

**WELLHEAD PROTECTION PLAN
FOR THE**

City of Red Wing, Minnesota

Nonvulnerable Setting

Date of City Council Adoption of Final Plan:_____

Plan will be in effect from the date of adoption.

August 5, 2016



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Forward

This document presents the wellhead protection (WHP) plan for the City of Red Wing that will help provide for an adequate and safe drinking water supply for community residents. It contains the following components:

- Assessment of the data elements used to prepare the plan;
- Delineation of the wellhead protection area;
- Delineation of the drinking water supply management area;
- Assessments of well and drinking water supply management area vulnerability;
- Impact of land and water use changes on the public water supply well(s) used by the water supplier;
- Issues, problems, and opportunities affecting the well(s), well water, and the drinking water supply management area;
- Wellhead protection goals for this plan;
- Objectives and plan of action for achieving the wellhead protection goals;
- Evaluation program for assessing the effectiveness of this plan; and
- Contingency strategy to address an interruption of the water supply.

Water Supply Wells Included in This Plan

This Wellhead Protect Plan includes all the wells used by the City as a source of drinking water. The individual wells are designated on the following table. Wells 7-1, 7-2 and 7-3 are tributary to the Twin Bluff Water Treatment Plant at 1468 Pioneer Road. Wells 8-1 and 8-2 are tributary to the Charlson Crest Water Treatment Plant at 302 Water Street.

Unique Number	Well Name or Number	Use/Status
216020	Well 7-1	Primary water supply
151565	Well 7-3	Primary water supply
686251	Well 7-3	Primary water supply
686252	Well 8-1	Primary water supply
686258	Well 8-2	Primary water supply

Well head Protection Team

The wellhead protection team includes individuals from the City's Public Works, Engineering and Planning Departments. The individuals and their contact information is provided below.

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Chapter 1 - Introduction

1.1 Background

The wellhead protection (WHP) plan for the City of Red Wing was prepared in cooperation with the Minnesota Department of Health (MDH) and the Minnesota Rural Water Association. It contains specific actions that the City 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, Goodhue County, and others will provide is presented to identify their roles in protecting the City's drinking water supply. The plan is effective for 10 years after the approval date specified by MDH and the city is responsible for implementing its WHP plan of action, as described in Table 9 of this report. Furthermore, the city 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 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 I contains the first part of the plan, consisting of the delineation of the wellhead protection area (WHPA), the drinking water supply management area (DWSMA), and the vulnerability assessments for the public water supply well(s) and the DWSMA. This part of the plan is summarized in Chapter 3.
- Appendix II contains the inventory of potential contamination sources. This inventory is discussed in Chapter 4 in terms of assigning risk to the city's water supply and is also discussed in Chapter 6, relating to issues, problems or opportunities.
- Appendix III contains the contingency strategy to provide for an alternate water supply if there is a disruption caused by contamination or mechanical failure. This information is discussed in Chapter 11.
- Appendix IV contains the letters from the Minnesota Department of Health summarizing the Scoping Decisions
- Appendix V contains copies of correspondence, including notifications to local units of Government (LUGs), and correspondence between the City and the Minnesota Department of Health.
- Appendix VI contains background information used for data element assessment
- Appendix VII contains the Inner Wellhead Management Zone (IWMZ) Potential Contaminant Source Inventory Reports.

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

The data elements that are included in this plan were used to 1) delineate the WHPA and the DWSMA and to assess DWSMA and well vulnerability and 2) document the need for the WHP measures that will be implemented to help protect the city's water supply from potential sources of contamination. The city met with representatives from MDH on two occasions to discuss data elements that are specified in Minnesota Rules, part 4720.5400, for preparing a WHP plan.

The first scoping meeting, held on May 22, 2012, addressed the data elements that were needed to support the delineation of the WHPA, the DWSMA, and the well(s) and DWSMA vulnerability assessments. The second scoping meeting, held on February 4, 2014, discussed the data elements required to 1) identify potential risks to the public water supply and 2) develop effective management strategies to protect the public water supply in relation to well and DWSMA vulnerability. The results of each meeting were communicated to the city by MDH through a formal scoping decision notice and are presented in Appendix IV. Not all of the data elements listed in the WHP rule had to be addressed in the WHP plan because of the nonvulnerable nature of the city's source of drinking water.

Table 1 is the assessment of the present and future implications of the data elements on the four planning activities. The data elements that are shaded are not required or needed, as previously stated, because of the nonvulnerable setting. These data elements are included in the table for information purposes only. The data elements that are marked high (H) are considered to have a direct implication or impact on the activity. Data elements that have an indirect or marginal impact on an activity are shown as moderate (M). A data element that has little if any impact is shown as low (L). The source of the data is shown under "Data Source."

Table 1 - Assessment Results for the Data Elements

Data Element	Present and Future Implications				Data Source
	Use of the Well (s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Precipitation					MN Climatology Office
Geology					
Maps and geologic descriptions	M	H	M	H	MGS, DNR, USGS, Consultant Reports
Subsurface data	H	H	H	H	MGS, MDH, MPCA, DNR, MDA
Borehole geophysics	H	H	L	H	MGS, Consultant Reports
Surface geophysics	M	M	L	M	DNR, MPCA, Consultant Reports
Maps and soil descriptions					NRCS
Eroding lands					NRCS
Soils					
Maps and soil descriptions					

Data Element	Present and Future Implications				Data Source
	Use of the Well (s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Eroding lands					
Water Resources					
Watershed units					DNR, USGS
List of public waters					DNR
Shoreland classifications					DNR
Wetlands map					LMIC
Floodplain map					FEMA
Land Use					
Parcel boundaries map	L	H	L	H	County
Political boundaries map	L	H	L	L	County Metro Council
PLS map	L	H	L	L	City, MGEO
Land use map and inventory	H	L	H	H	Sanborn Fire Maps, Historical Society, City Records, County
Comprehensive land use map	M	L	H	H	City, County
Zoning map	M	L	H	H	City, County
Public Utility Services					
Transportation routes and corridors					
Storm/sanitary sewers and PWS system map					City
Oil and gas pipelines map					LMIC
Public drainage systems map or list					County, LMIC
Records of well construction, maintenance, and use	H	H	H	M	City, CWI, MDH files
Surface Water Quantity					
Stream flow data					DNR, USGS, Metro Council
Ordinary high water mark data					DNR
Permitted withdrawals					DNR
Protected levels/flows					DNR
Water use conflicts					DNR
Groundwater Quantity					
Permitted withdrawals	H	H	H	H	DNR
Groundwater use conflicts	M	M	H	H	DNR
Water levels	H	H	H	M	DNR, MPCA, MDA, MDH, City
Surface Water Quality					
Stream and lake water quality management classification					DNR
Monitoring data summary					MPCA, SWCD, WSD/WMO
Groundwater Quality					
Monitoring data	H	H	H	H	MPCA, MDH

Data Element	Present and Future Implications				Data Source
	Use of the Well (s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Isotopic data	M	M	M	M	MDH
Tracer studies	M	M	M	M	Not Available (<i>default description</i>)
Contamination site data					MPCA, MDA
Property audit data from contamination sites					City, MPCA
MPCA and MDA spills/release reports					City, MPCA

The data elements listed in Table 1 were identified by the MDH to be used in the WHP plan and were specified in the scoping decision notices. The selection of a data element for inclusion in the plan is based on 1) the hydrogeological setting and 2) vulnerability of the wells used by the City, 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 DWSMA. Each of the main categories is discussed below.

2.1 PHYSICAL ENVIRONMENT

Precipitation information was not required because aquifer is hydraulically confined.

Geologic information was obtained from 1) existing maps, reports, and studies that are listed in the References section of the Part 1 report, and 2) the records of wells, test borings, and well sealing records that are on file at the MDH and stored in the County Well Index (CWI) database. Soil data was not required because aquifer the hydraulically confined.

Geologic information was used to determine 1) the extent and composition of the aquifer(s) used by the city wells, 2) the vulnerability of the aquifer at the location of each well used by the Public Water Supplier, and 3) the vulnerability of the DWSMA. Geologic information affects the delineation of the WHPA because it is used to address the aquifer transmissivity and hydrologic boundaries delineation criteria. Second, geologic information provides insight into the pathways that recharging water takes to enter the aquifer which impact: 1) the use of the well, and 2) the quality and quantity of water that is pumped. Finally, it is the principle information that is used to assess DWSMA vulnerability, which impacts land- and groundwater-uses within the DWSMA.

The main geologic units in the area consist of several water bearing formations that are used for water supply. The individual residential wells near the East Wellhead Protection Area are typically finished in the Iron-ton-Galesville. The two formations are separated by the Eau Claire formation which has low permeability causing the Mount Simon to be a confined aquifer.

All of the water supply wells used by the City draw water from the Mount Simon Aquifer. Well 7-1 is also open to approximately 20 feet of the overlying Eau Claire Formation, but since this length is only 7% of the total open interval, the contribution from the Eau Claire Formation is considered negligible. The confined nature, and the isolation and depth of the Mount Simon Aquifer were important in designating the Aquifer as non-vulnerable to contamination from surface activities.

Soils and erosion information was required because of the aquifer hydraulically confined.

Water resources information was not required because of the aquifer hydraulically confined.

2.2 LAND USE

Land use information was obtained from the maps referenced in Chapter 14 relating to existing parcel boundaries, political boundaries, public land survey coordinates, comprehensive land-use, and zoning. Appendix II contains the map and inventory of potential contamination sources.

Parcel boundaries and public land survey coordinates were used in defining DWSMA boundaries. DWSMA boundaries impact land- and groundwater-uses because they define where the WHP plan will be implemented. They have no direct impact on 1) the use of the public water supply well(s), 2) delineation of the WHP area, and 3) the quantity and quality of the well water used by the City.

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 the Public Water Supplier.

The East DWSMA is partially outside the corporate city limits and is under the jurisdiction of Featherstone Township and Goodhue County. The area inside the city limits is zoned C1-Civic, PUD-Planned Unit Development, RM1-Multifamily Residential, R1-Residential and AC-Agricultural Conservation. The area zoned CI-Civic contains a Middle school and athletic fields. The area zoned Planned Unit Development contains multi-family condominiums and townhomes. Most of the area zoned residential or agricultural residential has been developed, and it is unlikely that there will be significant additional development. The area in the township is zoned agricultural-residential, and is largely developed for residential use.

The West DWSMA is within the corporate city limits and is zoned C1-Civic, PUD-Planned Unit Development, B1-Local business and AR-Agricultural Residential. The C1-Civic zone contains an elementary school and athletic fields. There is the potential for additional fill in development in the area zoned for Planned Unit Development. The areas zoned Agricultural Residential is currently farmed but could be used for future residential development. There are no known plans to do so at the present time.

The information contained in Appendix II 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. The priorities that are assigned to the WHP action steps that are specified in the plan are based on the information contained in Appendix II. As a result, these actions steps affect the

future use of the public water supply well(s) and land- and groundwater-uses within the DWSMA. Both DWSMAs are deemed to be non-vulnerable to contamination from surface activities. The action steps include monitoring future development activities to make sure that any changes that have the potential to cause contamination are identified and the necessary controls are put into place. Groundwater use was included to meet the hydrologic boundary and water use criteria for delineating the WHPA.

Information about public utility services includes maps of 1) transportation routes and corridors, 2) storm sewers, sanitary sewers, the public water supply distribution system, 3) gas and oil pipelines, and 4) public drainage systems was not required because of the aquifer hydraulically confined. Record of the construction and maintenance of the public water supply wells is presented in the Part 1 report. Pumping may affect the movement of contamination toward a well and the one and ten-year capture areas are used to establish priorities for managing potential contamination sources within the DWSMA. The construction and maintenance of a public water supply well affect the well vulnerability assessment and the focus of the potential contamination source inventory.

2.3 SURFACE WATER QUANTITY INFORMATION

Surface Water Quantity Information was not required for surface water resources because of aquifer is hydraulically confined.

2.4 GROUNDWATER QUANTITY INFORMATION

A list of wells covered by state appropriations permits, including the amounts of water appropriated, type of use, and aquifer source were assessed as follows. The Public Water Supplier provided the information describing pumping for water supply over the previous 5 years and the projected pumping for the first five years of plan implementation. The City Water Supplier Wells are the only high-capacity well pumping within a 5-mile radius and are the only wells included in the Part 1 analysis.

There are no known well interference problems and water use conflicts within the DWSMA. Well interference and water use conflicts, if they exist, are used to delineate the WHPA because they document hydrologic boundaries that must be included.

A search was conducted for environmental bore holes, including the unique number, aquifer measured, years of record, and average monthly levels from the observation well networks that are maintained by the DNR and the U.S. Geological Survey. This information is used to delineate the WHPA by providing information that helps to define aquifer recharge and the distribution of hydraulic head. It may have an indirect influence on water use within the DWSMA because the water level data can be used to document seasonal or long-term impacts that pumping has on the aquifer supplying the public water supply well. This information has no impact on the quality the water supplying the public water supply well and land- and groundwater-uses within the DWSMA. There were no environmental bore holes listed.

2.5 SURFACE WATER QUALITY INFORMATION

Surface Water Quality Information was not required for surface water resources because of aquifer is hydraulically confined.

2.6 GROUNDWATER WATER QUALITY INFORMATION

Groundwater quality information was obtained from the Public Water Supply Program and Well Management Program at MDH, the Public Water Supplier, and from reports and studies that are listed in the references section of this report.

The presence of human-made contaminants is used to identify potential sources of the contamination that should receive a high priority for inventory and for supporting the priority that is assigned to objectives and actions in the plan that manage these sources. This affects the focus of land and water use management practices within the DWSMA. There are no known records indicating the existence of any pathogens or other human caused contaminants from any of the water supply wells.

Water chemistry and isotopic data from wells, springs, or other groundwater sampling points and reports of groundwater tracer studies is used to determine the 1) time needed for surface water or precipitation to travel from the surface to the source water aquifer and 2) degree to which the source water aquifer is impacted by recharge from surface water features. This assessment affects the delineation of the WHPA because it helps define the degree of hydraulic confinement and whether a surface water feature comprises a hydraulic boundary that must be included. Also, this information is used to determine the sustainability of the aquifer and any surface water features that may be impacted by increased pumping within the DWSMA. A carbon 14 age analysis is available for well 7-1, which is in the east well field. The water age was designated as ancient, indicating that surface contamination and significant surfaced water infiltration is not evident. Other tracer or chemical analysis of springs or other surface water was not identified. This information would not be expected to demonstrate influence from surface water due to the confined nature of the aquifer.

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 well 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 the DWSMA. Also, the hydro-geologic 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 within the aquifer used by the City.

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

A detailed description of the process used for 1) delineating the WHPA and the DWSMA, and 2) preparing the vulnerability assessments of the city water supply well(s) and DWSMA is presented in Appendix I. This work was completed by John Greer, P.G., Barr Engineering Company, Minneapolis, Minnesota.

3.1 WHPA and DWSMA Delineation

Figure 1a shows the boundaries of the WHPA and the DWSMA for western well field. Figure 1b shows the boundaries of the WHPA and the DWSMA for eastern well field. The WHPAs were delineated using computer simulations of groundwater movement to generate the underground capture zones for city Wells 7-1 (Unique No. 216020), 7-2 (Unique No. 151565), 7-3, (Unique No. 686251), 8-1 (Unique No. 686252) and 8-2 (Unique No. 686258). The eastern well field includes wells 7-2, 7-2 and 7-3. The western well field includes wells 8-1 and 8-2.

The DWSMA boundaries were designated using easily locatable surface features such as property lines and public land survey coordinates. A more detailed description of means to delineate the DWSMA was included in the Part I report, and is provided in Appendix I.

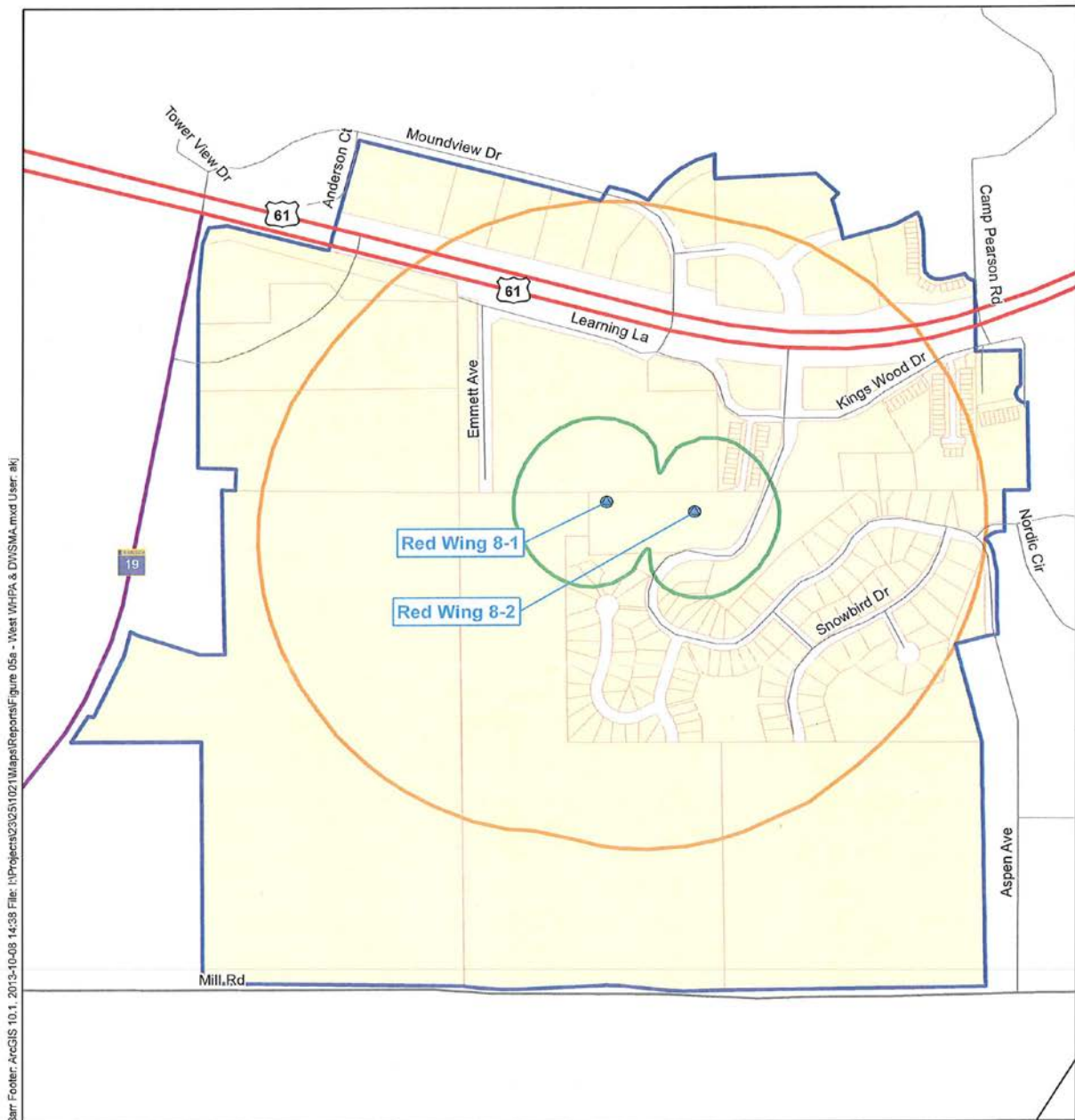
- Center-lines of highways, streets or roads;
- Public Land Survey coordinates;
- Property or fence lines; and
- Political boundaries.

3.2 Well Vulnerability Assessment

The construction and water quality obtained from each water supply well used by the City of Red Wing is included in the assessment of well vulnerability. The vulnerability of the city wells is considered low because they are constructed so that each well is adequately sealed into the borehole and does not pump water that contains human-caused contaminants.

3.3 DWSMA Vulnerability Assessment

The low vulnerability assigned to the DWSMAs (Figures 2a and 2b) were determined using geologic, soils, and groundwater chemistry information and indicates that at least 10 feet of clay-rich geological material covers the source water aquifer.



Barr Footer: ArcGIS 10.1, 2013-10-08 14:38 File: I:\Projects\23051021\Maps\Reports\Figure 05a - West WHPA & DWSMA.mxd User: akj

- Red Wing Municipal Well
- DWSMA
- WHPA
- Emergency Response Zone
- DWSMA Parcel

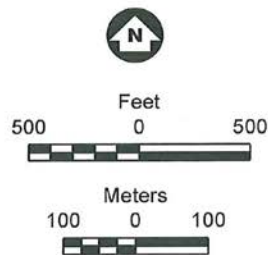
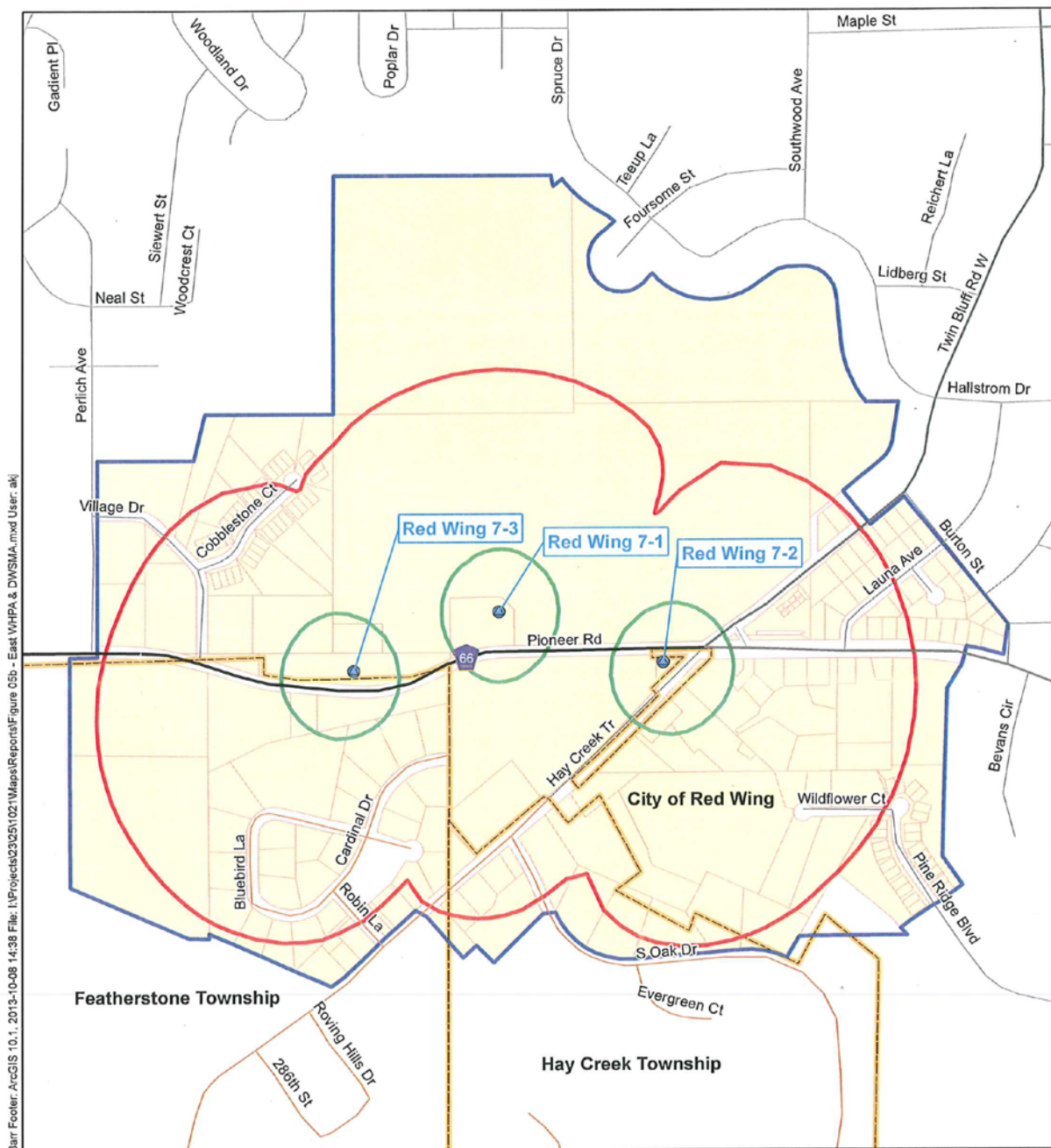


Figure 1a

WEST WHPA & DWSMA
Red Wing WHPP
City of Red Wing
Goodhue County, MN



Barr Footer: ArcGIS 10.1, 2013-10-08 14:38 File: \\Projects\23051021\Map\Reports\Figure 03b - East WHPA & DWSMA.mxd User: akj

- Red Wing Municipal Well
- DWSMA
- WHPA
- Emergency Response Zone
- Municipal Boundary
- DWSMA Parcel

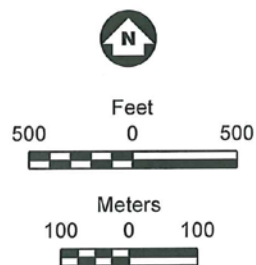


Figure 1b

EAST WHPA & DWSMA
Red Wing WHPA
City of Red Wing
Goodhue County, MN



Barr Footer: ArcGIS 10.1, 2013-10-08 14:38 File: I:\Projects\23251021\Maps\Reports\Figure 06a - West DWSMA Vulnerability.mxd User: akj

- Red Wing Municipal Well
- DWSMA
- Aquifer Vulnerability**
 - High
 - Moderate
 - Low

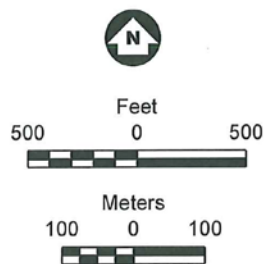
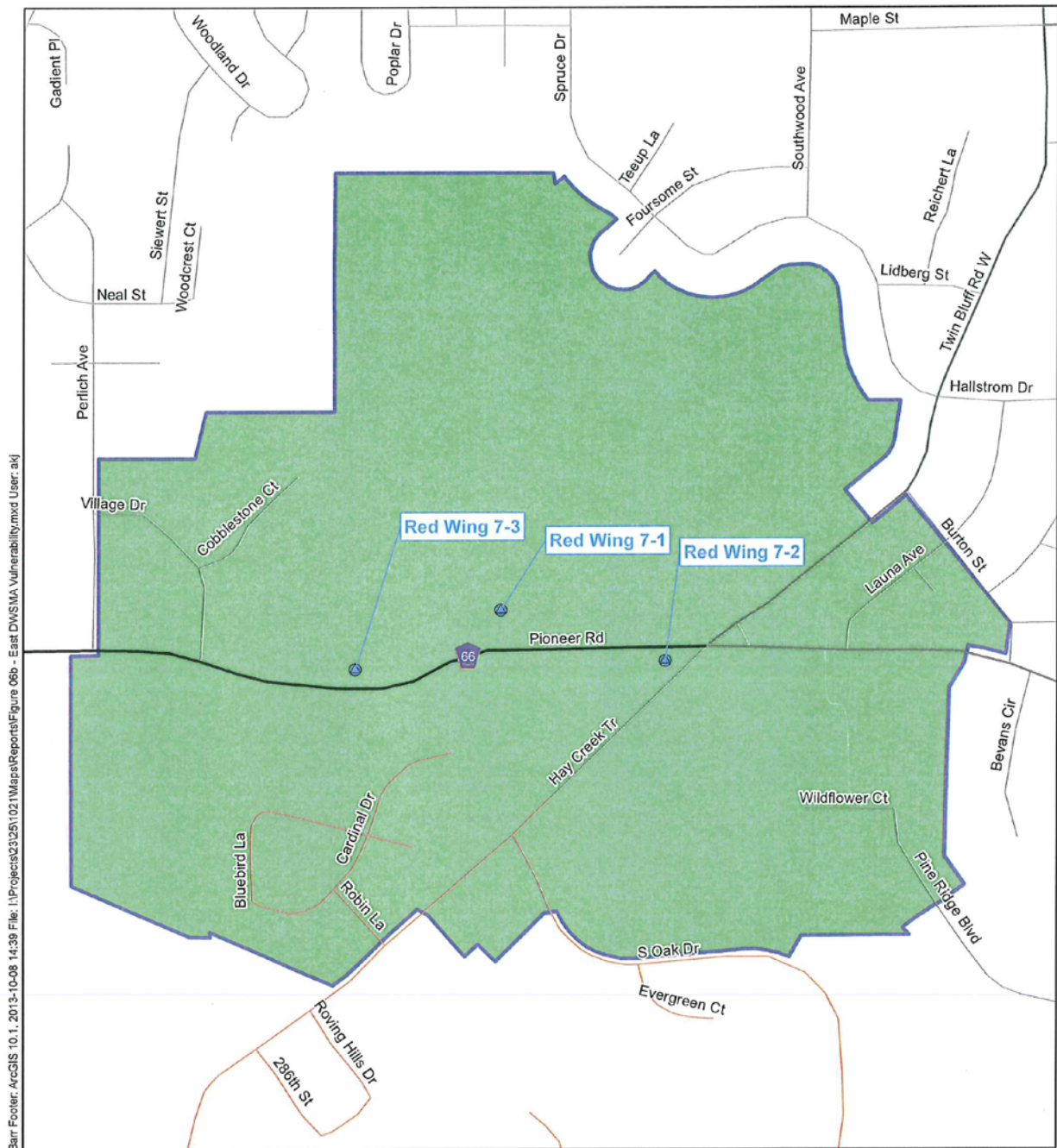







Figure 2a

WEST DWSMA VULNERABILITY
Red Wing WHPP
City of Red Wing
Goodhue County, MN



Barr Footer: ArcGIS 10.1, 2013-10-08 14:39 File: \\Projects\\3251021\\Maps\\Reports\\Figure 06b - East DWSMA Vulnerability.mxd User: akj

-  Red Wing Municipal Well
-  DWSMA
- Aquifer Vulnerability**
 -  High
 -  Moderate
 -  Low

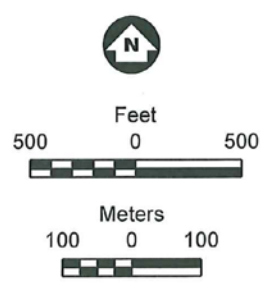


Figure 2b
 EAST DWSMA VULNERABILITY
 Red Wing WHPP
 City of Red Wing
 Goodhue County, MN

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Chapter 4 - Establishing Priorities and Assigning Risk to Potential Contamination Sources

The types of potential contamination sources that may exist within the Drinking Water Supply Management Area (DWSMA) were derived from the information collected to satisfy the data element requirements (Chapter 2). The impact assigned to each data element as part of the assessment process (Table 1) was used to assess the types of potential contamination sources that may present a risk to the city's drinking water supply. The very low vulnerability assessment for the DWSMA indicates that, generally, only wells, other types of boreholes, excavations that may reach the aquifer, and certain types of Environmental Protection Agency Class V Wells are likely to impact the city wells.

4.1 Contaminants of Concern

None of the human-caused contaminants regulated under the federal Safe Drinking Water Act have been detected at levels indicating that any well itself serves to draw contaminants into the aquifer as a result of pumping. Radium, a naturally occurring contaminant has been detected in concentrations slightly below or at the Maximum Contaminate Level (MCL) of 5.0 picocuries/liter in the city wells. Iron and manganese are also present at concentrations greater than the Secondary Maximum Contaminate Levels. The City has constructed two greensand filter water filtration plants to remove the radium, iron and manganese to acceptable levels. The lack of contaminants resulting from surface activities indicates that the aquifer receives recharge over a long time period and is not likely to be directly impacted by land uses.

4.2 Inventory Results and Risk Assessment

A description of the locations of potential contamination sources is presented in Appendix II. A summary of the results for the Inner Wellhead Management Zone (IWMZ) is listed in Table 2 and Table 3 presents these results for the remainder of the DWSMA. The priority assigned to each type of potential contamination source addresses 1) the number inventoried, 2) its proximity to a city well, 3) the capability of local geologic conditions to absorb a contaminant, 4) the effectiveness of existing regulatory controls, 5) the time required for the City of Red Wing to obtain cooperation from governmental agencies that regulate it, and 6) the administrative, legal, technical, and financial resources needed. A **high (H)** risk potential implies that the potential source type has the greatest likelihood to negatively impact the city's water supply and should receive highest priority for management. A **low (L)** risk potential implies that a lower priority for implementing management measures is assigned.

Table 2 - Potential Contamination Sources and Assigned Risk for the IWMZ

Source Type	Total	Level of Risk
Well 7-1 IWMZ		
• Municipal water supply well (unique no. 216020)	1	L
• Emergency Power generator fuel tank	1	L
• French drain for floor drains	1	L
• Storm sewer	1	L

Well 7-2 IWMZ		
• Municipal Water supply well (unique no. 151565)	1	L
• Sanitary sewer	1	L
• Storm sewer	1	L
Well 7-3 IWMZ		
• Municipal Water supply well (unique no. 686251)	1	L
• Emergency Power generator fuel tank	1	L
• Water treatment backwash tank w/o direct sewer connection	1	L
• Sanitary sewer	1	L
• Storm sewer	2	L
Well 8-1 IWMZ		
• Municipal Water supply well (unique no. 686252)	1	L
• Storm sewer	1	L
Well 8-2 IWMZ		
• Municipal Water supply well (unique no. 686258)	1	L
• Water treatment backwash tank w/o direct sewer connection	1	L
• Storm sewer	2	L
• Emergency Power generator fuel tank	1	L
• Sanitary sewer	1	L
• Storm water management pond	1	L

Table 3 - Potential Contamination Sources and Assigned Risk for the Rest of the DWSMA

Municipal

Potential Source Type	Total Number	Number Within Emergency Response Area and Level of Risk		Number Within Remainder of the DWSMA and Level of Risk	
East DWSMA - Domestic wells with bottom below 600 ft MSL or of unknown depth	16	0	L	16	L
East DWSMA - Municipal wells	3	3	L	0	N.A.
West DWSMA – Municipal Wells	2	2	L	N.A.	N.A.

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Chapter 5 - Impact of Land and Water Use Changes on the Public Water Supply Well(s)

The city estimates that the following changes to the physical environment, land use, surface water, and groundwater-may occur over the 10-year period that the WHP plan is in effect (Table 4). This is needed 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. The anticipated changes may occur within the jurisdictional authority of the city, although some may not. Table 4 describes the anticipated changes to the physical environment, land use, and surface water or groundwater in relationship to the 1) influence that existing governmental land and water programs and regulations may have on the anticipated change, and 2) administrative, technical, and financial considerations of the City of Red Wing and property owners within the DWSMA.

Table 4a - Expected Land and Water Use Changes – West Drinking Water Supply Management Area

Expected Change (Physical Environment, Land Use, Surface Water, Groundwater)	Impact of the Expected Change On the Source Water Aquifer	Influence of Existing Government Programs and Regulations on the Expected Change	Administrative, Technical, and Financial Considerations Due to the Expected Change
Physical Environment: No change is anticipated	Does not apply	Does not apply	Does not apply
Land Use: The DWSMA is zoned is A/R – Agricultural / Residential; B1 – Local business; R1- Residential and PUD – Planned Unit Development. Land use is not anticipated to change. Additional development will be minimal and likely limited to individual housing units. Residential development within the DWSMA will be in the city limits and would be connected to city water and sewer service.	Potential development will not impact DWSMA. No additional sources of contamination would be added as a result of this development.	Does not apply	Does not apply
Surface Water: No change is anticipated	Does not apply	Does not apply	Does not apply
Groundwater: No change is anticipated	Does not apply	Does not apply	Does not apply

Table 4b - Expected Land and Water Use Changes – East Drinking Water Supply Management Area

Expected Change (Physical Environment, Land Use, Surface Water, Groundwater)	Impact of the Expected Change On the Source Water Aquifer	Influence of Existing Government Programs and Regulations on the Expected Change	Administrative, Technical, and Financial Considerations Due to the Expected Change
Physical Environment: No change is anticipated	Does not apply	Does not apply	Does not apply
Land Use: The portion of the DWSMA that is within the city limits is zoned Residential, Planned Unit Development and Agricultural/Residential. The portion of the DWSMA that is outside the city limits is single family residential. No significant changes or significant additional development is anticipated. Individual residential units constructed outside the city limits will use on-site wells and waste disposal.	On-site waste disposal systems will not impact the water supply wells due to the confined nature of the aquifer. Individual water supply wells may or may not have an impact depending upon their depth.	Any new water supply wells will need to meet the current well code construction requirements. Proper well construction will minimize the potential for surface activities to impact the water supply aquifer.	Does not apply
Surface Water: No change is anticipated	Does not apply	Does not apply	Does not apply
Groundwater: No change is anticipated	Does not apply	Does not apply	Does not apply

Chapter 6 - Issues, Problems, and Opportunities

6.1 Identification of Issues, Problems and Opportunities

The City of Red Wing has identified water and land use issues and problems and opportunities related to 1) the aquifer used by the city water supply wells, 2) the quality of the well water, or 3) land or water use within the DWSMA. The city assessed 1) input from public meetings and written comments it received, 2) the data elements identified by MDH during the scoping meetings, and 3) the status and adequacy of the city's official controls and plans on land and water uses, in addition to 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 city's DWSMA. Identifying issues, problems and opportunities, including resource needs, enables the city 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.

6.2 Comments Received

There have been several occasions for local governments, state agencies, and the general public to identify issues and comment on the city's WHP plan. At the beginning of the planning process, local units of government were notified that the city was going to develop its WHP plan and were given the opportunity to identify issues and comment. A public information meeting was held to review the results of the delineation of the wellhead protection area, DWSMA, and the vulnerability assessments. The meetings of the city's wellhead protection team were open to the public. No comments were made during the initial public hearing. One representative from a township that is a part of the DWSMA called to see if there would be any impact on township residents.

A second public hearing was held on Monday, May 9, 2016, before the completed WHP plan was sent to MDH for state agency review and approval. The meeting notification and a copy of the draft Wellhead Protection Plan were sent to the local units of government (LUG). No comments were received from any local units of government. Comments were received from The Minnesota Department of Health and the Minnesota Rural Water Association, and were incorporated into the Plan as approved by the Red Wing City Council and submitted to the Department of Health.

The issues and problems identified through the public and governmental comments are summarized in Table 5.

Table 5 - Issues, Problems, and Opportunities

Issue Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	Adequacy of Existing Controls to Address the Issue
Township official questioned if the wellhead management plan would impact them.	Aquifer DWSMA and development impacts.	Official was concerned that our Wellhead protection plan could impact township residents	None of the township private wells pump from the Mount Simon Aquifer and would not pose a contamination risk, therefore impact on township residents is minimal.	No additional controls are necessary. Any new development would not be expected to utilize the Mount Simon aquifer due to depth and radium concentration.
Portion of the east DWSMA is outside the City limits	DWSMA control	A portion of the East DWSMA is outside the legal jurisdiction of the City. It would not be possible for the Public Water Supply to require controls or management procedures without township or county cooperation.	The individual residential wells in this area are generally hydraulically isolated from the aquifer used by the City. Any new development would be residential in nature and would use wells similar to the existing ones.	No additional controls are necessary. Any new development would not be expected to utilize the Mount Simon aquifer due to depth and radium concentration.
Potential construction of new wells that could penetrate the water supply aquifer	Aquifer water quality	There is a potential for new wells to be drilled deep enough to penetrate the water supply aquifer, presenting a new source of contamination	It is unlikely, though possible, that the water supply aquifer would be used due to the known presence of radium, and the availability of water from shallower aquifers.	If a new well were proposed that would penetrate or impact the water supply aquifer, the owner would be provided wellhead Protection and well maintenance information. Any new wells will be added to the Potential Contaminate Source Inventory (PCSI).
West DWSMA is zoned agricultural. There is the potential for construction of future high capacity agricultural irrigation wells.	Aquifer water quality	Improper well construction could lead to potential aquifer contamination. Large volume wells could impact water quantity.		New wells would be constructed in compliance with the code, which would minimize the potential for contamination. New wells would also be added to the PCSI. DNR would review a preliminary appropriation permit request and consider possible impacts to the city municipal wells in collaboration with the city and MDH.

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

In addition to its own controls, the City of Red Wing will rely upon partnerships formed with local units of government, state agencies, and federal agencies with regulatory controls or resource management programs in place to help implement its WHP plan. The level of support that a local, state, and federal agency can provide depends on its legal authority, as well as the resources available to local governments.

7.1 Existing Controls and Programs of the City of Red Wing

Table 6 shows the legal controls and/or programs that the city has identified to support the management of potential contamination sources within the DWSMA. It should be noted that all active wells were determined to be non-vulnerable, and are not subject to contamination from surface activities.

Table 6 - Controls and Programs of the City of Red Wing

Type of Control	Program Description
Building Permits	Provides an opportunity to require performance standards to offset potential risk posed by a land use.
Ordinance Requiring Hookup to City Services (if available)	This requirement applies to both water and wastewater services. Reduces the likelihood that the pumping of other wells will impact contaminant movement to the city wells. Also reduces the potential from septic tanks and drain fields.
Zoning	Insures that develop is consistent with the local and that the necessary infrastructure is in place.
Storm Water Management	Includes zoning, building codes and ordinances to minimize potential of erosion and contamination form improper disposal of storm water

7.2 Local Government Controls and Programs

The following departments or programs within Goodhue County may be able to assist the city 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 - Local Agency Controls and Programs

Government Unit	Name of Control/Program	Program Description
Goodhue County Soil and Water Conservation District	Water Planning - Prepared the Goodhue County Local Water Quality Management	Establishes countywide goals and priorities towards protecting water resources.

	Plan	
Goodhue County Divisions of Buildings, Planning and Zoning	Building permits, zoning regulations, and land use planning	Land use and structure type regulation.
Goodhue County Environmental Health Services	Delegated authority for well management	Permit and inspect new wells, and the sealing of abandoned wells
Featherstone Township (applies to East WHPA only)	Zoning regulations	Area that is outside the City limits is zoned FR- 1 Residential. Large scale, industrial development that would have the potential to impact the WHPA is not permitted by that zoning.

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. Furthermore, MDH 1) administers state regulations that affect specific potential sources of contamination and 2) can provide technical assistance to property owners to comply with these regulations.

The following table identifies the specific regulatory programs or technical assistance that state and federal agencies may provide to the City of Red Wing to support implementation of the WHP plan. It is likely that other opportunities for assistance may be available over the 10-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 the city's WHP plan was first approved by MDH.

Table 8 - State and Federal Agency Controls and Programs

Government Unit	Type of Program	Program Description
MDH	State Well Code (Minnesota Rules, Chapter 4725)	MDH has authority over the construction of new wells and the sealing of wells. MDH staff in the Well Management Program offer technical assistance for enforcing well construction codes, maintaining setback distances for certain contamination sources, and well sealing.
MDH	Source Water Protection Unit	MDH has staff that will help the city identify technical or financial support that other governmental agencies can provide to assist with managing potential contamination sources.
MDH	Clean Water Fund – Well Sealing Grants	The City has obtained a grant from the MDH to seal well no. 3 located at 639 21 st St. This work was completed in 2015.

DNR	Water appropriation permitting (Minnesota Rules, Chapter 6115)	DNR can require that anyone requesting an increase in existing permitted appropriations, or to pump groundwater, must address concerns regarding the impacts to drinking water if these concerns are included in a WHP plan.
USEPA	Regulation of Class V wells	USEPA would regulate any Class V wells if they were to be constructed in the future. At the present time, there are no known Class V wells in either DWSMA.

7.4 Support Provided by Nonprofit Organizations

The following table identifies support that is available by nonprofit organizations. This support will also likely change in the future and other entities or programs may be identified in future revisions.

Government Unit	Type of Program	Program Description
Minnesota Rural Water Association	Source Water Protection Program	MRWA provided extensive technical assistance during the preparation of the Phase II Well Head protection document.
Red Wing Community Awareness and Emergency Response	Emergency Spill Response	Red Wing CAER is organization of local industry, and governmental emergency response groups. The group has equipment and training to serve as a first respondent to chemical spills, particularly those in surface water. Spill cleanup reduces the potential for groundwater contamination.

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Chapter 8 - 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:

- Maintain a safe and adequate drinking water supply for community residents;
- Increase awareness among public officials, land owners and the general public about the importance of Wellhead Protection in protecting the drinking water supply.
- Develop and implement an active, community-wide water conservation program.
- Emergency and Contingency Planning to address disruption of a public water supply from a human caused accident or natural disaster.

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Chapter 9 - Objectives and Plan of Action

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), 2) the potential contaminant source inventory (Chapter 4), 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). In general, the current land use planning and governmental controls already in place in the DWSMA are adequate to protect the WHPA from contamination. This is largely due to the non-vulnerable nature of the drinking water supply aquifer and wells. The objectives and action plan are primarily aimed at monitoring future changes in land use planning and zoning in the DWSMA that could allow activities that have the potential to impact the WHPA. A secondary objective is to couple the public education and information aspects of the wellhead protection program with other similar programs, including water supply planning and conservation programs, and surface water management to increase the public awareness of related water supply and quality issues.

9.1 Objectives

The following objectives have been identified to support the goals of the WHP plan for the City of Red Wing:

1. Create public awareness and general knowledge about the importance of WHP for maintaining an adequate and safe drinking water supply;
2. Coordinate with other agencies to create awareness of wellhead protection and minimize potential for contamination.
3. Monitor activities within the DWSMA and IWMZ to minimize or control those that have the potential to cause contamination.
4. Coordinate the WHPP information and educational efforts with those associated with other water supply and quality programs;
5. Monitor future changes in land use planning and other activities that could impact the water supply;
6. Maintain adequate emergency response strategies to be able to effectively react to any incidents that could result in contamination.
7. Monitor potential development within DWSMA to minimize activities with potential to cause water supply contamination; and
8. Obtain more information about the aquifer to assist with long term planning.
9. Periodically update WHP activities to address new concerns or developments that were not anticipated when the plan was originally developed.

9.2 WHP Measures and Action Plan

Based upon the factors, the WHP team has identified WHP measures that will be implemented by the city over the 10-year period that its WHP plan is in effect. The objective that each measure supports is noted as well as 1) the lead party and any cooperators, 2) the anticipated cost for implementing the measure and 3) the year or years in which it will be implemented.

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:

- Data Collection
- IWMZ Management
- Land Use Management
- Potential Contamination Source Management
- Public Education and Outreach
- Reporting and Evaluation
- Water Use and Contingency Strategy

9.3 Establishing Priorities

WHP measures reflect the administrative, financial, and technical requirements needed to address the risk to water quality or quantity presented by each type of potential contamination source. Not all of these measures can be implemented at the same time, so the WHP team assigned a priority to each. A number of factors must be considered when WHP action items are selected and prioritized (part 4720.5250, subpart 3):

- Contamination of the public water supply wells by substances that exceed federal drinking water standards.
- Quantifiable levels of contamination resulting from human activity.
- The location of potential contaminant sources relative to the wells.
- The number of each potential contaminant source identified and the nature of the potential contaminant associated with each source.
- The capability of the geologic material to absorb a contaminant.
- The effectiveness of existing controls.
- The time needed to acquire cooperation from other agencies and cooperators.
- The resources needed, i.e., staff, money, time, legal, and technical resources.

The City of Red Wing defines a priority for implementing a WHP measure as follows. A high priority measure is defined as that needed to address an existing deficiency with physical infrastructure that could lead to contamination or disruption in service. A medium priority measures include data gathering, public information and documentation tasks that promote the goals and document the tasks. Low priority measures are those that would not address deficiencies or promote program goals. While all tasks will be implemented over a 10-year period, the data gathering, public information and documentation tasks typically begin early in the 10-year period that the City's WHP plan is in effect.

The majority of the goals are assigned a medium priority. This is largely due non-vulnerable classification of the wells and aquifers, and the fact that most of the facilities are relatively new and were constructed in accordance with modern standards.

Table 9 - WHP Plan of Action

CATEGORY 1: MONITORING, DATA COLLECTION AND ASSESSMENT:

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame											
					2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
WHP Measure (1): Work with MDH Hydrologist to conduct an aquifer test on one or more of the public water supply wells. Work with MDH to develop a work plan that identifies steps and resources to complete work.	Obtain more information about the aquifer to assist with long term planning.	Low	Deputy Director Public Works – Utilities (currently Robert Stark), MDH hydrologist	unknown		X										
WHP Measure (2): Update the well inventory (spreadsheet and map) every 2 ½ years. Review the status of existing wells and add new wells identified in the DWSMA. Attempt to identify depths on wells that were not in the CWI.	Obtain more information about the aquifer to assist with long term planning.	Medium	Deputy Director Public Works – Utilities (currently Robert Stark)	\$500/time	X		X		X			X		X		X
WHP Measure (3): Provide a map of the DWSMA to the local Fire Dept., City and County Public Works Departments pointing out the specific location of city wells. Request their awareness and prompt response to accidents, spills and clean-up efforts near the PWS wells.	Coordinate with other agencies to create awareness of wellhead protection and minimize potential for contamination.	Medium	Deputy Director Public Works – Utilities (currently Robert Stark)	\$500	X											

Table 9 - WHP Plan of Action - Continued

CATEGORY 2- WELL MANAGEMENT

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame																
					2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027						
WHP Measure (4): Manage the Inner Wellhead Management Zone (IWMZ) include all that apply: 1. Review and update the IWMZ survey form for all wells in the system every 6 years. 2. Monitor setbacks for all new potential sources of contamination within the IWMZ. 3. Implement the most current recommended wellhead protection measures identified in the IWMZ-PCSI Reports.	Monitor future changes in land use planning and other activities that could impact the water supply.	Medium	Deputy Director Public Works – Utilities (currently Robert Stark) (Items 1,2 and 3) Cooperators include MRWA (Item 1) and MDH Drinking Water Staff (Item 1)	\$500/time	X					X										X	
				\$500/time	X		X			X		X					X				X
				\$500/time	X			X		X		X					X				X

Table 9 - WHP Plan of Action - Continued

CATEGORY 3: EDUCATION AND OUTREACH

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame											
					2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
WHP Measure (7): Distribute the MN Rural Water Association’s “Where Does My Drinking Water Come From?” brochure to landowners in the DWSMA.	Coordinate with other agencies to create awareness of wellhead protection and minimize potential for contamination.	Medium	Deputy Director Public Works – Utilities (currently Robert Stark); Rural Water Groundwater Specialist	\$500	X					X						X
WHP Measure (8): Post and highlight WHP education information on your city or utility website.	Create public awareness and general knowledge about the importance of the WHP for maintaining an adequate and safe drinking water supply.	Medium	Deputy Director Public Works – Utilities (currently Robert Stark), Information Technology Department	\$1000	X	X	X	X	X	X	X	X	X	X	X	X
WHP Measure (9): Select wellhead protection education items from the MN Rural Water Association source water protection website to use to educate the public about WHP in your community.	Coordinate the WHPP information and educational efforts with those associated with other water supply and quality programs.	Medium	Deputy Director Public Works – Utilities (currently Robert Stark); Rural Water Groundwater Specialist	\$500	X		X		X		X		X		X	X

WHP Measure (13): Educate the public on water conservation practices they can implement to reduce water use.	Create public awareness and general knowledge about the importance of the WHP for maintaining an adequate and safe drinking water supply.	Medium	Deputy Director Public Works – Utilities (currently Robert Stark);	\$1000	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WHP Measure (14): Implement the water management plan approved by the Minnesota DNR.	Coordinate the WHPP information and educational efforts with those associated with other water supply and quality programs.	Medium	Deputy Director Public Works – Utilities (currently Robert Stark);	Not a separate cost	X														
WHP Measure (15): Request the County Water Plan Coordinator includes the DWSMA Map and identifies local WHP issues and activities when the County Water Management Plan is updated.	Coordinate the WHPP information and educational efforts with those associated with other water supply and quality programs.	Medium	Deputy Director Public Works – Utilities (currently Robert Stark); County Water Plan coordinator	\$500	X														

Table 9 - WHP Plan of Action - Continued

CATEGORY 4: LAND USE PLANNING

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame										
					2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
WHP Measure (18): Reference and or incorporate the Wellhead Protection Plan in the City's Comprehensive Plan	Monitor future changes in land use planning and other activities that could impact the water supply;	Medium	Deputy Director Public Works – Utilities (currently Robert Stark), in cooperation with the Planning Department.	\$500		X									

Table 9 - WHP Plan of Action - Continued

CATEGORY 5: COORDINATION, REPORTING AND EVALUATION

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame										
					2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
WHP Measure (19): Hold annual meeting with the WHP Team and local resource partners involved in plan implementation to discuss new WHP issues, past year’s accomplishments and activities planned for the upcoming year.	Periodically and update WHP activities to address new concerns or developments that were not anticipated when the plan was originally developed.	Medium	Wellhead protection team	\$1500/yr	X	X	X	X	X	X	X	X	X	X	X
WHP Measure (20): Complete and submit an annual year-end report on completed WHP activities to the City Council.	Periodically and update WHP activities to address new concerns or developments that were not anticipated when the plan was originally developed.	Medium	Deputy Director Public Works – Utilities (currently Robert Stark); City Council	\$500/yr	X	X	X	X	X	X	X	X	X	X	X

9.4 Commitments from Cooperators

The City of Red Wing will depend upon support from the following agencies to implement the measures identified below.

Table 10 - Cooperating Agencies List

Agency	Measure	Actions Agency Will Take
Minnesota Department of Health	1	Assist with aquifer study
Goodhue County Soil and Water Conservation District	6, 15, 16	Coordinate County efforts, especially with portions of the DWPMA that is outside the Red Wing City Limits
Minnesota Rural Water Association	7, 9	Provide educational material

Chapter 10 - Evaluation Program

Evaluation is used to support plan implementation and is required under Minnesota Rules, part 4720.5270, prior to amending the city's WHP plan. Plan evaluation is specified under Objective X 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 DWSMA. The City has identified the following procedures that it will use to evaluate the success with implementing its WHP plan:

1. An annual briefing to the city council will provide the basis for documenting whether each action step for that year was implemented.
2. 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 DWSMA;
3. The city will assess the results of each action item that has been taken annually to determine whether the action item has accomplished its purpose or whether modification is needed. Assessment results will be presented in the annual report to the city council.
4. The city will prepare a written report that documents how it has assessed plan implementation and the action items that were carried out. The report will be presented to MDH at the first scoping meeting held with the city to begin amending the WHP plan.

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Chapter 11 - Contingency Strategy

The WHP plan includes a contingency strategy that addresses disruption of the water supply caused by either contamination or mechanical failure. An Emergency Response Plan, was developed as part of the Water Supply and emergency Plan, however that document has not yet been approved by the Department of Natural Resources. A stand-alone Water Supply Contingency Plan was developed and is included in Appendix III.

The City of Red Wing is isolated from surrounding communities and there are no interconnections with other public water supplies. The design of the water supply and treatment infrastructure was based on providing the same or greater degree of reliability provided by interconnected systems, and has the capability to withstand most natural or mechanical catastrophic events.

Two completely independent treatment facilities are provided, each with multiple dedicated wells. Both treatment plants and four of the five wells are provided with standby generators that have 100% capacity. The remaining well (7-2) has provisions to enable a portable generator to be used. The City has two portable generators that have the capacity to power this well if necessary. Either plant has the capacity to meet the peak day demands. This capacity could be extended by implementing the emergency water use restrictions identified in the Emergency Response Plan. While all the wells draw from the same aquifer, which is designated as non-vulnerable, the wellfields are 4 miles apart. It is unlikely that a contamination event could impact both wellfields.

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Chapter 12 - Glossary of Terms

Data Element. A specific type of information required by the Minnesota Department of Health to prepare a wellhead protection plan.

Drinking Water Supply Management Area (DWSMA). The surface and subsurface areas surrounding a public water supply well, including the wellhead protection area, that must be managed by the entity identified in the wellhead protection plan. (Minnesota Rules, part 4720.5100, subpart 13). This area is delineated using identifiable landmarks that reflect the scientifically calculated wellhead protection area boundaries as closely as possible.

Emergency Response Area (ERA). The part of the wellhead protection area that is defined by a one-year time of travel within the aquifer that is used by the public water supply well (Minnesota Rules part 4720.5250, subpart 3). It is used to set priorities for managing potential contamination sources within the DWSMA.

Emergency Standby Well. A well that is pumped by a public water supply system only during emergencies, such as when an adequate water supply cannot be achieved because one or more primary or seasonal water supply wells cannot be used.

Inner Wellhead Management Zone (IWMZ). The land that is within 200 feet of a public water supply well (Minnesota Rules, part 4720.5100, subpart 19). The City of Red Wing must manage the IWMZ to help protect it from sources of pathogen or chemical contamination that may cause an acute health effect.

Nonpoint Source Contamination. Refers to contamination of the drinking water aquifer that is caused by polluted runoff or pollution sources that cannot be attributed to a specifically defined origin, e.g., runoff from agricultural fields, feedlots, or urban areas.

Point Source Contamination. Refers to contamination of the drinking water aquifer that is attributed to pollution arising from a specifically defined origin, such as discharge from a leaking fuel tank, a solid waste disposal site, or an improperly constructed or sealed well.

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

Seasonal Water Supply Well. A well that is only used to provide drinking water during certain times of the year, either when pumping demand cannot be met by the primary water supply well(s) or for a facility, such as a resort, that is closed to the public on a seasonal basis.

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 City of Red Wing or 2) an aquifer that is a source of public drinking water.

WHP Area (WHPA). 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. An overall outcome of implementing the WHP plan, e.g., providing for a safe and adequate drinking water supply.

WHP Measure. A method adopted and implemented by a City of Red Wing 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. A capability needed to achieve one or more WHP goals, e.g., implementing WHP measures to address high priority potential contamination sources within 5 years.

Chapter 13 - List of Acronyms

The following acronyms appear in the test of this report. The acronyms are generally defined in the test; however they are summarized here for convenience.

Acronym	Meaning
CAER	Community Awareness and Emergency Response
CWI	County Well Index
DNR	Department of Natural Resources
DWSMA	Drinking Water Supply Management Area
ERA	Emergency Response Area
FEMA	Federal Emergency Management Agency
GCSWCD	Goodhue County Spoil and Water Conservation District
IWMZ	Inner Wellhead Management Zone
LMIC	Land Management Information Center
LUG	Local Unit of Government
MCL	Maximum Contaminate Level
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MGIO or MGEO	Minnesota Geospatial Information Office
MGS	Minnesota Geological Survey
MPCA	Minnesota Pollution Control Agency
NRCS	Natural Resources Conservation Service
PUD	Planned Unit Development
SWCD	Soil and Water Conservation District
USGS	United States Geological Service
USEPA	United States Environmental Protection Agency
WPA	Well Head Protection Area
WHP or WHPP	Well Head Protection Plan
WMO	Watershed Management Organization
WSD	Watershed District

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Chapter 14 - References

Wellhead Protection Information

Wellhead Protection Statutory Requirements – Minnesota rules Parts 4720.5100 to 45720.5590

WWW.health.state.mn.us/divs/eh/water/swp/whp

Minnesota Well Index – <https://apps.health.state.mn.us/cwi>

Agency Websites

Goodhue County soil and Water Conservation District – www.goodhueswcd.org

Minnesota Department of Health – www.health.state.mn.us

Minnesota Rural Water Association – www.mrwa.com

Minnesota Department of Natural Resources – www.dnr.state.mn.us

Minnesota Pollution Control Agency – www.pca.state.mn.us

City of Red Wing

City Website - www.red-wing.org

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Appendix I – WHPA and DWSMA Delineation and Vulnerability Assessments

The Well Head Protection Area (WHPA) and the Drinking Water supply Management Area (DWSMA) were determined by Barr Engineering in the preparation of the Phase I portion of the City's Well Head Protection Plan. The criteria and procedures used in the WHPA and DWSMA delineations were contained in Chapters 2, 3 and 4 of the Phase I report. The vulnerability assessments of the water supply wells and the DWSMA were contained in Chapters 5 and 6. These chapters are reproduced here in their entirety.

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2.0 Criteria for Wellhead Protection Area Delineation

The following criteria were used to ensure accurate delineation of the WHPA.

2.1 Time of Travel

A minimum ten-year time of travel criteria must be used to determine a WHPA (MN Rule 4720.5510) so there is sufficient reaction time to remediate potential health impacts in the event of contamination of the aquifer. A time of travel of ten years was considered in this study. As required by the Wellhead Protection Rules, the one-year time of travel was also determined for each well addressed in this study.

2.2 Aquifer Transmissivity

Per discussions with Minnesota Department of Health (MDH) staff during the Pre-Delineation Meeting (MDH, 2013), aquifer transmissivity and hydraulic conductivity for the vicinity of Red Wing were determined from published values and specific capacity data using the TGuess Method (Bradbury and Rothschild, 1985). The U.S. Geological Survey conducted a pumping test in 2001 on Prairie Island Well 3 (completed in the Mt. Simon Sandstone) and obtained a transmissivity of 3000 ft²/day (300 m²/day) and a hydraulic conductivity of 10 ft/day (3 m/day) (Winterstein, 2002). Specific capacity was calculated for wells located within the model domain using data taken from the Minnesota County Well Index (CWI) (MGS, 2012). The TGuess calculations arrived at geometric mean transmissivity values of 95 ft²/day (8.8 m²/day) for the Eau Claire Formation and 2600 ft²/day (240 m²/day) for the Mt. Simon Sandstone. The transmissivity calculations are summarized in Appendix B. For model input, hydraulic conductivity values were calculated by dividing the transmissivity values by average layer thicknesses near the Red Wing well fields. The corresponding hydraulic conductivity values were 2 ft/day (0.68 m/day) for the Eau Claire Formation and 12 ft/day (3.6 m/day) for the Mt. Simon Sandstone. These conductivity values were allowed to vary during the model calibration over ranges determined from the maximum and minimum values from the specific capacity calculations and typical values reported in Runkel et al. (2003). See Section 2.5 for more discussion of the model calibration.

2.3 Daily Volume of Water Pumped

Pumping data for Red Wing for the period 2008 through 2012 is summarized in Table 3. The largest annual withdrawal for 2008-2012 was 611,121,000 gallons in 2008. The projected total withdrawal for 2018 is estimated to be 542,598,719 gallons based on the 2010 per capita water use and a 2018

population estimate extrapolated from the 2000-2010 population growth rate. Projected pumping rates for 2018 were estimated for each well based on the percentage of the total volume that each well pumped from 2008-2012. The pumping rate for each well used in the delineation of the WHPA was the maximum of either the projected 2018 pumping rate, or those reported for 2008-2012.

2.4 Conceptual Hydrogeologic Model

2.4.1 Geologic History

Red Wing is located in a geologic feature called the Hollandale Embayment – a large bay in an ancient shallow sea where sediment was deposited as the seas waxed and waned to form what is now most of the major bedrock geologic units in eastern Minnesota. During the Quaternary (about the last two-million years), glacial advances eroded away higher relief bedrock units and deposited a mixture of glacially derived tills and outwash over the landscape. This glacial drift is quite thin (< 50 feet thick) over much of southeastern Minnesota, except where alluvium has filled deep channels eroded into the bedrock by rivers (Delin and Woodward, 1984).

2.4.2 Regional Bedrock Geology

The bedrock subcrop as interpreted by Runkel (1998) is shown on Figure 1. Locations of two geologic cross sections through the study area are also shown on Figure 1. Geologic cross section A-A' is a generally west to east cross section (Figure 2) and cross section B-B' is a generally north to south cross section (Figure 3).

The hydrostratigraphic units of importance for this study are described in more detail below in age order from oldest to youngest.

Mt. Simon Sandstone

The Cambrian-aged Mt. Simon Sandstone is up to 250 feet (76 m) thick and consists of fine- to coarse-grained quartzose sandstone intermixed with beds of feldspathic sandstone, siltstone, and shale (Runkel, 1998). It is the only high-capacity aquifer available to Red Wing. Except for a small area in Pine County, the Mt. Simon Sandstone is a confined aquifer in Minnesota (Delin and Woodward, 1984).

Eau Claire Formation

The Cambrian-aged Eau Claire Formation is composed of commonly interbedded very fine- to fine-grained sandstone, siltstone, and shale (Runkel, 1998). The Eau Claire Formation is recognized as a

regional confining unit, though under shallow bedrock conditions (< 200 ft of overlying bedrock) it can locally produce enough water to be classified as an aquifer (Runkel et al., 2003).

2.4.3 Recharge and Discharge of Groundwater

Recharge to the Mt. Simon Sandstone comes from leakage through overlying units, e.g. the Eau Claire Formation and drift (Delin and Woodward, 1984). The Mississippi River forms the primary regional discharge zone for groundwater. Vertical gradients across the Eau Claire Formation transition from downward in southwestern Goodhue County to upward nearing the Mississippi River. Flowing conditions have been observed in wells completed in the Mt. Simon Sandstone in and near the City of Red Wing; e.g. the sealing record 251610 for Red Wing Well 4 and both the pumping and observation wells in the Prairie Island pumping test (Winterstein, 2002).

2.4.4 Direction of Groundwater Flow

Regional groundwater flow for all bedrock aquifers in the vicinity of Red Wing is generally to the north-northeast toward the Mississippi River. Near high capacity wells, groundwater flow is typically toward the wells. A published contour map for the Mt. Simon Sandstone is included in Appendix C.

2.5 Model Description

The finite difference code MODFLOW-2000 (McDonald and Harbaugh, 1988; Harbaugh et al., 2000) was used for this study to simulate groundwater flow in the Eau Claire Formation and Mt. Simon Sandstone. MODFLOW is public domain software that is available at no cost from the United States Geological Survey. The pre- and post-processor Groundwater Vistas (Version 6.29, Build 5) (Environmental Simulations, Inc., 2011) was used to create the data files and evaluate the results.

Per the discussion at the Red Wing Pre-Delineation meeting (MDH, 2013), a two-layer model was constructed for the porous media flow evaluation portion of the Red Wing WHPA delineation. The two layers represent the following geologic units:

- Layer 1 = Eau Claire Formation
- Layer 2 = Mt. Simon Sandstone

The south, west, and east horizontal model boundaries are based on the Mt. Simon Sandstone potentiometric surface map from Delin and Woodward (1984). The west and east no-flow boundaries of the model follow approximate groundwater flow paths interpreted from the potentiometric surface map. The southern constant head boundary follows the 850 ft contour. No

potentiometric surface maps for the Eau Claire Formation were located. The 900 ft contour on the Ironton-Galesville Sandstones (Wonewoc Sandstone) contour map from Delin and Woodward (1984) is located in approximately the same place as the Mt. Simon 850 ft contour. Since the Eau Claire Formation separates the Mt. Simon Sandstone from the Wonewoc Sandstone, the southern constant-head boundary in Layer 1 was set to the average of the overlying and underlying heads (875 ft). Appendix C includes a map of the model domain and boundary conditions.

The Mississippi River forms the northern boundary of the model and was represented using the River package. Since the bedrock map (Figure 1) shows mostly Eau Claire Formation subcropping below the Mississippi River, all River cells were located in Layer 1. River stages were set to elevations from the LiDAR data for Goodhue County (MnDNR, 2011). River water surface elevations are 205.5 m (674.2 ft) upstream of Lock and Dam #3, 203.15 m (666.5 ft) between the dam and Lake Pepin, and 203 m (666 ft) in Lake Pepin.

Six faults were included in the model along orientations shown on the bedrock map from the Goodhue County Geologic Atlas (Runkel, 1998). Mapped faults were included in the model using the Horizontal Flow Barrier (HFB) package. The HFB package allows the hydraulic conductivity along one or more faces of a grid cell to differ from the cell value.

The top of Layer 1 and bottom of Layer 2 are no-flow boundaries. Since the Eau Claire Formation is recognized as a regional confining unit, recharge to the model is expected to be minimal or zero within the model domain. Potential recharge was evaluated during model calibration using the Recharge package. The bottom of Layer 2 represents the top of the Proterozoic sedimentary rocks. The Minnesota Geological Survey's interpretation of the stratigraphy encountered in Red Wing Well 7-2 identifies the geologic unit encountered in the bottom 45 feet of the well as the Fond du Lac Formation and identifies the primary lithology of the upper 41 feet as sandstone and the lower 4 feet as shale. Morey (1977) describes the Fond du Lac Formation in southeast Minnesota as being comprised of red, moderately well cemented, very poorly sorted sandstone with interbedded shale. Based on this description, the Proterozoic rocks were assumed to be much less conductive than the Mt. Simon Sandstone and can thus be represented by a no-flow boundary.

Layer top and bottom surfaces were generated by interpolating stratigraphy information in the CWI. The CWI database does not contain any wells that penetrate the full thicknesses of the Eau Claire Formation or Mt. Simon Sandstone in or near the southwestern part of the model domain. Average thicknesses of 34.9 m and 75.9 m for the Eau Claire Formation and Mt. Simon Sandstone,

respectively, were calculated from the stratigraphy dataset and applied to wells 247196 and 217760 (both of which terminate in the Eau Claire) to add southwestern points for contouring the Mt. Simon Sandstone top and bottom surfaces. Contact elevations were determined using depths from the CWI and ground surface elevations from the LiDAR data for Dakota, Goodhue, Washington (MnDNR, 2011), Wabasha (MnDNR, 2008), and Rice Counties (Rice County, 2007) at each well location. Appendix C includes a map of layer contacts.

Head data for the Eau Claire Formation and Mt. Simon Sandstone from the CWI were used as calibration targets. Water levels for old Red Wing Wells 1 (219012) and 2 (216017) were updated to 2006 measurements taken when the wells were sealed. The City of Red Wing measured a current Mt. Simon water level of 683.5 ft in old Red Wing Well 4 (219011) (Stark, 2013). Active high capacity wells in the model were not used as head targets, nor were wells located very close to active high capacity wells in the model. Two wells with anomalous water levels, 145830 in Layer 1 and 219015 in Layer 2, were not included in the calibration dataset. The calibration targets were divided into multiple groups and assigned weights according to data quality, layer, and proximity to the Red Wing well fields. Higher weights were assigned to targets deemed more important to match (e.g. water level at Well 4 and Layer 2 targets near the Red Wing well fields) and lower weights were assigned to less essential targets (e.g. Layer 1 targets).

The automated inverse optimization software PEST (Version 12.1) (Watermark Numerical Computing, 2005) was used to calibrate the model by independently varying hydraulic conductivity, riverbed leakance, and HFB conductivity over specified ranges such that the sum of squared residuals (difference between measured and modeled heads) at the head targets was minimized. Recharge was set to zero and not varied in the final calibration since PEST always reduced recharge to its lower bound, even when the lower bound was set extremely low (1×10^{-20} m/day).

Four distinct hydraulic conductivity zones were created; two in Layer 1 and two in Layer 2. Appendix C includes a map of the conductivity zones. Zones 1 and 2 in Layer 1 correspond to regions where the Eau Claire Formation is under deep and shallow bedrock conditions, respectively. (Following Runkel et al. (2003), a unit is under deep bedrock conditions when there is 200 feet or more of overlying bedrock.) All of Layer 2 is in Zone 4 except for the region between the Delin and Woodward (1984) 800 ft contour and the southern boundary of the model; the horizontal hydraulic conductivity of Zone 3 was fixed at the value (2 m/day) which gave the best match between the modeled and published 800 ft contours. The horizontal hydraulic conductivities of Zones 1, 2, and 4 were allowed to vary independently over ranges determined from specific capacity data and typical

values found in Runkel, et al. (2003). The vertical to horizontal hydraulic conductivity ratio (K_v/K_h) for Zones 1 and 2 was held fixed at 4.5×10^{-5} , a value determined by Juckem (2009) from a groundwater modeling study of the counties in Wisconsin directly across the Mississippi River from Red Wing. Vertical hydraulic conductivity of Zone 4 was allowed to vary independently between upper and lower bounds one-tenth of the horizontal hydraulic conductivity bounds for this zone (0.1 is a typical K_v/K_h ratio).

River leakance was allowed to vary independently over a range reported by Juckem (2009). The six faults were each assigned a unique reach number; the same conductivity is assigned to all HFB faces in each reach. Since the effects of the faults near Red Wing on groundwater flow in the area are not well known, the hydraulic conductivities of the HFB reaches were allowed to vary independently over a wide range encompassing many orders of magnitude. Appendix C contains a summary of the calibration, including a table of calibration ranges and final calibrated values for hydraulic conductivity, river leakance, and HFB hydraulic conductivity, residual maps, and a plot of measured versus modeled heads.

MODFLOW files for the calibrated model are included in Appendix G.

2.6 Groundwater Flow Field

As discussed in the conceptual model (Section 2.4) and depicted on Figure 3.7-1 of Delin and Woodward (1984) (included in Appendix C), groundwater flow in the Mt. Simon Sandstone in the vicinity of Red Wing is to the north-northeast towards the Mississippi River. The groundwater flow directions determined by the groundwater flow model in this study are consistent with the expected flow patterns. Figure 4 shows the modeled heads in the Mt. Simon Sandstone.

3.0 Delineation of the Wellhead Protection Areas

Delineation of the WHPA for the Red Wing wells involved the evaluation of porous media flow only. Per discussions at the Pre-Delineation Meeting (MDH, 2013), a fracture flow delineation was not required.

3.1 Porous Media Flow Evaluation

The groundwater flow model discussed above in Section 2.0 was used to simulate the groundwater flow field in the vicinity of Red Wing. The porous media capture zone for each of the Red Wing wells was delineated using the software program MODPATH (Pollock, 1994) with the modeled groundwater flow field. A minimum of 180 particles were distributed vertically surrounding the open interval of each well. These particles were tracked backwards in time for both 1 and 10 years. A porosity value of 0.233 was used for the Mt. Simon Sandstone (Norvitch et al., 1974). In the absence of published porosity data for the Eau Claire Formation, a value of 0.10, reasonable for both shale and fine sandstone (Freeze and Cherry, 1979), was assumed. In plan view, the areas encompassed by the particle traces were then outlined as the one- and ten-year porous medium time of travel zones for each well.

3.1.1 Sensitivity Analysis

A sensitivity analysis was performed for the model using the auto sensitivity option in Groundwater Vistas. The horizontal and vertical hydraulic conductivities in Zone 4 were adjusted to the limits of the calibration range presented in Appendix C, while the horizontal hydraulic conductivities in Zones 1 and 2, the horizontal and vertical hydraulic conductivities in Zone 3, the riverbed hydraulic conductivity, and the fault (HFB cell) hydraulic conductivities were all adjusted plus and minus 50 percent of their final calibrated values. The model was most sensitive to the horizontal hydraulic conductivity in both of the Mt. Simon conductivity zones (Zones 3 and 4). Output from the sensitivity analysis is presented in Appendix C.

Multiple particle tracking simulations were conducted to account for uncertainty in the groundwater flow model. For these simulations, the horizontal hydraulic conductivity values for the most sensitive zones (Zones 3 and 4) were adjusted to the same upper and lower bounds used in the sensitivity analysis. Particle traces from all simulations were combined to define a composite porous media flow capture zone for each well.

3.2 Other Groundwater Withdrawal

Potential interference from other high capacity wells in the area was incorporated by including wells from the Minnesota Department of Natural Resources (MnDNR) SWUDS database in the groundwater flow model. The locations of these wells are shown on a map in Appendix C. Average pumping rates based on annual pumping for the period 2007-2011 were used for these wells. Pumping from wells other than the Red Wing wells was not adjusted to address future use.

3.3 WHPA Delineation

The composite 10-year porous media capture zones define the WHPAs. Emergency Response Zones are delineated for each well from the 1-year porous media capture zones. The WHPAs and Emergency Response Zones are shown on Figures 5a (West Well Field) and Figure 5b (East Well Field).

4.0 Delineation of the Drinking Water Supply Management Areas

Due to the distance between the two well fields, two separate DWSMAs were delineated for Red Wing. The Red Wing DWSMAs encompass the WHPAs with boundaries that correspond to geographically identifiable features (e.g., parcel boundaries, roads, quarter section lines). Parcel boundaries were used as much as possible in the delineation of the DWSMAs. The DWSMAs that encompass the 10-year groundwater time of travel zones are shown on Figure 5a (West Well Field) and Figure 5b (East Well Field). A larger map showing the proximity of the two DWSMAs to one another is included in Appendix D. The West Well Field DWSMA is entirely within the city limits of Red Wing, while the East Well Field DWSMA extends into Featherstone Township and Hay Creek Township to the south of the City.

5.0 Well Vulnerability Assessment

The MDH evaluated the vulnerability of the Red Wing municipal wells to contamination from contaminants released at the surface. The evaluation parameters include geology, well construction, pumping rate, and water quality. All of the active Red Wing wells are classified as not vulnerable. Copies of the MDH well vulnerability scoring sheets for the Red Wing wells are presented in Appendix E.

6.0 Drinking Water Supply Management Area Vulnerability Assessment

The vulnerability of the Mt. Simon Sandstone aquifer supplying the Red Wing wells was assessed using geologic logs for wells located within and surrounding the DWSMAs.

Geologic logs listed in the CWI for wells in the vicinity of the DWSMAs were reviewed and “L scores” based on the thickness of low permeability units above the Mt. Simon Sandstone at each well location were assigned to each well. The MnDNR (1991) procedure for computing L scores was used. Vulnerability ratings were assigned from the L scores as follows:

L Score	Vulnerability Rating
< 1	High
1-4	Moderate
> 4	Low

A map of the L scores calculated for this analysis is included in Appendix F. The L scores range from 9 to 31. These high L scores indicate that the Mt. Simon Sandstone is well-protected by overlying low-permeability formations. Hence the vulnerability of the aquifer in both DWSMAs is classified as Low. Figure 6a (West Well Field) and Figure 6b (East Well Field) show vulnerability maps for the Red Wing DWSMAs.

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Appendix II – Inventory of Potential Contamination Sources

This appendix contains a tabulated inventory of the potential sources of contamination that were identified in each of the DWSMA's. The potential sources of contamination are essentially limited to wells that have a bottom elevation below 600 feet MSL. This includes the 5 municipal water supply wells.

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FAC_I	INV_I	INV_C	INV	IN	INV_STAT	MAT_C	MATERI	VALUE	VAL_UNIT	PSYS_ACRO	PSYS_ID	INV_COMM	C R
1	1	WEL	Well	A	Active	X100	Water	240 feet	240 feet	MDH CWI	573773		
2	2	WEL	Well	A	Active	X100	Water						
3	3	WEL	Well	A	Active	X100	Water					depth unknown per parcel owner	
4	4	WEL	Well	A	Active	X100	Water	240 feet	240 feet	COUNTY	573830		
5	5	WEL	Well	A	Active	X100	Water						
6	6	WEL	Well	A	Active	X100	Water						
7	7	WEL	Well	A	Active	X100	Water	220 feet	220 feet	MDH CWI	522663		
8	8	WEL	Well	A	Active	X100	Water						
9	9	WEL	Well	A	Active	X100	Water					depth unknown per parcel owner	
10	10	WEL	Well	A	Active	X100	Water						
11	11	WEL	Well	A	Active	X100	Water					depth unknown per parcel owner	
12	12	WEL	Well	A	Active	X100	Water						
13	13	WEL	Well	A	Active	X100	Water						
14	14	WEL	Well	A	Active	X100	Water						
15	15	WEL	Well	A	Active	X100	Water	260 feet	260 feet	MDH CWI	554707		
16	16	WEL	Well	A	Active	X100	Water	260 feet	260 feet	MDH CWI	547315		
17	17	WEL	Well	A	Active	X100	Water	630 feet	630 feet		216020	Municipal water supply well 7-1	
18	18	WEL	Well	A	Active	X100	Water	665 feet	665 feet		151565	Municipal water supply well 7-2	
19	19	WEL	Well	A	Active	X100	Water	639 feet	639 feet		686251	Municipal water supply well 7-3	
20	20	WEL	Well	A	Active	X100	Water	665 feet	665 feet		686252	Municipal water supply well 8-1	
21	21	WEL	Well	A	Active	X100	Water	662 feet	662 feet		686258	Municipal water supply well 8-2	

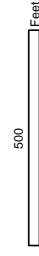
FAC_I	FAC_NAME	FAC_C	FAC_TYPE	ST_ADDR	S_CITY	STA\ZIP5_C	COUNTY_C	PIN	FAC_COMM
1	Kim Brown	1101	Residence	1630 Bluebird Lane	Red Wing	MN	55066	Goodhue	3111000070 240 feet deep well, bottom approx. 570 feet MSL
2	Donald Mitchell	1101	Residence	1655 Bluebird Lane	Red Wing	MN	55066	Goodhue	3111001160
3	Mark Wasmund	1101	Residence	1690 Bluebird Lane	Red Wing	MN	55066	Goodhue	3111000060 depth unknown
4	Carol Jensen	1101	Residence	1730 Bluebird Lane	Red Wing	MN	55066	Goodhue	3111000050 240 feet deep well, bottom approx. 565 feet MSL
5	Anthony Olin	1101	Residence	1755 Bluebird Lane	Red Wing	MN	55066	Goodhue	3111001120
6	Kristen Schlauderoff	1101	Residence	2371 Cardinal Drive	Red Wing	MN	55066	Goodhue	3110000080
7	Kenneth Roberts	1101	Residence	2414 Cardinal Drive	Red Wing	MN	55066	Goodhue	3111001170 220 feet deep well, bottom approx. 595 feet MSL
8	James Machnik	1101	Residence	2430 Cardinal Drive	Red Wing	MN	55066	Goodhue	3111001150
9	Craig Firl	1101	Residence	2460 Cardinal Drive	Red Wing	MN	55066	Goodhue	3111001140 Depth unknown
10	Dwight Scheitel	1101	Residence	2283 Hay Creek Trail	Red Wing	MN	55066	Goodhue	340062400
11	Marlies Corner	1101	Residence	2350 Hay Creek Trail	Red Wing	MN	55066	Goodhue	340060900 depth unknown
12	Douglas Knapp	1101	Residence	2365 Hay Creek Trail	Red Wing	MN	55066	Goodhue	340062100 Depth unknown
13	Michael Roberts	1101	Residence	2440 Hay Creek Trail	Red Wing	MN	55066	Goodhue	3110001120
14	Steven Yockey	1101	Residence	2315 South Oak Road	Red Wing	MN	55066	Goodhue	3430000010
15	Christopher O'Conner	1101	Residence	2320 South Oak Road	Red Wing	MN	55066	Goodhue	3430000090 260 feet deep well, bottom at approx. 587 feet, MSL
16	Donald Blahnick	1101	Residence	2333 South Oak Road	Red Wing	MN	55066	Goodhue	3430000020 260 feet deep well, bottom approx. 585 feet MSL
17	City of Red Wing	4334	Public water supplier	1468 Pioneer Road	Red Wing	MN	55066	Goodhue	556200560 Well 7-1 630 feet deep
18	City of Red Wing	4334	Public water supplier	1468 Pioneer Road	Red Wing	MN	55066	Goodhue	5560000050 Well 7-2 665 feet deep
19	City of Red Wing	4334	Public water supplier	1468 Pioneer Road	Red Wing	MN	55066	Goodhue	5560100010 Well 7-3 639 feet deep
20	City of Red Wing	4334	Public water supplier	302 Aspen Avenue	Red Wing	MN	55066	Goodhue	558480310 Well 8-1 665 feet deep
21	City of Red Wing	4334	Public water supplier	302 Aspen Avenue	Red Wing	MN	55066	Goodhue	558480310 Well 8-2 662 feet deep

1468 Pioneer Road

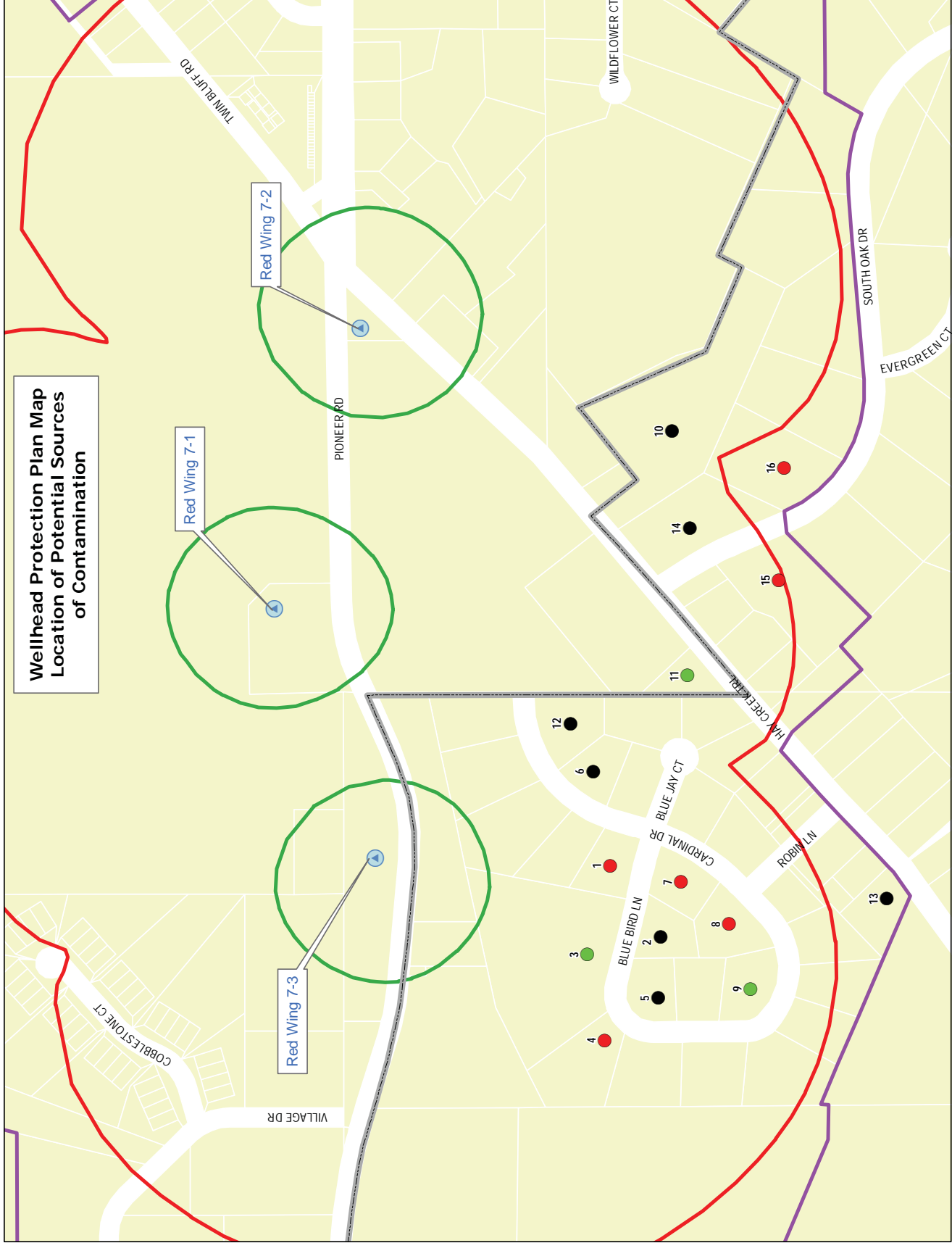
Wellhead Protection Plan Map Location of Potential Sources of Contamination

- Known Depth
- No Data
- Unknown Depth
- Red Wing Municipal Well
- WHPA
- Emergency Response Zone
- DWSMA
- Parcels
- Municipal Boundary

Number	Depth (Ft)	Number	Depth (Ft)
1	240	9	Unknown
2	No Data	10	No Data
3	Unknown	11	Unknown
4	240	12	No Data
5	No Data	13	No Data
6	No Data	14	No Data
7	220	15	260
8	180	16	260



Source: This map document was created from a variety of sources, including City of Red Wing Code and Geographic Information System (GIS) Data. The City of Red Wing assumes no liability for the completeness or accuracy of any data used in this map. The City of Red Wing does not warrant or make any representation as to the accuracy or completeness of the data. The City of Red Wing assumes no liability for any damages or losses resulting from the use or misuse of this map document.



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Appendix III – Contingency Strategy

This contingency strategy identifies actions the City can take to provide water to residents in the event of contamination or other emergencies that impact water supply, treatment and distribution.

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a. WATER SUPPLY CONTINGENCY PLAN (4720.5280)

WATER SUPPLY CONTINGENCY PLAN

RED WING, MINNESOTA

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 - 2. Treatment
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 - 4. Maps and Plans
- C. PRIORITY OF WATER USERS DURING WATER SUPPLY EMERGENCY
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Annual Plan Review

<i>Date Reviewed</i>	<i>Reviewer</i>	<i>Comments</i>

Plan Distribution

<i>Person</i>	<i>Organization</i>	<i>Plan Location</i>

Prepared by: _____ Date Approved: _____



MINNESOTA DUTY OFFICER

BCA Operations Center



651-649-5451

TDD: 1-800-627-3529

1-800-422-0798

Satellite Phone: 1-254-543-6490

About the Duty Officer

The Minnesota Duty Officer Program provides a single answering point for local and state agencies to request state-level assistance for emergencies, serious accidents or incidents, or for reporting hazardous materials and petroleum spills. The duty officer is available 24 hours per day, seven days per week.

If there is an immediate threat to life or property, call 911 first.

When to Call the Duty Officer

- Natural disasters (tornado, fire, flood etc)
- Requests for National Guard
- Hazardous materials incidents
- Search and rescue assistance
- AMBER Alerts

Examples of incidents the duty officer can assist with include (but are not limited to):

- Requests for Civil Air Patrol
- Radiological incidents
- Aircraft accidents/incidents
- Pipeline leaks or breaks
- Substances released into the air

Agency Resources Available

State Agencies

- Department of Agriculture
- Department of Commerce
- Department of Education
- Department of Health
- Department of Human Services
- Department of Military Affairs
- Department of Natural Resources
- Department of Transportation
- Minnesota Office of Enterprise Technology
- Minnesota Pollution Control Agency

Department of Public Safety

- Bureau of Criminal Apprehension
- Homeland Security and Emergency Management
- Minnesota Joint Analysis Center
- Minnesota State Patrol
- Office of Pipeline Safety
- State Fire Marshal
- Other state agencies not listed

Other Resources

- Minnesota Arson Hotline
- Local bomb squads
- Chemical assessment teams
- Emergency response teams
- Fire and rescue mutual aid
- Amateur radio (ARES/RACES)
- Minnesota voluntary organizations
- Fire chiefs assistance teams
- Search-and-rescue dogs
- Interagency Fire Center
- U.S. Air Force Search and Rescue Center

A. PURPOSE

The purpose of this Contingency Plan is to establish, provide and keep updated, certain emergency response procedures and information for the City of Red Wing, MN, which may become vital in the event of a partial or total loss of public water supply services.

B. PUBLIC WATER SUPPLY CHARACTERISTICS

1. Current Supply Source

The City of Red Wing's water system includes 5 active wells that feed 2 water treatment plants. Wells 7-1, 7-2, and 7-3 are tributary to the Twin Bluff Treatment Plant and Wells 8-1 and 8-2 are tributary to the Charlson Crest Water Treatment Plant. All 5 wells are 630-665 feet deep and draw water from the Mount Simon Aquifer.

Table B-1 Summary of the Water Supply Wells

Well Tributary to Twin Bluff Water Plant	Well Number 7-1	Well Number 7-2	Well Number 7-3
Supply Source	Mount Simon	Mount Simon	Mount Simon
Unique Well No.	216020	151565	686251
Well Depth (ft.)	630	665	639
Well Diameter (in.)	24	24	24
Latitude of Well	44.542800	44.543641	44.527811
Longitude of Well	-92.545561	-92.549011	-92.552067
Well Capacity (gpm)	1500	1500	1500
Well Production (gpm)	1500	1500	1500

Wells Tributary to Charlson Crest Water Plant	Well Number 8-1	Well Number 8-2
Supply Source	Mount Simon	Mount Simon
Unique Well No.	686252	686258
Well Depth (ft.)	665	662
Well Diameter (in.)	24	24
Latitude of Well	44.564469	44.564305
Longitude of Well	-92.629392	-92.627619
Well Capacity (gpm)	1500	1500
Well Production (gpm)	1500	1500

2. Treatment

The water supply wells have concentrations of naturally occurring radium that are close to or exceed the water quality maximum contaminant level (MCL). The wells also have elevated concentrations of iron and manganese. Both treatment plants utilize greensand filtration to oxidize and remove the radium, iron and manganese. The filtered water is chlorinated and fluoridated per Minnesota Department of Health regulations. Twin Bluff treatment plant has a maximum capacity of 4500 gallons per minute. The Charlson Crest

Plant has a maximum capacity of 3000 gallons per minute. Both treatment plants operate independently and each can meet the maximum daily demands of the City.

3. **Storage and Distribution**

The water distribution system is configured into six separate pressure zones. Five of the pressure zones utilize elevated storage to provide storage and pressure maintenance. The most easterly intermediate pressure zone utilizes 3 below grade pressure reducing valves and obtains water from the main intermediate pressure zone. The water storage facilities are summarized below:

- a. *Pioneer Road Ground Storage*; 1.0 million gallons; Provides storage for water prior to pumping to the low and intermediate pressure zones.
- b. *Sorin's Bluff Ground Storage*; 1.0 million gallons; Provides storage for the low pressure zone.
- c. *Hiawatha Hills Ground Storage*; 1.8 million gallons; Provides storage for the low pressure zone.
- d. *Sand Hill Standpipe*; 0.3 million gallons; Provides storage for the intermediate pressure zone.
- e. *Pine Ridge Ground Storage*; 0.5 million gallons; Provides storage for the intermediate pressure zone.
- f. *River Bluffs hydrosphere*; 0.3 million gallons; Provides storage for the river bluffs intermediate pressure zone.
- g. *Charlson Crest hydrosphere*; 0.3 million gallons; Provides storage for the western intermediate pressure zone.
- h. *Pioneer Road Standpipe*; 0.7 million gallons; Provides storage for the high pressure zone.

The distribution system consists of slightly more than 100 miles of water main ranging in size from 4-14 inches.

4. **Maps/Plans**

As-built drawings of the distribution are maintained at the Public Works Office. An electronic file reference system is used to locate individual drawings by street name. The City also has a comprehensive GIS system that includes all underground utilities, including mains, and service and valve locations. The GIS data base includes size, year installed, maintenance history and service requirements, and can be accessed from a desk and lap top computers, cell phones and electronic tablets.

C. **PRIORITY OF WATER USERS DURING WATER SUPPLY EMERGENCY**

Maximum and minimum daily water use by customer category are estimated below. These estimates are based on monthly totals as we do not have daily metering. Also, the commercial and industrial customer categories are grouped together.

Table C-1—Water Use Priority Grouping

Priority Group and Rank	Maximum daily use (gpd)	Minimum daily use (gpd)
Residential--#1	950,000	625,000
Institutional--#2	276,000	126,000
Commercial/Industrial--#3	450,000	116,129

Irrigation--#5	566,000	0
Unaccounted	Typically 3-5%	Typically 3-5%
Wholesale	Insignificant total	Insignificant total

1. Triggers for implementing water supply reduction/allocation procedures:

The triggers for implementing water supply reduction/allocation procedures are subdivided into three categories or stages of increasing urgency.

Stage 1 – Groundwater levels not sustained; Demand approaching supply or treatment capacity.

Stage 2 – Water demand failures with localized impact; Localized security breach

Stage 3 – Equipment failures with widespread impact; Contamination

D. ALTERNATIVE WATER SUPPLY OPTIONS

The City has two, totally independent water treatment facilities, each supplied with raw water from a separate dedicated well field. Both of the plants have the capacity to meet the needs of the entire city. If there were a problem with one treatment plant or well field, the City would be able to meet our needs with the other facilities. All wells, both treatment plants and the booster pump stations either have dedicated emergency power generators, or have the electrical connections and switching capability to connect portable a portable generator. The city has several portable generators that can be used. Each pressure zone has duplicate means of supplying water and pressure maintenance. Several potential sources of water to supplement available from wells and treatment plants are discussed below.

- 1. Surface water sources and treatment needs** - Surface water sources of any capacity are limited to the Mississippi River, and would require treatment for suspended solids and disinfection. The City's treatment facilities are not capable of suspended solids removal to the extent required to meet water supply needs.
- 2. Bottled water supplies, delivery and distribution** – Preliminary discussions were held with a local bottled water supplier. They indicated that they would work with the City in the event of an emergency; however no formal contracts were developed.
- 3. System interconnects with other water supplies** - Red Wing has no system interconnects with neighboring communities. There are no other public water supplies that are within 10 miles of the city limits. The closest would be Lake City and Prairie Island Indian Community. Both of these systems are much smaller than Red Wing's and it is unlikely that they could meet a significant demand in Red Wing as well as their internal needs.
- 4. New well** - Existing wells have capacity to supply in excess of 10 million gallons per day. There are no plans to construct any additional wells in the foreseeable future. The City has property near both treatment plants that would be evaluated as a potential site, however the actual location would be identified on need.
- 5. Emergency or backup wells** – Several establishments have wells that are used primarily for irrigation. One industry, the S.B. Foot Tanning Company has two wells that are used for process water. These tend to be lower capacity, but would be available in the event of

an emergency. It should be noted that none of these draw water from the same underground formation that the municipal wells do, and the water quality would have to be verified before these could be used for potable use. The City operates an analytical laboratory that routinely tests drinking water and could verify water quality and safety in the event of an emergency.

6. **Emergency treatment of water system** - The water treatment facilities are designed for iron, manganese and radium removal. If both water plants were out of service, the plants could be bypassed. Disinfection equipment is in place at the Twin Bluff Booster Plant. Iron and manganese are aesthetic contaminants and do not pose health hazards. The radium concentration is above the drinking water standard, but untreated water could be for non-consumption use if coupled with bottled water for drinking and cooking purposes.
7. **Source Management (blending).** – Source blending would not provide a significant advantage. All our wells come from the same aquifer and have very similar chemical characteristics. Other potential sources of water would pose contamination issues and are not located where they could be pumped through the treatment plants.

E. **INVENTORY OF AVAILABLE EMERGENCY EQUIPMENT AND MATERIALS**

Table E-1 contains a list of services, equipment and supplies that are available to the City (system) to respond to a disruption in the water system. It is believed that the items contained in Table E-1 would be adequate to respond to most (if not all) water system emergencies.

Table E-1 – Contact Information for Emergency Equipment and Material

Description	Owner	Telephone	Location	Acquisition Time
Well Repair	Traut Wells	320.251.5090	Waite Park, MN	day
Pump Repair	Traut Wells	320.251.5090	Waite Park, MN	day
Electrician	City Electrician	651.385.3690	Red Wing, MN	immediately
Plumber	City Plumber	651.385.3690	Red Wing, MN	immediately
Backhoe	MJS of Red Wing	651.267.0382	Red Wing, MN	immediately
Chemical Feed	Vessco, Inc.	651.941.2678	Chanhassen, MN	day
Meter Repair	Red Wing Utility Department	internal	Red Wing, MN	immediately
Generator	Vendor – Depends on unit	Depends on unit	Twin Cities, MN	day
Valves*	Minnesota Pipe & Equipment	507.285.5389	Rochester, MN	day
Pipe & fittings*	Minnesota Pipe & Equipment	507.285.5389	Rochester, MN	day
SCADA Integrator	Automation Services, Inc.	651.345.5753	Lake City, MN	2-3 hours

*Red Wing Utility Department maintains an inventory of all the common pipe, fittings and valves used in the distribution system.

F. EMERGENCY IDENTIFICATION PROCEDURES

Table F-1 Procedural Operations

Incident	Response Procedure and Comments
Identify Disruption (Mechanical Failure or Contamination)	Identifies the nature of the water supply disruption and communicates this information to the city government, the alternate response coordinator, and members of the emergency oversight committee.
Notify Response Personnel	Notifies city staff and others who will be responding to the water supply emergency about the disruption and coordinates their efforts to correct it.
Incident Direction and Control	Identifies the actions that are needed to correct the water supply emergency and directs responders to implement corrective actions.
Internal Communication	Communicates the status of response efforts to the primary spokesperson and the emergency oversight committee as needed to keep these parties informed of progress.
Assess Incident Response on Continual Basis	Assesses the efforts to correct the water supply disruption on a continual basis so that the emergency oversight committee can take additional corrective actions and the city government and public are updated on issues and progress.
Define the Extent of a Contamination Disruption	Coordinates efforts to define the extent and level of the contamination with local, state, and federal agencies. This may continue after initial corrective actions have been implemented.
Assess the Extent of a Mechanical Disruption	Coordinates efforts to define the cause(s) of the mechanical failure and the equipment, data, and expertise that are needed to correct it. Identifies measures for reducing the likelihood that a similar mechanical failure will not occur in the future.
Identify Need for an Alternate Water Supply	Evaluates the need to obtain an alternate water supply, the time period it is needed before the water supply emergency is corrected, and the actions that are needed to achieve it.

G. NOTIFICATION PROCEDURES

1. Agency Notification

Table G-1 contains the names and telephone numbers for contacts at various local and state agencies that may be notified in the event of a public water supply system emergency. Based on the nature of the emergency and the information available, various representatives from this listing will be selected by the response coordinator to be part of Emergency Management Team which will then meet throughout the duration of the emergency to aid in decision-making and positive outcomes.

Table G-1. Agency Emergency Contact Listing

Personnel	Name	Primary Telephone	Other Telephone
Mayor/Board Chair	Daniel Bender	651.385.7521	651.385.3600 (City Hall)
Council Members	Dean Hove	651.388.1072	651.385.3600 (City Hall)
Council Members	Jason Seibon	612.963.4158	651.385.3600 (City Hall)
Council Members	Lisa Pritchard Bayley	651.388.7638	651.385.3600 (City Hall)
Council Members	Dan Monson	651.212.6573	651.385.3600 (City Hall)
Council Members	Peggy Rehder	651.388.4651	651.385.3600 (City Hall)
Council Members	Ralph Rauterkus	651.388.7303	651.385.3600 (City Hall)
Council Members	Dustin Schulenberg	651.388.9249	651.385.3600 (City Hall)
City Administrator	Kay Kulhmann	651.385.3612	651.385.3600 (City Hall)
State Duty Officer	Minnesota State Duty officer	800.422.0798	651.649-5451
County Emergency Director	Diane Richter-Biwer	651.267.2639	651.267.2600
Emergency Management Director	Tony Grosso	651.267.2611	651.380.3302 (cell)
Police Chief	Roger Pulman	651.267.2600	911
Fire Chief	Thomas Schneider	651.388.7141	911
County Sheriff	Scott McNurlin	651.385.3155	911
School Superintendent	Karsten Anderson	651.386.4500	
Ambulance	Red Wing Fire and EMT	651.388.71	911
Hospital	Mayo Clinic – Red Wing	651.267.5000	
Doctor or Medical Facility	Mayo Clinic –Red Wing	651.267.5000	
Power Company	Xcel Energy	800.895.1999 (electric)	800.895.2999 (gas)
Highway Department	DOT District 6 - Rochester	507.286.7500	
Telephone Company	CenturyLink	855.707.4993	
Neighboring Water System	City of Lake City	651.345.6813	
MnDNR Groundwater Division			
MRWA Technical Services	Robyn Hoerr	800.821.5028	218.821.5028
MDH District Engineer	Paul Halverson	507.206.2724	507.206.2700
MDH Source water Protection	Pat Bailey	507.206.2741	507.206.2700

2. **Critical Response Personnel** – Contact information for Emergency Response Personnel from a variety of agencies that could be involved in an emergency are listed in Table G-2 below. This is not intended to be a complete list, does include the primary response personnel from the area.

Table G-2 – Critical Response Personnel

Title	Name	Address	Telephone	Response Assignment
City Emergency Management Director	Tony Grosso	Red Wing Police Department 430 6 th St. Red Wing, MN 55066	651.267.2632 Emergency: 911	Coordinate actions to address emergency
Goodhue County Emergency Management	Diane Biewer-Richter OEM Director	Goodhue County Sheriff Department 430 6 th St. Red Wing, MN 55066	651.267.2600 651.267.2639 Emergency: 911	Coordinate actions to address emergency
Public Works-Utilities	Bob Stark Deputy Director Public Works	City of Red Wing 229 Tyler Road, N Red Wing, MN 55066	W: 651.385.5211 C: 651.380.9010	Direct or contact individuals and businesses to resolve issue(s)
Chief Water Operator	Corey Aadalen	City of Red Wing 229 Tyler Road, N Red Wing, MN 55066	W: 651.385.5160 C: 651.380.3417	Direct or contact individuals and businesses to resolve issue(s)
Water Operators	Ed Krawiecki Kurt Krie	City of Red Wing 229 Tyler Road, N Red Wing, MN 55066	W: 651.385.5161 C: 651.764.0257 C: 651.380.8218	Direct or contact individuals and businesses to resolve issue(s)
Public Relations	Kay Kuhlmann Council Administrator	City of Red Wing 315 West 4 th Street Red Wing, MN 55066	W: 651.385.3612 W: 651.386.3600	Contact media to inform citizens/businesses of emergency
Information Technology	Laura Blair Division Director	City of Red Wing 315 West 4 th Street Red Wing, MN 55066	W: 651.385.3699 W: 651.386.3600	Contact media to inform citizens/businesses of emergency
Public Health/Medical	Nina Arneson Health & Human Services Director	Goodhue County Public Health 509 W. 5th St. Red Wing, MN 55066	651-385-6100 800-950-2142	Assist City as needed to address emergency
Alt. Public Health/Medical	Mary Heckman Health & Human Services Deputy Director	Goodhue County Public Health 509 W. 5th St. Suite 104 Red Wing, MN 55066	651-385-6100 800-950-2142	Assist City as needed to address emergency

3. **Public Information Plan**

The City has established a Public Information Protocol that is intended to provide a single point of information release with back up and support by others. This is intended to make sure the information that is released is consistent and based on the most up to date information. The protocol states that the release of public information during an emergency will be by the Council Administrator. The administrator could delegate this to somebody else depending

upon the severity and nature of the emergency. The goal is to make sure the information that goes out is consistent, accurate and up-to-date. The City of Red Wing and Goodhue County maintain an Emergency Operations Center, and the City and County both have an emergency Operations Director that could also assist.

The City conducted a desk-top water contamination exercise in conjunction with the Minnesota Department of Health several years ago. Participants included City administrative, public works and utilities and public safety staff; local hospital emergency and triage staff; Minnesota Department of Health and local Emergency Management Directors.

- a. **Public Relations Center** – Public and media relations and information during an emergency would be managed through the City Hall under the direction of the Council Administrator. The Council Administrator is also designated as the individual that would direct the release any information. The current administrator is Kay Kuhlmann. Her telephone number and email address are (651.385.3612 and kay.kuhlmann@ci.red-wing.mn.us. The City Hall is typically open during normal business hours, but would remain open as needed. After hours communication would normally handles by the public safety (police, fire, sheriff) dispatch through the 911 program. Other significant resources available at the City Hall include the local access television and city web-site maintenance.
- b. **Checklists** - The Council administrator would work with staff from other departments to develop information that should be released and the appropriate recommendations for utility and resident actions. These could include Public Works and Utilities, Public Safety, Information Technology, Engineering, as well as other public and private entities.

Information checklist to be conveyed to the public and media would depend upon the incident details, but could include the following:

- Name of water system
- Contaminant of concern and date
- Source of contamination
- Public health hazard
- Steps the public can take
- Steps the water system is taking
- Other information

- c. **Media Contacts** – Contacts for local media are provided below.

Media	Name	Telephone	Address
Newspaper	Republican Eagle	651.301.7880	2760 North Service Drive, Red Wing, MN 55066
Television	Government Access – Channel 6	651.385.3699	315 West 3 rd St. Red Wing, MN 55066
Radio	KWING/KCUE	651.388.3511	474 Guernsey Ln Red Wing, MN 55066
Shopper	Hiawatha Valley Shopper	715.792.2880	P.O. Box 324 Red Wing, MN 55066
Red Wing City Website	City Website	651.385-3600	www.red-wing.mn.us

G. MITIGATION AND CONSERVATION PLAN

1. MITIGATION

- a. **Infrastructure maintenance/upgrades/maps** – The City maintains a comprehensive GIS mapping system that includes all the water storage, pumping and distribution infrastructure. The GIS mapping is accessible from electronic tablets as well as desk computers. Maintenance records are also accessible from the GIS system. As- build drawings are stored as hardcopies and are also scanned and are accessible electronically through the GIS mapping system.
- b. **Regular inspection of tower, well, pump house** – Both water plants are manned 8 hours each week day and are checked on weekends. All the remote facilities are checked daily. The hatches on the ground storage reservoirs are equipped with intrusion alarms that are monitored by SCADA. Water plants and pump houses are also equipped with intrusion alarms that are continuously monitored by an alarm service.
- c. **Staff emergency training** – Utility staff receive emergency training on related to emergency operations and response. These include confined space, blood borne pathogens and first aid. The city also regularly participates in emergency response procedures associated with the Xcel Prairie Island Nuclear Generating Station (PINGS), which is located in the City. While this training is aimed at potential incidents at the PINGs, the response and communication procedures would also apply to a water supply emergency. Utility managers have also received training in the FEMA Incident Command procedures.
- d. **System security analysis** - The critical functions of the water supply, treatment, storage and distribution system are monitored by a comprehensive SCADA system. The SCADA system was recently converted from radio to fiber optic communications, and is being upgraded to take advantage of the additional communication potential. The SCADA network can be monitored from smart phones and iPads, which can provide faster remote response. Pump houses and buildings are equipped with intrusion alarms that are monitored by a private company. Intrusion alarms are also installed on reservoir hatches that are accessible and could be compromised or vandalized.
- e. **Site new backup well** – Currently there are no plans to construct additional wells in the foreseeable future and there has been no analysis of potential well locations. It should

be noted that Red Wing currently has two independent well fields, each of which has the capacity to meet the total needs of the city. It should also be noted that the aquifer and all the wells were determined to be non-vulnerable and problems due to contamination are very unlikely.

- f. **System valving to isolate problems**- Water distribution system is valved at each junction or cross, as is normally the case. A distribution valves are exercised on a regular basis. Valves that are not operable are noted and identified in the GIS mapping system. The City also maintains a comprehensive water distribution model. This model could be used to evaluate alternatives to address localized water pressure or availability issues.
- g. **Sanitation procedures for construction/repairs** – Water mains and reservoirs are disinfected for repairs and other maintenance procedures that would allow contaminants to enter the system. The facilities are not placed back into service until samples are tested and found to be safe. The City laboratory can analyze samples and determine if the contaminate levels are acceptable.

2. CONSERVATION

- a. **Water Meters** – All water is metered and meters readings are used to determine water usage. Metered water is also used to determine the usage charge for sewage for most customers. Residential meters are included on a replacement schedule and larger meters are rebuilt.
- b. **Public Education** - The Utility Department has implemented a public education and information program that is intended to promote water conservation as well as inform the general public about the infrastructure used to supply potable water to their home. This has included public information announcements on local access television, a tour of the water treatment plant and several informational inserts that were included with customer utility bills. The inserts addressed topics such as that identified below.
 - i) General information regarding water conservation and the benefit customers can achieve;
 - ii) Instructions on how to monitor individual water use and compare to “typical” customers using the information available on utility bills;
 - iii) Recommendations for cost effective lawn sprinkling;
 - iv) General description of water infrastructure, including wells, treatment plants, reservoirs and distribution system.
 - v) Procedures for determining individual household water pressure and the benefits for installing a pressure reducing valve.

- 1. **Rate structure** – A uniform rate structure is applied to all customer categories. The rate includes a fixed component that varies with meter size, and a usage component. The same rates apply to each customer category.
- 2. **Leak control Surveys** – A comprehensive distribution water leak survey is completed every three years. The last one was completed during the summer of 2015.
- 3. **Pressure monitoring and control** – The water utility is evaluating options for reducing distribution system pressure through pumping and storage tank operating procedures. The Utility Department also has pressure gages that individual customers can borrow to check the

pressure in their home. Those customers with higher than optimum pressure are advised to install a pressure reducing valve on their service. In addition to reducing usage, these reducing valves minimize the potential for catastrophic leaks.

4. **Usage audits-** Changes in customer usage are monitored each billing period. Customers that experience a significant increase or decreasing in metered usage are contacted to see if they are aware of the change. The meters are replaced if the change in usage cannot be explained.
5. **Water Loss Audit** – The City is currently conducting a water loss audit in accordance with AWWA M36 guidelines. It is our intent to conduct this audit on an annual or semiannual basis.

Appendix IV – Scoping Decision Notices

The Minnesota Department of Health provided Scoping Decision Notices Prior to completion of both the Phase I and Phase II wellhead Protection Plan. Copies of these Notices are provided below.

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Protecting, maintaining and improving the health of all Minnesotans

May 22, 2012

Mr. Robert Stark, P.E.
Deputy Director of Utilities
City of Red Wing
229 Tyler Road North
Red Wing, Minnesota 55066

Dear Mr. Stark:

Subject: Scoping Decision Notice No. 1 for the City of Red Wing, PWSID 1250013

This letter provides notice of the results of the Scoping 1 meeting held with you and Corey Aadalen (city of Red Wing), John Greer from Barr Engineering, and Robyn Hoerr and me (Minnesota Department of Health) on May 14, 2012, regarding wellhead protection planning. During the meeting, we discussed the preparation of Part I of a 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 used by Red Wing. 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 is the area delineated using identifiable landmarks that reflect the wellhead protection area boundaries as closely as possible.

According to the state wellhead protection rule, the city will have until February 15, 2016, to complete its entire Wellhead Protection Plan, Part I and Part II. The criteria used for determining the time period for completion of the Wellhead Protection Plan are prescribed in the rule (Minnesota Rules, part 4720.5130). As we discussed, this is a final date by which the plan must be approved. You may choose to complete the plan over a shorter timeframe, according to your schedule and budget priorities.

At 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 that the city must provide to the Minnesota Department of Health (MDH) to meet rule requirements for preparing Part I of the Wellhead Protection Plan. The wellhead rule refers to the existing

Mr. Robert Stark

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May 22, 2012

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 Wellhead Protection Plan [Table 1], 2) lists the pumping volumes for each well [Table 2], 3) lists permitted high-capacity wells [Table 3], and 4) includes maps of the well locations. A summary of the information that the city needs to provide is included at the end of the Scoping Decision Notice No. 1 form.

After we have had an opportunity to review the information listed in the Scoping Decision Notice No. 1 that you will be providing to MDH, we would appreciate the opportunity to again meet with you and select the appropriate method for delineating your wellhead protection area. We also will discuss how you can become involved in the preparation of the Part I report.

It is our understanding that you will be contracting a consultant to prepare the delineations and vulnerability assessments and that John Greer of Barr Engineering Co. will be providing these services for the city. After Mr. Greer has had an opportunity to develop a conceptual model of the local hydrogeologic setting, we would like to meet to discuss the proposed delineation approach. This pre-delineation meeting may be accomplished by a conference call if 1) MDH approves, and 2) the consultant provides figures for the discussion beforehand.

Prior to finalizing the wellhead protection area boundaries, we highly recommend that we informally review preliminary model results and assess whether any changes are needed to meet rule requirements. Model input and solution files should be submitted in electronic form. The same applies to geographical data, such as the wellhead protection area and drinking water supply management area. When geographic data are submitted electronically, ArcInfo export or ArcView shapefile formats are preferred. It will greatly accelerate our review if these geographic data use the 1983 North American Datum (NAD83), Universal Transverse Mercator, Zone 15 North (UTM, Z15N) projection, with meter distance units. Other datum and projection systems are acceptable as long as they are documented. Specific questions regarding electronic geographic data can be directed to Michael Baker, Source Water Protection Unit, at 651/201-4651.

Finally, it is our understanding that you will serve officially as the wellhead protection manager on behalf of the city. You are responsible for providing written notice to local units of government of the city's intent to develop the Wellhead Protection Plan, as required by the wellhead protection rule (part 4720.5300, subpart 3). A copy of this notice should be forwarded to MDH and must include a list of the city wells, their unique well numbers, and contact information for you as wellhead protection manager. Robyn Hoerr of the Minnesota Rural Water Association is the Planner assigned to the city of Red Wing's wellhead protection effort. Robyn can provide you with some examples of the notification of intent that other communities have used. Please contact her at 218-821-5028.

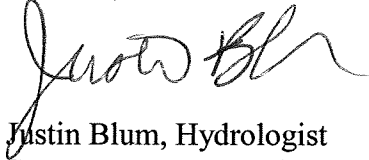
Mr. Robert Stark

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May 22, 2012

In closing, we look forward to working with you on completion of your Wellhead Protection Plan. If you have any questions regarding our comments, please contact me at 651/201-4698 or at Justin.blum@state.mn.us.

Sincerely,



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

JLB:kmc

Enclosures: Scoping Decision Notice No. 1, Summary of Data Requested, Table 1 - Well Information, Table 2 - Pumping Information for City of Red Wing - Mt. Simon Aquifer, Table 3 - Permitted Withdrawals From the Mt. Simon Aquifer Near Red Wing, Maps of Well Locations

cc: Pat Bailey, Planner, Source Water Protection Unit, Rochester District Office
Robyn Hoerr, Minnesota Rural Water Association
John Greer, Barr Engineering Company

SCOPING DECISION NOTICE No. 1

The purpose for the first Scoping Meeting, as required by Minnesota Rules, part 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 Rules, part 4720.5310) refers to the information required for wellhead planning as data elements. This form lists the data elements that are stated in Minnesota Rules, part 4750.5400. The Minnesota Department of Health (MDH) uses this form to designate which data elements are needed to prepare 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	
Red Wing		PWSID = 1250013	
		May 22, 2012	
Name of the Wellhead Protection Manager			
Mr. Robert Stark, Deputy Director of Utilities			
Address	City	Zip	
229 Tyler Road North	Red Wing	55066	
Unique Well Numbers			Phone
216020 (Well 7-1), 151565 (Well 7-2), 686251 (Well 7-3), 686252 (Well 8-1), 686258 (Well 8-2)			651-385-5112

Instructions for Completing the Scoping No. 1 Form

N	D	V	S	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.
X				

N	D	V	S	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.
	X			

N	D	V	S	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 wells 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.
		X		

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

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT

A. PRECIPITATION				
N	D	V	S	A.1: An existing map or list of local precipitation gauging stations.
X				
Technical Assistance Comments:				
N	D	V	S	A.2: An existing table showing the average monthly and annual precipitation, in inches, for the preceding five years.
X				
Technical Assistance Comments:				
B. GEOLOGY				
N	D	V	S	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.
	X	X	X	
Technical Assistance Comments: Information of this type is required to characterize the geologic and hydrogeologic setting of the PWS well field(s). This information is used to define aquifer geometry, location and magnitude of the recharge and discharge areas, and groundwater flow information. Aquifer tests or alternatives listed in MN Rules, part 4720.5510, subpart 6, can be used to help characterize flow in the aquifer. Reference all information used to develop the conceptual model of the geologic setting and submit to MDH only the information that is not available in the public domain.				
N	D	V	S	B.2: Existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department.
	X	X	X	
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 PWS or city has information of test drilling or site investigations conducted by the city that is not available in the public domain.				
N	D	V	S	B.3: Existing borehole geophysical records from wells, borings, and exploration test holes.
	X	X	X	
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.				
N	D	V	S	B.4: Existing surface geophysical studies.
	X	X	X	
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	C.1: Existing maps of the soils and a description of soil infiltration characteristics.
X				
Technical Assistance Comments:				
N	D	V	S	C.2: A description or an existing map of known eroding lands that are causing sedimentation problems.
X				
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:				
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: This information may be helpful in delineating the DWSMA, if available. If this information is provided, identification numbers must be provided for each parcel. An electronic format for the map is preferable.				
N	D	V	S	E.2: An existing map of political boundaries.
	X		X	
Technical Assistance Comments: Please provide this information if the boundaries have been updated/changed. This information may help 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 wells and other wells within the drinking water supply management area.
	X	X	X	
Technical Assistance Comments: If the information is different than that on-file with MDH, please provide 1) the pumping rates for the current and previous years, and the projected annual pumping rates for the next five years for each well in the PWS; and 2) well record(s) for the PWS wells. Information about the PWS wells may affect the vulnerability assessment due to rehabilitation/reconstruction of a well or changes in pumping rates.				

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	X	X	
Technical Assistance Comments: Please notify MDH of surface water/well interference problems of which the PWS is aware, because this information would be used to delineate the WHPA or determine or confirm the vulnerability rating.				

H. GROUNDWATER QUANTITY

N	D	V	S	H.1: An existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source.
X	X	X	X	
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	H.2: An existing description of known well interference problems and water-use conflicts.
X	X	X	X	
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.				
N	D	V	S	H.3: An existing list of state environmental boreholes, including unique well number, aquifer measured, years of record, and average monthly levels.
X	X	X	X	
Technical Assistance Comments: Only submit monthly water level measurements (with unique well numbers and dates) if this information is not available in the public domain.				

DATA ELEMENTS ABOUT WATER QUALITY

I. SURFACE WATER QUALITY

N	D	V	S	I.1: An existing map or list of the state water quality management classification for each stream and lake.
X				
Technical Assistance Comments:				
N	D	V	S	I.2: An existing summary of lake and stream water quality monitoring data, including: 1. bacteriological contamination indicators; 4. sedimentation; 2. inorganic chemicals; 5. dissolved oxygen; and 3. organic chemicals; 6. excessive growth or deficiency of aquatic plants.
X				
Technical Assistance Comments:				

J. GROUNDWATER QUALITY				
N	D	V	S	J.1: An existing summary of water quality data, including: 1) bacteriological contamination indicators; 2) inorganic chemicals; and 3) organic chemicals.
	X	X	X	
Technical Assistance Comments: Submit if the PWS has information that is not available in the public domain, because the information may help explain groundwater flow paths.				
N	D	V	S	J.2: An existing list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points.
	X	X	X	
Technical Assistance Comments: Submit if the PWS has information that is not available in the public domain, because the information may help explain groundwater flow paths.				
N	D	V	S	J.3: An existing report of groundwater tracer studies.
	X	X	X	
Technical Assistance Comments: Submit if the PWS has information that is not available in the public domain, because the information may help explain groundwater flow paths.				
N	D	V	S	J.4: An existing site study and well water analysis of known areas of groundwater contamination.
		X	X	
Technical Assistance Comments: Submit if the PWS 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	J.5: An existing property audit identifying contamination.
X				
Technical Assistance Comments:				
N	D	V	S	J.6: An existing report to the Minnesota Department of Agriculture and the Minnesota Pollution Control Agency of contaminant spills and releases.
	X	X		
Technical Assistance Comments: Notify MDH of reports on spills or contaminant releases that are on-file with the PWS or city but are not in the public domain. These reports do not need to be submitted but the MDH staff would like to review the reports.				

Summary of Data Requested to be Provided to MDH

As discussed during the first Scoping Meeting on May 14, 2012, the public water supply (PWS) will supply the following information for Part I of their Wellhead Protection Plan to the Minnesota Department of Health. 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, the well records for the PWS wells, and a map showing the locations of all the PWS wells, to review the accuracy of 1) all PWS well construction, 2) well locations, and 3) pumping information. (F.5)

Table 1 lists well use and construction for each of the PWS wells. Have you reconstructed any wells? Are there well records for reconstructed wells?

The enclosed map shows the locations of the primary public water supply wells. Please let us know if you feel the wells are not correctly located. These locations must be used to delineate your wellhead protection areas.

Table 2 shows the available pumping information and indicates what information the PWS needs to provide for the delineation of the capture zone. Please provide 1) the pumping data that was sent to the Minnesota Department of Natural Resources for the 2011 calendar year, 2) whether this rate was measured or estimated, and 3) the projected annual pumping amounts for the next five years.

- 2) Please provide a copy of any aquifer test or specific capacity information for the PWS wells that was obtained during well construction, maintenance, or repair. (B.1)
- 3) Is there an existing map of parcel and/or political boundaries that could be used for defining the Drinking Water Supply Management Area (DWSMA)? If you wish to use parcel lines, please provide the parcel identification number for each parcel boundary along with the map. Have the city boundaries changed? If the city boundaries have changed, please provide the new boundaries. The boundaries of the DWSMA may be larger if political boundaries are used instead of the parcel boundaries. (E.1 and E.2)
- 4) Are there other private well records, soil boring reports, geophysical studies, or water level measurements in your files that MDH staff did not identify at the scoping meeting and that would be available for MDH staff to review and copy? (B.2, B.3, B.4, and H.3)
- 5) Please identify reports that you have on-file relating to leaks/contamination sites that may be a concern to your drinking water supply that MDH may review and copy. (J.4)
- 6) Do your files contain water chemistry data, such as bacteria, virus, inorganic, organic, or isotopic results from wells or other groundwater sampling points, that is not currently available to MDH that MDH may review and copy? (J.1 and J.2)
- 7) Please identify reports that you have in your files relating to groundwater tracer studies that have been conducted. (J.3)
- 8) Please provide information about other high-capacity wells in your area that may not be permitted and are not listed on the attached Table 3. (H.1)
- 9) Please describe any conflicts over water use that the PWS has been involved with, such as 1) private wells that went dry (or well interference) or 2) springs or wetlands that were affected. Was the Department of Natural Resources involved in resolving the conflict? (G.5 and H.2)

Table 1 - Well Information

Local Well Name	Unique No.	Use/Status ¹	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/Reconstructed	Well Vulnerability	Aquifer
7-1	216020	P	16	350	630	1975	Low	Mt. Simon
7-2	151565	P	14	390	665	1983	Low	Mt. Simon
7-3	686251	P	18	384	639	2005	Low	Mt. Simon
8-1	686252	P	18	470	665	2005	Low	Mt. Simon
8-2	686258	P	18	460	662	2006	Low	Mt. Simon
Inactive Wells								
1	219012	A	18	149	488	1931/2006	Sealed - H0246210	
2	216017	A	20	149	474	1932/2006	Sealed - H0246211	
3	218623	I	20	385	770	1950	?	
4	219011	A	18	381	620	1956/2006	Sealed - H0251610	
5	219016	I	12	243	684	1970	?	

Note: 1. Primary (P), Inactive (I), or Abandoned (A) Well

Table 2 - Pumping Information for City of Red Wing - Mt. Simon Aquifer

Permit	Well Name	Unique No.	2007	2008	2009	2010	2011*	Projected* To 2016
1976-5086	7-1	216020	94,519,000	108,433,000	137,417,000	144,969,000		
1976-5086	7-2	151565	91,626,000	107,466,000	118,692,000	148,753,000		
1976-5086	7-3	686251	174,682,000	158,454,000	83,966,000	0		
1976-5086	8-1	686252	116,589,000	127,866,000	145,587,000	123,110,000		
1976-5086	8-2	686258	128,740,000	108,902,000	93,241,000	116,869,000		
1976-5086	5	219016	Well was not used.					

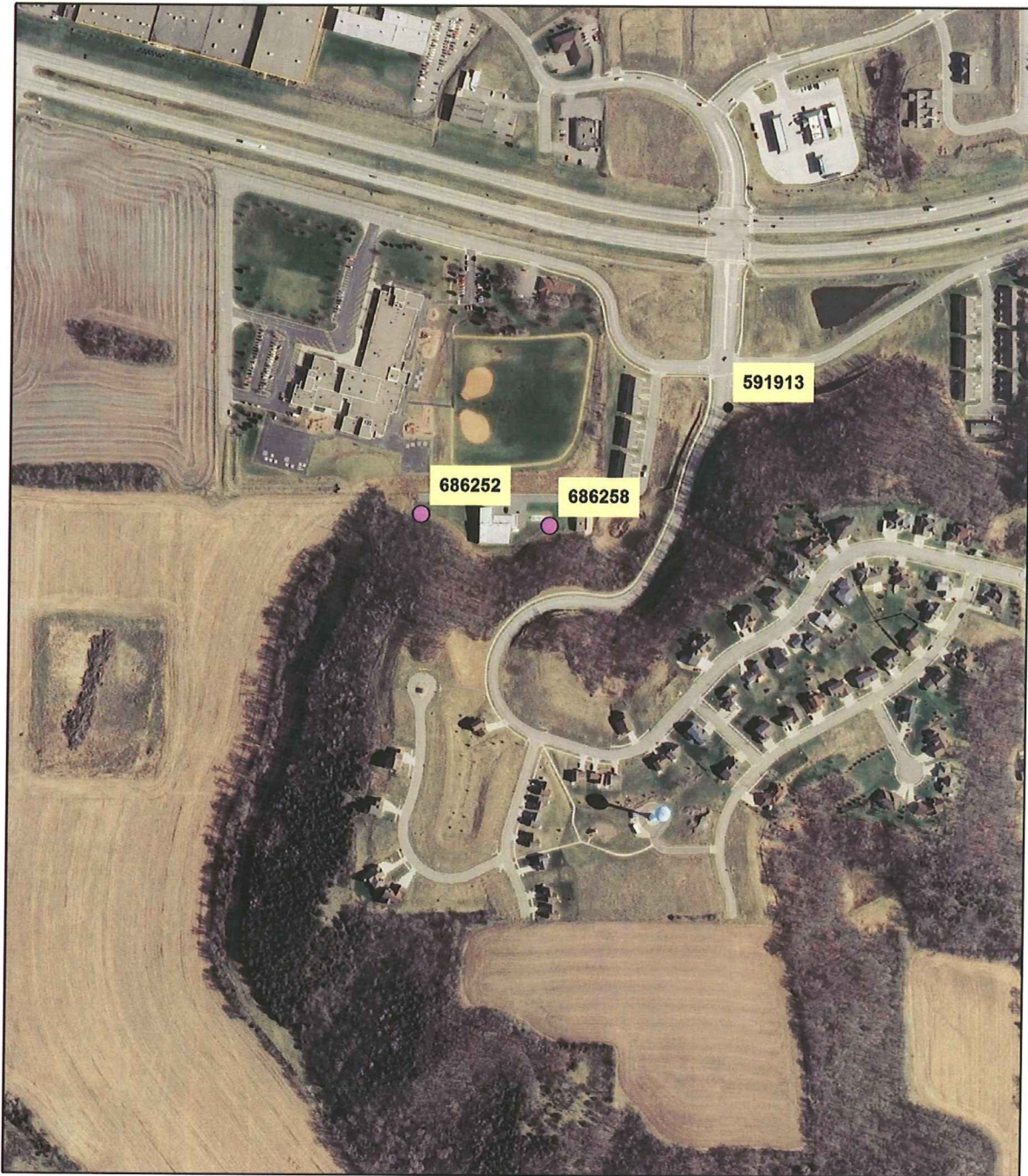
* Data to be provided by the city.
Information from DNR State Water Use Database System.



Well 7-1, 7-2 and 7-3 Locations

0 250 500 1,000 Feet





Well 8-1 and 8-2 Locations

0 250 500 1,000 Feet



February 14, 2014

Mr. Robert Stark, P.E.
Deputy Director of Public Works – Utilities
City of Red Wing
229 Tyler Road North
Red Wing, Minnesota 55066

Dear Mr. Stark:

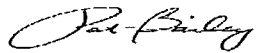
Subject: Scoping 2 Decision Notice and Meeting Summary – City of Red Wing – PWSID 1250013

This letter provides notice of the results of a scoping meeting held with you and Corey Aadalen (city of Red Wing), Robyn Hoerr (Minnesota Rural Water Association), and me on February 4, 2014 at the Red Wing Wastewater Treatment Plant Office regarding wellhead protection (WHP) planning. During the meeting, we discussed the data elements that must be included and used 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 that were discussed at the meeting. We also discussed a summary of planning issues that were identified during the Part I WHP Plan development process which should be considered for inclusion in your Part II WHP Plan.

The city of Red Wing 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 city of Red Wing will have until August 16, 2016, to complete its WHP plan. Red Wing was given additional time due to Minnesota Rules, part 4720.5130, subpart 4, item D.

If a data element is marked on the enclosed notice as a data element that must be used and it does not exist, it is helpful if your plan notes this. It is MDH's understanding the city of Red Wing will develop a draft of the remainder of the WHP plan. I will be contacting you to review the progress of the development of Part II of your plan. If you have any questions regarding the enclosed notice, contact me by email at pat.bailey@state.mn.us or by phone at (507) 206-2741.

Sincerely,



Pat Bailey, Planner
Source Water Protection
Environmental Health Division
18 Wood Lake Drive Southeast
Rochester, Minnesota 55904-5506

PB:ds-b

Enclosures

cc: Paul Halverson, MDH Engineer, -- Rochester District Office
Robyn Hoerr, Minnesota Rural Water Association
Kathy Johnson, City Clerk, City of Red Wing
Ron Struss, Minnesota Department of Agriculture

SCOPING 2 DECISION NOTICE Non-Vulnerable DWSMA

Remainder of the Wellhead Protection Plan

Name of Public Water Supply:		Date:
City of Red Wing PWSID 1250013		February 14, 2014
Name of the Wellhead Protection Manager:		
Robert Stark, P.E.		
Address:	City:	Zip:
229 Tyler Road North	Red Wing	55066
Unique Well Numbers:		Phone:
21620 (Well 7-1), 15165 (Well 7-2), 68621 (Well 7-3) 68652 (Well 8-1), 68625 (Well 8-2)		(651) 385-5112

Instructions for Completing the Scoping 2 Form

N	R	S	N = Not required. If this box is checked, this data element is NOT necessary for your wellhead protection plan because it is not needed or it has been included in the first scoping decision notice. Please go to the next data element.
X			

N	R	S	R = Required for the remainder of the plan. If this box is checked, this data MUST be used for the "remainder of the plan."
	X		

N	R	S	S = Submit to MDH. If this box is checked, this data element MUST be included in your wellhead protection plan and submitted to MDH.
		X	
If there is NO check mark in the "S" box but there is an "X" in the "R" box, this data element MUST be included in your plan, but should NOT be submitted to MDH. This box will only be checked if MDH does not have access to this data element. This will help to reduce the cost by reducing the amount of paper and time to reproduce the data element.			

Note: Any data elements required in the first scoping decision notice must also be used to complete the remainder of the wellhead protection plan.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT

PRECIPITATION			
N	R	S	An existing map or list of local precipitation gauging stations.
X			
Technical Assistance Comments:			
N	R	S	An existing table showing the average monthly and annual precipitation in inches for the preceding five years.
X			
Technical Assistance Comments:			
GEOLOGY			
N	R	S	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.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	Existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	Existing borehole geophysical records from wells, borings, and exploration test holes.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	Existing surface geophysical studies.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
SOILS			
N	R	S	Existing maps of the soils and a description of soil infiltration characteristics.
X			
Technical Assistance Comments:			
N	R	S	A description or an existing map of known eroding lands that are causing sedimentation problems.
X			
Technical Assistance Comments:			

WATER RESOURCES			
N	R	S	An existing map of the boundaries and flow directions of major watershed units and minor watershed units.
X			
Technical Assistance Comments:			
N	R	S	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	R	S	The shoreland classifications of the public waters listed under subitem (2), pursuant to part 6120.3000 and Minnesota Statutes, sections 103F.201 to 103F.221.
X			
Technical Assistance Comments:			
N	R	S	An existing map of wetlands regulated under chapter 8420 and Minnesota Statutes, section 103G.221 to 103G.2373.
X			
Technical Assistance Comments:			
N	R	S	An existing map showing those areas delineated as floodplain by existing local ordinances.
X			
Technical Assistance Comments:			

DATA ELEMENTS ABOUT THE LAND USE

LAND USE			
N	R	S	An existing map of parcel boundaries.
	X	X	
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing map of political boundaries.
	X	X	
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing map of public land surveys including township, range, and section.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

N	R	S	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		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			

DATA ELEMENTS ABOUT WATER QUANTITY

SURFACE WATER QUANTITY			
N	R	S	An existing description of high, mean, and low flows on streams.
X			
Technical Assistance Comments:			
N	R	S	An existing list of lakes where the state has established ordinary high water marks.
X			
Technical Assistance Comments:			
N	R	S	An existing list of permitted withdrawals from lakes and streams, including source, use, and amounts withdrawn.
X			
Technical Assistance Comments:			
N	R	S	An existing list of lakes and streams for which state protected levels or flows have been established.
X			
Technical Assistance Comments:			
N	R	S	An existing description of known water-use conflicts, including those caused by groundwater pumping.
X			
Technical Assistance Comments:			
GROUNDWATER QUANTITY			
N	R	S	An existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	An existing description of known well interference problems and water use conflicts.
	X	X	
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	An existing list of state environmental bore holes, including unique well number, aquifer measured, years of record, and average monthly levels.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

DATA ELEMENTS ABOUT WATER QUALITY

SURFACE WATER QUALITY			
N	R	S	An existing map or list of the state water quality management classification for each stream and lake.
X			
Technical Assistance Comments:			
N	R	S	An existing summary of lake and stream water quality monitoring data, including: 1. bacteriological contamination indicators; 4. sedimentation; 2. inorganic chemicals; 5. dissolved oxygen; and 3. organic chemicals; 6. excessive growth or deficiency of aquatic plants.
X			
Technical Assistance Comments:			
GROUNDWATER QUALITY			
N	R	S	An existing summary of water quality data, including: 1. bacteriological contamination indicators; 2. inorganic chemicals; and 3. organic chemicals.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	An existing list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	An existing report of groundwater tracer studies.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing site study and well water analysis of known areas of groundwater contamination.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	An existing property audit identifying contamination.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	R	S	An existing report to the Minnesota Department of Agriculture and the Minnesota Pollution Control Agency of contaminant spills and releases.
	X		
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

City of Red Wing Scoping 2 Meeting Wellhead Protection (WHP) Planning Issues Summary

Drinking Water Protection Issues Identified to Date:

The East DWSMA covers land in Featherstone and Hay Creek Townships and therefore these areas are not under the direct land use control of the City of Red Wing.

Water Quality Detections and Implications: *The source water has radium (226&228) and Gross Alpha that have exceeded the MCLs. For this reason the City of Red Wing has a treatment process to remove radionuclides. The source water, however, is not vulnerable to surface contamination and there are no detections of human caused contaminants. The implication is that the only potential contaminants that need to be inventoried are wells.*

Old Municipal Well Information:

The Minnesota Department of Health has compiled historical information for use in the planning process. Although all wells that are referenced in the Old Municipal Well Search are outside the DWSMAs, this information along with the Sanborn maps can be used by the City of Red Wing to locate and verify the status of the wells. If unused wells are found, efforts should be made to get them sealed. (These efforts would be outside the Part 2 plan unless unused wells were found in the DWSMA). MDH Well Management will have Clean Water Legacy funds to seal unused wells both private and public water supply wells. To obtain email updates on when funds become available subscribe to Grant and Loan Information at <http://www.health.state.mn.us/grants/>.

Sanborn Maps:

- ☒ Sanborn Maps are available for this area
- ☐ Sanborn Maps are not available for this area.

Recommended WHP Measures:

It was suggested that Red Wing consider joining MNWARN. It was indicated that there was some concern about entering into this mutual aid agreement but that staff would try to bring the idea forward again. (Considering joining MN WARN could be a measure in the Plan of Action).

The City of Red Wing has given tours of the water plant. This is a great educational activity and could be a measure in the Plan of Action if these tours continue in the future.

Scoping 2 Decision Notice Attachment
Potential Contaminant Source Inventory Requirements

Low Vulnerability DWSMA

The following current and historical potential contaminant sources and related codes, and facility designation and related codes must be included in the potential contaminant source inventory. Each potential contaminant source identified must be assigned a facility designation and related code.

<u>Potential Contaminant Sources (PCS)</u>	<u>PCS Codes</u>
Large Capacity Cesspool (potential Class V)	CVLCC
Large Capacity Waste Water Disposal Site (potential Class V)	CVWWD
Motor Vehicle Waste Disposal Well (potential Class V)	CVMVW
Wells	WEL

List of Designated Facilities and Codes

Residential

Residential Category Description: includes all establishments offering residence or accommodation, such as homes, apartments, housing for the elderly, hotels, and motels.

Facility Codes and Designations

1000: All Establishments Offering Residence

Commercial

Commercial Category Description: includes establishments typically associated with commercial land use. Examples include: general sales and service; retail sales and service; automobile sales and service; finance and insurance; business, professional, scientific and technical services; food services, and personal services.

Facility Codes and Designations

2000: General Sales and Service

Industrial

Industrial Category Description: includes manufacturing establishments located in plants, factories or mills and employs power-driven machines and materials handling equipment. Many manufacturing establishments process products of agriculture, forestry, fishing, mining or quarrying.

Facility Codes and Designations

3000: Manufacturing and Wholesale Trade

Transportation, Communication and Utilities

Transportation, Communication, and Utilities Category Description: a catch-all category that includes transportation, communication and utilities for essential facilities.

Facility Codes and Designations

4000: Transportation, Communication, Information, and Utilities

Arts, Entertainment and Recreation

Arts, Entertainment, and Recreation Category Description: includes establishments that provide services for cultural, entertainment, and recreational activities such as live performances, events, exhibits intended for public viewing and historical sites.

Facility Codes and Designations

5000: Arts, Entertainment, and Recreation

Education, Public Administration, Health Care, and other Institutions

Institutional Category Description: a catch-all category that includes education, public administration, health care, and other institutions. Examples include schools of all types, governmental buildings, military installations, public safety facilities, medical clinics and hospitals, other health and human services facilities, religious institutions, and death care services.

Facility Codes and Designations

6000: Education, Public Administration, Health Care, and Other Institutions

Construction

Construction Category Description: includes establishments that build structures or perform additions, alterations, reconstruction, installation and repairs. Examples include excavation contractors, carpentry, concrete contractors, painters, electricians, painters, highway and street construction, and sewer and well drilling.

Facility Codes and Designations

7000: Construction-Related Businesses

Mining and Extractive Uses

Mining and Extractive Uses Category Description: includes establishments that extract natural mineral solids, liquid materials, and gases.

Facility Codes and Designations

8000: Mining and Extraction Establishments

Agriculture and Forestry

Agricultural and Forestry Category Description: includes establishments that grow crops, raise animals, harvest timber and harvest fish and other animals from farms, ranches, or natural habitats.

Facility Codes and Designations

9000: Agriculture, Forestry, Fishing, and Hunting

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Appendix V – Correspondence

Relevant Correspondence between wellhead Protection team and other project participants is provided in this appendix.

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December 24, 2013

Honorable Mayor and Council Members
City of Red Wing
315 4th Street
Red Wing, MN 55066

RE: City of Red Wing Wellhead Protection Plan

Dear Mayor and Council Members:

The City of Red Wing is in the process of preparing a wellhead protection plan in compliance with the Minnesota Wellhead Protection Rules (MN 4720.51— 4720.55900). The first phase of this plan includes delineation of the Red Wing Wellhead Protection Area (WHPA) and the Drinking Water Supply Management Area DWSMA). By definition, the WHPA is that area where groundwater contamination could reach a water supply well with a ten year timeframe. This area was determined using computer modeling. The DWSMA encompasses the WHPA with boundaries that correspond to geographically identified features such as parcel boundaries, roads and quarter section lines.

The purpose for this letter is to notify the local units of government that are wholly or partially within these areas. The attached figures 5a and 5b identify the WHPAs and DWSMAs for the two locations where the City has municipal drinking water supply wells. Figure 5b shows that both the WHPA and the DWSMA extend into Featherstone and Hay Creek Townships. The water supply aquifer underlying both of the DWSMAs were evaluated for their vulnerability to contamination from surface activities. Both of the DWSMAs were determined to have low aquifer vulnerability. This is illustrated on figures 6a and 6b.

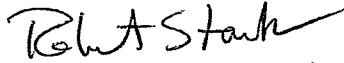
The second phase of the wellhead protection plan process is to identify potential sources of contamination within the DWSMAs and prepare a management plan that would protect the City's water supply in the event of a groundwater contamination incident. This work will be completed during 2014.

A public information meeting will be held during the City Council meeting on Monday, January 27, 2014. At this meeting, the WHPAs, DWSMAs and the aquifer vulnerability assessments will be reviewed and a representative from the Minnesota Department of Health will be present to answer any questions.

229 Tyler Road North
Red Wing, MN 55066
Website: www.red-wing.org
Phone: 651.385.3674
Fax: 651.388.0243

Please contact me at (651) 385-5112 or by email at bob.stark@ci.red-wing.mn.us if you have any questions or desire additional information.

Sincerely,

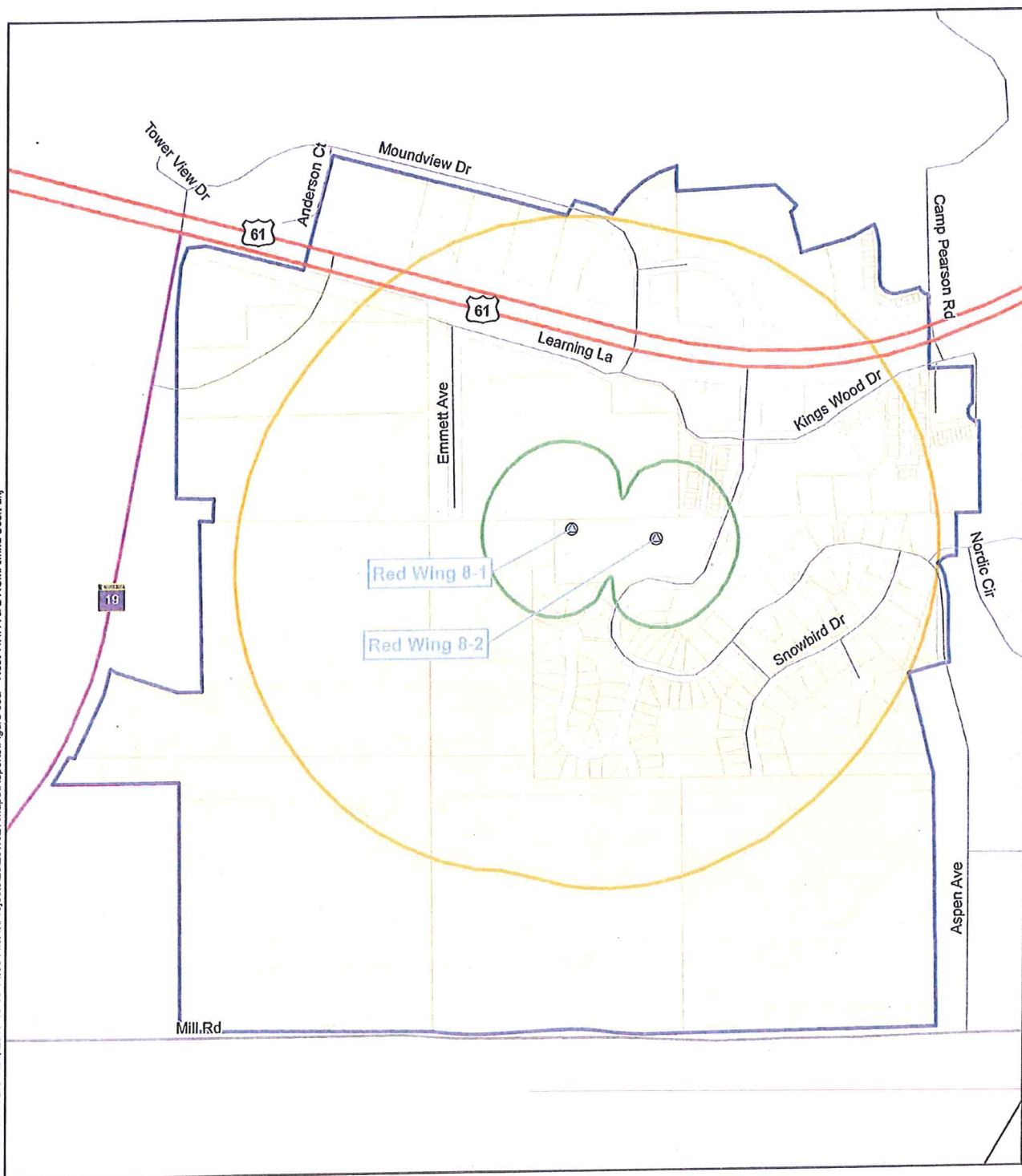





Robert Stark, P.E.
Deputy Director Public Works – Utilities

attachments

cc:

Mr. Justin Blum, Minnesota Department of Health
Ms. Pat Bailey, Minnesota Department of Health
John Greer, Barr Engineering



-  Red Wing Municipal Well
-  DWSMA
-  WHPA
-  Emergency Response Zone
-  DWSMA Parcel

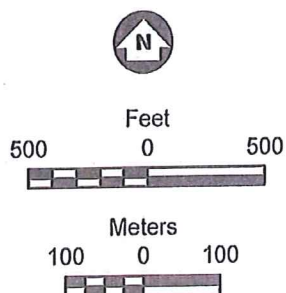
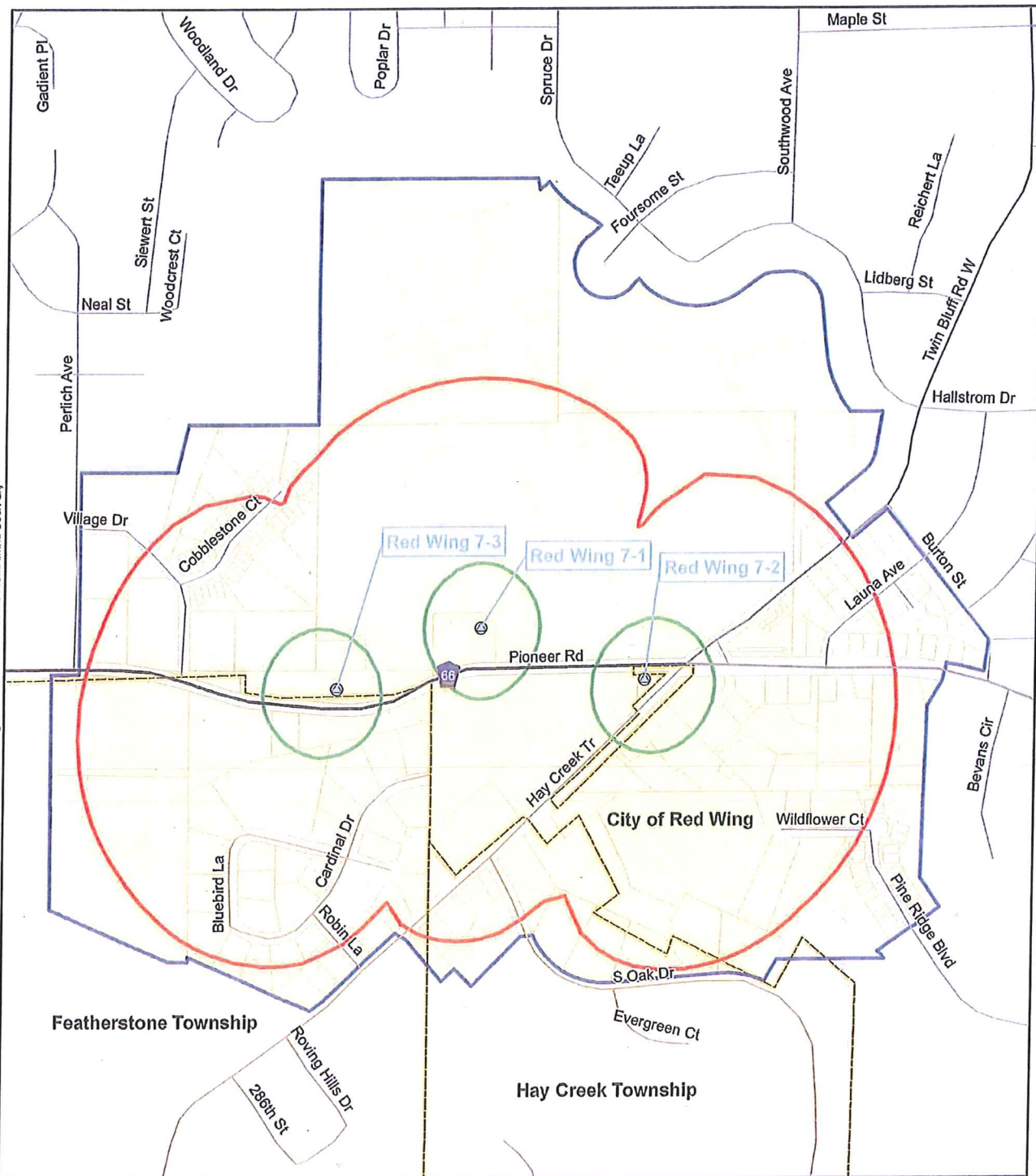


Figure 5a

WEST WHPA & DWSMA
Red Wing WHPA
City of Red Wing
Goodhue County, MN



- Red Wing Municipal Well
- DWSMA
- WHPA
- Emergency Response Zone
- Municipal Boundary
- DWSMA Parcel

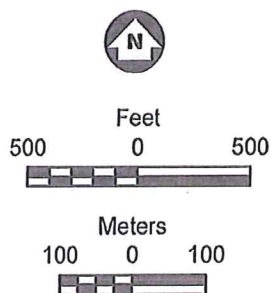


Figure 5b

EAST WHPA & DWSMA
Red Wing WHPA
City of Red Wing
Goodhue County, MN

Barr Footer: ArcGIS 10.1, 2013-10-08 14:38 File: I:\Projects\23251021\Maps\Reports\Figure 06a - West DWSMA Vulnerability.mxd User: alj

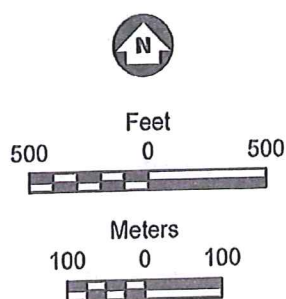
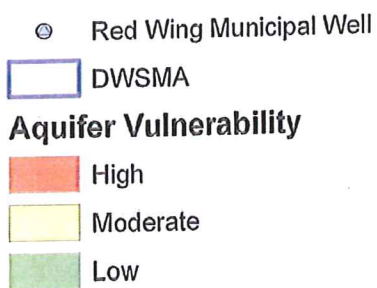


Figure 6a

WEST DWSMA VULNERABILITY

Red Wing WHPP

City of Red Wing

Goodhue County, MN

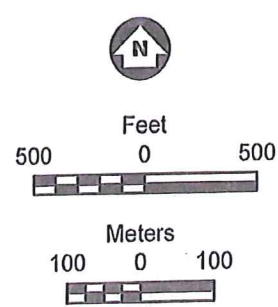
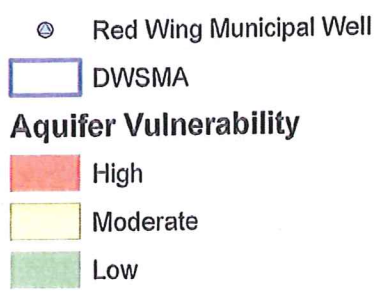
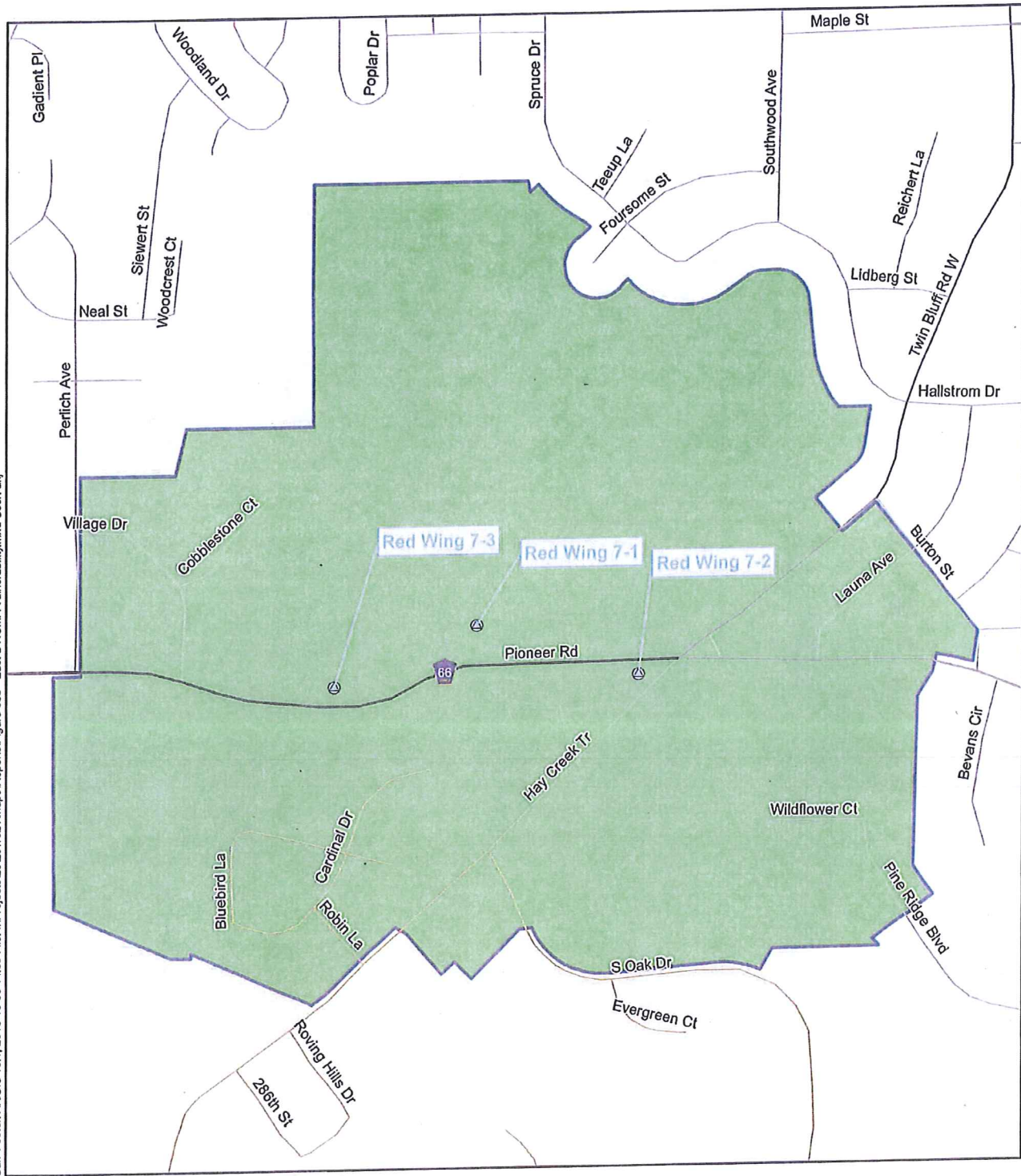


Figure 6b
 EAST DWSMA VULNERABILITY
 Red Wing WHPP
 City of Red Wing
 Goodhue County, MN



November 18, 2014

Anthony Olin
1755 Bluebird Lane
Red Wing, MN 55066

Dear Mr. Olin:

The City of Red Wing is in the process of completing the second phase of our Well Head Protection Plan. A Well Head Protection Plan is a statutory requirement for public water supplies and is administered by the Minnesota Department of Health. The purpose is to minimize the potential for groundwater contamination that could impact public water supply wells. This is two-phase process. The first phase is a determination of the area on the ground surface where activities or facilities could cause contamination that would reach a public water supply well within a 10-year period. This area is determined using computer modelling is designated as the *Drinking Water Supply Management Area (DWSMA)*. The DWSMA for the wells tributary to the Twin Bluff Water Treatment Plant, 1468 Pioneer Road, is illustrated by the map on the back of this page. The second phase of a Well Head Protection Plan is the development of an inventory of potential sources of contamination within the DWSMA, followed by preparation of a management plan that would minimize the potential for contamination from those sources. Typical sources of contamination could include other wells, septic drain fields, buried chemical or gasoline storage tanks, waste disposal sites or sinkholes.

The City's wells are much deeper (630-660 feet deep) and utilize a different aquifer than a typical private well within the DWSMA. There are also layers of soil and rock that inhibit the movement of water from the surface to the aquifer. As a result, the City's drinking water supply wells are not vulnerable to contamination from the surface with the exception of other wells that could penetrate the same aquifer used by the City. We have identified 39 private wells within the DWSMA and have depth information on 25 of them. You are receiving this letter because you are identified as the deed holder for a parcel where information on any wells is not available through the County Well Index, or from the Goodhue County Environmental Health Department. While it is very unlikely that any of the private wells are deep enough to be a concern, we do need to develop an inventory that is as complete as possible. It would be very much appreciated if you could fill in the depth of any wells on the parcel identified in the mailing address above and return it in the enclosed envelope.

I sincerely appreciate your assistance. Please do not hesitate to contact me if you have any questions or would like additional information. My telephone number and email address are (651) 385-5112 and bob.stark@ci.red-wing.mn.us.

Sincerely,

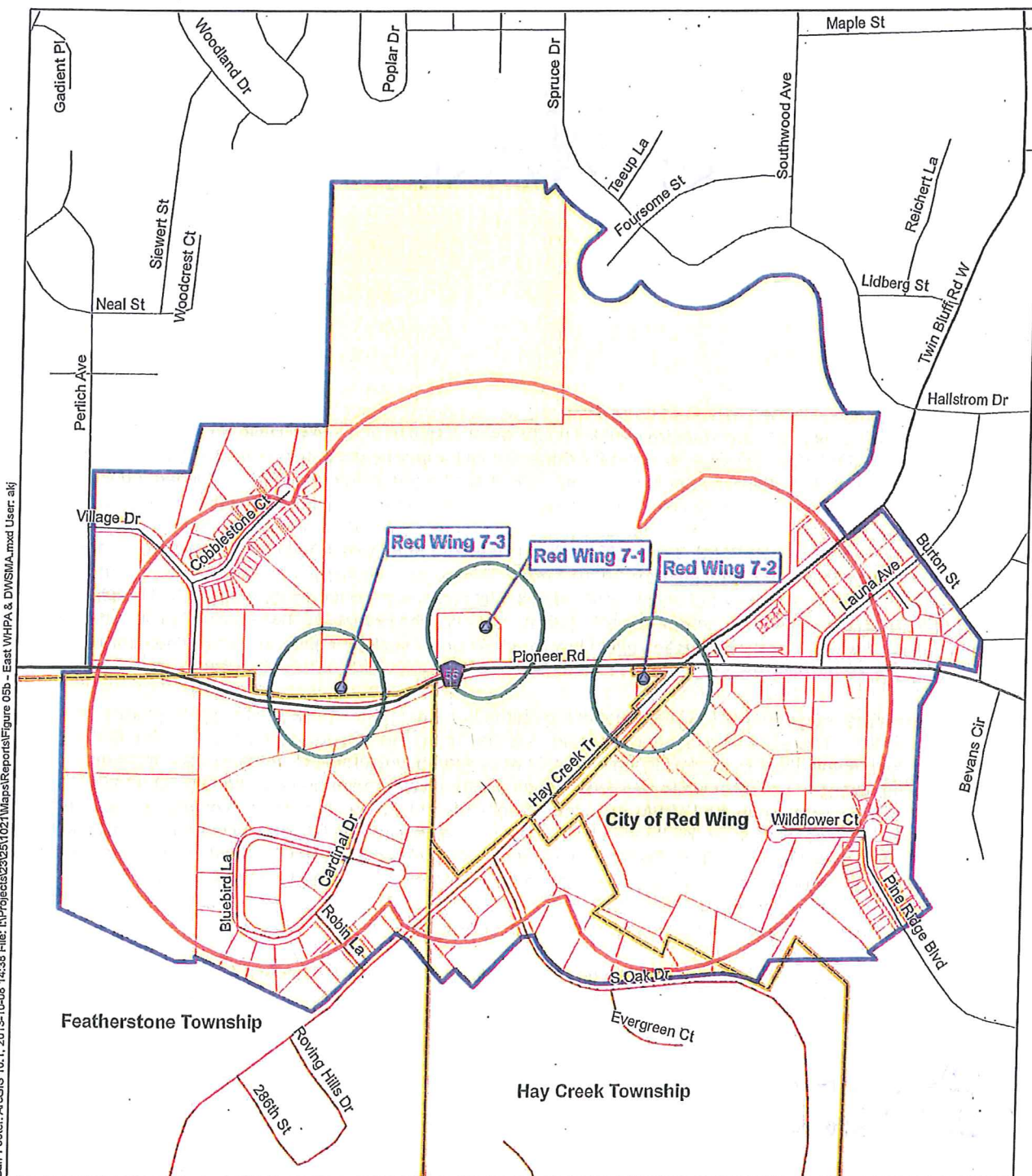
Robert Stark
Deputy Director Public Works - Utilities

The depth of the well on the property identified by the address above is _____ feet.
or

_____ Depth unknown

229 Tyler Road North
Red Wing, MN 55066
Website: www.red-wing.org
Phone: 651.385.3674
Fax: 651.388.0243

Barr Footer: ArcGIS 10.1, 2013-10-08 14:38 File: t:\Project\23251021\Map\Reports\Figure 05b - East WHPA & DWSMA.mxd User: alj



- Red Wing Municipal Well
- DWSMA
- WHPA
- Emergency Response Zone
- Municipal Boundary
- DWSMA Parcel

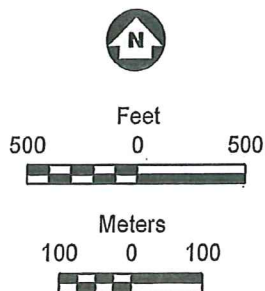


Figure 5b

EAST WHPA & DWSMA
Red Wing WHPA
City of Red Wing
Goodhue County, MN



February 19, 2016

Steve Hyllengren
Vasa Township Chairperson
33060 White Rock Road
Cannon Falls, MN 55009

Re: Red Wing Minnesota
Well Head Protect Plan – Phase II draft

Dear Chairperson Hylengren:

The City of Red Wing is in the process of developing a wellhead protection plan for its drinking water supply wells. Enclosed for your review and comment is the completed Part 2 Draft Report for this system as required in the MN Wellhead Protection Rule (4720.5350, subpart 1). This portion of the Plan includes information pertaining to:

1. The inventory of potential contaminants of concern within the Drinking Water Supply Management Area (DWSMA);
2. The data that was considered in this portion of the plan;
3. Issues, problems, and concerns within the DWSMA;
4. Goals, objectives, and action strategies to address the issues and concerns within the DWSMA;
5. A Plan evaluation strategy; and
6. A contingency strategy in the event of water system disruption.

Your comments on this portion of the Plan will be accepted throughout the 60-day comment period. Please send your written comments to me by April 20, 2016. My contact information is below.

Consistent with the Wellhead Protection Rule (4720.5330, subpart 7) a Public Hearing has been scheduled during the regular April 25th, 2016 City Council meeting in the Council Chambers, 315 West 4th Street, Red Wing, Minnesota to discuss issues and address all comments related to the enclosed document. The Council meeting will start at 7:00 p.m.

229 Tyler Road North
Red Wing, MN 55066
Website: www.red-wing.org
Phone: 651.385.3674
Fax: 651.388.0243

Please do not hesitate to contact me if you have any questions or need additional information. My email address is bob.stark@ci.red-wing.mn.us and my telephone number is (651) 385-5112.

We look forward to your participation.

Sincerely:

Robert Stark, P.E.
Deputy Director Public Works – Utilities

Enclosure

229 Tyler Road North
Red Wing, MN 55066
Website: www.red-wing.org
Phone: 651.385.3674
Fax: 651.388.0243

Stark, Bob

From: Robyn Hoerr <robynmrwa@hotmail.com>
Sent: Friday, November 14, 2014 11:53 AM
To: Stark, Bob
Subject: Re: Wells not on County Well Index, but with Disclosure IDs

It seems you are leaving no stone unturned! Nice work!

Have a great weekend!

Robyn Hoerr
Groundwater Specialist
MN Rural Water Association

On Nov 14, 2014, at 11:00 AM, "Stark, Bob" <bob.stark@ci.red-wing.mn.us> wrote:

I am in the process of completing Phase II of the City of Red Wing's Well Head Protection Plan and had corresponded with you previously regarding private wells within our Drinking Water Supply Management Area that were not included in the County Well Index. I have attached a list of the parcels within our Drinking Water Supply Management Area that I believe have wells. I have searched the CWI using address, and section/township/range, as well as using the map query function, but have only been able to find information on 10 of the potential 40 wells. I have also checked the disclosure certificates that were available, but none of them had any specific well information, other than location.

I have spoken with Jason Peterson, Goodhue County Sanitarian, and he is going to check the county files to see if he can come up with any other information. I am in the process of sending out letters to the residents with a return envelope where they can supply any information they might have with respect to well depth. Would appreciate any other information or guidance that you might have.

Thank you for your assistance.

Bob Stark, P.E. | Deputy Director
Public Works Department | Utilities Division
Tel: 651.385.5112 | cell: 651.380.9010
Fax: 651.388.0243
229 Tyler Road North | Red Wing, MN 55066
email: bob.stark@ci.red-wing.mn.us

From: Mofjeld, Norman (MDH) [<mailto:norman.mofjeld@state.mn.us>]
Sent: Thursday, October 16, 2014 8:32 AM
To: Stark, Bob
Subject: RE: Wells not on County Well Index, but with Disclosure IDs

Dear Bob Stark:

Some of the older well disclosure certificates provide well depth information. A well may be in CWI but not under the current address, such as the old Rural Route No. and Box No. You would need the section, Township, Range, and then name of the original property owner to try to find the well. If you can provide me with a list of the well disclosure certificate numbers I can have the well disclosure

certificates sent to you. Also, I would recommend contacting the delegated well program, the Goodhue County Environmental Health Department at (651) 385-6130.

Sincerely,

Norman R. Mofjeld, Hydrologist, P.G.
Well Management Section
Minnesota Department of Health
625 North Robert Street
P.O. Box 64975
St. Paul, Minnesota 55164-0975
(651) 201-4593
norman.mofjeld@state.mn.us

From: Stark, Bob [<mailto:bob.stark@ci.red-wing.mn.us>]
Sent: Monday, October 13, 2014 4:05 PM
To: *MDH_WellDisclosures
Subject: Wells not on County Well Index, but with Disclosure IDs

I am working on our Wellhead Protection Plan. I have identified several properties in our Drinking Water Supply Management Area with wells that are not assigned a Unique Well Number, but they do have Well Disclosure identification numbers. Does MnDOH have any information on these wells? Is there another way to get well construction details if they do not have a unique well number and do not show up on the online county well index?

Thanks for your help.

Bob Stark, P.E. | Deputy Director
Public Works Department | Utilities Division
Tel: 651.385.5112 | cell: 651.380.9010
Fax: 651.388.0243
229 Tyler Road North | Red Wing, MN 55066
email: bob.stark@ci.red-wing.mn.us

<DWSMA Wells.xlsx>

Stark, Bob

From: Robyn Hoerr <robynmrwa@hotmail.com>
Sent: Monday, March 09, 2015 8:06 AM
To: Stark, Bob
Subject: Red Wing WHP Plan Comments

Hi Bob,

First of all, I really want to apologize for taking so long to get back to you regarding your WHP draft PCSI. I really thought that you sent me your complete plan draft and I didn't catch that when I initially read your cover letter, so I figured I would need a big chunk of time to do an adequate job reviewing it. I completely misunderstood that you were looking for comments related to the PCSI portion of the plan. So, without further ado--here they are!

I think that you did a super job putting the PCSI together. The investigative work that you did up front will be appreciated. My only suggestion is that you add the municipal wells (and any existing old municipal wells that are no longer part of the municipal system) to this inventory, as per a recent policy clarification by the MDH.

After you have done that, feel free to send it to Mike Baker at MDH (Michael.Baker@state.mn.us) requesting that he review and endorse the PCSI. His phone number is (651) 201-xxxx in case you need to get in touch with him. You will likely need to send the PCSI shape file and the Excel spread sheet to him.

I also looked over you start of the WHP plan body. It looks great so far, but I do have some recommendations:

1. In addition to the information in Table 1 regarding the data elements/assessment, I recommend that you provide a brief paragraph for each major data element category (ex., Geology, Land Use, Public Utility Services, etc.) that describes the data and how the information it provides applies or influences how the DWSMAs will be managed. In other words, what is the data, and why is it important for this plan? The Table itself doesn't provide this important information.
2. In section 3.1, were all of the criteria used to delineate the DWSMA boundary? If you are not sure, you could simply repeat the language in the Part 1 report regarding the DWSMA delineation.
3. Does Table 2 indicate that there were no wells located in the IWMZ areas for each of the city's wells? It may be easier/clearer to just state that.
4. Did you look for Class V wells existing within the DWSMAs? If so, you might consider including it in Table 3, but that it had zero.
5. Other issues that could be added to Table 5 include the fact that there are wells in the DWSMAs, and it is important that they be maintained and operated properly. Also, if there are additional old municipal wells in need of sealing, this is a good place to note that.

5. In Table 8, you really don't need to include the MPCA for it's role in septic system regulation since Red Wing is non-vulnerable and doesn't need to address septic systems. You might consider adding the USEPA Region 5, however, for their role in regulating the Class V Wells. Also, the MDH role in regulation of the construction and operation of wells in Goodhue County is limited to municipal wells only since Goodhue has a delegated well program.

Thank you for the opportunity to review your plan progress to date. Let me know if you have questions regarding my comments above, or further plan development.

Robyn Hoerr

Groundwater Specialist

MN Rural Water Association

*Home Office: 10641 184th CT NW
Elk River, MN 55330*

Cell: 218-821-5028

Email: Robyn.Hoerr@mrwa.com

Web: www.mrwa.com

Stark, Bob

From: Robyn Hoerr <robynmrwa@hotmail.com>
Sent: Sunday, March 29, 2015 11:27 AM
To: Stark, Bob
Subject: Re: Red Wing WHP Plan Comments

Yes, Bob. I would say that the priority for those wells would be low.

Robyn Hoerr
Groundwater Specialist
MN Rural Water Association
Cell: 218-821-5028
Email: Robyn.Hoerr@mrwa.com

On Mar 27, 2015, at 3:14 PM, Stark, Bob <bob.stark@ci.red-wing.mn.us> wrote:

Robyn – Thank you for your comments.

In your comment in the second paragraph regarding adding existing or old wells to the inventory were you suggesting they be added to the potential contamination sources in table 2? If so, I would assume that since they were constructed in compliance with the well code, that the level of risk would be low. Is this a valid assumption?

Thank you.

Bob Stark, P.E. | Deputy Director
Public Works Department | Utilities Division
Tel: 651.385.5112 | cell: 651.380.9010
Fax: 651.388.0243
229 Tyler Road North | Red Wing, MN 55066
email: bob.stark@ci.red-wing.mn.us

From: Robyn Hoerr [<mailto:robynmrwa@hotmail.com>]
Sent: Monday, March 09, 2015 8:06 AM
To: Stark, Bob
Subject: Red Wing WHP Plan Comments

Hi Bob,

First of all, I really want to apologize for taking so long to get back to you regarding your WHP draft PCSI. I really thought that you sent me your complete plan draft and I didn't catch that when I initially read your cover letter, so I figured I would need a big chunk of time to do an adequate job reviewing it. I completely misunderstood that you were looking for comments related to the PCSI portion of the plan. So, without further ado--here they are!

I think that you did a super job putting the PCSI together. The investigative work that you did up front will be appreciated. My only suggestion is that you add the municipal

wells (and any existing old municipal wells that are no longer part of the municipal system) to this inventory, as per a recent policy clarification by the MDH.

After you have done that, feel free to send it to Mike Baker at MDH (Michael.Baker@state.mn.us) requesting that he review and endorse the PCSI. His phone number is (651) 201-xxxx in case you need to get in touch with him. You will likely need to send the PCSI shape file and the Excel spread sheet to him.

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1. In addition to the information in Table 1 regarding the data elements/assessment, I recommend that you provide a brief paragraph for each major data element category (ex., Geology, Land Use, Public Utility Services, etc.) that describes the data and how the information it provides applies or influences how the DWSMAs will be managed. In other words, what is the data, and why is it important for this plan? The Table itself doesn't provide this important information.

2. In section 3.1, were all of the criteria used to delineate the DWSMA boundary? If you are not sure, you could simply repeat the language in the Part 1 report regarding the DWSMA delineation.

3. Does Table 2 indicate that there were no wells located in the IWMZ areas for each of the city's wells? It may be easier/clearer to just state that.

4. Did you look for Class V wells existing within the DWSMAs? If so, you might consider including it in Table 3, but that it had zero.

5. Other issues that could be added to Table 5 include the fact that there are wells in the DWSMAs, and it is important that they be maintained and operated properly. Also, if there are additional old municipal wells in need of sealing, this is a good place to note that.

5. In Table 8, you really don't need to include the MPCA for it's role in septic system regulation since Red Wing is non-vulnerable and doesn't need to address septic systems. You might consider adding the USEPA Region 5, however, for their role in regulating the Class V Wells. Also, the MDH role in regulation of the construction and operation of wells in Goodhue County is limited to municipal wells only since Goodhue has a delegated well program.

Thank you for the opportunity to review your plan progress to date. Let me know if you have questions regarding my comments above, or further plan development.

Robyn Hoerr
Groundwater Specialist
MN Rural Water Association

Home Office: 10641 184th CT NW
Elk River, MN 55330
Cell: 218-821-5028
Email: Robyn.Hoerr@mrwa.com
Web: www.mrwa.com

Stark, Bob

From: Robyn Hoerr <robynmrwa@hotmail.com>
Sent: Thursday, April 21, 2016 11:13 AM
To: Stark, Bob
Subject: High Capacity Well Measure for Plan

Hi Bob,

Here is some language that you can use for a measure in the WHP plan to address the potential for high capacity wells to be constructed in the DWSMAs:

Collaborate with the MNDNR Water Appropriations Program and the MDH Source Water Protection Unit in the identification of new high-capacity wells that are proposed for construction within or near the DWSMA. The WHP Manager will alert the MDH upon learning about the construction or use of a high capacity well in or near the DWSMA. Potential impacts will be evaluated.

Source of Action: WHP Manager

Cooperator: MNDNR staff, including the Regional Hydrologist; MDH

Time Frame: On-going activity

Estimated Cost: Staff time

Robyn Hoerr

Groundwater Specialist

MN Rural Water Association

Home Office: 10641 184th CT NW

Elk River, MN 55330

Cell: 218-821-5028

Email: Robyn.Hoerr@mrwa.com

Web: www.mrwa.com

Stark, Bob

From: Robyn Hoerr <robynmrwa@hotmail.com>
Sent: Thursday, March 24, 2016 11:31 AM
To: Stark, Bob
Subject: Comments on Red Wing WHP Part 2 Draft
Attachments: WHP -PHASE 2 document 2-12-16_RH_Comments.pdf

Hi Bob,

Thank you for the opportunity to review the Red Wing WHP plan draft and provide comments. I've attached the plan draft file with my comments embedded in the document.

FYI...I have a request in to MDH for the land use/land cover maps and tables that are required to be submitted with the plan. Mike Baker should be able to provide those to me, and I will forward them on to you when I receive them.

Please let me know if you have any questions regarding my comments.

Thanks!

Robyn Hoerr

Groundwater Specialist

MN Rural Water Association

Home Office: 10641 184th CT NW

Elk River, MN 55330

Cell: 218-821-5028

Email: Robyn.Hoerr@mrwa.com

Web: www.mrwa.com

Stark, Bob

From: Bailey, Pat (MDH) <pat.bailey@state.mn.us>
Sent: Friday, April 15, 2016 11:57 AM
To: Stark, Bob
Cc: 'Robyn Hoerr' (robyn.hoerr@mrwa.com)
Subject: Wellhead Protection Plan Part 2
Attachments: llc00712.pdf; llc00713.pdf; WHP -PHASE 2 document 2-12-16_RH_PBComments.pdf

Hi Bob,

Attached is your draft plan with detailed comments made by Robyn. I would concur with her comments and I added a few more. As Robyn stated you need to include land use related maps ... i.e. parcel and political boundary maps can be on the same map as well as maps showing zoning and a comp plan map. I have attached land cover maps that can be added too. Also if you need pdfs of the Inner Wellhead Management Zone-PCSI reports, I can send you those to include in the appendix.

In regard to the well inventory, did you utilize elevation information to exclude those wells based on depth of the well where the depth was known? From Scoping 2 Notice *All potential contaminant sources and facility designations as listed on the attachment [inventory wells 600 elevation (feet, MSL) of the bottom of the well and deeper for East DWSMA and 500 elevation (feet, MSL) of the bottom of the well and deeper for West DWSMA) and wells of undocumented or unknown depths for the potential contaminant source inventory];*

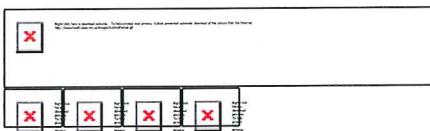
There are several good measures in the plan of action but as indicated by Robyn there are some that can be consolidated or appear to be repeats.

Although not in your DWSMAs, the city can certainly incorporate actions in sealing old muni wells into the plan, if desired. I cannot remember the status of all the older wells but you may want to consider that too.

I would suggest Robyn, you and I have a have a quick conference call next week so we can go through the comments and make sure you have the maps etc. you need. I also can attend the public hearing on April 25th if anyone had any questions about the rule or program.

Let me know when you would be available next week if the conference call idea sounds worthwhile.
Sincerely, Pat

PAT BAILEY
Principal Planner
Minnesota Department of Health
Source Water Protection
18 Wood Lake Drive Rochester
p 507-206-2741 | m 507-779-5700



Stark, Bob

From: Bailey, Pat (MDH) <pat.bailey@state.mn.us>
Sent: Thursday, April 21, 2016 4:00 PM
To: Stark, Bob; 'Robyn Hoerr' (robyn.hoerr@mrwa.com)
Subject: Well in PCSI Inventory
Attachments: DC432620.pdf

Some of the wells meet the depth criteria that Justin indicated and some don't ... Maybe it should just be noted in the comment section of the spreadsheet. I talked to Mark Wettlaufer and he seemed good with that... If there will be a mailing of well maintenance brochures, I don't see the harm in sending to everyone.

I don't see that there is likely unused well in the East DWSMA. I did come across a disclosure document attached that appears to be in the West DWSMA and associated with a parcel now owned by the Lutheran Home. Any ideas Bob?

I am trying to review the PCSI list and compare to MDH Well Management database... just to check so probably will not be able to get back with you until tomorrow ..free in the morning?

Pat

PAT BAILEY

Principal Planner
Minnesota Department of Health
Source Water Protection
18 Wood Lake Drive Rochester
p 507-206-2741 | m 507-779-5700



Stark, Bob

From: Bailey, Pat (MDH) <pat.bailey@state.mn.us>
Sent: Friday, April 22, 2016 1:14 PM
To: Stark, Bob
Cc: 'Robyn Hoerr' (robyn.hoerr@mrwa.com)
Subject: Red Wing WHP Plan - Wells within East DWSMA
Attachments: 00573830.pdf; RedWing East DWSMA Wells.xlsx

Bob,

Attached is a spreadsheet with the wells that have uniques and the elevations. Justin determined a cutoff elevation at 600 for the East DWSMA.. This is quite conservative and as you indicated all these wells are in the aquifer now called the Tunnel City/Lone Rock.

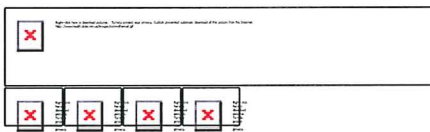
After talking to my Supervisor.. I think it would OK to include all the wells and in the comment line indicate the ones that meet the depth criteria. Of the well owner related measures, I think sending out a mailing to all well owners in the DWSMA about Well Maintenance is reasonable. The other ones nitrate clinic, unused well info, well sealing demo are probably not needed.

I am wondering about the fate of two wells. The one shown in the disclosure I sent yesterday and the well that was on the First Covenant Church property. Our records indicated that the church hooked up to city water but don't know if they are still using the well or not?

Will give you a call on Monday.

Sincerely, Pat

PAT BAILEY
Principal Planner
Minnesota Department of Health
Source Water Protection
18 Wood Lake Drive Rochester
p 507-206-2741 | m 507-779-5700



Appendix VI – Data Element Assessment Background Information

Appendix VI contains background information used for data element assessment.

1. Parcel Boundaries map
2. Political Boundaries Map
3. PLS Map
4. Land Use Map
5. Zoning Map

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Parcel Map - East DWSMA

Red Wing Municipal Well

Parcels

DWSMA

Municipal Boundary

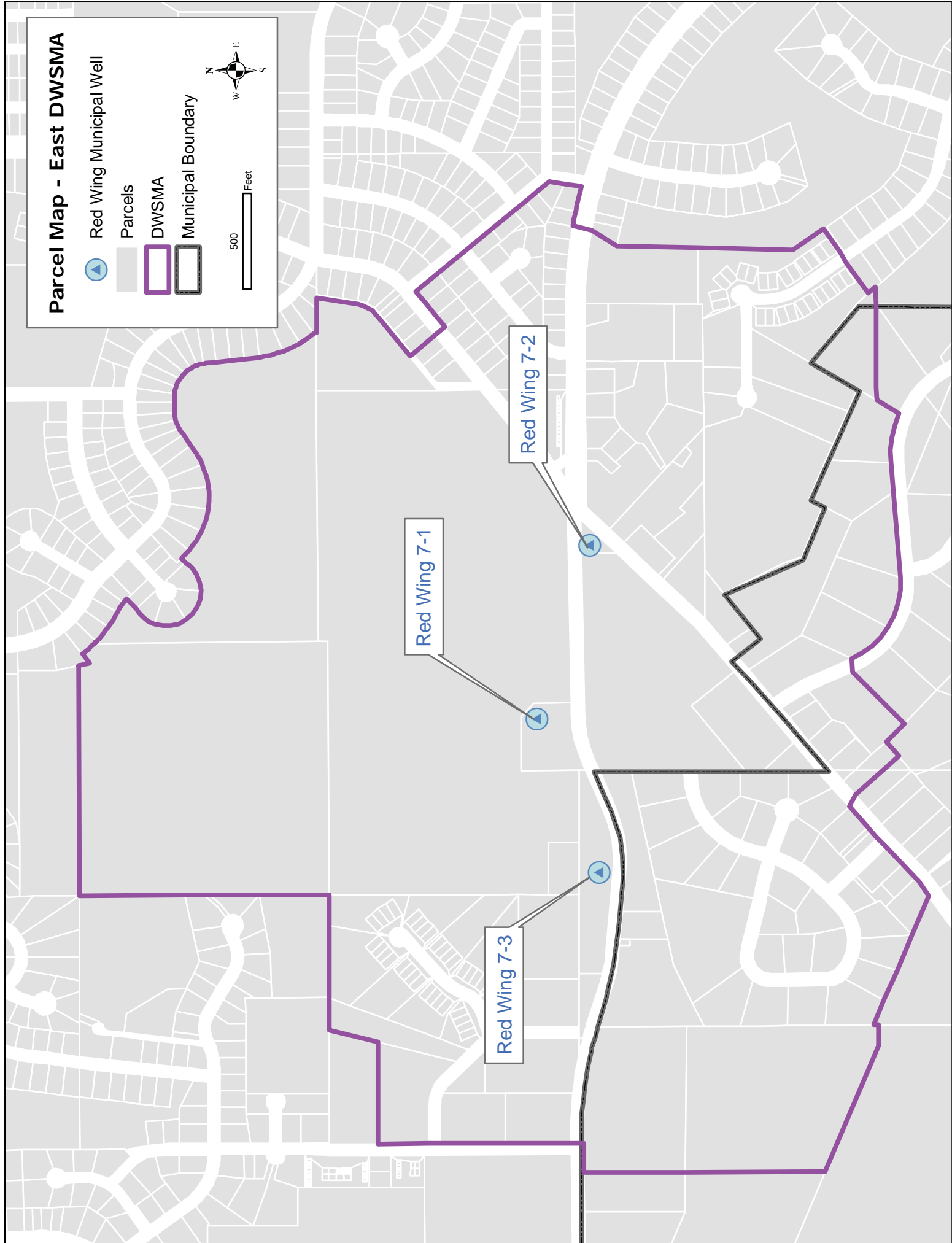


500 Feet

Red Wing 7-1

Red Wing 7-2

Red Wing 7-3



Parcel Map - West DWSMA

Red Wing Municipal Well

Parcels

DWSMA

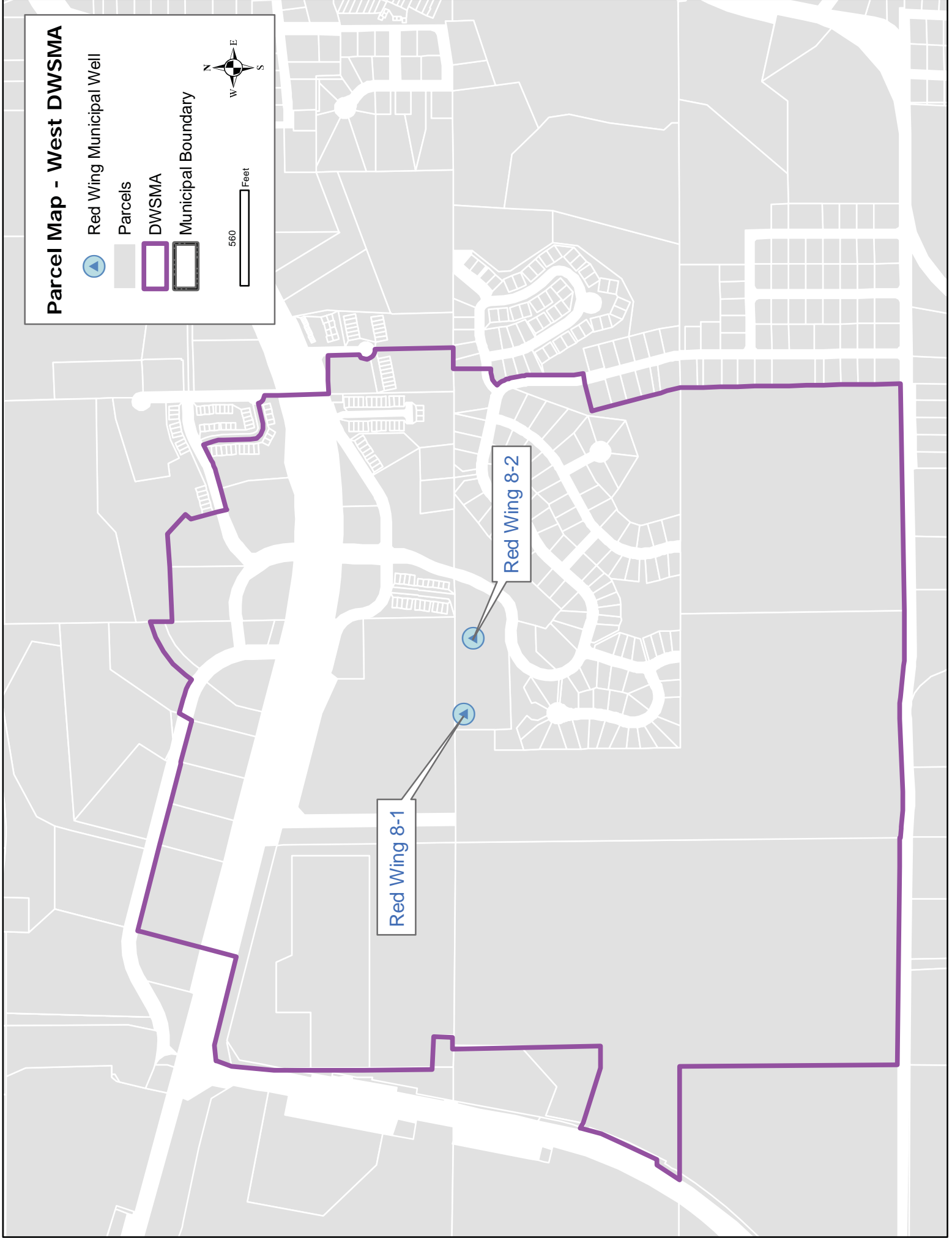
Municipal Boundary

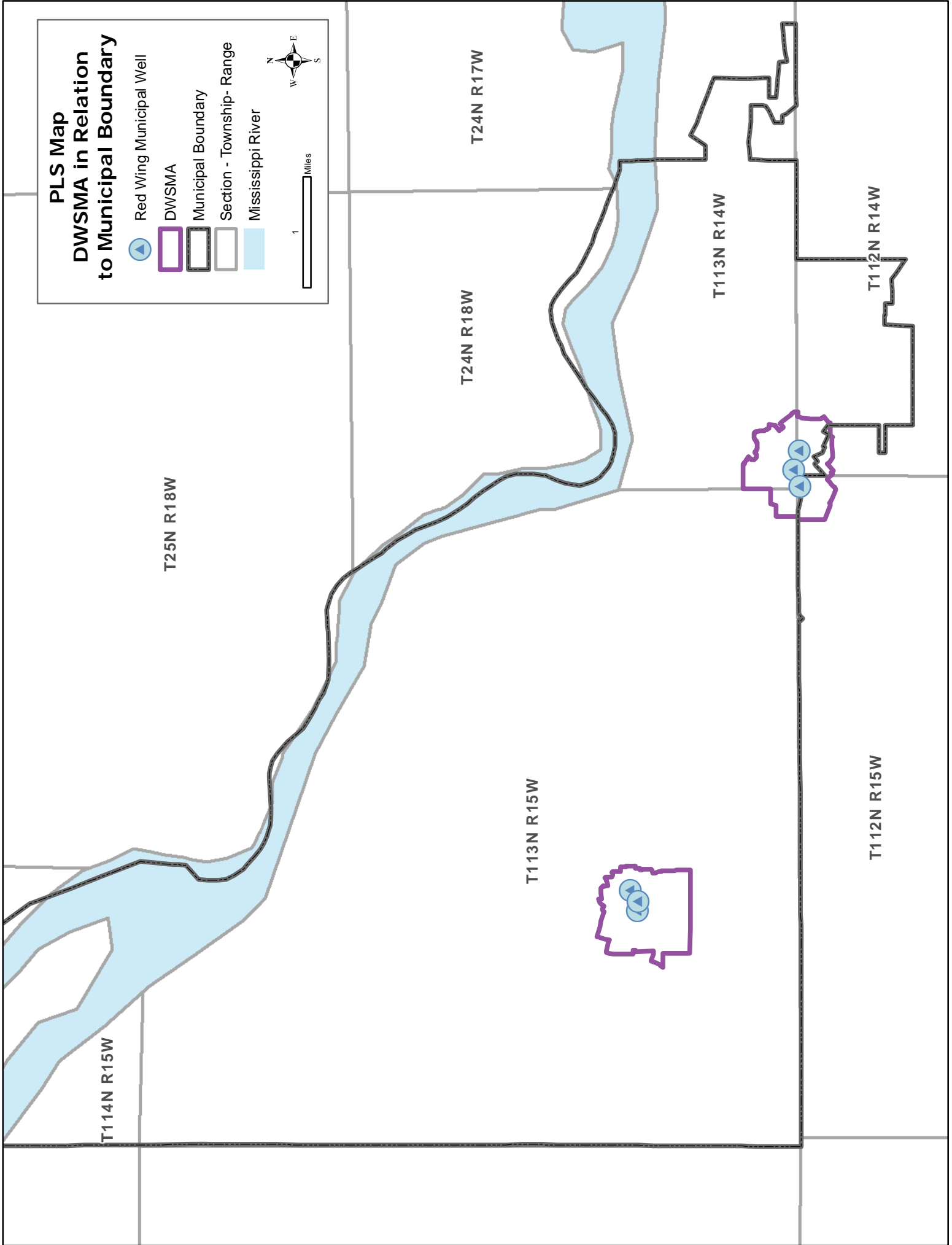


560 Feet

Red Wing 8-1

Red Wing 8-2





PLS Map - East DWSMA

Red Wing Municipal Well

DWSMA

Municipal Boundary

Section - Township- Range



500 Feet

T1113N R15W

T1113N R14W

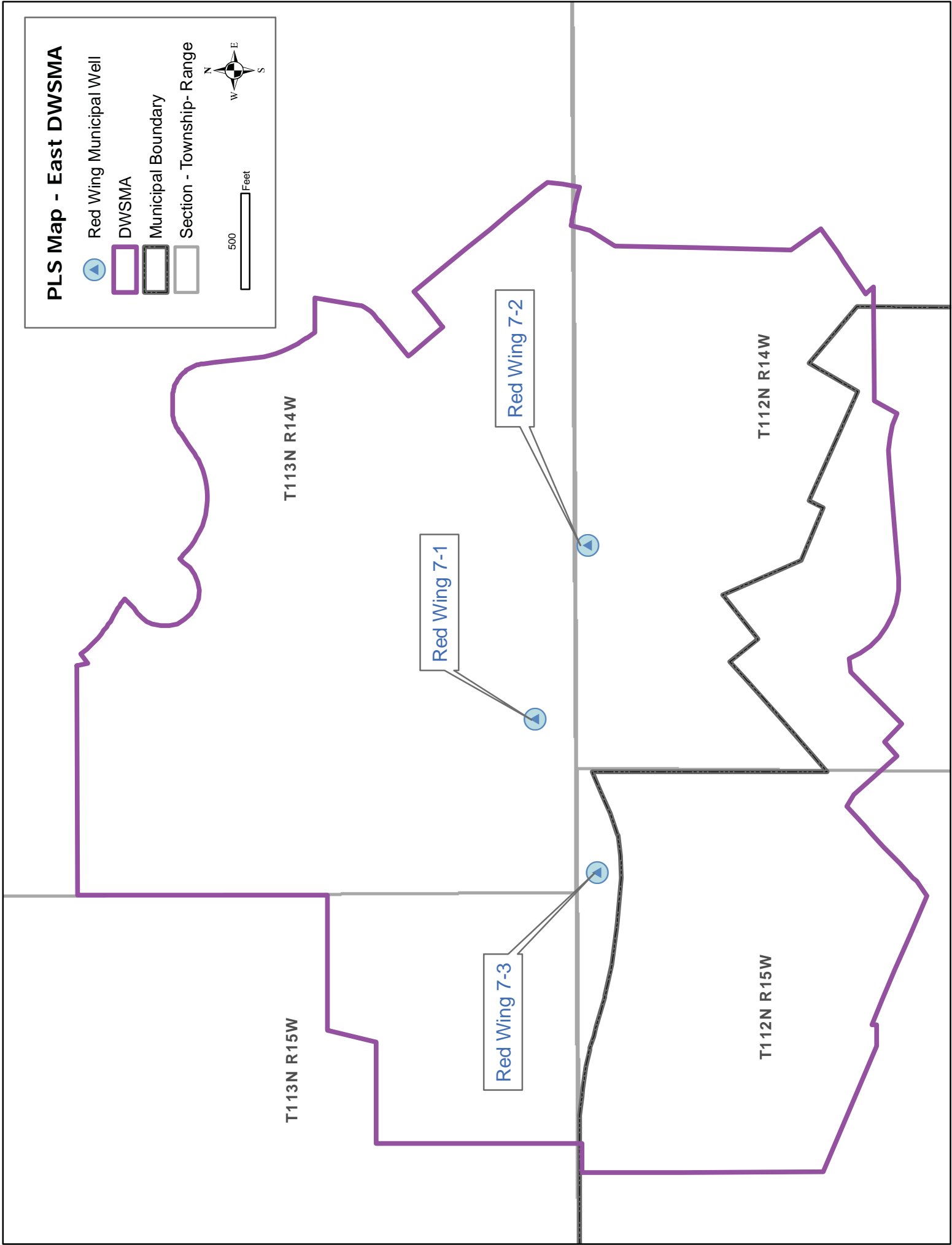
Red Wing 7-1

Red Wing 7-3

Red Wing 7-2

T1112N R15W

T1112N R14W

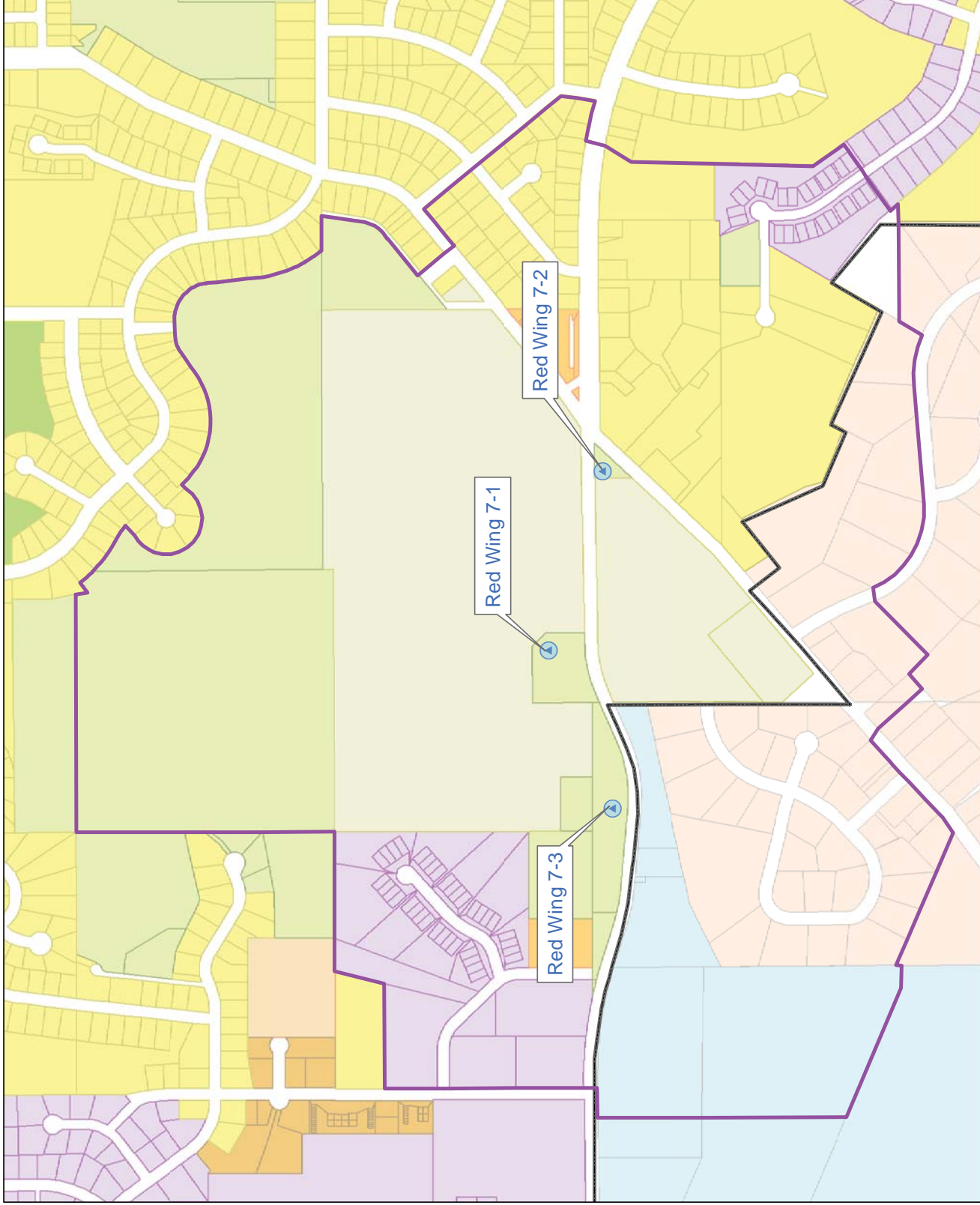


Zoning Map East DWSMA

- Red Wing Municipal Well
- A-Agriculture
- AC-Agriculture Conservation
- AR-Agriculture Residential
- B1-Local Business
- B2-General Business
- B2a-General Business (adj. to B3)
- B3-Central Business
- CI-Civic
- I1-Light Industrial
- I2-General Industrial
- MC-Mixed Use/Industrial/Office Commercial
- MCT-Mixed Use Commercial Tourism
- PUD-Planned Unit Development
- Prairie Island Indian Community
- R1-Residential one
- R2-Residential Two
- RF-Riverfront
- RM1-Residential Multi-Family One (
- RM2-Residential Multi-Family Two
- Split Zoning
- A3 - Goodhue County
- R1 - Goodhue County
- DWSMA
- Municipal Boundary

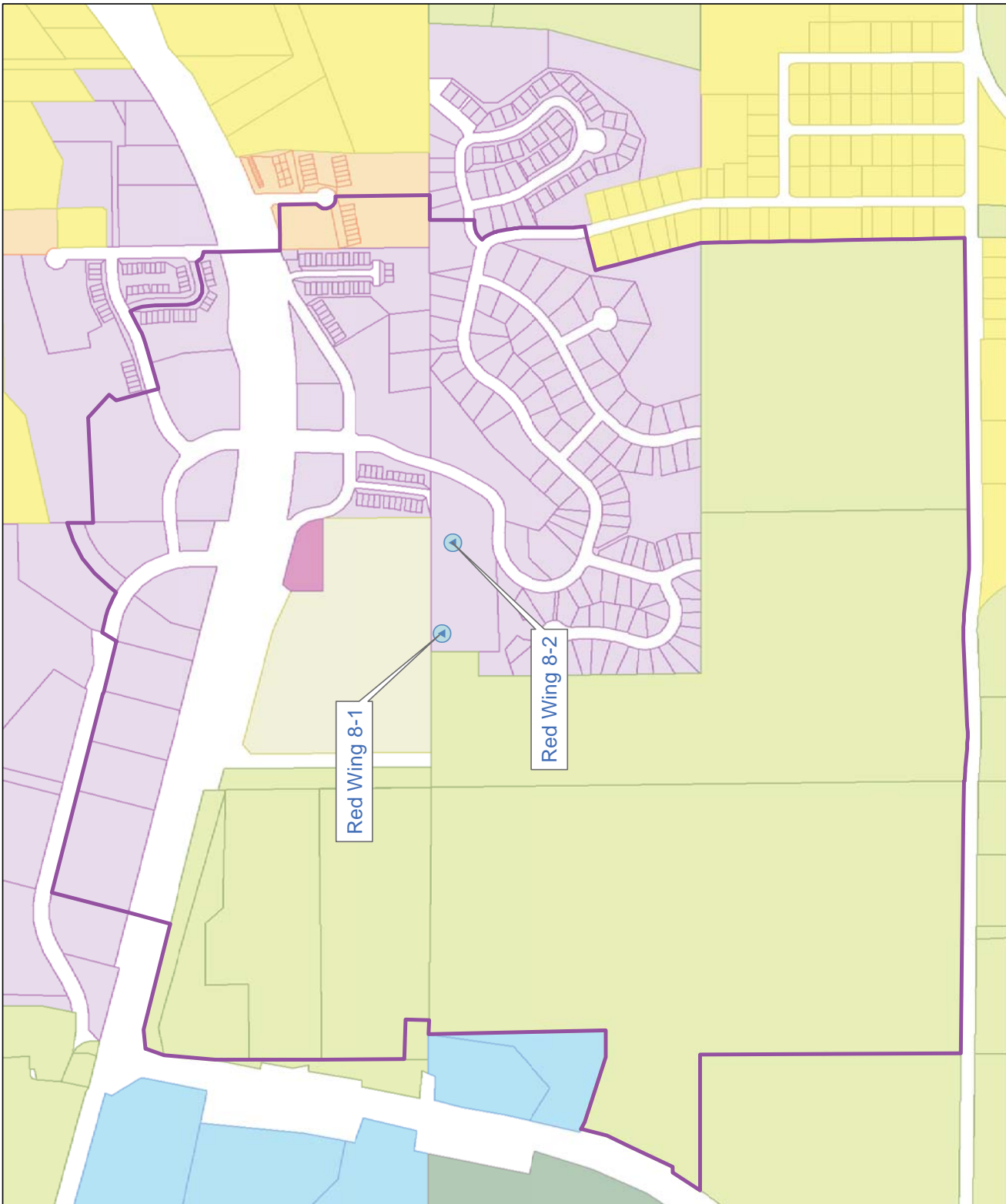
Zoning Classification	% Within DWSMA
AR-Agriculture Residential	23
CI-Civic	26
R1-Residential One	15
RM1-Residential Multi-Family	2
PUD-Planned Unit Development	9
R1-Goodhue County	15
A3-Goodhue County	10

750 Feet

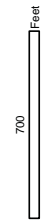


Zoning Map West DWSMA

- Red Wing Municipal Well
- A-Agriculture
- AC-Agriculture Conservation
- AR-Agriculture Residential
- B1-Local Business
- B2-General Business
- B2a-General Business (adj. to B3)
- B3-Central Business
- CI-Civic
- I1-Light Industrial
- I2-General Industrial
- MC-Mixed Use/Industrial/Office Commercial
- MCT-Mixed Use Commercial Tourism
- PUD-Planned Unit Development
- Prairie Island Indian Community
- R1-Residential one (3.5-5 units/acre)
- R2-Residential Two (5-8 units/acre)
- RF-Riverfront
- RM1-Residential Multi-Family One (8-16 units/acre)
- RM2-Residential Multi-Family Two (+16 units/acre)
- Split Zoning
- DWSMA
- Municipal Boundary



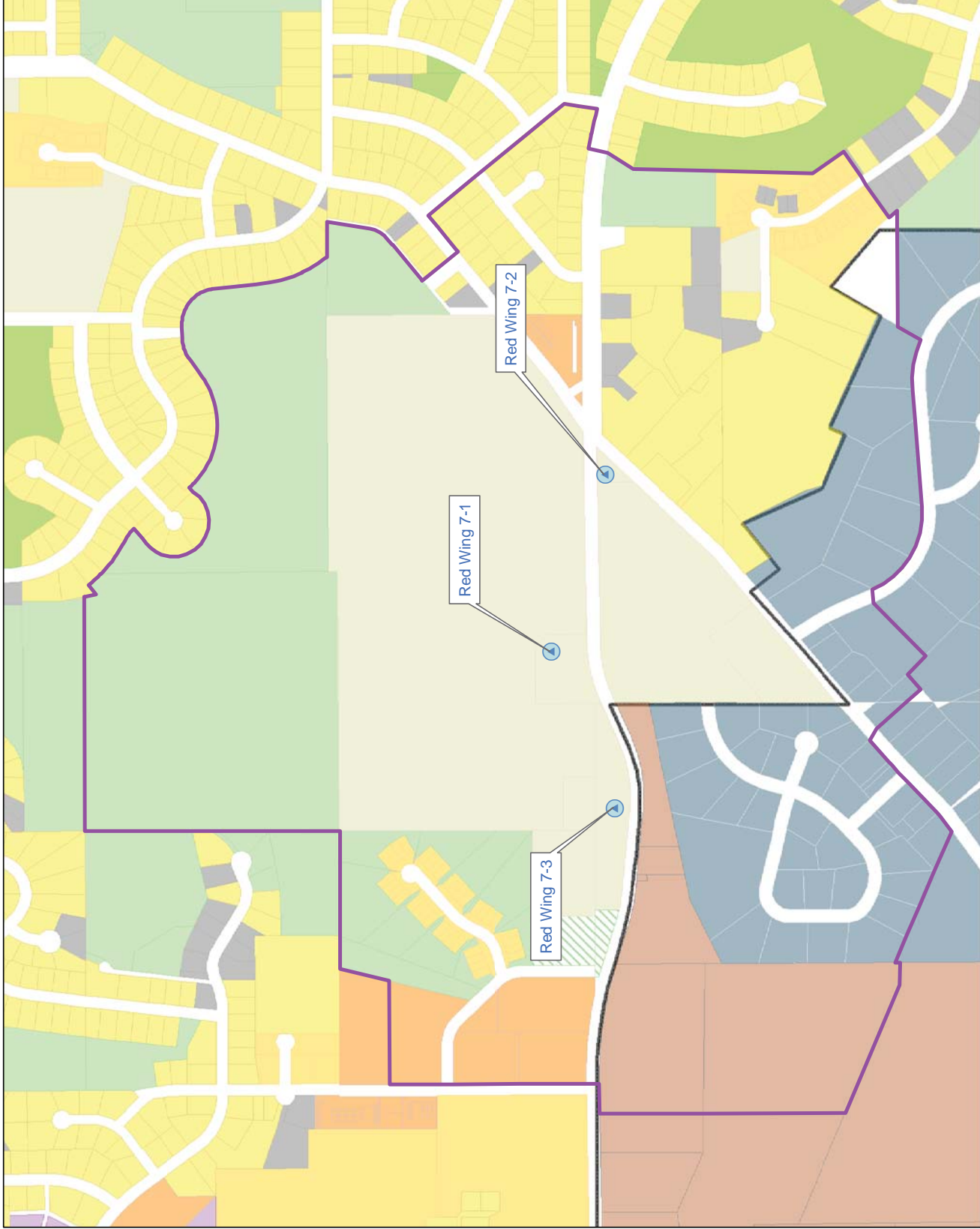
Zoning Classification	% Within DWSMA
AR-Agriculture Residential	63
CI-Civic	5
B1-Local Business	0.03
PUD-Planned Unit Dev.	31
RM1-Residential Family 1	0.97
Total	100



Comprehensive Land Use Map East DWSMA

- Red Wing Municipal Well
- Agriculture
- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Downtown
- Community Commercial
- Mixed Use Commercial
- Regional Commercial
- Industry
- Institutional
- Open Space
- Park (active)
- Prairie Island Community
- Utility
- Vacant
- A3-Urban Fringe
- R1-Suburban Residential
- DWSMA
- Municipal Boundary

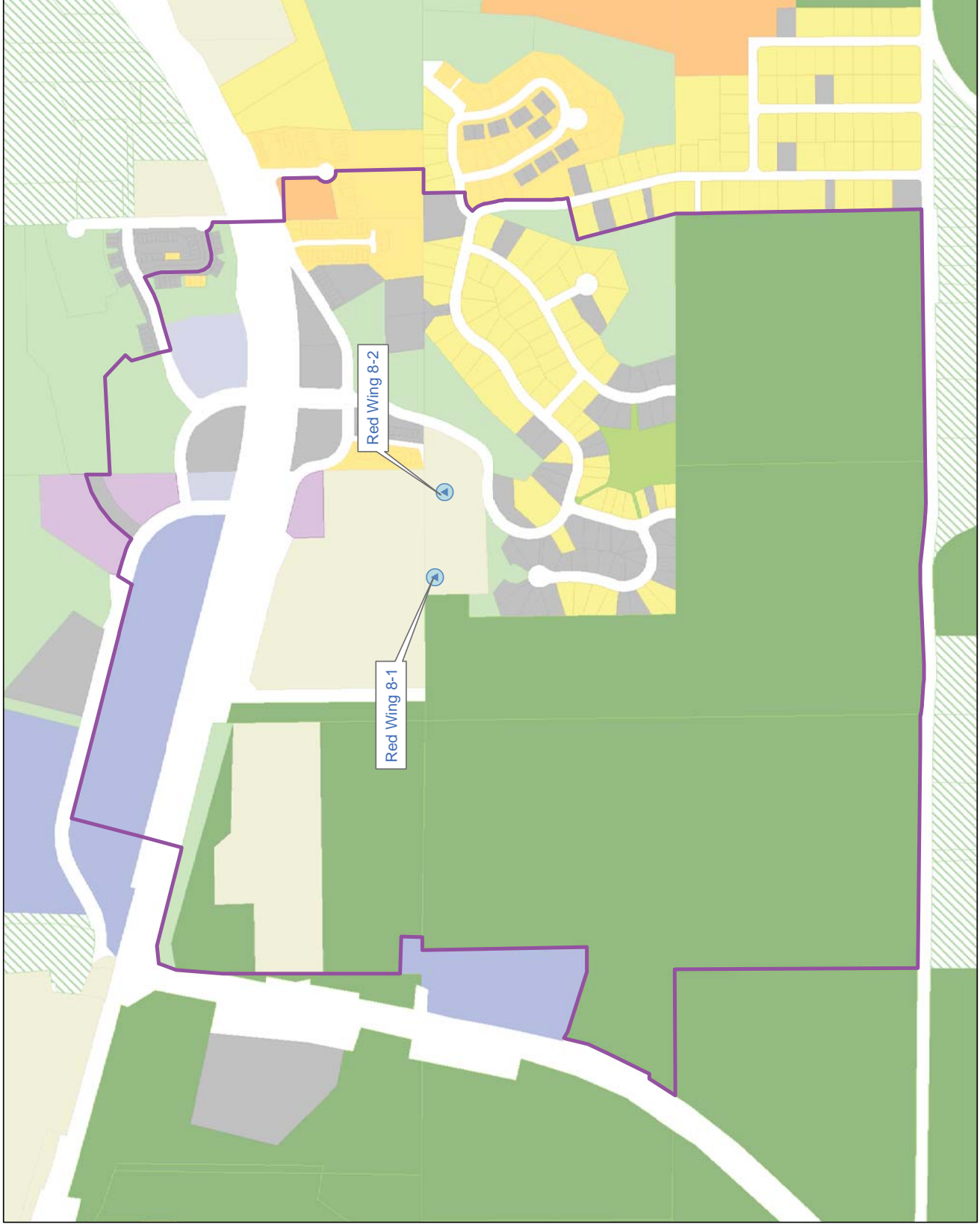
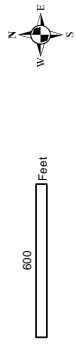
Land Use/Zoning Category	% Within DWSMA
Open Space	24
Rural Residential	1
High Density Residential	3
Medium Density Residential	3
Low Density Residential	13
Vacant	2
Institutional	30
A3-UrbanFringe (County)	9
R1-Suburban Residential (County)	15



Comprehensive Land Use Map West DWSMA

- Red Wing Municipal Well
- Agriculture
- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Downtown
- Community Commercial
- Mixed Use Commercial
- Regional Commercial
- Industry
- Institutional
- Open Space
- Park (active)
- Prairie Island Community
- Utility
- Vacant
- DWSMA
- Municipal Boundary

Land Use Category	% Within DWSMA
Agriculture	61
Institutional	13
Open Space	8
Regional Commercial	1
Community Commercial	1
Vacant	8
Medium Density Residential	2
Low Density Residential	6



Appendix VII – Inner Wellhead Management Zone Potential Contaminate Source Inventory Report

Appendix VII contains the Inner Wellhead Management Zone (IWMZ) Potential Contaminate Source Inventory for wells 7-1, 7-2, 7-3, 8-1 and 8-2. The report for each well contains an inventory of the potential sources of contamination, the distance from the contamination sources to the well, an aerial photograph showing the well and the potential sources of contamination, and recommended wellhead protection measures. The protection measures are incorporated into the Plan of Action contained in Chapter 9.

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

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1250013	COMMUNITY
NAME	Red Wing	
ADDRESS	Red Wing Public Utilities, c/o Mr. Corey Aadalen, 229 Tyler Road North, Red Wing, MN 55066	

FACILITY (WELL) INFORMATION

NAME	Well #7-1	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?
FACILITY ID	S05	<input type="checkbox"/> YES (Please attach a copy)
UNIQUE WELL NO.	216020	<input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
COUNTY	Goodhue	

PWS ID / FACILITY ID	1250013 S05	UNIQUE WELL NO.	216020
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)			LOCATION	
		Minimum Distances		Sensitive Well¹	Within 200 Ft. Y / N / U	Dist. from Well
		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 well² (Class V well - illegal³)	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	50/300/150⁴	50/300/150⁴	100/600/300⁴	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	
*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	

PWS ID / FACILITY ID	1250013 S05	UNIQUE WELL NO.	216020
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
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		Y	75	N
SWI	Storm water drainage well² (Class V well - illegal³)	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		Y	80	Y
*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	illegal³	illegal³		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		

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
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 ^s	20		Y	40	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	N		

[illegible]

	none found within 200' of this well.						
--	--------------------------------------	--	--	--	--	--	--

PWS ID / FACILITY ID

1250013 S05

UNIQUE WELL NO.

216020

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

Bailey, Pat (SWP)

DATE

12 - 6 - 2016

PWS ID / FACILITY ID	1250013 S05	UNIQUE WELL NO.	216020
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RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Sorbent material should be maintained on site for immediate clean-up of spills.		
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		
The stormwater pipe should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website.		

COMMENTS
PT4 electrical generator with internal fuel tank (emergency pumping). SD1 storm sewer pipe starts SW of well house flows ~ 200 ft and then south. there is a sanitary sewer outside IWMZ, under Pioneer Rd.

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

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

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1250013	COMMUNITY
NAME	Red Wing	
ADDRESS	Red Wing Public Utilities, c/o Mr. Corey Aadalen, 229 Tyler Road North, Red Wing, MN 55066	

FACILITY (WELL) INFORMATION

NAME	Well #7-2	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?
FACILITY ID	S06	<input type="checkbox"/> YES (Please attach a copy)
UNIQUE WELL NO.	151565	<input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
COUNTY	Goodhue	

PWS ID / FACILITY ID	1250013 S06	UNIQUE WELL NO.	151565
-----------------------------	-------------	------------------------	--------

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
		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	
*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	

PWS ID / FACILITY ID	1250013 S06	UNIQUE WELL NO.	151565
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
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	40	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	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	75	N
SWI	Storm water drainage well² (Class V well - illegal³)	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		
IWD	Industrial waste disposal well (Class V well)²	illegal³	illegal³		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		

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*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 ^s	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		

[illegible]

	none found within 200' of this well.						
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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.

3

PWS ID / FACILITY ID

1250013 S06

UNIQUE WELL NO.

151565

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

Bailey, Pat (SWP)

DATE

12 - 6 - 2016

PWS ID / FACILITY ID	1250013 S06	UNIQUE WELL NO.	151565
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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.		
The stormwater pipe should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website.		

COMMENTS
Storm sewer runs east-west under Pioneer Road. SB2s represent closest pts of main sewer lines east - west edge of Pioneer Rd and a line runs south along west side of well that joins sewer main under Twin Bluffs Rd.

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

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

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1250013	COMMUNITY
NAME	Red Wing	
ADDRESS	Red Wing Public Utilities, c/o Mr. Corey Aadalen, 229 Tyler Road North, Red Wing, MN 55066	

FACILITY (WELL) INFORMATION

NAME	Well #7-3	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?
FACILITY ID	S07	<input type="checkbox"/> YES (Please attach a copy)
UNIQUE WELL NO.	686251	<input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
COUNTY	Goodhue	

PWS ID / FACILITY ID	1250013 S07	UNIQUE WELL NO.	686251
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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		
*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		

PWS ID / FACILITY ID	1250013 S07	UNIQUE WELL NO.	686251
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
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	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	98	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	40	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	51	N
SWI	Storm water drainage well² (Class V well - illegal³)	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		
IWD	Industrial waste disposal well (Class V well)²	illegal³	illegal³		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		

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
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 ^s	20		Y	84	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		

[illegible]

	none found within 200' of this well.						
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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.

3

PWS ID / FACILITY ID

1250013 S07

UNIQUE WELL NO.

686251

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

Bailey, Pat (SWP)

DATE

12 - 6 - 2016

PWS ID / FACILITY ID	1250013 S07	UNIQUE WELL NO.	686251
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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.		
Sorbent material should be maintained on site for immediate clean-up of spills.		
The stormwater pipe should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website.		

COMMENTS
SD1 closest pt to well. SB1 sanitary sewer line from Twin Bluff Water Treatment Facility joins main SB2 under Pioneer Rd. PT4 self contained double walled with leak detection (emergency pumping).

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

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

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1250013	COMMUNITY
NAME	Red Wing	
ADDRESS	Red Wing Public Utilities, c/o Mr. Corey Aadalen, 229 Tyler Road North, Red Wing, MN 55066	

FACILITY (WELL) INFORMATION

NAME	Well #8-1	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?
FACILITY ID	S08	<input type="checkbox"/> YES (Please attach a copy)
UNIQUE WELL NO.	686252	<input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
COUNTY	Goodhue	

PWS ID / FACILITY ID	1250013 S08	UNIQUE WELL NO.	686252
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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		
*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		

PWS ID / FACILITY ID	1250013 S08	UNIQUE WELL NO.	686252
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
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		Y	60	N
SWI	Storm water drainage well² (Class V well - illegal³)	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		
IWD	Industrial waste disposal well (Class V well)²	illegal³	illegal³		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		

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non- community				
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		

[illegible]

	none found within 200' of this well.						
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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.

3

PWS ID / FACILITY ID

1250013 S08

UNIQUE WELL NO.

686252

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
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Were the isolation distances maintained for the new sources of contamination?			
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Is the system monitoring existing nonconforming sources of contamination?			
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Reminder Question: Were the wellhead protection measure(s) implemented?			
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INSPECTOR

Bailey, Pat (SWP)

DATE

12 - 6 - 2016

PWS ID / FACILITY ID	1250013 S08	UNIQUE WELL NO.	686252
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RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
The stormwater pipe should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website.		

COMMENTS
A backwash tank emergency overflow is connected to the storm sewer line near SD1 point.

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

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

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1250013	COMMUNITY
NAME	Red Wing	
ADDRESS	Red Wing Public Utilities, c/o Mr. Corey Aadalen, 229 Tyler Road North, Red Wing, MN 55066	

FACILITY (WELL) INFORMATION

NAME	Well #8-2	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?
FACILITY ID	S09	<input type="checkbox"/> YES (Please attach a copy)
UNIQUE WELL NO.	686258	<input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
COUNTY	Goodhue	

PWS ID / FACILITY ID	1250013 S09	UNIQUE WELL NO.	686258
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PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well¹	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 well² (Class V well - illegal³)	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	50/300/150⁴	50/300/150⁴	100/600/300⁴	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		
*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		

PWS ID / FACILITY ID	1250013 S09	UNIQUE WELL NO.	686258
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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				
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	75	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		Y	70	Y
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	110	Y
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	150	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		Y	149	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		
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		

PWS ID / FACILITY ID

1250013 S09

UNIQUE WELL NO.

686258

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
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Were the isolation distances maintained for the new sources of contamination?			
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Is the system monitoring existing nonconforming sources of contamination?			
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Reminder Question: Were the wellhead protection measure(s) implemented?			
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INSPECTOR

Bailey, Pat (SWP)

DATE

12 - 6 - 2016

PWS ID / FACILITY ID	1250013 S09	UNIQUE WELL NO.	686258
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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.		
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.		
Sorbent material should be maintained on site for immediate clean-up of spills.		
The stormwater pond should be managed to insure optimal performance. Information on stormwater management can be found on the Minnesota Pollution Control Agency website.		

COMMENTS
PT4 electrical generator, internal fuel tank (for emergency pumping). SD1 runs north from the Charlson Crest Treatment building. Another SD1 from backwash tank. These pipes N, 90 to W. SB1 closet point sewer line from treatment building.

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

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