
Potential Contaminant Source Inventory

Appendix D
WHP Plan Implementation Measures for the DWSMA

Appendix E
Supporting Documents

Appendix A

Assessment of Data Elements Used to Prepare the Wellhead Protection Plan for Elk River Municipal Utilities

Exhibits

Exhibit A - Scoping Documents

Exhibit B - Physical Environment Data Elements

Exhibit C - Land Use Data Elements

Exhibit D - Public Utility Services Data Elements

Exhibit E - Water Quantity and Quality Data Elements

Appendix A

Assessment of Data Elements

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Assessment of Data Elements Used to Prepare This Plan

Forward

By Minnesota Department of Health (MDH) rule 4720.5200 subparts 1 and 2, a wellhead protection (WHP) plan must assess the present and future implications of the data elements stated in the Scoping Decision Notices presented to Elk River Municipal Utilities (ERMU) at the Scoping 1 and Scoping 2 meetings.

This appendix addresses assessments of data elements as required by MDH for the Drinking Water Supply Management Area (DWSMA) for the following criteria:

A. The use of the wells;
B. WHP delineation criteria as stated in the Scoping 1 documents;
C. The quality and quantity of water supplying the public water supply wells; and
D. The land and groundwater uses in the individual DWSMA.

Exhibit A contains the Scoping 1 and 2 documents that contain data elements specific to the DWSMA. The Scoping 1 document addresses data elements specific to determining the vulnerability of ERMU wells and DWSMA and delineation requirements. The Scoping 2 document addresses the inventory and management of potential contaminant sources within the DWSMA. Due to the variable geologic vulnerability of the ERMU DWSMA, this WHP plan needs to assess a complement of data elements assigned for both a low and moderately vulnerable DWSMA. The Scoping 2 document and associated figures and tables included in this appendix support the assessments.

The following data elements were identified by the MDH to be used in the WHP plan (Plan) and were specified in the scoping decision notices that were presented to ERMU. The selection of a data element for inclusion in the plan is based on 1) the hydrogeological setting 2) vulnerability of the wells used by ERMU, and 3) vulnerability of the DWSMA known at the time that each scoping meeting was held. Each data element is assessed for its impact on 1) the use of the public water supply well, 2) delineation of the WHPA, 3) the quality and quantity of water supplying the public water supply well, and 4) land and groundwater uses within the low and moderately vulnerable DWSMA.

All figures and tables referenced in this document are located in exhibits at the end of this document unless stated otherwise.

PHYSICAL ENVIRONMENT DATA ELEMENTS

Geology

This data element has been addressed in the Part I portions of the Plan (Appendix B). The DWSMA map (Figure 1 in the Plan) illustrates the variable vulnerability of the well water capture area. A complete description of the geological conditions present in the ERMU DWSMA is on file with the MDH.

The following are excerpts from *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 Elk River Municipal Utilities, 2021*. 'There are relatively minor changes to the boundaries of the ERAs, the WHPA, and the DWSMA since the previous WHP plan. Six of the eight ERMU wells are considered not vulnerable to contamination, while Wells #3 and #5 are classed as vulnerable. Water sampled from the six non-vulnerable wells is of pre-modern age…Low level

tritium was measured in Well #3 and Well #5 has a moderate level of tritium and other indicators of human impact…which is characteristic of mixed age water. Similar to the previous plan, the majority of the DWSMA is considered to have a low vulnerability…Within the low vulnerability areas, the primary threats to the city's aquifer are other wells that reach or penetrate it. Where the DWSMA vulnerability is classed as moderate, 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 several types of contaminant threats, including chemical storage tanks and abandoned wells which can provide conduits for contaminants to quickly reach the city's aquifer.'

Water Resources

The majority of the DWSMA is within the Mississippi River-St. Cloud watershed (HUC 07010203). The DWSMA is further split by three minor watersheds. Maps of major and minor watershed boundaries with general flow directions are located in Exhibit B of this Appendix.

There are areas of 'flood hazard' within the ERMU DWSMA according to the Federal Emergency Management Agency. The four Flood Insurance Rate Maps (FIRM) that cover potions of the DWSMA are:

- FIRM panel #27141C0380F, effective date: 11/16/2011.
- FIRM panel #27141C0390F, effective date: 11/16/2011.
- FIRM panel #27141C0385F, effective date: 11/16/2011.
- FIRM panel #27141C0395F, effective date: 11/16/2011.

See Exhibit B of this Appendix for a map illustrating the flood hazard zones in the DWSMA. No ERMU wells are located within a flood hazard zone.

Assessments of the Physical Environment Data and Their Impact on the Following:

Use of the PWS Wells

Geology in the ERMU DWSMA influences vertical recharge of precipitation to the aquifer. Factors such as rainfall intensity, soil type, slope, vegetation and thickness of glacial sediments and/or other geologic sediments overlying the aquifer influence the rate and amount of precipitation or surface water that infiltrates to an aquifer. Two vulnerable wells, Well #3 and Well #5, are located in an area designated as moderately vulnerable (Figure 1 of the WHP plan). As stated in the Part 1 report (Appendix B), water and contaminants may travel from the land surface to the ERMU's aquifer within a time span of years to decades.

Delineation of the WHPA

Geologic information was used to address aquifer transmissivity and hydrologic boundaries delineation criteria and combined with groundwater monitoring data, was the principal information used to assess DWSMA vulnerability, which was determined to be moderately vulnerable within the protection area.

Quality and Quantity of Water Supplying the PWS Wells

Groundwater quality information was obtained from the Public Water Supply Program and Well Management Program at MDH and the Public Water Supplier. Information that summarizes groundwater quality is used to assess the pathways that recharge takes to the aquifer and this may impact the selection of methods that are used to delineate the WHPA and to assess well and DWSMA vulnerability. The presence of human-made contaminants is used to 1) calibrate a groundwater flow model by providing a means of checking travel time distance from the source of a contaminant to a public water supply well and 2) assess the vulnerability of the well and the DWSMA. The presence of naturally occurring contaminants is used to assess the extent that the source water aquifer is isolated from surface water recharge. The presence of either human-made or naturally occurring contaminants may influence pumping of the public water supply well

because pumping may impact the rate at which contamination may be moving into the aquifer. Due to the presence of low levels of tritium in Well #3 and moderate levels of tritium in Well #5, MDH has assigned an area comprising about 10 percent of the DWSMA as moderately vulnerable.

The DNR is the principle source of water quantity information. Water quantity information affects the 1) delineation of a WHPA because the pumping amounts are used to calculate the daily well discharge which is a WHPA delineation criterion, 2) use of the public water supply well because a maximum annual amount for the public water supply system is specified under the DNR appropriations permit, and 3) land and water use within a DWSMA because pumping may impact whether other wells or existing land uses may cause contamination of the aquifer or contamination to move toward the public water supply well. It may indirectly affect the future quantity and quality of the water from the public water supply well.

There are no known well interference problems and water use conflicts within the ERMU DWSMA (communication with DNR, 2022). Well interference and water use conflicts are used (if they exist) to delineate the WHPA because they document hydrologic boundaries that must be included. Also, they indicate areas where aquifer recharge is insufficient to meet pumping demands and this condition 1) limits groundwater use in the DWSMA and 2) may impact land uses such as agricultural irrigation or industry that rely on high capacity wells.

Land and Groundwater Uses in the DWSMA

The geologic information was used to determine the vulnerability of the aquifer to contamination from land use activities in the DWSMA. For a moderately vulnerable DWSMA an inventory of chemical/petroleum storage tanks and wells - both presently occurring and historical should be included (Exhibit A). Management strategies developed in this plan address the level of risk, as determined by the wellhead protection team, to the groundwater supply posed by each relevant potential contaminant source identified. Water resources information affects the use of land and water resources within the DWSMA because it defines regulations that are in place to assist with managing 1) the uses for surface water and 2) potential contamination sources that may contribute contaminants to the aquifer used by ERMU.

LAND USE DATA ELEMENTS

Land Use:

The location and numbers of potential contaminant sources and land uses past and present identifies what are the greatest potential risks to the public wells and the aquifer. This is subsequently used to develop and prioritize actions or measures. Land ownership information available from public sources, political boundaries and public land surveys helps to locate potential contaminant sources (Appendix C). Those land owners and government units identified in the DWSMA can assist with implementing management strategies and actions. The Forward section of the WHP plan illustrates political boundaries and public land survey information (Figure 1).

Land cover data and a map, along with a comprehensive land use and zoning map provide the background for evaluating current and future land uses and the compatibility of these with protecting the PWS wells and aquifer.

A review of land cover located in Chapter 4 (Table 4-2) of the WHP plan indicates the DWSMA has a total area of approximately 17,300 acres of which about 40 percent of the land cover acreage is various types of development ranging from commercial/industrial areas to residential and open space. These same land cover categories comprise over 70 percent of the moderately vulnerable area. Agricultural land cover categories

(cultivated crops, pasture/ hay land) comprise about 22 percent of the DWSMA land cover with about 150 acres located within the moderately vulnerable area. ERMU wells are generally located within residential, public open space areas or in, or near commercial zones. Wells #4, #5 and #6 are located in the moderately vulnerable potion of the DWSMA. Commercial areas typically contain storage tanks which may pose groundwater impacts. Continued efforts to protect ERMU wells and source water is important for the long-term protection of groundwater and drinking water quality. See Exhibit C for additional details of land cover categories and extent. Land use controls within the ERMU DWSMA are administered by three jurisdictions: the City of Elk River (94 percent) and the cities of Ostego (~5 percent) and Nowthen (~1 percent) of the DWSMA total area.

Residential and associated light commercial districts are projected to expand in the next decade. City comprehensive planning and zoning maps covering the DWSMA are in Exhibit C. The aquifer used by ERMU is susceptible to potential contamination from storage tanks typically located in commercial or industrial zones that are within the moderately vulnerable area and unused or improperly sealed wells within the DWSMA, especially those wells ranked as a high and intermediate priority.

Public Utility Services:

All of the utility data elements, except the PWS distribution system, can affect land and water uses because they can be potential sources of contamination. As such, they may limit future land and groundwater uses because of historical contamination releases or the risk that they may present to public health. Construction and maintenance records of how public water supply wells are constructed or used are on record with ERMU and the MDH. on wells within the DWSMA provides information on whether these wells may serve as pathways for contaminants into the aquifer.

U.S. Highways 10 and 169, City of Elk River arterial roads and Sherburne county roads and a major railroad right of way transect the DWSMA. In the moderately vulnerable portion of the DWSMA, and due to the very close proximity of Well #2 and Well #3 to railroad tracks, management of spills and accidental discharges are of concern. A map of transportation routes is shown in Exhibit C.

The City of Elk River maintains public storm sewers, sanitary sewer lines and public water distribution in portions of the DWSMA that is within municipal boundaries. See Exhibit D for a map of storm water and sanitary sewer lines within the moderately vulnerable portion of the DWSMA.

According to the National Pipeline Mapping System (Pipeline & Hazardous Materials Safety Administration, US Department of Transporation) there are natural gas pipelines within the DWSMA but no hazardous liquid pipelines (Exhibit D).

Potential Contaminant Source Inventory:

Information regarding other wells is limited to that displayed in the publically accessible Minnesota Well Index.

With the assistance of MDH, the ERMU's Wellhead Protection Team conducted an inventory of known potential contaminant sources (PCS) located within the DWSMA (Appendix C). Several categories of PCS are currently found within the DWSMA and are discussed in greater detail in Chapter 4 of this WHP plan. Appendix C provides detailed maps and a list of specific sources of potential contaminant sources.

Management of the DWSMA will involve strategies to address all categories of identified PCSI. See Chapters 4 and 8 and Appendix D.

Assessments of Land Use Data and Their Impact on the Following:

Use of the PWS Wells:

Information relating to the parcel boundaries, public land survey coordinates, center lines of roads have no direct impact on the use of the public water supply wells.

Priorities assigned to the action steps in the plan are based on information relating to the comprehensive land use and zoning maps and can impact the use of ERMU wells by using the information as a tool to direct land use activities that can either increase, or decrease the amount of water required to be produced by the ERMU wells.

Information relating to the potential contaminant sources within the DWSMA has the ability to impact the use of a PWS well in the event that the sources begin to contribute contaminants to the ground water aquifer that begin appearing in ground water monitoring results. Groundwater contamination of the aquifer that the ERMU utilizes for their drinking water may result in the necessity to limit use of a well, or discontinue the use of a well altogether.

The distribution of the public water supply system, specifically the amount of water storage and treatment capabilities, affects the amount of pumping that is needed to meet water supply needs and to maintain potable water standards.

Delineation of the WHPA:

Information relating to the parcel boundaries, public land survey coordinates, and centerlines of roads have no impact on the delineation of the WHPA.

The public water supply distribution system influences the number of wells that must be pumped to meet water demands of the public, which affects the boundaries of the WHPA and emergency response area (ERA).

The pumping of ERMU wells affects the delineation of the WHPA because the pumping amount is a delineation criterion.

Quality and Quantity of Water Supplying the Wells:

Information relating to the parcel boundaries, public land survey coordinates, and center lines of roads have no impact on the quality and quantity of water supplying the ERMU wells.

The information in Appendix A relating to the comprehensive land use and zoning maps provides the basis for defining the types of potential contamination sources that may or do impact the quantity and quality of the well water used by the public water supply.

Information about land uses and the PCSI is important to the quality of the water supplying ERMU wells because it includes locations and data about potential contaminant sources within the DWSMA that could introduce contaminants into the drinking water aquifer that ERMU uses as its drinking water source. The moderately vulnerable portion of the DWSMA is more susceptible to contamination from certain categories of land use activities, and therefore increased potential impact on the quality of ERMU's drinking water.

The information related to the transportation routes and corridors can all be considered potential contaminant sources from accidental spills or releases and proximity to the ERA and WHPA. These types of PCS have the ability to impact ERMU's drinking water quality and quantity.

Land and Groundwater Uses in the DWSMA:

Information relating to the parcel boundaries, public land survey coordinates, and center lines of roads have impact on the land and groundwater uses in the DWSMA because they define where the WHP plan will be implemented.

The comprehensive land use and zoning maps affect land and water use within the DWSMA because they provide a basis for limiting future land uses that may be incompatible with ordinances or planning goals. As such, they may be used for denying new potential contamination sources or imposing performance standards that affect the use of existing or new public water supply wells and the quantity and quality of the well water used by ERMU. The effective use of these tools will be most critical in the moderately vulnerable area of the DWSMA where the aquifer being used for ERMU's drinking water source may be more susceptible to contamination from land uses.

Information about the potential contaminant sources located within the various land uses is important to land and groundwater uses within the DWSMA because the inventory identifies locations of various land uses that have potential to contribute to ground water contamination. ERMU is able to use the inventory, in conjunction with ERMU and City of Elk River land use controls, to reduce the likelihood of seeing an impact to their drinking water from these potential contaminant sources. In the moderately vulnerable area of the DWSMA where land use activities have a higher potential to impact public drinking water, the City of Elk River can adopt additional zoning controls, or utilize existing zoning controls to disallow certain land uses, or direct land use activities to areas that will reduce potential impact to groundwater quality, or place restrictions on land use permits in order to prevent contamination from activities to occur.

The transportation routes or corridors all represent potential contamination sources. As such, they may limit future land and groundwater uses because of potential spill or releases or the risk that they may present to public health and safety.

WATER QUANTITY DATA ELEMENTS

Groundwater Quantity:

Pumping of high capacity wells may affect the movement of contamination toward or away from another well and should be considered when managing contamination already in an aquifer. The continued use of a contaminated well or how much an uncontaminated well can be pumped before it affects the movement of contamination to other wells needs to be considered in managing the DWSMA. Pumping may impact groundwater levels when recharge is less than withdrawal such as during times of drought. Therefore, pumping may impact water use within a DWSMA and may impact land uses such as for recreational or agricultural purposes. The pumping limits for most community public water supply wells and private high capacity wells are set under a DNR appropriations permit.

Data collected for this WHP plan amendment indicates there are eight ERMU-owned wells and sixteen other public and private wells with active state groundwater appropriation permits within the DWSMA (Exhibit E1). Groundwater levels and quantity are adequate for the amounts that ERMU is currently permitted by a groundwater appropriation that is administered by the DNR. Presently, there appears to be sufficient groundwater quantity based upon existing pumping capacity of all high capacity wells completed in the aquifer used by ERMU. ERMU will continue to work with the MDH and DNR to identify any new high capacity wells in the area that may affect ERMU's public water supply or alter the current WHPA delineation. There are no known well interference or groundwater use conflicts near the ERMU. Exhibit E1 contains additional information regarding groundwater quantities.

Assessments of the Water Quantity Data and Its Impact on the Following:

Use of the PWS Wells:

Groundwater quantity data impacts the use of the public water supply (PWS) well because a maximum annual amount for the public water supply system is specified under the DNR appropriations permit. Information related to the pumping of high capacity wells in or near a DWSMA may impact the use of ERMU's wells because the use of high capacity wells has the ability to influence the direction of flow of groundwater as well as existing contaminant plumes in an area. If an area near ERMU's wells becomes contaminated, ERMU may be required to change the current use of the wells to slow the progression of a plume toward ERMU's wells, or prevent a contaminant plume from entering the drinking water supply.

Delineation of the WHPA:

Water quantity (both surface and groundwater) data impacts the WHPA delineation because pumping amounts are used to calculate the daily well discharge, which is a WHPA delineation criterion.

Data relating to the high, mean and low flow rates of streams (if available) affects the delineation of the WHPA because it can be used to 1) determine the interconnectivity between surface water and the aquifer used by ERMU's wells, and 2) calibrate the groundwater model that was used to delineation the WHPA. Also, the interaction between surface water and the aquifer that is used as the source of drinking water affects the vulnerability of the wells and DWSMA. Information related to the pumping of high capacity wells is used for the delineation of the WHPA because it may present a flow boundary (which is a delineation criterion), and may affect the movement of groundwater flow in an area.

Quantity of Water Supplying the Wells:

Water quantity (both surface and groundwater) may only indirectly affect the future quantity of the water from the public water supply wells, if at all.

The data related to the pumping of high capacity wells in or near the DWSMA has the ability to impact the quality and quantity of water supplying ERMU's wells because 1) the amount of water being pumped by these high capacity wells may have the ability to affect the static water levels of the aquifer, and 2) the pumping of these wells can influence the direction of ground water flow and the direction of flow of existing contaminant plumes.

Land and Groundwater Uses within the DWSMA:

Water quantity (both surface and groundwater) data impacts the land and groundwater uses within a DWSMA because pumping may impact whether other wells or existing land uses may cause contamination of the aquifer or contamination to move toward the public water supply wells.

Land and groundwater uses within the DWSMA may be influenced by the pumping of high capacity wells in or near the DWSMA when recharge is less than withdrawal, such as during times of drought. The result of this would require that ERMU enact stricter water conservation measures for its system users, or the DNR may limit certain types of water uses within its jurisdiction in order to ensure that higher priority water users' demands are satisfied.

WATER QUALITY DATA ELEMENTS

Groundwater Quality:

Groundwater quality data is used to evaluate the current water quality condition and sustainability of the PWS aquifer, and to identify potential sources of contamination or land uses that pose greater risk to the PWS aquifer. These potential sources of contamination or land uses should receive higher priority when

assigning management strategies in the plan. Groundwater quality information throughout the DWSMA can be used to assess the pathways of recharge to the aquifer and therefore provides information for prioritizing areas within a DWSMA that need land management measures.

The extent that groundwater quality may already be impaired by previous land and groundwater use practices can be indicated in studies, spill reports, and property audits. This information can assist in developing priority actions for managing land and groundwater uses within a DWSMA. These reports and studies may also indicate the rate that a contamination plume is moving towards or into the aquifer used by the PWS, as well as the likelihood that the PWS may need to consider implementing water treatment methods in the future.

Well water quality from ERMU's wells is of good quality. At present, none of the contaminants for which the Safe Drinking Water Act has established health-based standards is found above maximum allowable levels in ERMU's water supply, nor are any present at one-half of those levels. The 2021 Consumer Confidence Report is located in Exhibit E2.

There have been a number of identified spill or release sites within the moderately vulnerable portion of the DWSMA that occurred in the past. These sites were associated with leaky fuel storage tanks that have been remediated and are considered "closed" sites. These sites are listed in the current PCSI as historical 'leaky' underground storage tanks (Appendix C – Exhibit C1).

Exhibit E2 contains additional information regarding groundwater quality.

Assessments of the Water Quality Data and Its Impact on the Following:

Use of the PWS Wells:

The presence of human-made or naturally occurring contaminants may influence pumping of the public water supply well because pumping may impact the rate at which contamination may be moving into the aquifer. Furthermore, the level of contamination may require that the water be treated for potable use or be blended with other water to reduce contaminant levels to drinking water standards.

Delineation of the WHPA:

Information related to groundwater quality is used to assess the pathways that recharge takes to an aquifer which may impact the selection of methods that are used to delineate the WHPA and to assess well and DWSMA vulnerability. The presence of human-made contaminants is used to 1) calibrate a groundwater flow model by providing a means of checking travel time distance from the source of a contaminant to a public water supply well, and 2) assess the vulnerability of the well and the DWSMA. The presence of naturally occurring contaminants is used to assess the extent that the source water aquifer is isolated from surface water recharge.

Quality of Water Supplying the Wells:

Site studies and water quality analyses of known areas of groundwater contamination, property audit results, reports of contamination spills and releases by the Minnesota Pollution Control Agency and Minnesota Department of Agriculture provide basic information that is used to determine the extent that groundwater quality may already be impaired by previous land and groundwater use practices. This information is used to assess the vulnerability of the wells and the DWSMA, which affects 1) the scope, and direction of the inventory of potential contamination sources and 2) the resulting priorities that are assigned to objectives and actions for managing land and groundwater uses within a DWSMA. Also, the hydrogeologic information contained in the reports is used to refine the understanding of local groundwater conditions that affects the delineation of the WHPA. There are no known areas of contamination from spills or releases within the aquifer used by the ERMU.

Land and Groundwater Uses in the DWSMA:

With the exception of Well #3 and Well #5 (low levels of chlorides in both wells and nitrate in Well #5), the aquifer supplying drinking water to ERMU is generally free of human made contaminants as indicated by groundwater monitoring. ERMU will place a high priority on the development of actions in this plan that focus on working with property owners to manage the different forms of potential contaminant sources (Appendix C) within the DWSMA to reduce the risk of impact to the drinking water aquifer.

EXHIBITS

Exhibit A - Scoping Documents
Exhibit B - Physical Environment Data Elements
Exhibit C - Land Use Data Elements
Exhibit D - Public Utility Service Data Elements
Exhibit E - Water Quantity and Quality Data Elements

Exhibit A

Minnesota Department of Health
Scoping 1 and Scoping 2 Notice Documents
for
Elk River Municipal Utilities

Exhibits

Exhibit A1 – Scoping 1 Document

Exhibit A2 – Scoping 2 Document

Exhibit A1

MDH Scoping 1 Document

February 17, 2021

DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

February 17, 2021

Mr. Dave Ninow, Water Superintendent
Elk River Municipal Utilities
P.O. Box 430
Elk River, Minnesota 55330-0430

Dear Mr. Ninow:

Subject: Scoping Decision Notice No. 1 for Elk River Municipal Utilities (ERMU), PWSID 1710004

This letter provides notice of the results of the Scoping 1 (virtual) meeting held with you, Tony Mauren, Michelle Canterbury, and Tom Sagstetter (ERMU staff) and Robyn Hoerr (Minnesota Rural Water Association) on February 5, 2021, regarding wellhead protection planning. During the meeting, we discussed the amendment of ERMU's Part I Wellhead Protection Plan that will document the 1) delineation of a wellhead protection area, 2) delineation of a drinking water supply management area, and 3) assessments of well and aquifer vulnerability related to these areas for the primary water supply wells that are used by ERMU. The wellhead protection area is the surface and subsurface area surrounding your public water supply wells through which contaminants are likely to move and affect your drinking water supply. The drinking water supply management area (DWSMA) is the area delineated using identifiable landmarks that reflect the wellhead protection area boundaries as closely as possible.

The ERMU will have until February 5, 2023, to prepare and submit to MDH its entire Wellhead Protection Plan, Part I and Part II. The wellhead protection rule describes the criteria used for determining the time period for completion of the Wellhead Protection Plan (Minnesota Rules, part 4720.5130). The Minnesota Department of Health (MDH) recommends that half of the time allotted be dedicated to completing Part II of the plan.

It is our understanding that MDH will assist ERMU with amending its Part I Plan. There will be no cost to the ERMU for any involvement by MDH staff with this work. It will be the responsibility of ERMU to assist with the data collection to aid in the delineation and vulnerability assessments, if needed. For our meeting, I provided a preliminary draft of the amended Part 1 Plan. Please feel free to let me know if you have any questions or changes to the report. In the meantime, we will be moving forward with finalizing it and sending it to you for final review and approval.

During our meeting, we discussed rule requirements and the types of information needed to prepare the Part I report. The Wellhead Protection Plan must be prepared in accordance with Minnesota Rules, parts 4720.5100 to 4720.5590. General wellhead protection requirements and criteria for delineating the wellhead protection area and data reporting are presented in Minnesota Rules, parts 4720.5500 to 4720.5510.

The enclosed Scoping Decision Notice No. 1 formally identifies the information ERMU must provide to MDH to meet wellhead rule requirements. The rule refers to the existing information required for wellhead planning as data elements. Much of this information is available in the public domain, as described in the Scoping Decision Notice No. 1 form. You only need to provide the information that is not in the public domain and, therefore, not available to MDH. The Scoping Decision Notice No. 1 form also 1) lists the Minnesota unique well number and well construction for each well that will be included in the WHP Plan [Table 1]; 2) lists the pumping volumes for each well [Table 2]; and 3) lists other high-capacity wells within approximately one and half miles of your existing DWSMA [Table 3]. Please review the summary of additional information that we'd like to receive from you, if it is available. The summary is included at the end of the Scoping Decision Notice No. 1 form. Thank you again for your quick response last month to my information request for the five-year projected pumping volumes.

Finally, it is our understanding that you will continue serving as the wellhead protection manager on behalf of ERMU. Wellhead managers are responsible for providing written notice to local units of government of ERMU's intent to prepare the WHP Plan, as required by the WHP rule (part 4720.5300, subpart 3). A copy of this notice should be forwarded to MDH and must include a list of ERMU wells, their unique well numbers, and contact information for the wellhead protection managers. Robyn can provide you with some examples of the notification of intent that other communities have used. Please feel free to contact Robyn at 763-295-2113.

In closing, we look forward to working with you on the completion of your Wellhead Protection Plan. If you have any questions regarding our comments, please contact me at 651-201-4691 or at gail.haglund@state.mn.us.

Sincerely,

Gail Haglund

Gail Haglund, P.G. Hydrologist
Source Water Protection Unit
Environmental Health Division
P.O. Box 64975
St. Paul, Minnesota 55164-0975

GH:ds-b
Enclosures: Scoping Decision Notice No. 1; Summary of Data Requested; Table 1 - Public Water Supply Well Information; Table 2 - Annual Volume of Water Pumped From PWS Wells; Table 3 - Permitted High-Capacity Wells

cc: Robyn Hoerr, Planner, Minnesota Rural Water Association
Jennifer Soltys, Engineer, Drinking Water Protection, St. Cloud District Office

SCOPING DECISION NOTICE No. 1

Amendment of the WHP Plan

The purpose for the first Scoping Meeting, as required by Minnesota Rule 4720.5310, is to discuss the information necessary for preparing the Part I Report of a Wellhead Protection Plan. The Part I Report identifies the area that provides the source of drinking water for the public water supply (PWS) so that the PWS can develop land use or management practices to protect their groundwater resource from contamination. Specifically, the Part I Report documents the delineation of the wellhead protection area (WHPA), the delineation of the drinking water supply management area (DWSMA) and assesses the vulnerability of the PWS wells and DWSMA.

The wellhead rule (Minnesota Rule 4720.5310) refers to the information required for wellhead planning as data elements. This form lists the data elements that are stated in Minnesota Rule 4750.5400. The Minnesota Department of Health (MDH) uses this form to designate which data elements are needed to amend the Part I Report, based on the hydrogeological setting, vulnerability of the wells, and aquifer information known at the time of the Scoping 1 Meeting.

Name of Public Water Supply		**Date**
Elk River Municipal Utilities (ERMU) **(PWSID = 1710004)**		February 17, 2021
Name of the Wellhead Protection Manager		
Dave Ninow, Water Superintendent		
Address	**City**	**Zip**
P.O. Box 430	Elk River	55330-0430
Unique Well Numbers		**Phone**
255153 (Well #2 - Previously 271176) 221176 (Well #3) 481794 (Well #4) 537682 (Well #5)	580320 (Well #6) 664852 (Well #7) 694499 (Well #8) 757624 (Well #9)	763-635-1361

Instructions for Completing the Scoping No. 1 Form

N	D	V	S	
X				**N =** If this box is checked with an "X," this data element is **NOT** necessary for the **Part I Report** of your Wellhead Protection Plan. This data element may be identified later at the Scoping 2 Meeting and used for the Part 2 Report. Please go to the next data element.

N	D	V	S	
	X			**D =** If this box is checked with an "X," the preparer of the Part I Report is **required** to use this information for the **DELINEATION** of the WHPA or the DWSMA. If there is no check in the "S" box, this information is available in the public domain or is on-file at MDH.

N	D	V	S	
		X		**V =** If this box is checked with an "X," the preparer of the Part I Report is **required** to use this information for the **VULNERABILITY** assessment of the PWS well or the DWSMA. If there is no check in the "S" box, this information is available in the public domain or is on-file at MDH.

N	D	V	S	
			X	**S =** If this box is checked with an "X," the PWS **must SUBMIT** the information to MDH.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT

A. PRECIPITATION

N	D	V	S	
X				A.1: An existing map or list of local precipitation gauging stations.

Technical Assistance Comments:

N	D	V	S	
X				A.2: An existing table showing the average monthly and annual precipitation, in inches, for the preceding five years.

Technical Assistance Comments: Because of the hydrogeologic setting, monthly precipitation is not necessary. However, annual precipitation may be useful for estimating infiltration with layered model systems, such as ERMU's existing Modflow model.

B. GEOLOGY

N	D	V	S	
	X	X	X	B.1: 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.

Technical Assistance Comments: Information of this type is required to characterize the geologic and hydrogeologic setting of the ERMU wellfields. Since the previous amendment (2011), the Sherburne County Geologic Atlas, Parts A and B have been published (2013 and 2017, respectively). This information is in the public domain and is useful for defining aquifer geometry, location and magnitude of the recharge and discharge areas, and groundwater flow information. Aquifer tests or alternatives listed in MN Rules 4720.5510, subpart 6, can be used to help characterize flow in the aquifer. ERMU has already provided MDH with longer term aquifer testing data for the four newer wells (Wells #6-#9). This information, along with existing specific capacity data, has been useful for estimating aquifer parameters for the delineation.

N	D	V	S	
	X	X	X	B.2: Existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department.

Technical Assistance Comments: Information of this type may be useful to refine the understanding of the geologic and hydrogeologic setting on a local basis. Submit only if the ERMU has information of test drilling or site investigations that are not available in the public domain.

N	D	V	S	
	X	X	X	B.3: Existing borehole geophysical records from wells, borings, and exploration test holes.

Technical Assistance Comments: Information from geophysical records may provide additional information about aquifer thickness, well construction, and water level information at a local scale. Submit only if the information is not available in the public domain. Borehole geophysics has been done at both Wells #7 and #8, and this information is already available to MDH.

N	D	V	S	
	X	X	X	B.4: Existing surface geophysical studies.

Technical Assistance Comments: Information from geophysical studies may be useful to refine the understanding of the geology on a local basis. Submit only if the information is not available in the public domain.

C. SOILS

N	D	V	S	
X				C.1: Existing maps of the soils and a description of soil infiltration characteristics.

Technical Assistance Comments:

N	D	V	S	
X				C.2: A description or an existing map of known eroding lands that are causing sedimentation problems.

Technical Assistance Comments:

D. WATER RESOURCES				
N	D	V	S	D.1: An existing map of the boundaries and flow directions of major watershed units and minor watershed units.
	X			
Technical Assistance Comments: This information is in the public domain and is useful for regional groundwater modeling.				
N	D	V	S	D.2: An existing map and a list of public waters as defined in Minnesota Statutes, section 103G.005, subdivision 15, and public drainage ditches.
X				
Technical Assistance Comments:				
N	D	V	S	D.3: The shoreland classifications of the public waters listed under sub-item (2), pursuant to part 6120.3000 and Minnesota Statutes, sections 103F.201 to 103F.221.
X				
Technical Assistance Comments:				
N	D	V	S	D.4: An existing map of wetlands regulated under Chapter 8420 and Minnesota Statutes, section 103G.221 to 103G.2373.
X				
Technical Assistance Comments:				
N	D	V	S	D.5: An existing map showing those areas delineated as floodplain by existing local ordinances.
X				
Technical Assistance Comments:				

DATA ELEMENTS ABOUT THE LAND USE

E. LAND USE				
N	D	V	S	E.1: An existing map of parcel boundaries.
	X		X	
Technical Assistance Comments: Parcel information is available in the public domain, however, please inform MDH if there are any significant recent changes/updates to parcels that may be used for mapping the boundaries of the DWSMA or vulnerability areas.				
N	D	V	S	E.2: An existing map of political boundaries.
	X		X	
Technical Assistance Comments: Please inform MDH if the boundaries have been recently updated/changed. This information may be used to delineate the DWSMA. An electronic format for the map is preferable.				
N	D	V	S	E.3: An existing map of public land surveys, including township, range, and section.
	X			
Technical Assistance Comments: This information is available in the public domain and may be used to delineate the DWSMA.				
N	D	V	S	E.4: A map and an inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources.
X				
Technical Assistance Comments:				
N	D	V	S	E.5: An existing, comprehensive land-use map.
X				
Technical Assistance Comments:				
N	D	V	S	E.6: Existing zoning map.
X				
Technical Assistance Comments:				

F. PUBLIC UTILITY SERVICES				
N	**D**	**V**	**S**	F.1: An existing map of transportation routes or corridors.
	X			
Technical Assistance Comments: This information is available in the public domain and may be used to delineate the DWSMA.				
N	**D**	**V**	**S**	F.2: An existing map of storm sewers, sanitary sewers, and the public water supply systems.
X				
Technical Assistance Comments:				
N	**D**	**V**	**S**	F.3: An existing map of gas and oil pipelines used by gas and oil suppliers.
X				
Technical Assistance Comments:				
N	**D**	**V**	**S**	F.4: An existing map or list of public drainage systems.
X				
Technical Assistance Comments:				
N	**D**	**V**	**S**	F.5: An existing record of construction, maintenance, and use of the public water supply well(s) and other wells within the drinking water supply management area.
	X	**X**	**X**	
Technical Assistance Comments: Please take a moment to review Tables 1 and 2. In particular, please review the construction information for any wells that may have been rehabbed since the previous amendment (2009) to ensure that the information in Table 1 is up-to-date. Information about the ERMU wells may affect the vulnerability assessment due to rehabilitation/reconstruction of a well or changes in pumping rates. Thank you for already providing the projected annual pumping rates for the next five years.				

DATA ELEMENTS ABOUT WATER QUANTITY

G. SURFACE WATER QUANTITY				
N	**D**	**V**	**S**	G.1: An existing description of high, mean, and low flows on streams.
X				
Technical Assistance Comments:				
N	**D**	**V**	**S**	G.2: An existing list of lakes where the state has established ordinary high water marks.
X				
Technical Assistance Comments:				
N	**D**	**V**	**S**	G.3: An existing list of permitted withdrawals from lakes and streams, including source, use, and amounts withdrawn.
X				
Technical Assistance Comments:				
N	**D**	**V**	**S**	G.4: An existing list of lakes and streams for which state protected levels or flows have been established.
X				
Technical Assistance Comments:				
N	**D**	**V**	**S**	G.5: An existing description of known water-use conflicts, including those caused by groundwater pumping.
X				
Technical Assistance Comments:				

H. GROUNDWATER QUANTITY

N	D	V	S	
	X	X	X	H.1: An existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source.

Technical Assistance Comments: Please submit this information for wells that are not permitted by the DNR because this information may be useful in identifying the hydrologic boundary conditions that could affect the size and shape of the WHPA boundaries.

N	D	V	S	
	X	X	X	H.2: An existing description of known well interference problems and water-use conflicts.

Technical Assistance Comments: Please notify MDH of well interference problems of which the PWS is aware. Interference problems with other wells, if present, likely indicate a hydrologic boundary that would need to be considered in making the WHPA delineation. This applies to wells constructed into the Mt. Simon Sandstone aquifer.

N	D	V	S	
	X	X		H.3: An existing list of state environmental boreholes, including unique well number, aquifer measured, years of record, and average monthly levels.

Technical Assistance Comments: This information is available in the public domain and may be useful for the delineation.

DATA ELEMENTS ABOUT WATER QUALITY

I. SURFACE WATER QUALITY

N	D	V	S	
X				I.1: An existing map or list of the state water quality management classification for each stream and lake.

Technical Assistance Comments:

N	D	V	S	
X				I.2: An existing summary of lake and stream water quality monitoring data, including: 1. bacteriological contamination indicators; 2. inorganic chemicals; 3. organic chemicals; 4. sedimentation; 5. dissolved oxygen; and 6. excessive growth or deficiency of aquatic plants.

Technical Assistance Comments:

J. GROUNDWATER QUALITY

N	D	V	S	
	X	X	X	J.1: An existing summary of water quality data, including: 1) bacteriological contamination indicators; 2) inorganic chemicals; and 3) organic chemicals.

Technical Assistance Comments: Submit if the ERMU has information that is not available in the public domain because the information may help explain groundwater flow paths.

N	D	V	S	
	X	X	X	J.2: An existing list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points.

Technical Assistance Comments: Submit if the ERMU has information that is not available in the public domain because the information may help explain groundwater flow paths.

N	D	V	S	
	X	X	X	J.3: An existing report of groundwater tracer studies.

Technical Assistance Comments: Submit if the ERMU has information that is not available in the public domain because the information may help explain groundwater flow paths.

N	D	V	S	
		X	X	J.4: An existing site study and well water analysis of known areas of groundwater contamination.

Technical Assistance Comments: Submit if the ERMU has information on contaminant sources not available in the public domain because these reports may contain additional geologic or hydrogeologic information.

N	D	V	S	
X				J.5: An existing property audit identifying contamination.

Technical Assistance Comments:

N	D	V	S	
	X	X		J.6: An existing report to the Minnesota Department of Agriculture and the Minnesota Pollution Control Agency of contaminant spills and releases.

Technical Assistance Comments: Please notify MDH of reports on spills or contaminant releases that are on-file with the ERMU but are not in the public domain. These reports do not need to be submitted but MDH staff would like to review reports.

Summary of Data Request
Specific Data to be Provided to MDH by the Elk River Municipal Utilities (ERMU)

As discussed during the first Scoping Meeting on February 5, 2021, the ERMU will supply the following information to the Minnesota Department of Health for amending Part I of their Wellhead Protection Plan. The number of the data element that refers to the information needed to prepare the Part I Report is listed in the parenthesis at the end of each request.

1) Municipal Well Information: Use Tables 1 and 2 and the records for the ERMU wells to review the accuracy of all ERMU well construction and the pumping information. (F.5)

   Table 1 lists well use and construction for each of the ERMU wells. During our scoping meeting, you mentioned re-development work on Well #9 in 2018. Did this work result in any changes to well construction (for example, changes in the length of casing or a shortening of the open interval)? If so, please provide a copy of the revised construction record for the well and we will update our databases.

2) If available, please provide a copy of any longer-term aquifer tests or specific capacity information for the ERMU wells that has been obtained since the last amendment ten years ago (2011). Please note that ERMU has already provided data for the longer term tests conducted at the four newer wells, Wells #6-#9. (B.1)

Table 1 – ERMU 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
Well #2	255153	Primary	16	136	290	08/1948	CEMS	Not Vulnerable
Well #3	221176	Primary	20 x 16	201	315	10/23/1974	CMTS	Vulnerable
Well #4	481794	Primary	24 x 18	197	225	12/15/1992	CMTS	Not Vulnerable
Well #5	537682	Primary	30 x 24 x 18	316	406	08/17/1994	CMTS	Vulnerable
Well #6	580320	Primary	24 x 18	212	300	02/12/1999	CMTS	Not Vulnerable
Well #7	664852	Primary	24 x 18	240	341	07/20/2001	CMTS	Not Vulnerable
Well #8	694499	Primary	30 x 24 x 18	264.8	390	06/30/2004	CMTS	Not Vulnerable
Well #9	757624	Primary	24 x 18	296	454	01/30/2008	CMSH	Not Vulnerable

Note: 1. CEMS- Eau Claire-Mt. Simon Aquifer; CMTS- Mt. Simon Aquifer; CMSH- Mt. Simon-Hinckley Aquifer.

Table 2 - Annual Volume of Water Discharged from Water Supply Wells

MPARS Permit ID	Local Well ID	Unique No.	2015	2016	2017	2018	2019	Highest annual rate from "5 most recent" selected years	Pumping Amount Used in Previous Delineation
1975-3215	2	255153	57.703	**61.584**	15.390	11.217	5.180	61.584	119.108 (2008)
1975-3215	3	221176	184.524	106.245	146.935	**187.908**	171.621	187.908	160.719 (2007)
1975-3215	4	481794	182.469	**212.577**	159.723	173.899	200.931	212.577	135.43 (2005)
1975-3215	5	537682	67.151	123.474	**177.245**	102.337	109.803	177.245	147.089 (2006)
1975-3215	6	580320	94.601	82.998	43.593	**102.444**	75.632	102.444	129.574 (2007)
1975-3215	7	664852	91.654	68.486	89.660	**114.283**	107.811	114.283	103.259 (2008)
1975-3215	8	694499	**107.128**	107.403	83.771	49.000	2.959	107.403	143.185 (2007)
1975-3215	9	757624	14.744	38.836	71.865	81.458	**104.658**	104.658	28.92 (projected)
TOTALS:			799.974	801.603	788.182	**822.546**	778.595	1068.102	967.284

(Expressed as millions of gallons. **Bold values** indicate highest annual rate from "**5 most recent**" selected years.) Source: MN Dep't. of Natural Resources Division of Waters - MNDNR Permitting and Reporting System (MPARS)

Table 3 - Other Permitted High-Capacity Wells Within 1.5 Miles of the DWSMA

Unique Number	Well Name	DNR Permit Number	Aquifer	Use	5-Year Maximum Annual Volume of Water Pumped (million gallons)	Daily Volume (gallons)
167972	Ind School District 728	1980-3169	CMTS	Landscaping/Athletic Field Irrigation	11.673	121
217937	Great River Energy	1984-3149	CECRCMTS	Thermoelectric Power Generation - Non Cooling	Permit Terminated (2019)	
217941	Plaisted Companies, Inc.	1972-0366	CMTSPMHN	Sand and Gravel Washing; Dust Control	89.496	932
217951	Wingard, John P	1968-0166	CMTS	Agricultural Crop Irrigation	16.8	174
217957	*Wingard, Art	1968-0376	CMTS	Agricultural Crop Irrigation	13.56	141
217958	Burquest, Lloyd K	1958-0173	CMTS	Agricultural Crop Irrigation	0	0
217958	McHugh, James L; McHugh, Mary	1957-0410	CMTS	Agricultural Crop Irrigation	12.393	129
217977	Barton Sand and Gravel Co.	1991-3086	CMTS	Sand and Gravel Washing; Dust Control	39.68	412
221168	Wingard, Tom	1965-0147	CECRCMTS	Agricultural Crop Irrigation	53.22	552
221170	*Wingard, Art	1968-0376	CECRCMTS	Agricultural Crop Irrigation	3.78	39.2
242333	McHugh, James L; McHugh, Mary	1957-0410	CMTS	Agricultural Crop Irrigation	12.339	128
247618	Elk River Country Club Inc	1961-0483	CMTS	Golf Course Irrigation	6.873	71
272869	Moritz, Martin	1977-6482	CFRNCMTS	Agricultural Crop Irrigation	11.934	124
413541	Ind School District 728	2009-0398	CMTS	Landscaping/Athletic Field Irrigation	2.632	27
415954	Elk River, City of	2007-0506	CEMS	Golf Course Irrigation	12.2	127
497392	Elk River, City of	1994-3198	CIGLCMTS	Landscaping/Athletic Field Irrigation	2.0	21
502520	Beck, Orville	1990-3270	CMTSPMFL	Agricultural Crop Irrigation	13.32	138
504337	Beck, Orville	1990-3269	CEMS	Agricultural Crop Irrigation	1.44	15
709269	Otsego, City of	2005-3146	CMTS	Municipal/Public Water Supply	111.2	1153

Unique Number	Well Name	DNR Permit Number	Aquifer	Use	5-Year Maximum Annual Volume of Water Pumped (million gallons)	Daily Volume (gallons)
221166	Sanford, Jim; Sanford, Jeffrey	1992-3077	CEMS	Irrigation	19.2	199
217956	Sanford, Jim; Sanford, Jeffrey	1992-3077	CEMS	Irrigation	13.2	137
217952	Del Hayes And Sons Inc	1966-0295	CMTS	Irrigation	39.7	412

Exhibit A2

MDH Scoping 2 Document

September 29, 2021

DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

September 29, 2021

Mr. Dave Ninow, Water Superintendent
Elk River Municipal Utilities
PO Box 430
Elk River, Minnesota 55330-0430

Subject: Scoping 2 Decision Notice and Meeting Summary – Elk River Municipal Utilities – PWSID 1710004

Dear Mr. Ninow,

This letter provides notice of the results of a scoping meeting held with you, Michelle Canterbury, Tom Sagstetter, and Tony Mauren (Elk River Municipal Utilities), Robyn Hoerr (Minnesota Rural Water Association), and me on September 20, 2021, at the Elk River Municipal Utilities office regarding wellhead protection (WHP) planning. During the meeting, we discussed the data elements that must be compiled and assessed to prepare the part of the WHP plan related to the management of potential contaminants in the approved drinking water supply management area. The enclosed Scoping 2 Decision Notice lists the data elements discussed at the meeting. We also discussed a summary of planning issues and recommendations that were identified during the Part 1 WHP Plan development process which should be considered for inclusion in your Part 2 WHP Plan.

Elk River Municipal Utilities has met the requirements to distribute copies of the first part of the WHP plan to local units of government and hold an informational meeting for the public. The Elk River Municipal Utilities will have until February 5, 2023, to complete its WHP plan.

Ms. Hoerr will be working with you and a consultant of your choosing to develop a draft of the remainder of the WHP plan. I will be contacting you to review the progress of the development of Part 2 of your plan. Upon request, the Technical Assistance Planner can provide a glossary of terminology, identification of information sources for the required Data Elements, and other technical assistance documents. If you have any questions regarding the enclosed notice, contact me by email at chad.r.anderson@state.mn.us or by phone at 651-201-5847.

Sincerely,

Chad Anderson, Planner
Environmental Health Division
Source Water Protection Unit
3333 Division Street, Suite #212
St. Cloud, Minnesota 56301

CA:ds-b

Enclosures: Scoping 2 Decision Notice, PCSI Requirements, WHP Planning Issues Summary

cc: Jennifer Soltys, MDH Engineer, St. Cloud
Calvin Portner, City Administrator, City of Elk River
Robyn Hoerr, Groundwater Specialist, Minnesota Rural Water Association
Luke Stuewe, Minnesota Department of Agriculture

Date: September 29, 2021

Name of Public Water Supply: Elk River Municipal Utilities

PWSID: 1710004

Name of the Wellhead Protection Manager: Mr. Dave Ninow, Water Superintendent

Address: PO Box 430

City: Elk River

Zip: 55330-0430

Phone: 763-441-2020

Primary Unique Well Numbers: 255153 (Well #2), 221176 (Well #3), 481794 (Well #4), 537682 (Well #5), 580320 (Well #6), 664852 (Well #7), 694499 (Well #8), 757624 (Well #9)

DWSMA Vulnerability: ☒ Low ☒Moderate

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 MUST be submitted in the Part 2 by including it in the plan narrative and/or appendix. An asterisk* with red text indicates information that MUST be contained in the Part 2.

- ☐ *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 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 tow nship, 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 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 low vulnerability inventory wells greater than 100 feet in depth. Also, inventory wells of undocumented or unknown depths.
    - If DWSMA contains moderate 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.

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.

Required to be discussed in 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.

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 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. Or, if the Part 1 is included in the appendix that can be referenced.

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 –

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: 04/2019

To obtain this information in a different format, call: 651-201-4570. Printed on recycled paper.

DEPARTMENT OF HEALTH

Elk River Municipal Utilities Scoping 2 Meeting
Wellhead Protection (WHP) Plan Amendment
Summary of Planning Issues

Public Water Supplier: Elk River Municipal Utilities ("ERMU", or "Utility")

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

- There are relatively minor changes to the boundaries of the ERAs, the WHPA, and the DWSMA since the previous WHP plan. These changes are primarily due to a refinement of the location of Well #5 (537682), and to changes in the annual pumping used to determine the protection areas in comparison to the pumping volumes used for the previous plan.
- Additionally, a change in the vulnerability status occurred for Well #3 from not vulnerable to vulnerable, due to the detection of low levels of tritium in recent sampling.

Community changes and implications for management:

- The eastern side of Elk River has experienced a considerable amount of residential development, however, this has not amounted to a huge shift in pumping demand. Commercial demand since 2018, or the most recent plan evaluation, has not changed considerably.

- ERMU is considering the construction of new well for the utility in about five years (2025). Additional information about the need for adding this well is included in the utility's comprehensive plan. The utility will likely be expanded to the south or southeast to accommodate future growth in this area.

Key management activities to carry forward:

Note to plan writer: Update current language so management strategies are SMART (Specific, Measurable, Achievable, Relevant/Realistic, Timing). Consider using the MDH Management Strategy Catalog.

- An evaluation of the activities proposed in the WHP Plan of Action from the 2013 WHP Plan (Table 9) suggests that eight of the activities proposed were not completed to date. The activities not listed as complete in the evaluation include Measures 2,5,6,9 (Public Education & Outreach), 12,15 (Potential Contamination Source Management), 27 (Reporting and Evaluation), and 29 (Water Use and Contingency Strategy). MDH recommends that ERMU review each Measure to confirm that the activity was not completed, and to determine whether each Measure should be a part of the next WHP Plan of Action.

- The evaluation of the activities proposed in the 2013 WHP Plan indicates that Measures 1,3,4,7,8,10,11,13,14,16,17,18,19,20,21,22,23,24, 25,26 and 28 were all completed. The nature of many of these Measures is such that the WHP Plan may be better with their continuation. MDH recommends that ERMU 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 ERMU's experience with implementing the measure and their success/failure with it.

New management strategies to consider:

- Well Locating - MDH records indicate that there are about ten deeper wells (i.e., wells constructed between 200 and 400 feet deep) that have been constructed within the DWSMA boundaries since the previous plan and which have not been field located. The ERMU is encouraged to work with MDH to physically locate these deeper wells to confirm their status. Information from these wells can also be used to confirm aquifer vulnerability at their locations.

- Planning for a Replacement Well(s) - According to MDH records, ERMU Well #2 (255153) is more than 70 years old. The ERMU may want to include measures in their amended WHP Plan to take steps to prepare for the replacement for Well #2. The measures might include: the drilling of a test well(s), water quality sampling, and capacity testing.

- Water Quality Monitoring - MDH recommends that the standard assessment monitoring package should be analyzed during year six or seven at any primary wells that exist at the time. MDH can provide sample bottles and cover analytical costs, pending available resources. The ERMU may need to collect the samples and ship them to MDH.

- One domestic well on Elk River city property (at city hall) was identified in the WHP Implementation Evaluation for sealing in near future. MDH recommends that the ERMU procure the necessary funding to seal the well.

- MDH recommends that ERMU coordinate with Sherburne SWCD regarding their well sealing grant program, which makes up a part of the Sherburne County Water Plan as updated in 2018.
- The ERMU was notified of a petroleum release (fuel oil #1 & #2) investigation at the Elk River High School – the spill was discovered on 6/17/2020 when a UST was being removed and a corroded product line was discovered. While the spill occurred approximately ½ mile from Elk River Municipal Well #3, Nova Group, GBC (contractor) notes that borings discovered no impacts, soil samples did not have any detections and groundwater had low diesel range organics below levels of concern. The MPCA has the site listed as Active. MDH recommends that the Utility communicate annually with the MPCA Petroleum Remediation Program and take action accordingly, until the site is closed and threat to groundwater has been satisfactorily mitigated.

Old municipal wells that need to be sealed:

- ERMU has expressed the possibility of decommissioning Well #2 at a future, undetermined date. MDH recommends the inclusion of the decommissioning and sealing of the well in the WHP Plan to ensure the activity is eligible for grant funding.

- One domestic well on Elk River city property (at city Hall) was identified in the WHP Implementation Evaluation for sealing in near future.
- Under previous WHP, the Utility:
    - sealed an artesian well behind the former cinema building in the older part of Elk River.
    - sealed the Houlton Farm well (Elk River City-owned) artesian well within one year time of travel (TOT) of Well #4.
    - sealed a well within one year time of travel of Well #3.

Important partnerships to maintain or establish:

- MDH – water quality monitoring, additional sampling for Well #5, well sealing records.
- SWCD - Nitrate clinic and well sealing.
- City of Elk River Engineering Department.
- City of Elk River Planning Department.
- Minnesota Rural Water Association—Implementation of measures assistance.

Water quantity issues and implications:

- Existing data do not suggest water quantity issues.

Water quality issues and implications:

- Water samples and field parameters were collected by MDH staff in May and August of 2016 for three surface water features and Well #5. The stable isotope results did not indicate a strong connection between Well #5 and local surface water features. In addition, the isotope results from Well #5 did not indicate rapid recharge. All water quality sampling results are well below the maximum contaminant levels (MCLs) and do not exceed drinking water standards.

- The chloride results and Cl/Br ratios for Well #5 suggest that the well has had some impact from land use activities. Nitrate was undetectable in Well #5, though low levels have been measured during past regulatory monitoring events (ex., 2.0 mg/l on July 7, 2014).

- Well #5 was sampled for tritium on three previous occasions (1999, 2012, and 2013), with results ranging from 3.9 to 8.8 TU, indicating that the well is receiving a contribution of young water and is considered vulnerable to activities occurring at the land surface.

Sanborn Maps:

☒ Sanborn Maps are available for this area.

☐ Sanborn Maps are not available for this area.

Exhibit B

Physical Environment Data Elements

Water Resources

Figures

Figure B1 – Major Watershed Map

Figure B2 – Minor Watersheds in ERMU DWSMA

Figure B3 – FEMA Flood Zones in ERMU DWSMA

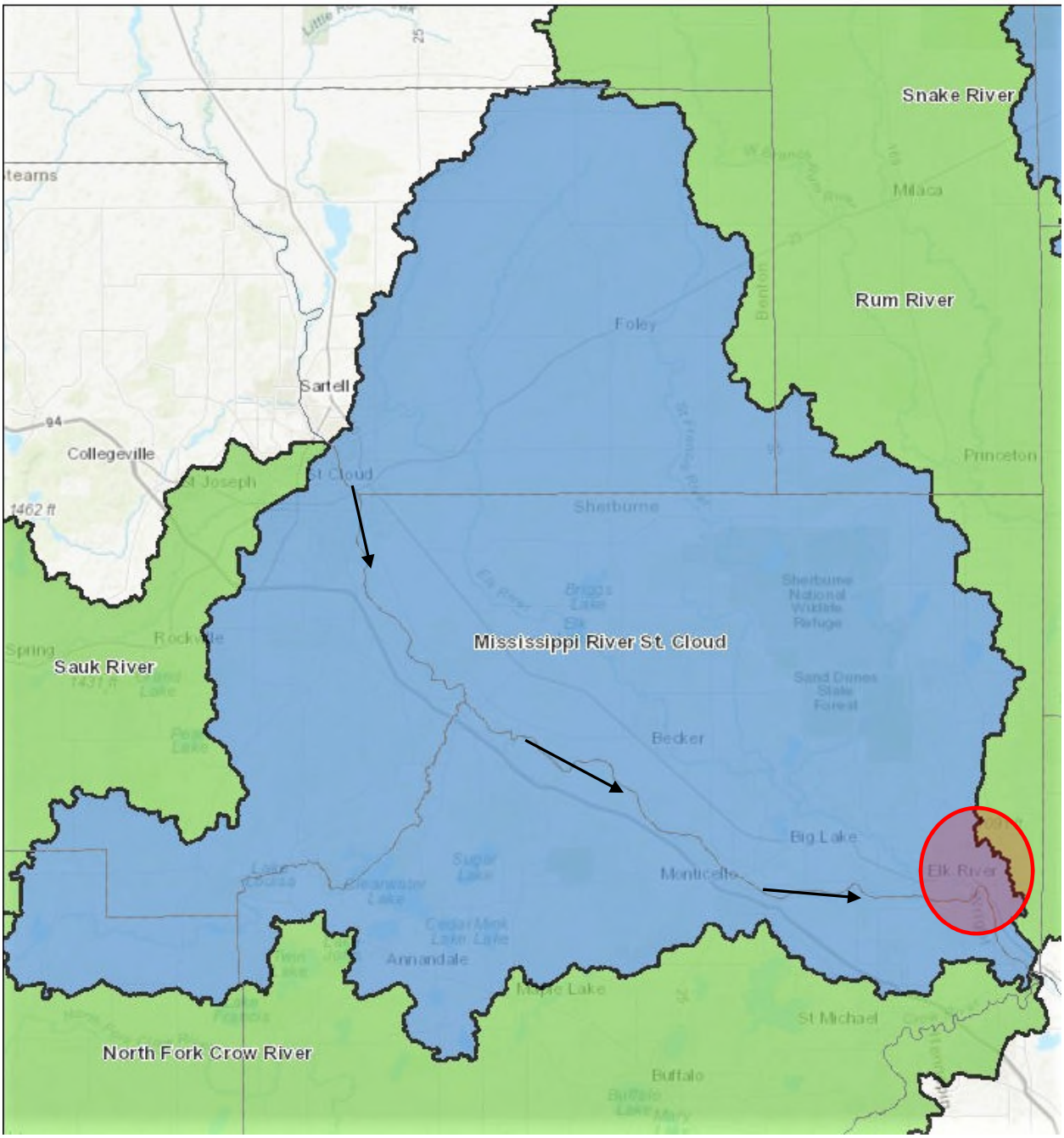


Figure 1

Mississippi River – St. Cloud Watershed, HUC# 07010203
(General area of ERMU DWSMA shown in red)

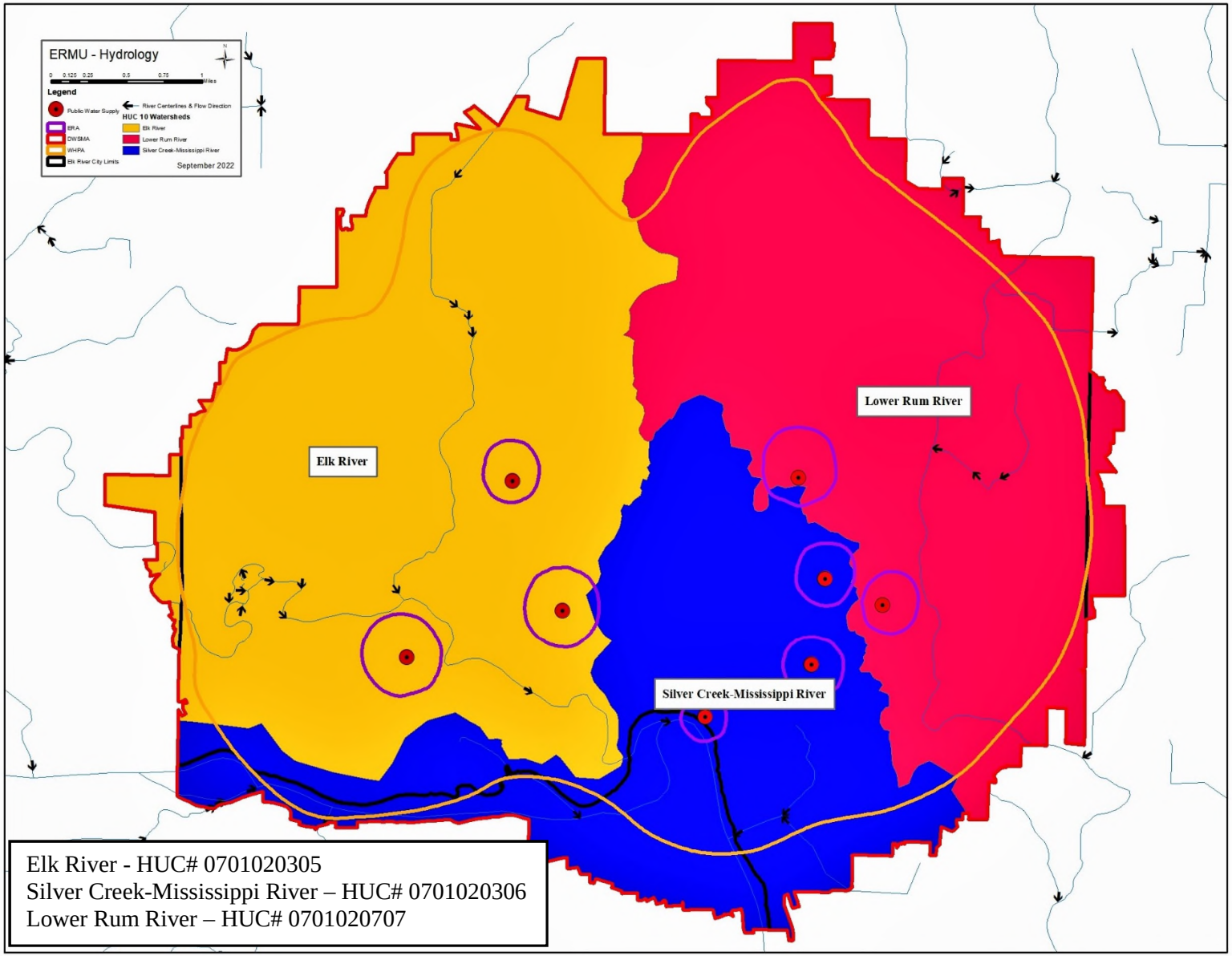


Figure 2

Minor Watersheds in ERMU DWSMA

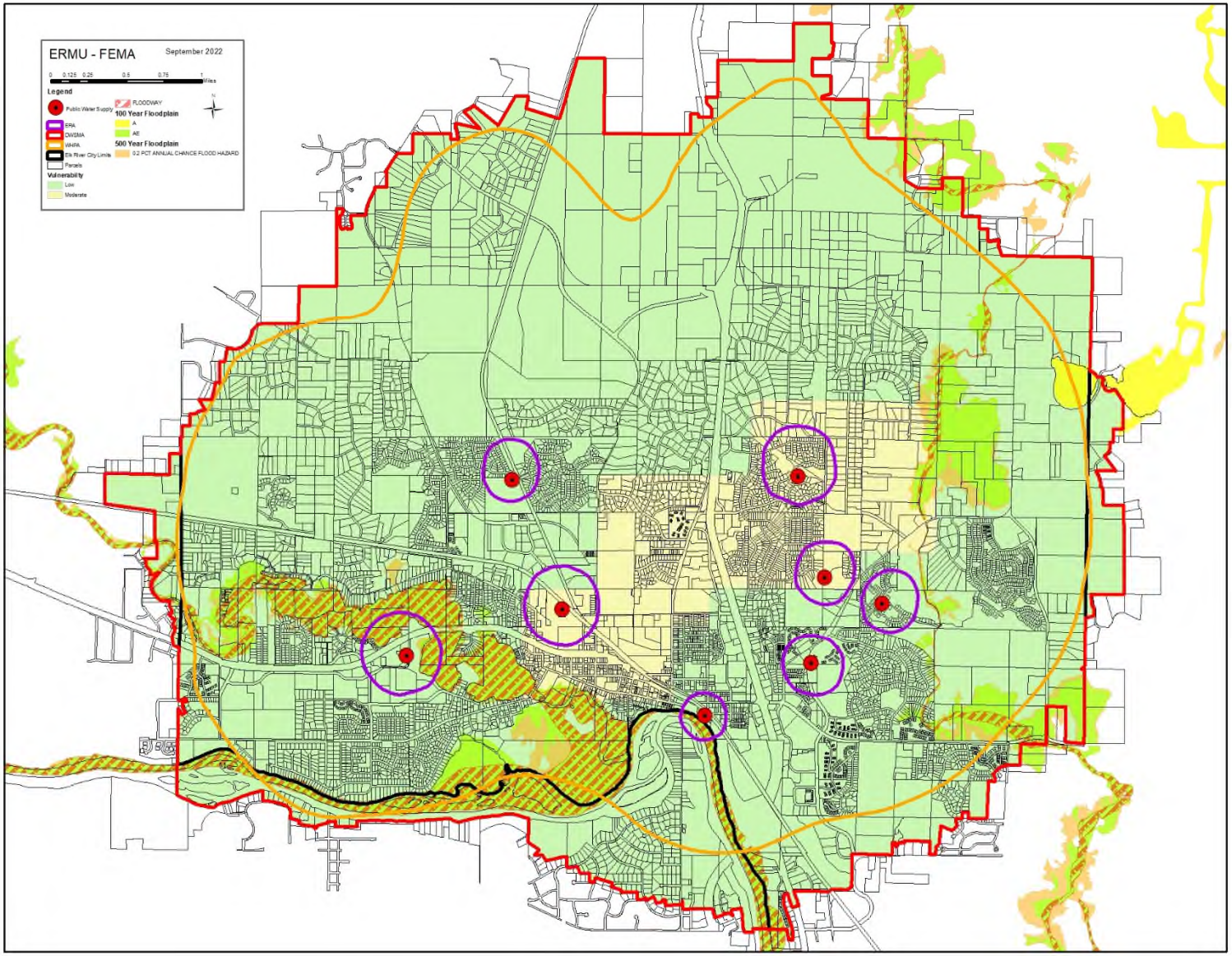


Figure 3

FEMA Flood Zones in ERMU DWSMA

Exhibit C

Land Use Data Elements

Tables

C1 - 2019 National Land Cover Data Set Legend

Figures

Figure C1 – National Land Cover Data Map

Figure C2 - City of Elk River Land Use Map

Figure C3 - City of Elk River Zoning Map

Figure C4 - City of Otsego Future Land Use Map

Figure C5 - City of Otsego Zoning Map

Figure C6 - City of Nowthen Comprehensive Plan

Figure C7 - City of Nowthen Zoning Map

Figure C8 - ERMU DWSMA Transportation Map

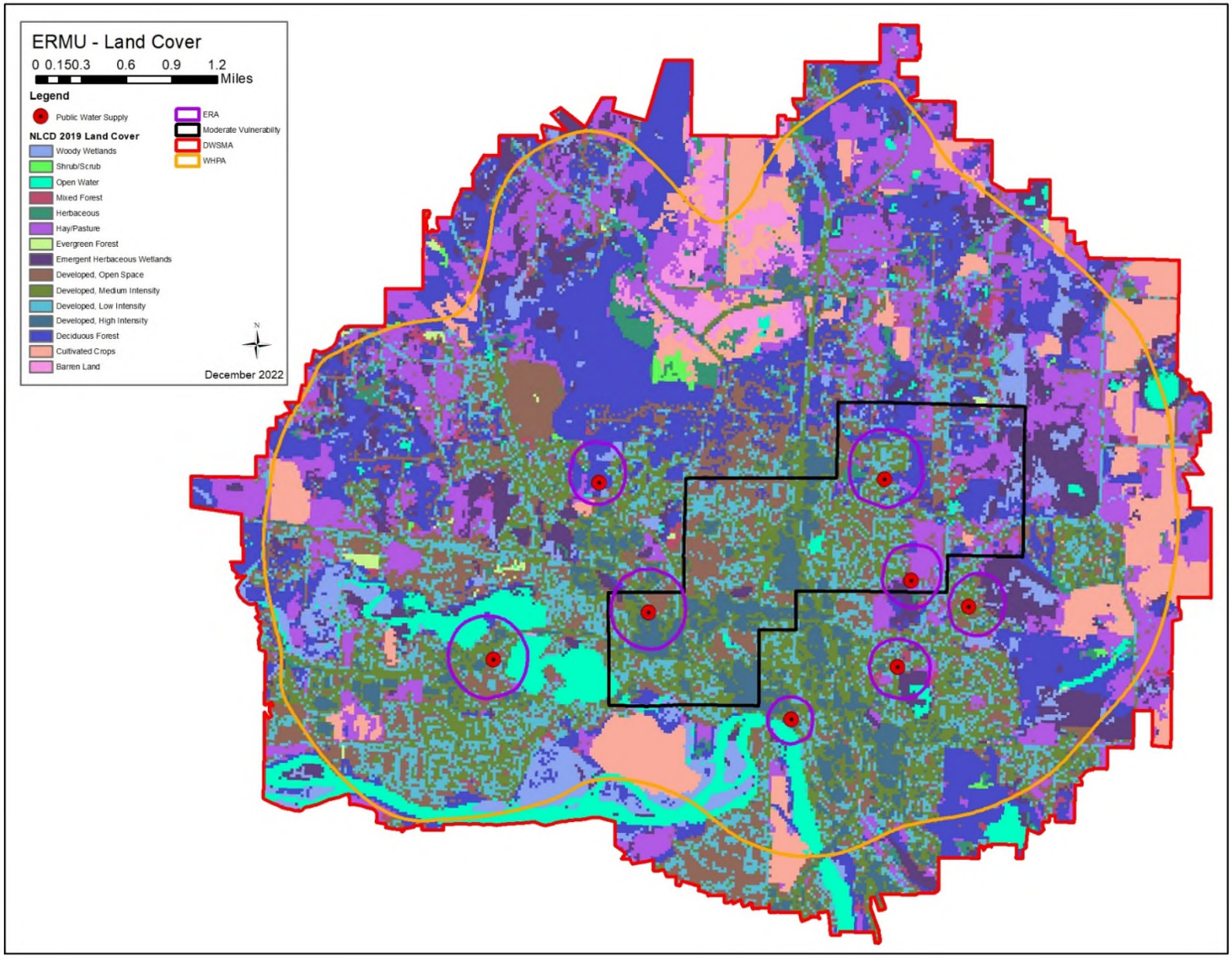


Figure C1

2019 National Land Cover Data for the ERMU DWSMA

Land Cover - DWSMA	% of area	Acres
Open Water	4.94%	853.04
Developed, Open Space	12.25%	2,115.77
Developed, Low Intensity	11.64%	2,009.49
Developed, Medium Intensity	11.43%	1,973.18
Developed, High Intensity	4.53%	782.80
Barren Land	1.67%	288.68
Deciduous Forest	18.33%	3,164.79
Evergreen Forest	0.21%	36.86
Mixed Forest	0.78%	135.02
Shrub/Scrub	0.21%	37.07
Herbaceous	1.31%	226.05
Hay/Pasture	13.76%	2,376.31
Cultivated Crops	7.66%	1,322.92
Emergent Herbaceous Wetlands	7.29%	1,258.14
Woody Wetlands	3.98%	686.89
Total		**17,268**

Land Cover - Moderately Vulnerability	% of area	Acres
Open Water	1.28%	24.49
Developed, Open Space	19.86%	378.86
Developed, Low Intensity	19.21%	366.45
Developed, Medium Intensity	21.14%	403.33
Developed, High Intensity	12.62%	240.87
Barren Land	0.00%	0.00
Deciduous Forest	10.56%	201.40
Evergreen Forest	0.01%	0.22
Mixed Forest	0.57%	10.88
Shrub/Scrub	0.00%	0.00
Herbaceous	0.46%	8.75
Hay/Pasture	7.94%	151.43
Cultivated Crops	0.18%	3.37
Emergent Herbaceous Wetlands	4.21%	80.36
Woody Wetlands	1.97%	37.58
Total		**1,908**

Land Cover - Low Vulnerability	% of area	Acres
Open Water	5.39%	828.55
Developed, Open Space	11.31%	1,736.91
Developed, Low Intensity	10.70%	1,643.05
Developed, Medium Intensity	10.22%	1,569.85
Developed, High Intensity	3.53%	541.92
Barren Land	1.88%	288.68
Deciduous Forest	19.29%	2,963.39
Evergreen Forest	0.24%	36.64
Mixed Forest	0.81%	124.14
Shrub/Scrub	0.24%	37.07
Herbaceous	1.41%	217.30
Hay/Pasture	14.48%	2,224.88
Cultivated Crops	8.59%	1,319.55
Emergent Herbaceous Wetlands	7.67%	1,177.78
Woody Wetlands	4.23%	649.31
Total		**15,360**

(Source: National Land Cover Data - 2019, U.S. Geological Survey)

Table C1

2019 National Land Cover Data for ERMU DWSMA

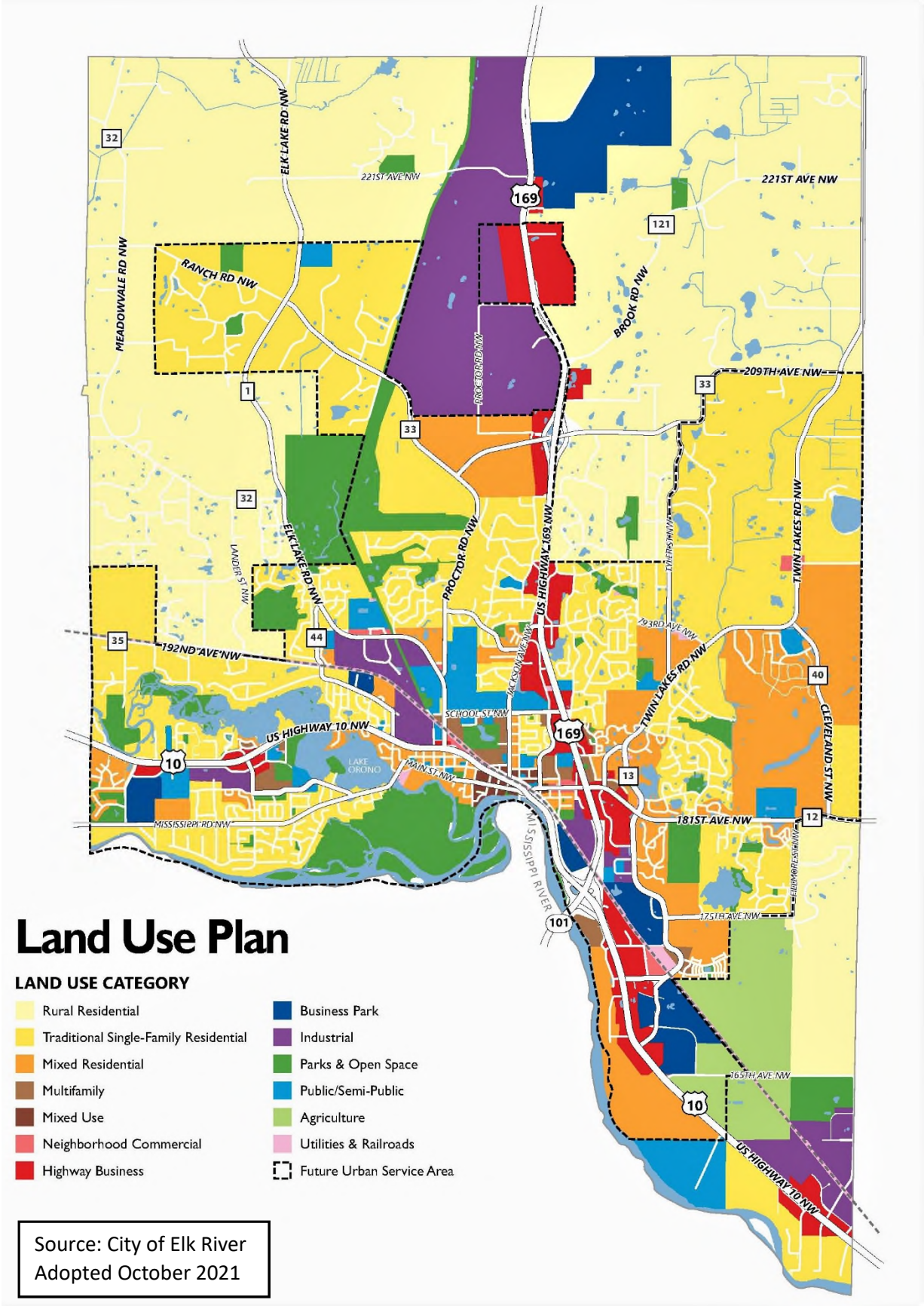
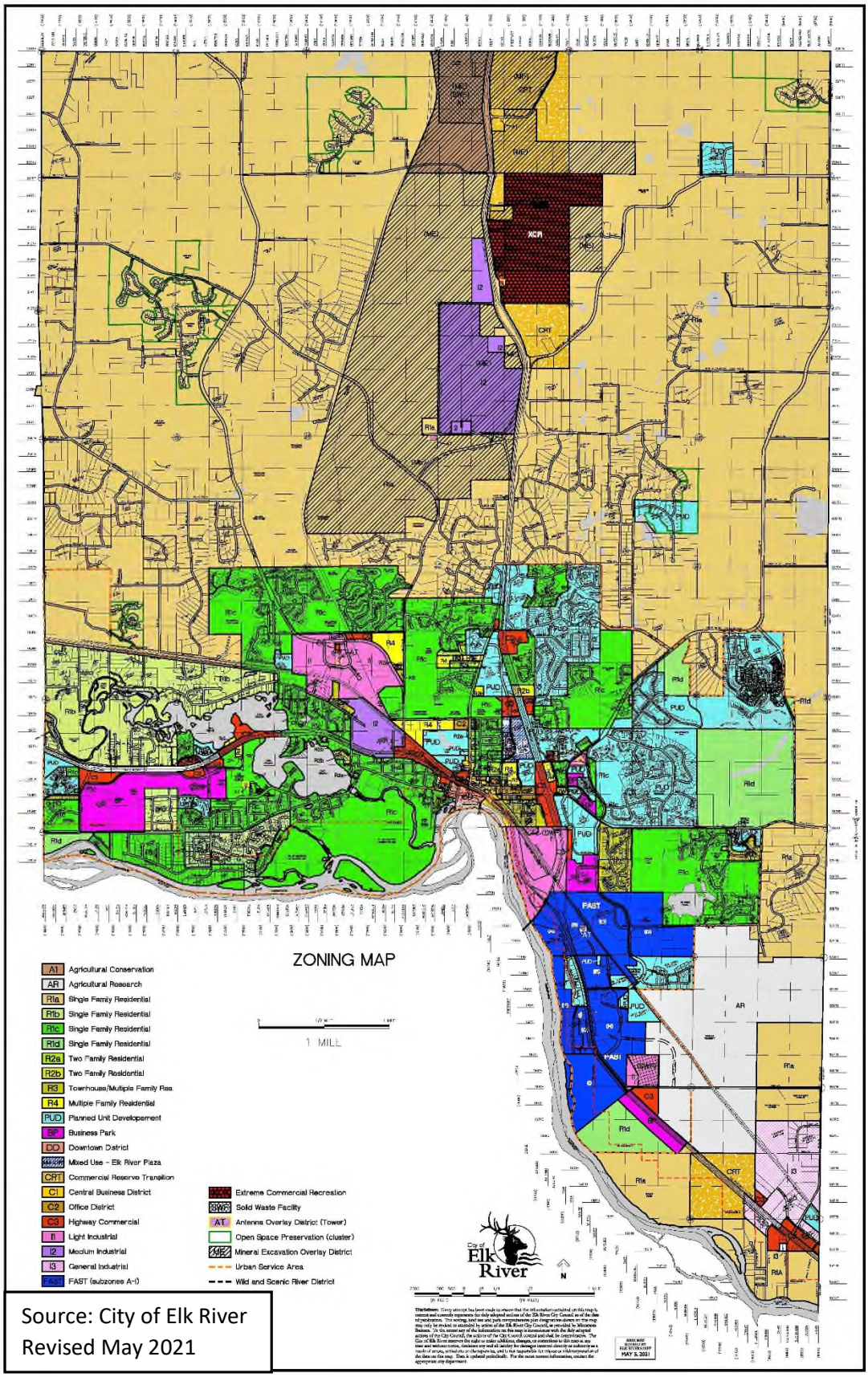


Figure C2

City of Elk River Land Use Plan



Source: City of Elk River
Revised May 2021

Figure C3

City of Elk River Zoning Map

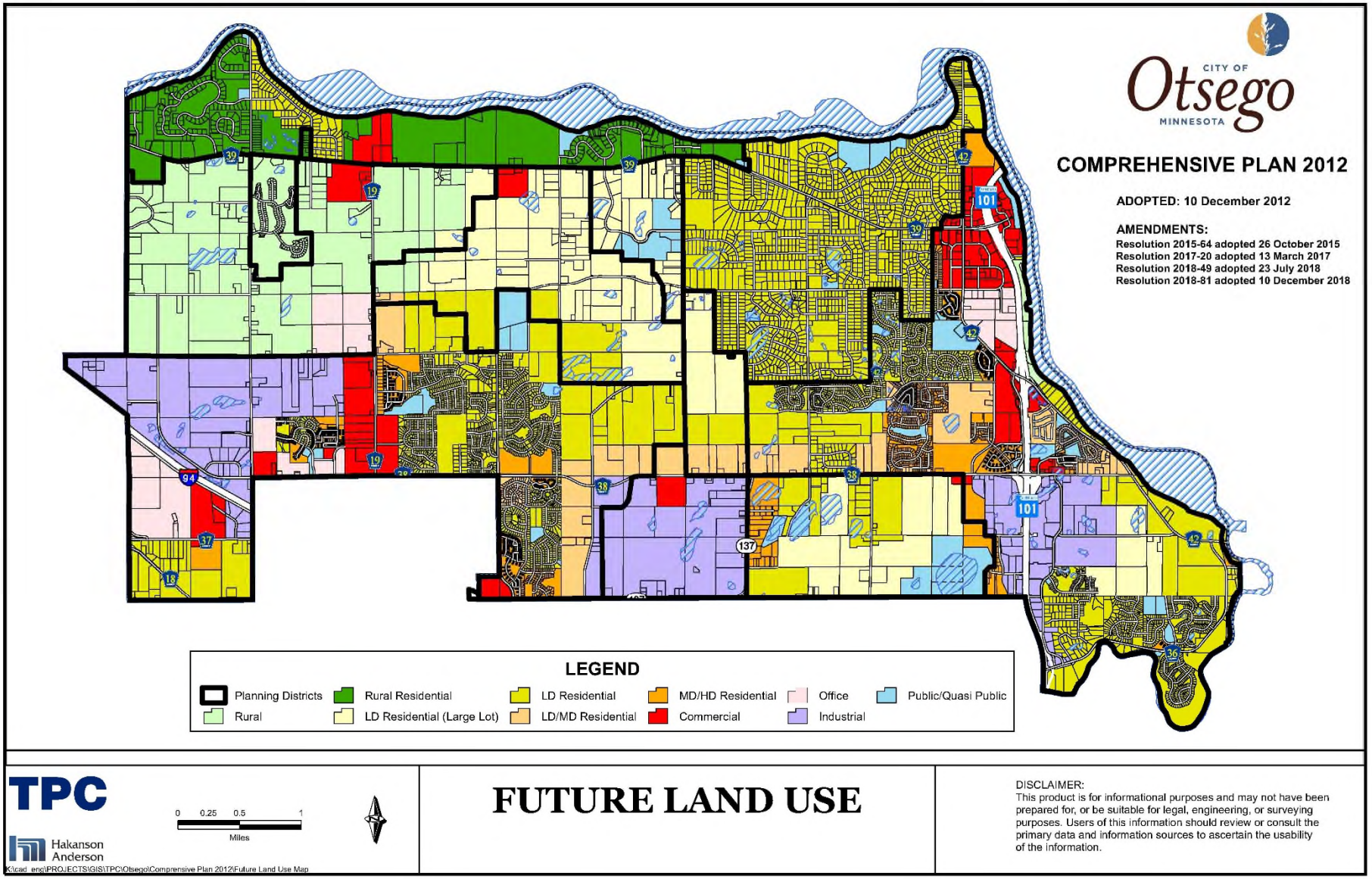


Figure C4

City of Otsego Future Land Use Map

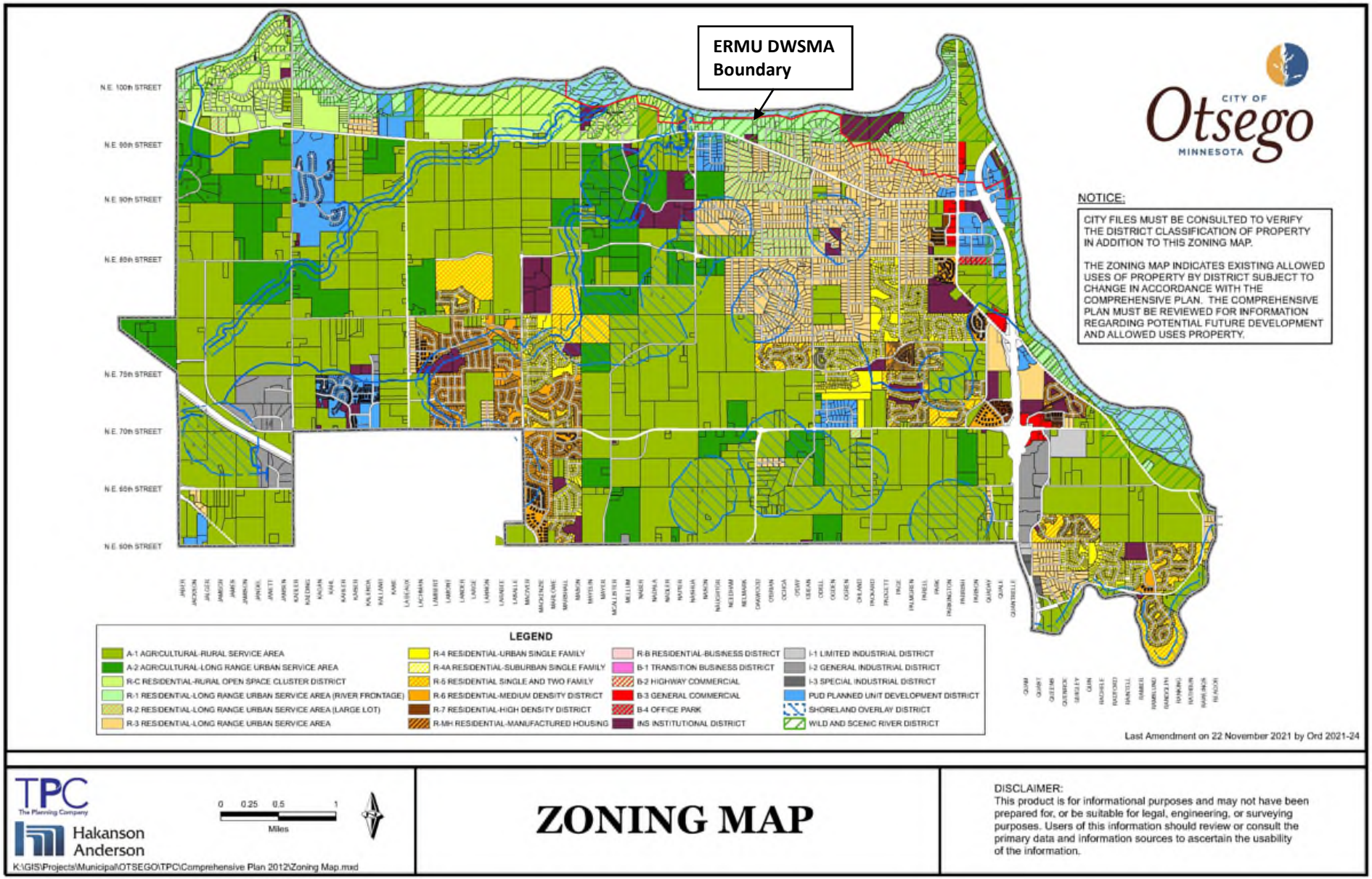


Figure C5

City of Otsego Zoning Map

(Approximate ERMU DWSMA Boundary outlined in red)

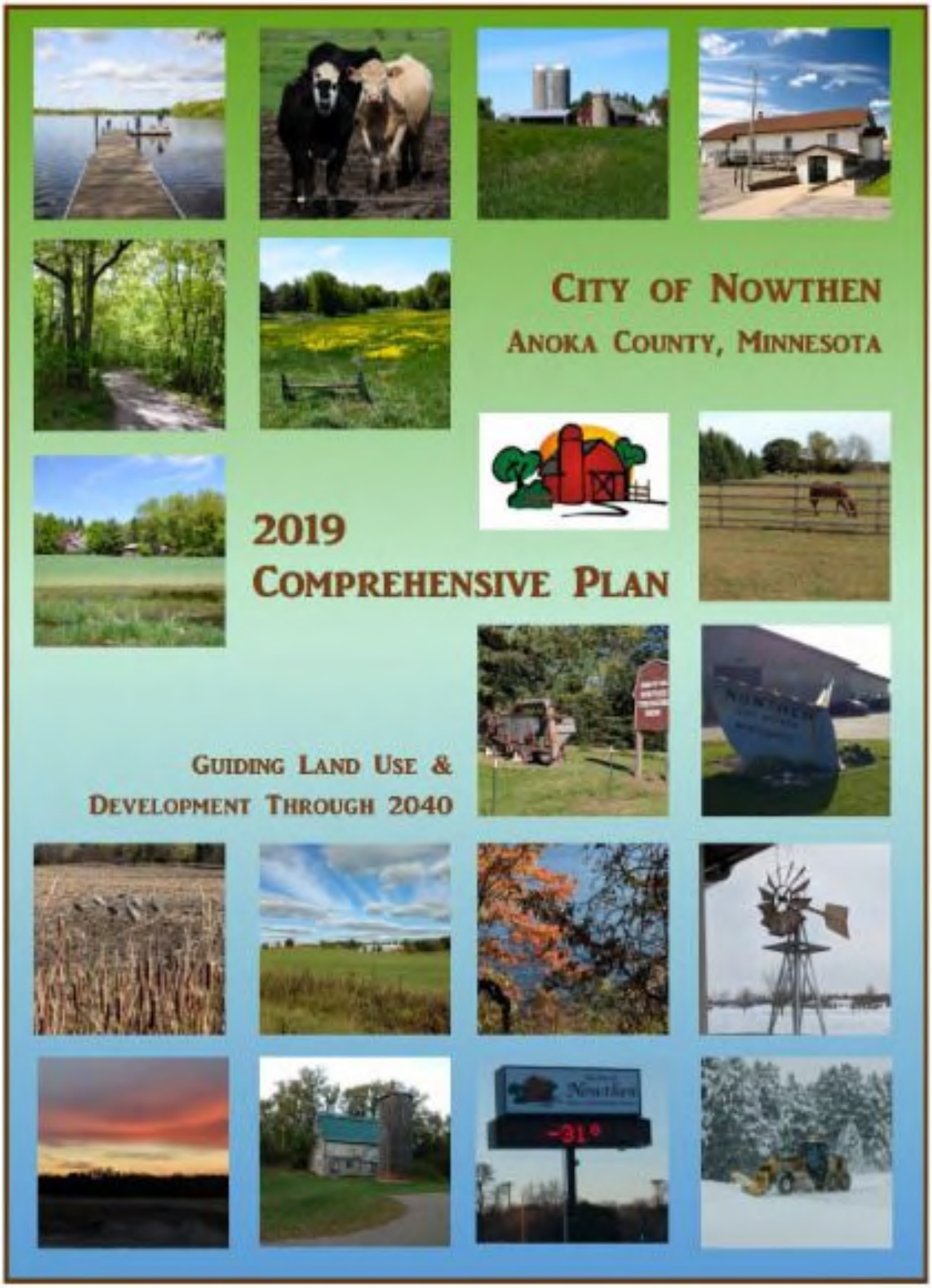


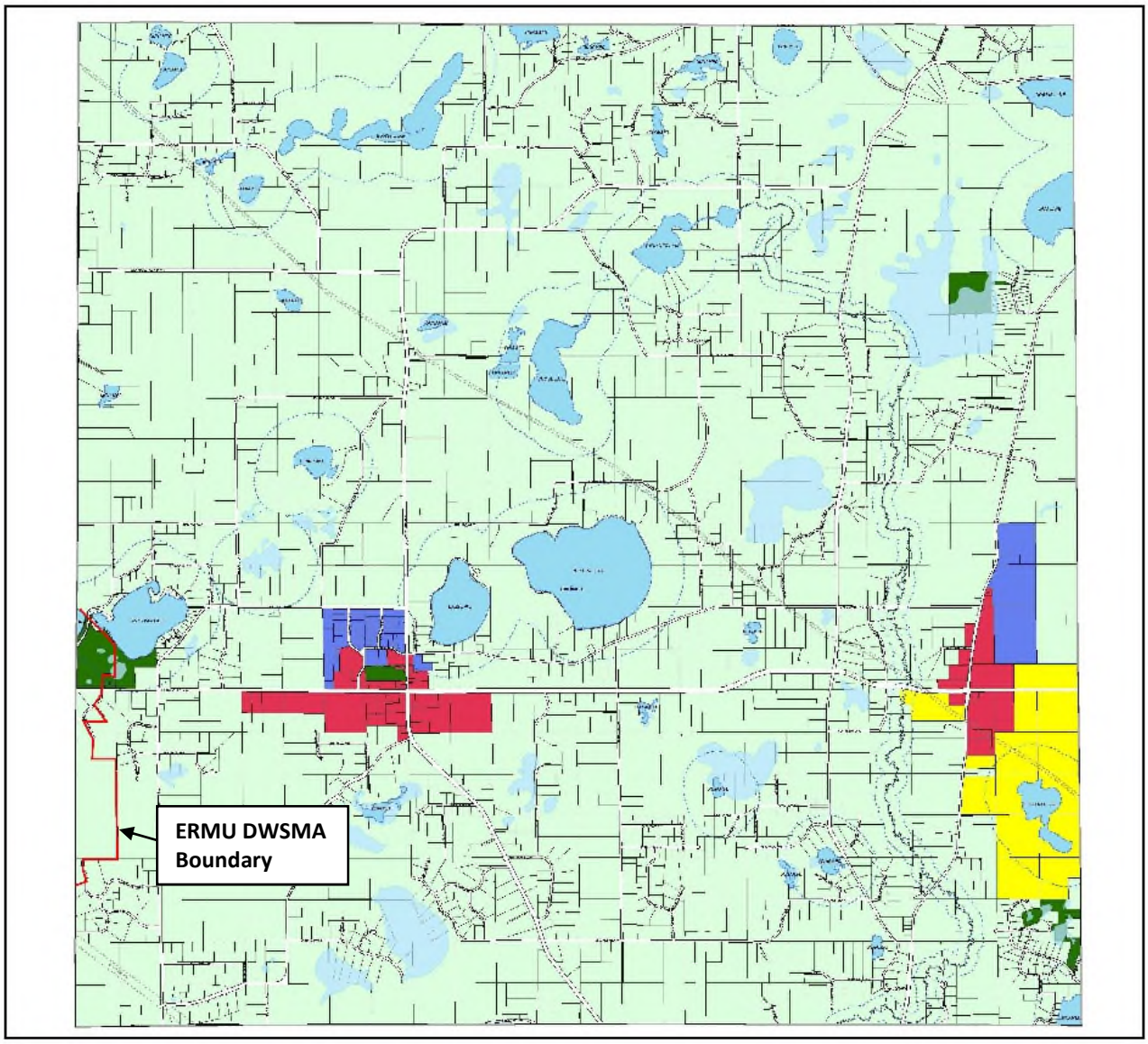
Figure C6

City of Nowthen Comprehensive Plan

NOTICE: City files must be consulted to verify the zoning classification of property in addition to this map.

CITY OF NOWTHEN

Zoning Map



ZONING MAP

- *C-1 - Commercial District (365 acres / 1.72%)*
- *I-1 - Industrial District (225 acres / 1.06%)*
- *CON - Conservancy District (156 acres / 0.74%)*
- *RRA - Rural Residential Agriculture (19,897 acres / 94.20%)*
- *RRT - Rural Residential Transition (478 acres / 2.26%)*
- *Shoreland Overlay District*

TPC The Planning Company

N

Figure C7

City of Nowthen Zoning Map

(Approximate ERMU DWSMA area outlined in red)

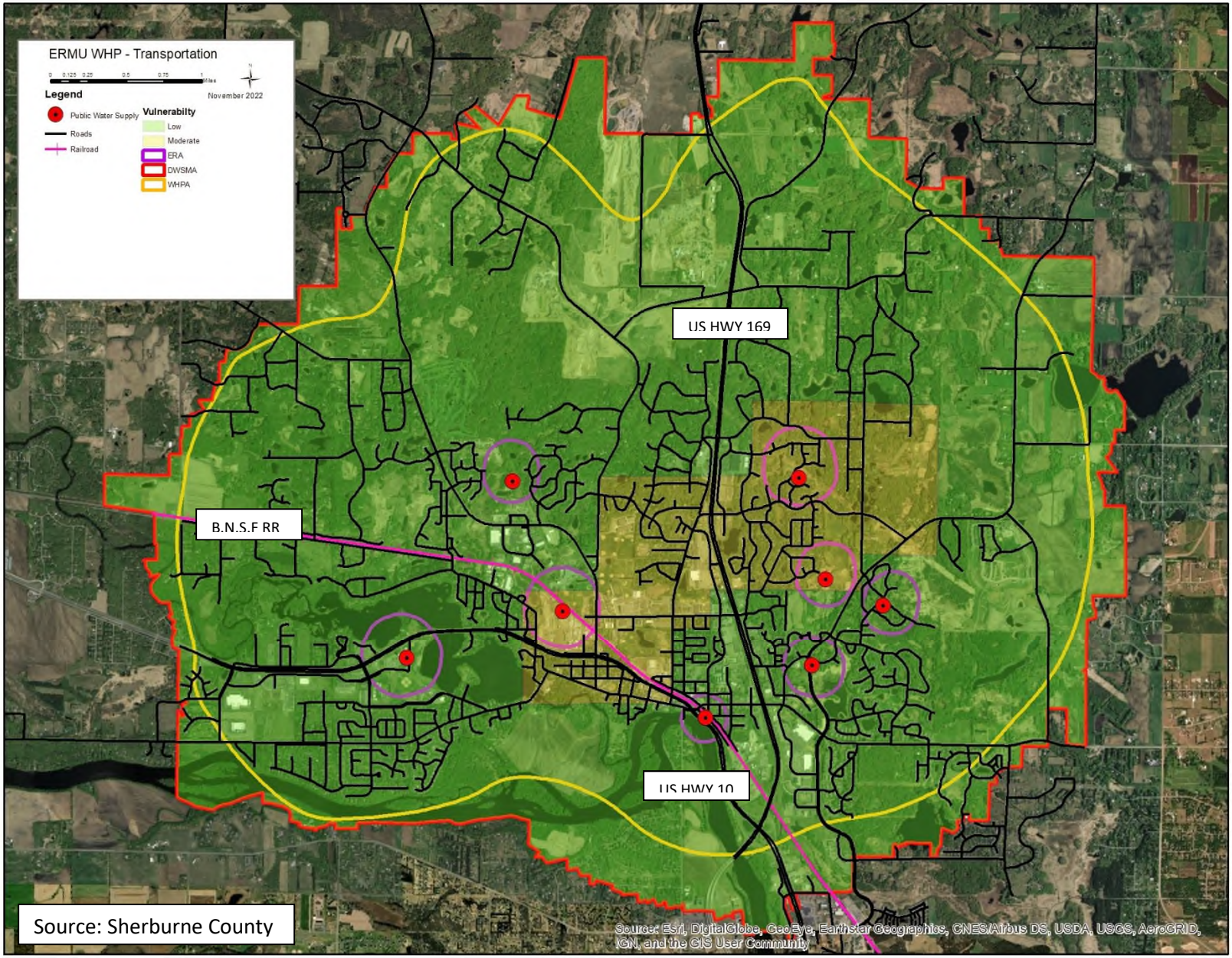


Figure C8

ERMU DWSMA Transportation Map

Exhibit D

Public Utility Services

Figures

Figure D1 - ERMU Sanitary and Stormwater Sewers in the Moderately Vulnerable Portion of the ERMU DWSMA

Figure D2 – Natural Gas and Hazardous Liquid Pipeline Map

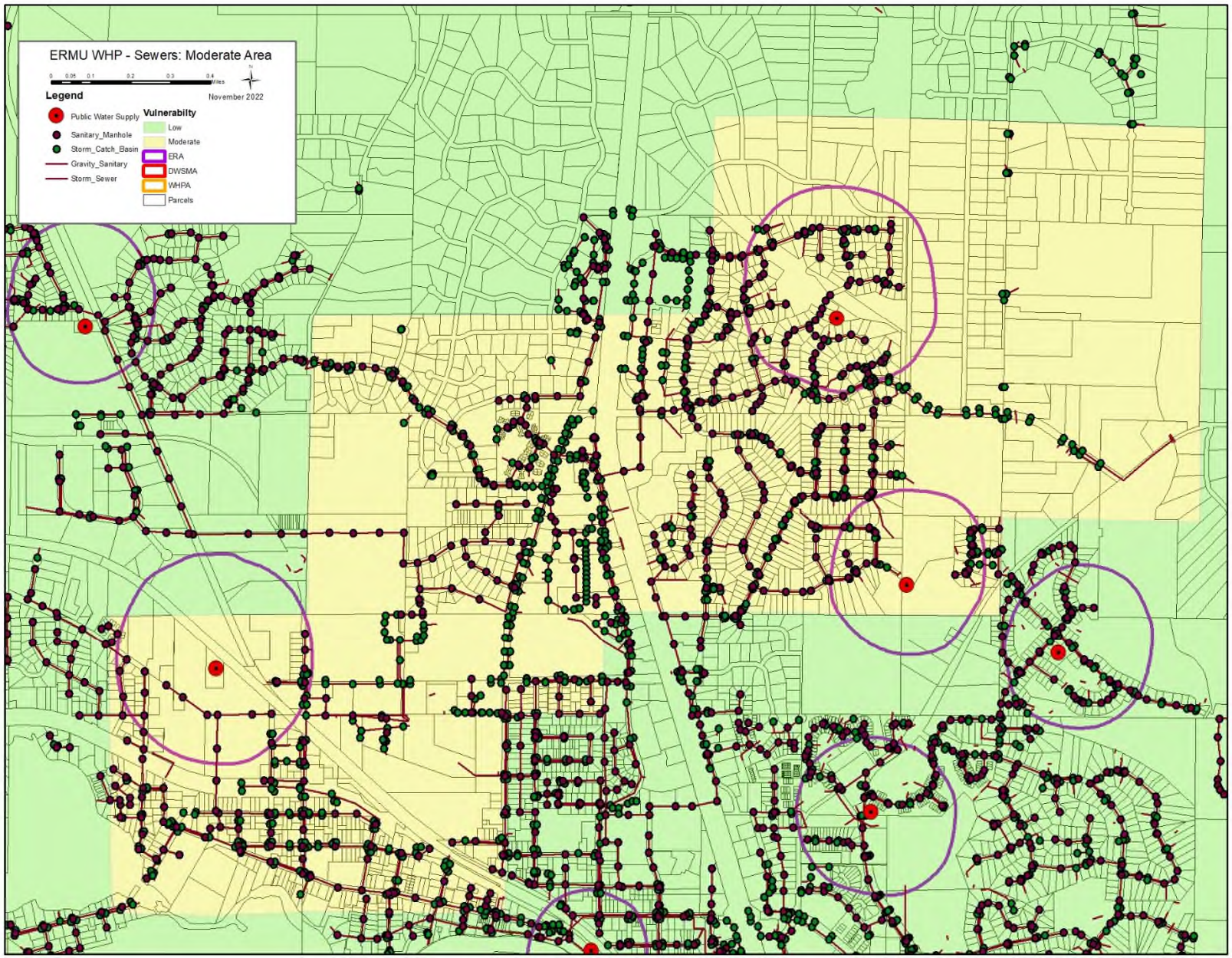


Figure D1

ERMU Sanitary and Stormwater Sewers in the Moderately Vulnerable Portion of DWSMA

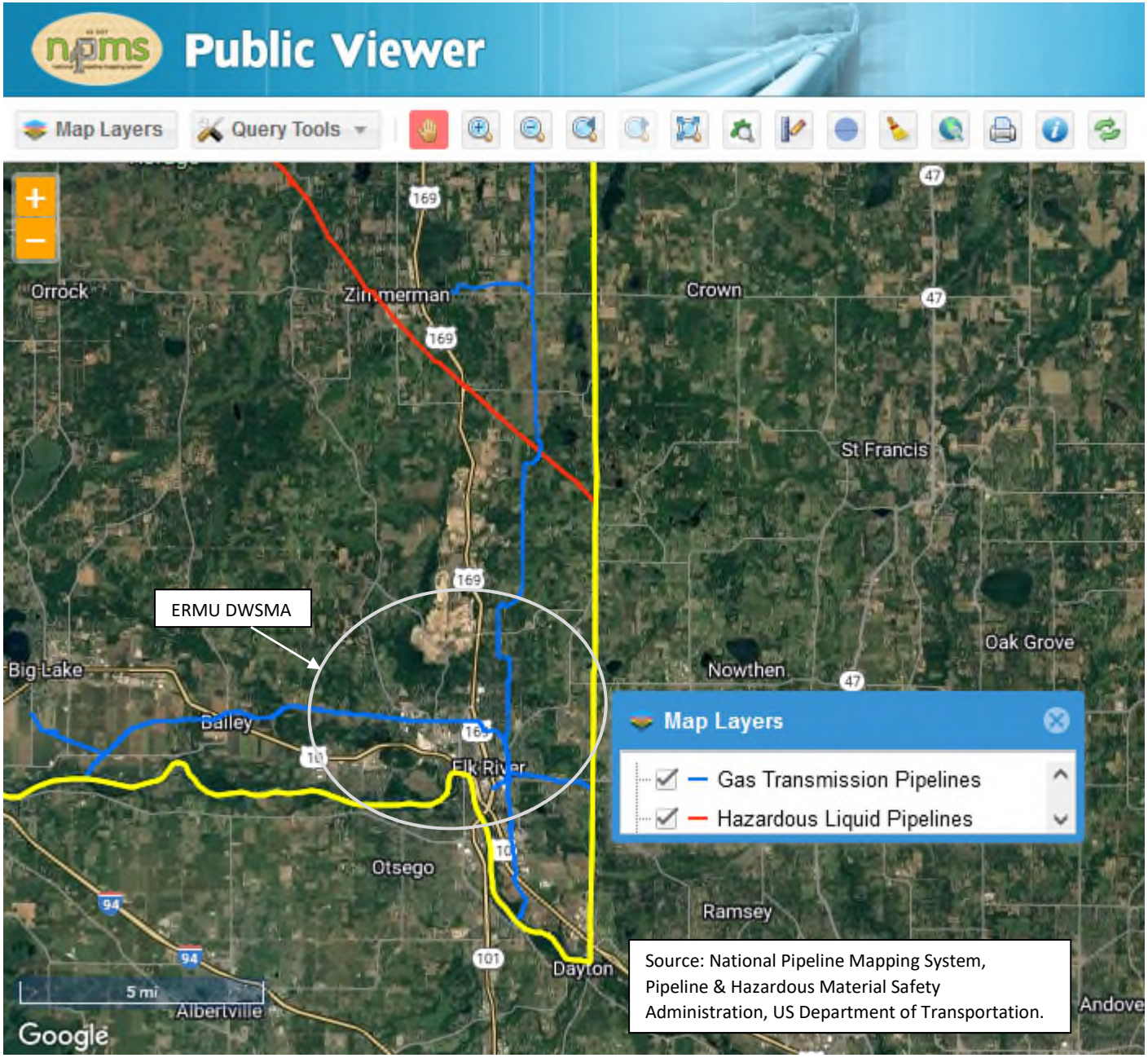


Figure D2
Natural Gas and Hazardous Liquid Pipelines
(Approximate ERMU DWSMA Boundary shown in white)

Exhibit E

Water Quantity and Water Quality Data

Exhibits

Exhibit E1 – Groundwater Quantity

Exhibit E2 – Groundwater Quality

Exhibit E1

Groundwater Quantity Data Elements

Tables

Figures

Permit #	Landowner	Status	Well #	Well Depth	Use Category	Resource	Resource Name
1961-0483	Elk River Country Club Inc	Active	247618	300	Non-Crop Irrigation	Groundwater	CMTS
1972-0366	Plaisted Companies, Inc.	Active	217941	603	Industrial Processing	Groundwater	CMTSPMHN
1972-0366	Plaisted Companies, Inc.	Active	217941	603	Special Categories	Groundwater	CMTSPMHN
1975-3205	AME Inc	Active	251818	80	Industrial Processing	Groundwater	
1975-3215	Elk River Municipal Utilities	Active	217945	308	Water Supply	Groundwater	CECRCMTS
1975-3215	Elk River Municipal Utilities	Active	221176	315	Water Supply	Groundwater	CMTS
1975-3215	Elk River Municipal Utilities	Active	537682	405	Water Supply	Groundwater	CMTS
1975-3215	Elk River Municipal Utilities	Active	664852	341	Water Supply	Groundwater	CEMS
1975-3215	Elk River Municipal Utilities	Active	255153	292	Water Supply	Groundwater	CECRCMTS
1975-3215	Elk River Municipal Utilities	Active	481794	225	Water Supply	Groundwater	CMTS
1975-3215	Elk River Municipal Utilities	Active	580320	300	Water Supply	Groundwater	CECRCMTS
1975-3215	Elk River Municipal Utilities	Active	694499	390	Water Supply	Groundwater	CMTS
1975-3215	Elk River Municipal Utilities	Active	757624	454	Water Supply	Groundwater	CMTS
1977-3690	Moritz, Martin	Active		56	Agricultural Irrigation	Groundwater	
1979-3078	Elk River, City of	Active		0	Power Generation	Surface Water	Orono
1980-3169	Ind School District 728	Active	167972	500	Non-Crop Irrigation	Groundwater	CMTS
1991-3086	Barton Sand and Gravel Co.	Active	217977	615	Industrial Processing	Groundwater	CMTS
1991-3086	Barton Sand and Gravel Co.	Active	217977	615	Special Categories	Groundwater	CMTS
1994-3198	Elk River, City of	Active	497392	355	Non-Crop Irrigation	Groundwater	CIGLCMTS
1994-3200	Elk River, City of	Active	490075	37	Non-Crop Irrigation	Groundwater	QWTA
1997-3148	CST Companies, LLC	Active	624171	197	Industrial Processing	Groundwater	QBAA
1997-3148	CST Companies, LLC	Active	576789	475	Industrial Processing	Groundwater	CMSH
2007-0506	Baer Necessities LLC	Active	415954	148	Non-Crop Irrigation	Groundwater	CEMS
2009-0398	Ind School District 728	Active	413541	298	Non-Crop Irrigation	Groundwater	CMTS
2011-0314	Elk Run Village Condominium Assoc	Active	778611	200	Non-Crop Irrigation	Groundwater	QBAA
2020-3429	Trout Brook South Community Association	Active	779966	83	Non-Crop Irrigation	Groundwater	
2020-3431	Trout Brook South Community Association	Active	777993	67	Non-Crop Irrigation	Groundwater	
2020-3432	Trout Brook South Community Association	Active	779965	208	Non-Crop Irrigation	Groundwater	CWOC
2022-1187	Minnesota Department of Transportation - District 3B	Active		0	Water Level Maintenance	Groundwater	

Table E1-1

DNR Water Appropriation Permits in ERMU DWSMA

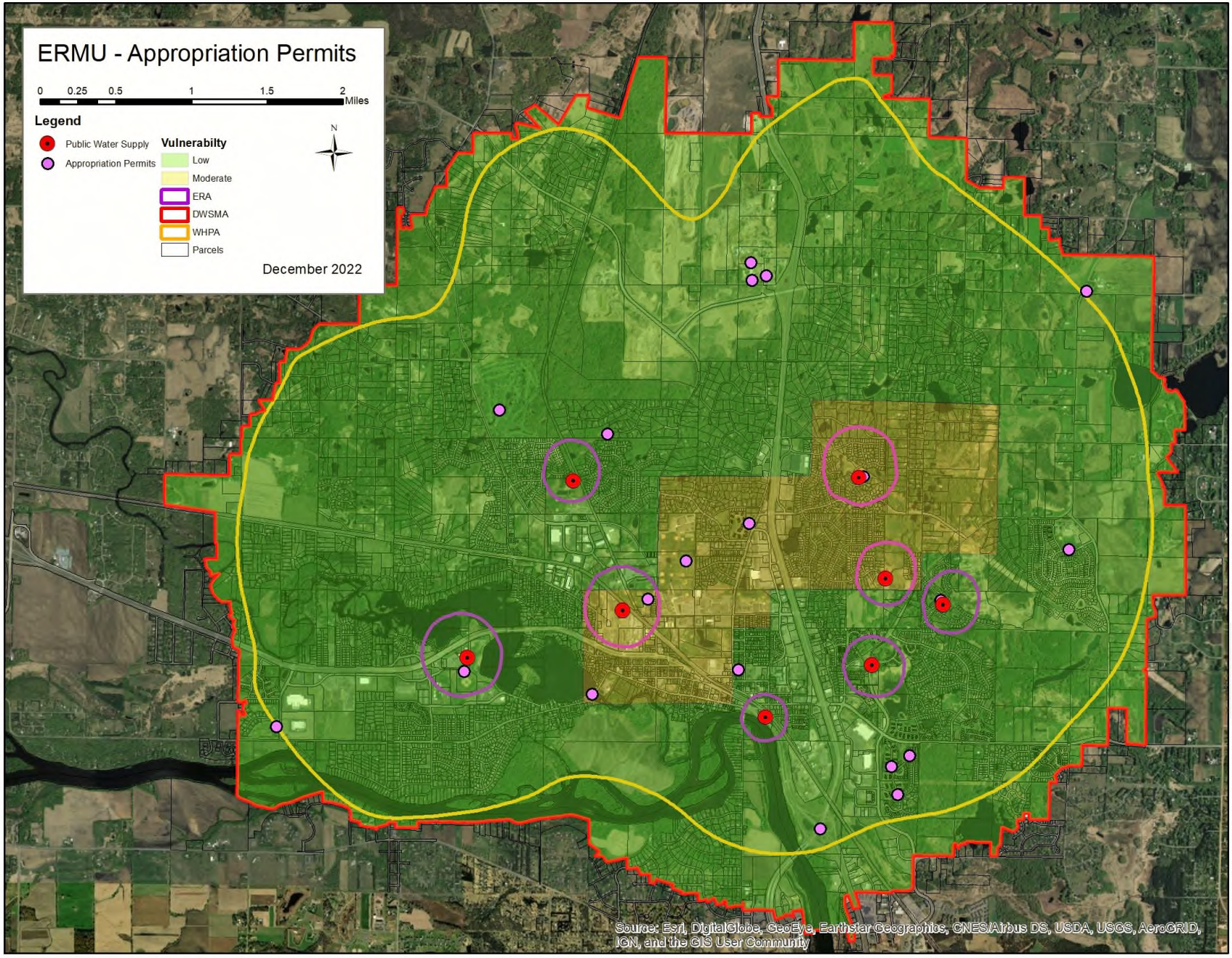


Figure E1

DNR Water Appropriation Permits in ERMU DWSMA

MPARS Permit ID	Local Well ID	Unique No.	2015	2016	2017	2018	2019	Highest annual rate from "5 most recent" selected years	Pumping Amount Used in Previous Delineation
1975-3215	2	255153	57.703	**61.584**	15.390	11.217	5.180	61.584	119.108 (2008)
1975-3215	3	221176	184.524	106.245	146.935	**187.908**	171.621	187.908	160.719 (2007)
1975-3215	4	481794	182.469	**212.577**	159.723	173.899	200.931	212.577	135.43 (2005)
1975-3215	5	537682	67.151	123.474	**177.245**	102.337	109.803	177.245	147.089 (2006)
1975-3215	6	580320	94.601	82.998	43.593	**102.444**	75.632	102.444	129.574 (2007)
1975-3215	7	664852	91.654	68.486	89.660	**114.283**	107.811	114.283	103.259 (2008)
1975-3215	8	694499	**107.128**	107.403	83.771	49.000	2.959	107.403	143.185 (2007)
1975-3215	9	757624	14.744	38.836	71.865	81.458	**104.658**	104.658	28.92 (projected)
TOTALS:			799.974	801.603	788.182	**822.546**	778.595	1068.102	967.284

(Expressed as millions of gallons. **Bold values** indicate highest annual rate from "**5 most recent**" selected years.) Source: MN Dep't. of Natural Resources Division of Waters - MNDNR Permitting and Reporting System (MPARS)

Table E1-2

Annual Volume of Water Discharged from ERMU Wells

(See Appendix A – Exhibit A and Appendix B – Exhibit B2 for additional information)

Exhibit E2

Groundwater Quality Data Elements

Tables

Table E2-1 – Isotope and Water Quality Results

Exhibits

Exhibit E2-1 – 2021 Consumer Confidence Report for ERMU

Well Name (Unique Number)	Tritium[1] (TU)	Nitrate (mg/L)	Chloride/ Bromide Ratio	Chloride (mg/L)	Bromide (mg/L)	Arsenic (µg/L)
Well #2 (255153)	< 0.8 Premodern Age	< 0.05	54	< 0.5	0.0092	< 1.0
Well #3 (221176)	1.1 Mixed Age	< 0.05	147	1.66	0.0113	< 1.0
Well #4 (481794)	< 0.8 Premodern Age	< 0.05	51	< 0.5	0.0098	< 1.0
Well #5 (537682)	4.5 Modern Age	1.5	702	17.2	0.0245	< 1.0
Well #6 (580320)	< 0.8 Premodern Age (sampled 2009)	0.38 (2020 treatment plant result)				< 1.0 (2015 treatment plant result)
Well #7 (664852)	< 0.8 Premodern Age (sampled 2009)	< 0.05 (2020 treatment plant result)				< 1.0 (2018 treatment plant result)
Well #8 (694499)	<0.8 Premodern Age	0.07	75	0.803	0.0107	< 1.0
Well #9 (757624)	< 0.8 Premodern Age (sampled 2013)	< 0.05 (2020 treatment plant result)				< 1.0 (2012 treatment plant result)

Table E2-1

Isotope and Water Quality Results

(From: MDH Amendment of the Wellhead Protection Plan, Part 1, 2021 – See Appendix B for further information)

Exhibit E2-1

2021 Consumer Confidence Report for ERMU

ANNUAL WATER QUALITY REPORT

Reporting Year 2021

Presented By

Elk River Municipal Utilities

PWS ID#: 1710004

We've Come a Long Way

Once again, we are proud to present our annual water quality report covering the period between January 1 and December 31, 2021. In a matter of only a few decades, drinking water has become exponentially safer and more reliable than at any other point in human history. Our exceptional staff continues to work hard every day—at all hours—to deliver the highest-quality drinking water without interruption. Although the challenges ahead are many, we feel that by relentlessly investing in customer outreach and education, new treatment technologies, system upgrades, and training, the payoff will be reliable, high-quality tap water delivered to you and your family.

Source Water Assessment

A Source Water Assessment Plan (SWAP) is now available at our office, or you may search "Elk River" at swareport.web.health.state.mn.us/SWA_Default.html. This plan is an assessment of the delineated area around our listed sources through which contaminants, if present, could migrate and reach our source water. It also includes an inventory of potential sources of contamination within the delineated area and a determination of the water supply's susceptibility to contamination by the identified potential sources. About 90 percent of our drinking water supply management area is considered non-vulnerable, and less than 10 percent is vulnerable. Our Wellhead Protection Plan has many items that address limiting or stopping potential contamination.

It is important to seal unused wells and contact your county or city to update records. Every unused well is a potential pipeline to contamination if left unsealed. The same goes for contaminants that are put on the ground or in water. Things that are absorbed into the ground or flow to a waterway percolate down to drinking water sources in variable time lines. This can affect our drinking water. Please use caution when using chemicals and getting rid of items that may affect the environment.

Where Does My Water Come From?

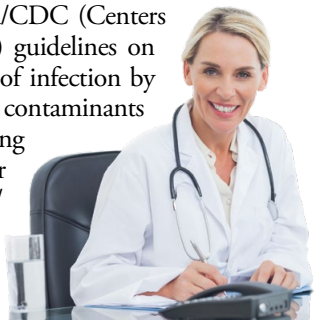
Elk River Municipal Utilities (ERMU) wells are supplied from the Mt. Simon-Hinckley Aquifer. Eight wells, four water towers, over 123 miles of water main, 1,289 fire hydrants, and just under 3,000 valves are maintained by ERMU. In 2021 ERMU pumped over 977 million gallons of water. We are proud to serve over 5,400 water customers.

Lead in Home Plumbing

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high-quality drinking water, but we cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at (800) 426-4791 or online at: www.epa.gov/safewater/lead.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) 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 (800) 426-4791 or online at: http://water.epa.gov/drink/hotline.



Questions?

For more information about this report, or for any questions relating to your drinking water, please call Elk River Municipal Utilities at (763) 441-2020. Visit www.ermumn.com if you'd like to view this report in a digital format.

Pressure Vacuum Breaker Devices – Inspections Free for Residential Customers

Pressure vacuum breaker (PVB) testing is now offered at no charge to our residential customers! Appointments are available for testing from late April until mid-October. The time line may be adjusted depending on the irrigation season, as freezing temperatures will not allow for systems to be operational. PVB devices are required to be tested annually by a backflow prevention-certified professional. We will test to be sure the device is working. If it is not, you will need to replace it or have the device repaired by a certified technician. These backflow prevention devices are required in every plumbing system that has an irrigation system. They are located on the outside of your home, likely where the irrigation line extends from the interior. You can book an appointment with ease online, or feel free to call our offices at (763) 441-2020.

What Is Backflow?

Backflow is the reversal of flow of nonpotable water, contaminants, or other substances into the treated drinking water system. Backflow could impact the quality of the water in homes, businesses, and other facilities, with the potential to create health hazards when the water is used for drinking, cooking, or bathing. Although these undesirable occurrences are rare, the effects on the community's health and safety can be significant. Most homes and businesses utilize backflow prevention devices to limit the risk of contaminating the community water supply. Some customers are required to install and maintain these devices on the main water service lines.

A loss of pressure within a plumbing system that has no backflow prevention device may allow water to be drawn back into the system and contaminate it. Consumption of the contaminated water could result in severe illness. In addition, once a plumbing system is contaminated, any contamination can be drawn into the community water supply and compromise the water for many others.

What Is a Backflow Prevention Assembly?

The mechanism designed to prevent backflow is known as a backflow prevention assembly. The most common of these mechanisms installed on irrigation systems are PVB or reduced pressure zone devices.

Backflow prevention devices are required on irrigation systems, and you may notice them alongside your house. The device protects you by preventing water that has been released into your irrigation system from being drawn back into the home, avoiding potential consumption in the case of a loss of system pressure.

If you have questions on backflow prevention, please contact HydroCorp at (844) HYDRO INFO (493-7646) with any questions regarding cross-connections and backflow prevention.

What Is a Cross-Connection?

Cross-connection refers to any connection between a potable (drinkable) water supply and nonpotable sources, including liquids, solids, and gases that could contaminate drinking water. Irrigation systems present a risk of contamination from stagnant water, lawn chemicals, or fertilizers.

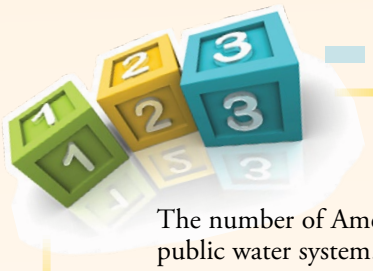
Water Main Flushing

We flush each hydrant annually to identify any operational issues, so that they may be repaired and functional in the event of an emergency. Distribution mains (pipes) convey water to homes, businesses, and hydrants in your neighborhood. The water entering distribution mains is of very high quality; however, water quality can deteriorate in areas of the distribution mains over time. Water main flushing is the process of cleaning the interior of water distribution mains by sending a rapid flow of water through the mains.

Flushing maintains water quality in several ways. For example, flushing removes sediments like iron and manganese. Although iron and manganese do not pose health concerns, they can affect the taste, clarity, and color of the water. Additionally, sediments can shield microorganisms from the disinfecting power of chlorine, contributing to the growth of microorganisms within distribution mains. Flushing helps remove stale water and ensures the presence of fresh water with sufficient dissolved oxygen and disinfectant levels and an acceptable taste and smell.

During flushing operations in your neighborhood, some short-term deterioration of water quality, though uncommon, is possible. You should avoid tap water for household uses at that time. If you do use the tap, allow your cold water to run for a few minutes at full velocity before use and avoid using hot water to prevent sediment accumulation in your hot water tank.

Please contact us if you have any questions or if you would like more information on our water main flushing schedule.



BY THE NUMBERS

The number of Americans who receive water from a public water system. **300 MILLION**

1 MILLION The number of miles of drinking water distribution mains in the U.S.

The number of gallons of water produced daily by public water systems in the U.S. **34 BILLION**

135 BILLION The amount of money spent annually on maintaining the public water infrastructure in the U.S.

The number of active public water systems in the U.S. **151 THOUSAND**

199 THOUSAND The number of highly trained and licensed water professionals serving in the U.S.

The age in years of the world's oldest water, found in a mine at a depth of nearly two miles. **2 BILLION**

Water Softening

ERMU does not treat our water for hardness. Our system has 16 grains per gallon. Feel free to contact us if you have any questions on the topic. Please be mindful that oversoftening water may cause corrosion.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, in some cases, radioactive material, and substances resulting from the presence of animals or from human activity. Substances that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

Pesticides and Herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and may also come from gas stations, urban stormwater runoff, and septic systems;

Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule, and the water we deliver must meet specific health standards. Here, we only show those substances that were detected in our water (a complete list of all our analytical results is available upon request). Remember that detecting a substance does not mean the water is unsafe to drink; our goal is to keep all detects below their respective maximum allowed levels.

The state recommends monitoring for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
2,4-D (ppb)	2017	70	70	0.25	NA	No	Runoff from herbicide used on row crops
Barium (ppm)	2018	2	2	0.02	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chlorine (ppm)	2021	[4]	[4]	0.79	0.69–0.87	No	Water additive used to control microbes
Fluoride (ppm)	2021	4	4	0.72	0.70–0.74	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Gross Alpha Particles (pCi/L)	2020	15.4	0	3.6	ND–3.6	No	Erosion of natural deposits
Haloacetic Acids [HAAs]–Stage 1 (ppb)	2021	60	NA	7.4	1.60–7.40	No	By-product of drinking water disinfection
Nitrate (ppm)	2021	10	10	1.7	ND–1.70	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [total trihalomethanes]–Stage 1 (ppb)	2021	80	NA	12.5	7.7–12.5	No	By-product of drinking water disinfection

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH %ILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2019	1.3	1.3	0.28	1/30	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2019	15	0	1.8	0/30	No	Lead service lines; Corrosion of household plumbing systems, including fittings and fixtures; Erosion of natural deposits

UNREGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Manganese (ppb)	2019	0.41	ND–0.81	NA
Sodium[1] (ppm)	2021	3.58	3.40–3.58	NA
Sulfate (ppm)	2021	7.76	2.95–7.76	NA

[1] In-home water softening can increase the level of sodium in your water.

Definitions

90th %ile: The levels reported for lead and copper represent the 90th percentile of the total number of sites tested. The 90th percentile is equal to or greater than 90% of our lead and copper detections.

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

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.

NA: Not applicable.

pCi/L (picocuries per liter): A measure of radioactivity.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

Appendix B

Part 1
Wellhead Protection Plan
for
Elk River Municipal Utilities

Exhibits

Exhibit B1

Wellhead Protection Plan Part 1 – Elk River Municipal Utilities
Bolton & Menk, Inc. (2011)

Exhibit B2

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 Elk River Municipal Utilities.
Minnesota Department of Health (March 2021)

Exhibit B1

Wellhead Protection Plan Part 1 – Elk River Municipal Utilities

Bolton & Menk, Inc. (2011)

BOLTON & MENK, INC.

Consulting Engineers & Surveyors

Well Head Protection Plan Part 1
Elk River Municipal Utilities

Bolton & Menk, Inc.
7533 Sunwood Drive NW
Suite 206
Ramsey, MN 55303

M21.101953

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APPENDICES

1.0 PUBLIC WATER SUPPLY PROFILE

The following persons are the contacts for the ERMU Wellhead Protection Plan

1.1. WELLHEAD PROTECTION MANAGER

Ms. Angela Hauge
Water Operator
13069 Orono Parkway
P.O. Box 430
Elk River, Minnesota 55330-0430
Telephone: 763.441.2020
Email: ahauge@elkriverutilities.com

Mr. Dave Berg
Water Superintendent
13069 Orono Parkway
P.O. Box 430
Elk River, Minnesota 55330-0430
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1.2. WELLHEAD PROTECTION PLAN CONSULTANT

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2.0 INTRODUCTION

Bolton & Menk, Inc. (BMI) was retained by the Elk River Municipal Utilities (ERMU) to assist in the update and development of its Wellhead Protection Plan for its public water supply (Public Water Supply Identification Number 1710004). The ERMU is responsible for the public water supply system serving the City of Elk River located in Sherburne County, Minnesota. The location of the city is shown in Figure 1 and the ERMU municipal wells are depicted in Figure 2.

This report is Part I of the Wellhead Protection Plan. Its contents have been completed in accordance with the Minnesota Department of Health (MDH) Wellhead Protection Rules (MN Rules Chapter 4720). The rules are based on the legal mandates from the 1986 and 1996 federal Safe Drinking Water Act, and the 1989 Minnesota Groundwater Protection Act.

2.1. PURPOSE AND SCOPE

The goal of Minnesota's wellhead and source water protection program is to prevent human-derived contaminants from entering the source waters used for public water supplies. The ERMU has initiated this update to its Wellhead Protection Plan (WHPP) because it has been more than 10 years since the initial WHPP was completed, and the ERMU has constructed three (3) additional municipal wells since the last WHPP was approved.

This report addresses the extent of the 20-year capture zones and the vulnerability of the eight (8) active existing ERMU public water supply wells.

Specifically, this Plan summarizes the approach and results of delineating the Wellhead Protection Areas (WHPAs) and Drinking Water Supply Management Area (DWSMA) for Municipal Well Numbers 2-9 (Unique Well Nos. 255153, 221176, 481794, 537682, 580320, 664852, 694499, 757624, respectively). Municipal Well 1 (Unique Well No. 108513) was properly sealed in 1996 due to formation caving and resulting sand issues.

In addition, this WHPP includes vulnerability assessments for the ERMU public water supply wells and their corresponding DWSMA.

2.2. BACKGROUND

The original Wellhead Protection Area Delineation report for the Elk River public water supply system (Part I Wellhead Protection Plan) was completed in October 1999. The initial Plan included Municipal Wells 2-6. Part II of the Wellhead Protection Plan was completed by the ERMU and was dated November 1, 2001.

After Municipal Well 7 was constructed, an amendment to the ERMU Wellhead Protection Area Delineation report was completed in 2002. Presently, the ERMU has until June 12, 2012 to complete the updates for Parts I and II of its Wellhead Protection Plan.

A scoping meeting for the update to the Elk River Wellhead Protection Plan was held on November 10, 2009. The MDH Scoping Decision Notice No. 1 letter (Scoping Document) was dated December 17, 2009. The ERMU mailed a Notice of Plan Development Letter to neighboring communities on January 14, 2010. The required pre-delineation meeting was held between MDH staff and BMI staff on October 1, 2010.

2.3. CHANGES SINCE THE PREVIOUS WELLHEAD PROTECTION PLAN

Since the 2001 and 2002 Wellhead Protection Plan, the following events have occurred and work has been conducted:

- Public Water Supply Wells 8 and 9 were constructed
- Pumping tests were performed on Wells 7, 8, and 9
- Samples were collected from the public water supply wells and analyzed for tritium
- Geologic and hydrogeologic studies by the Minnesota Geological Survey were completed for the region.

2.4. REQUIRED DATA ELEMENTS

In accordance with Minnesota Rule Chapter 4720.5400 and the December 17, 2009 MDH Scoping Document, the following sections discuss the required data elements for this Plan. In summary, the required data elements included geology, groundwater quantity, and groundwater quality. Only select portions of the land use, public utility services and surface water quantity data elements were required. The precipitation, soils, water resources and surface water quality data elements were not required for this Plan.

2.4.1. Physical Environment Data Elements

2.4.1.1. Precipitation

This data element was not required to be evaluated as part of this Plan due to the apparent hydrologic separation of the source water aquifer from surface waters. However, precipitation infiltration was considered in the groundwater flow model used to delineate the Wellhead Protection Areas (WHPAs).

2.4.1.2. Geology

The local and regional geologic and hydrogeologic conditions are assumed to influence the delineation of the Wellhead Protection Areas (WHPAs) for the public water supply wells. The local and regional hydrogeologic conditions of the Elk River area are discussed in detail in Section 3.0 of this Plan.

By characterizing these conditions, the geometry, location and magnitude of groundwater recharge and discharge areas, and groundwater flow directions of the source water aquifer could be determined. Through the use of public-domain well records and local and regional geologic studies and publications, the geology and hydrogeology of the area has been evaluated and reviewed for the WHPA delineations and vulnerability assessments. These resources have been provided by the MDH, the Minnesota Geological Survey (MGS), and the United States Geological Survey (USGS). The ERMU has no additional geologic information from logs, or borehole geophysical records from wells, borings, or exploration test holes, nor additional information from surface geophysical studies.

2.4.1.3. Soils

Since the bedrock source water aquifer utilized by the ERMU public water supply wells exhibits confined hydrologic conditions and is not in direct hydrologic connection with surface waters, soil characteristics and infiltration rates have not been evaluated as part of this Plan.

2.4.1.4. Water Resources

Since the bedrock source water aquifer is not under the direct influence of surface waters, major and minor watershed units and surface water bodies in the vicinity of the public water supply wells have not be reviewed in any detail for this Plan.

2.4.2. Land Use Data Elements

2.4.2.1. Land Uses

Figures have been included in this Plan that show parcel and political boundaries as well as public land surveys including township, range, and section boundaries. This information was primarily used to delineate the Drinking Water Supply Management Area (DWSMA) and determine whether the limits of the DWSMA cross political

boundaries. Specific land uses and zoning within and adjacent to the DWSMA should be reviewed, evaluated, and presented in Part II of the Plan.

2.4.2.2. Public and Private Utilities

Figures have been included in this Plan depicting the major transportation routes and corridors. Sanitary and storm sewer coverage and the possible presence of large-scale pipelines within the DWSMA will be examined in Part II of the Plan. In addition, high capacity wells in the Elk River area could significantly influence the local groundwater flow fields if they pump from the source water aquifers. Therefore, high capacity wells other than the ERMU public water supply wells were evaluated when delineating the WHPAs.

Since other wells in the Elk River area likely influence the groundwater flow fields of the source water aquifer, private and public wells were evaluated and assessed in detail when delineating the WHPAs for the ERMU wells.

Specific information relating to the construction, maintenance, and use of the ERMU public water supply wells has been compiled, utilized, and presented in this Plan. This information was used in delineating the WHPAs and completing the vulnerability assessments.

2.4.3. Water Quality Data Elements

2.4.3.1. Surface Water Quantity

Since the bedrock source water aquifer used by the ERMU public water supply wells is not in direct hydraulic connection with surface waters, this data element was not extensively researched for this Plan. However, to the extent that local and regional surface water bodies influence the groundwater flow directions of the source water aquifer, indirectly provide recharge to underlying aquifers, and act as groundwater divides, surface water features were incorporated into the groundwater flow model used to delineate the Wellhead Protection Areas.

There are no known water-use conflicts between the pumping and use of the ERMU public water supply wells and surface water bodies. The pumping of the ERMU wells does not appear to impact or influence surface water levels.

2.4.3.2. Groundwater Quantity

The ERMU public water supply system currently utilizes one bedrock source water aquifer – the Mount Simon-Hinckley Aquifer. All eight (8) ERMU wells utilize this aquifer. This aquifer appears adequate to meet the growing water demand of the Elk River area. Currently, there are no known, groundwater-use conflicts between ERMU and other parties.

The ERMU has provided the 2005-2009 water use and pumping volume records as presented in this Plan to determine an appropriate discharge rate for the wells in the groundwater flow model used to

delineate the Wellhead Protection Areas. In addition, the ERMU has estimated its projected increase in public water supply demand and subsequent groundwater use for 2015.

The MGS/MDH County Well Index (CWI) database of wells and the Minnesota Department of Natural Resources (MNDNR) State Water Use Database System (SWUDS) were utilized as sources of information to identify and locate wells and their pumping rates that could potentially influence and affect the groundwater flow fields of the Mount Simon-Hinckley Aquifer and consequently the shape and geometry of the WHPAs. In addition, studies completed by the USGS, the MGS, the MNDNR, and the MDH have been reviewed and their information incorporated into delineating the WHPAs and performing the vulnerability assessments. Furthermore, the MDH provided an existing groundwater flow model for refinement and use in delineating the WHPAs.

2.4.4. Water Quality Data Elements

2.4.4.1. Surface Water Quality

Since the source water aquifer used by the ERMU public water supply system does not appear to be directly influenced by surface waters, the quality of local surface water bodies has not been evaluated and assessed for this Plan.

2.4.4.2. Groundwater Quality

Generally, the quality of the groundwater in the source water aquifer used by ERMU for public water supplies is good and free of harmful contaminants and pollutants. Water samples from the ERMU public water supply system are routinely collected and analyzed by the MDH as required under the Minnesota Public Water Supply Program and the federal Safe Drinking Water Act. The samples are tested for microorganisms, inorganic compounds, organic chemicals, pesticides and herbicides, and radioactive contaminants.

The ERMU public water supply system has always remained in full compliance with all state and federal drinking water regulations. The ERMU adds fluoride, chlorine, and polyphosphate to the public water supply as required. These additives reduce tooth decay, sanitize, and prevent the buildup of iron and manganese deposits in the system, respectively.

There are currently no issues related to the quality of ERMU's public water supply. A copy of the City's 2009 Drinking Water Consumer Confidence Report is provided on the ERMU website: (http://www.elkriverutilities.com/informationwaterreport.php).

Some Minnesota communities that rely on the Mount Simon-Hinckley Aquifer its water is high in radium; however, this does not appear to be the case in the ERMU wells.

3.0 PHYSIOGRAPHIC CONDITIONS

The resources and sources of information used to review, assess, and define the geologic and hydrogeologic conditions in the ERMU area are summarized in the References section of this Plan.

3.1. REGIONAL AND LOCAL GEOLOGY

The majority of unconsolidated deposits overlying bedrock in ERMU consist of glacier-derived or glacier-related sediments. These surficial sediments are typically comprised of clay-rich tills, sand and gravel terrace deposits, lake and organic deposits, and sandy river deposits (alluvium).

Generally, the depth to bedrock in the Elk River area ranges from 100-200 feet. According to the well records of the ERMU wells, bedrock was encountered at depths ranging from 90 to 253 feet.

The uppermost bedrock in the Elk River area is typically the Eau Claire Formation, a siltstone and shale with minor amounts of very fine to fine sandstone overlying the Mount Simon Sandstone. It is present and significantly thick (tens of feet thick) throughout most of Elk River. However, there appear to be areas in the Elk River area where buried bedrock valleys are present. In these valleys the Eau Claire Formation is likely thinner or may be absent.

The Mount Simon Sandstone contains varying amounts of siltstone and shale in the upper third of the formation, but the middle part consists of friable, medium- to coarse-grained sandstone and the lower 10-30 feet is silty, poorly sorted, and commonly pink or light red. The base of Mount Simon is very coarse-grained with pebble-sized grains of quartz. The underlying Hinckley Sandstone consists of thin-bedded to massive units of yellow to salmon and red or nearly white sandstone. The rock is well-sorted with cross-bedding and ripple marks common.

3.2. REGIONAL AND LOCAL HYDROGEOLOGY

In the Elk River area, there are interpreted to be two aquifers: the unconfined, shallow water table aquifer and the Mount Simon-Hinckley bedrock aquifer. These aquifers are hydrologically separated from each other by varying degrees.

Typically, groundwater flow in the water table aquifer is strongly influenced, controlled by, and connected to local surface water bodies. This unconfined and highly vulnerable aquifer is not typically capable of sustaining high-capacity wells, and its water quality is usually poor. Recharge to this aquifer comes primarily from the direct infiltration of precipitation.

The uppermost bedrock aquifer in the Elk River area is the Mount Simon-Hinckley Aquifer. It appears to be present throughout the Elk River area. Although comprised of two distinct bedrock formations, this aquifer is regionally defined as a single hydrogeologic unit. It is hydrologically separated from the overlying water table aquifer by the fine-grained Eau Claire Formation.

The Mount Simon-Hinckley Aquifer is the only source of water for the ERMU public water supply system. Based on static water level data obtained from the MGS/MDH CWI database for wells open to this aquifer, the generalized groundwater flow direction in this aquifer is southward toward the Mississippi River in the Elk River area. The water

quality of this aquifer is typically very hard and has high levels of radium in other areas of Minnesota.

Regional groundwater recharge to the Mount Simon-Hinckley Aquifer is derived from slow leakage through overlying bedrock formations and lateral recharge from outside of Elk River where the aquifer formations subcrop directly beneath glacial deposits or outcrops at the land surface. Some recharge to the aquifer may also come laterally from coarse-grained glacial deposits in areas where the aquifer may be truncated by bedrock valleys. The Mount Simon-Hinckley aquifer is interpreted to not be in direct hydrologic connection with surface waters in the Elk River area. However, water from these features will infiltrate the subsurface and recharge the aquifer slowly over time.

A third aquifer system is likely present in the region. This aquifer system consists of sand and gravel aquifers within the unconsolidated deposits above the bedrock, but hydrologically separated from the water table aquifer and the Mount Simon-Hinckley bedrock aquifer by clay deposits. These aquifers typically vary widely in lateral extent, thickness, and in hydrogeologic capability. There is no direct evidence that these buried sand and gravel aquifers are prolific in the Elk River area or within the immediate vicinity of the ERMU wells, and therefore, for the purposes of this Wellhead Protection Plan, their presence and hydrologic influence have not been addressed.

4.0 WHPA AND DWSMA DELINEATIONS

4.1. 4.1 DATA ELEMENTS ASSESSMENT

4.1.1. ERMU Wells and Public Water Supply

ERMU currently has eight (8) public water supply wells to serve the city of Elk River. All eight wells are open to and utilize the Mount Simon-Hinckley Aquifer. The locations of these wells are shown on Figure 1 and the construction details for the wells are summarized in Table 1. Copies of the MDH well records for the wells are provided in Appendix A, and a summary of the annual groundwater production and use from 2005-2009 is provided as Table 2.

The population of Elk River is likely to continue increasing and the demand for public water is expected to increase approximately 1% over the next five years. The increased demand for public water supplies is expected to be met by the newest ERMU well (Well 9). The existing ERMU public water supply system should be capable of meeting this additional future demand, but may need to construct additional public water supply wells in the next 10 years or during the life of this Plan.

4.1.2. Wellhead Protection Area Criteria

The following sections discuss in detail the criteria used to delineate the Wellhead Protection Area (WHPA) for each of the ERMU public water supply wells, as specified in Minnesota Rules Chapter 4720.5510.

4.1.2.1. Time of Travel

The WHPAs for the public water supply wells have been delineated to a maximum 20-year travel time. The one-, five-, and ten-year travel time WHPAs have also been delineated and are shown in the figures.

Table 1
Municipal Well Details

Well No.	Unique Well No.	Year Constructed	Easting	Northing	Aquifer Formation(s) Utilized	Total Depth (ft)	Casing Depth (ft)	Casing Diameter (in)	Capacity (GPM)	Status	Well Vulnerability	Aquifer Vulnerability
2	255153	1948	455900.8	5016638	Eau Claire-Mt. Simon	290	136	16	650	Primary	Not Vulnerable	Low
3	221176	1974	454382	5017775	Mt. Simon	315	201	16	1,000	Primary	Not Vulnerable	Low
4	481794	1992	452724.5	5017274	Mt. Simon	225	197	18	1,000	Primary	Not Vulnerable	Low
5	537682	1994	456939	5019206	Mt. Simon	406	316	18	1,000	Primary	Vulnerable*	Moderate
6	580320	1999	453851	5019159	Mt. Simon	300	212	18	1,000	Primary	Not Vulnerable	Low
7	664852	2001	457031.4	5017196	Mt. Simon	341	240	18	1,000	Primary	Not Vulnerable	Low
8	694499	2004	457176.6	5018116	Mt. Simon	390	265	18	1,000	Primary	Not Vulnerable	Low
9	757624	2008	457790.3	5017838	Mt. Simon-Hinckley	454	296	18	600	Primary	Not Vulnerable	Low

Notes: Locations in UTM Zone 15 NAD 83 coordinates (meters)
GPM - gallons per minute
* 10.6 TU of tritium detected in December 2009

4.1.2.2. Hydrologic Flow Boundaries

As discussed in Section 3.2, recharge to the Mount Simon-Hinckley source water aquifer occurs via downward and lateral leakage of groundwater from water-bearing overlying and adjacent geologic deposits. The main local flow boundaries used in the groundwater flow modeling related to surface water features are Orono Lake, the Elk River and the Mississippi River.

The pumping of wells other than the ERMU public water supply wells can influence the groundwater flow field of the Mount Simon-Hinckley Aquifer. High capacity wells near the public water supply wells were considered during the delineation of the WHPAs. The MNDNR SWUDS was used to identify, locate, and quantify high capacity wells in the Elk River area that were then incorporated into the groundwater flow modeling. Table 3 in this Plan summarizes these wells, the related permitted volumes, and their historical groundwater withdrawal volumes.

4.1.2.3. Daily Volumes

The historical (2005-2009) and projected (2015) pumping volumes for each of the public water supply wells are summarized in Table 2. The historical data was provided by the ERMU, the MDH, and MNDNR SWUDS. The projected volumes were based on ERMU estimates and historical water use trends. The highest annual volumes for each well are highlighted in the table. These volumes were converted to pumping rates and used in the groundwater flow modeling to delineate the WHPAs.

4.1.2.4. Groundwater Flow Field

There are few available resources or publications documenting the groundwater flow fields of the Mount Simon-Hinckley Aquifer in the Elk River area. Groundwater level data suggest the regional flow of the Mount Simon-Hinckley Aquifer is toward the Twin Cities. The groundwater flow field of the Mount Simon-Hinckley Aquifer appears to be southward in the Elk River area and this flow field direction was simulated in the groundwater flow modeling used to delineate the WHPAs.

Table 2
Ground Water Production and Use

Well No.	Unique Well No.	2005 (MG)	2006 (MG)	2007 (MG)	2008 (MG)	2009 (MG)	Average (MGY)	2015 Projected* (MGY)	Highest (gal/day)	Highest** (m^3/day)
2	255153	44.728	93.94	106.948	119.108	70.106	86.97	86.97	326,323	1,235
3	221176	92.892	145.505	160.719	154.108	107.5	132.14	132.14	440,326	1,667
4	481794	135.43	96.309	122.265	105.371	112.364	114.35	114.35	371,041	1,404
5	537682	140.52	147.089	109.419	114.321	123.305	126.93	126.93	402,984	1,525
6	580320	124.238	121.031	129.574	110.467	117.929	120.65	120.65	354,997	1,344
7	664852	67.886	85.367	101.592	103.259	101.088	91.84	91.84	282,901	1,071
8	694499	109.238	123.319	143.185	121.916	127.908	125.11	125.11	392,288	1,485
9	757624	NA	NA	NA	20.568	22.751	21.66	28.92	79,232	300
	Total Volume Pumped (MGY)	714.93	812.56	873.70	849.12	782.95	819.65	826.91		

Notes: * Assumes total withdrawal increase of 7.26 MG above 2009 volumes to be met from Well 9
** Pumping rate used in the ground water flow modeling
NA - Not Applicable - Well not yet constructed
Shaded box indicates highest annual pumping volume

Table 3
Local and Regional High Capacity Wells

Facility	DNR Permit No.	Unique Well No.	T	R	S	Easting*	Northing*	Aquifer	Use	Permitted Volume (MGY)	2004 Usage (MGY)	2005 Usage (MGY)	2006 Usage (MGY)	2007 Usage (MGY)	2008 Usage (MGY)	5-yr Average (MGY)	Discharge to be Used in Modeling (m^3/day)
Barton Sand & Gravel	1972-0366	217941	33	26	15	455833	5021430	Mt. Simon	Gravel Washing	75.0	35.1	46.5	19.4	3.2	1.1	21.06	218
City of Elk River	2007-0506	415954	33	26	31	450690.5	5016537	Eau Claire-Mt. Simon	Golf Course	10.0	0	0	0	9.1	6.9	3.2	33

Notes: * Locations in UTM Zone 15, NAD 83 coordinates

Table 4
Regional Aquifer Transmissivity Estimates

Aquifer	Description	Location	Date	Executor	Transmissivity (ft^2/day)	Hydraulic Conductivity (ft/day)	Hydraulic Conductivity (m/day)	Hydraulic Conductivity (m/day) [4]
Mount Simon-Hinckley	Well 6 (24-hour test); Well 3 and 578941 observation wells	Elk River, MN	February 1999	MN Dept. of Health	4,500	9 - 11.3	2.7 - 3.4	
	Well 7 (24-hour, constant rate test); no observation wells	Elk River, MN	August 2001	ERMU	8,350	16.7 - 20.9 [3]	5.1 - 6.4	17.0
	Well 8 (24-hour, constant rate test); no observation wells	Elk River, MN	March 2004	ERMU	12,500	25 - 31 [3]	7.6 - 9.4	25.4
	Well 9 (28-hour, step test); no observation wells	Elk River, MN	March 2008	ERMU	8,300	16.6 - 20.8 [3]	5.1 - 6.3	16.9
Mount Simon-Hinckley	Well 7 (24-hour test)	Champlin, MN	September 1990	Rust Environment and Infrastructure[2]	2,540	18.7	5.7	
	Well 6 (24-hour test)	Anoka, MN	April 1998	MN Dept. of Health	1,870	11.2	3.4	
	EOR-K.Barr Report[1]	Anoka County	October 2000	Norvitch et al. (1973)	2,713	13.8	4.2	
	Well 5 Development (24-hour specific capacity test)	Cambridge, MN	June 2004	SEH Inc.	1,712	5.7	1.7	
	Wells 11 & 17 (48-hour test)	St. Louis Park, MN	October 2003	SEH Inc.	1,970	7.5	2.3	

Notes:
[1] These values were selected as most representative and were used in the Anoka County Deep Wells Model
[2] A copy was provided in the Andover 1996 Wellhead Protection Area Delineation Report
[3] Assumes an aquifer thickness of 400 or 500 feet
[4] Assumes an aquifer thickness of 150 feet

4.1.2.5. Aquifer Transmissivity

Aquifer pumping tests have been conducted for the Mount Simon-Hinckley Aquifer using ERMU Municipal Wells 6, 7, 8, and 9. The tests performed on Wells 7, 8, and 9 were only specific capacity tests and would not meet the MDH criteria for a comprehensive test. The results of these tests are summarized in Table 4 and the data provided in Appendix B. Several other aquifer pumping tests have been conducted in the region for the Mount Simon-Hinckley Aquifer. The results of these pumping tests are also summarized in Table 4.

The aquifer transmissivities and permeabilities derived from these tests were utilized in developing and refining the groundwater flow model to delineate the WHPAs. When the tests indicated a disparity in calculated values of the aquifer characteristics, a range of values were used in the modeling for the purpose of accounting for hydrogeologic variability and enveloping several possible hydrologic conditions and scenarios.

4.1.3. Issues Involving the Quantity and Quality of Groundwater Supplying the Public Water Supply Wells

Although the Mount Simon-Hinckley Aquifer is highly regulated and its use limited in the seven-county metropolitan area of the Twin Cities, it is a highly productive source of water and is capable of sustaining several high capacity wells in the Elk River area. There is currently no evidence that the quality of this aquifer has been impacted in the Elk River area, nor is its productivity diminishing over time. The public water supply for Elk River is routinely sampled and tested for contamination as regulated under the federal Safe Drinking Water Act. As discussed in Section 2.3.4.2, the ERMU's public water supply is currently free of contaminants, pollutants, and pathogens. The ERMU is unaware of any significant water-use conflicts between the public water supply system and other groundwater users or surface waters.

Currently, the ERMU exclusively depends upon the Mount Simon-Hinckley Aquifer for its public water supply source of water. All eight public water supply wells are open to this source water aquifer. Due to its typically low capacity, poor water quality, and very high sensitivity to pollution, the shallow water table aquifer is not a viable option for public water supply for Elk River. Should the Mount Simon-Hinckley Aquifer no longer be a viable source, surface waters (i.e. the Mississippi River and possibly the Elk River) could potentially be a source of public water supply for the ERMU to the Elk River community. However, the use of this resource would require expensive water treatment. There are no plans in the immediate future to use these resources for the public water supply.

The ERMU anticipates the potential need to construct additional public water supply wells within the next 10 years to meet the increasing demand for water as Elk River continues to grow. However, there are no immediate plans to construct additional wells at this time.

To lower the demand for public water supply and conserve water, the ERMU currently implements an increasing block structure for water use rates, has an

odd-even lawn watering restriction, and does not allow lawn watering between 10:00 a.m. and 6:00 p.m. In addition, the ERMU has a Smart Irrigation Rebate Program and provides information to the public regarding water and irrigation conservation tips through its website and billing correspondence.

4.1.4. Land and Groundwater Uses

Since the Mount Simon-Hinckley Aquifer is hydrologically separated from the water table aquifer and activities at the land surface, and it is not under the direct influence of surface waters, land uses near the public water supply wells and within the WHPAs are not a significant concern. Land uses and activities are assumed not to directly influence the delineation of the WHPAs. However, due to the high levels of tritium in Well 5, land uses will be an important consideration for managing portions of the DWSMA and will therefore, be reviewed and evaluated in detail for Part II of the Plan.

The pumping of other wells near the public water supply wells could influence the lateral extent and geometry of the WHPAs. As presented in Table 3, local high-capacity wells and privately-owned wells near the ERMU public water supply wells were incorporated into the groundwater flow model used to delineate the WHPAs.

4.2. CONCEPTUAL GROUNDWATER FLOW MODEL

The hydrogeologic conceptual model of the Mount Simon-Hinckley Aquifer in the Elk River area consists of a three-layer system. The upper layer consists of the unconsolidated glacial drift material above bedrock (the unconfined water table aquifer), the middle layer is the Eau Claire Formation, and the bottom, third layer represents the Mount Simon-Hinckley Aquifer.

The uppermost layer (Layer 1) is assumed to be unconfined. The lower two layers are assumed to be exhibiting confined hydrologic conditions; however, to varying degrees, groundwater leakage occurs between the layers through the top and bottom of the units. The groundwater leakage out of or into the base of the Mount Simon-Hinckley Aquifer from the deeper bedrock basement is assumed to be negligible and was not incorporated into the model. Regionally, the Mount Simon and Hinckley sandstones are considered one continuous aquifer with no resistance to groundwater flow between them.

In the model, the aquifers are assumed to be laterally continuous through the Elk River area with relatively consistent thicknesses. The groundwater flow direction in the Mount Simon-Hinckley aquifer was assumed to be southward.

4.3. GROUNDWATER FLOW MODELING

A computer-generated, steady-state, groundwater flow model was used and refined to delineate the WHPAs for the eight ERMU wells. The following sections describe in detail the methods, construction, development, refinement, calibration, and results of the three-layer groundwater flow model used for this Wellhead Protection Plan.

4.3.1. Methodology

Groundwater Vistas® software (Version 5) was utilized for the delineating the WHPAs for ERMU's public water supply wells. This pre-and post-processing software platform utilizes and enhances the EPA's, public-domain, MODFLOW groundwater flow modeling program. An existing MODFLOW model was provided to BMI by the Minnesota Department of Health (MDH) to use as a framework groundwater flow model for this Plan. This model was previously used for the initial ERMU Wellhead Protection Plan, but has been updated and refined for this current ERMU Wellhead Protection Plan.

The MODFLOW model provided by the MDH was used for the large-scale model domain and finite-difference grid to simulate the regional groundwater flow fields and macro-model hydrogeologic properties. The local hydrogeologic parameters and groundwater flow fields in the Elk River area were refined and calibrated based on unique and specific data obtained from the ERMU, the MDH, the MGS, and BMI during the course of this project.

The model was developed using a UTM Zone 15, NAD 83 metric coordinate system.

4.3.2. Model Refinement and Calibration

For a detailed description, explanation, and discussion of the original MODFLOW regional groundwater flow model, the reader should refer to the October 1999 report titled "Wellhead Protection Area Delineation – Elk River Municipal Wells", available through the MDH.

The following refinements were made to the model:

- The precise locations of the ERMU wells were corrected
- The pumping rates of the ERMU wells were updated to reflect the highest levels recorded 2005-2009 (refer to Table 2)
- Specific storage and porosity values were added to Layer 3
- Discrete, varied hydraulic conductivities in Layer 3 were replaced with one hydraulic conductivity value
- A range of vertical and horizontal hydraulic conductivities were used in Layer 3
- Dry cells observed in Layer 1 during early runs of the model were corrected by slightly adjusting the base elevation of Layer 1 and the top elevation of Layer 2
- High capacity wells in the vicinity of the ERMU public water supply wells were incorporated

Layer 1 of the model represents the uppermost, shallow, unconfined aquifer, and Layer 2 simulates the Eau Claire Formation. The Mount Simon-Hinckley bedrock aquifer was represented in Layer 3. As previously discussed, the Mount Simon-Hinckley Aquifer formations were assumed to be a single hydrologic layer with no significant differences in head or hydrogeologic properties between the individual bedrock units. The model features for these two aquifers and their properties are summarized in Table 5.

Two aquifer permeabilities were used in Layer 3 to include the potential range of hydrologic characteristics of the Mount Simon-Hinckley Aquifer based on the data obtained from local and regional aquifer pumping tests. The low permeability used was 7.0 m/d, the high permeability was 15 m/d. The model was solved with these two permeabilities to delineate two capture zones for each public water supply well. The two sets of capture zones were then combined to develop a single composite WHPA for each well (refer to Section 4.5).

The thicknesses and base elevations used for the layers in the model were originally derived from well data throughout the Elk River area, and were not updated from the base model provided by the MDH. The thickness of the Mount Simon-Hinckley Aquifer according to the ERMU public water supply wells does not appear to significantly deviate from the thickness assigned for Layer 3 in the model.

Fixed head boundaries were used in Layers 1 and 2 of the model to represent local and regional surface water bodies such as the Mississippi River, the Elk River, creeks and lakes.

Local high-capacity wells, open to all or part of the Mount Simon-Hinckley Aquifer, were incorporated into the model. Information regarding these high-capacity wells is provided in Table 3. The discharges used in the model for the private wells were three-year volume averages from the MNDNR SWUDS database, and are summarized in the table. The discharges used for the ERMU public water supply wells in the model reflect the highest historical or project volumes highlighted in Table 2.

Table 5
Groundwater Flow Model Parameters

Layer	Aquifer Represented	Horizontal Permeability (m/d)	Vertical Permeability (m/d)	Specific Storage	Specific Yield	Effective Porosity	Total Porosity
1	Sand and gravel glacial deposits (water table aquifer)	15.2	5.067	0.0005	0.15	0.30	0.30
2	Eau Claire Formation	0.031	0.00031	0.00005	0.0	0.10	0.15
3	Mount Simon-Hinckley	7.0 and15.0	0.7 and 1.5	0.00004*	0.0	0.20	0.30

Notes: * Based on MDH aquifer pumping test for Well 6
N/A - not applicable

4.3.3. Results

The large-scale, regional groundwater flow fields for Layers 1, 2, and 3 did not appreciably change from the original model results. To test and verify the accuracy of the model, the head elevations calculated by the groundwater flow model for Layer 3 were compared to the measured head elevations of the Mount Simon-Hinckley Aquifer compiled by the MDH in the calibration datasets developed for the model.

Generally, higher horizontal permeabilities used in Layer 3 of the model resulted in better model solutions. The mean values of the Layer 3 residuals from the calculated versus measured heads data were typically 10-15% of the total head range for the model layer. These results suggest the model is generally accurate and acceptably calibrated.

4.4. UNCERTAINTY

Two permeabilities were utilized in the ERMU area for the layer representing the Mount Simon-Hinckley Aquifer. The different permeabilities were used to simulate the potential variability in the hydrogeologic properties of the aquifers. Although relatively insignificant, the use of two permeabilities resulted in combined and composite WHPAs for the public water supply wells. When horizontal permeabilites of less than 5 m/d were used in Layer 3 of the model, there were areas in Layer 3 where the model went dry. The vertical permeability value used in the model did not significantly influence the lateral extent or geometry of the capture zones (Wellhead Protection Areas) of the ERMU wells.

An effective porosity of 0.20 for Layer 3 of the groundwater flow model was used. This porosity may be lower than the mean porosity of the Mount Simon-Hinckley Aquifer; but it was used to account for the potential of fracture flow and preferred groundwater pathways through the aquifer. The use of a lower porosity results in slightly larger capture zones (WHPAs) for the wells.

To also account for uncertainty, local and regional wells were incorporated into the model. The model was solved with and without discharges from the well(s) closest to the ERMU public water supply wells. This approach was used to simulate the potential changes, impacts, and influence to the local groundwater flow regime and the WHPAs from these wells. The pumping of the one local well located in the vicinity of the ERMU public water supply wells (Unique Well No. 217941) did not significantly alter the resulting WHPA.

Due to geologic complexity, the groundwater flow model and resulting WHPAs of the ERMU public water supply wells are only estimates. Assumptions had to be made in developing and finalizing the model. Therefore, there exists unavoidable uncertainty in the final delineations of the WHPAs.

4.5. FINAL WHPA AND DWSMA DELINEATIONS

The 20-year capture zones for the eight (8) ERMU public water supply wells were created from the base elevation of Layer 3 in the groundwater flow model. The 20-year WHPAs for the ERMU wells enveloped and touched each other, and were therefore,

combined into a single, final WHPA. Two or more capture zones were delineated for each municipal well using two different permeabilities and with and without neighboring high-capacity wells pumping.

In addition to the 20-year capture zones, the one-, five-, and ten-year capture zones were delineated as composites of the capture zones for the wells. The capture zones from the groundwater flow model were converted to ArcView® shapefiles and finalized using ArcView® GIS software. The WHPAs for the public water supply wells are shown in Figure 5.

Using the 20-year WHPA boundary, the corresponding DWSMA was delineated using the most recent parcel boundary map for the Elk River area. Figures 6 and 7 depict the extent and geometry of the DWSMA. The ArcView files of the WHPAs and DWSMA have been provided to the MDH. The DWSMA slightly extends beyond the Elk River city limits westward into Sherburne County (Big Lake Township), eastward into Anoka County (Burns Township), and southward into the Sherburne County and the City of Otsego.

5.0 WELL AND DWSMA VULNERABILITIES

This section evaluates the vulnerability of the ERMU public water supply wells and corresponding DWSMA to potential contaminant sources at the land surface. The vulnerability assessments for the wells and DWSMA were conducted in accordance with the rules for preparing and implementing wellhead protection measures (MN Rules Chapter 4720.5210). Specifically, the wells and DWSMA have been assessed for their likelihood for pollution from land surface sources.

The vulnerability of the public water supply wells is based on information regarding the geologic conditions at the wellhead, the wells' construction, and chemical and isotopic composition of the groundwater. The vulnerability of the DWSMA is based on the lateral and vertical extent and composition of geologic materials overlying the Mount Simon-Hinckley Aquifer, and the chemical and isotopic composition of the groundwater.

The MDH has developed a process and database of community and non-community, non-transient public water supply wells in Minnesota. The database stores information pertinent to well vulnerability and sensitivity to land surface activities, and rates the vulnerability of individual wells with a scoring system. A score is determined for each well based on factors such as well construction, geology at the well site, and chemical data. Higher scores correlate to greater perceived vulnerability to pollution. A score of 45 or higher is generally used to identify vulnerable wells from non-vulnerable wells. A well is also considered more vulnerable if contamination has been detected (volatile organic compounds detected or nitrate-nitrogen levels greater than 10 mg/L), or if tritium has been detected in concentrations greater than 1.0 tritium unit (TU), indicating the presence of young (post-1953) water in the groundwater. The MDH Well Vulnerability Scoring Sheets for the ERMU public water supply wells are included in Appendix C.

5.1. PUBLIC WATER SUPPLY WELL VULNERABILITY

As previously discussed, the Mount Simon-Hinckley aquifer appears to exhibit confined hydrologic conditions and is not in direct hydraulic connection with the shallow water table aquifer or surface waters. In most of the Elk River area, the Mount Simon-Hinckley Aquifer is confined by the siltstone and shale of the Eau Claire Formation.

Isotope analyses (tritium testing) were conducted on five of the ERMU public water supply wells in December 2009. With the exception of the aquifer near Well 5, the analyses indicated that the groundwater in this aquifer is relatively old (pre-1953). This suggests that the aquifer is not recharged quickly from water at the land surface, and the aquifer is generally not sensitive to land surface activities.

The water sample collected from Well 5 indicated that the groundwater in the aquifer at that locale is younger (post-1953). Aquifer recharge is interpreted to possibly occur more rapidly in this area. One explanation for this differing condition is that the overlying and hydraulic confining Eau Claire Formation is thinner at the Well 5 location and potentially absent east of the well where buried bedrock valley are present. Because the shale bedrock is thinner or absent, more groundwater likely flows downward from shallower aquifers and overlying surface water bodies into the Mount Simon-Hinckley Aquifer. A second explanation for younger groundwater in Well 5 is the possibility the integrity of the well casing has been compromised. A breach in the well casing could allow groundwater from upper aquifers, above the top of the Mount Simon-Hinckley Aquifer, to flow downward and mix with older groundwater within the well. For these reasons, Well 5 has been classified as vulnerable.

5.2. DWSMA VULNERABILITY

The geologic conditions within the DWSMA delineated for the ERMU public water supply wells were assessed to determine the sensitivity and vulnerability of the Mount Simon-Hinckley Aquifer to land use activities. Surficial geology maps available from the Minnesota Geological Survey (MGS) were used to identify the types and characteristics of the uppermost geologic deposits in the DWSMA (refer to Figure 8).

In addition, discussions and collaboration with MDH staff were conducted to better define and agree upon the aquifer vulnerability in the DWSMA. The MDH completed a technical memorandum on the vulnerability of Well 5 and the Mount Simon-Hinckley Aquifer in its vicinity. A copy of this memorandum is provided in Appendix D.

Generally, due to the continuous lateral extent of the shale-rich, low permeability, Eau Claire Formation overlying and protecting the Mount Simon and Hinckley sandstone formations in the Elk River area, most of the DWSMA for the ERMU public water supply wells has been classified with a low vulnerability. However, due to interpreted presence of a buried bedrock valley resulting in the thinning or absence of the Eau Claire Formation, the DWSMA has been classified as moderately vulnerable in the vicinity of Well 5. The two vulnerability areas of the DWSMA are shown in Figure 9.

6.0 CONCLUSIONS

A groundwater flow model, developed and refined for the Elk River area, was used to delineate the WHPAs for the eight, actively-used, ERMU public water supply wells. The model appears to accurately simulate the Mount Simon-Hinckley Aquifer – the source water aquifer used by all the public water supply wells. The 20-year WHPAs for the ERMU public water supply wells, calculated from the model, were used to delineate the DWSMA.

Based on the well vulnerability assessments, ERMU Wells 2, 3, 4, 6, 7, 8, and 9 have been given a non-vulnerable rating to land surface activities and potential contaminant sources, but Well 5 is considered vulnerable to land surface uses. Furthermore, the DWSMA delineated for the ERMU

wells and the Mount Simon-Hinckley Aquifer has been divided into low vulnerability and moderate vulnerability areas.

7.0 RECOMMENDATIONS

Since most of the DWSMA has been assessed as having low vulnerability, the management strategies incorporated into Part II of ERMU's Wellhead Protection Plan could focus only on other wells that penetrate the Mount Simon-Hinckley Aquifer in the low vulnerability areas. For the moderately vulnerable area of the DWSMA however, Part II WHPP management strategies should include performing a comprehensive review of land uses and activities within this region of the DWSMA.

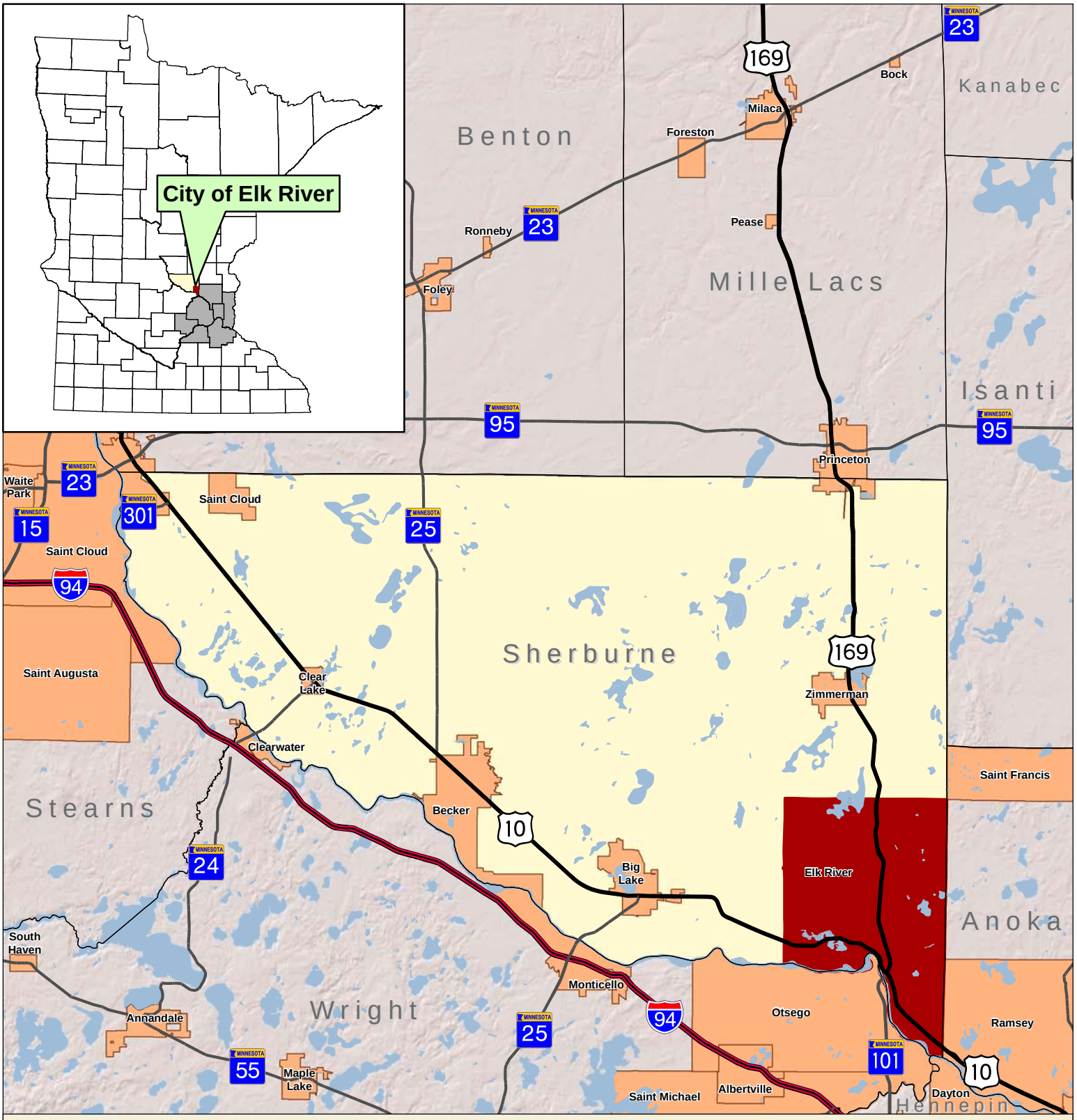
To more accurately evaluate the vulnerability of Well 5 and the area of the DWSMA classified as moderately vulnerable, the following should be considered:

- If or when the pump is to be removed from Well 5 for maintenance, the ERMU should make arrangements to televise this well to assess the integrity of the casing.
- A more intensive well inventory in the 1- and 5-year WHPAs of Well 5 should be conducted with a particular focus on identifying abandoned or unused bedrock wells.
- Provide support for future bedrock mapping that could provide a better understanding of the extent and characteristics of the Eau Claire Formation confining unit.

Additional hydrogeologic work could provide supplemental data and information that can be used to more accurately refine and revise the groundwater flow model for future updates to the ERMU Wellhead Protection Plan. The ERMU will consider the following additional work:

- Perform a more complete and thorough aquifer pumping test for Wells 7, 8, and 9 (and any future wells). The test should be conducted in accordance with MDH Wellhead Protection Plan rules (i.e. 24-hour pumping and recovery periods, the use of non-pumping observation wells, logarithmic recording of groundwater levels, etc.).
- Routinely record the static and pumping groundwater levels of the public water supply wells. This data can be used in the future to better define the local groundwater flow fields of the aquifers, and determine whether the supply of groundwater in the aquifer is diminishing over time. It will also provide information on the magnitude of interference between the wells.
- Work with county and/or state government agencies in future and ongoing efforts to compile regional geologic and hydrogeologic information through investigations and studies. Specifically, the ERMU could provide information in the completion of the Sherburne County Geologic Atlas.
- Coordinate with the MDH and/or MGS to have one or more of the ERMU wells flow-logged. This work could possibly be done at no cost to the ERMU and would provide valuable information regarding preferential flow paths and conduits within the Mount Simon and Hinckley bedrock formations. This additional data will assist in better understanding the behavior of groundwater flow in this multi-bedrock formation aquifer.

FIGURES



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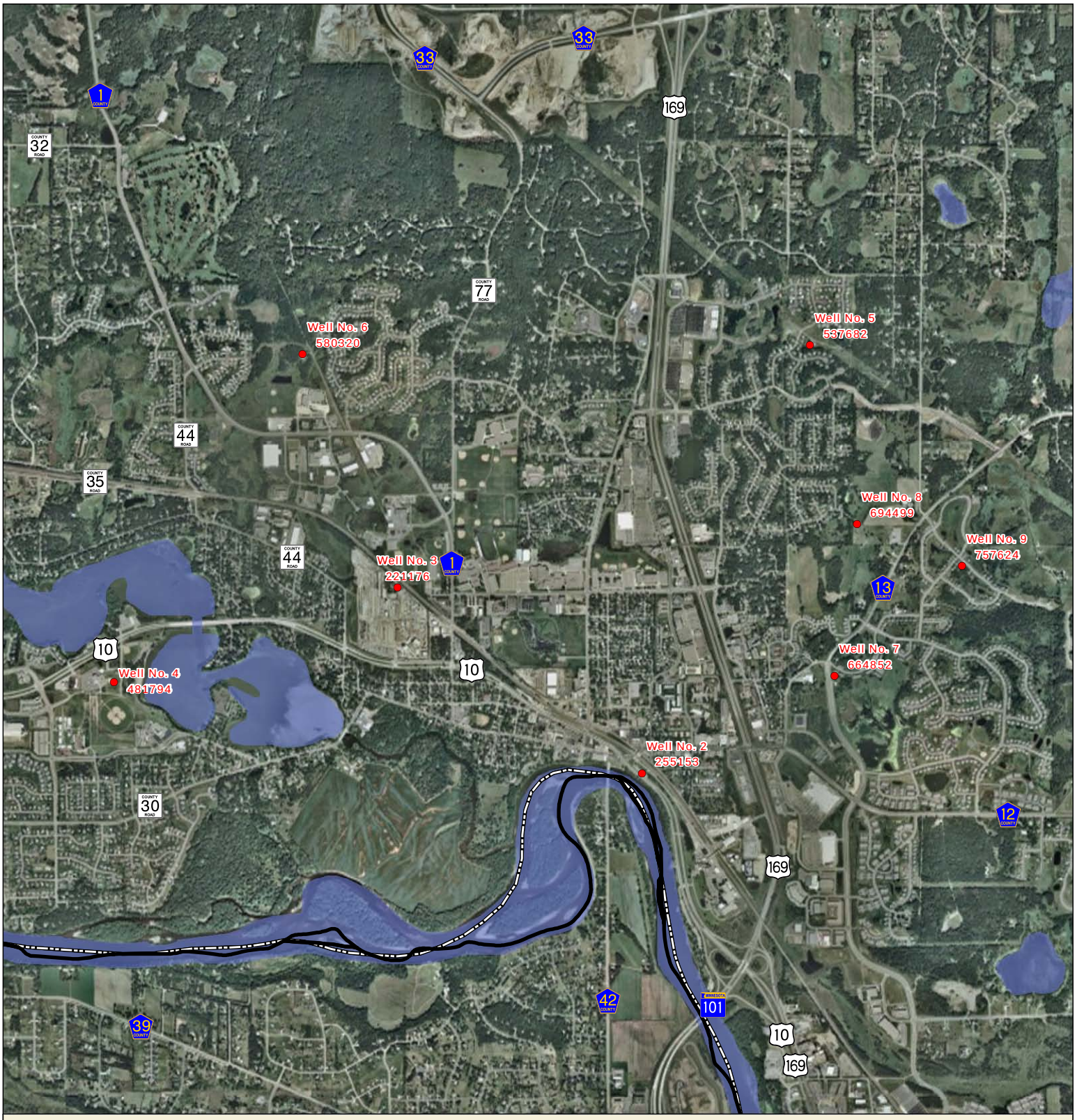

0 0.5 Miles

Legend

- Well Locations
- County Boundaries
- City Limits
- Lakes & Rivers

Source: City of Elk River, ESRI, 2009 Minneapolis Imagery, MNDNR, MNDOT

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City of Elk River

WELLHEAD PROTECTION PLAN PHASE I

ERMU Municipal Well Location Map

Figure 2

January, 2011

Map Document: (\\arcserver1\gis\ELKR\M21101953\ESRI\Maps\101953-Figure 2-85x11.mxd)
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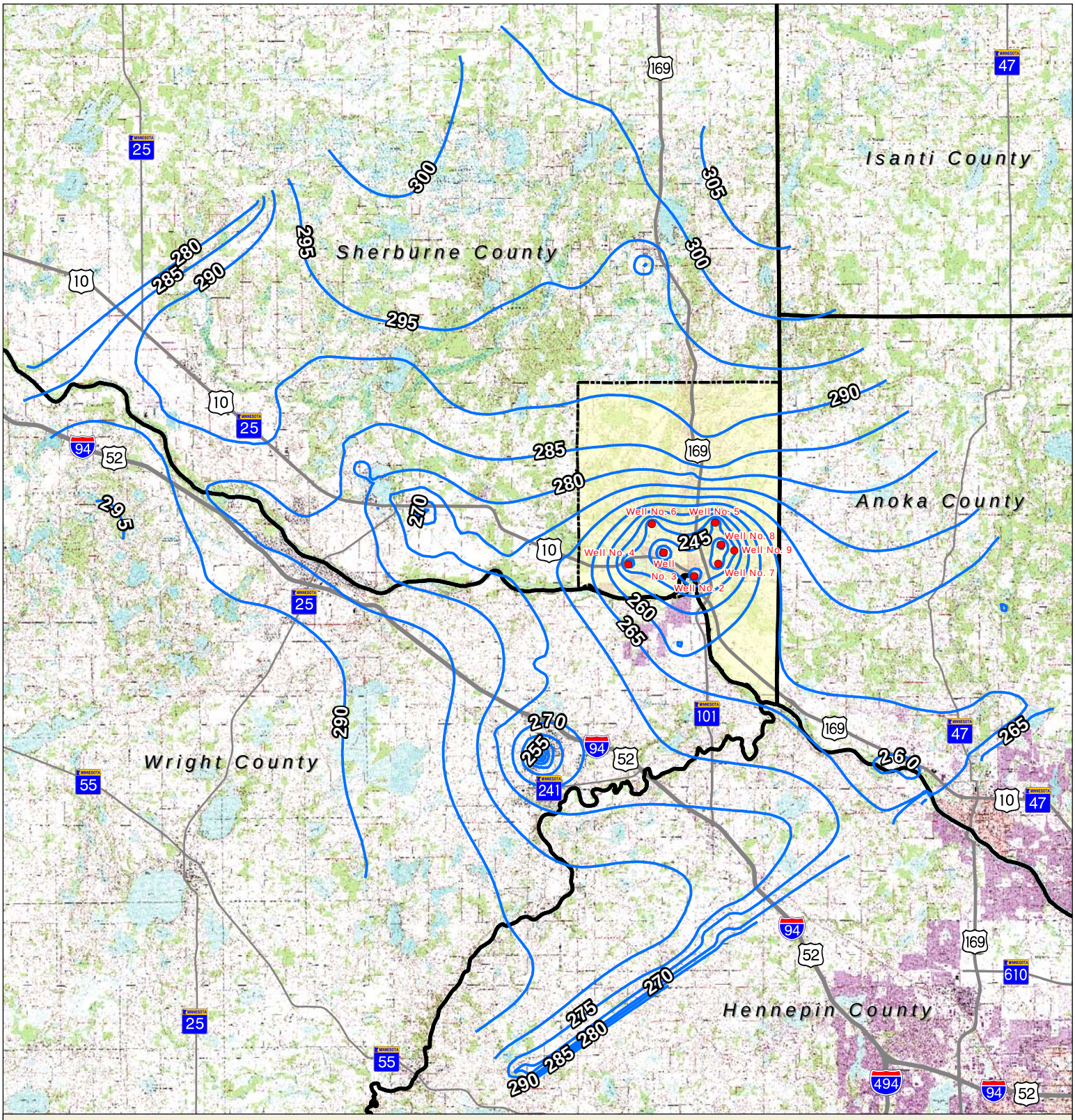
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Sherburne County
Anoka County
Wright County
Hennepin County
Well No. 6
Well No. 5
Well No. 8
Well No. 9
Well No. 4
Well No. 3
Well No. 7
Well No. 2
300
305
295
280
285
290
270
265
260
255
245
241
0
4
Miles
Legend
Well Locations
Contours (m Above MSL)
Elk River City Limits
County Boundaries
Trunk Highways
Interstate
U.S. Highway
State Highway
Source: City of Elk River, LMIC, USGS, MNDNR, MNDOT
WELLHEAD PROTECTION PLAN PHASE I
Groundwater Flow Direction Contours (Layer 3, K=7 m/d)
Figure 3
January, 2011
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Map Document: (\\arcserver1\gis\ELKR\M21101953\ESRI\Maps\101953-Figure 3-85x11.mxd)
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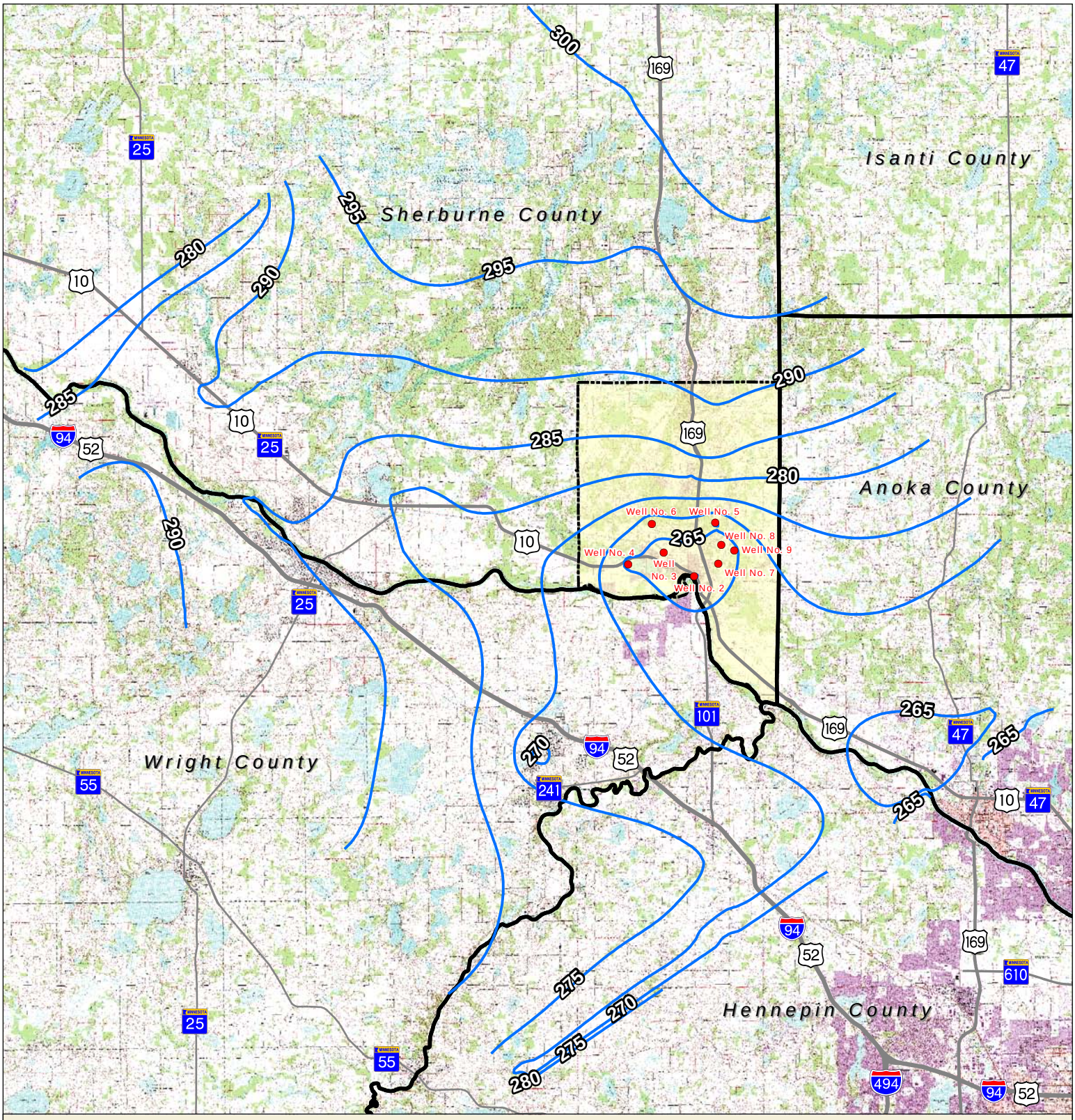
Isanti County
Sherburne County
Anoka County
Wright County
Hennepin County
300
295
290
285
280
275
270
265
Well No. 6
Well No. 5
Well No. 8
Well No. 9
Well No. 4
Well No. 3
Well No. 7
Well No. 2
0
4
Miles
Legend
Well Locations
Contours (m Above MSL)
Elk River City Limits
County Boundaries
Trunk Highways
Interstate
U.S. Highway
State Highway
Source: City of Elk River, LMIC, USGS, MNDNR, MNDOT
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WELLHEAD PROTECTION PLAN PHASE I
Groundwater Flow Direction Contours (Layer 3, K=25 m/d)
Figure 4
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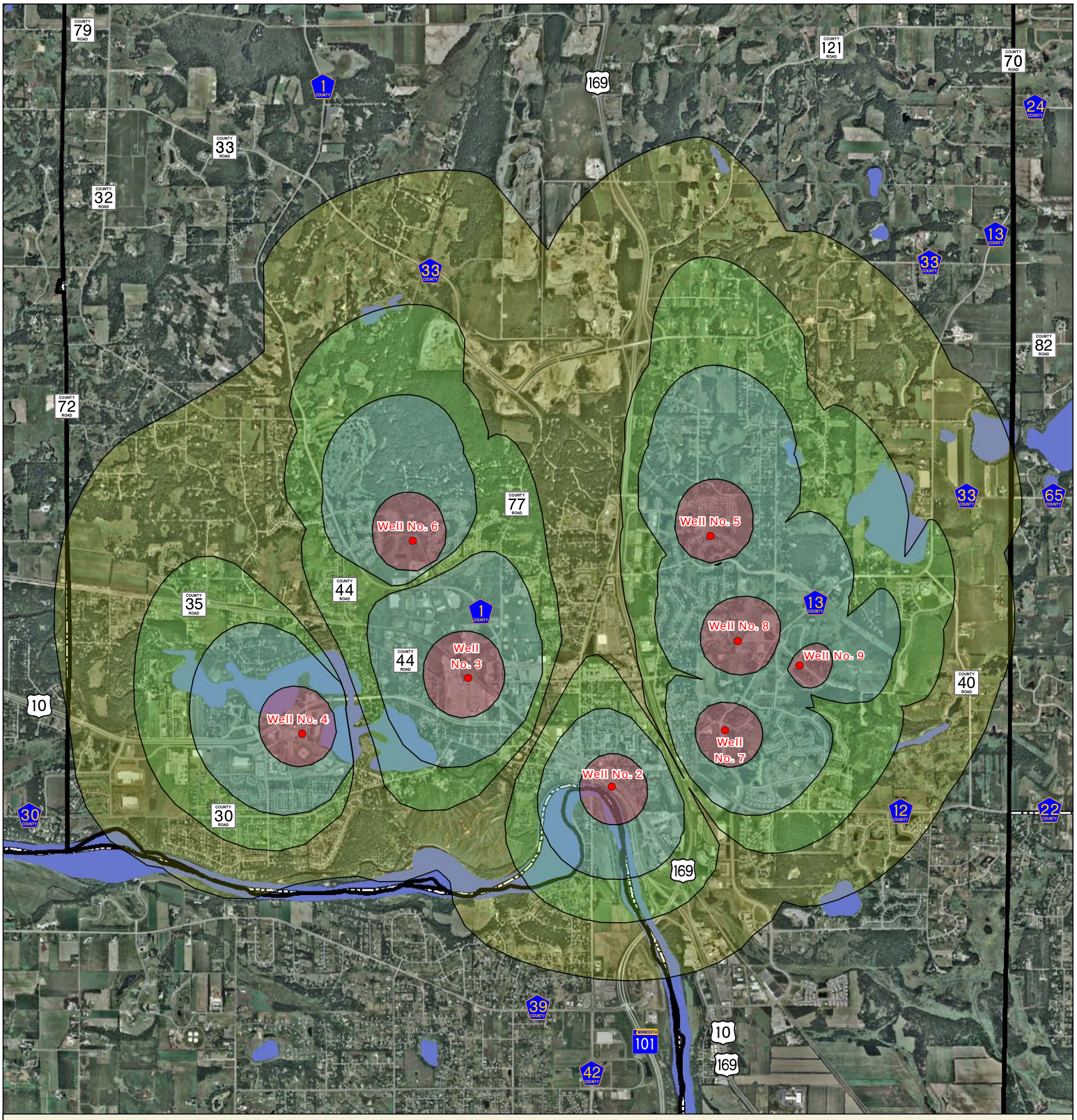

Legend

Wellhead Protection Area

- 1 Year
- 5 Year
- 10 Year
- 20 Year
- Well Locations
- County Boundaries
- Lakes & Rivers
- City Limits

Source: City of Elk River, ESRI, 2009 Minneapolis Imagery, MNDNR, MNDOT

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City of Elk River

WELLHEAD PROTECTION PLAN PHASE I

Wellhead Protection Areas

Figure 5

January, 2011

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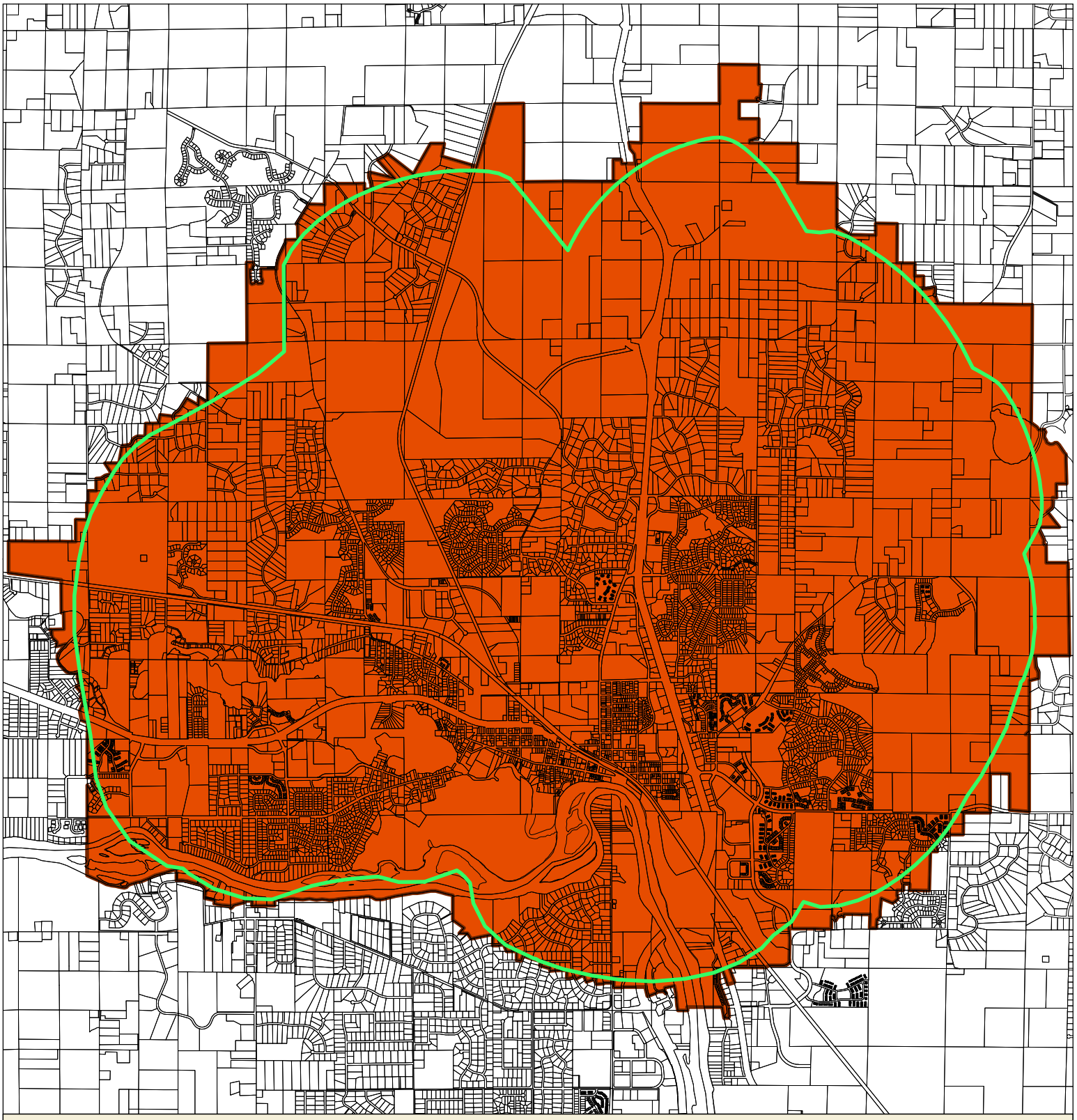

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City of Elk River

WELLHEAD PROTECTION PLAN PHASE I

Drinking Water Supply Management Area

Figure 6

January, 2011

Source: City of Elk River, LMIC, USGS, MNDNR, MNDOT

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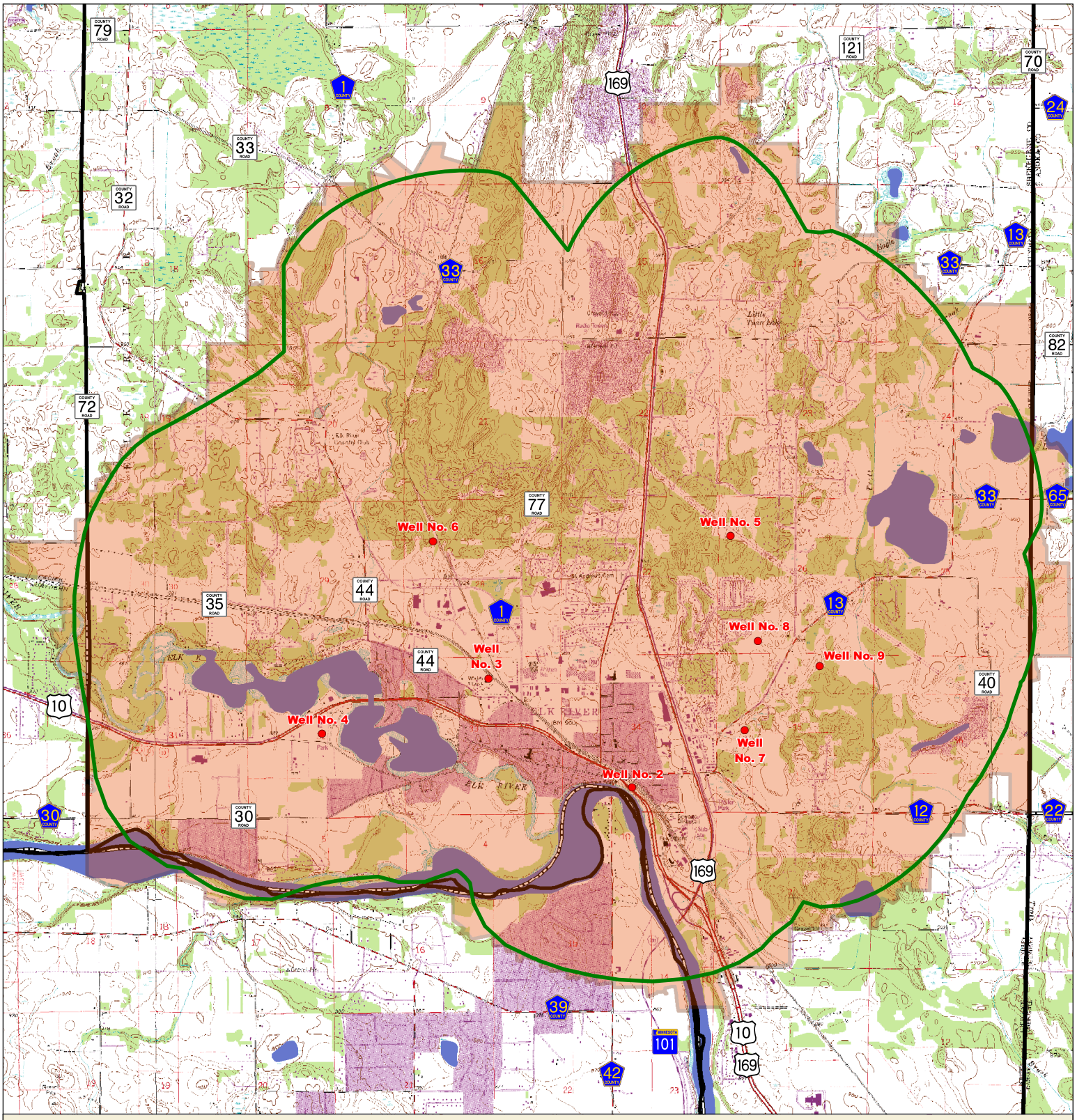

Legend

- Well Locations
- DWSMA
- 20 Year WHPA
- City Limits
- County Boundaries
- Lakes & Rivers

Source: City of Elk River, LMIC, USGS, MNDNR, MNDOT

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WELLHEAD PROTECTION PLAN PHASE I

Drinking Water Supply Management Area

Figure 7

January, 2011

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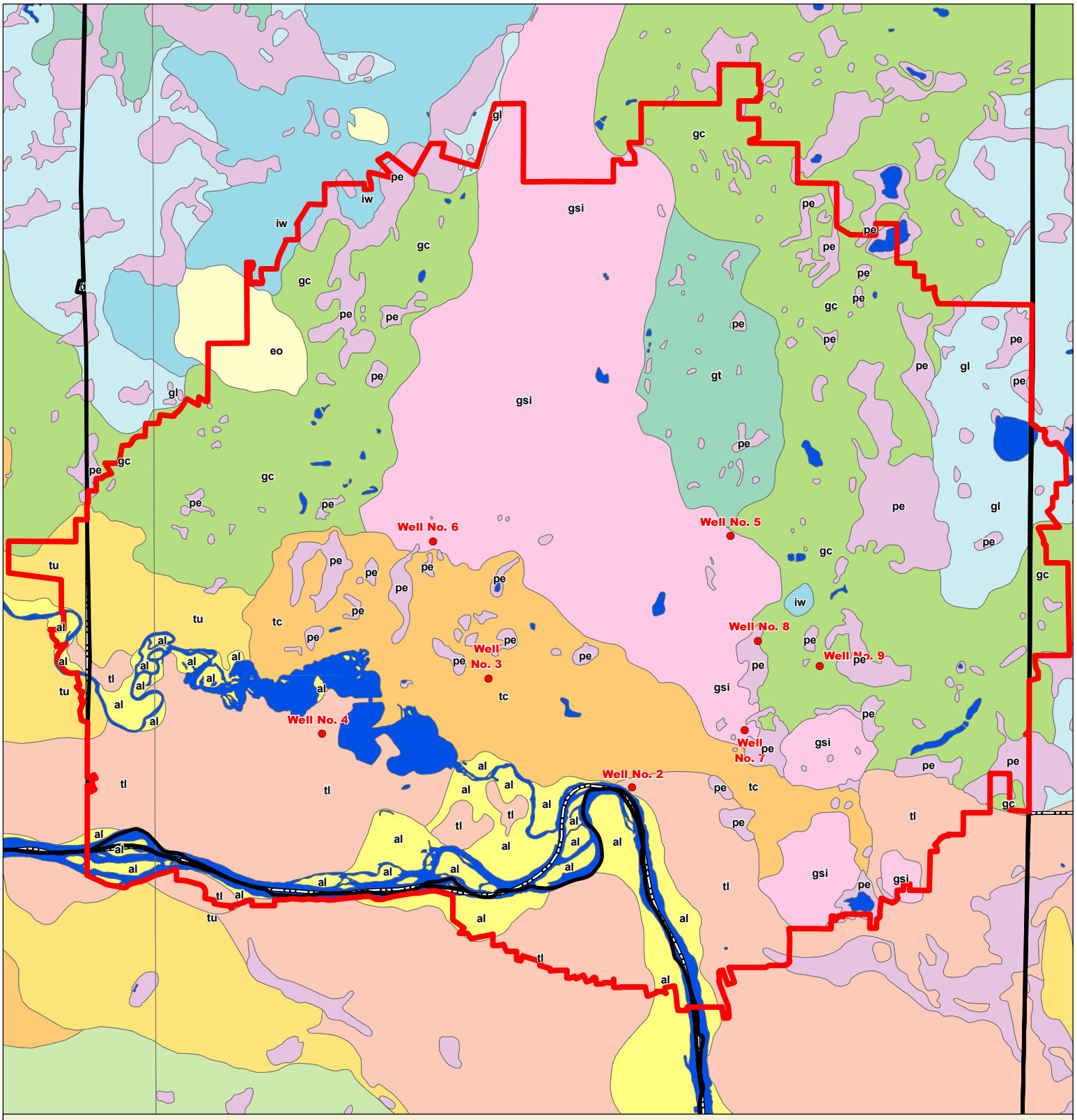

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City of Elk River

WELLHEAD PROTECTION PLAN PHASE I

Surficial Geology of the DWSMA

Figure 8

Source: City of Elk River, Minnesota Geologic Society, MNDNR, MNDOT

January, 2011

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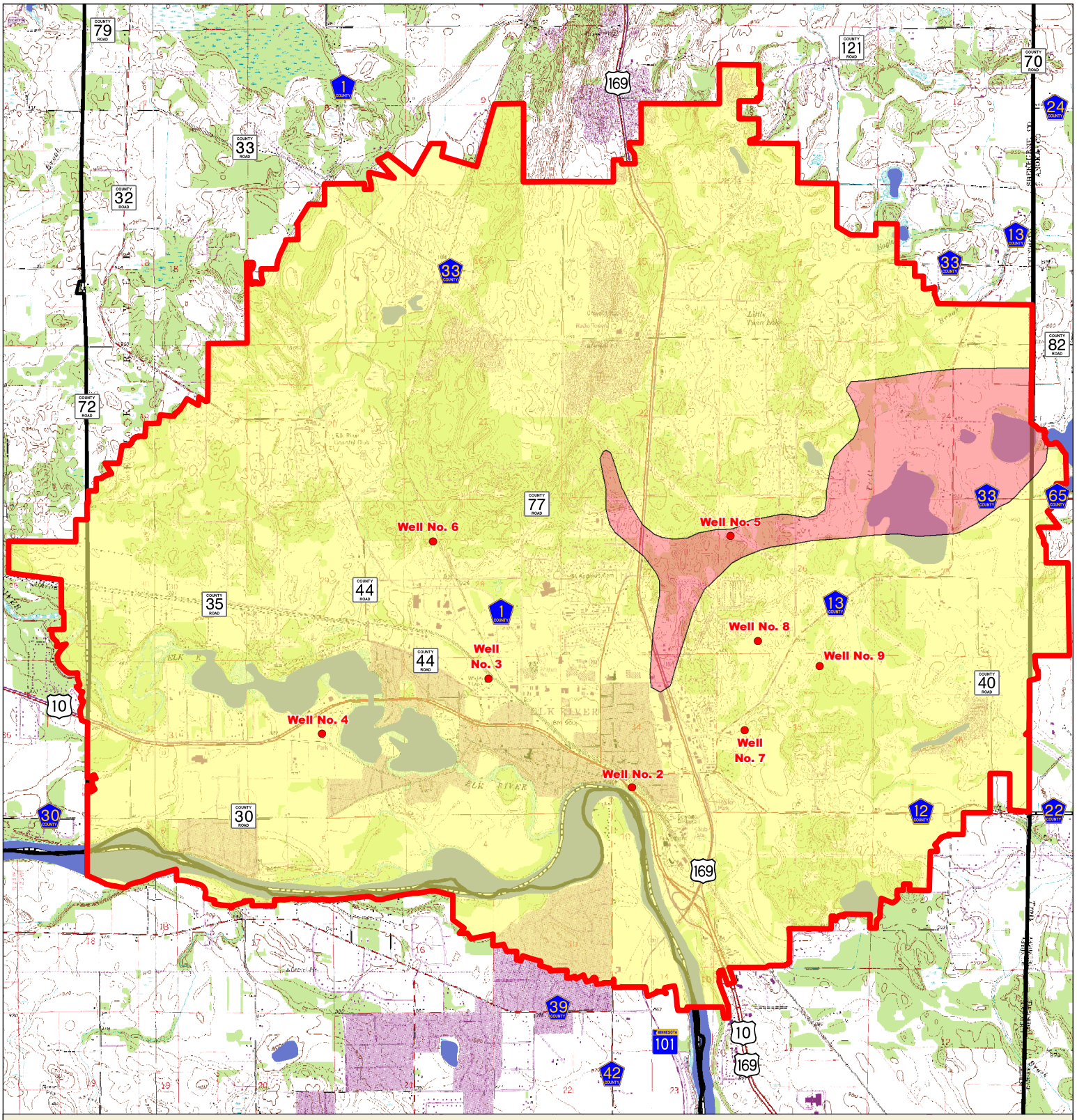

Legend

- Well Locations
- DWSMA
- DWSMA Low Vulnerability
- DWSMA Moderate Vulnerability
- City Limits
- County Boundaries
- Lakes & Rivers

Source: City of Elk River, LMIC, USGS, MNDNR, MNDOT

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City of Elk River

WELLHEAD PROTECTION PLAN PHASE I

Drinking Water Supply Management Area

Figure 9

January, 2011

Map Document: (\\arcserver1\gis\ELKR\M21101953\ESRI\Maps\101953-Figure 9-DWSMA Vulnerability-85x11.mxd)
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APPENDIX A

WELL RECORDS

Unique No. 00255153
County Name Sherburne

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 1031

Update Date 2009/12/01
Entry Date 2002/02/20

Township Name	Township	Range	Dir	Section	Subsection
	33	26	W	34	CDADBA

Well Depth 290 ft. | Depth Completed 290 ft. | Date Well Completed 1948/08/00

Well Name ELK RIVER 2

Drilling Method Cable Tool

Well Owner's Name ELK RIVER 2

ELK RIVER MN 55330

Contact's Name CITY OF ELK RIVER
322 KING AV
ELK RIVER MN 55330

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Casing Drive Shoe? ☐ Yes ☐ No

Hole Diameter

Casing Diameter 16 in. to 136 ft. Weight(lbs/ft)

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
DRY SAND & GRAVEL			0	35
SAND, GRAVEL & CLAY			35	43
SAND, GRAVEL & ROCKS			43	55
SANDY CLAY			55	73
STICKY CLAY (SHALE)			73	108
SANDY CLAY		HARD	108	125
SANDROCK & SHALE			125	160
SHALE			160	200
SANDROCK & SHALE			200	235
SANDROCK			235	275
CAVING SANDROCK			275	290

Screen N

Open Hole From 136 ft. to 290 ft.

Make Type

Static Water Level -1 ft. from Land surface Date 1948/08/00

PUMPING LEVEL (below land surface)
37 ft. after 3 hrs. pumping 737 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction. type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

WELL FORMERLY ASSIGNED UNIQ# 271176.

WELL FLOW 45 GPM.

WELL FORMERLY TWIN CITY MILK PRODUCERS.

USGS Quad: Elk River Elevation: 875
Aquifer: CBMS At Id: 75-3215

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 62012
License Business Name
Name of Driller HAGLUND

Report Copy

Unique No. 00221176
County Name Sherburne

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 1031

Update Date 2009/11/30
Entry Date 1988/04/17

Township Name	Township	Range	Dir	Section	Subsection
	33	26	W	33	ABCBBA

Well Depth 315 ft. | Depth Completed 315 ft. | Date Well Completed 1974/10/23

Well Name ELK RIVER 3

Drilling Method Cable Tool

Well Owner's Name ELK RIVER 3

ELK RIVER MN 55330

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Contact's Name CITY OF ELK RIVER
322 KING AV
ELK RIVER MN 55330

Use Community Supply(municipal)

Casing Drive Shoe? ☐ Yes ☐ No

Hole Diameter

Casing Diameter Weight(lbs/ft)
16 in. to 201 ft.
20 in. to 154 ft.

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW		0	15
SAND BINDER	BROW		15	34
WATER SAND	GRAY		34	49
SAND & CLAY & STONES	BROW		49	99
SHALE & SANDSTONE			99	124
ST. PETER SHALE	GREEN		124	140
SHALE	LIGHT		140	156
SHALE & SANDROCK	GREEN		156	200
SANDROCK	WHITE		200	265
SANDROCK	WHITE		265	300
HINCKLEY	RED		300	315

Screen N

Open Hole From 201 ft. to 315 ft.

Make Type

Static Water Level 7 ft. from Land surface Date 1974/10/23

PUMPING LEVEL (below land surface)
69 ft. after hrs. pumping 1300 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
ft. direction. type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 968.

USGS Quad: Elk River Elevation: 913
Aquifer: CMTS Alt Id: 75-3215

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27015
License Business Name
Name of Driller SIGAFOOS, G.

Report Copy

Unique No. 00481794
County Name Sherburne

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 1031

Update Date 2009/11/20
Entry Date 1993/08/18

Township Name	Township	Range	Dir	Section	Subsection
	33	26	W	32	BDDDAA

Well Depth 225 ft. | Depth Completed 225 ft. | Date Well Completed 1992/12/15

Well Name ELK RIVER 4

Drilling Method Cable Tool

Well Owner's Name ELK RIVER
GARY ST
ELK RIVER MN 55330

Contact's Name CITY OF ELK RIVER
322 KING AV
ELK RIVER MN 55330

Drilling Fluid: Water

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply(municipal)

Casing — Drive Shoe? ☑ Yes ☐ No

Casing Diameter				Weight(lbs/ft)
24	in. to	121	ft.	94.62
18	in. to	197	ft.	70.59

Hole Diameter: 0 in. to 225 ft.

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
GRAVEL/ROCKS			0	25
CLAY/ROCKS			25	65
ROCK & HARDPAN			65	73
ROCKY CLAY			73	110
SHALEY SANDSTONE			110	120
SHALEY SANDSTONE			120	130
SHALEY SANDSTONE			130	185
SANDROCK			185	195
SOFT SANDROCK			195	225

Screen N | Open Hole From 197 ft. to 225 ft.
Make Type

Static Water Level -12 ft. from Land surface Date 1992/03/00

PUMPING LEVEL (below land surface)
40 ft. after 6 hrs. pumping 1500 g.p.m.

Well Head Completion
Pitless adapter mfr BAKER Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information — Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount(yds/bags)	
G	0	197	11.5	Y

Nearest Known Source of Contamination
125 ft. direction. N type SDF
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr name
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

WELL FLOWS. M.G.S. NO. 3692.

NW. CORNER OF ORONO RD. AND GARY ST.

USGS Quad: Elk River Elevation: 883
Aquifer: CMTS Alt Id: 3692

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27058
License Business Name
Name of Driller MANTHIE, D.

Report Copy

Unique No. 00537682
County Name Sherburne

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 1031

Update Date 2003/01/02
Entry Date 1999/01/08

Township Name	Township	Range	Dir	Section	Subsection
	33	26	W	26	BCBABA

Well Depth 406 ft. | Depth Completed 406 ft. | Date Well Completed 1994/08/17

Well Name ELK RIVER 5

Drilling Method Cable Tool

Well Owner's Name ELK RIVER 5
11070 197TH AV
ELK RIVER MN 55330

Contact's Name CITY OF ELK RIVER
322 KING NW AV
ELK RIVER MN 55330

Drilling Fluid: Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Casing Drive Shoe? ☐ Yes ☐ No

Hole Diameter: in. to 406 ft.

Casing Diameter / Weight (lbs/ft)
30 in. to 150 ft.
24 in. to 288 ft.
18 in. to 316 ft.

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND CLAY GRAVEL	BROWN	MEDIUM	0	91
CLAY/GRAVEL	GRAY	HARD	91	126
SAND/GRAVEL/CLAY	BROWN	MEDIUM	126	131
GRAVEL/ROCKS	BROWN	MEDIUM	131	141
SAND/GRAVEL/CLAY LAYER	GRAY	MEDIUM	141	166
SAND/CLAY LAYERS	BROWN	MEDIUM	166	256
CLAY	GRAY	SOFT	256	266
SAND/GRAVEL	VARIE	HARD	266	288
HARDPAN ROCK	GRAY	HARD	288	291
SANDY/CLAY	GRAY	HARD	291	301
FINE SANDSTONE	WHITE	MEDIUM	301	315
SANDSTONE	WHITE	MEDIUM	315	340
SANSTONE	WHITE	SOFT	340	406

Screen N
Open Hole From 316 ft. to 406 ft.
Make Type

Static Water Level 73 ft. from Land surface Date 1994/08/17

PUMPING LEVEL (below land surface)
112.7 ft. after 8 hrs. pumping 1000 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount (yds/bags)	
G	0	150	26	Y
G	0	288		

Nearest Known Source of Contamination
ft. direction. type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr name
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☐ No

USGS Quad: Elk River Elevation: 990
Aquifer: CMTS Alt Id: 75-3215

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71536
License Business Name
Name of Driller POHLKAMP, D.

Report Copy

Unique No. 00580320
County Name Sherburne

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 1031

Update Date 2005/03/11
Entry Date 1999/03/19

Township Name	Township	Range	Dir	Section	Subsection
	33	26	W	28	BCAABC

Well Depth 300 ft. | Depth Completed 300 ft. | Date Well Completed 1999/02/12

Well Name ELK RIVER 6

Drilling Method Cable Tool

Well Owner's Name ELK RIVER 6
12701 ELK LAKE RD
ELK RIVER MN 55330

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Contact's Name ELK RIVER MUICIPAL UTILITIES
322 KING AV
ELK RIVER MN 55330

Casing Drive Shoe? ☑ Yes ☐ No

Hole Diameter
in. to 212 ft.
in. to 300 ft.

Casing Diameter / Weight(lbs/ft)
24 in. to 138 ft. — 94.62
18 in. to 212 ft. — 70.59

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND/GRAVEL	BROWN	SOFT	0	17
CLAY/GRAVEL	BROWN	SOFT	17	26
GRAVEL	GRAY	SOFT	26	50
SAND/CLAY/GRAVEL	BROWN	MEDIUM	50	80
SHALE/RUBBLE	BROWN	MEDIUM	80	105
SHALE/SANDSTONE	GRN/R	MED-HRD	105	120
SHALE/SANDSTONE	GRN/WH	MED-HRD	120	128
SHALE/SANDSTONE	GRN/WH	MEDIUM	128	177
SHALE/SANDSTONE	GRN/WH	MED-HRD	177	206
SHALE SANDSTONE	GRN/WH	MEDIUM	206	260
SANDSTONE	TAN	SOFT	260	300
SANDSTONE	RED	HARD	300	300

Screen N
Open Hole From 212 ft. to 300 ft.
Make Type

Static Water Level 17 ft. from Land surface Date 1999/02/12

PUMPING LEVEL (below land surface)
48 ft. after 10 hrs. pumping 1000 g.p.m.

Well Head Completion
Pitless adapter mfr BAKER Model 9PS1820
Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount (yds/bags)	
G	0	212	10	Y

Nearest Known Source of Contamination
ft. direction. type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed Y
Mfr name GOULDS
Model HP 100 Volts 460
Drop Pipe Length 100 ft. Capacity 100 g.p.m
Type S

Any not in use and not sealed well(s) on property? ☑ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☑ No

USGS Quad: Elk River Elevation: 929
Aquifer: CMTS Alt Id: 1710004906

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71701
License Business Name
Name of Driller MCALPINE, J.

Report Copy

Unique No. 00664852
County Name Sherburne

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 1031

Update Date 2009/11/19
Entry Date 2002/01/30

Township Name	Township	Range	Dir	Section	Subsection
	33	26	W	35	BCDCDD

Well Depth 341 ft. | Depth Completed 341 ft. | Date Well Completed 2001/07/20

Well Name ELK RIVER 7

Drilling Method Driven

Well Owner's Name ELK RIVER 7
18513 TWIN LAKES RD
ELK RIVER MN 55330

Drilling Fluid: Water

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply(municipal)

Contact's Name CITY OF ELK RIVER
322 KING AV
ELK RIVER MN 55330

Casing: Drive Shoe? ☑ Yes ☐ No

Hole Diameter

Casing Diameter / Weight(lbs/ft)
24 in. to 180 ft.
18 in. to 240 ft.

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND	BROW	SOFT	0	10
SAND & GRAVEL W/CLAY LE	BROW	SOFT	10	70
CLAY & GRAVEL	BROW	SOFT	70	75
SANDY CLAY	BROW	SOFT	75	140
SAND	BROW	SOFT	140	150
SANDY CLAY	BROW	SOFT	150	159
SANDSTONE & SHALE	BRN/G	SFT-MED	159	180
SANDSTONE & SHALE GRE	VARIE	SFT-MED	180	200
SANDSTONE & SHALE	TAN/G	SFT-MED	200	230
SANDSTONE & SHALE	GRY/G	SFT-MED	230	244
SANDSTONE & SHALE	GRY/G	SFT-MED	244	285
SANDSTONE	YELLO	SOFT	285	290
SANDSTONE	YEL/TA	SOFT	290	295
SANDSTONE	TAN	SOFT	295	335
SANDSTONE	YEL/TA	SOFT	335	340
SANDSTONE	PINK	HARD	340	341

Screen Y | Open Hole From ft. to ft.

Make JOHNSON | Type L

Diameter	Slot	Length	Set	Fitting
12	30	100	240 ft. to 340 ft.	

Static Water Level 12 ft. from Land surface | Date 2001/07/20

PUMPING LEVEL (below land surface)
157 ft. after 24 hrs. pumping 1500 g.p.m.

Well Head Completion
Pitless adapter mfr | Model
Casing Protection ☑ 12 in. above grade
☐ At-grade(Environmental Wells and Borings ONLY)

Grouting Information: Well grouted? ☑ Yes ☐ No

Material	From	To(ft.)	Amount(yds/bags)
G	0	230	

Nearest Known Source of Contamination
100 ft. direction W type SOF
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☑ Not Installed | Date Installed N
Mfr name
Model | HP | Volts
Drop Pipe Length ft. | Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☑ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

GAMMA LOGGED 7-2-2001. M.G.S. NO. 4097.

USGS Quad: Elk River | Elevation: 910
Aquifer: QMTS | Alt Id: 1710004S07

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71536
License Business Name
Name of Driller TRAUT, T.

Report Copy

Unique No. 00694499
County Name Sherburne

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes Chapter 1031

Update Date 2009/11/19
Entry Date 2004/08/30

Township Name	Township	Range	Dir	Section	Subsection
	33	26	W	26	CDCBCB

Well Depth 390 ft. | Depth Completed 390 ft. | Date Well Completed 2004/06/30

Well Name ELK RIVER 8

Drilling Method Cable Tool

Well Owner's Name ELK RIVER PUBLIC UTILITIES
11011 190TH NW AV
ELK RIVER MN 55330

Contact's Name ELK RIVER PUBLIC UTILITES
13060 ORONO PK
ELK RIVER MN 55330

Drilling Fluid
Additive (+ Bentonite)

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Use Community Supply (municipal)

Casing Drive Shoe? ☑ Yes ☐ No

Casing Diameter				Weight (lbs/ft)
30	in. to	150	ft.	118
24	in. to	211	ft.	94.63
18	in. to	265	ft.	70.59

Hole Diameter
in. to 150 ft.
in. to 390 ft.

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
SAND, ROCKS	ORAN	HARD	0	70
SAND, CLAY/ROCKS	BROW	HARD	70	80
HARDPAN	BROW	HARD	80	155
SAND & GRAVEL	VARIE	MEDIUM	155	203
EAU CLAIRE SHALE	GREEN	MEDIUM	203	245
EAU CLAIRE SHALE	GREEN	MEDIUM	245	250
MT. SIMON SANDSTONE	TAN	MEDIUM	250	390

Screen N
Make Type

Open Hole From 264 ft. to 390 ft.

Static Water Level 12 ft. from Land surface Date 2004/03/23

PUMPING LEVEL (below land surface)
69.5 ft. after 24 hrs. pumping 1500 g.p.m.

Well Head Completion
Pitless adapter mfr BAKER Model
Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount (yds/bags)	
G		150	9	Y
G		264	16	Y

Nearest Known Source of Contamination
200 ft. direction N type SEW
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Mfr name GOULDS
Model 12CHC-7 HP 175 Volts 480
Drop Pipe Length 140 ft. Capacity 1300 g.p.m
Type S

Any not in use and not sealed well(s) on property? ☐ Yes ☑ No

Was a variance granted from the MDH for this Well? ☐ Yes ☑ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

M.G.S. NO. 4307

GAMMA LOGGED 1-20-04 BY JIM TRAEN

ENGINEER: H.R. GREEN & ASSOCIATES

USGS Quad: Elk River Elevation: 918
Aquifer: CMTS Alt Id: 4307

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 71015
License Business Name
Name of Driller SIGAFOOS, R.

Report Copy

Unique No. 00757624
County Name Sherburne

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 1031

Update Date 2009/11/20
Entry Date 2008/01/30

Township Name	Township	Range	Dir	Section	Subsection
	33	26	W	35	ABACBD

Well Depth 454 ft. | Depth Completed 454 ft. | Date Well Completed 2008/01/30

Well Name ELK RIVER 9

Drilling Method Dual Rotary

Contact's Name CITY OF ELK RIVER
13069 ORONO PK
ELK RIVER MN 55330

Drilling Fluid: Water

Well Hydrofractured? ☐ Yes ☐ No
From ft. to ft.

Well Owner's Name ELK RIVER 9
ELK RIVER MN 55330

Use Community Supply (municipal)

Casing: Drive Shoe? ☑ Yes ☐ No

Casing Diameter / Weight (lbs/ft):
24 in. to 199 ft.
18 in. to 296 ft.

Hole Diameter:
in. to 310 ft.
in. to 454 ft.

GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO
CLAY	BROW	SOFT	0	5
CLAY/SAND/GRAVEL	BROW	SOFT	5	20
SAND/GRAVEL CLAY ROCK	BROW	SOFT	20	65
SANDY CLAY	BROW	SOFT	65	70
SILTY GRAVEL & ROCKS	BRN/G	SOFT	70	75
GRAVEL & ROCKS	BRN/G	SOFT	75	80
GRAVEL & ROCKS	BROW	SOFT	80	120
SAND, GRAVEL, & ROCKS	BROW	SOFT	120	170
SANDY CLAY GRAVEL, ROC	BROW	SOFT	170	175
SAND, GRAVEL, & ROCKS	GRAY	SOFT	175	179
SAND, GRAVEL, ROCKS, SA	VARIE	MEDIUM	179	185
SAND, GRAVEL, ROCKS, SA	VARIE	MEDIUM	185	190
SHALE & SANDSTONE	GRN/T	MEDIUM	190	195
SHALE & SANDSTONE GRN/	VARIE	MEDIUM	195	205
SHALE & SANDSTONE	GRN/T	MEDIUM	205	255
SANDSTONE W/ SHALE	WHT/G	MEDIUM	255	275
SHALE & SANDSTONE	GRN/T	MEDIUM	275	285
SANDSTONE	WHT/Y	MEDIUM	285	295
SANDSTONE	WHITE	SOFT	295	315
SANDSTONE	YELLO	SOFT	315	349
SANDSTONE	PINK	HARD	349	454

Screen N
Open Hole From 296 ft. to 454 ft.
Make Type

Static Water Level 19 ft. from Land surface Date 2008/01/30

PUMPING LEVEL (below land surface)
41 ft. after 8 hrs. pumping 600 g.p.m.

Well Head Completion
Pitless adapter mfr Model
Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information: Well grouted? ☑ Yes ☐ No

Material	From	To (ft.)	Amount (yds/bags)	
G		296	16	Y

Nearest Known Source of Contamination
150 ft. direction. E type O
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed N
Mfr name
Model HP Volts
Drop Pipe Length ft. Capacity g.p.m
Type

Any not in use and not sealed well(s) on property? ☑ Yes ☐ No

Was a variance granted from the MDH for this Well? ☐ Yes ☑ No

REMARKS, ELEVATION, SOURCE OF DATA, etc.

CONTAMINATION: WETLAND. M.G.S. NO. 4786.

USGS Quad: Elk River Elevation: 922
Aquifer: CMSH Alt Id: 75-3215

Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 1404
License Business Name
Name of Driller TONY/DAN

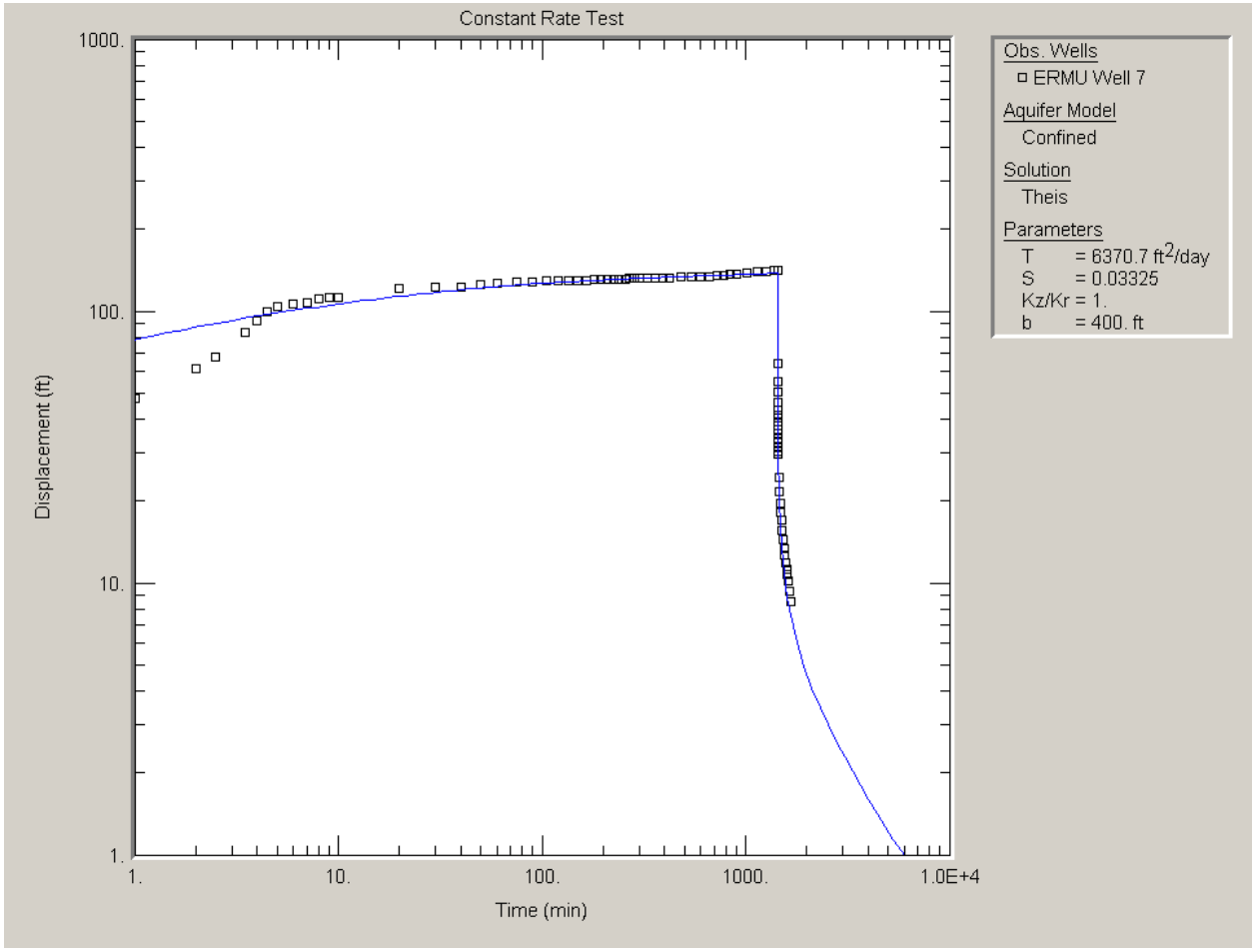
Report Copy

APPENDIX B

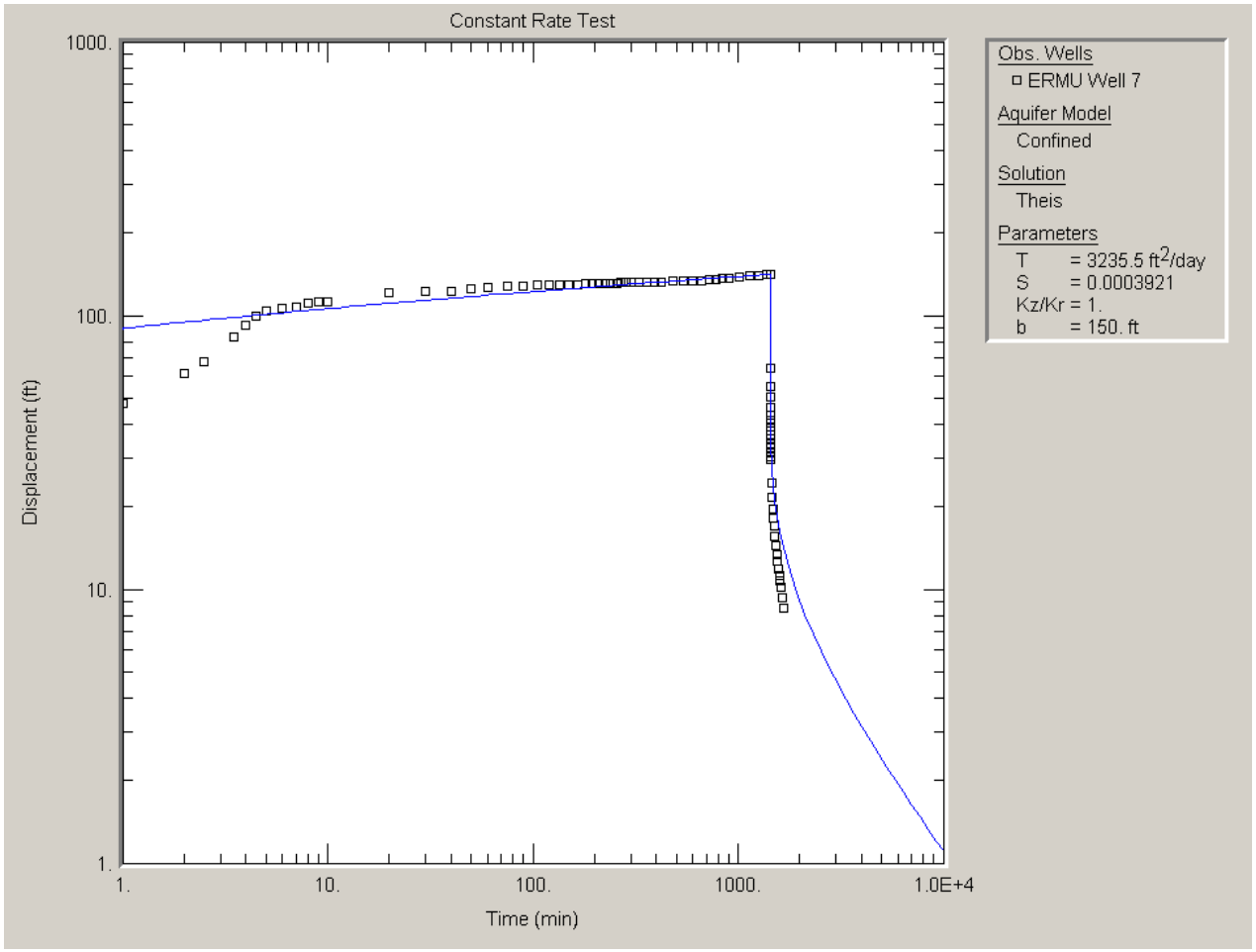
AQUIFER PUMPING TEST DATA

Well 7 Aquifer Test
2001

Aquifer Thickness = 400 ft



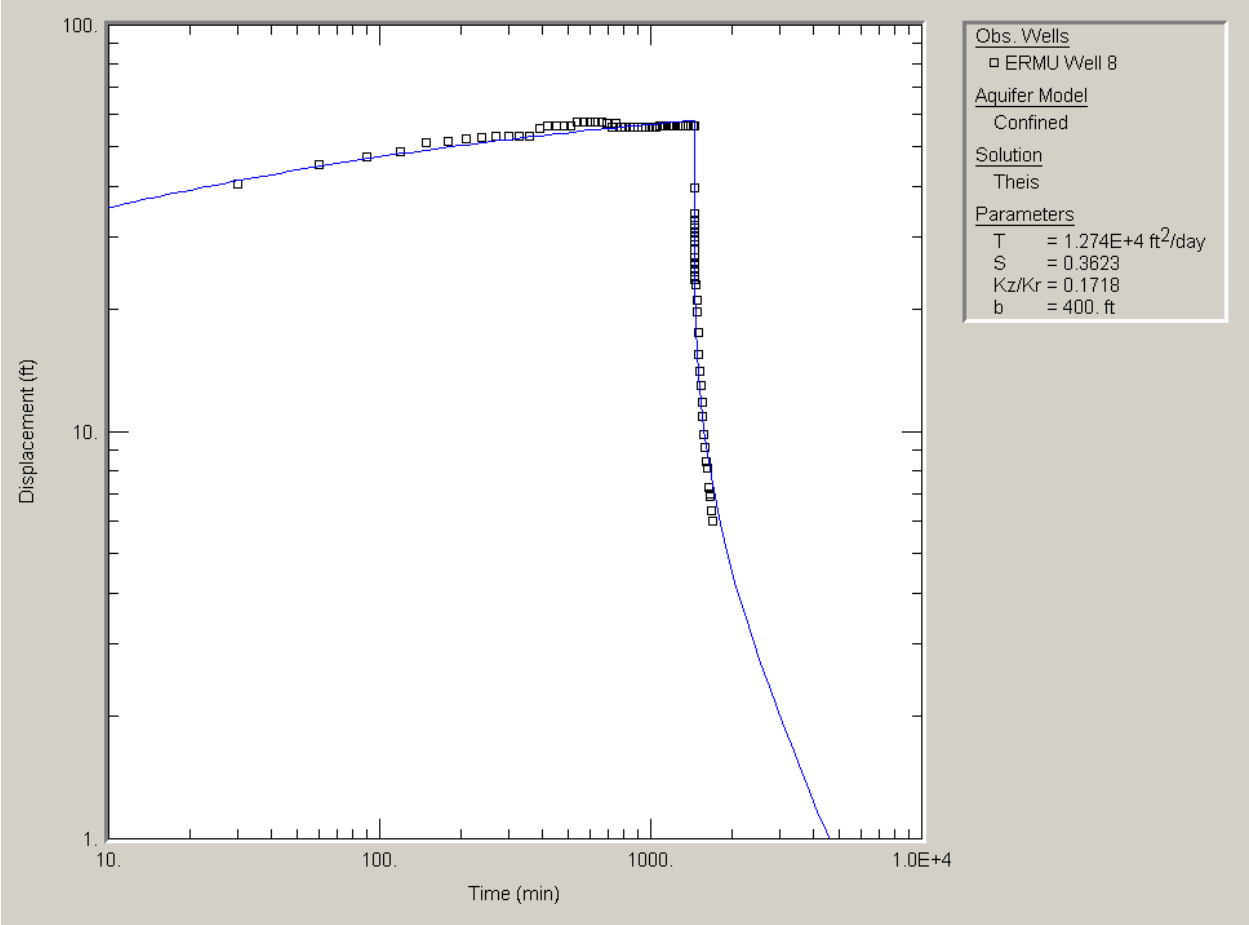
Aquifer Thickness = 150 ft



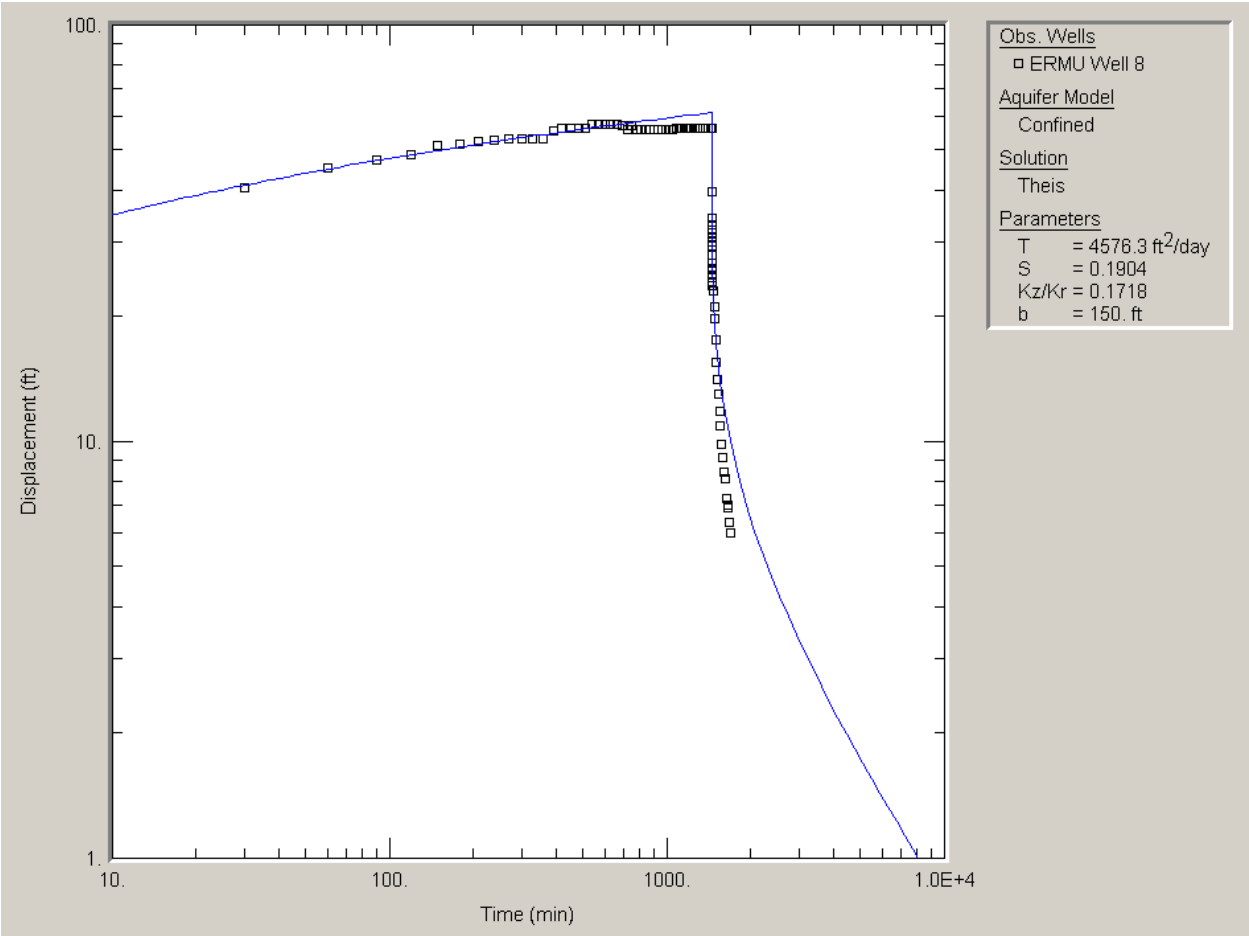
Well 8 Aquifer Test

2004

Aquifer Thickness = 400 ft



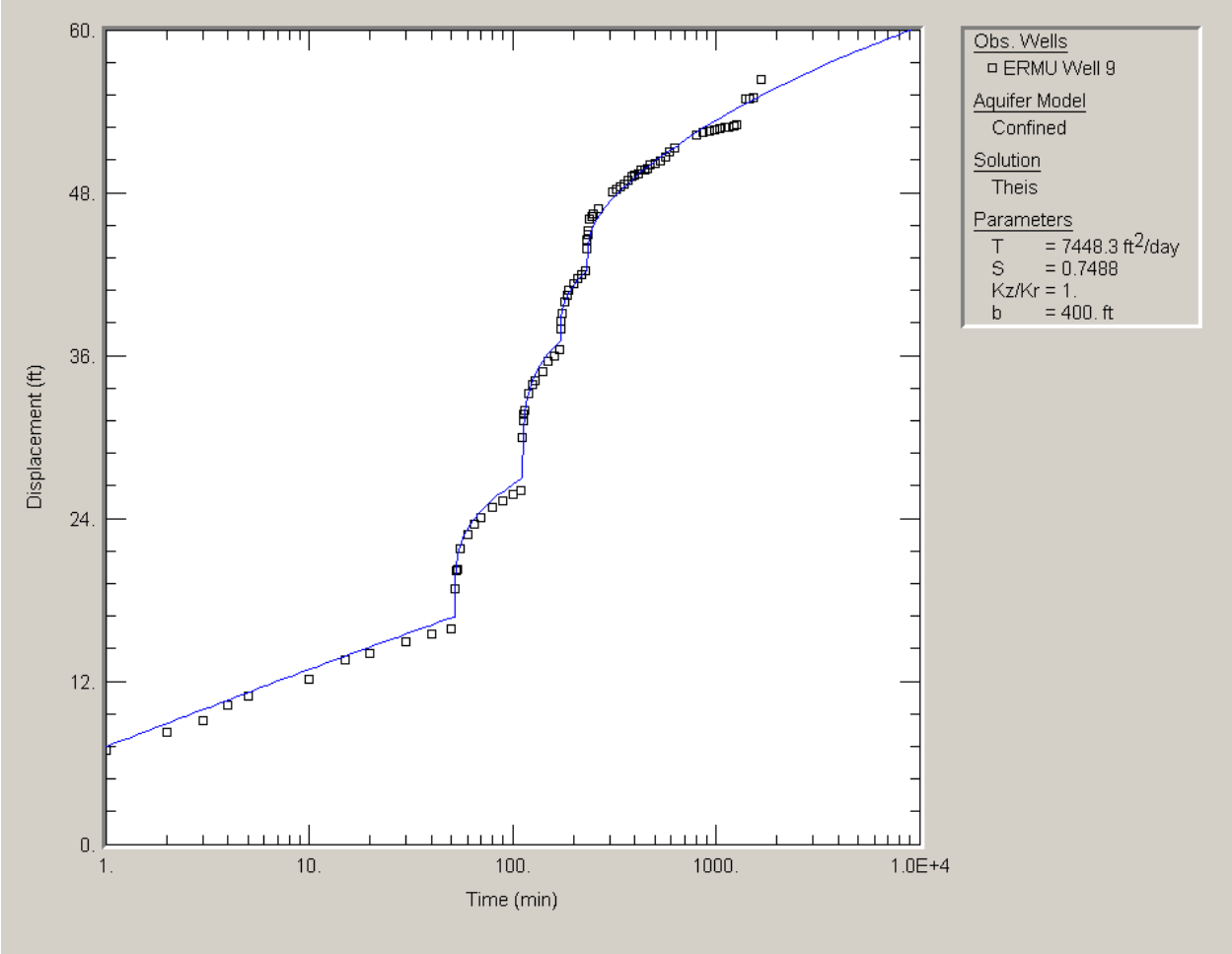
Aquifer Thickness = 150 ft



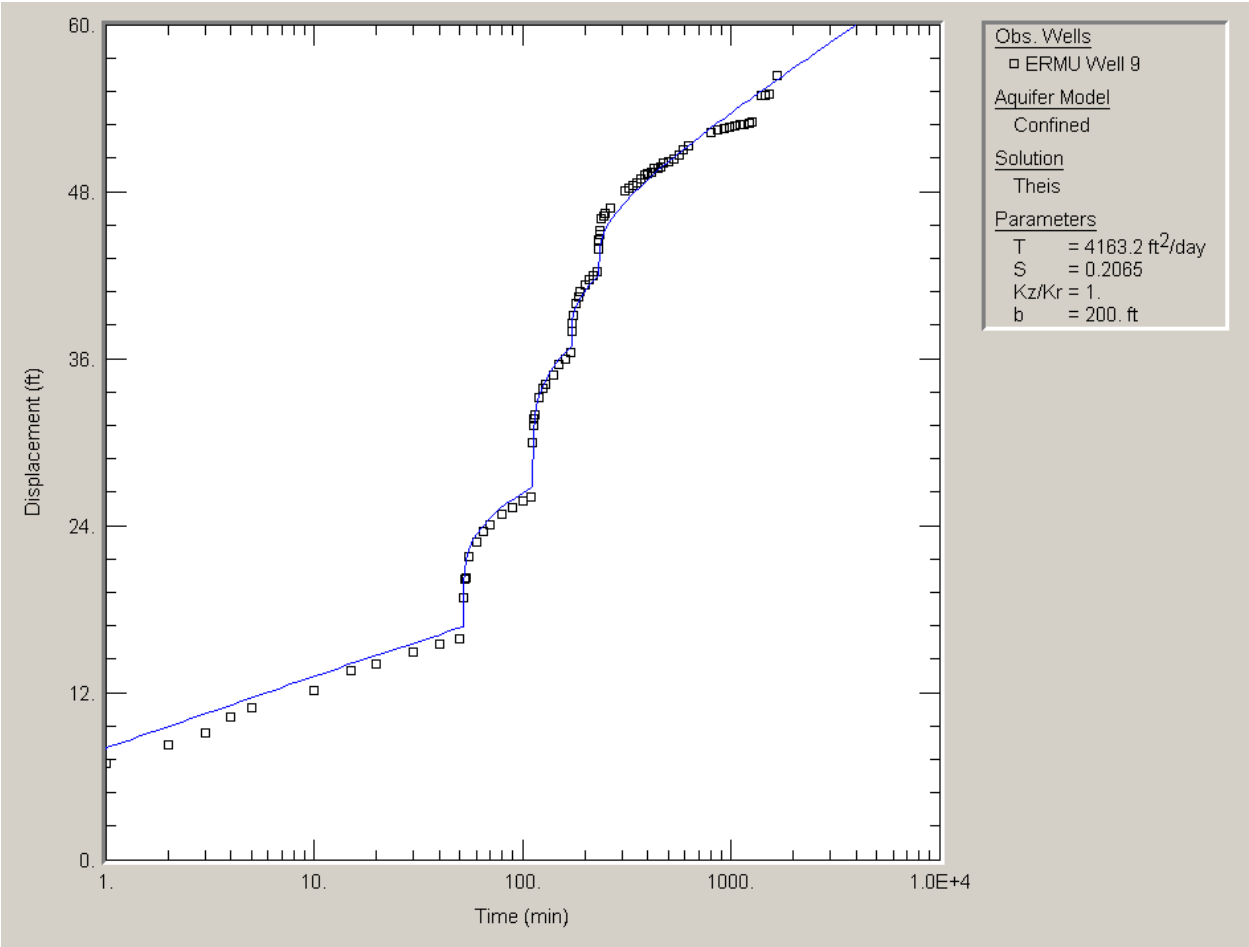
Well 9 Aquifer Test

2008

Aquifer Thickness = 400 ft



Aquifer Thickness = 200 ft



APPENDIX C

WELL VULNERABILITY WORKSHEETS

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1710004 TIER: 2
SYSTEM NAME: Elk River WHP RANK:
WELL NAME: Well #2 UNIQUE WELL #: 00255153

COUNTY: Sherburne TOWNSHIP NUMBER: 33 RANGE: 26 W SECTION: 34 QUARTERS: CACD

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	15
L Score	:	4	
Geologic Data From	:	Well Record	
Year Constructed	:	1948	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	136	10
Well Depth	:	290	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Not applicable	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		Unknown	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	650	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	2.2 04/20/2009	NOT VULNERABLE
Maximum tritium detected	:	<.8 01/07/1999	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		45
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE
Vulnerability Overridden	:		

COMMENTS
NITRATE DATA FROM PWSD 1989, 5/73 SAMPLE L SCORE INCLUDES 10 FEET OF CASED CECR

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1710004 TIER: 2
SYSTEM NAME: Elk River WHP RANK:
WELL NAME: Well #3 UNIQUE WELL #: 00221176

COUNTY: Sherburne TOWNSHIP NUMBER: 33 RANGE: 26 W SECTION: 33 QUARTERS: ABCB

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	10	
Geologic Data From	:	Well Record	
Year Constructed	:	1974	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	201	5
Well Depth	:	315	
Casing grouted into borehole?		Unknown	0
Cement grout between casings?		Unknown	5
All casings extend to land surface?		Yes	0
Gravel - packed casings?		Unknown	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	850	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	.12 04/20/2009	NOT VULNERABLE
Maximum tritium detected	:	<.8	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		30
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE
Vulnerability Overridden	:		

COMMENTS
NITRATE DATA FROM GWRD, 12/18/89

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1710004 TIER: 2
SYSTEM NAME: Elk River WHP RANK:
WELL NAME: Well #4 UNIQUE WELL #: 00481794

COUNTY: Sherburne TOWNSHIP NUMBER: 32 RANGE: 26 W SECTION: 32 QUARTERS: ACB

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	0
L Score	:	14	
Geologic Data From	:	Well Record	
Year Constructed	:	1992	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	197	10
Well Depth	:	225	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	<.05 05/13/2004	NOT VULNERABLE
Maximum tritium detected	:	<.8 12/15/2009	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		20
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE
Vulnerability Overridden	:		

COMMENTS
0.8 TU at well no.3 (unique well no. 221176).

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1710004 TIER: 2
SYSTEM NAME: Elk River WHP RANK:
WELL NAME: Well #5 UNIQUE WELL #: 00537682

COUNTY: Sherburne TOWNSHIP NUMBER: 33 RANGE: 26 W SECTION: 27 QUARTERS:

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Mt. Simon	
DNR Geologic Sensitivity Rating	:	Low	20
L Score	:	2	
Geologic Data From	:	Well Record	
Year Constructed	:	1994	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	316	5
Well Depth	:	406	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	2 05/07/2007	10
Maximum tritium detected	:	10.6 12/15/2009	VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		45
Wellhead Protection Vulnerability Rating	:		VULNERABLE
Vulnerability Overridden	:		

COMMENTS
Previous tritium result of 3.9 TU on 1/7/1999.

625 Robert St. N. St. Paul MN 55155
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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1710004 TIER: 2
SYSTEM NAME: Elk River WHP RANK:
WELL NAME: Well #6 UNIQUE WELL #: 00580320

COUNTY: Sherburne TOWNSHIP NUMBER: 33 RANGE: 26 W SECTION: 28 QUARTERS: BCA

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	8	
Geologic Data From	:	Well Record	
Year Constructed	:	1999	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	212	5
Well Depth	:	300	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	.13 05/18/2010	NOT VULNERABLE
Maximum tritium detected	:	<.8 12/15/2009	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		25
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE
Vulnerability Overridden	:		

COMMENTS

625 Robert St. N. St. Paul MN 55155
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MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1710004 TIER: 2
SYSTEM NAME: Elk River WHP RANK:
WELL NAME: Well #7 UNIQUE WELL #: 00664852

COUNTY: Sherburne TOWNSHIP NUMBER: 33 RANGE: 26 W SECTION: 35 QUARTERS:

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	8	
Geologic Data From	:	Well Record	
Year Constructed	:	2001	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	240	5
Well Depth	:	341	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	<.05 05/13/2004	NOT VULNERABLE
Maximum tritium detected	:	<.8 12/15/2009	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		25
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE
Vulnerability Overridden	:		

COMMENTS

L score of 8 comes entirely from thickness of CECR as derived from MGS gamma log (159' - 244'). Overlying sandy clay was not credited but probably provides some additional protection.

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1710004 TIER: 2
SYSTEM NAME: Elk River WHP RANK:
WELL NAME: Well #8 UNIQUE WELL #: 00694499

COUNTY: Sherburne TOWNSHIP NUMBER: RANGE: SECTION: QUARTERS:

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Mt. Simon	
DNR Geologic Sensitivity Rating	:	Very low	10
L Score	:	11	
Geologic Data From	:	Well Record	
Year Constructed	:	2004	
Construction Method	:	Cable Tool/Bored	0
Casing Depth	:	265	5
Well Depth	:	390	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		No	0
Isolation distance violations?			0
Pumping Rate	:	1000	10
Pathogen Detected?			NOT VULNERABLE
Surface Water Characteristics?			NOT VULNERABLE
Maximum nitrate detected	:	Unknown	0
Maximum tritium detected	:	.8 12/15/2009	NOT VULNERABLE
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		25
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE

Vulnerability Overridden :

COMMENTS

625 Robert St. N. St. Paul MN 55155
P.O. Box 64975 St. Paul MN 55164 - 0975

MINNESOTA DEPARTMENT OF HEALTH
SECTION OF DRINKING WATER PROTECTION
SWP Vulnerability Rating

PWSID: 1710004 TIER: 2
SYSTEM NAME: Elk River WHP RANK:
WELL NAME: Well #9 UNIQUE WELL #: 00757624

COUNTY: Sherburne TOWNSHIP NUMBER: RANGE: SECTION: QUARTERS:

CRITERIA		DESCRIPTION	POINTS
Aquifer Name(s)	:	Mt. Simon-Hinckley	
DNR Geologic Sensitivity Rating	:	Very low	15
L Score	:	7	
Geologic Data From	:	Well Record	
Year Constructed	:	2008	
Construction Method	:	Rotary/Drilled	0
Casing Depth	:	296	5
Well Depth	:	454	
Casing grouted into borehole?		Yes	0
Cement grout between casings?		Yes	0
All casings extend to land surface?		Yes	0
Gravel - packed casings?		No	0
Wood or masonry casing?		No	0
Holes or cracks in casing?		Unknown	0
Isolation distance violations?			0
Pumping Rate	:	600	10
Pathogen Detected?			0
Surface Water Characteristics?			0
Maximum nitrate detected	:	<.05 08/20/2008	0
Maximum tritium detected	:	Unknown	0
Non-THMS VOCs detected?			0
Pesticides detected?			0
Carbon 14 age	:	Unknown	0
Wellhead Protection Score	:		30
Wellhead Protection Vulnerability Rating	:		NOT VULNERABLE
Vulnerability Overridden	:		

COMMENTS

APPENDIX D

MDH DWSMA AND WELL 5

VULNERABILITY TECHNICAL MEMORANDUM

Memo

Date: February 17, 2011

To: Elk River Wellhead File

From: G. Haglund

Subject: DWSMA Vulnerability Assessment

For the most part, the vulnerability of the Mt. Simon Sandstone aquifer serving the Elk River Municipal Utilities (ERMU) is low. Natural geologic protection is provided to the aquifer by the overlying clay-rich till materials and the Eau Claire Shale confining unit. Except in the case of ERMU Well 5 (537682), isotopic results from water sampled at the ERMU wells has confirmed the non-vulnerable nature of the wells and aquifer. The isotopic signature at Well 5 (537682), however, is anomalous relative to the other ERMU wells and has consistently indicated recharge to the well by young water. During the past ten years, Well 5 (537682) was sampled on two occasions for enriched tritium analyses; the results were 3.9 TU (1999) and 10.6 TU (2009). It is possible that young water is entering the well due to a well construction issue, such as a leaky casing. Also, surface water can recharge an otherwise non-vulnerable aquifer by means of poorly constructed or deteriorating abandoned wells. For the purposes of this vulnerability assessment, however, it was assumed that well construction is not an issue and that surface water from the land surface is recharging the aquifer through the overlying geologic materials.

Using existing information, a moderate vulnerability area was mapped in the vicinity of Well 5 (537682). This area represents a bedrock valley feature, trending roughly from the northeast to the southwest. Because there are so few bedrock wells in the area, the boundaries of the valley were interpreted largely from previous work by the MGS (Runkel and Tipping, 2003). Within the moderate vulnerability area, the Eau Claire Shale confining unit is assumed to be relatively thin (< 20 feet) or absent. In addition, the overlying glacial till in the moderate vulnerability area was determined to be less clay-rich and consequently, less protective. On the driller's logs of water wells located in the moderate vulnerability area, the terms 'sandy clay' or 'gravel and clay' were typically used to describe the tills encountered at depth. The coarse-textured tills combined with the absence of the Eau Claire Shale confining unit contribute to the moderate vulnerability rating.

It should be noted that there are other locations within the Elk River DWSMA where bedrock valley features have been mapped and where the Eau Claire confining unit is thin or absent. For example, a fairly large bedrock valley feature has been mapped near ERMU Well 4 (481794). Yet unlike Well 5 (537682), Well 4 (481794) is not being recharged by young water. Driller's logs of water wells located in this part of Elk River typically classify the till as clay-rich in comparison to the till materials in northeast Elk River (near Well 5 [537682]). The clay-rich materials provide a greater degree of protection to the aquifer, and serve to impede the vertical movement of surface water. Bob Tipping (MGS) confirmed that isotopic data from drift wells located in southwest Elk River (in the vicinity of Well 4 [481794]) have no tritium, whereas drift wells in northeast Elk River (in the vicinity of Well 5 [537682]) have detectable tritium.

To decrease the uncertainty associated with the vulnerability assessment, the MDH recommends the following work:

1) In the future, if the pump is to be removed from Well 5 (537682) for maintenance, the ERMU should make arrangements to televise this well to assess the integrity of the casing;
2) Conduct a more intensive well inventory in the 1- and 5-year contribution area of Well 5, with a particular focus on identifying abandoned or unused bedrock wells;
3) Support future work, such as bedrock mapping, that will provide a better understanding of the distribution of the Eau Claire Shale confining unit.

References:

Runkel, A.C., Tipping, R.G., and Mossler, J.H. (2003), *Geology in support of groundwater management for the northwestern Twin Cities Metropolitan area*, Open-File Report, 08-04, Minnesota Geological Survey, St. Paul, Minn., 45 p.

Exhibit B2

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 Elk River Municipal Utilities.

Minnesota Department of Health (March 2021)

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

Elk River Municipal Utilities

March 2021

DEPARTMENT OF HEALTH

CLEAN WATER LAND & LEGACY AMENDMENT

Introduction

This summary documents the amended delineation of the emergency response areas (ERAs), wellhead protection areas (WHPAs), and drinking water supply management area (DWSMA), and the vulnerability assessments for the Elk River Municipal Utilities (ERMU) drinking water supply wells and DWSMA (PWSID 1710004). These were initially approved in May, 2011 and must now be amended as the public water supply's wellhead plan has nearly expired.

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	Well Vulnerability
Well #2	255153	Primary	16	136	290	08/1948	Mt. Simon (CMTS)	Not Vulnerable
Well #3	221176	Primary	20 x 16	201	315	10/23/1974	Mt. Simon (CMTS)	Vulnerable
Well #4	481794	Primary	24 x 18	197	225	12/15/1992	Mt. Simon (CMTS)	Not Vulnerable
Well #5	537682	Primary	30 x 24 x 18	316	406	08/17/1994	Mt. Simon (CMTS)	Vulnerable
Well #6	580320	Primary	24 x 18	212	300	02/12/1999	Mt. Simon (CMTS)	Not Vulnerable
Well #7	664852	Primary	24 x 18	240	341	07/20/2001	Mt. Simon (CMTS)	Not Vulnerable
Well #8	694499	Primary	30 x 24 x 18	264.8	390	06/30/2004	Mt. Simon (CMTS)	Not Vulnerable
Well #9	757624	Primary	24 x 18	296	454	01/30/2008	Mt. Simon-Hinckley (CMSH)	Not Vulnerable

Protection Area Boundaries

The amended protection area boundaries for the ERMU are shown in Figure 1. There are relatively minor changes to the boundaries of the ERAs, the WHPA, and the DWSMA since the previous WHP plan. These changes are primarily due to a refinement of the location of Well #5 (537682), and also to changes in the annual pumping used to determine the protection areas in comparison to the pumping volumes used for the previous plan. For several wells, the pumping volumes of the wells decreased since 2011; for other wells, the pumping volumes increased. The changes to the WHPA and DWSMA boundaries are shown in Figure 2.

Vulnerability Assessments and Management Implications

Six of the eight ERMU wells are considered not vulnerable to contamination, while Wells #3 and #5 (221176 and 537682) are classed as vulnerable (Table 1). Well vulnerability is confirmed by groundwater age data and other water chemistry characteristics (Table 2). Water sampled from the six non-vulnerable wells is of pre-modern age, as determined by the lack of the tritium isotope in the well water. Low level tritium was measured in Well #3, which is characteristic of mixed age water. A moderate level of tritium and other indicators of human impact (such as low level nitrate and chloride) confirms the vulnerable nature of Well #5.

Table 2 - Isotope and Water Quality Results
(Date Sampled: July 30,2020 unless otherwise indicated)

Well Name (Unique Number)	Tritium[1] (TU)	Nitrate (mg/L)	Chloride/ Bromide Ratio	Chloride (mg/L)	Bromide (mg/L)	Arsenic (µg/L)
Well #2 (255153)	< 0.8 Premodern Age	< 0.05	54	< 0.5	0.0092	< 1.0
Well #3 (221176)	1.1 Mixed Age	< 0.05	147	1.66	0.0113	< 1.0
Well #4 (481794)	< 0.8 Premodern Age	< 0.05	51	< 0.5	0.0098	< 1.0
Well #5 (537682)	4.5 Modern Age	1.5	702	17.2	0.0245	< 1.0
Well #6 (580320)	< 0.8 Premodern Age (sampled 2009)	0.38 (2020 treatment plant result)				< 1.0 (2015 treatment plant result)
Well #7 (664852)	< 0.8 Premodern Age (sampled 2009)	< 0.05 (2020 treatment plant result)				< 1.0 (2018 treatment plant result)
Well #8 (694499)	<0.8 Premodern Age	0.07	75	0.803	0.0107	< 1.0
Well #9 (757624)	< 0.8 Premodern Age (sampled 2013)	< 0.05 (2020 treatment plant result)				< 1.0 (2012 treatment plant result)

Note: 1. Tritium age reference: Lindsey et. al, 2019.

For the most part, the DWSMA vulnerabilities are unchanged from the prior plan, ranging from low to moderate. Similar to the previous plan, the majority of the DWSMA is considered to have a low vulnerability; in these areas, natural geologic protection is provided to the aquifer from overlying clay-rich till materials and the Eau Claire formation. Due to the protective clay and shale layers, surface

water and contaminants are impeded and travel from the land surface to the city's aquifer likely occurs over a time span of decades or longer. Within the low vulnerability areas, the primary threats to the city's aquifer are other wells that reach or penetrate it.

Where the DWSMA vulnerability is classed as moderate, pathways exist where water and contaminants may travel from the land surface to the aquifer within a time span of years to decades. The moderate vulnerability rating reflects uncertainty about the pathway for young water reaching the wells. Information gained from the Sherburne County Geologic Atlas (Lusardi, B.A., 2013) was used to identify locations near Wells #3 and #5 (221176 and 537682) where there is less natural geologic protection overlying the aquifer. This area coincides with a relatively deep buried bedrock valley feature, and where the protective Eau Claire formation is thin or absent. To be consistent with current practice, the boundaries of the moderate vulnerability area were refined using geographic features, such as public land survey data, for this amendment. Moderately vulnerable aquifers are prone to several types of contaminant threats, including chemical storage tanks and abandoned wells which can provide conduits for contaminants to quickly reach the city's aquifer.

Water Quality Concerns - At present, none of the human-caused contaminants for which the Safe Drinking Water Act has established health-based standards is found above maximum allowable levels in the city's water supply, nor are any present at one-half of those levels.

Documentation and Recommendations

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.

1. **Well Locating** - MDH records indicate that there are approximately 10 deeper wells (i.e., wells constructed between 200 and 400 feet deep) that have been constructed within the DWSMA since the previous plan and which have not been field located. The ERMU is encouraged to work with MDH to provide accurate locations for these deeper wells. Information from these wells can be used to confirm aquifer vulnerability at their locations.
2. **Planning for a Replacement Well(s)** - According to MDH records, ERMU Well #2 (255153) is more than 70 years old. The ERMU may want to include measures in their amended WHP Plan to take steps to prepare for the replacement for Well #2. The measures might include: the drilling of a test well(s), water quality sampling, and capacity testing.
3. **Water Quality Monitoring** - MDH recommends that the standard assessment monitoring package should be analyzed during year six or seven at any primary wells that exist at the time. MDH can provide sample bottles and cover analytical costs, pending available resources. The ERMU may need to collect the samples and ship them to MDH.

Selected References

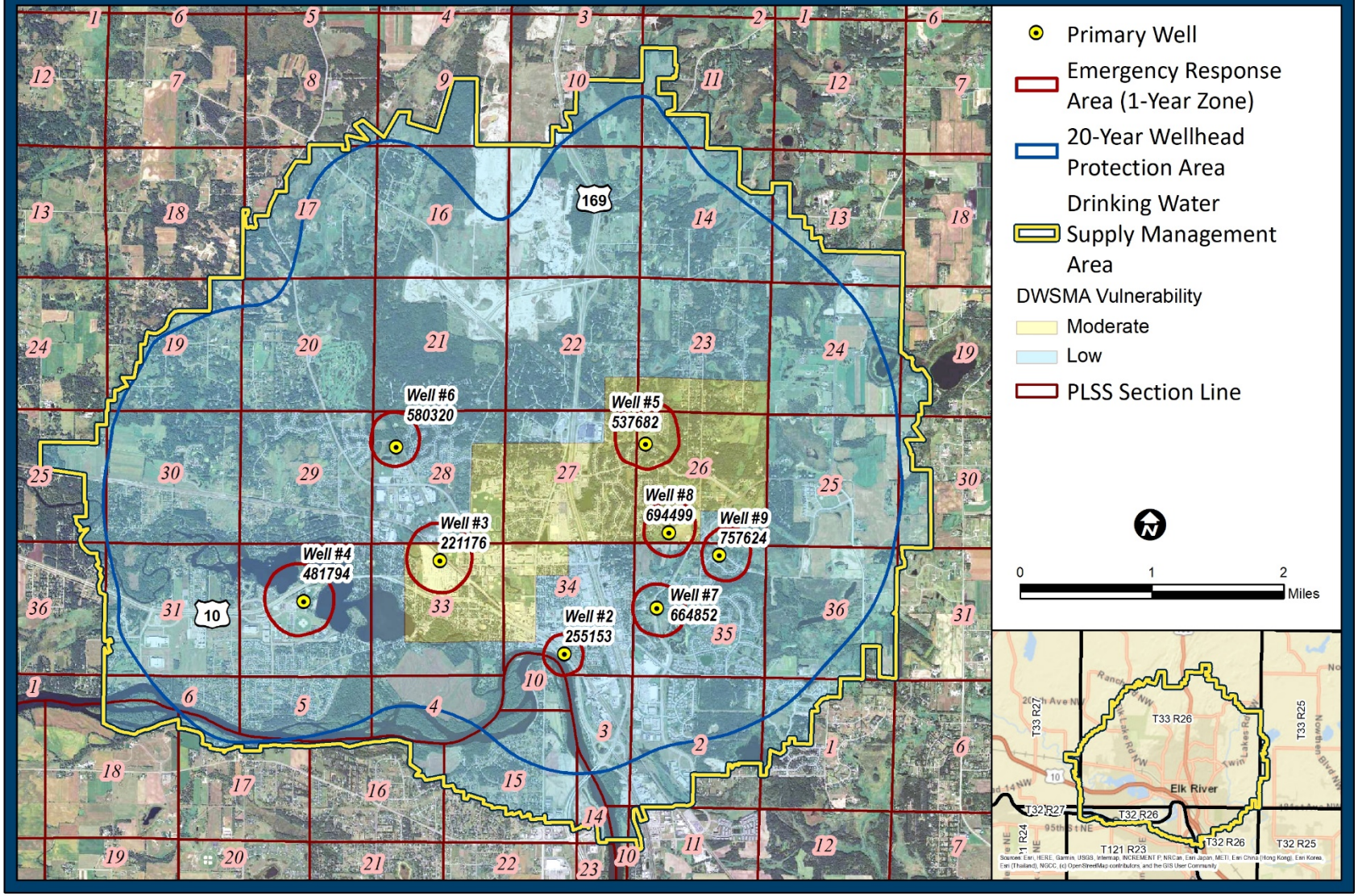
Berg, J.A. (2017), *Geologic atlas of Sherburne County, Minnesota*, Minnesota Department of Natural Resources, Division of Waters, County Atlas Series, C-32, Part B, St. Paul, Minn., 56 p., 2 plates, scale 1:100,000.

Lindsey, B.D., Jurgens, B.C., and Belitz, K., (2019), *Tritium as an indicator of modern, mixed, and premodern groundwater age*, *Scientific Investigations Report 2019-5090*, U.S. Geological Survey, Reston, Va., 18 p.

Lusardi, B.A., (Project mgr.) (2013), *Geologic atlas of Sherburne County, Minnesota*, Minnesota Geological Survey, County Atlas Series, C-32, Part A, St. Paul, Minn., 5 plates, scales 1:100,000 and smaller.

Sherburne & Wright Counties
Minnesota

Figure 1
Drinking Water Supply Management Area and Vulnerability
Elk River Municipal Utilities



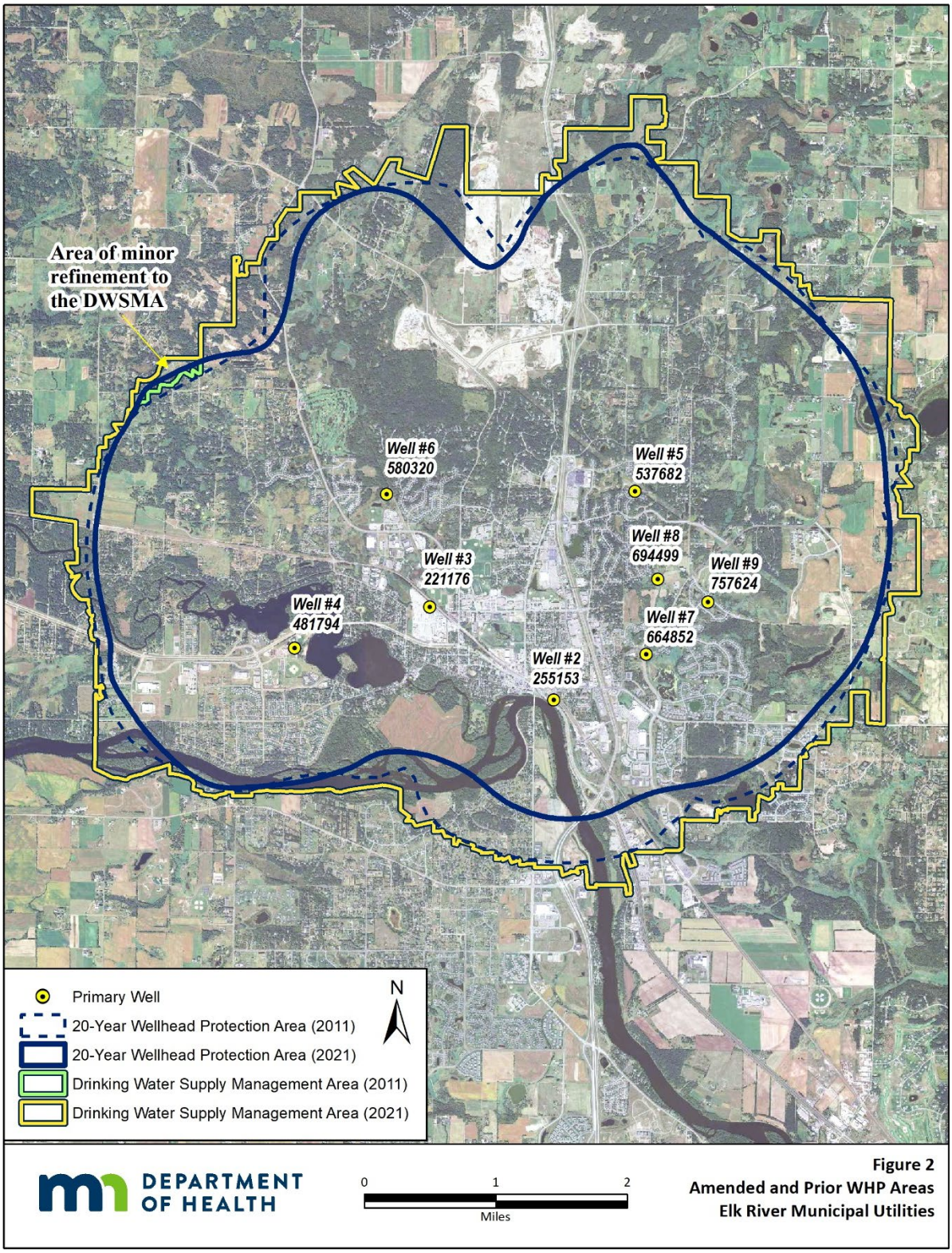


Figure 2
Amended and Prior WHP Areas
Elk River Municipal Utilities

Appendix C

Potential Contaminant Source Inventory

for

Elk River Municipal Utilities DWSMA

Exhibits

Exhibit C1 - DWSMA PCSI Maps and Table

Exhibit C2 - Inner Well Management Zone Inventory

Exhibit C3 - Old Municipal Well Report for ERMU

Exhibit C1

Potential Contaminant Source Inventory (PCSI)
For
ERMU DWSMA

Figures

Tables

Figures

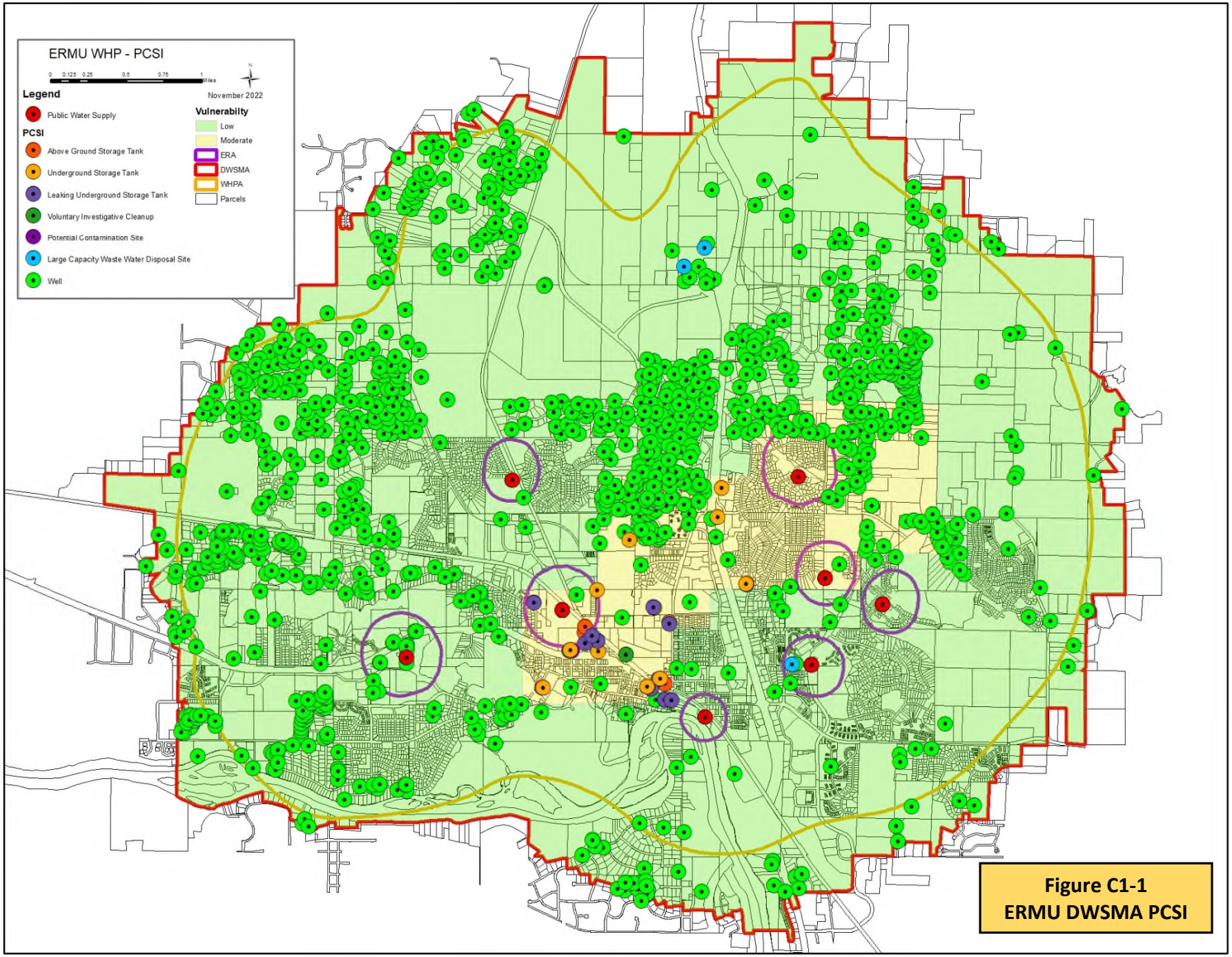


Figure C1-1
ERMU DWSMA PCSI

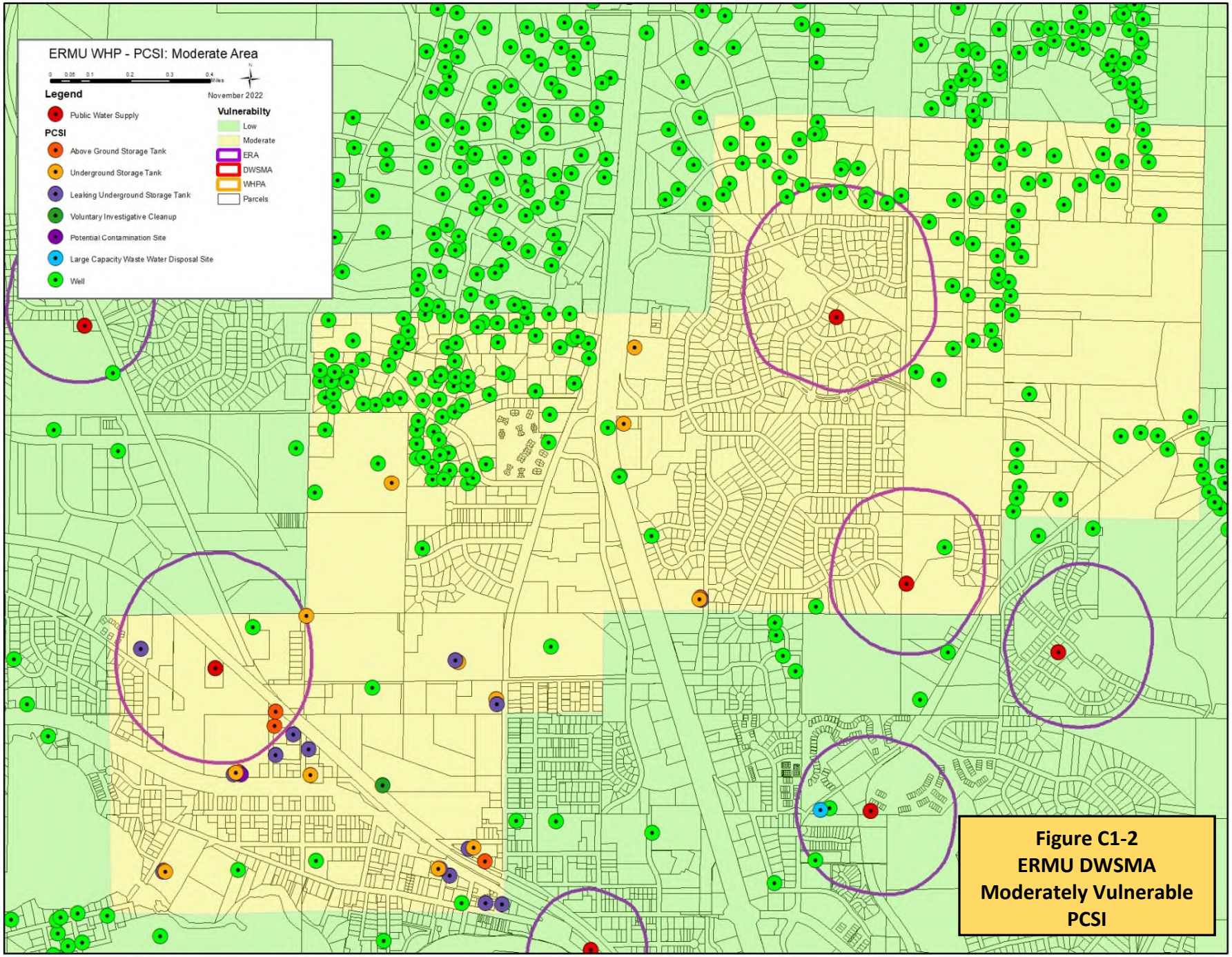


Figure C1-2
ERMU DWSMA
Moderately Vulnerable
PCSI

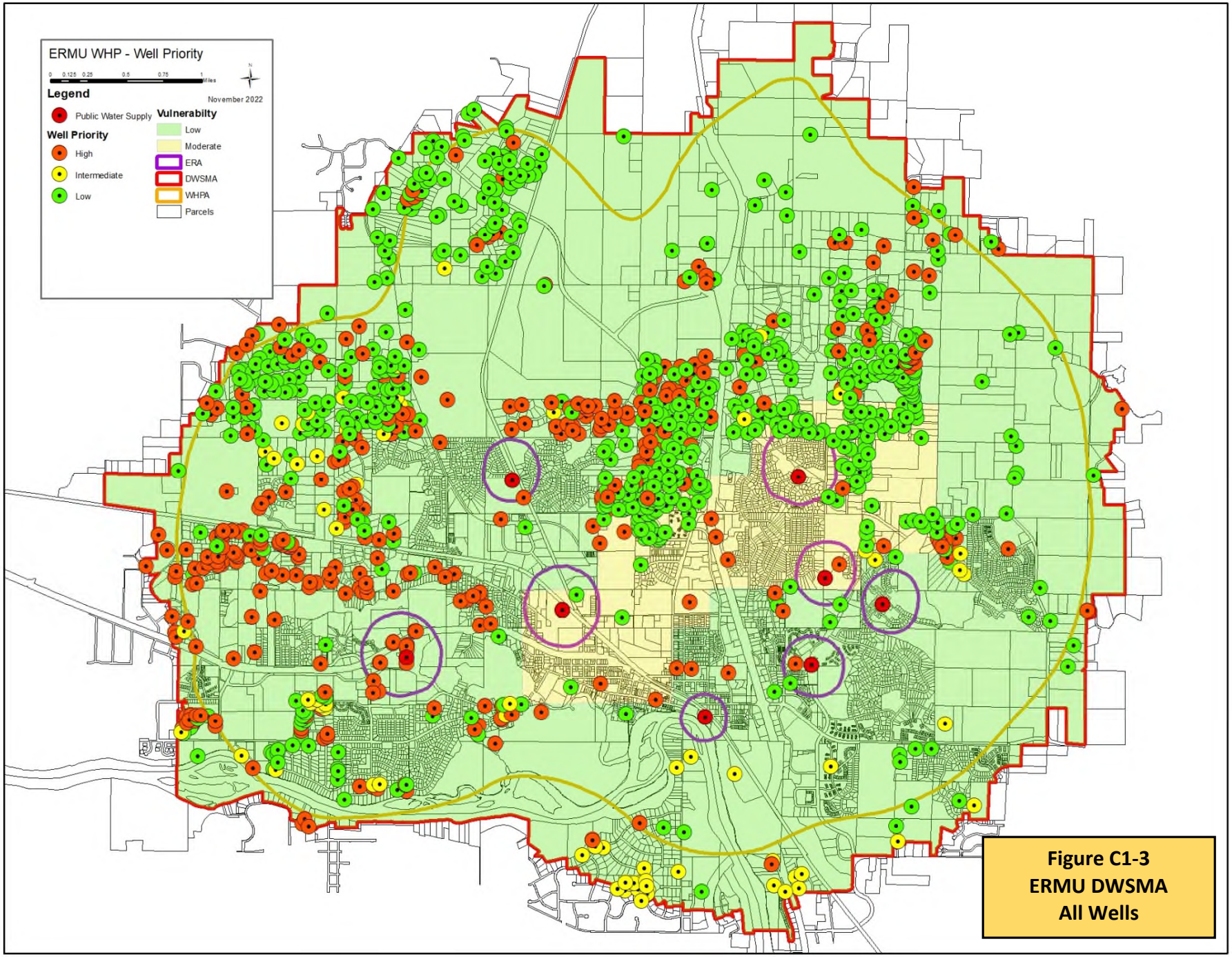


Figure C1-3
ERMU DWSMA
All Wells

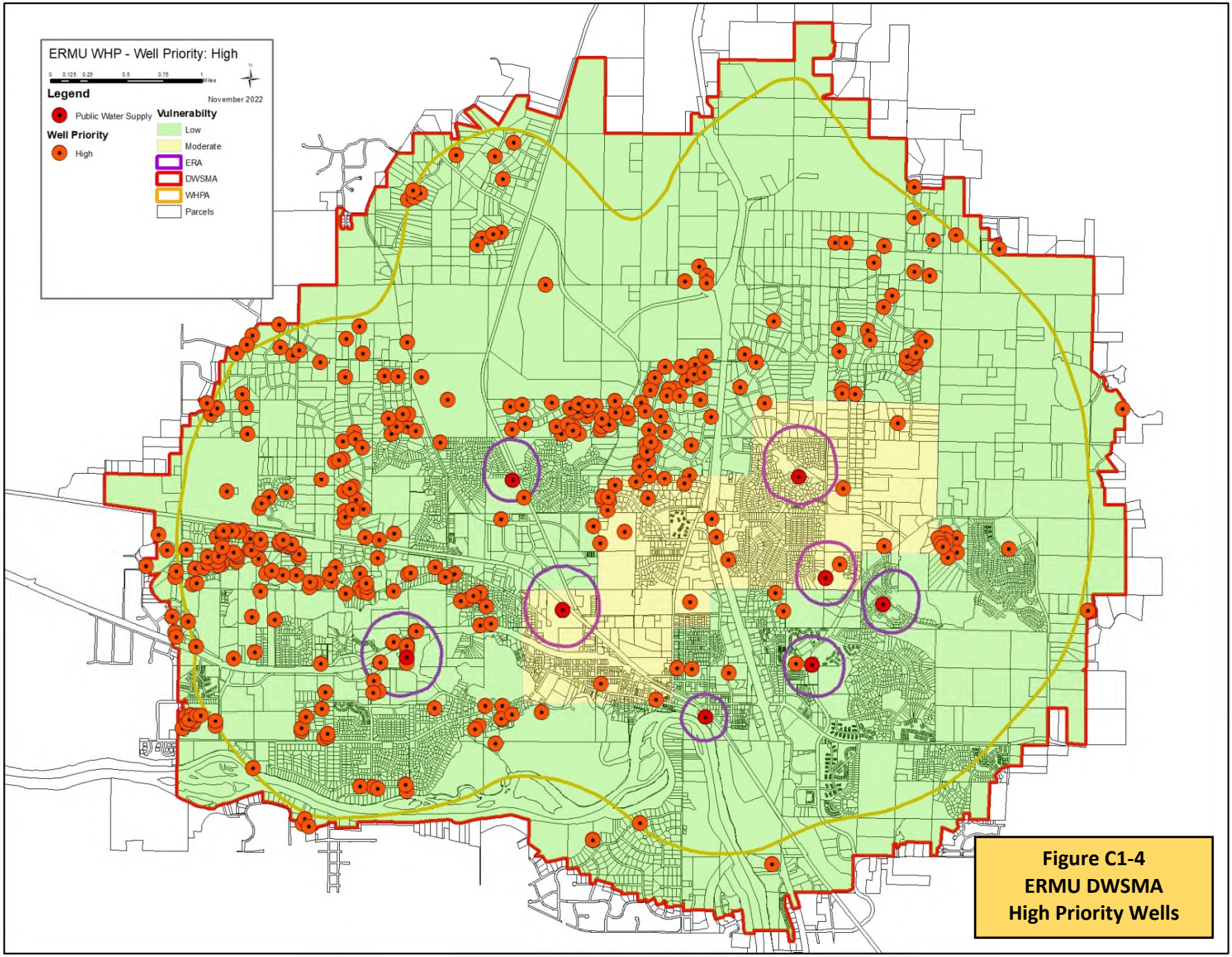


Figure C1-4
ERMU DWSMA
High Priority Wells

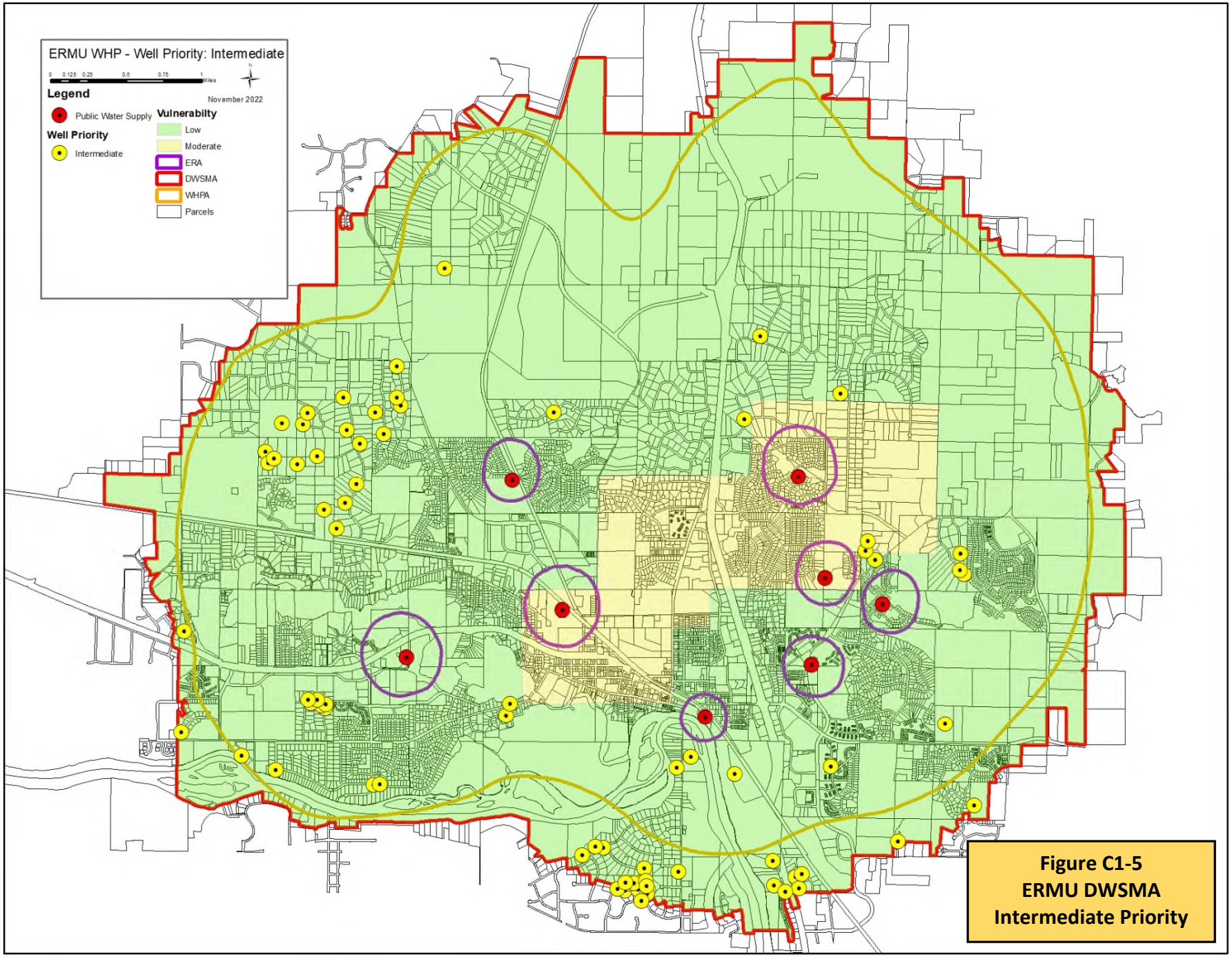


Figure C1-5
ERMU DWSMA
Intermediate Priority

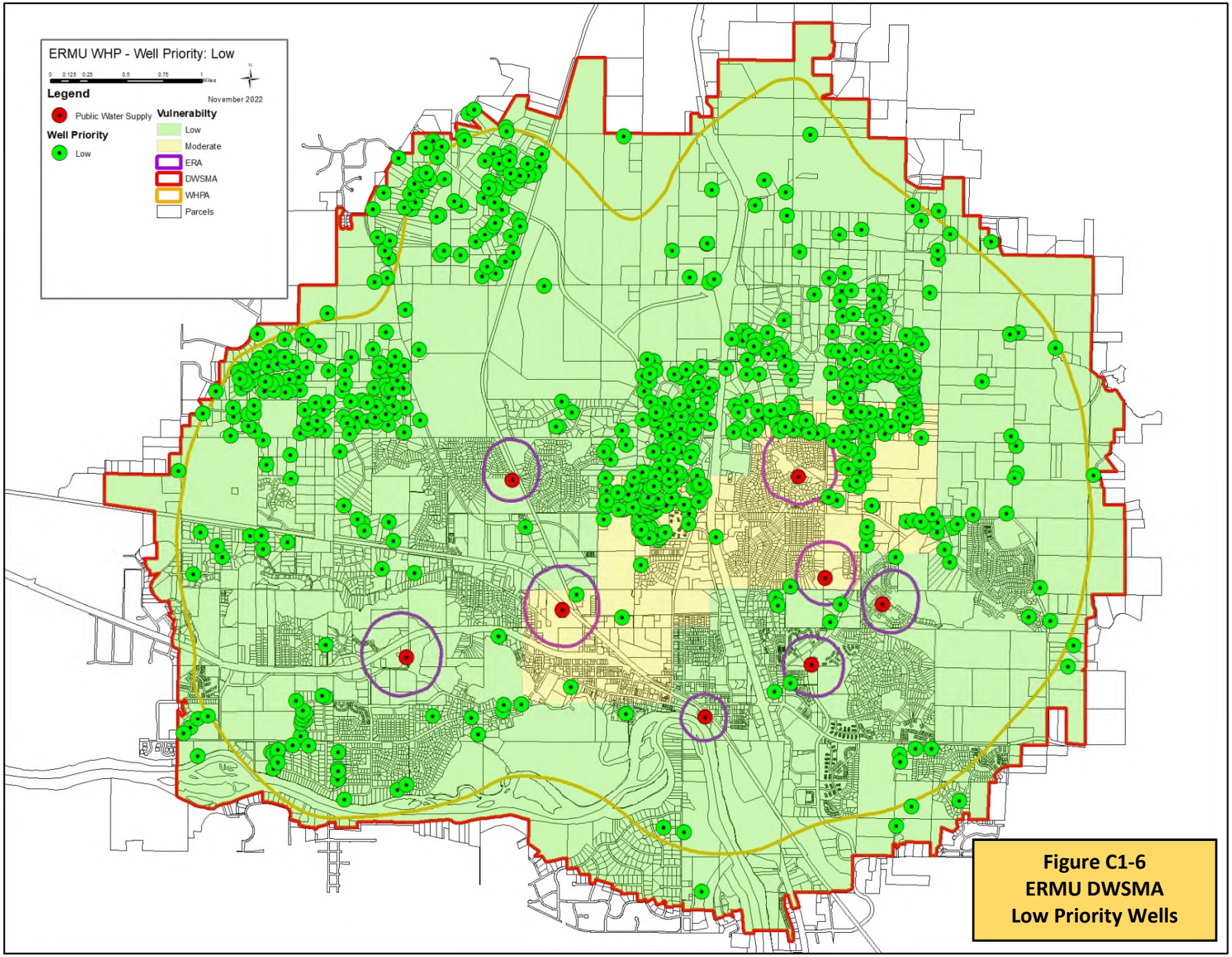


Figure C1-6
ERMU DWSMA
Low Priority Wells

Tables

Table C1-1

ERMU DWSMA
PCSI Moderately Vulnerable
(No Wells)

ERMU DWSMA

Moderately Vunerable PCSI (No Wells)

PCSI ID	PIN	FAC NAME	ADDRESS	CITY	ZIP	PCS Code	STATUS	PROGRAM ID	COMMENT	Location
1600	75-405-1010	Crow River Rental	728 Railroad Dr	Elk River	55330	AST	A	101234	Aboveground Tanks; MPCA #TS0124275 - 2 fuel tanks	Moderate
1601	75-403-0070	Beaudry Oil & Propane	730 Quinn Ave	Elk River	55330	AST	A	109947	Aboveground Tanks; Former Houle Oil Bulk Plant site; MPCA #TS0055883 - 11 tanks	ERA
1602	75-403-0060	Beaudry Oil & Propane	711 Proctor Rd	Elk River	55330	AST	A	111104	Aboveground Tanks; Former Houle Oil Co Inc; MPCA #TS0052901 - 5 tanks	ERA
1603	75-127-4300	MNDOT District 3B Elk River	18938 Dodge St NW	Elk River	55330	AST	A	38717	Aboveground Tanks; MPCA #TS0009352 - 5 tanks	Moderate
1604	75-403-0090	Rinker Materials	1340 6th St NW	Elk River	55330	AST	A	4075	Aboveground Tanks; Former Forterra Concrete Products; MPCA #TS0009306 - 8 tanks	Moderate
1605	75-911-0105	Elk River Municipal Utilities	1705 Main St	Elk River	55330	AST	U	176	Aboveground Tanks; MPCA #TS0050341 - 5 tanks	Moderate
1608	75-405-2320	Botrys Properties Llc	335 Lowell Ave Nw	Elk River	55330	AST	A	118876	Aboveground Tanks; (aka Charlie Brown) MPCA #TS0013906 - 2 tanks	Moderate
1650	75-410-0830	Beaudry Express	610 Proctor Ave	Elk River	55330	UST	A	118032	Underground Tanks; convenience store; MPCA #TS0018318 - 5 tanks	Moderate
1651	75-133-1102	ISD 728 VandenBerge Middle School	948 Proctor Ave NW	Elk River	55330	UST	A	10846	Underground Tanks; MPCA #TS0009337 - 2 tanks	Moderate
1652	75-134-2100	ISD 728 - Elk River Area High School	900 School St NW	Elk River	55330	UST	I	1656	Underground Tanks; MPCA #TS0009338 - 2 tanks (1 removed, 1 closed-in-place)	Moderate
1653	75-134-2200	Morrell Transfer Inc	809 Jackson Ave NW	Elk River	55330	UST	R	116612	Underground Tanks; MPCA #TS0009353 - 3 tanks removed	Moderate
1654	75-128-4106	ISD 728 Salk Junior High School	11970 Highland Rd	Elk River	55330	UST	R	11135	Underground Tanks; MPCA #TS0009336 - 1 tank removed	Moderate
1655	75-566-0210	Coborn's Elk River 2023	19425 Evans St NW	Elk River	55330	UST	A	138250	Underground Tanks; MPCA #TS0130272	Moderate
1656	75-558-0105	Speedway	11554 193rd Ave NW	Elk River	55330	UST	A	13609	Underground Tanks; MPCA #TS0018700 - 4 tanks	ERA
1657	75-405-1010	Hassan 101, Llc	728 Railroad Dr Nw	Elk River	55330	UST	R	116018	Underground Tanks; Former NAPA store (razed), now a vacant lot; MPCA #TS0018055 - 3 tanks removed;	Moderate
1659	75-405-2320	Botrys Properties Llc	335 Lowell Ave Nw	Elk River	55330	UST	A	118876	Underground Tanks; (aka Charlie Brown) MPCA #TS0013906 - 3 tanks removed, 5 underground tanks remain	Moderate
1661	75-911-0105	Elk River Municipal Utilities	1705 Main St	Elk River	55330	UST	R	176	Underground Tanks; MPCA #TS0009312 - 4 tanks removed	Moderate

ERMU DWSMA

Moderately Vunerable PCSI (No Wells)

PCSI ID	PIN	FAC NAME	ADDRESS	CITY	ZIP	PCS Code	STATUS	PROGRAM ID	COMMENT	Location
1662	75-403-0090	Rinker Materials	1340 6th St NW	Elk River	55330	UST	R	4075	Underground Tanks; Former Forterra Concrete Products; MPCA #TS0009306 - 7 tanks removed	Moderate
1663	75-127-4300	MNDOT District 3B Elk River	18938 Dodge St NW	Elk River	55330	UST	R	38717	Underground Tanks; MPCA #TS0009352 - 4 tanks removed	Moderate
1700	75-405-0940	Hassan 101, Llc	728 Railroad Dr Nw	Elk River	55330	LUST	I	189137	Petroleum Remediation, Leak Site; MPCA #LS00015740; Former Napa Store (razed)	Moderate
1701	75-405-0275	City of Elk River Property	720 Main St NW	Elk River	55330	LUST	I	196624	Petroleum Remediation, Leak Site; MPCA #LS0018687	Moderate
1702	75-405-0190	Beaudry Oil	335 Lowell Ave	Elk River	55330	LUST	I	199146	Petroleum Remediation, Leak Site; MPCA #LS0010983; appears to be adjacent to Charlie Brown car wash - likely same parcel due to redevelopment	Moderate
1703	75-402-0043	Beaudry Oil & Propane Company	630 Proctor Ave NW	Elk River	55330	LUST	I	190926	Petroleum Remediation, Leak Site; MPCA #LS0013526; appears to be the same site as the Charlie Brown car wash due to redevelopment	Moderate
1704	75-867-0105	Beaudry Oil Bulk Facility	726 Quinn Ave NW	Elk River	55330	LUST	I	194327	Petroleum Remediation, Leak Site; MPCA #LS0015298; this parcel adjacent to 75-403-0070	ERA
1705		Elk River Municipal Well #3	Upland Ave NW & Meadowvale Rd NW	Elk River	55330	LUST	I	196505	Petroleum Remediation, Leak Site; MPCA #LS0014084	ERA
1707	75-405-2320	Botrys Properties Llc	335 Lowell Ave Nw	Elk River	55330	LUST	I	118876	Petroleum Remediation, Leak Site; MPCA #LS0017730	Moderate
1708	75-806-0001	Amoco Ss #5053	308 Jackson Pl	Elk River	55330	LUST	C	116610	Petroleum Remediation, Leak Site; MPCA# LS0002021; site has been redeveloped	Moderate
1709	75-911-0105	Elk River Municipal Utilities	1705 Main St	Elk River	55330	LUST	I	176	Petroleum Remediation, Leak Site; MPCA #LS0004396	Moderate
1710	75-403-0090	Rinker Materials	1340 6th St NW	Elk River	55330	LUST	I	4075	Petroleum Remediation, Leak Site; MPCA #LS004535 & LS0001439 (Former Forterra Concrete Products site)	Moderate
1711	75-403-0060	Beaudry Oil & Propane Company	711 Proctor Rd	Elk River	55330	LUST	I	111104	Petroleum Remediation, Leak Site; MPCA #LS0012389; former Houle Oil Co. site	ERA
1712	75-127-4300	MNDOT District 3B Elk River	18938 Dodge St NW	Elk River	55330	LUST	I	38717	Petroleum Remediation, Leak Sites; MPCA #LS0004182 & LS0002337	Moderate

ERMU DWSMA

Moderately Vunerable PCSI (No Wells)

PCSI ID	PIN	FAC NAME	ADDRESS	CITY	ZIP	PCS Code	STATUS	PROGRAM ID	COMMENT	Location
1713	75-134-2200	Morrell Transfer Inc	809 Jackson Ave NW	Elk River	55330	LUST	I	116612	Petroleum Remediation, Leak Site; MPCA #LS0012836	Moderate
1717	75-134-2100	ISD 728 - Elk River Area High School	900 School St NW	Elk River	55330	LUST	I	1656	Petroleum Remediation, Leak Site; MPCA #LS0021282	Moderate
1800	75-403-0090	Rinker Materials	1340 6th St NW	Elk River	55330	PCS	A	4075	Toxics Reduction; MPCA #5533WFRTRR1346T; Former Forterra Concrete Products	Moderate
1801	75-134-2309	Elk River Oil Co	Railroad Dr	Elk River	55330	VIC	I	110270	Investigation and Cleanup: Tanks; MPCA #TS0119765, LS0013394 & LS0013413	Moderate

Table C1-2

ERMU DWSMA
High Priority Wells PCSI

ERMU DWSMA

High Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
1	75-557-0105	City of Elk River	WEL	A	255153	ELK RIVER 2	ERA	CEMS	High
2	75-402-0082	Elk River Municipal Utilities	WEL	A	221176	ELK RIVER 3	ERA	CMTS	High
3	75-794-0110	City of Elk River	WEL	A	481794	ELK RIVER 4	ERA	CMTS	High
4	75-574-0010	Elk River Municipal Utilities	WEL	A	537682	ELK RIVER 5	ERA	CMTS	High
5	75-128-2310	Elk River Municipal Utilities	WEL	A	580320	ELK RIVER 6	ERA	CMTS	High
6	75-135-2305	City of Elk River	WEL	A	664852	ELK RIVER 7	ERA	CMTS	High
7	75-705-0106	Elk River Municipal Utilities	WEL	A	694499	ELK RIVER 8	ERA	CMTS	High
8	75-735-0060	Elk River Municipal Utilities	WEL	A	757624	ELK RIVER 9	ERA	CMSH	High
9		WALDRON, WILLIAM	WEL	U	169544	Unknown Location	Moderate	CMTS	High
14	75-497-0210	Carlson, Jessica &parish, Ronald Jr	WEL	A	166007		WHPA	CEMS	High
19	75-482-0120	Eckblad, James A & Terrie	WEL	A	417063		WHPA	CEMS	High
20	193325330001	Burns Township of	WEL	A	416624		DWSMA	CMTS	High
21	75-518-0230	Voltzke, Karl D &patricia	WEL	A	441138		WHPA	CEMS	High
25	75-452-0140	Dixon, Terrance P & Amy	WEL	A	502961		WHPA	CECR	High
26	75-115-3401	Cst Companies Llc	WEL	A	474075		WHPA	CEMS	High
31	75-131-2435	Westerlund, Gary L	WEL	A	165963		WHPA	CECR	High
33	75-761-0140	Ind School Dist 728	WEL	A	413541		WHPA	CEMS	High
35	75-475-0190	Van Valkenburg, Terry L	WEL	A	169377		WHPA	CEMS	High
49	1	GREG KREUSER	WEL	U	152530	Unknown Location	WHPA	CEMS	High
51	75-517-0230	Schmidt, Terrill J & Venesha D	WEL	A	451445		WHPA	CECR	High
56	75-517-0334	Grace, Terry M & Martha K	WEL	A	502940		WHPA	CEMS	High
63	75-503-0520	Buhl, Gregory A & Barbara E	WEL	A	426164		WHPA	CMTS	High
64	75-503-0714	Torgerson, Ryan & Jody	WEL	A	158312		WHPA	CMTS	High
69	75-475-0250	Schuldt, Charles & Mary	WEL	A	127927		WHPA	CEMS	High
70	75-474-0110	Ihla, Conrad A & Julia	WEL	A	434615		WHPA	CEMS	High
79	75-517-0318	Eisel, Jon & Shelly	WEL	A	434329		WHPA	CECR	High
83	75-503-0222	Johnson, Paul R & Penny A	WEL	A	437544		WHPA	CEMS	High
87	75-518-0260	Roberts, Jill M & Denis B - Trustee	WEL	A	500656		WHPA	CEMS	High
91	75-707-0320	Hoheisel, Justin & Sara	WEL	A	154159		WHPA	CECR	High
94	75-493-0140	Patten, Tyler T & Christina M	WEL	A	155286		WHPA	CEMS	High
97	75-508-0310	Luniewski, Lawrence E	WEL	A	406295		WHPA	CEMS	High
100	75-503-0238	Burley, Robert W & Joanne C-Trustee	WEL	A	429260		WHPA	CMTS	High
105	75-130-1401	Seth, James & Debra M	WEL	A	147197		WHPA	CECR	High
118	75-452-0170	Beebe, Dennis B	WEL	A	433879		WHPA	CECR	High
133	75-853-0105	Yankee Doodle Enterprises Llc	WEL	A	267311		ERA		High
134	75-452-0220	Zhybryk, Siarhei & Julia	WEL	A	502524		WHPA	CEMS	High
135	75-517-0225	Widing, Cynthia Kay	WEL	A	456518		WHPA	CECR	High
139	75-506-0210	Eversman, Richard L & Cindy	WEL	A	125281		WHPA	CEMS	High
142	1	MAINT. BLDG. 90741	WEL	U	126751	Unknown Location	Moderate	MTPL	High

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High Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
144	75-132-3105	Sherburne County	WEL	A	261449		WHPA		High
145	75-465-0430	Hoselton, D Lavina	WEL	A	105096		WHPA	CECR	High
149	75-428-0212	Barbeln, Keith M	WEL	A	166010		Moderate	CEMS	High
156	75-474-0310	Nething, Douglas L & Julie K	WEL	A	156643		WHPA	CECR	High
157	75-504-0305	Doran, Nicole &dusenka, Christopher	WEL	A	449089		DWSMA	CECR	High
164	75-503-0310	Peabody, Kent J & Jeanne M - Trust	WEL	A	431611		WHPA	CEMS	High
171	75-505-0156	Mcquown, Timothy W & Jennifer A	WEL	A	417016		WHPA	CEMS	High
179	75-120-4000	E R Country Club,inc	WEL	A	264164		WHPA		High
182	75-482-0340	Jones, Jeremy & Cerise	WEL	A	139724		WHPA	CECR	High
184	75-517-0322	Berg, Lonny L & June E	WEL	A	436316		WHPA	CMTS	High
185	75-517-0330	Skarolid, Richard S	WEL	A	425336		WHPA	CECR	High
192	75-452-0130	Wood, Michael K	WEL	A	502543		WHPA	CEMS	High
195	75-452-0145	Held, Terry M & Josephine	WEL	A	502971		WHPA	CECR	High
205	75-130-2000	Dobel Farm, Llc	WEL	A	217942		WHPA	CEMS	High
207	75-505-0148	Olson, Richard & Jessica	WEL	A	417860		WHPA	CECR	High
208	75-517-0332	Chaddock, Alexander K & Gracia R	WEL	A	437551		WHPA	CECR	High
210	75-503-0204	Mcalpine, Neil A	WEL	A	425712		WHPA	CMTS	High
216	75-128-2300	Ind School Dist 728	WEL	A	578941		ERA	CEMS	High
218	75-510-0305	Stavlo, Shawn	WEL	A	417920		WHPA	CECR	High
219	75-503-0525	Molstad, Kari A	WEL	A	423125		WHPA	CMTS	High
228	75-517-0140	Meyer, Steven G & Wendy M	WEL	A	433876		WHPA	CECR	High
235	75-431-0110	Lorge, John L & Deborah	WEL	A	169509		Moderate	CMTS	High
244	75-428-0202	Dunn, Brian W & Marybeth	WEL	A	144176		Moderate	CEMS	High
255	75-120-2311	Woodruff, Gary P	WEL	A	446003		WHPA	CEMS	High
260	75-503-0742	Sauk, Gerald J & Rita G	WEL	A	416127		WHPA	CECR	High
262	75-473-0260	Stearns, Scott A & Christine M	WEL	A	149704		WHPA	CECR	High
263	75-408-0590	Ind School Dist 728	WEL	U	248812		Moderate	CMTS	High
270	75-517-0306	Thole, John T & Lisa L	WEL	A	456554		WHPA	CECR	High
274	75-504-0325	Cloud, Ronald S & Patricia	WEL	A	500558		DWSMA	CEMS	High
275	75-513-0430	Elk River Municipal Utilities	WEL	A	674497		Moderate	CMSH	High
276	75-503-0740	Johnson, Rachel M & Khan, Yousaf J	WEL	A	416639		WHPA	CEMS	High
280	75-662-0310	Jacobs, Todd & Melissa	WEL	A	658506		WHPA	CMTS	High
286	75-503-0240	Phleger, Joshua Michael	WEL	A	434310		WHPA	CEMS	High
290	118040000010	COUNTY OF WRIGHT - PARKS	WEL	U	262164		DWSMA		High
291	75-132-2205	Lindenfelser, Tami C & Bebo, D	WEL	A	146169		WHPA	CMTS	High
293	75-132-1300	City of Elk River Park	WEL	A	261506		ERA		High
297	75-452-0115	Baken, Jeremiah	WEL	A	449879		WHPA	CEMS	High
298	75-404-0035	U S West, Inc	WEL	A	217945		WHPA	CMTS	High
299	75-500-0245	Sando, Jeffrey Cornell 2012 Trust	WEL	A	434330		WHPA	CMTS	High

ERMU DWSMA

High Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
300	75-508-0230	Simmons, Keith D & Crystal L	WEL	A	450160		WHPA	CECR	High
301	10-412-0245	Schmeltzer, Timothy D	WEL	A	170542		DWSMA	CEMS	High
302	1	TESLOW, BYRON L.	WEL	U	217943	Unknown Location	ERA	CMTS	High
307	75-504-0350	Stricker, Ronald & Gloria - Trust	WEL	A	408709		DWSMA	CEMS	High
315	75-499-0160	Baer, Brandi & Steven	WEL	A	163675		WHPA	CECR	High
316	75-910-0125	Christian Builders, Inc	WEL	A	439922		WHPA	CECR	High
319	75-132-2400	Enright, James & Darlene Rev Trust	WEL	A	261441		ERA		High
320	75-132-1300	City of Elk River Park	WEL	A	125252		ERA	CMTS	High
327	75-500-0225	Moberg, Matthew & Cheryl	WEL	A	188000		WHPA	CMTS	High
328	75-518-0250	Cunningham, Thomas John	WEL	A	451447		WHPA	CEMS	High
329	75-517-0415	Miller, John H & Cheryl	WEL	A	449243		WHPA	CMTS	High
345	75-128-3203	Chambers Investment Co	WEL	A	261485		WHPA		High
348	75-510-0130	Hieb, Ralph J & Carolyn M	WEL	A	423600		WHPA	CECR	High
350	75-452-0165	Eng, Zacharia & Kennett, Mackenzie	WEL	A	437245		WHPA	CECR	High
352	75-518-0115	Johnson, Howard & Rhonda	WEL	A	506554		WHPA	CEMS	High
353	75-518-0240	Green, David C & Judith	WEL	A	449134		WHPA	CECR	High
361	75-503-0702	Jetson, John & Melissa	WEL	A	449887		WHPA	CEMS	High
362	75-467-0160	Sanford, Ryan	WEL	A	760608		WHPA	CMTS	High
366	75-473-0310	Jimenez, Edie &jaramillo, Alejandra	WEL	A	169524		WHPA	CEMS	High
367	1	GIEBENHAIN, JANE	WEL	U	189945	Unknown Location	WHPA	CECR	High
369	75-487-0235	Pfeifer Properties South Llc	WEL	A	149805		WHPA	CECR	High
372	75-452-0210	Deilke, Gunnar	WEL	A	502548		WHPA	CMTS	High
377	1		WEL	U	140010	Unknown Location	WHPA	CEMS	High
383	75-116-2105	Tiller Corporation	WEL	A	217977		WHPA	PMHN	High
389	75-489-0180	Syverson, Dale	WEL	A	126676		WHPA	CMTS	High
390	75-752-0020	Windsor Oaks of Elk River Hmown Asn	WEL	A	674499		WHPA	CMTS	High
391	75-132-2420	Solar Partnership Iii Llp	WEL	A	126543		ERA	MTPL	High
395	75-504-0150	Olson, Peter & Kelsey	WEL	A	433900		DWSMA	CECR	High
397	75-475-0160	Pearson, Bruce & Delores	WEL	A	147185		WHPA	CEMS	High
403	75-452-0185	Gruber, Joelle	WEL	A	453537		WHPA	CEMS	High
414	10-125-4110	Anderson, Mark P & Lisa A	WEL	A	156217		DWSMA	CEMS	High
416	10-125-4110	Anderson, Mark P & Lisa A	WEL	A	193629		DWSMA	CECR	High
418	75-504-0020	City of Elk River	WEL	A	415954		DWSMA	CEMS	High
422	75-474-0230	Wurscher, Mark S & Casandra	WEL	A	418366		WHPA	CMTS	High
425	75-484-0220	Hickerson, Paul N & Kayla R	WEL	A	166992		WHPA	CMTS	High
426	75-453-0270	Mccarty, Diane K & Nye T Trust	WEL	A	435880		WHPA	CEMS	High
430	75-132-2420	Solar Partnership Iii Llp	WEL	A	248125		ERA		High
433	75-465-0905	Thomsen, Timothy & Crystal	WEL	A	140011		WHPA	CEMS	High
442	75-707-0060	Windsor Oaks of Elk River Hmown Asn	WEL	A	126540		WHPA	CECR	High

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High Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
445	75-503-0208	Fraser, Scott R	WEL	A	439002		WHPA	CEMS	High
447	75-500-0250	Bay, Mark W & Judy A	WEL	A	193646		WHPA	CECR	High
449	75-817-0105	Main, Randy L & Catherine J	WEL	A	447841		WHPA	CMTS	High
458	75-503-0744	Averill, Bradley J	WEL	A	421773		WHPA	CEMS	High
459	75-462-0225	Elk River Shores Llc	WEL	A	425945		WHPA	CEMS	High
461	75-503-0505	Wilkerson, Richard & Delilah - Etal	WEL	A	439956		WHPA	CEMS	High
464	75-517-0302	Grovender, John&thomas, Kelly-Trust	WEL	A	426338		WHPA	CECR	High
466	75-503-0206	Winskowski, Todd & Lorena	WEL	A	434678		WHPA	CMTS	High
467	75-514-0110	Beaudoin, Gregory & Michelle	WEL	A	439964		DWSMA	CEMS	High
469	75-517-0235	Harms, Don & Patricia Revble Trust	WEL	A	451485		WHPA	CECR	High
473	75-473-0340	Stanwood, Andrew & Kylie	WEL	A	126724		WHPA	CMTS	High
475	75-114-4406	Kostreba, Roger A & Irene - Trustee	WEL	A	149674		WHPA	CECR	High
479	75-518-0120	Bookey, Kevin G & Gail A	WEL	A	449076		WHPA	CMTS	High
485	75-131-2130	White, Lorraine M Trust	WEL	A	463002		WHPA	CMTS	High
486	75-115-3401	Cst Companies Llc	WEL	A	217941		WHPA	PMHN	High
499	75-503-0530	Mulvaney, Kevin J	WEL	A	452532		WHPA	CEMS	High
501	75-003-4401	Crown Residential Housing Llc	WEL	A	217936		DWSMA	INDT	High
504	75-517-0465	Gavin, Timothy J & Jane	WEL	A	447870		WHPA	CECR	High
507	75-487-0120	Pearson, Douglas D & Mary Celine	WEL	A	127224		WHPA	CECR	High
512	75-474-0340	Anderson, Irvin	WEL	A	107227		WHPA	CEMS	High
524	75-517-0304	Kremer, Elizabeth A	WEL	A	451450		WHPA	CECR	High
527	75-474-0420	Junes, Dalen H & Mary J	WEL	A	405468		WHPA	CECR	High
544	75-120-2305	Smith, Walter J & Sharon L	WEL	A	445998		WHPA	CECR	High
550	75-428-0202	Dunn, Brian W & Marybeth	WEL	A	166016		Moderate	CEMS	High
551	75-504-0160	Kurtz, Jonathan L & Nicole L	WEL	A	510855		DWSMA	CECR	High
554	75-486-0410	Anderson, Ross A & Wanda	WEL	A	126449		WHPA	CECR	High
559	75-431-0230	Droogsma, Dale E & Lois J	WEL	A	149676		Moderate	CMTS	High
576	75-503-0236	Yaritz, Joseph G	WEL	A	451506		WHPA	CMTS	High
583	75-503-0202	Hike, Dustin M & Jennifer J	WEL	A	416142		WHPA	CMTS	High
585	75-499-0150	Schroeder, Bradley J & Kristin M	WEL	A	186160		WHPA	CECR	High
595	75-503-0515	Gustafson, Adam Paul & Stefenie Jo	WEL	A	431566		WHPA	CMTS	High
596	10-125-4115	Jones Family Trust	WEL	A	449231		DWSMA	CEMS	High
602	75-517-0320	Hennum, Gregory J & Denise	WEL	A	506540		WHPA	CECR	High
603	75-464-0120	Brenteson, Terry & Judith	WEL	A	107213		WHPA	CEMS	High
604	75-705-0110	City of Elk River	WEL	A	674496		ERA	CEMS	High
606	75-452-0190	Lawrence, Patrick P & Zurnieden, L	WEL	A	433881		WHPA	CEMS	High
611	75-452-0155	Berber, Piotr & Vasilisa	WEL	A	502993		WHPA	CECR	High
614	75-474-0210	Hp Minnesota I Llc	WEL	A	104730		WHPA	CECR	High
615	75-135-2310	F & M Properties Llc	WEL	A	248635		ERA		High

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High Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
622	75-119-4102	Haugen, James Dale & Brenda Joyce	WEL	A	160049		WHPA	CECR	High
633	1	LLOYD, HUBERT	WEL	U	220998	Unknown Location	WHPA	INDT	High
647	75-452-0165	Eng, Zacharia & Kennett, Mackenzie	WEL	A	503023		WHPA	CECR	High
648	75-475-0030	Ridgewood Assoc Inc	WEL	A	140020		WHPA	CEMS	High
651	75-901-0405	White, Lorraine M Trust	WEL	A	265265		WHPA		High
654	75-517-0145	Libor, Joseph R & Leitheiser, Kali	WEL	A	434307		WHPA	CECR	High
657	75-428-0145	Mayo, Rowley G & Julie A	WEL	A	149469		Moderate	CECR	High
694	118332002010	JOHN F LENZ REVOCABLE TRUST	WEL	A	743840		DWSMA	CEMS	High
707	313325220003	Fausch, Craig R	WEL	A	739553		DWSMA	CEMS	High
713	75-482-0330	Anderson, Ryan	WEL	A	467647		WHPA	CEMS	High
714	75-638-0305	Schwamberger, Christian & Haverty	WEL	A	647356		WHPA	CEMS	High
716	75-638-0315	Decathelineau, Owen P & Susan L	WEL	A	662276		WHPA	CMTS	High
719	75-638-0105	Curry, John P Ii & Kathryn M	WEL	A	653373		WHPA	CEMS	High
727	75-428-0208	Eggert, Theofil & Jeanne	WEL	A	149440		Moderate	CEMS	High
728	75-130-1301	Mooney, John & Heidi & Mooney, N	WEL	A	506431		WHPA	CEMS	High
736	75-126-4211	Dehn, Brian R	WEL	A	460018		Moderate	CECR	High
738	75-503-0724	Mix, Gerald Thomas	WEL	A	512835		WHPA	CEMS	High
739	75-503-0730	Guggenberger, Alex & Sarah	WEL	A	416640		WHPA	CEMS	High
745	75-474-0150	Vedders, Kellee & Steven	WEL	A	114459		WHPA	CECR	High
750	118242005010	JOHN T & KIM M LENZ	WEL	A	500681		DWSMA	CEMS	High
754	75-503-0470	Schwark, Daniel & Mary	WEL	A	451426		WHPA	CEMS	High
763	75-499-0320	Manis, Michael J	WEL	A	500317		WHPA	CECR	High
767	75-120-2308	Bouri, Samir & Denise	WEL	A	561587		WHPA	CECR	High
770	75-114-4305	Ege, Donald & June	WEL	A	655095		WHPA	CMTS	High
772	75-114-3101	Mcnair, Andrew M & Kelsey R	WEL	A	156660		WHPA	CECR	High
776	75-722-0115	Bacigalupo, Gregory & Julie	WEL	A	709855		DWSMA	CMTS	High
785	75-503-1020	Weidner, James A & Susan B	WEL	A	473789		WHPA	CECR	High
790	75-580-0335	Beaudry, Sarah	WEL	A	593620		WHPA	CECR	High
796	75-474-0180	Hamilton, James E & Teresa	WEL	A	430315		WHPA	CEMS	High
800	75-120-4305	Carlson, Bruce & Seneca, Debora	WEL	A	717806		WHPA	CECR	High
805	75-503-0720	Walliczek, Mathew	WEL	A	503244		WHPA	CEMS	High
807	75-699-0120	Grupa, Brad C & Sandra K	WEL	A	717205		WHPA	CEMS	High
809	75-503-0708	Pim, William S & Jennifer S	WEL	A	462997		WHPA	CEMS	High
810	75-499-0235	Dougherty, Toni Jo	WEL	A	515745		WHPA	CEMS	High
815	75-474-0250	Castagneri, Christine J & Gregory D	WEL	A	429107		WHPA	CEMS	High
819	75-699-0115	Berg, John P & Zeman, Lisa M	WEL	A	717212		WHPA	CEMS	High
821	75-474-0220	Lubrecht, Robert & Mary C	WEL	A	270265		WHPA	INDT	High
822	75-699-0105	Orrock, Kurt & Kelly	WEL	A	710821		WHPA	CEMS	High
830	75-499-0238	Lomsak, Jamie R & Hannah	WEL	A	462406		WHPA	CEMS	High

ERMU DWSMA

High Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
833	75-580-0415	Uphoff, Samuel E & Sara D	WEL	A	642286		WHPA	CECR	High
834	75-699-0110	Orrock, Keith E & Susan J	WEL	A	730190		WHPA	CEMS	High
836	75-804-0105	Droogsma, Nathan & Kelly	WEL	A	675345		WHPA	CEMS	High
841	75-499-0140	Johnson, Christopher & K	WEL	A	524961		WHPA	CECR	High
842	75-499-0230	Becker, Phillip & Liestman, Shelly	WEL	A	469281		WHPA	CEMS	High
847	75-580-0115	Nierenhausen, Ronald J	WEL	A	655047		WHPA	CECR	High
848	75-121-4405	Coleman, David M	WEL	A	760229		WHPA	CEMS	High
850	75-473-0205	Brindley, James M	WEL	A	689620		WHPA	CEMS	High
851	75-580-0130	Gabrielson, Shawna & Shawn	WEL	A	635358		WHPA	CECR	High
853	75-503-0704	Sayler, Joshua C & Ciri L	WEL	A	518862		WHPA	CMTS	High
857	75-120-4000	E R Country Club,inc	WEL	A	247618		WHPA	INDT	High
860	75-580-0110	Taylor, Neil A & Deborah A	WEL	A	617821		DWSMA	CEMS	High
867	75-473-0360	Jogodka, Alan J & Swanson, Donna P	WEL	A	460013		WHPA	CEMS	High
871	75-473-0130	Aaron, Michael C & Robyn R	WEL	A	533510		WHPA	CEMS	High
885	75-487-0210	Eibensteiner, James	WEL	A	148108		WHPA	INDT	High
904	75-499-0327	Bauer, Samuel S & Welsh, Genelle G	WEL	A	511953		WHPA	CEMS	High
918	1		WEL	U	434638	Unknown Location	WHPA	CMTS	High
937	75-643-0145	Reed, Casey	WEL	A	667091		WHPA	CEMS	High
943	75-662-0205	Kiser, Darren L	WEL	A	661110		WHPA	CEMS	High
944	75-662-0105	Cloutier, Timothy L & Brenda J	WEL	A	680209		WHPA	CEMS	High
945	75-502-0130	Weiss, Gregory W & Jill M	WEL	A	406255		WHPA	CEMS	High
949	75-515-0180	Juettner, Gary & Diane Rvcbl Trust	WEL	A	610494		DWSMA	MTPL	High
951	75-662-0210	Stanley, Robert & Melissa	WEL	A	655181		WHPA	CECR	High
952	75-662-0210	Stanley, Robert & Melissa	WEL	U	329444		WHPA		High
954	75-662-0115	Amble, Don & Tobi	WEL	A	668078		WHPA	CEMS	High
959	75-502-0155	Pogreba, Anthony J & Beth A	WEL	A	533768		WHPA	CECR	High
961	75-662-0220	Dalzell, Darin L & Janelle A	WEL	A	664709		WHPA	CEMS	High
962	75-514-0120	Phillips, Michael & Sharon -trustee	WEL	A	468328		DWSMA	INDT	High
973	75-662-0305	Larson, Jeremy & Ericka	WEL	A	745278		WHPA	CEMS	High
977	75-120-2410	Thompson, Eric John & Angela Jo	WEL	A	509249		WHPA	CEMS	High
982	75-119-1320	Pall, Victoria	WEL	A	578989		DWSMA	CEMS	High
983	75-484-0170	Ott, Richard H & Ann C	WEL	A	661071		WHPA	CEMS	High
996	75-115-3400	Plaisted Property Management Llc	WEL	A	576789		WHPA	CMSH	High
1001	75-114-4400	Sherburne County	WEL	A	512758		WHPA	CEMS	High
1007	75-500-0235	Schwartz, Jonathan T & Ellen R	WEL	A	183898		WHPA	CMTS	High
1008	75-588-0140	Sawatzke, Paul M & Laurie	WEL	A	593130		DWSMA	CEMS	High
1009	75-114-4201	Rydberg, Joanne - Trust	WEL	A	649218		WHPA	CMTS	High
1013	75-114-3107	Schiestl, Dale & Carol	WEL	A	481844		WHPA	CECR	High
1018	75-113-3200	Dreesen, Brian & Tanya	WEL	A	559486		WHPA	CMTS	High

ERMU DWSMA

High Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
1027	75-114-4105	Vanlith, Wendy L	WEL	A	494871		WHPA	CMSH	High
1033	75-621-0245	Flahaven, Michael T & Erin J	WEL	A	652699		DWSMA	CEMS	High
1036	75-621-0135	Mcchesney, Todd M & Julie R	WEL	A	653930		WHPA	CEMS	High
1039	75-621-0130	Baumgartner, Kurt A & Donna J	WEL	A	646126		WHPA	CEMS	High
1042	75-621-0235	Waknitz, James & Rochelle	WEL	A	646127		DWSMA	CEMS	High
1063	75-455-0310	Swenson, Larry D	WEL	A	498140		WHPA	CEMS	High
1064	75-455-0280	Benson, Timothy & Cokley, Ashley	WEL	A	488767		WHPA	CEMS	High
1070	75-503-0732	Fischer, Patricia A Revocable Trust	WEL	A	400823		WHPA	CEMS	High
1071	75-517-0155	Beidelman, Bruce K & Diane J	WEL	A	456566		WHPA	CEMS	High
1075	10-412-0250	Werner, Madeline & Sean	WEL	A	503024		DWSMA	CEMS	High
1076	10-412-0165	Belz, Matthew L & Holthaus, Laura J	WEL	A	722606		DWSMA	CMTS	High
1078	10-422-0150	Eldredge, Charles L & Jennifer K	WEL	A	732502		DWSMA	CEMS	High
1080	10-422-0130	Jondahl, Maria Trust	WEL	A	731102		DWSMA	CEMS	High
1087	75-455-0270	Hanson, Terry L	WEL	A	525309		WHPA	CEMS	High
1092	75-456-0470	Jindra, Ty	WEL	A	513741		WHPA	CEMS	High
1097	75-456-0460	Koch, Richard & Mcmillan, C	WEL	A	561505		WHPA	CEMS	High
1099	75-467-0140	Douglas, Elizabeth	WEL	A	540456		WHPA	CMTS	High
1103	75-504-0315	Palmer, David A & Nora	WEL	A	470385		DWSMA	CEMS	High
1110	75-504-0355	During, Randy & Judith	WEL	A	479539		DWSMA	CECR	High
1112	75-504-0310	Mills, Victor	WEL	A	462832		DWSMA	CECR	High
1117	75-413-1440	Madsen, Rhonda Jean	WEL	A	421023		WHPA	CMTS	High
1120	1		WEL	U	500591	Unknown Location	WHPA	CEMS	High
1121	75-504-0140	Aday, Joseph M & Jennifer A	WEL	A	524227		DWSMA	CECR	High
1122	75-504-0130	Sellner, Fay Marie	WEL	A	498133		DWSMA	CEMS	High
1123	75-456-0240	Knutson, Joseph & Chilstrom, Tanya	WEL	A	592689		WHPA	CECR	High
1130	75-413-0820	Larson, Joan Marie	WEL	A	533144		WHPA	CEMS	High
1141	75-455-0420	Hinton, Kelsey	WEL	A	561513		WHPA	CMTS	High
1144	75-491-0250	Skinner, Ben L & Robin D	WEL	A	451500		WHPA	CMTS	High
1151	75-413-0110	Jarmoluk Living Trust	WEL	A	506503		WHPA	CEMS	High
1166	75-405-0140	2tlc, Llc	WEL	A	655591		Moderate		High
1168	75-455-0110	Lopez, Sandra L	WEL	A	496835		WHPA	CEMS	High
1173	75-404-0091	Church of St Andrew-Elk Rv	WEL	A	578934		WHPA	CECR	High
1174	75-131-1101	Rahn, Bruce & Cathryne	WEL	A	462990		WHPA	CMTS	High
1179	75-131-2425	Laurent, Carla Jean	WEL	A	412242		WHPA	CMTS	High
1181	75-131-2211	Shank, Jeremiah	WEL	A	478420		WHPA	CEMS	High
1183	75-132-2420	Solar Partnership Iii Llp	WEL	A	169416		ERA	CEMS	High
1190	75-131-2215	Freeman, Casey & Welty, Risa	WEL	A	631414		WHPA	CECR	High
1191	75-133-2200	Larson, Rainie L & Andrew J	WEL	A	174568		WHPA	CEMS	High
1192	75-131-1210	Boelter, Michael D & Carole	WEL	A	658028		WHPA	CEMS	High

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High Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
1200	75-418-0230	Nelson, Patricia	WEL	A	502916		WHPA	CEMS	High
1201	75-465-0835	Cameron, Frank H & Kim M	WEL	A	415922		WHPA	CEMS	High
1202	75-775-0115	Ind School Dist 728	WEL	I	722626		Moderate	CMSH	High
1204	75-482-0410	Brisbin, Rae L	WEL	A	418488		WHPA	CEMS	High
1205	75-132-1210	Jones, Sara A & Timothy M	WEL	A	169490		WHPA	CEMS	High
1207	75-590-0020	Newberger, Nicole E & Matthew S	WEL	A	592629		WHPA	CEMS	High
1208	75-482-0040	Schnabel, Daniel J & Blake, Kari	WEL	A	439963		WHPA	CEMS	High
1209	75-130-3336	Hirman, Bernard Trust	WEL	A	510873		WHPA	CEMS	High
1211	75-460-0150	Hanchar, Siarhei & Natallia	WEL	A	425745		WHPA	CEMS	High
1212	75-482-0050	Hoffman, Brian Allen & Karen L	WEL	A	506517		WHPA	CEMS	High
1213	75-590-0010	Haberman, Galen R	WEL	A	417947		WHPA	CEMS	High
1222	75-462-0165	Duggan, Stephanie B & Robert E	WEL	A	748004		WHPA	CEMS	High
1223	75-130-4303	Manthey, Erin & Manthey, Timothy	WEL	A	481822		WHPA	CEMS	High
1225	75-129-3406	Shaheen, J & Stickelmeyer, J	WEL	A	445997		WHPA	CEMS	High
1229	75-507-0150	West, Bruce & Melissa	WEL	A	559362		WHPA	CEMS	High
1230	75-462-0360	Mccullough, Daniel &vicki Rev Trust	WEL	A	618674		WHPA	CEMS	High
1232	75-130-3325	Jones, James J & Jones, Robert J	WEL	A	458479		WHPA	CECR	High
1234	75-531-0110	Lahaye, Kasandra & Parrish, Mark	WEL	A	503241		WHPA	CEMS	High
1240	75-130-3375	Schultz, John W	WEL	A	503665		WHPA	CMTS	High
1241	75-507-0120	Hendrickx, Travis & Britnee C	WEL	A	503140		WHPA	CEMS	High
1243	75-531-0140	Powell, Reginald M & Joanne M	WEL	A	462419		WHPA	CEMS	High
1247	75-130-3355	Armstrong, Kevin T	WEL	A	598313		WHPA	CEMS	High
1248	75-527-0150	Bolan, Cheryl A	WEL	A	483300		WHPA	CEMS	High
1253	75-130-4301	Moe, Susan Marie	WEL	A	518629		WHPA	CEMS	High
1254	75-531-0130	Klimek, Larry & Greier, Carol-Trust	WEL	A	510886		WHPA	CEMS	High
1256	75-511-0120	Wells, Meagan	WEL	A	420552		WHPA	CEMS	High
1258	75-129-3113	Nelson, William H & Elizabeth P	WEL	A	460021		WHPA	CEMS	High
1259	75-130-3365	Bertilson, Merlin &debra	WEL	A	448388		WHPA	CEMS	High
1260	75-527-0130	Rettmann, Mitchell	WEL	A	462404		WHPA	CEMS	High
1261	75-527-0120	Volkers, Jason E & Cheryl L	WEL	A	462421		WHPA	CEMS	High
1263	75-511-0110	Snyder, Tim Scott	WEL	A	416773		WHPA	CEMS	High
1264	75-527-0110	Rohde, Jay	WEL	A	540505		WHPA	CEMS	High
1265	75-130-3320	Wells Fargo Bank: Phh Mortgage Corp	WEL	A	765331		WHPA	CEMS	High
1266	75-452-0115	Baken, Jeremiah	WEL	A	504405		WHPA	CEMS	High
1267	75-518-0140	Nathe, Kenneth A & Julie	WEL	A	533528		WHPA	CECR	High
1269	75-452-0185	Gruber, Joelle	WEL	A	477305		WHPA	CEMS	High
1270	75-686-0140	Rohde, Dean & Natasha	WEL	A	684465		WHPA	CEMS	High
1273	75-686-0135	Curtis, Christopher D & Jennifer J	WEL	A	690612		WHPA	CEMS	High
1274	75-686-0130	Good, Michael B & Roxanne M	WEL	A	694577		WHPA	CEMS	High

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High Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
1275	75-686-0105	Malenke, Daniel T & Melissa A	WEL	A	694564		WHPA	CEMS	High
1276	75-130-4203	Louzon, Robert	WEL	A	448386		WHPA	CEMS	High
1277	75-686-0125	Atangan, Mark Anthony & Amy K	WEL	A	690619		WHPA	CEMS	High
1280	75-686-0120	Monson, Bradley D & Cari L	WEL	A	684466		WHPA	CEMS	High
1281	75-686-0115	Raum, Nicholas A	WEL	A	715510		WHPA	CEMS	High
1283	75-518-0125	Ford, Kevin D & Rebecca	WEL	A	495784		WHPA	CEMS	High
1284	75-130-4202	Harnois Living Trust	WEL	A	448387		WHPA	CEMS	High
1285	75-129-3105	Deitrich, George	WEL	A	639088		WHPA	CECR	High
1286	75-517-0260	Stolp, Terrence & Katye	WEL	A	464369		WHPA	CEMS	High
1294	75-129-3100	Kaunzner, Scott R & Teresa	WEL	A	460938		WHPA	CEMS	High
1295	75-452-0160	Smeby, William H & Patricia L	WEL	A	510872		WHPA	CEMS	High
1307	75-128-4200	Nystrom, James - Trustee	WEL	A	593609		WHPA	CEMS	High
1354	75-128-1405	Schroeder-Davis Trust	WEL	A	562959		Moderate	CECR	High
1360	75-431-0414	Halbakken, Thomas&rebecca	WEL	A	406303		Moderate	CMTS	High
1384	75-853-0105	Yankee Doodle Enterprises Llc	WEL	A	447828		ERA	CEMS	High
1385	75-465-0650	Omites, Shannon & Metz, Melanie	WEL	A	104814		WHPA	CEMS	High
1393	75-473-0330	Rasmussen-Myers, Jesse J & Johnson,	WEL	A	437958		WHPA	CEMS	High
1394	75-510-0335	Lee, Brian	WEL	A	494292		Moderate	CECR	High
1398	75-128-4106	Ind School Dist 728	WEL	U	505684		Moderate		High
1402	75-422-0380	Arntson, Jessie	WEL	A	186151		WHPA	CEMS	High
1404	75-544-0105	Guardian Angels Health Ser	WEL	A	178141		WHPA	CEMS	High
1405	75-909-0205	City of Elk River	WEL	A	497392		ERA	CMSH	High
1417	75-503-0726	Grimmer, Lee S	WEL	A	405406		WHPA	CEMS	High
1419	75-469-0140	Sola, Lillian	WEL	A	149437		WHPA	CECR	High
1422	75-465-0810	Reed, Steven H & Kelley M	WEL	U	400842		WHPA	CEMS	High
1423	75-486-0220	Waldoch, Eric R	WEL	A	156677		WHPA	CECR	High
1428	75-128-4106	Ind School Dist 728	WEL	A	167972		Moderate	CMSH	High
1430	75-126-2145	Maas, Jay & Brenda L	WEL	A	752554		Moderate		High
1431	75-484-0225	Welle, Steven Joseph	WEL	U	778065		WHPA		High
1458	75-472-0155	Anderson, Bruce M & Kathryn	WEL	A	639063		WHPA	CECR	High
1460	75-472-0110	Palmer, Cheryl & Brent	WEL	A	578414		WHPA	CECR	High
1462	75-481-0230	Sola, Erik & Lori	WEL	A	518884		WHPA	CECR	High
1465	75-472-0250	Droogsma, Darryl & Susan	WEL	A	637113		WHPA	CECR	High
1491	75-004-1001	Krivich, Michael & Lisa	WEL	A	146197		WHPA	CEMS	High
1493	75-428-0214	Slavik, Joseph & Ashley	WEL	A	158434		Moderate	CEMS	High
1496	1	TIX, PETER	WEL	U	788495	Unknown Location	Moderate		High
1498	75-132-3105	Sherburne County	WEL	A	269296		ERA		High
1499	75-132-3105	Sherburne County	WEL	A	269297		WHPA		High
1500	75-700-0105	Dahlheimer, Robert P	WEL	U	808392		WHPA		High

ERMU DWSMA

High Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
1502	118023002020	TIMOTHY D & MARY C BOERGER	WEL	U	809795		WHPA		High
1503	75-133-4200	City of Elk River	WEL	U	277862		WHPA	CEMS	High
1504	75-486-0330	Dahlheimer, Philip & Ann	WEL	A	826599		WHPA		High
1505	75-474-0160	Petrich, Thomas P & Nancy M	WEL	A	1000020498		WHPA		High
1508	75-504-0020	City of Elk River	WEL	A	1000021138		WHPA		High
1509	75-504-0020	City of Elk River	WEL	A	278550		WHPA	CEMS	High
1511	75-115-3400	Plaisted Property Management Llc	WEL	A	831485		WHPA		High
1512	75-422-0420	Thomas, Jeffrey E & Dawn	WEL	A	1000022053		WHPA		High
1513	118040006050	RYAN THOMAS &	WEL	A	831676		DWSMA		High
1514	75-505-0134	O'brien, Robert & Jennifer	WEL	U	1000023854		WHPA		High
1515	118332002010	JOHN F LENZ REVOCABLE TRUST	WEL	A	833830		DWSMA		High
1517	75-715-0115	Kelleher, Lisa & Michael	WEL	A	839591		WHPA		High
1518	1	MNDOT	WEL	U	830747	Unknown Location	Moderate		High
1519	1	MNDOT	WEL	U	830748	Unknown Location	Moderate		High

Table C1-3

ERMU DWSMA
Intermediate Priority Wells PCSI

ERMU DWSMA

Intermediate Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
10	118040004170	MARK A & MARY JEAN NYSTROM	WEL	A	156290		DWSMA	CTCG	Intermediate
15	118025004010	DENNIS & DONNA GERTGEN	WEL	A	105084		DWSMA	CWEC	Intermediate
42	75-002-3310	Aps Enterprises, Llp	WEL	A	431685		DWSMA	CWOC	Intermediate
53	118025003040	JOSHUA SEDERBERG &	WEL	A	143452		DWSMA	CTCG	Intermediate
62	75-517-0316	Leinonen, Garrett	WEL	A	452368		WHPA	CWOC	Intermediate
67	75-130-1103	Krapfl, Jennifer J	WEL	A	190430		WHPA	CWEC	Intermediate
73	75-130-1100	Barrett, Gregory H & Books, Dawn	WEL	A	439921		WHPA	CWEC	Intermediate
92	75-888-0115	Begelman, Ilya	WEL	A	171035		WHPA	CTCW	Intermediate
98	118025003010	TERRY J & JACLYN A HOEL TRUST	WEL	A	105091		DWSMA	CWEC	Intermediate
124	75-517-0455	Erickson, Ronald Franklin	WEL	A	429285		WHPA	CWOC	Intermediate
152	75-517-0326	Falls, Scott T	WEL	A	426280		WHPA	CWOC	Intermediate
178	75-126-4203	Olson, Eric M	WEL	A	128046		WHPA	CTCG	Intermediate
186	75-003-4401	Crown Residential Housing Llc	WEL	A	463895		DWSMA	CTCE	Intermediate
209	75-126-4209	Yothers, James A & Rachel E	WEL	A	510858		Moderate	CWOC	Intermediate
212	75-704-0205	The Delta Apartments, L.l.c.	WEL	A	547923		DWSMA	CTCG	Intermediate
215	118040003130	DUANE A & GLORIA J MILLESS	WEL	A	136065		DWSMA	CWOC	Intermediate
225	75-136-3300	Froland, Anthony & Carrie	WEL	A	450345		WHPA	CWOC	Intermediate
238	75-517-0430	Kuiper, Richard A & Susan	WEL	A	426282		WHPA	CAMB	Intermediate
239	118024004010	TAMMY GIBBENS	WEL	A	143535		DWSMA	CTCG	Intermediate
243	75-499-0174	Hortian, Jared & Rachael	WEL	A	503041		WHPA	CWOC	Intermediate
248	75-126-4204	Brooks, Barry & Quam, Karen	WEL	A	128116		Moderate	CWOC	Intermediate
253	118040005020	BENJAMIN FIELDS	WEL	U	146255		DWSMA	CTCG	Intermediate
281	118025001260	KEVIN A JONES&	WEL	A	105122		DWSMA	CWEC	Intermediate
292	118040006050	RYAN THOMAS &	WEL	A	146100		DWSMA	CTCG	Intermediate
321	75-003-1200	Great River Energy	WEL	U	217937		WHPA	CWMS	Intermediate
324	118025004030	APRIL D HINES REV TRUST	WEL	A	152591		DWSMA	CTCW	Intermediate
368	118025004020	JOHN W IBELING	WEL	A	126808		DWSMA	CTCG	Intermediate
382	118025001260	KEVIN A JONES&	WEL	A	143550		DWSMA	CTCG	Intermediate
421	118025001290	RICHARD J & DEBORAH NADEAU	WEL	A	143451		DWSMA	CTCG	Intermediate
427	75-474-0360	Malvig, David R & Susan J-Trustees	WEL	A	425854		WHPA	CWEC	Intermediate
462	75-499-0220	Abell, Alan L & Carol D	WEL	A	417930		WHPA	CWEC	Intermediate
582	75-002-3320	Atlas Group Llc	WEL	A	416129		DWSMA	CWEC	Intermediate
592	75-499-0210	Dallman, Ricky H & Judy	WEL	A	434468		WHPA	CWOC	Intermediate
601	118041001050	JAN M DEHN	WEL	A	152577		DWSMA	CTCG	Intermediate
621	118040003010	M R WELTY HOMES LLC	WEL	A	140106		DWSMA	CWOC	Intermediate
628	118025001270	SCOTT & SHEILA FARKAS	WEL	A	143511		DWSMA	CTCG	Intermediate
631	75-508-0140	Jerred, Michael J & Kerry K	WEL	A	410638		WHPA	CWOC	Intermediate
634	75-517-0150	Mccarty, Joshua	WEL	A	447800		WHPA	CWEC	Intermediate
643	118025004040	LLTJ ENTERPRISES LLC	WEL	A	105083		DWSMA	CTCW	Intermediate

ERMU DWSMA

Intermediate Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
686	118500104404	ORONAX PROPERTIES LLC	WEL	A	503057		WHPA	CWOC	Intermediate
693	118030000080	ANDREW J SCHUUR	WEL	A	547247		WHPA	CWOC	Intermediate
724	75-517-0340	Mcclay, Daniel B & Heidi K	WEL	A	459754		WHPA	CWEC	Intermediate
793	75-499-0173	Jones, Dustin & Taylor	WEL	A	704107		WHPA	CWOC	Intermediate
813	75-610-0125	Matt, Craig A & Schroeder, Andrea F	WEL	A	610074		WHPA	CWEC	Intermediate
818	75-119-4200	Mixer, Todd H	WEL	A	408630		WHPA	CWEC	Intermediate
843	75-610-0110	Helget, Thomas B	WEL	A	610114		WHPA	CWEC	Intermediate
886	75-487-0210	Eibensteiner, James	WEL	A	126461		WHPA	CWOC	Intermediate
926	75-499-0435	Kampa, Robert L & Vicki L	WEL	A	473179		WHPA	CWEC	Intermediate
1088	75-504-0330	Olson, Derrick G & Isham, Robin	WEL	A	494256		DWSMA	CWOC	Intermediate
1128	75-413-0940	Carter, Don	WEL	A	425892		WHPA	CWOC	Intermediate
1143	75-455-0220	Bulen, Tyler G	WEL	A	596935		WHPA	CWEC	Intermediate
1149	75-455-0410	Lapointe, Emery & Kathleen Rev Trst	WEL	A	535455		WHPA	CWEC	Intermediate
1150	75-455-0210	Marcy, Rodney	WEL	A	598763		WHPA	CWEC	Intermediate
1152	75-456-0210	Olson, Roger	WEL	A	598756		WHPA	CWEC	Intermediate
1158	75-413-0410	Novak, Karen	WEL	A	193460		WHPA	CWOC	Intermediate
1163	75-456-0110	Gates, Robin A	WEL	A	592598		WHPA	CWEC	Intermediate
1164	75-456-0130	Morlock, Bobbie D	WEL	A	602683		WHPA	CWEC	Intermediate
1188	75-496-0110	Sinkler, Kenneth & Karen - Trustees	WEL	A	559392		DWSMA	CWEC	Intermediate
1239	75-518-0165	Bryant, Kyle D & Rachael	WEL	A	505697		WHPA	CWEC	Intermediate
1245	75-518-0160	Barney, Randal & Cynthia	WEL	A	522362		WHPA	CWOC	Intermediate
1272	75-518-0340	Stotts, Kevin M & Erin R	WEL	A	510878		WHPA	CWOC	Intermediate
1322	75-130-1406	Johnson, Marvin L Jr & Teresa	WEL	A	546163		WHPA	CWOC	Intermediate
1371	75-130-1110	Thornberg, Chad E & Ashleigh M	WEL	A	472065		WHPA	CWOC	Intermediate
1372	75-130-1203	Boos, Brian J	WEL	A	547932		WHPA	CWEC	Intermediate
1388	75-117-4014	Opitz, Brent O & Lauren E	WEL	A	197433		WHPA	CWOC	Intermediate
1403	75-710-2000	Trout Brook South Condo H.o. Assoc	WEL	A	779965		WHPA	CWOC	Intermediate
1406	75-510-0160	Gesche, Shari	WEL	A	511960		WHPA	CWEC	Intermediate
1432	75-002-3310	Aps Enterprises, Llp	WEL	U	416196		DWSMA	CTCG	Intermediate
1448	75-704-0105	Scan Interiors Inc	WEL	A	518875		DWSMA	CWEC	Intermediate
1449	75-529-0120	Fritz, Eugene L & Elizabeth	WEL	A	556714		DWSMA	CTCG	Intermediate
1453	75-001-2400	Goetz, Bruce C	WEL	A	674454		DWSMA	CTCG	Intermediate
1463	75-472-0205	Nyberg, Charles J & Kathlene M	WEL	A	439946		WHPA	CWOC	Intermediate
1466	75-472-0210	Dalchow, Bruce R & Catherine	WEL	A	400271		WHPA	CWOC	Intermediate
1477	75-478-0450	Gongoll, Joan M & Jefrey A - Trust	WEL	A	423138		WHPA	CWOC	Intermediate
1482	75-464-0060	Fogarty, Dennis P Revocable Trust	WEL	A	531548		WHPA	CTCW	Intermediate

Table C1-4

ERMU DWSMA
Low Priority Wells PCSI

ERMU DWSMA

Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
12	75-486-0120	Schmidt, Eric C & Stephanie R	WEL	A	149480		WHPA	QBAA	Low
22	75-503-0540	Skrundevskiy, Nikolay & Lyuda	WEL	A	431676		WHPA	QBAA	Low
30	75-510-0425	Deruyter, Terry & Sarah	WEL	A	416665		WHPA	QBAA	Low
32	75-505-0245	Arko, Randall L & Lori	WEL	A	192862		WHPA	QBAA	Low
34	75-424-0170	Kemnitz, Jessica	WEL	A	105189		Moderate	QBAA	Low
36	75-478-0530	Kline, Michael R & Merry L	WEL	A	416077		WHPA	QBAA	Low
37	75-117-4008	Micek, Michele & Justin	WEL	A	429240		WHPA	QBAA	Low
39	75-499-0120	Parkhill, James & Diane Rev Trust	WEL	A	434495		WHPA	QBAA	Low
40	75-510-0620	Cook, Gregory & Pamela	WEL	A	418916		Moderate	QBAA	Low
43	75-503-0120	Brustad, Brandyn & Nichole	WEL	A	437955		WHPA	QBAA	Low
48	75-517-0445	Burge, Arlin D	WEL	A	449902		WHPA	QBAA	Low
50	75-503-0620	Stone, Kimberly Ann	WEL	A	405402		WHPA	QBAA	Low
52	75-517-0130	Hexom, Eric D & Mary V	WEL	A	500559		WHPA	QBAA	Low
59	1	BOB HADLEY	WEL	U	420579	Unknown Location	WHPA	QBAA	Low
66	75-505-0160	Chryklund, Renee L	WEL	A	423145		WHPA	QBAA	Low
72	75-117-4010	Smith, Charley W - Trust - Etal	WEL	A	410607		WHPA	QBAA	Low
76	75-508-0245	Eichten, Brian S & Ann T	WEL	A	423571		WHPA	QBAA	Low
81	75-135-2120	Bergstrom, Philip & Pamela	WEL	A	126546		WHPA	QBAA	Low
82	75-503-0720	Walliczek, Mathew	WEL	A	404702		WHPA	QBAA	Low
84	1		WEL	U	425940	Unknown Location	Moderate	QBAA	Low
85	75-120-4301	Jaeger, David R	WEL	A	451439		WHPA	QBAA	Low
86	75-484-0380	Olesen, Jerome D & Barbara J	WEL	A	131283		WHPA	QBAA	Low
89	75-428-0505	Bohaty, Ann Louise	WEL	A	146196		Moderate	QBAA	Low
90	75-486-0250	Foster, Richard C Revocable Trust	WEL	A	149774		WHPA	QBAA	Low
96	75-505-0430	Wondrow, Terry	WEL	A	188792		WHPA	QBAA	Low
99	75-499-0310	Weaver, Carolyn	WEL	A	429245		WHPA	QBAA	Low
104	75-126-1121	Warren, Richard R & Susan	WEL	A	430294		Moderate	QBAA	Low
106	75-471-0150	Herbst, Kevin	WEL	A	162810		Moderate	QBAA	Low
107	75-517-0130	Hexom, Eric D & Mary V	WEL	A	435750		WHPA	QBAA	Low
109	75-510-0210	Keyser, Ryan J & Ebner, Amanda M	WEL	A	418966		WHPA	QBAA	Low
110	75-513-0230	Xiong, Lunn & Vang, Pang	WEL	A	452536		Moderate	QBAA	Low
112	75-503-0218	Caswell, Lynn P & Signe M	WEL	A	430288		WHPA	QBAA	Low
119	75-428-0150	Elliott, Terrence & Mary	WEL	A	127223		Moderate	QBAA	Low
122	75-510-0230	Sitko, Kimberly & Kitzman, Kelly	WEL	A	426741		Moderate	QBAA	Low
123	75-453-0140	Guertin, Gregory & Cota-Guertin,a	WEL	A	429279		WHPA	QBAA	Low
127	75-508-0155	Frost, Jeremy J	WEL	A	417937		WHPA	QBAA	Low
130	75-117-1210	Townsend, Jacob L	WEL	A	421414		DWSMA	QBAA	Low
131	75-510-0410	Lorentzen, Corey M & Cathy	WEL	A	416669		WHPA	QBAA	Low
132	75-126-2144	Mattson, Thomas & Sharon Trust	WEL	A	425737		Moderate	QBAA	Low

ERMU DWSMA

Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
137	75-503-0320	Steichen, Cristi A & Gary L	WEL	A	416059		WHPA	QBAA	Low
140	75-722-0105	Junge, Joshua & Amber	WEL	A	744043		WHPA	QBAA	Low
141	75-503-0734	Smith, Kevin E & Nancy	WEL	A	433827		WHPA	QBAA	Low
146	75-124-1202	Yerigan, Bruce D - Trustee	WEL	A	179090		WHPA	QBAA	Low
147	75-487-0330	Kauphusman, Casey & Amanda	WEL	A	426190		WHPA	QBAA	Low
148	75-510-0150	Lieser, Mark H & Jean	WEL	A	426729		WHPA	QBAA	Low
150	75-453-0265	Vang, Pa Woua & Lofgren, Tyler D	WEL	A	500565		WHPA	QBAA	Low
153	75-484-0215	Vipavetz, Richard & Joanne - Trust	WEL	A	425070		WHPA	QBAA	Low
154	75-503-0480	Odland, Ryan Paul	WEL	A	431688		WHPA	QBAA	Low
155	118024003030	JASON & LAURA ANTHONY	WEL	A	126459		WHPA	QBAA	Low
163	75-503-0550	Christianson, Jessica & Jason N	WEL	A	405407		WHPA	QBAA	Low
166	75-126-1120	Warren, Donna M Revocable Trust	WEL	A	199145		Moderate	QBAA	Low
168	75-126-2101	Maas, Jay & Brenda L	WEL	A	155941		Moderate	QBAA	Low
172	75-513-0110	Bengtson, Shawn C & Rebecca L	WEL	A	437203		Moderate	QBAA	Low
173	75-121-4401	Miller, Jeremy P & Tammy J	WEL	A	709899		WHPA	QWTA	Low
174	75-497-0125	Hagglund, Michael & Kathryn	WEL	A	425943		DWSMA	QBAA	Low
176	75-503-0214	Schield, Donavon L & Karen R	WEL	A	431680		WHPA	QBAA	Low
177	75-428-0150	Elliott, Terrence & Mary	WEL	A	105188		Moderate	QBAA	Low
180	75-428-0222	Tice, Aaron C & Paula S	WEL	A	165932		Moderate	QBAA	Low
183	75-510-0460	Siemers, Alan D & Debra	WEL	A	406665		Moderate	QBAA	Low
187	75-505-0235	Kuiper, Allan & Marilyn	WEL	A	434635		WHPA	QBAA	Low
188	75-512-0210	Lea, Mark D Living Trust	WEL	A	438959		WHPA	QBAA	Low
189	75-517-0425	Smith, Craig A & Judy M	WEL	A	448366		WHPA	QBAA	Low
190	75-872-0120	Solid Rock Church	WEL	A	404739		WHPA	QBAA	Low
193	75-471-0310	Miskowitz, M & Vossen, T	WEL	A	125253		Moderate	QBAA	Low
194	75-513-0150	Munnelly, Patrick K &barbara	WEL	A	502902		Moderate	QBAA	Low
197	75-413-0980	Weed, Jeremy	WEL	A	162828		WHPA	QBAA	Low
203	1	OLESON, JIM	WEL	U	169019	Unknown Location	Moderate	QBAA	Low
204	75-503-1005	Horton, Dustin A & Sara L	WEL	A	416106		WHPA	QBAA	Low
220	75-517-0420	Klotter, Charles & Annette Trust	WEL	A	452356		WHPA	QBAA	Low
221	75-487-0250	Sybilrud, Christopher J	WEL	A	148152		WHPA	QBAA	Low
224	1		WEL	U	452408	Unknown Location	WHPA	QBAA	Low
226	75-508-0310	Luniewski, Lawrence E	WEL	A	425930		WHPA	QBAA	Low
229	1	LARSON, D.	WEL	U	155937	Unknown Location	WHPA	QBAA	Low
233	75-508-0330	Grimm, Corey & Stephanie	WEL	A	408997		WHPA	QBAA	Low
234	75-135-2121	Paul, John E	WEL	A	429164		WHPA	QBAA	Low
240	75-481-0170	Puchtel, Joseph & Rebecca	WEL	A	155545		WHPA	QBAA	Low
242	75-452-0130	Wood, Michael K	WEL	A	503022		WHPA	QBAA	Low
245	75-119-1100	St Louis Pk Sptsman Club	WEL	A	720882		DWSMA	QBAA	Low

ERMU DWSMA

Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
247	75-479-0155	Scouten, Nicholas & Stephanie	WEL	A	450161		WHPA	QBAA	Low
249	75-499-0190	Farrington, Terrance & L	WEL	A	437207		WHPA	QBAA	Low
250	75-499-0240	Rivers, Eric G & Karen E	WEL	A	437209		WHPA	QBAA	Low
252	75-484-0350	Cummings, Douglas	WEL	A	171061		WHPA	QBAA	Low
254	75-115-3100	2tlc Llc	WEL	A	179097		WHPA	QBAA	Low
256	75-125-4101	Akm Farm Llc	WEL	A	125272		WHPA	QBAA	Low
257	75-508-0390	Krone, Curtis D & Diane C	WEL	A	194979		WHPA	QBAA	Low
259	75-119-4100	Bolin, Peter M & Mary Josefa	WEL	A	425796		WHPA	QBAA	Low
261	75-126-4101	Howse, G Craig & Melissa J-Trustees	WEL	A	439973		Moderate	QBAA	Low
264	75-517-0135	Kirk, Eric & Reiter, Jody	WEL	A	442094		WHPA	QBAA	Low
266	75-503-0430	Opong-Vaughn, Josephine	WEL	A	415963		WHPA	QBAA	Low
267	75-502-0150	Madden Living Trust	WEL	A	434695		WHPA	QBAA	Low
268	75-136-1102	Osborn, William E & Patricia L	WEL	A	431666		WHPA	QBAA	Low
269	75-503-0224	Anderson, Mark & Crawford Anderson	WEL	A	416166		WHPA	QBAA	Low
271	75-117-3413	Brindamour, Thomas & Melissa	WEL	A	417044		DWSMA	QBAA	Low
272	75-117-2107	Bilyeu, Arnold & Shirley	WEL	A	433828		DWSMA	QBAA	Low
277	75-503-0748	Scott, Kyle Eugene	WEL	A	510854		WHPA	QBAA	Low
278	75-503-0232	Straus, Louis C & Kathleen L -trust	WEL	A	418971		WHPA	QBAA	Low
282	75-503-0710	Shonyo, Donald & Diana - Trustee	WEL	A	437571		WHPA	QBAA	Low
283	75-503-0625	Brown, Leanne Marie	WEL	A	416052		WHPA	QBAA	Low
284	75-122-2200	Tiller Corporation	WEL	A	437549		WHPA	QBAA	Low
285	75-510-0345	Check, John Michael & Holly Lynn	WEL	A	406658		Moderate	QBAA	Low
287	75-119-4101	Vansteenburg, Catherine	WEL	A	418499		WHPA	QBAA	Low
295	75-513-0220	Mueller, Barbara	WEL	A	158348		Moderate	QBAA	Low
296	75-486-0150	Smith, Timothy D & Janet L	WEL	A	149407		WHPA	QBAA	Low
304	75-505-0146	Lau, Dennis L & Cynthia	WEL	A	196416		WHPA	QBAA	Low
305	75-888-0110	Barrett, Mark J & Sue R	WEL	A	155299		WHPA	QBAA	Low
306	75-428-0165	Lewis, Andrew & Erin	WEL	A	160679		Moderate	QBAA	Low
308	75-510-0165	Brutskiy, Michael P & Kseniya	WEL	A	408481		WHPA	QBAA	Low
309	75-872-0115	Solid Rock Church	WEL	A	188793		WHPA	QBAA	Low
312	75-857-0220	Dahl, Joshua J & Jersi M	WEL	A	502538		DWSMA	QBAA	Low
318	75-453-0320	Tyler, Thomas L & Vicki G-Trustees	WEL	A	430202		WHPA	QBAA	Low
323	10-125-1100	Demars, Barbara J	WEL	A	415992		DWSMA	QBAA	Low
325	75-502-0310	Slaughter, Timothy J	WEL	A	194952		WHPA	QBAA	Low
326	75-120-2309	Smith, Walter J & Sharon L	WEL	A	425888		WHPA	QBAA	Low
330	75-510-0105	Hauan, Harvey R	WEL	A	416795		WHPA	QBAA	Low
331	75-510-0650	Richardson, Bradley J & Robin Trust	WEL	A	420553		ERA	QBAA	Low
332	75-471-0166	Arntson, Wade & Joy	WEL	A	417962		Moderate	QBAA	Low
335	75-510-0315	Cooper, Andrew B & Renee A	WEL	A	406674		WHPA	QBAA	Low

ERMU DWSMA

Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
336	75-115-1412	Cazett, Dale & Michele	WEL	A	457034		WHPA	QBAA	Low
340	75-453-0245	Schumacher, Steven&pamela	WEL	A	452489		DWSMA	QBAA	Low
341	75-487-0310	Brown, Michael	WEL	A	405436		WHPA	QBAA	Low
344	75-487-0380	Brandvig, Eric T	WEL	A	416607		WHPA	QBAA	Low
351	75-119-1315	Gleason, Edward A & Pamela B	WEL	A	166070		DWSMA	QBAA	Low
355	75-487-0320	Mullenmaster, Gregory &joyce	WEL	U	133387		WHPA	QBAA	Low
356	75-510-0450	Scheffler, Steven & Carol	WEL	A	415993		Moderate	QBAA	Low
357	75-431-0120	Lindstrom, James T	WEL	A	169525		Moderate	QBAA	Low
358	75-130-3310	Vojta, Michael J	WEL	A	143700		WHPA	QBAA	Low
360	75-512-0220	Sorensen, David & Deborah	WEL	A	448360		WHPA	QBAA	Low
363	75-453-0140	Guertin, Gregory & Cota-Guertin,a	WEL	A	430308		WHPA	QBAA	Low
364	75-485-0170	Glaser, Christopher J & Julia K	WEL	A	178276		WHPA	QBAA	Low
365	75-510-0385	Faue Kregel Family Trust	WEL	A	508465		WHPA	QBAA	Low
370	75-115-3100	2tlc Llc	WEL	A	183652		WHPA	QBAA	Low
371	75-126-4202	Cardinal, Ronald K & Janet J	WEL	A	432497		Moderate	QBAA	Low
373	75-117-4100	Palmer, Wade S & Diane L	WEL	A	450370		WHPA	QBAA	Low
375	75-117-3415	Ilstrup, Scott & Marianne K	WEL	A	767804		DWSMA	QBAA	Low
376	75-126-2105	Benson, Richard & Grace	WEL	A	655282		Moderate	QBAA	Low
379	75-431-0422	Keifenheim, Gary P & Mary	WEL	A	156195		Moderate	QBAA	Low
380	75-484-0220	Hickerson, Paul N & Kayla R	WEL	A	451466		WHPA	QBAA	Low
381	75-505-0152	Ness, David H	WEL	A	434426		WHPA	QBAA	Low
384	75-513-0210	Moore-Sneve, Charlene	WEL	A	452357		Moderate	QBAA	Low
385	75-502-0135	Gregerson, Jeffrey Ardell	WEL	A	452381		WHPA	QBAA	Low
386	75-510-0165	Brutskiy, Michael P & Kseniya	WEL	A	418922		WHPA	QBAA	Low
387	75-497-0145	Kipfer, Blair T	WEL	A	405449		DWSMA	QBAA	Low
392	75-517-0450	Crank, Michael L	WEL	A	429190		WHPA	QBAA	Low
393	75-426-0230	Peterson, Roberta L	WEL	A	168665		WHPA	QBAA	Low
394	75-508-0150	Ranallo, Stephen G	WEL	A	405897		WHPA	QBAA	Low
396	75-513-0130	Milless, Perry E & Michelle M	WEL	A	418495		Moderate	QBAA	Low
398	75-471-0160	Quammen, Keith	WEL	A	146165		Moderate	QBAA	Low
399	75-500-0110	Kulla, Dustin L	WEL	A	416792		WHPA	QBAA	Low
400	75-505-0150	Berry, Scott C & Deborah A	WEL	A	451495		WHPA	QBAA	Low
401	75-513-0410	Cassady Revocable Trust	WEL	A	425708		Moderate	QBAA	Low
402	75-503-0635	Fox, Michael E & Mary S	WEL	A	430284		WHPA	QBAA	Low
406	75-510-0155	Waller, Nancee	WEL	A	420565		WHPA	QBAA	Low
407	75-510-0635	Sydow, Kelly D	WEL	A	421006		Moderate	QBAA	Low
409	75-002-1117	Walde, Rachel & Popham, Robert	WEL	A	429108		WHPA	QBAA	Low
410	75-508-0350	Brink, Terry R & Christina	WEL	A	434337		WHPA	QBUA	Low
413	75-502-0210	Sturos, William A & Lisa A	WEL	A	434460		WHPA	QBAA	Low

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Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
419	75-116-3301	Miller, Kenneth & Traylor, Debra	WEL	A	423563		WHPA	QBAA	Low
423	75-500-0215	Kvistad, Jerome W & Karen K - Trust	WEL	A	408746		WHPA	QBAA	Low
429	75-505-0420	Munger, Gerald D & Kathleen	WEL	A	182162		WHPA	QBAA	Low
431	75-510-0445	Carlson, Chad & Lisa	WEL	A	426155		Moderate	QBAA	Low
432	75-428-0242	Degreeff, Judy & Nicholas D	WEL	A	127221		Moderate	QBAA	Low
434	75-513-0440	Huber, James D Jr & Becky	WEL	A	191137		Moderate	QBAA	Low
435	75-846-0105	Jones, Scott Michael & Cheryl Lou	WEL	A	425702		DWSMA	QBAA	Low
438	75-505-0330	Belde, Joshua & Jennifer	WEL	A	404747		WHPA	QBAA	Low
440	75-505-0310	Hauge, Brian T	WEL	A	724328		WHPA	QBAA	Low
441	75-503-0535	Kohorst, Eric & Anne	WEL	A	199194		WHPA	QBAA	Low
444	1	HUMPHREY, MILFORD	WEL	U	143958	Unknown Location	Moderate	QBAA	Low
446	75-510-0520	Rehling, Joseph & Kaylyn	WEL	A	453439		Moderate	QBAA	Low
451	75-510-0635	Sydow, Kelly D	WEL	A	417936		Moderate	QBAA	Low
452	75-484-0120	Reid, Lucas & Jamie	WEL	A	503050		WHPA	QBAA	Low
456	75-453-0265	Vang, Pa Woua & Lofgren, Tyler D	WEL	A	445977		WHPA	QBAA	Low
460	75-510-0340	Lee, Brian	WEL	A	416443		Moderate	QBAA	Low
463	75-508-0250	Talberg, Timothy & Karen	WEL	A	434429		WHPA	QBAA	Low
470	75-503-0714	Torgerson, Ryan & Jody	WEL	A	433818		WHPA	QBAA	Low
471	75-500-0230	Hamilton, Matthew & Karen	WEL	A	442526		WHPA	QBAA	Low
472	75-474-0410	Kattengell, Steven & Nancy	WEL	A	169368		WHPA	QBAA	Low
474	75-508-0170	Ogren, Eric S & Christine	WEL	A	423997		WHPA	QBAA	Low
477	75-500-0140	Hoffert, S & J & Hoffert, Michael	WEL	A	183684		WHPA	QBAA	Low
478	75-486-0220	Waldoch, Eric R	WEL	A	107201		WHPA	QBAA	Low
480	75-510-0510	Kleffman, Levi J & Stephanie	WEL	A	406664		ERA	QBAA	Low
482	75-510-0615	Lueck, Kenneth A & Stacy	WEL	A	418911		Moderate	QBAA	Low
487	75-662-0320	Eriksson, Anthony J	WEL	A	655134		WHPA	QBAA	Low
488	75-503-0450	Larson, Robert & Larson, Ryan	WEL	A	452334		WHPA	QBAA	Low
489	75-505-0340	Welle, Katelyn & Peterson, Zachary	WEL	A	500697		WHPA	QBAA	Low
490	75-513-0330	Elkington, Robert & Laura	WEL	A	424826		Moderate	QBAA	Low
492	75-484-0140	Boe, Brett & Theresa	WEL	A	126462		WHPA	QBAA	Low
494	75-120-2307	Shank, Dara & Brian - Trustees	WEL	A	111242		WHPA	QBAA	Low
495	75-510-0120	Dummer, David J & Sandra	WEL	A	442671		WHPA	QBAA	Low
496	75-503-0510	Burgoyne, Michael R & Tammy M	WEL	A	405424		WHPA	QBAA	Low
497	75-503-0610	Blakstvedt Family Revocable Trust	WEL	A	405426		WHPA	QBAA	Low
500	75-512-0260	Peterson, John E	WEL	A	448367		WHPA	QBAA	Low
502	75-890-0275	Rp3 Llc	WEL	U	190412		WHPA	QBAA	Low
503	75-431-0320	Stock, Richard A & Mary	WEL	A	155194		Moderate	QBAA	Low
506	75-471-0220	Forsyth, Dennis W & Pamela A	WEL	A	193477		Moderate	QBAA	Low
511	75-127-3200	Church of St Andrew	WEL	A	186161		Moderate	QBAA	Low

ERMU DWSMA

Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
513	75-485-0130	Brown, Bret A & Rebecca J	WEL	A	193604		WHPA	QBAA	Low
515	1	SANTWIRE, GARY	WEL	U	126725	Unknown Location	Moderate	QBAA	Low
520	75-002-1120	Ocel, Michael W & Marva J	WEL	A	452418		WHPA	QBAA	Low
522	75-115-2205	2tlc Llc	WEL	A	186176		WHPA	QBAA	Low
525	75-517-0245	Glowacki, Derek D	WEL	A	433821		WHPA	QBAA	Low
526	75-486-0330	Dahlheimer, Philip & Ann	WEL	A	162789		WHPA	QBAA	Low
529	75-428-0555	Wolle, Deborah Ann-Trustee	WEL	A	146194		Moderate	QBAA	Low
530	1	SCHULKE, JERRY	WEL	U	122676	Unknown Location	WHPA	QBAA	Low
532	75-504-0345	Emerson, Donelle M & Jon J	WEL	A	430312		DWSMA	QBAA	Low
533	75-517-0328	Dubay, Joel R & Lori A	WEL	A	426701		WHPA	QBAA	Low
534	75-117-1101	Liashkovich, Pavel & Anna	WEL	A	169363		WHPA	QBAA	Low
536	75-117-4007	Ostien, Douglas B & Grace	WEL	A	761487		WHPA	QBAA	Low
537	75-510-0470	Dukowitz, Gary & Brenda	WEL	A	434417		ERA	QBAA	Low
538	75-123-1102	Olson, Clair	WEL	A	162815		WHPA	QBAA	Low
539	75-505-0210	Laing, Brody F	WEL	A	408495		WHPA	QBAA	Low
540	75-505-0164	Skalisky, Mikhail A	WEL	A	188262		WHPA	QBAA	Low
542	75-117-1401	Barrs, Sean & Jennifer	WEL	A	417051		WHPA	QBAA	Low
545	75-117-4012	Johnson, Richard Gene	WEL	A	446017		WHPA	QBAA	Low
546	75-126-1110	Wardarski, Michael	WEL	A	451430		Moderate	QBAA	Low
547	75-453-0150	Gates, Jesse	WEL	A	451456		WHPA	QBAA	Low
548	75-503-0230	Boyd, Charles S & Diane	WEL	A	409599		WHPA	QBAA	Low
549	75-117-3405	Benson, Sherri	WEL	A	449262		DWSMA	QBAA	Low
553	75-517-0110	Dick, Sara & Matthew S	WEL	A	430328		WHPA	QBAA	Low
555	75-503-0234	Ogle, Randy A & Kathryn M - Trustee	WEL	A	196365		WHPA	QBAA	Low
561	75-513-0120	Menth, Linda Lou Revocable Trust	WEL	A	450127		Moderate	QBAA	Low
563	75-471-0130	Beckstrand, Bob & Bjella-Beckstrand	WEL	A	429237		Moderate	QBAA	Low
564	75-487-0370	Christoferson, Andrew	WEL	A	439046		WHPA	QBAA	Low
565	1		WEL	U	166015	Unknown Location	Moderate	QBAA	Low
566	75-503-0555	Lynch, Samuel R & Sarah J	WEL	A	417097		WHPA	QBAA	Low
567	75-503-0712	Lura, Keith V & Carol K	WEL	A	416619		WHPA	QBAA	Low
569	75-503-0226	Vainelovich, Sergey & Svetlana	WEL	A	449110		WHPA	QBAA	Low
570	75-471-0150	Herbst, Kevin	WEL	A	425916		Moderate	QBAA	Low
572	75-119-4101	Vansteenburg, Catherine	WEL	A	434461		WHPA	QBAA	Low
573	75-499-0180	Olson, Arthur R & Kristen	WEL	A	434467		WHPA	QBAA	Low
574	75-503-0615	Corrigan, Timothy E & Jean	WEL	A	407738		WHPA	QBAA	Low
575	75-484-0355	Hangaard, Michael & Mary	WEL	A	146106		WHPA	QBAA	Low
577	75-508-0380	Callender Family Trust	WEL	A	416608		WHPA	QBAA	Low
578	75-503-0640	Chalmers, Angela M & Apps, Tory B	WEL	A	426745		WHPA	QBAA	Low
580	75-453-0155	Ksilander, Susan R Trust	WEL	A	437204		WHPA	QBAA	Low

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Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
581	75-500-0120	Goth, Gary T & Charlene A - Trustee	WEL	A	426349		WHPA	QBAA	Low
586	75-517-0410	Ethun, Sonja	WEL	A	502963		WHPA	QBAA	Low
587	75-485-0190	Graham, Daniel L & Daneen A	WEL	A	439714		WHPA	QBAA	Low
588	75-002-1110	Ruppeluis, Gerald J & E	WEL	A	405441		WHPA	QBAA	Low
590	75-116-2301	Orrock, Todd D & Becky	WEL	A	425701		WHPA	QBAA	Low
593	75-711-0105	Sammons, Peggy & Retzlaff, Kandi	WEL	A	417018		WHPA	QBAA	Low
598	75-517-0470	Shade, Steven Matthew & Carrie L	WEL	A	430313		WHPA	QBAA	Low
607	75-485-0170	Glaser, Christopher J & Julia K	WEL	A	128115		WHPA	QBAA	Low
608	1		WEL	U	166963	Unknown Location	Moderate	QBAA	Low
610	75-512-0260	Peterson, John E	WEL	A	417988		WHPA	QBAA	Low
612	75-487-0350	Sabraski, Scott J	WEL	A	433877		WHPA	QBAA	Low
613	75-503-0625	Brown, Leanne Marie	WEL	A	418955		WHPA	QBAA	Low
616	75-503-0746	Annen, John C & Joann	WEL	A	417802		WHPA	QBAA	Low
617	75-484-0150	Arnold, Susan R - Trustee	WEL	A	417034		WHPA	QBAA	Low
618	75-123-4400	Youngmark, Ricky & Frandrup, D	WEL	A	417073		Moderate	QBAA	Low
620	75-422-0180	Kendrick, Robert F & Peggy	WEL	A	156193		WHPA	QBAA	Low
623	75-505-0170	Weber, Chris & Sarah	WEL	A	429109		WHPA	QBAA	Low
624	75-126-1102	Hattell, Caroline L & Melvin J	WEL	A	439003		Moderate	QBAA	Low
629	75-487-0235	Pfeifer Properties South Llc	WEL	A	126448		WHPA	QBAA	Low
630	75-505-0168	Dehkes, Gregory J & Shannel M	WEL	A	405811		WHPA	QBAA	Low
635	75-497-0120	Anderson, Brian K & Theresa	WEL	A	405825		WHPA	QBAA	Low
636	75-487-0260	Ziegler, Larry J	WEL	A	140162		WHPA	QBAA	Low
638	75-491-0340	Hegge, Joseph D & Sarah M	WEL	A	169353		WHPA	QBAA	Low
642	75-484-0360	Netka, Roy F & Beaumaster, Kathryn	WEL	A	418983		WHPA	QBAA	Low
644	75-497-0150	Koski, Robert L & Joanna S	WEL	A	178881		DWSMA	QBAA	Low
645	75-500-0220	Griffiths, Steven & Maureen	WEL	A	193421		WHPA	QBAA	Low
649	75-505-0260	Scholl, Cory	WEL	A	448355		WHPA	QBAA	Low
650	75-707-0205	Miller, Travis	WEL	A	156270		WHPA	QBAA	Low
652	75-503-0228	Long, Gerald P & Kathleen M	WEL	A	439041		WHPA	QBAA	Low
653	75-111-3300	Swanson, Michael E & Lindsey M	WEL	A	431609		WHPA	QBAA	Low
656	75-113-3200	Dreesen, Brian & Tanya	WEL	A	184492		WHPA	QBAA	Low
658	75-510-0605	Becker, Cheryl R-Trustee	WEL	A	406667		WHPA	QBAA	Low
660	75-517-0240	Schulte, Cody & Kristi	WEL	A	429169		WHPA	QBAA	Low
661	75-500-0285	Raines, Richard B & Borel, Heidi	WEL	A	165921		WHPA	QBAA	Low
663	75-505-0140	Schmaltz, John J & Mary E	WEL	A	425488		DWSMA	QBAA	Low
668	75-505-0410	Barnes, James R	WEL	A	455257		WHPA	QBAA	Low
669	75-510-0615	Lueck, Kenneth A & Stacy	WEL	A	416672		Moderate	QBAA	Low
679	118500151104	THOMAS & LEA LINDHE	WEL	A	697548		WHPA	QBAA	Low
685	118500154101	EQUITY TRUST CO CUSTODIAN	WEL	U	452404		DWSMA	QBAA	Low

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Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
687	75-130-1200	Steffens, Daniel J	WEL	A	761706		WHPA	QBAA	Low
704	303325220010	Murray, Russell J	WEL	A	540030		DWSMA	QBAA	Low
709	75-126-4205	Ertel, Jeanette Revocable Trust	WEL	A	777633		WHPA	QBAA	Low
715	75-126-3405	Koppendrayer, Harlan & Tami	WEL	A	747754		Moderate	QBAA	Low
721	75-518-0145	Marcinkowski, Jill L	WEL	A	506526		WHPA	QBAA	Low
725	75-427-0210	Standish Clark Llc	WEL	A	126704		WHPA	QBAA	Low
726	75-428-0545	Carlson, Patrick & Schreder, Wendy	WEL	A	426330		Moderate	QBAA	Low
729	75-428-0216	Lindahl, Ted A & Kendra S	WEL	A	661841		Moderate	QBAA	Low
730	75-428-0405	Cloutier, Anthony Richard	WEL	A	178890		Moderate	QBAA	Low
731	75-428-0105	Ganeva, Lyudmila	WEL	A	421012		Moderate	QBAA	Low
733	75-428-0130	Martin, Dale P & Beverly	WEL	A	420198		Moderate	QBAA	Low
734	75-431-0260	Jarvie, Jesse O & Schlangen, Megan	WEL	A	416697		Moderate	QBAA	Low
737	75-471-0260	Flahave, Patrick & Patricia -trust	WEL	A	731279		Moderate	QBAA	Low
740	75-128-1140	Ree, Matthew D & Lindsay M	WEL	A	709851		WHPA	QBAA	Low
741	75-130-1111	Fyten, Eric D And Heidi L	WEL	A	615432		WHPA	QBAA	Low
742	75-503-1010	Deusterman Family Living Trust	WEL	A	417060		WHPA	QBAA	Low
743	75-503-0722	Frane, Cynthia D Revocable Trust	WEL	A	618660		WHPA	QBAA	Low
744	75-580-0330	Krieger, Dan M & Linda M	WEL	A	623660		WHPA	QBAA	Low
746	75-580-0325	Waddell, Jeffrey & Leboutellier, L	WEL	A	592882		WHPA	QBAA	Low
747	75-510-0645	Milless, Michael A	WEL	A	470383		ERA	QBAA	Low
748	75-474-0240	Trombley, Donald J	WEL	A	434943		WHPA	QBAA	Low
749	75-503-0650	Christensen, David Adam	WEL	A	516059		WHPA	QBAA	Low
752	75-580-0310	Obler, James P & Kristi L Rev Trust	WEL	A	623699		WHPA	QBAA	Low
753	75-580-0305	Duy, Terry L & Robinson, Cassandra	WEL	A	602073		WHPA	QBAA	Low
755	75-580-0205	Roehrdanz, Charles O & Rebecca L	WEL	A	613569		WHPA	QBAA	Low
756	75-510-0450	Scheffler, Steven & Carol	WEL	A	415973		Moderate	QBAA	Low
758	75-502-0245	Riewer, William J & Maria T	WEL	A	518879		WHPA	QBAA	Low
759	75-499-0405	Burma, Aric S & Kristen Dawn-Kulics	WEL	A	469817		WHPA	QBAA	Low
761	75-499-0307	Lonsky, Ryan R & Kristi J	WEL	A	469816		WHPA	QBAA	Low
762	75-502-0315	Ogamba, Daniel & Munah & Gbadyu, S	WEL	A	521312		WHPA	QBAA	Low
764	75-119-1400	Held, Kathleen A Held Living Trust	WEL	A	704123		WHPA	QBAA	Low
765	75-581-0105	Baker, Keith J & Susan M	WEL	A	558959		WHPA	QBAA	Low
766	75-662-0405	Mcclellan, Maxine R Revocable Trust	WEL	A	664084		WHPA	QBAA	Low
768	75-121-2000	Tiller Corporation	WEL	A	731146		WHPA	QBAA	Low
769	75-117-4009	Honek, William P & Debra Kay	WEL	A	537241		WHPA	QBAA	Low
774	75-500-0210	Bistodeau, Brian R	WEL	A	506505		WHPA	QBAA	Low
775	75-114-1106	Claessens, Mark	WEL	A	571084		DWSMA	QBAA	Low
777	75-505-0215	Eubanks, John G & Debra Ziemer	WEL	A	578408		WHPA	QBAA	Low
778	75-505-0220	Coffield, Christopher & Kimberly	WEL	A	537956		WHPA	QBAA	Low

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Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
780	75-117-1210	Townsend, Jacob L	WEL	A	518660		DWSMA	QBAA	Low
781	2	Elk Run Condominium Assoc	WEL	A	778611	Unknown Location	Moderate	QBAA	Low
782	75-126-2140	Thies, James E & Diane M	WEL	A	709885		Moderate	QBAA	Low
784	75-503-1045	Lassle, Troy J & Heather L	WEL	A	425835		WHPA	QBAA	Low
787	75-125-1215	Wickham, David L	WEL	A	523225		WHPA	QBAA	Low
788	75-580-0435	Weatherly, Chad M & Rebecca L	WEL	A	638353		WHPA	QBAA	Low
789	75-126-2142	Klein, Jeffrey D & Joan M	WEL	A	667098		Moderate	QBAA	Low
791	75-610-0245	Hiller, Frederick & Rychner,cynthia	WEL	A	621732		WHPA	QBAA	Low
792	75-517-0460	Rogers, David & Karen	WEL	A	464152		WHPA	QBAA	Low
795	75-499-0153	Smith, William M & Elizabeth J	WEL	A	638361		WHPA	QBAA	Low
797	75-610-0230	Iverson, Daniel L & Elizabeth J	WEL	A	610115		WHPA	QBAA	Low
799	75-123-4300	Quaid, Jess J & Harvey, Alana G	WEL	A	417086		Moderate	QBAA	Low
801	75-610-0235	Makovec, Mark & Susan M	WEL	A	621736		WHPA	QBAA	Low
802	75-610-0240	Mordal, Douglas W & Ruth M	WEL	A	621747		WHPA	QBAA	Low
804	75-513-0442	Begin, Kevin C & Jacqueline A	WEL	A	570111		Moderate	QBAA	Low
806	75-510-0470	Dukowitz, Gary & Brenda	WEL	A	709891		ERA	QBAA	Low
808	75-123-3415	Artman, Gregory D & Cathleen J	WEL	A	703871		Moderate	QBAA	Low
811	75-503-0645	Olson, Gregory J & Debra J	WEL	A	521651		WHPA	QBAA	Low
814	75-474-0250	Castagneri, Christine J & Gregory D	WEL	A	528592		WHPA	QBAA	Low
816	75-499-0236	Erickson, Troy B & Hernandez, Ana	WEL	A	492218		WHPA	QBAA	Low
817	75-610-0120	Christian, Matthew E & Christi J	WEL	A	610059		WHPA	QBAA	Low
820	75-499-0171	Schinkowsky, Aleksandra J & Nelson,	WEL	A	642319		WHPA	QBAA	Low
823	75-510-0640	Chamberlain, Richard D & Margaret M	WEL	A	435437		Moderate	QBAA	Low
824	75-610-0115	Anderson, Mychal & Courtney	WEL	A	610091		WHPA	QBAA	Low
825	75-513-0441	Guidarelli, Joseph & Barbara	WEL	A	566679		Moderate	QBAA	Low
827	75-513-0450	Botts, Bradley B & Robin K	WEL	A	521949		Moderate	QBAA	Low
829	75-580-0315	Staples, Edward W & Patricia J	WEL	A	638371		WHPA	QBAA	Low
831	75-499-0172	Krippner, Douglas &elizabeth	WEL	A	464366		WHPA	QBAA	Low
832	75-503-0706	Desautels, Adam D & Melissa	WEL	A	571652		WHPA	QBUA	Low
835	75-510-0460	Siemers, Alan D & Debra	WEL	A	425054		Moderate	QBAA	Low
837	75-580-0410	Pierson, Darren R & Kelly L	WEL	A	615641		DWSMA	QBAA	Low
838	75-510-0465	Andreasen, Patrick D & D	WEL	A	421138		Moderate	QBUA	Low
839	75-499-0239	Bescheinen, Doug H	WEL	A	494254		WHPA	QBAA	Low
844	75-503-0605	Williams, John P & Diane H Trustee	WEL	A	193787		WHPA	QBAA	Low
845	75-610-0215	Olson, Christopher & Anne	WEL	A	610144		WHPA	QBAA	Low
846	75-610-0105	Morrell, Trent & Brenda	WEL	A	600828		WHPA	QBAA	Low
849	75-474-0330	Kirkeide, Joseph P & Yvonne L	WEL	A	256891		WHPA	QBAA	Low
852	75-580-0125	Adams, Marc & Katherine	WEL	A	627502		WHPA	QBAA	Low
855	75-499-0176	Kielty, Thomas S & Harriet A	WEL	A	507786		WHPA	QBAA	Low

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Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
856	75-471-0170	Goeden-Massuch, Jolene	WEL	A	473101		Moderate	QBAA	Low
858	75-471-0120	Berscheid, Matthew B & Jessica L	WEL	A	638377		Moderate	QBAA	Low
859	75-499-0242	Sparza, Alyssa & Arturo	WEL	A	504367		WHPA	QBAA	Low
861	75-510-0350	Woldt, Garland R & Garnett R	WEL	A	492221		Moderate	QBUA	Low
863	75-610-0205	Krupicka, Janice L	WEL	A	631448		WHPA	QBAA	Low
864	75-517-0115	Bretheim, Robert	WEL	A	534075		WHPA	QBAA	Low
865	75-610-0210	Lavallee, Jon T & Yvette T	WEL	A	631408		WHPA	QBAA	Low
866	75-897-0105	Hinton, Aaron & Cortni	WEL	A	479163		WHPA	QBAA	Low
868	75-503-0550	Christianson, Jessica & Jason N	WEL	A	512851		WHPA	QBAA	Low
872	75-499-0246	Wild, Terry L & Colleen M	WEL	A	467615		WHPA	QBAA	Low
874	75-502-0240	Hawes, Jesse S	WEL	A	564807		WHPA	QBAA	Low
875	75-502-0225	Voss, Jeremy R & Brita K	WEL	A	523090		WHPA	QBAA	Low
876	75-487-0220	Robinson, Lynnette Revocable Trust	WEL	A	694494		WHPA	QBAA	Low
878	75-502-0230	Myhr, Edward P	WEL	A	533015		WHPA	QBAA	Low
880	75-643-0435	Kutzer, Mark & Kathleen	WEL	A	642778		WHPA	QBAA	Low
882	75-499-0305	Risting, Timothy W & Michelle A	WEL	A	474094		WHPA	QBAA	Low
883	75-643-0430	Houghton, Benjamin & Morrison, Dawn	WEL	A	655186		WHPA	QBAA	Low
884	75-499-0335	Johnston Family Trust	WEL	A	523217		WHPA	QBAA	Low
887	75-503-0212	Ezati, Rosalie	WEL	A	698835		WHPA	QBAA	Low
889	75-643-0425	Gragert, Larry & Carol A	WEL	A	689330		WHPA	QBAA	Low
891	75-502-0320	Vanheel, Jeffery A & Pamela	WEL	A	534937		WHPA	QBAA	Low
892	75-503-0440	Bauer, Matthew S & Brenda L	WEL	A	520012		WHPA	QBAA	Low
893	75-502-0220	Dubois, Michael H & Mary E	WEL	A	523019		WHPA	QBAA	Low
894	75-453-0261	Karsten, Joshua M	WEL	A	471011		WHPA	QBAA	Low
895	75-643-0420	Smith, Michael T & Sandwick, Dena	WEL	A	669959		WHPA	QBAA	Low
896	75-643-0330	Christy, Thomas & Catherine	WEL	A	661835		WHPA	QBAA	Low
899	75-499-0328	Hamilton, Tracy J	WEL	A	461898		WHPA	QBAA	Low
900	75-453-0260	Clark, John P & Mary J	WEL	A	458908		WHPA	QBAA	Low
901	75-503-0210	Pufahl, Daniel P	WEL	A	699601		WHPA	QBAA	Low
902	75-487-0240	Turenne, William L & Kerri M	WEL	A	661838		WHPA	QBAA	Low
903	75-643-0325	Graif, James R & Lynn	WEL	A	722457		WHPA	QBAA	Low
905	75-124-3100	Nowak, Terrence J	WEL	A	541762		WHPA	QBAA	Low
906	75-643-0320	Klein, Michael P & Laurie A	WEL	A	693370		WHPA	QBAA	Low
907	75-643-0140	Vencil, Kellan & Mccolloch-Vencil,	WEL	A	656141		WHPA	QBAA	Low
909	75-643-0415	Osterman, Shayla & Timothy - Trust	WEL	A	661091		WHPA	QBAA	Low
910	75-499-0196	Chatham, Lori Ann & Tye	WEL	A	474059		WHPA	QBAA	Low
911	75-643-0135	Madson, Thomas C & Charlotte-Trust	WEL	A	690642		WHPA	QBAA	Low
912	75-119-4104	Smith, Ann Elizabeth	WEL	A	531372		WHPA	QBAA	Low
913	75-503-0220	Demary, Jacob W	WEL	A	504039		WHPA	QBAA	Low

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Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
914	75-499-0325	Foley, Michelle R	WEL	A	494295		WHPA	QBAA	Low
915	75-643-0205	Wisniewski, Daniel & Barbara	WEL	A	645814		WHPA	QBAA	Low
916	75-499-0326	Hanson, James D & Renee K	WEL	A	471030		WHPA	QBAA	Low
917	75-643-0210	Lade, Kristen	WEL	A	697546		WHPA	QBAA	Low
919	75-643-0310	Boettcher, Robert & Catherine	WEL	A	686059		WHPA	QBAA	Low
921	75-643-0305	Berg, Terry & Emily	WEL	A	631747		WHPA	QBAA	Low
922	75-502-0305	Lentz, Michael D	WEL	A	551269		WHPA	QBAA	Low
923	75-643-0410	Foxcroft, Ivan & Zanielle	WEL	A	647403		WHPA	QBAA	Low
924	75-643-0215	Schwamberger, Thomas & Kathy	WEL	A	642336		WHPA	QBAA	Low
925	75-503-0204	Mcalpine, Neil A	WEL	A	652546		WHPA	QBAA	Low
927	75-499-0450	Roberts, Carl D & Carol A	WEL	A	510860		WHPA	QBAA	Low
928	75-499-0430	Sikich, Mark J	WEL	A	462413		WHPA	QBAA	Low
929	75-499-0440	Griner, Henry V & Leslie	WEL	A	510861		WHPA	QBAA	Low
930	75-502-0306	Johnson, Renee L & Duane L	WEL	A	518850		WHPA	QBAA	Low
931	75-643-0405	Koosmann, Mariah & Adam	WEL	A	663423		WHPA	QBAA	Low
932	75-502-0307	Stroschein, James L & Diane - Trust	WEL	A	528650		WHPA	QBAA	Low
933	75-499-0199	Utz, Michael J & Leisha M	WEL	A	477325		WHPA	QBAA	Low
934	75-502-0308	Hazzard, Archie W,jr & Pamela	WEL	A	516236		WHPA	QBAA	Low
935	75-643-0125	Powers, Bruce R & Laura J - Trustee	WEL	A	691647		WHPA	QBAA	Low
936	75-643-0110	Ruone, Jill M	WEL	A	672363		WHPA	QBAA	Low
939	75-643-0115	Deangelis, Joshua & Alyse	WEL	A	661065		WHPA	QBAA	Low
940	75-643-0130	Wanha, Charles R & Jean P	WEL	A	669953		WHPA	QBAA	Low
941	75-643-0120	Hansen, Jeffrey R & Michelle L	WEL	A	738190		WHPA	QBAA	Low
942	75-502-0135	Gregerson, Jeffrey Ardell	WEL	A	528632		WHPA	QBAA	Low
946	75-120-2401	Downing, Jeffrey & Jennifer	WEL	A	506576		WHPA	QBAA	Low
947	75-662-0110	Plucinak, Steven C & Sara L	WEL	A	673026		WHPA	QBAA	Low
956	75-508-0370	Tveit, Lee R & Melissa S	WEL	A	588018		WHPA	QBAA	Low
958	75-662-0120	Cameron, Chad & Liz	WEL	A	673025		WHPA	QBAA	Low
963	75-120-1105	City of Elk River	WEL	A	602259		WHPA	QBAA	Low
964	75-484-0340	Schlichting, Brian P & Sarah E	WEL	A	706443		WHPA	QBAA	Low
965	75-486-0320	Tietz, Michael G & Sharon M	WEL	A	630072		WHPA	QBAA	Low
966	75-484-0335	Swanson, David	WEL	A	126446		WHPA	QBAA	Low
968	75-508-0340	Roos, Ronald W & Louene	WEL	A	661840		WHPA	QBAA	Low
969	75-637-0105	Held, Kathleen A Held Living Trust	WEL	A	584424		WHPA	QBAA	Low
970	75-502-0110	Anderson, Christopher & Mellum, K	WEL	A	703260		WHPA	QBAA	Low
971	75-124-1404	Latt, Laura Marie	WEL	A	625485		WHPA	QBAA	Low
972	75-662-0235	Vernon, Michael J & Kimberly R	WEL	U	664648		WHPA	QBAA	Low
974	75-508-0145	Hacker, Donald R & Kimberly J	WEL	A	638362		WHPA	QBAA	Low
975	75-662-0410	Laszcwski, Walter S & Diana R	WEL	A	664701		WHPA	QBAA	Low

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PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
976	75-120-2416	Stewart, Greg R & Edith M	WEL	A	602092		WHPA	QBAA	Low
978	75-662-0415	Krueger, Myrna R Family Trust	WEL	A	650729		WHPA	QBAA	Low
979	75-486-0440	Czech, Richard & Mccully, Lisamarie	WEL	A	149435		WHPA	QBAA	Low
981	75-124-2410	Hagen, Michael Murtin	WEL	A	739647		WHPA	QBAA	Low
986	75-508-0225	Boese, Bart & Conner, Lisa	WEL	A	498167		WHPA	QBAA	Low
987	75-120-2110	Brooks, Marlene S	WEL	A	709884		WHPA	QWTA	Low
988	75-512-0230	Kelash, John P Jr & Tamara L	WEL	A	479514		WHPA	QBAA	Low
990	75-123-2205	Lane, Thomas R & Lynn M	WEL	A	709406		WHPA	QBAA	Low
992	75-117-3412	Brindamour, Thomas & Melissa	WEL	A	582494		DWSMA	QBAA	Low
994	75-115-3400	Plaisted Property Management Llc	WEL	A	592869		WHPA	QBAA	Low
995	75-115-3400	Plaisted Property Management Llc	WEL	A	674461		WHPA	QBAA	Low
997	75-115-3401	Cst Companies Llc	WEL	A	624171		WHPA	QBAA	Low
998	75-114-3306	Clem, Gary L & Laura L	WEL	A	624517		WHPA	QBAA	Low
1000	75-114-3406	Stewart, Harold D & Mary E	WEL	A	486168		WHPA	QBAA	Low
1002	75-114-4405	Meredith, Sandy J	WEL	A	486185		WHPA	QBAA	Low
1003	75-500-0275	Thompson, Daryl & Janelle	WEL	A	417069		WHPA	QBAA	Low
1004	75-117-4012	Johnson, Richard Gene	WEL	A	462794		WHPA	QBAA	Low
1005	75-114-3310	Stewart, Thomas L Jr	WEL	A	473126		WHPA	QBAA	Low
1006	75-715-0125	Rosenthal, Troy A & Kristine C	WEL	A	749144		WHPA	QBAA	Low
1010	75-607-0115	Klein, Nathan & Lisa	WEL	A	615938		DWSMA	QBAA	Low
1014	75-607-0105	Krawczynski, Michael	WEL	A	636939		DWSMA	QBAA	Low
1015	75-588-0145	Larson, Thomas R & Katherine E	WEL	A	589197		DWSMA	QBAA	Low
1016	75-500-0260	Thompson, Scott A & Tamela	WEL	A	640152		WHPA	QBAA	Low
1017	75-114-3102	Spurlock, Roger L & Jill M	WEL	A	624904		WHPA	QBAA	Low
1021	75-114-3105	Tralle, James A &minnell	WEL	A	750628		WHPA	QBAA	Low
1022	75-500-0205	Ahles, Paul A & Anna	WEL	A	504441		WHPA	QBAA	Low
1025	75-117-4007	Ostien, Douglas B & Grace	WEL	A	468985		WHPA	QBAA	Low
1026	75-114-4103	Walter, James & Tammy	WEL	A	514528		WHPA	QBAA	Low
1028	75-115-4102	Dobrava, John P & Elissa L	WEL	A	678216		WHPA	QBAA	Low
1029	75-621-0145	Meyer, Todd W & Sandra L	WEL	A	632424		WHPA	QBAA	Low
1030	75-621-0255	Weege, Mitchell E & Diane J	WEL	A	629527		DWSMA	QBAA	Low
1031	75-621-0140	Briggs, Matthew P & Isabella M	WEL	A	646112		WHPA	QBAA	Low
1032	75-117-1405	Krajsa, Christine M	WEL	A	477330		WHPA	QBAA	Low
1037	75-621-0240	Hilyar, Jaime H & Rachel L	WEL	A	629543		DWSMA	QBAA	Low
1040	75-117-2102	Koppendrayer, Daren & Jamie	WEL	A	739649		DWSMA	QBAA	Low
1041	75-621-0125	Misfeldt, Danial R	WEL	A	632436		WHPA	QBAA	Low
1043	75-115-1415	Lemmon, Norman S &roberta	WEL	A	523951		WHPA	QBAA	Low
1044	75-621-0230	Hallgren, James A & Terese A	WEL	A	636465		DWSMA	QBAA	Low
1045	75-115-2400	Jt Land Company, Llc	WEL	A	731129		WHPA	QBAA	Low

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Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
1046	75-621-0115	Schrupp, Kevin A & Brittany R	WEL	A	624099		WHPA	QBAA	Low
1047	75-621-0110	Rafinski, James A & Primus, Kristy	WEL	A	624072		WHPA	QBAA	Low
1048	75-621-0105	Castle, Donald D & Jennifer A	WEL	A	643989		WHPA	QBAA	Low
1049	75-115-1400	Berglund, Guy S.w & Staples, Carol	WEL	A	724618		WHPA	QBAA	Low
1050	75-621-0220	Geraghty, Alicia	WEL	A	617476		DWSMA	QBAA	Low
1051	75-621-0215	Bruflat, Todd M & Alisa M	WEL	A	620065		WHPA	QBAA	Low
1054	75-621-0205	Holmes, John A & Joan L Trust	WEL	A	702131		WHPA	QBAA	Low
1055	75-117-1220	Wimpfheimer, Job A & Crystal J	WEL	A	687869		DWSMA	QBAA	Low
1058	75-505-0138	Beaudry, Melvin J & Jeanette F	WEL	A	631410		WHPA	QBAA	Low
1068	75-503-1035	Firle, James & Lynette	WEL	A	438000		WHPA	QBAA	Low
1069	75-503-0734	Smith, Kevin E & Nancy	WEL	A	197596		WHPA	QBAA	Low
1072	75-503-1025	Ostmoe, Paul D & Linda K	WEL	A	470623		WHPA	QBAA	Low
1073	75-503-1040	Zimski, Daniel C & Christine M	WEL	U	418902		WHPA	QBAA	Low
1074	75-128-1205	Herrboldt, Dean J & Lori D	WEL	A	656144		WHPA	QBAA	Low
1083	75-456-0480	Kupfer, Tia H & Welna, Jacob M	WEL	A	495798		WHPA	QBAA	Low
1086	75-504-0335	Monroy, David L & Rohnda	WEL	A	658042		DWSMA	QBAA	Low
1089	75-467-0270	Dare, Leola M - Trustee	WEL	A	127236		WHPA	QBAA	Low
1104	75-456-0450	Lawrence, John A & Joni L	WEL	A	479537		WHPA	QBAA	Low
1113	75-456-0250	Caskey, Andrew & Czeck, Jenna	WEL	A	592014		WHPA	QBAA	Low
1114	75-504-0360	Thompson, Laverne E & Judy K	WEL	A	462835		DWSMA	QBAA	Low
1116	75-456-0440	Sternberg, Veronica M	WEL	A	479521		WHPA	QBAA	Low
1119	75-504-0110	Schrupp, Timothy	WEL	A	473138		DWSMA	QBAA	Low
1125	75-456-0430	Tenute, Christopher & Dianne	WEL	A	479527		WHPA	QBAA	Low
1126	75-467-0110	Stuefen, Boyd & Ann	WEL	A	580593		WHPA	QBAA	Low
1129	75-456-0230	Curtis, Hans & Amber	WEL	A	483365		WHPA	QBAA	Low
1133	75-456-0420	Humphreys, Ryan J & Anne M	WEL	A	479547		WHPA	QBAA	Low
1139	75-724-0105	Hauta, Jason & Jan	WEL	A	681330		WHPA	QBAA	Low
1153	75-413-0330	Dubay, Romona M	WEL	A	408735		WHPA	QBAA	Low
1155	75-413-0710	Rasmussen, Annie S	WEL	A	408632		WHPA	QBAA	Low
1159	75-456-0160	Swenson, Sonya	WEL	A	592680		WHPA	QBAA	Low
1165	75-455-0120	Jensen, Kadie & Erik	WEL	A	592005		WHPA	QBAA	Low
1167	75-455-0510	Redmond, Ronald J & Debra A	WEL	A	595864		WHPA	QBAA	Low
1169	75-423-0080	Bossany, G & Skinner, E	WEL	A	611083		WHPA	QBAA	Low
1170	75-133-4212	Briggs, Chad B & Terry A	WEL	A	504325		Moderate	QBAA	Low
1171	75-135-3215	Tall Pines 2 Llc	WEL	A	660594		ERA	QBAA	Low
1177	75-136-1106	Heacock, Brian J & Charleen	WEL	A	473103		DWSMA	QBAA	Low
1184	75-131-1400	Woodcock, Jessica R	WEL	A	523213		WHPA	QBAA	Low
1185	75-737-0115	Werner, Jeffrey R & Lisa A	WEL	A	731117		DWSMA	QBAA	Low
1195	75-133-1103	Central Lutheran Church	WEL	A	449256		Moderate	QBAA	Low

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PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
1228	75-507-0145	Denzel, Derek Joseph	WEL	A	523647		WHPA	QBAA	Low
1236	75-860-0105	Smith, Michelle M Revocable Trust	WEL	A	627417		WHPA	QBAA	Low
1268	75-130-4204	Delyser, Clifton & Peterson, Laura	WEL	A	448328		WHPA	QBAA	Low
1271	75-130-3351	Stuhr, Justin	WEL	A	488496		WHPA	QBAA	Low
1278	75-518-0130	Matter, Michael & Amy	WEL	A	467272		WHPA	QBAA	Low
1279	75-686-0110	Hop, Justin J	WEL	A	738455		WHPA	QBAA	Low
1282	75-129-3103	Kelly, Joanne M & Fosness, Patrick	WEL	A	467271		WHPA	QBAA	Low
1288	75-428-0250	Nordlund, Jamie A	WEL	A	165978		Moderate	QBAA	Low
1289	75-130-4201	Johnson, Douglas J	WEL	A	503004		WHPA	QBAA	Low
1291	75-428-0252	Peters, Ian R & Maree K	WEL	A	569333		Moderate	QBAA	Low
1293	1		WEL	U	165985	Unknown Location	Moderate	QBAA	Low
1296	75-428-0525	Severin, Steven E	WEL	A	433831		Moderate	QBAA	Low
1297	75-428-0530	Leland, Katrina	WEL	A	448380		Moderate	QBAA	Low
1298	75-517-0255	Lockwood, Jon K	WEL	A	502962		WHPA	QBAA	Low
1299	75-428-0520	Klabunde, Gregory B	WEL	A	448378		Moderate	QBAA	Low
1301	75-428-0620	Hight, Therese M	WEL	A	531510		Moderate	QBAA	Low
1302	75-126-4207	Hovald, W & Stobbe-Hovald,k-Trustee	WEL	A	578410		Moderate	QBAA	Low
1303	75-428-0238	Wilson, Harold L & Rebecca J	WEL	A	199126		Moderate	QBAA	Low
1304	75-518-0110	Hanks, Victor L & Judith A	WEL	A	473104		WHPA	QBAA	Low
1305	75-428-0550	Hartwig, Candace A & Jeff A	WEL	A	452348		Moderate	QBAA	Low
1308	75-129-3101	Bostrom, Robert C & Theresa A	WEL	A	645803		WHPA	QBAA	Low
1309	75-518-0220	Johnson, Jay C & Margaret M	WEL	A	473125		WHPA	QBAA	Low
1310	75-428-0236	Benson, Kenneth R & Helen L	WEL	A	199140		Moderate	QBAA	Low
1311	75-126-4210	Gatzke, Michael & Rachel	WEL	A	669946		Moderate	QBAA	Low
1312	75-126-4100	Roley, Jeffrey B	WEL	A	761473		Moderate	QBAA	Low
1313	75-518-0310	Beseman, Michael J & Katherine I	WEL	A	474098		WHPA	QBAA	Low
1314	75-128-4101	Anderson, Dennis D & Lorie A	WEL	A	183694		Moderate	QBAA	Low
1315	75-518-0105	Bohn, Terry L & Wendy E	WEL	A	470603		WHPA	QBAA	Low
1316	75-428-0234	Wallace, Joseph R	WEL	A	479961		Moderate	QBAA	Low
1317	75-126-4102	Ernst, Keith R	WEL	A	674829		Moderate	QBAA	Low
1319	75-126-4102	Ernst, Keith R	WEL	A	538146		Moderate	QBAA	Low
1320	75-428-0232	Fitch, James M Jr & Linda M	WEL	A	579141		Moderate	QBAA	Low
1321	75-428-0450	Arrache, Roberto A & Wendy A	WEL	A	417076		Moderate	QBAA	Low
1323	75-428-0455	Lind, Peter &iskierka Lind, Jessica	WEL	A	452592		Moderate	QBAA	Low
1324	75-125-2301	Anderson, John D	WEL	A	587815		WHPA	QBAA	Low
1325	75-126-1401	Warzecha, Paul J & Ellen M	WEL	A	516533		Moderate	QBAA	Low
1327	75-428-0460	Mcardle, Alex M & Ann L	WEL	A	417986		Moderate	QBAA	Low
1328	75-428-0175	Smith, Robyn M. Z. & Jeffrey J	WEL	A	502576		Moderate	QBAA	Low
1329	75-428-0224	Ostroot, Timothy & Tina	WEL	A	456088		Moderate	QBAA	Low

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PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
1330	75-428-0445	Nikle, Trenton J & Brenda	WEL	A	496807		Moderate	QBAA	Low
1331	75-428-0206	Wolcenski, Jeffrey	WEL	A	190434		Moderate	QBAA	Low
1332	75-428-0228	Breemeersch, Benjamin	WEL	A	510870		Moderate	QBAA	Low
1334	75-428-0210	Balster, Gary T & Jennifer	WEL	A	408618		Moderate	QBAA	Low
1335	75-428-0470	Maurer, James & Hela	WEL	A	105110		Moderate	QBAA	Low
1336	75-431-0440	Johnson, Timothy K & Brenda	WEL	A	165950		Moderate	QBAA	Low
1337	75-126-1402	Block, Dean & Ashley	WEL	A	557185		Moderate	QBAA	Low
1338	75-126-1402	Block, Dean & Ashley	WEL	A	653358		Moderate	QBAA	Low
1339	75-428-0440	Cory, Glenn & Sprague, J	WEL	A	408983		Moderate	QBAA	Low
1340	75-428-0435	Casey, Jeff & Thieling, Melissa	WEL	A	401351		Moderate	QBAA	Low
1341	75-428-0212	Barbeln, Keith M	WEL	A	408617		Moderate	QBAA	Low
1342	75-431-0434	Otterness, Rondi M	WEL	U	578407		Moderate	QBAA	Low
1343	75-428-0180	Schwab, Joseph T & Barbara J	WEL	A	183467		Moderate	QBAA	Low
1344	75-428-0410	Lewin, Mark P & Kathleen	WEL	A	423558		Moderate	QBAA	Low
1345	75-428-0415	Marsh, Michael A	WEL	A	197436		Moderate	QBAA	Low
1346	75-428-0195	Tix, Peter & Janelle	WEL	A	197437		Moderate	QBAA	Low
1347	75-431-0448	Friendshuh, Roy & Lois	WEL	A	405847		Moderate	QBAA	Low
1348	75-126-2101	Maas, Jay & Brenda L	WEL	A	579045		Moderate	QBAA	Low
1349	75-428-0125	Farber, Jacob D	WEL	A	412640		Moderate	QBAA	Low
1351	75-428-0115	Nash, Bruce A & Carol L	WEL	A	425904		Moderate	QBAA	Low
1352	75-431-0150	Wille, Suzette M	WEL	A	417021		Moderate	QBAA	Low
1353	75-428-0135	Gustafson, Paul & Barbara	WEL	A	434458		Moderate	QBAA	Low
1355	75-431-0428	Clifton Properties Llc	WEL	A	179024		Moderate	QBAA	Low
1356	75-471-0340	Wolff, David R & Roberta	WEL	A	570627		Moderate	QBAA	Low
1357	75-431-0426	Hassing, Steven R	WEL	A	166069		Moderate	QBAA	Low
1358	75-431-0426	Hassing, Steven R	WEL	A	702541		Moderate	QBAA	Low
1359	75-471-0350	Sporre, Amy D	WEL	A	487812		Moderate	QBAA	Low
1361	75-431-0220	Johnson, Brett E & Jill M	WEL	A	510853		Moderate	QBAA	Low
1362	75-431-0250	Lara-Gamboa, Luis & Lara-Gamboa, Va	WEL	A	660582		Moderate	QBAA	Low
1363	75-471-0330	Ellsworth, Katie & Anthony	WEL	A	709876		Moderate	QBAA	Low
1364	75-128-1410	Eilrich, Timothy P	WEL	A	743439		Moderate	QBAA	Low
1365	75-428-0140	Anderson, Gary L & June M	WEL	A	429124		Moderate	QBAA	Low
1366	75-503-0810	Brisse, Deborah & Donald	WEL	A	643740		WHPA	QBAA	Low
1367	75-503-0820	Zahler, John & Patricia	WEL	A	632708		WHPA	QBAA	Low
1368	75-503-0830	Bonin, Jacob	WEL	A	668084		WHPA	QBAA	Low
1369	75-125-1205	Sullivan, Matthew & Angela	WEL	A	710836		WHPA	QBAA	Low
1370	75-503-0840	Fleck, James L & Lorraine A	WEL	A	640178		WHPA	QBAA	Low
1373	75-126-1100	Johnson, Mitchell & Lumawag, Maria	WEL	A	472099		Moderate	QBAA	Low
1374	75-128-1145	Putnam, Donald & Beverly	WEL	A	750616		WHPA	QBAA	Low

ERMU DWSMA

Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
1375	75-872-0120	Solid Rock Church	WEL	A	554634		WHPA	QBAA	Low
1376	75-126-2110	Angle, James E	WEL	A	661812		Moderate	QBAA	Low
1377	75-503-1030	Lindberg, Diane Carol - Trust	WEL	A	450318		WHPA	QBAA	Low
1379	75-128-1200	Cotton, Brent M & Janet L	WEL	A	675327		WHPA	QBAA	Low
1380	75-126-1102	Hattell, Caroline L & Melvin J	WEL	A	609097		Moderate	QBAA	Low
1387	75-505-0230	Scherber, Arlen & Joanne Trust	WEL	A	196367		WHPA	QBAA	Low
1390	75-499-0198	Anderson, Aaron & Erin	WEL	A	454409		WHPA	QBAA	Low
1392	75-503-0718	Reeves, John W & Caley J	WEL	A	194144		WHPA	QBAA	Low
1400	75-503-0450	Larson, Robert & Larson, Ryan	WEL	A	778304		WHPA	QBAA	Low
1401	75-422-0390	Sorenson, Calvin Arthur	WEL	A	179050		WHPA	QBAA	Low
1407	75-484-0370	Dale, James A	WEL	A	105126		WHPA	QBAA	Low
1408	75-486-0350	Andrews, Nathan & Elisabeth	WEL	A	162070		WHPA	QBAA	Low
1409	75-471-0180	Pearson, Robert C & Beth	WEL	A	190372		Moderate	QWTA	Low
1410	75-508-0340	Roos, Ronald W & Louene	WEL	A	409403		WHPA	QBAA	Low
1411	75-124-3400	Kidd, Robert & Mary	WEL	A	493513		WHPA	QBAA	Low
1412	75-484-0320	Robideau, Donald & Joan	WEL	A	126771		WHPA	QBAA	Low
1413	75-431-0408	Haugen, Jesse	WEL	A	155931		Moderate	QBAA	Low
1414	75-428-0246	Koppendrayer, Randy & Barbara	WEL	A	162021		Moderate	QBAA	Low
1415	75-431-0210	Weatherly, David M & Rose	WEL	A	162793		Moderate	QBAA	Low
1416	75-428-0515	Hilgers, David	WEL	A	188293		Moderate	QBAA	Low
1418	75-431-0402	Rehwaldt, Alexie	WEL	A	421034		Moderate	QBAA	Low
1426	75-649-0120	Ind School Dist 728	WEL	A	490075		ERA	QWTA	Low
1427	75-116-1100	Aggregate Industries - Mwr Inc	WEL	A	725147		DWSMA	QBAA	Low
1436	75-478-0460	Jacobsen, Brian Gordon	WEL	A	429259		WHPA	QBAA	Low
1438	75-487-0130	Kovich, Joseph T & Patricia	WEL	A	149470		WHPA	QBAA	Low
1439	75-479-0130	Philbrook, Stephen T & Jolene R	WEL	A	634436		WHPA	QBAA	Low
1442	75-428-0220	Johnson, Kurt L	WEL	A	105111		Moderate	QBAA	Low
1446	1	MN DOT	WEL	U	577324	Unknown Location	Moderate	QWTA	Low
1450	75-529-0110	Hipsag, Thomas & Marlys-Trustees	WEL	A	462766		DWSMA	QBAA	Low
1451	75-002-1400	Brown, Leroy F & Ruth	WEL	A	658040		DWSMA	QBAA	Low
1459	75-472-0135	Krueger, Jacob A & Ellen J	WEL	A	189606		WHPA	QBAA	Low
1467	75-472-0255	Cook, Thomas J & Denise M	WEL	A	662277		WHPA	QBAA	Low
1481	75-006-2110	Foster, Richard C Revocable Trust	WEL	A	667100		DWSMA	QBAA	Low
1483	75-478-0530	Kline, Michael R & Merry L	WEL	A	695736		WHPA	QBAA	Low
1484	75-479-0150	Lambert, Kevin J	WEL	A	638390		WHPA	QBAA	Low
1485	75-479-0145	Galer, Bruce R & Joyce, Elizabeth C	WEL	A	562986		WHPA	QBAA	Low
1488	75-479-0110	Mabin, Cameron L	WEL	A	673888		WHPA	QBAA	Low
1492	75-479-0160	Coolidge, Ryan M & Jacklyn A	WEL	A	752562		WHPA	QBAA	Low
1507	75-431-0240	Beseman, Benjamin M & Peterzen, L	WEL	A	183880		Moderate	QBAA	Low

ERMU DWSMA

Low Priority Wells

PCSI ID	PIN	FAC NAME	PCS Code	STATUS	PROGRAM ID	COMMENT	Location	Aquifer	Well Priority
1510	75-125-1210	Duax, Anthony S	WEL	A	279172		WHPA	QBAA	Low

Table C1-5

ERMU DWSMA
USEPA Class V Injection Wells PCSI

ERMU DWSMA

Class V Wells

PCSI ID	PIN	FAC NAME	ADDRESS	CITY	ZIP	PCS Code	STATUS	PROGRAM ID	COMMENT	Location
1850	75-135-2310	F & M Properties Llc	18521 Line Ave Nw	Elk River	55330	CVWWD	A	MN-141-5W32-0002	Large capacity septic system	ERA
1851	75-115-3406	2tlc Llc	Po Box 332	Elk River	55330	CVWWD	A	MN-141-5W32-0003	Large capacity septic system; gravel pit area	WHPA
1852	75-115-3401	Cst Companies Llc	11717 205th Ave Nw Ste 2	Elk River	55330	CVWWD	A	MN-141-5W32-0012	Large capacity septic system; gravel pit area	WHPA

Exhibit C2

Inner Well Management Zone Forms
for
ERMU Primary Wells

Well #2 (255153)
Well #3 (221176)
Well #4 (481794)
Well #5 (537682)
Well #6 (580320)
Well #7 (664852)
Well #8 (694499)
Well #9 (757624)

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	1710004
NAME	Elk River
ADDRESS	Elk River Water Superintendent, 1705 Main Street, Elk River, MN 55330

COMMUNITY

FACILITY (WELL) INFORMATION

NAME	Well #2
SAMPLE POINT ID	S02
UNIQUE WELL NO.	255153
COUNTY	Sherburne

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / SAMPLE POINT ID	1710004 S02	UNIQUE WELL NO.	255153

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		Y	10	Y

PWS ID / SAMPLE POINT ID	1710004 S02	UNIQUE WELL NO.	255153

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		Y	30	Y
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	55	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		Y	100	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.		N		
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		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	1710004 S02	UNIQUE WELL NO.	255153

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		Y	200	Y
*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	Y	115	Y
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.

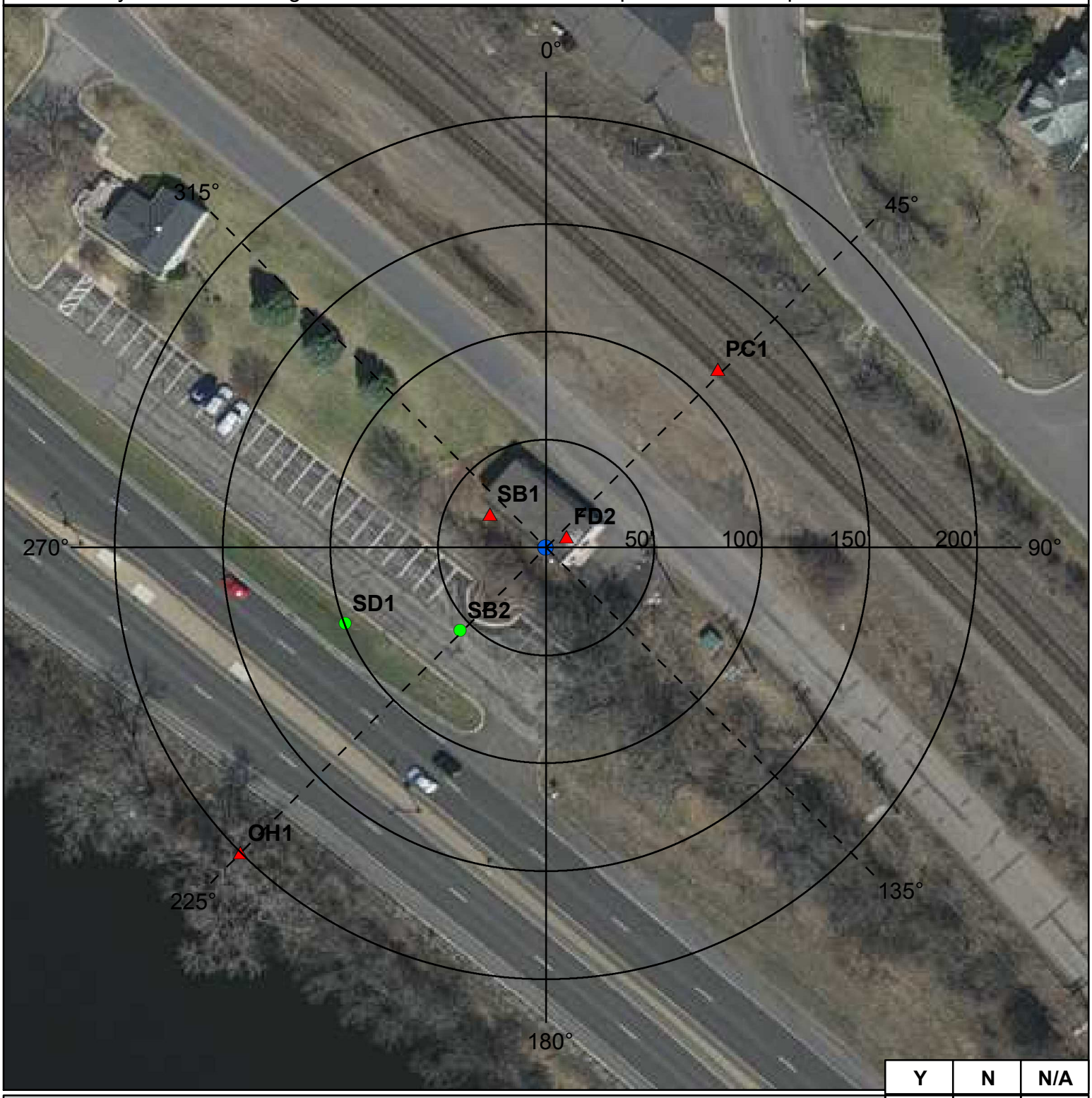
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; 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	1710004 S02	UNIQUE WELL NO.	255153

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	Hoerr, Robyn	DATE	9 - 15 - 2022

PWS ID / SAMPLE POINT ID	1710004 S02	UNIQUE WELL NO.	255153

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Any sewer lines that are observed to be leaking, cracked, or deteriorated, should be replaced.		10/25/2011
An emergency response plan should be adopted for hazardous material spills; it should include contacting the Minnesota Duty Officer at 1-800-422-0798 or 651-649-5451.		10/25/2011
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		10/25/2011
The stormwater pipe should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website .		10/25/2011

COMMENTS

The PC1 (potential contaminant that may drain into soil) indicates the location of the active railroad line which frequently carries hazardous materials.The SB1 (sewer service line) existing the well house connects the floor drain in the well house to the sanitary sewer line to the SW of the well house.

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

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	1710004
NAME	Elk River
ADDRESS	Elk River Water Superintendent, 1705 Main Street, Elk River, MN 55330

COMMUNITY

FACILITY (WELL) INFORMATION

NAME	Well #3
SAMPLE POINT ID	S03
UNIQUE WELL NO.	221176
COUNTY	Sherburne

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / SAMPLE POINT ID	1710004 S03	**UNIQUE WELL NO.**	221176

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	1710004 S03	UNIQUE WELL NO.	221176

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		Y	68	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.		N		
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		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	1710004 S03	UNIQUE WELL NO.	221176

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	Y	175	Y
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	Y	75	Y
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.

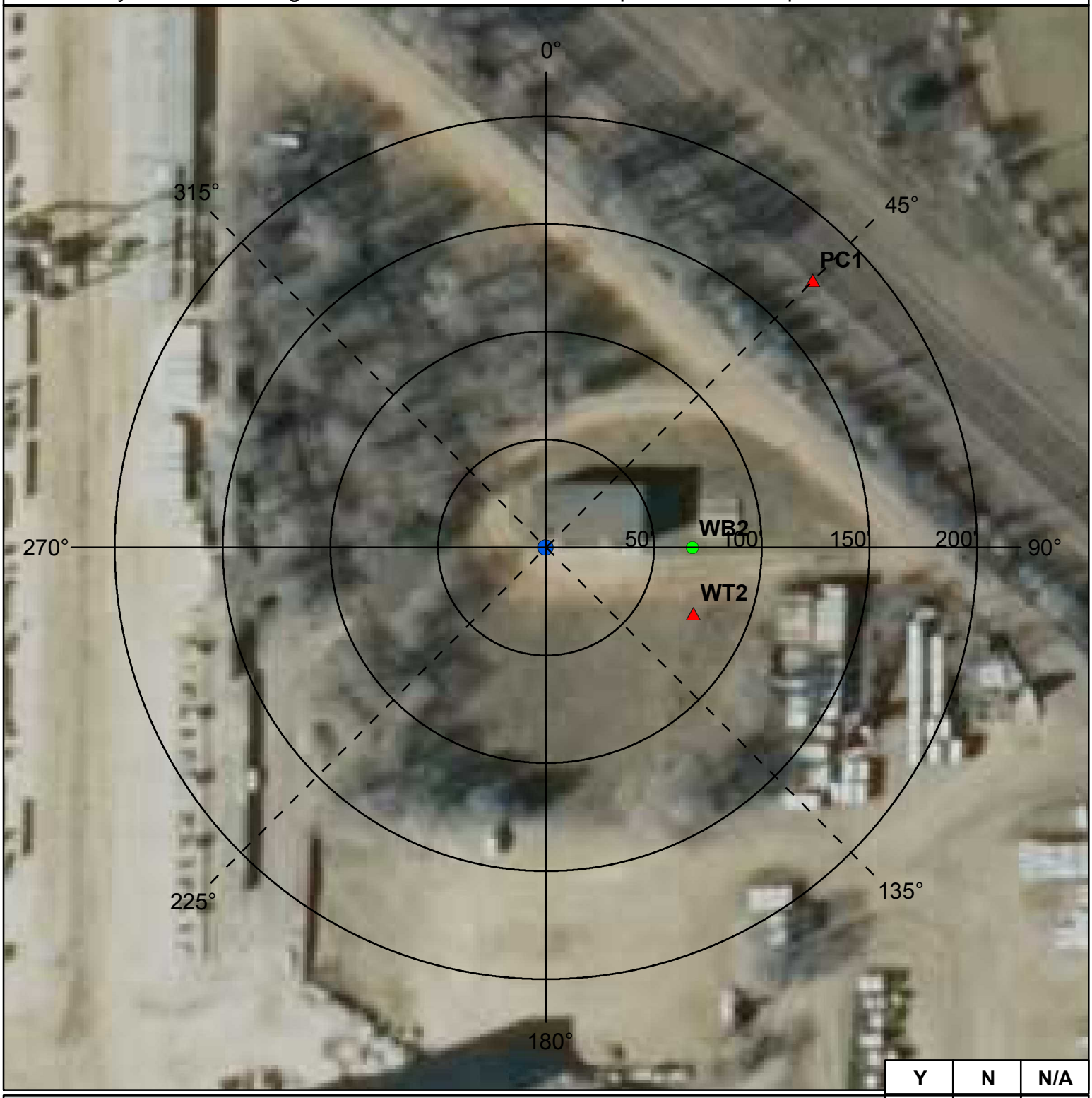
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; 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	1710004 S03	UNIQUE WELL NO.	221176

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	Hoerr, Robyn	DATE	9 - 16 - 2022

PWS ID / SAMPLE POINT ID	1710004 S03	UNIQUE WELL NO.	221176

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Any sewer lines that are observed to be leaking, cracked, or deteriorated, should be replaced.		10/25/2011
An emergency response plan should be adopted for hazardous material spills; it should include contacting the Minnesota Duty Officer at 1-800-422-0798 or 651-649-5451.		10/25/2011
Best management practices should be employed for outdoor chemical use, to prevent stormwater from moving chemical contaminants to surface waters or where wells could be impacted.		10/25/2011
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		10/25/2011

COMMENTS

PC1 point indicates the active railroad line in the survey area that often transports hazardous materials.

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

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	1710004	**COMMUNITY**
NAME	Elk River	
ADDRESS	Elk River Water Superintendent, 1705 Main Street, Elk River, MN 55330	

FACILITY (WELL) INFORMATION

NAME	Well #4
SAMPLE POINT ID	S04
UNIQUE WELL NO.	481794
COUNTY	Sherburne

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / SAMPLE POINT ID	1710004 S04	**UNIQUE WELL NO.**	481794

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	1710004 S04	UNIQUE WELL NO.	481794

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		Y	75	Y
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	125	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		Y	125	Y
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	60	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	193	
WEL	Operating well	record dist.	record dist.		N		
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		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		

PWS ID / SAMPLE POINT ID	1710004 S04	UNIQUE WELL NO.	481794

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				
*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		
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	Y	135	Y
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							
ETL	Electric transmission line	5/10	5/10		Y	28	N

* 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	1710004 S04	UNIQUE WELL NO.	481794

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	Hoerr, Robyn	DATE	9 - 16 - 2022

PWS ID / SAMPLE POINT ID	1710004 S04	UNIQUE WELL NO.	481794

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Any sewer lines that are observed to be leaking, cracked, or deteriorated, should be replaced.		01/25/2011
Best management practices should be employed for outdoor chemical use, to prevent stormwater from moving chemical contaminants to surface waters or where wells could be impacted.		10/25/2011
The monitoring well should have a properly secured well cap and the well casing should be inspected for damage. An at-grade monitoring well should be inspected to verify that the vault cover is watertight, secured, and provided with a well identification label.		10/25/2011
The stormwater pipe should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website .		10/25/2011

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

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	1710004
NAME	Elk River
ADDRESS	Elk River Water Superintendent, 1705 Main Street, Elk River, MN 55330

COMMUNITY

FACILITY (WELL) INFORMATION

NAME	Well #5
SAMPLE POINT ID	S05
UNIQUE WELL NO.	537682
COUNTY	Sherburne

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / SAMPLE POINT ID	1710004 S05	**UNIQUE WELL NO.**	537682

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	1710004 S05	UNIQUE WELL NO.	537682

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		Y	190	Y
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		Y	200	Y
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		Y	160	Y
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		Y	165	Y
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		Y	180	Y
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.		N		
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		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		

PWS ID / SAMPLE POINT ID	1710004 S05	UNIQUE WELL NO.	537682

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				
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		
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		Y	120	Y
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		Y	120	Y
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	Y	135	Y
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							
FFH	Fire or flushing hydrant	10	N/A		Y	75	N

* 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.

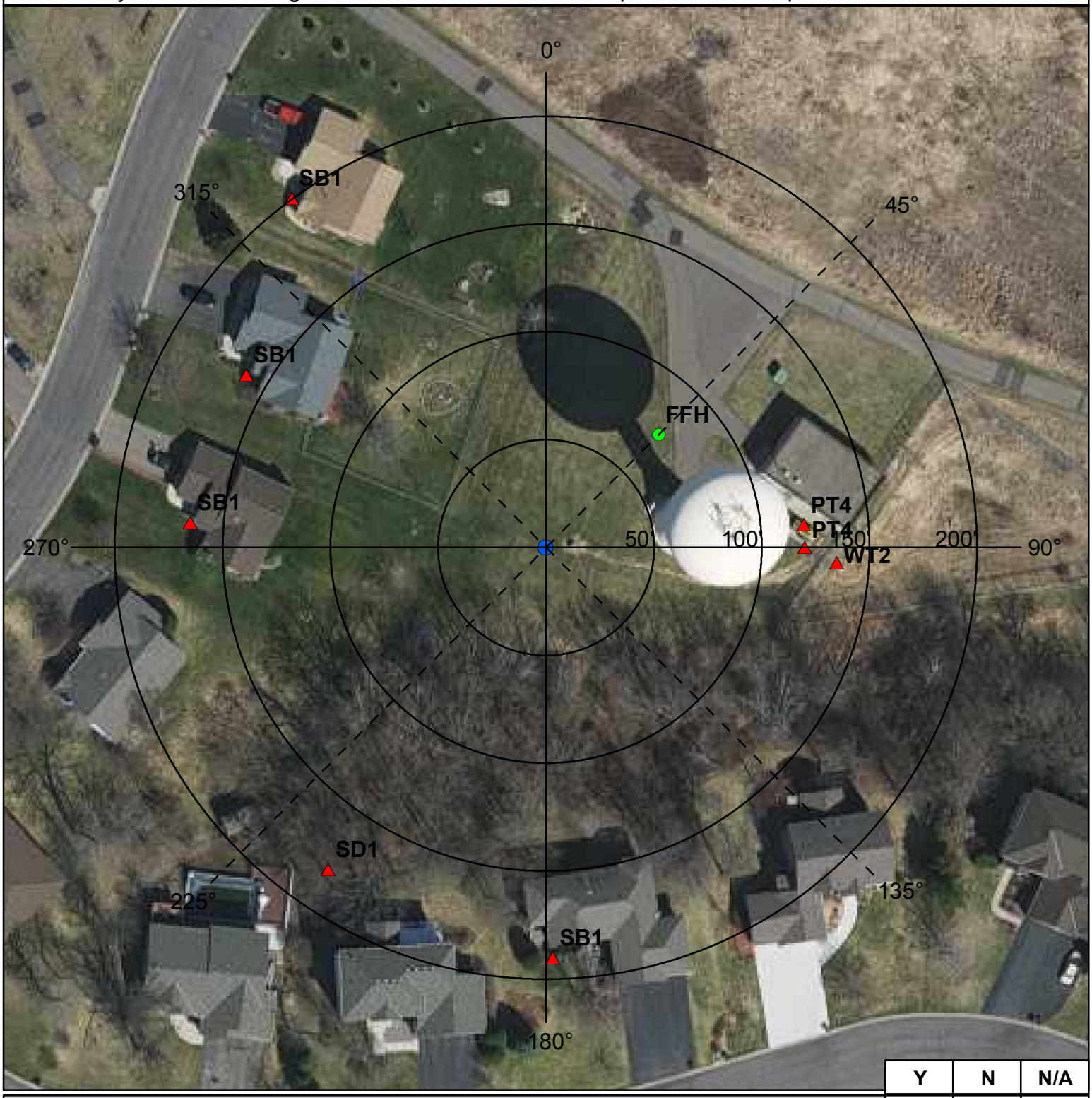
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; 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	1710004 S05	UNIQUE WELL NO.	537682

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	Hoerr, Robyn	DATE	9 - 16 - 2022

PWS ID / SAMPLE POINT ID	1710004 S05	UNIQUE WELL NO.	537682

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Any sewer lines that are observed to be leaking, cracked, or deteriorated, should be replaced.		10/25/2011
Tanks and secondary containments should be inspected on a regular basis for leak or spill detection . See: http://www.pca.state.mn.us/index.php/waste/waste-and-cleanup/waste-management/index.html for information, or call the Minnesota Pollution Control Agency at 1-800-657-3864.		10/25/2011
Sorbent material should be maintained on site for immediate clean-up of spills.		10/25/2011
An emergency response plan should be adopted for tank spills or leaks; it should include contacting the Minnesota Duty Officer at 1-800-422-0798 or 651-649-5451.		10/25/2011
The stormwater pond/pipe (choose) should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website .		10/25/2011

COMMENTS

ERMU diesel powered generator located next to the well house. Tank customarily kept 50% full of fuel for emergencies. Verizon also has a generator located to the south of the ERMU generator.

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

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	1710004
NAME	Elk River
ADDRESS	Elk River Water Superintendent, 1705 Main Street, Elk River, MN 55330

COMMUNITY

FACILITY (WELL) INFORMATION

NAME	Well #6
SAMPLE POINT ID	S06
UNIQUE WELL NO.	580320
COUNTY	Sherburne

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / SAMPLE POINT ID	1710004 S06	UNIQUE WELL NO.	580320

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	1710004 S06	UNIQUE WELL NO.	580320

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		Y	200	Y
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.		N		
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		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	1710004 S06	UNIQUE WELL NO.	580320

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		Y	175	Y
*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		Y	35	Y
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	Y	75	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	1710004 S06	UNIQUE WELL NO.	580320

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	Hoerr, Robyn	DATE	9 - 16 - 2022

PWS ID / SAMPLE POINT ID	1710004 S06	UNIQUE WELL NO.	580320

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Best management practices should be employed for outdoor chemical use, to prevent stormwater from moving chemical contaminants to surface waters or where wells could be impacted.		10/25/2011
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		10/25/2011

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

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	1710004
NAME	Elk River
ADDRESS	Elk River Water Superintendent, 1705 Main Street, Elk River, MN 55330

COMMUNITY

FACILITY (WELL) INFORMATION

NAME	Well #7
SAMPLE POINT ID	S07
UNIQUE WELL NO.	664852
COUNTY	Sherburne

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / SAMPLE POINT ID	1710004 S07	**UNIQUE WELL NO.**	664852

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		Y	130	Y

PWS ID / SAMPLE POINT ID	1710004 S07	UNIQUE WELL NO.	664852

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		Y	155	Y
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		Y	200	Y
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		Y	175	Y
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		Y	160	Y
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		Y	155	Y
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		Y	160	Y
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	175	Y
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	100	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	190	Y
*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		Y	80	N
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	195	Y
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	130	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.		N		
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		

PWS ID / SAMPLE POINT ID	1710004 S07	UNIQUE WELL NO.	664852

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				
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		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		
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		Y	175	Y
*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.						

PWS ID / SAMPLE POINT ID	1710004 S07	UNIQUE WELL NO.	664852

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				

* 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	1710004 S07	UNIQUE WELL NO.	664852

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?	X		
Is the system monitoring existing nonconforming sources of contamination?			

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

INSPECTOR	Hoerr, Robyn	DATE	9 - 16 - 2022

PWS ID / SAMPLE POINT ID	1710004 S07	UNIQUE WELL NO.	664852

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Any sewer lines that are observed to be leaking, cracked, or deteriorated, should be replaced.		10/25/2011
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		10/25/2011
The stormwater pipe should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website .		10/25/2011

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

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	1710004	**COMMUNITY**
NAME	Elk River	
ADDRESS	Elk River Water Superintendent, 1705 Main Street, Elk River, MN 55330	

FACILITY (WELL) INFORMATION

NAME	Well #8
SAMPLE POINT ID	S08
UNIQUE WELL NO.	694499
COUNTY	Sherburne

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / SAMPLE POINT ID	1710004 S08	**UNIQUE WELL NO.**	694499

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	1710004 S08	UNIQUE WELL NO.	694499

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.		N		
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		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	1710004 S08	UNIQUE WELL NO.	694499

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		Y	75	Y
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		Y	60	Y
*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.

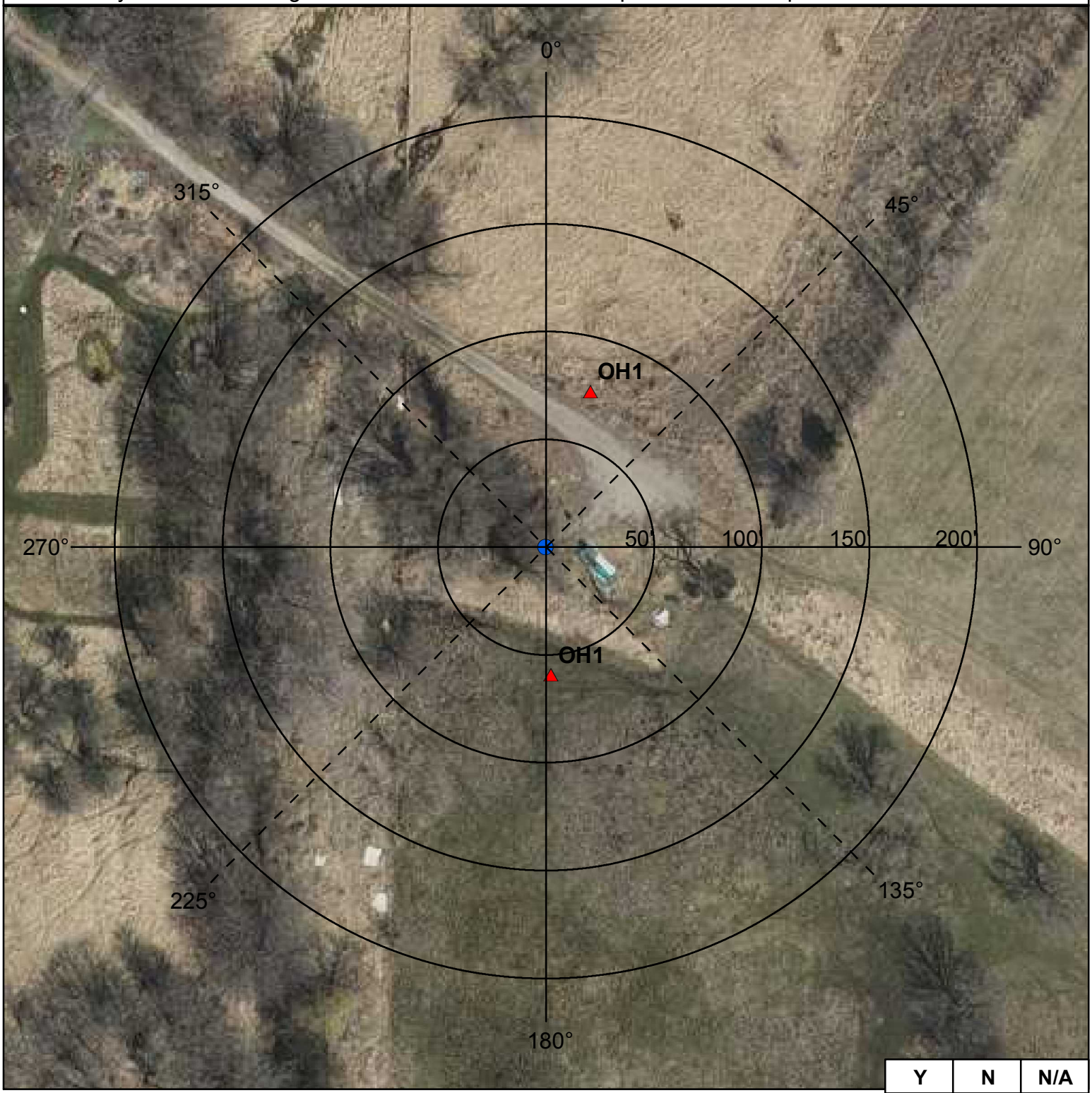
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; 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	1710004 S08	UNIQUE WELL NO.	694499

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	Hoerr, Robyn	DATE	9 - 16 - 2022

PWS ID / SAMPLE POINT ID	1710004 S08	UNIQUE WELL NO.	694499

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Best management practices should be employed for outdoor chemical use, to prevent stormwater from moving chemical contaminants to surface waters or where wells could be impacted.		10/25/2011

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

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	1710004	**COMMUNITY**
NAME	Elk River	
ADDRESS	Elk River Water Superintendent, 1705 Main Street, Elk River, MN 55330	

FACILITY (WELL) INFORMATION

NAME	Well #9
SAMPLE POINT ID	S09
UNIQUE WELL NO.	757624
COUNTY	Sherburne

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / SAMPLE POINT ID	1710004 S09	**UNIQUE WELL NO.**	757624

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	1710004 S09	UNIQUE WELL NO.	757624

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		Y	175	Y
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		Y	175	Y
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		Y	175	Y
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		Y	175	Y
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	200	Y
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	190	Y
*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		Y	175	Y
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	180	Y
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.		N		
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		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		

PWS ID / SAMPLE POINT ID	1710004 S09	UNIQUE WELL NO.	757624

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				
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		
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		Y	100	Y
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		Y	130	Y
*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.						

PWS ID / SAMPLE POINT ID	1710004 S09	UNIQUE WELL NO.	757624

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				

* 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.

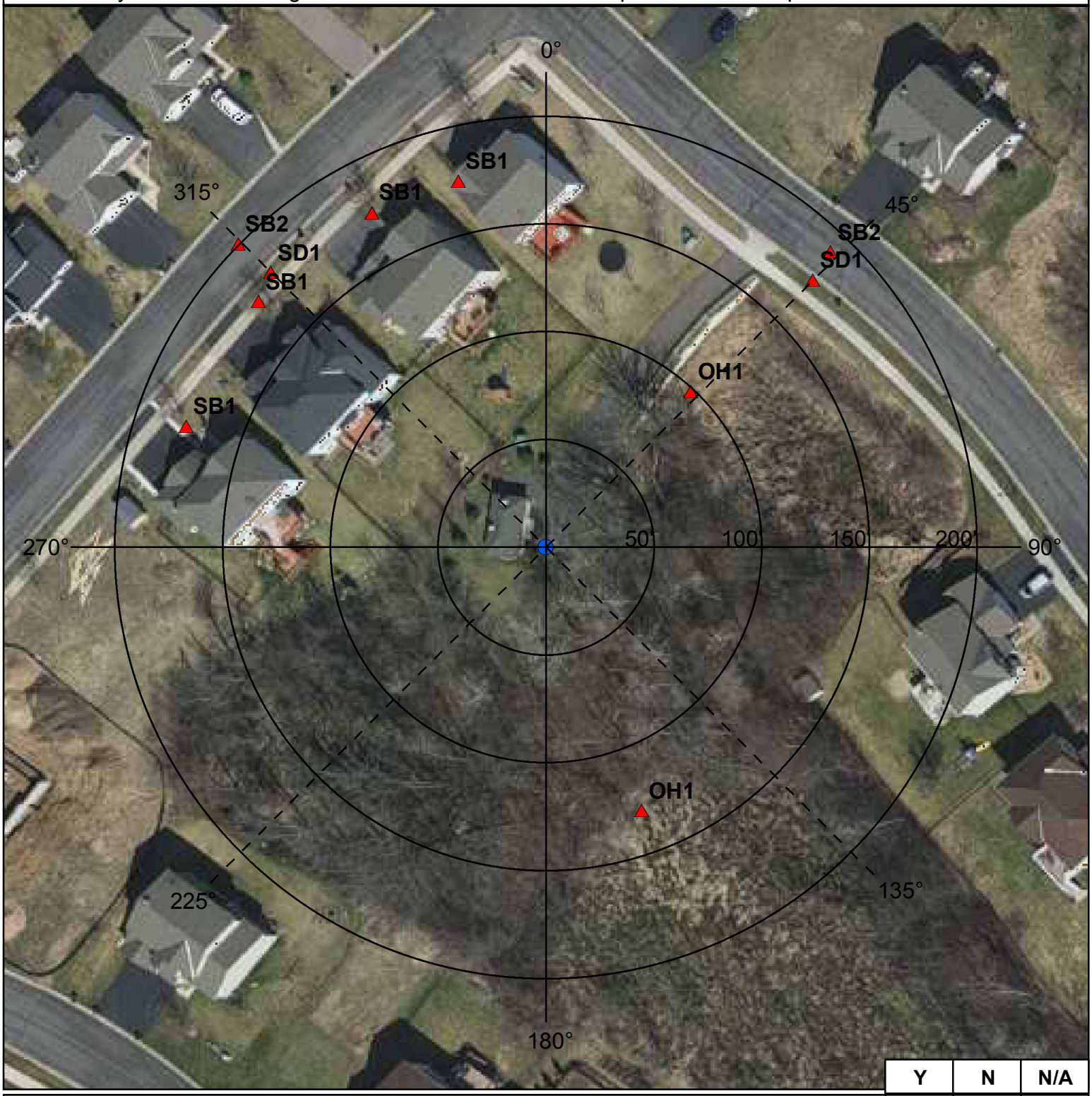
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; 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	1710004 S09	UNIQUE WELL NO.	757624

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	Hoerr, Robyn	DATE	9 - 16 - 2022

PWS ID / SAMPLE POINT ID	1710004 S09	UNIQUE WELL NO.	757624

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Any sewer lines that are observed to be leaking, cracked, or deteriorated, should be replaced.		10/25/2011
Best management practices should be employed for outdoor chemical use, to prevent stormwater from moving chemical contaminants to surface waters or where wells could be impacted.		10/25/2011
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		10/25/2011

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

Exhibit C3

Minnesota Department of Health
Public Water Supply Well Inventory

The Minnesota Department of Health Water Supply Inventory (aka The Old Municipal Well file) exhibit provides information on those public water supply wells the City of Elk River 1) currently use for primary and emergency sources in flow, 2) public water supply wells that have been removed from flow and 3) unverified wells that provide information about wells whose existence has not yet been confirmed.

These records indicating current and past wells the City of Elk River have owned or used can be useful in locating these old wells and developing a prioritization process to locating and sealing abandoned wells. Only the first four pages of this 44 page report is included in this Appendix. The complete Old Municipal Well File covers a period from July 8, 1919 to May 6, 1981 and is on file with the Elk River Municipal Utilities Water Superintendent.

Comments Regarding the Old Municipal Well File

1. One well has been 'Removed from Flow' – Records indicate Well #1 (217945) has been sealed (1996 – #H108513).

DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

Old Municipal Well Report for Elk River

PWSID: 1710004

MDH

May 2019

DEPARTMENT OF HEALTH

Minnesota Department of Health
Environmental Health in Minnesota

MDH Public Water Supply Sources Report

PWSID: 1710004
PWS Name: **Elk River**
PWS Type: **Community**
PWS Status: **Active**

Public Water Supply Sources: Information from MNDWIS and CWI (sorted by Sample Point ID)

Source Type Codes: **GW** = Ground water; **SW** = Surface water; **GUI** = Ground water under influence
Location Source: **MGS** = digitized by the MN Geological Survey; * indicates imcomplete records
O* = duplicate in Old Municipal Well Data; R* = duplicate in MNDWIS PWS Sources Removed from Flow; S* = duplicate in MNDWIS PWS Sources in Flow;

MNDWIS PWS SOURCES IN FLOW

Source Info							MNDWIS Data				CWI Data			
Sample Point ID	Name	Type	Availability	Status	Well No. (link to Well Log (s))	Location Info (link to Map)	Drill Year	Depth (in feet)	Case Depth (in feet)	Case Diam. (in inches)	Drill Date	Depth Completed (in feet)	Case Depth (in feet)	Case Diam. (in inches)
S02	**Well #2**	GW	Primary	Active	255153 O*	11/18/2009 (G. Haglund)	1948	290	136	16	08-00-1948	290	136	16
S03	**Well #3**	GW	Primary	Active	221176 O*	02/11/1999 (J. Blum)	1974	315	201	16	10-23-1974	315	201	16
S04	**Well #4**	GW	Primary	Active	481794	11/18/2009 (G. Haglund)	1992	225	197	18	12-15-1992	225	197	18
S05	**Well #5**	GW	Primary	Active	537682	02/06/2012 (R. Hoerr)	1994	406	316	18	08-17-1994	406	316	18
S06	**Well #6**	GW	Primary	Active	580320	02/11/1999 (J. Blum)	1999	300	212	18	02-12-1999	300	212	18
S07	**Well #7**	GW	Primary	Active	664852	11/18/2009 (G. Haglund)	2001	341	240	18	07-20-2001	341	240	18
S08	**Well #8**	GW	Primary	Active	694499	11/18/2009 (G. Haglund)	2004	390	265	24	06-30-2004	390	264.8	18
S09	**Well #9**	GW	Primary	Active	757624	11/18/2009 (G. Haglund)	2008	454	296	18	01-30-2008	454	296	18

MNDWIS PWS SOURCES REMOVED FROM FLOW

Source Info							MNDWIS Data				CWI Data			
Sample Point ID	Name	Type	Availability	Status	Well No. (link to Well Log (s))	Location Info (link to Map)	Drill Year	Depth (in feet)	Case Depth (in feet)	Case Diam. (in inches)	Drill Date	Depth Completed (in feet)	Case Depth (in feet)	Case Diam. (in inches)
S01	**Well #1**	GW	Sealed	Inactive	217945 O*	02/07/1995 (D. Schultz)	1919	292	135	0	00-00-1919	308	178	12

MNDWIS and CWI data value discrepancies in preceding tables are shown in **RED** (0 or null values excepted).

Old Municipal Wells

The following tables show information on wells whose existence (or previous existence) has not yet been confirmed.

OLD MUNICIPAL Well Data

Well Search Reference	Name (s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
Well A	Test Well				15	1	Before 1919					10 ft from the sidewalk on the E side of Princeton Street and 500 ft N of the N.P.R.R.	
Well B	Well No. 1; Houlton Well	217945 R*	292		135	12	1919	Cable Tool/Bored				Near corner of the village. Lot 5, Auditor's Sub-division No. 4 along the E line of Jackson Avenue and near the SW corner of the lot.	Sealed.
Well C	Well No. 2	255153 S*	292		135	16	1948	Cable Tool/Bored				Block 8 consisting of 5 lots with the well at the E end of the tract. Between Burlington Northern trackage and U.S. Highway No. 10 E of the junction of Main Street and R.C.P.A. Drive.	Former Twin Cities Milk Producers Association plant. Active.
Well D	Well No. 3	221176 S*	313		201	16	1975	Cable Tool/Bored					Active.

Databases Searched	Remarks
County Well Index (1-mile radius); MDH DWP Microfiche; MDH 1988-2002 Muni Well Inventory (1Suite); Biennial Report of the MN State Dairy and Food Commissioner-1907; Minnesota Geological Survey City Well File Folders; MGS Bulletin (22, 27, 31, or 32); MDH DWP MNDWIS; MN Historical Soc.- Fire Underwriters Insp. Bureau (Fisher) historical map ; Sanborn Fire Insurance Maps; MDH WELLS	

Old Municipal Well Data Compiled By: **Mara Boulanger** Compiled Date: **5/15/2019 9:30:38 AM**

OLD MUNICIPAL Well Data - the following data are from RAW HYDRO spreadsheets, and need to be processed accordingly.

Well Search Reference	Name(s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
1	Test Well		15 feet				1919						

OLD MUNICIPAL Well Data - the following data are from RAW HYDRO spreadsheets, and need to be processed accordingly.

Well Search Reference	Name(s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
												*10 feet from sidewalk on the East side of Princeton Street	
2	1919: Houlton Well 1971: Well Number (No.)1	217945 R*	1919: 300 feet 1923: 310 feet 1930: 300 feet 1973: 292 feet		1923: 0-170 feet 1930: 0-300 feet 1973: 0-135 feet	12 inch	1919	Drilled				*Center of Village *On Lot 5 of Auditor's Sub-Division No. 4 *Southeast Corner of Jackson and Fifth streets	
3	Twin Cities Milk Producers Association 1971: Well No. 2 (STILL IN USE)	271176											
4	Well No. 3 (STILL IN USE)	221176 S*											
5	Twin Cities Milk Producers Association								Reported in 1971 to have been capped and out of service			*South of the building *100 feet West of Well No. 2	

Databases Searched	Remarks

Old Municipal Well Data Compiled By: **Gail Haglund** Compiled Date: **8/1/2005**

Source: MN Dep't. of Health - 5/15/2019

Appendix D

WHP Plan Implementation Measures

for

Elk River Municipal Utilities DWSMA

Appendix D

Wellhead Protection Plan Implementation Measures

Table of Contents

Appendix D

WHP Implementation Measures

Introduction

Appendix D contains specific management strategies (measures) which address the issues, concerns and opportunities identified in Chapter 6 of the Elk River Municipal Utilities (ERMU) WHP plan. As discussed in Chapter 8 of the WHP plan, the ERMU WHP team has identified short and long-term goals and objectives for the wellhead protection plan. Implementation of the measures contained in this appendix are the approaches to achieving the stated goals and objectives.

Priorities

The DWSMA has two categories of geologic vulnerability – moderate and low as described in Chapter 3 of the WHP plan. The most abundant potential contaminant source in both vulnerability areas is wells.

Chapter 4.4 of the WHP plan describes the process the WHP team used to prioritize the approximately 1,000 wells inventoried in the DWSMA. The classification system used by the WHP team is based on known well depth and designated aquifer each well is likely using to create three levels of priority: high, intermediate and low. A level of risk was also assigned to each level of priority posed to the aquifer used by ERMU.

Those wells constructed in the same aquifer (Mt. Simon-Hinckley) as ERMU production wells are assigned the highest priority potential contaminant source to address in this WHP plan. Figures C1-1, C1-3 and C1-4 illustrate the distribution of high priority wells in the DWSMA. Table C1-2 provides additional public information about these wells. The intermediate and low classified wells are assigned as intermediate priority and low priority (respectively) to address in the WHP plan. See Figures C1-1, C1-3, C1-5 and C1-6 for maps showing the distribution of intermediate and low priority wells across the DWSMA and Tables C1-3 and C1-4 for additional information.

In the moderate vulnerability portion of the DWSMA the WHP team also considered above ground and underground storage tanks, leaky tank sites and other potential contaminated sites as presenting a possible risk to groundwater quality. See Figure C1-2 and Table C1-1 for distribution and associated information regarding these types of potential contaminant sources.

The USEPA requires the inventory of certain types of Class V injection wells that may be located within a DWSMA. Three large-sized subsurface sewage treatment systems classified as Class V wells are located in the low vulnerable portion of the DWSMA. See Figure C1-1 and Table C1-5.

Low levels of nitrate-nitrogen and chloride has been detected in Well #5. Sampling of Well #3 indicates chloride is present but no nitrates. These types of contaminants indicate aquifer recharge from younger, or ‘modern-age’ water. Both of these wells are located within the moderately vulnerable area of the DWSMA.

The DWSMA is crossed by city, state and county roads plus a rail line. Accidental spills on transportation routes could impact surface waters or ground water especially within the moderately vulnerable portion of the DWSMA.

The primary management strategies of this wellhead plan are focused on 1) educate the public regarding WHP and potential contaminant sources, 2) continue efforts to identify wells in the DWSMA and seal those wells that are unused or abandoned, 3) assess ERMU need to add new wells to meet growing demand for drinking water, 4) engage in water resource planning, including regional efforts to better understand the sustainability of the Mt. Simon-Hinckley aquifer, and 5) continue the current high level of WHP plan implementation efforts.

Objectives

Each table of measures identifies which objectives of this WHP plan the measure applies to. The objectives are listed as follows:

1. Communicate with the public about wellhead protection.
2. Utilize community involvement to protect drinking water.
3. Identify and engage with partners in aquifer preservation efforts.
4. Effectively manage public water infrastructure that ERMU owns and operates.
5. Provide guidance to private property owners to properly manage potential contaminant sources.
6. Collect, monitor and evaluate data necessary to support WHP Plan implementation.

Measure Tables

The following categories are used to further clarify the focus that each WHP measure provides, in addition to helping organize the measures listed in the action plan:

Table D1 - Education and Outreach
Table D2 - Potential Contaminant Source Management
Table D3 - Water Resource Planning
Table D4 - WHP Coordination, Evaluation and Reporting
Table D5 - Monitoring, Data Collection and Assessment
Table D6 - Security and Emergency Planning

The tables for each of the above categories lists each measure that will be implemented over the 10-year period that ERMU's WHP plan is in effect, including the priority assigned to each measure. Unless otherwise specified, all efforts to implement identified measures listed in Appendix D must be summarized by the eighth year after WHP approval to coincide with the beginning of the formal process to amend this current version of the WHP plan.

Dates noted in the tables are a target date to implement the WHP measure and may be modified to fit the schedule of ERMU or cooperators. The cost for each action is an estimate and could vary significantly from what is indicated. **An asterisk (*) associated with a measure indicates implementation of this measure is dependent on availability of grants or other financial resources**. The notation 'Staff' means that ERMU staff are conducting an 'in-kind' WHP activity as part of their usual duties.

The WHP Manager is the lead responsible party for implementing all measures and tracking such actions. ERMU fully intends to implement all actions listed in Appendix D, however, completion of some action items may be subject to sufficient resources to complete them.

Local Governmental Units and State Agency Support

Neither ERMU nor the City of Elk River (City) have official controls or programs in place within the entire DWSMA to implement all the measures listed in Appendix D. Therefore, ERMU and the City will rely upon appropriate working relationships with neighboring local governmental units and state or federal agencies that have the authority and/or resources to assist ERMU and the City in successfully implementing this wellhead protection plan.

Primary local partners are the Sherburne County Planning and Zoning Department and Sherburne Soil and Water Conservation District (SWCD). ERMU and/or the City will coordinate with these local government units in implementing measures that bring benefit to both private groundwater users and public water suppliers. ERMU and the City will maintain communications with the surrounding cities of Otsego (Wright County) and Nowthen (Anoka County) and Big Lake Township (Sherburne County) that have jurisdiction within portions of the DWSMA regarding land use and potential impact on groundwater.

State agencies also provide WHP implementation assistance to ERMU. Technical assistance from the MDH and DNR in structuring a comprehensive approach to better understand the resilience and long-term sustainability of the Mt. Simon-Hinckley aquifer is an example. MDH also provides financial support for the implementation of a public water supplier's WHP plan. The Minnesota Department of Agriculture works with SWCDs and other interests in promoting nitrogen management or other agricultural crop management practices with local producers and agricultural businesses. The Board of Water and Soil Resources works closely with SWCDs in providing financial support for many of the soil and water conservation projects local agencies and landowners are engaged in. The Minnesota Pollution Control Agency provides regulatory, technical and financial support to address management of some types of the potential contaminant sources inventoried in the DWSMA (storage tanks, leaky tank sites, septic systems, etc.) and can provide technical and financial assistance in groundwater and surface water quality protection projects.

On the federal level, the US Department of Agriculture's Farm Security Agency and Natural Resource Conservation Service (NRCS) provide a multitude of conservation programs with financial and technical assistance to landowners. The NRCS works closely with SWCDs in a support role. The Minnesota Rural Water Association (MRWA) is a nonprofit organization has a significant role in assisting ERMU with wellhead protection-related educational material and outreach to residents in the DWSMA.

To successfully achieve the goals and objectives of this wellhead protection plan, ERMU and the City will need to communicate with the various local and state entities described above to discuss partnership opportunities.

Table 2 provides an overview of the role cooperating state and local agencies play in assisting ERMU and the City in implementing WHP measures.

Table 1
Acronyms of Implementation Partners Used in Measure Tables

DNR	Minnesota Department of Natural Resources
ERMU	Elk River Municipal Utilities
LGU	Local Governmental Unit – Big Lake Township (Sherburne County), cities of Otsego (Wright County) and Nowthen (Anoka County).
MDH	Minnesota Department of Health
MPCA	Minnesota Pollution Control Agency
MRWA	Minnesota Rural Water Association
SWCD	Sherburne Soil and Water Conservation District
TBD	To Be Determined (staffing and/or costs)

Table 2
Cooperators and Associated Measures

Cooperating Agency	Education & Outreach	Potential Contaminant Source Management	Water Resource Planning	WHP Coordination, Evaluation and Reporting	Monitoring, Data Collection and Assessment	Security and Emergency Planning
DNR	-	Table D2	Table D3	-	-	Table D6
ERMU	All Measures					
LGU	Table D1	-	Table D3	Table D4	-	-
MDH	Table D1	Table D2	Table D3	-	Table D5	-
MPCA	-	Table D2	-	-	-	-
MRWA	Table D1	Table D2	-	-	Table D5	-
SWCD	Table D1	-	-	-	-	-

Note:

1. **In the following tables, an asterisk (*) indicates implementation of the measure is dependent on availability of grants or other financial resources.**
2. **Collaborators and costs are noted as "TBD" (To Be Determined) in some measures.**

Table D1
Education and Outreach

Education and Outreach																
Action #	Priority	Description	Objective Addressed	Cooperators	Cost	Implementation Time Frame										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
1	High	**Measure:** Provide educational materials to residents about wellhead protection.	1	ERMU, MRWA	Staff, $250	On Going									
2	Medium	**Measure:** Incorporate drinking water education into existing local activities and outreach events.	1, 2	ERMU, MRWA	Staff, $250	As Opportunities Occur									
3	High	**Measure:** Post the wellhead protection plan on the public water system's webpage.	1	ERMU, MRWA	Staff	•									
4	Medium	**Measure:** Display a map of the DWSMA in a public place.	1, 2	ERMU, MDH	Staff, $250	Frequency TBD									
5	Medium	**Measure:** Using a groundwater model, show local aquifer characteristics to students or civic groups.	1, 2, 3	ERMU	Staff, TBD	As Opportunities Occur									
6	Medium	**Measure:** Commission a travelling groundwater display for use by schools, water festivals, county fair or other events.	1,2,3	ERMU	Staff, TBD		•	•							
7	Low	**Measure:** Host a water testing clinic for private well users.	2,5	ERMU, SWCD, Others	$500			•				•			
8	High	**Measure:** Work with Sherburne county and regional watershed entities to include wellhead protection information in local plans.	2, 3	ERMU, LGUs	Staff		•								
9	Medium	**Measure:** Maintain partnerships with local elected officials and other public water suppliers to support future state and federal funding for drinking water protection efforts	2, 3	ERMU, LGUs	Staff	On Going									
10	Low	**Measure:** Collaborate with Sherburne SWCD in promoting residential conservation practices.	2	ERMU, SWCD	Staff, $500	•	On Going								

Table D2
Potential Contaminant Source Management

Potential Contaminant Source Management Measures																
Action #	Priority	Description	Objective Addressed	Cooperators	Cost	Implementation Time Frame										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
11	Medium	**Tanks** **Measure:** Provide information to storage tank owners about proper management.	1, 5	ERMU, MRWA, MPCA	Staff, $100	•				•				•	
12	Low	**Measure:** If a Leaking Underground Storage Tank (LUST) is identified, stay informed with MPCA for monitoring or remediation.	1, 5	ERMU, MPCA	Staff	On An As-Needed Basis									
13	High	**Wells** **Measure:** Provide well management and well sealing information to the public.	1, 2, 5	ERMU, MDH, MRWA	Staff, $250	On Going									
14	High	**Measure:** Identify unused wells and prioritize for sealing and apply for funding to seal wells.*	1, 2, 5	ERMU, MDH	Staff, TBD	On An As-Needed Basis									
15	Low	**Measure:** Notify MDH source water protection planner if a Class V well is identified in the DWSMA.	3	ERMU, MDH	Staff	On An As-Needed Basis									
16	Medium	**Measure:** Provide information to owners of high-capacity wells about potential impacts to aquifer(s) and public well(s).	3, 5	ERMU, MDH, DNR	Staff	On An As-Needed Basis									
17	High	**Measure:** Conduct an assessment of ERMU water supply wells to determine system expansion requirements to meet future demand for public drinking water.	4	ERMU	Staff	•	•								
18	Medium	**Measure:** Contact MDH Hydrologist and District Engineer for initial discussion prior to planning for a new public well.	4	ERMU, MDH	Staff	On An As-Needed Basis									
19	Medium	**Measure:** Determine need and cost of reconstructing or replacing Well #2 and seal if decommissioned.*	4	ERMU	Staff, TBD		•								
20	Low	**Stormwater** **Measure:** ERMU will continue working with the City of Elk River Department of Public Works - Stormwater Division regarding stormwater management practices in Emergency Response Areas.	4	ERMU	Staff	On Going									
21	Low	**Measure:** When reviewing construction or land use permit applications where stormwater treatment is needed, consider stormwater infiltration impacts on groundwater within the moderately vulnerable portion of the DWSMA.	2,4	ERMU	Staff	On An As-Needed Basis									

Table D3
Water Resource Planning

Water Resource Planning Measures																
Action #	Priority	Description	Objective Addressed	Cooperators	Cost	Implementation Time Frame										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
22	Medium	**Water Conservation** **Measure:** Provide information to residents about water conservation tips and water reuse practices.	1, 4	ERMU	Staff	On Going									
23	Medium	**Measure:** Continue a rebate program for water efficient fixtures or appliances.	1, 4	ERMU	Staff, TBD	On Going									
24	M	**Measure:** Continue use of tiered water rates to promote water efficiency and conservation.	2, 4	ERMU	Staff	On Going									
25	Low	**Land Use** **Measure:** Ask Sherburne County, City of Otsego and City of Nowthen to provide notification of any changes in land use or zoning in or near the ERMU DWSMA.	3	ERMU, LGU	Staff		●								
26	Low	**Measure:** Continue to communicate with City of Elk River to consider impacts to drinking water during zoning and permit reviews.	2, 3	ERMU	Staff	As Needed									
27	High	**Regional Groundwater Planning** **Measure:** ERMU will initiate the formation of a regional group for the purpose to better understand the sustainability of the Mt. Simon-Hinckley aquifer. Interested parties will include state agencies, local units of government, other public water suppliers and private sectors with an interest in the aquifer.	2, 3	ERMU, MDH, DNR, LGU	Staff, TBD	●	●								
28	Medium	**Measure:** Continue to take part in local and/or regional meetings related to water planning.	3	ERMU	Staff	As Needed									
29	Medium	**Measure:** Work with local and state governmental units in the development of the Mississippi – St. Cloud One Watershed One Plan to include the ERMU DWSMA map and identified WHP issues in the plan.	3	ERMU	Staff	●	●	●							

Table D4
WHP Coordination, Evaluation and Reporting

WHP Coordination, Evaluation and Reporting																	
Action #	Priority	Description	Objective Addressed	Cooperators	Cost	Implementation Time Frame											
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032		
30	Low	**<u>WHP Coordination</u>** **Measure:** Request Sherburne County, City of Otsego and City of Nowthen to include drinking water protection their comprehensive plans.	3	ERMU, LGU	Staff	•											
31	Medium	**Measure:** Conduct regular meetings with the WHP Team and local resource partners involved in plan implementation to discuss new WHP issues, past accomplishments and activities planned for the upcoming years.	3, 6	ERMU, LGU	Staff			•			•			•			
32	High	**<u>Evaluation and Reporting</u>** **Measure:** Maintain a "WHP folder" that contains date and documentation of WHP activities you have completed.	6	ERMU	Staff	On Going											
33	High	**Measure:** Complete an Evaluation Report every 2.5 years that evaluates the "progress of plan of action and the impact of any contaminant release on the aquifer supplying the public water supply well" MN WHP Rule 4720.5270.	6	ERMU	Staff			•			•			•			

Table D5
Monitoring, Data Collection and Assessment

Monitoring, Data Collection and Assessment																
Action #	Priority	Description	Objective Addressed	Cooperators	Cost	Implementation Time Frame										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
34	High	**Data Collection** **Measure:** Update the inventory of potential contaminant sources.	6	ERMU	Staff, TBD								•		
35	Medium	**Measure:** Complete a review of historical well and land use information to identify wells.	6	ERMU, MDH	Staff', TBD								•		
36	High	**Measure:** Work with MDH to conduct a standard assessment monitoring package for primary wells in preparation for a plan amendment.	4, 6	ERMU, MDH	Staff						•				
37	Low	**Measure:** ERMU will contact MDH if ERMU is informed of a new high capacity well proposal within the Elk River municipal boundaries of the DWSMA that may not be properly permitted.	6	ERMU, MDH	Staff	On an As-Needed Basis									
38	Low	**Inner Well Management Zone** **Measure:** Assist source water protection planning staff complete or update the Inner Wellhead Management Zone inventory.	4, 6	ERMU, MDH, MRWA	Staff					•					•
39	Medium	**Measure:** Implement measures listed in the Inner Wellhead Management Zone report and Sanitary Survey reports.	4, 6	ERMU, MDH	Staff	On an As-Needed Basis									
40	High	**Measure:** Make sure setback distances are met for new potential contaminant sources in the Inner Wellhead Management Zone.	4,6	ERMU, MDH	Staff	On an As-Needed Basis									

Table D6
Security and Emergency Planning

Security and Emergency Planning																	
Action #	Priority	Description	Objective Addressed	Cooperator(s)	Cost	Implementation Time Frame											
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032		
41	High	**Measure:** Meet with Elk River Fire Department to assess emergency response capabilities to accidental spills near ERMU wells; especially wells #2, #3 and #5.	2, 3, 4	ERMU	Staff	•	•										
42	Medium	**Measure:** Assess security needs and risks to public water system at facility access points.	4	ERMU	Staff		•	•									
43	Low	**Measure:** Update DNR Water Supply Plan on an as-needed basis or prior to amending this WHP plan, whichever comes first.	3, 4	ERMU, DNR	Staff	On an As-Needed Basis											

Appendix E

Supporting Documents

Figure E1 – ERMU Water Service Area Map

Exhibit E1 – DNR Water Supply Plan Approval Letter

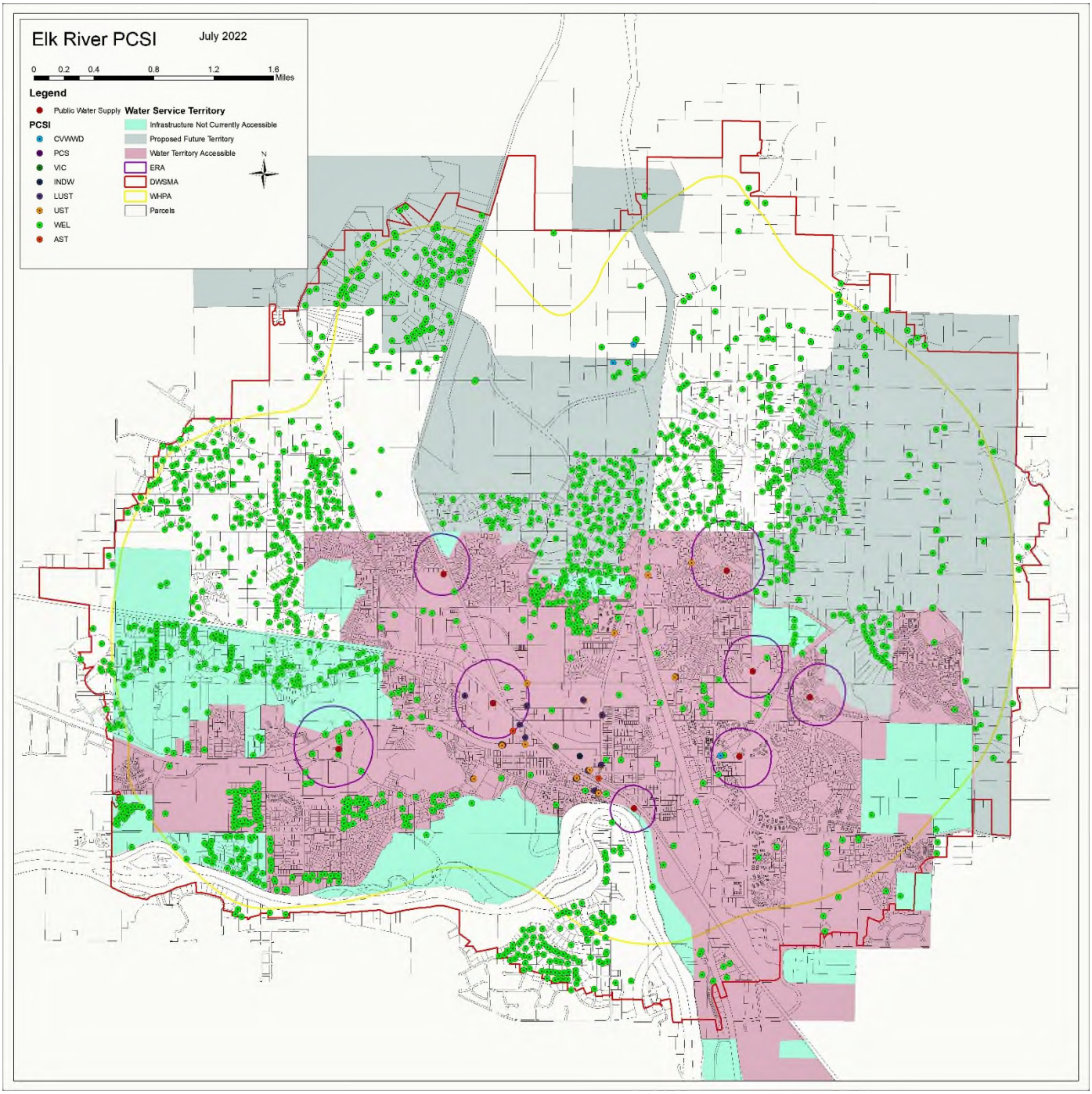


Figure E1

ERMU Public Water Services Map

Exhibit E1

DNR Water Supply Plan Approval Letter

MINNESOTA DEPARTMENT OF NATURAL RESOURCES
CENTRAL OFFICE
500 LAFAYETTE ROAD
SAINT PAUL, MN 55155
651-296-6157
888-646-6367

6/14/2017

CITY OF ELK RIVER
ERIC VOLK, WATER SUPERINTENDENT
PO BOX 430
ELK RIVER, MN 55330

RE: Water Supply Plan Approval, City of Elk River, Sherburne County

Dear Eric,

Our office has completed the review of your Water Supply Plan for public water supply authorized under DNR Water Appropriation Permit #1975-3215. I am pleased to advise you that in accordance with Minnesota Statutes, Section 103G.291, Subdivision 3, and on behalf of the Commissioner of the Department of Natural Resources, I hereby **approve your Water Supply Plan**. We encourage cities to complete the attached "Certification of Adoption" form. Please upload the form to MPARS-Water Supply Plan tab as soon as the city officially adopts the Plan.

The DNR, Minnesota Rural Water Association, and The Metropolitan Council 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 your efforts in planning for the future of the City of Elk River water supply and for conserving the water resources of the State of Minnesota. If you have any questions or need additional assistance with the city's water appropriation permit, please contact an Area Hydrologist at the Sauk Rapids Area Office at 320-223-7840.

Sincerely,

Roger Stradal
Area Hydrologist

Ec: Carmelita Nelson, DNR
Francine Larson, Sherburne County SWCD
Minnesota Permitting and Reporting System (MPARS)

CERTIFICATION OF ADOPTION
WATER SUPPLY PLAN

City or Water System Name: **Elk River, MN**

Name of Person Authorized to Sign
Certification on Behalf of the System: **Eric Volk**

Title: **Water Superintendent**

Address: **PO Box 430, Elk River, MN 55330**

Telephone: **(763) 635-1361** Fax:

E-mail: **evolk@elkriverutilities.com**

I certify that the Water Supply Plan approved by the Department of Natural Resources has been adopted by the city council or utility board that has authority over water supply services.

Signed:  Date: 6/22/17

Fax (651/296-0445) or mail this certification to: DNR Waters
Water Permit Programs Supervisor
500 Lafayette Road
St. Paul, MN 55155-4032