

# City of Big Falls

## WELLHEAD PROTECTION PLAN



September 2020

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## **PUBLIC WATER SUPPLY PROFILE**

### **PUBLIC WATER SUPPLY**

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## PART 2 EXECUTIVE SUMMARY

This portion of the wellhead protection (WHP) plan for the City of Big Falls includes:

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

Part 1 of the wellhead protection plan presented the 1) delineation of the wellhead protection area (WHPA) and the drinking water supply management area (DWSMA) and 2) the vulnerability assessments for the system's wells and the aquifer within the DWSMA. Part 1 of the WHP plan was submitted to the Minnesota Department of Health (MDH) and approved on March 8, 2018. The boundaries of the WHPA and DWSMA are shown in Figure 1.

The vulnerability assessment for the aquifer within the DWSMA was performed using available information and indicates that the aquifer used by the system is considered to be moderately vulnerable to contamination because there appears some likelihood that a small amount of recharge from the surface is occurring. Consequently, the principal potential sources of contamination to the aquifer are other wells that reach or penetrate it, shallow disposal-type wells and storage tanks. This information was presented to the WHP Team during the Second Scoping meeting held with the MDH when the necessary requirements for the content of Part 2 were outlined and discussed in detail.

The information and data contained in Chapters 1-4 of this part of the WHP Plan support the approaches taken to address potential contamination sources that have been identified as potentially affecting the aquifer used by the public water supply. The reader is encouraged to concentrate attention on Chapters 1-4 in order to better understand why a particular management strategy is included in Chapter 5.

In Chapter 1, the required data elements indicated by MDH in the Scoping 2 Decision Notice are addressed, as well as the assessment of data elements. Pertinent data elements include information about the geology, water quality, water quantity, land use, and the public utility services. The data elements and information supplied in Part 1 of the WHP Plan are based on the assessment that the aquifer providing drinking water for this system is moderately vulnerable to contamination from land uses, such as other wells that penetrate the same aquifer and land uses that either store liquids in tanks or dispose of liquids below the land surface.

Chapter 2 addresses the possible impacts that changes in the physical environment, land use, and water resources have on the public water supply. Limited changes in land use are expected and likely will not have significant impacts on the aquifer. The City of Big Falls has evaluated the support necessary to implement its wellhead protection plan. Limited resources pose a challenge due to the small size of the community and the city will focus efforts on building partnerships with local and state resource agencies to cooperate and collaborate on drinking water protection efforts.

The problems and opportunities concerning land use issues relating to the aquifer, well water, and the DWSMA, and those issues identified at public meetings are addressed in Chapter 3. The moderately vulnerable status of the aquifer and the good water quality currently produced by the system's wells leaves four major concerns to be addressed by this plan: 1) other wells located within the DWSMA that could become pathways for contamination to enter the aquifer; 2) the pumping effects of high-

capacity wells that may alter the boundaries of the delineated WHPA, reduce the hydraulic head in the aquifer, or cause the movement of contamination toward the public water supply wells; 3) underground or above-ground storage tanks that may release contaminants into groundwater and 4) shallow disposal-type wells. The city will proactively monitor the establishment of other high capacity wells.

The drinking water protection goals that the city would like to achieve with this plan are listed in Chapter 4. In general, the City would like to promote public health, economic development and community infrastructure by maintaining a good drinking water supply for the community.

The objectives and action plans for managing potential sources of contamination are contained in Chapter 5. Actions aimed toward educating the general public about groundwater and drinking water protection issues, proper well management, and collecting data relevant to wellhead protection planning are the general focus.

Chapter 6 contains a guide to evaluate the implementation of the identified management strategies of Chapter 5. The wellhead protection program implementation efforts for the City of Big Falls will be evaluated by the city at a minimum of every 2 ½ years.

Chapter 7 is the emergency/contingency plan, which outlines the steps the city will take in the event of contamination or mechanical disruption to the city's water supply.

## Summary of Wellhead Protection Actions

Wellhead Protection Action Item Descriptions	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Public Education and Outreach</b>										
Provide residents with an article that explains the importance of WHP.	•							•		
Request a large map of the DWSMA from MDH and display at city hall.	•									
Send Koochiching County SWCD a map of the DWSMA and letter requesting their support in protecting the city's DWSMA. Also request that they discuss the Big Falls WHP Plan when updating the county's CLWMP.	•									
<b>Potential Contaminant Source Management</b>										
Provide property owners who have a well in the DWMSA, information on proper management of their well.		•					•			
Apply for a MDH grant or SWCD cost-share funds to pay the costs to seal the two identified inactive unused wells and/or any others discovered in the DWSMA.	As Occurs									
If funds are received, have a certified contractor seal the well(s).	As Occurs									
WHP Team and Manager will update the PCSI map and table.					•					
Inform MDH if a Class V well is identified within the DWSMA.	As Occurs									
<b>Data Collection</b>										
Resample wells for vulnerability parameters as determined by the MDH.						•				
Contact MDH Hydrologist to get a list of any wells that might have been constructed within two miles of the DWSMA and verify their locations.							•			
<b>Inner Wellhead Management Zone</b>										
Implement measures that are specified in the IWMZ PCSI report.	•	•	•	•	•	•	•	•	•	•
Monitor and maintain the 200 ft. radius around the wells to ensure that setback distances for new potential contamination sources are met.	•	•	•	•	•	•	•	•	•	•
Request MDH assistance to update the IWMZ inventory for the PWS wells.					•					•
Assess security around the wells, and apply for MDH grant funds to implement any actions the city deems appropriate. Implement security measures if funds received.	Ongoing									
<b>Reporting and Evaluation</b>										
Prepare an evaluation of WHP plan implementation efforts every 2 ½ years.			•			•		•		
Summarize all WHP Plan implementation efforts in a report to MDH prior to the Scoping 1 meeting for the WHP Amendment.								•		
<b>Contingency Strategy</b>										
Update the Contingency Plan.					•					
The city will apply for MDH grant funds to purchase a back-up generator that can be wired into their system to provide positive water pressure in the event of a power outage. If the grant funds are awarded, the work will be completed.		•	•							
The City intends to integrate SCADA and related technologies to the water treatment and distribution facilities. Apply for grant funds to pay the costs associated with purchasing, wiring, and setting up the technologies to be compatible with the existing system. If funding is received, have the work completed.			•							



# CHAPTER ONE

## DATA ELEMENTS, ASSESSMENT (4720.5200)

### REQUIRED DATA ELEMENTS

#### Physical Environment Data Elements

Precipitation – This data element does not apply because there is not a direct hydraulic connection between the land surface and surface waters and the aquifer serving this water supply system.

Geology – This data element is required and is presented in detail in the first part of the WHP Plan and can be summarized here as follows. The water supply for the city of Big Falls comes from a sand and gravel aquifer that exhibits confined hydraulic conditions throughout the city's wellhead protection area. The aquifer is about 13 feet thick and is covered by approximately 65 feet of clay-rich till at the city wells. Generally, groundwater moves in a northerly direction in the wellhead protection area. The sensitivity of the aquifer used by the public water supplier is moderate throughout the drinking water supply management area. Significant thicknesses of clay-rich till are found between the land surface and the city's aquifer. However, low levels of tritium have been detected in samples from the city wells, suggesting that some post-1953 water is present. This indicates that the overlying till is leaky.

The Part 1 WHP Plan includes a geologic map and description of the geology, including aquifers, confining layers, recharge areas, discharge areas, sensitive areas, and groundwater flow characteristics. It also includes discussion of existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, and includes existing borehole geophysical records from wells, borings, and exploration test holes, and any surface geophysical studies on record.

In addition, the Part I WHP Plan offered recommendations to enhance the understanding of local hydrogeologic conditions including: 1) verifying the locations of all new wells within 2 miles of the DWSMA, and 2) conducting water quality monitoring.

Soils – This data element does not apply because there is not a direct hydraulic connection between the land surface and the aquifer serving this water supply system.

Water Resources – This data element, as defined by the state wellhead rule, does not apply because there is not a direct hydraulic connection between the land surface and the aquifer serving this water supply system.

#### Land Use Data Elements

Land Use – These data elements include information about parcel boundaries, political boundaries, potential contaminant sources, land use maps, and zoning maps. Information regarding parcel boundaries was obtained from the Koochiching County online data website and was used to refine information included in the potential contaminant source inventory including location of potential contaminant sources and correct ownership names and addresses. The parcel boundaries map showing the parcels for the properties located within the DWSMA is contained in Exhibit 1. A map showing the political boundaries is found in the

Appendix as Exhibit 2, and public land survey information is included in Figure 1. The DWSMA is entirely contained within the city limits. The city has a comprehensive plan with a land use map, and a standard zoning ordinance and map available for viewing at city hall. Land use within the DWSMA consists of undeveloped land, and is primarily forested and open. The development that does exist in the DWSMA is defined as low density. A generalized land cover map and summary table is included as Exhibit 4 in the Appendix.

The Inner Wellhead Management Zone (IWMZ) is a fixed two-hundred foot radius around all public water supply wells. The public water supplier is responsible to manage all potential contaminant sources identified within that area. The IWMZ was inventoried for potential contaminant sources for this planning process and that information can be found in the Appendix as Exhibit 5. Management strategies for the IWMZ are included in Chapter 5.

Due to the moderately vulnerable designation of the DWSMA determined during the Part 1 WHP planning process, an inventory of other wells, storage tanks, shallow disposal wells, and other potential contaminant sources located within the DWSMA is required, as identified in the Scoping 2 Decision Notice. A listing of potential contaminants inventoried within the DWSMA and a map showing their locations are included in the Appendix as Exhibit 3. At this time no shallow disposal wells (Class V wells) have been identified.

Public Utility Services – Records of well construction and maintenance is used to support the development of Chapter 7 of this plan, which details an emergency plan for this system. These records are kept by city staff at City Hall. As necessary, the city hires a licensed well driller to perform standard maintenance on the city wells. The city has copies of applicable documents at City Hall.

No major transportation routes, pipelines, or public drainage systems are located in the DWSMA. However, a map of existing transportation routes is included in the Appendix as Exhibit 6. The WHP Team assessed the level of risk from spills to be very low.

The City regularly maintains its sanitary sewer and public water supply system. The City does not have maps of size to include in the plan of the sanitary sewer and public water supply system. Maps are available and can be viewed at City Hall. The city has storm sewer infrastructure but none of it is in the DWSMA.

## **Water Quantity Data Elements**

Surface Water Quantity – This data element does not apply because there is not a direct hydraulic connection between surface waters and the aquifer serving this water supply system.

Groundwater Quantity – Groundwater levels are adequate for the amounts that the City of Big Falls is permitted for under the groundwater appropriations program that is administered by the Minnesota Department of Natural Resources (DNR). There are currently no other high-capacity wells within the DWSMA for which well interference complaints with the system's well(s) have been documented. At this time, there appears to be sufficient groundwater quantity, based upon the existing pumping capacity of well(s) completed in the aquifer used by the system. This data element applies as it relates to future groundwater uses that may

influence the ability of the aquifer to yield water to the public water supply. Increased water use may result in a reduction in aquifer yield or increase the likelihood that contaminants of human or natural origin may affect the quality of drinking water. The city's wells are the only high-capacity wells in the DWSMA requiring appropriation permits, and there is no record of any environmental bore holes.

## **Water Quality Data Elements**

Surface Water Quality – This data element does not apply because there is not a direct hydraulic connection between surface waters and the aquifer serving this water supply system.

Groundwater Quality – These data elements include information about the overall water quality of the aquifer the City of Big Falls is using for public water supply purposes as well as other groundwater quality information generated from groundwater studies.

The city doesn't have an existing summary of water quality data including bacteriological contamination indicators, inorganic chemicals, or organic chemicals for other wells in the DWSMA. A general overview of water quality data can be found in the city's Consumer Confidence Report which is provided to residents annually. It is important to note that these water quality results pertain to the water after treatment. Other existing information consists of isotopic and chemical analyses and indicates that the aquifer used by the City may be recharged by surface water. As such, there is a moderate probability that current land use has a direct impact on the quality of drinking water. Tests conducted by MDH have revealed traces of tritium in Well 734748 (decreased from 3.7 TU in 2006 to 1.04 TU), indicating there is some component of 'young' water recharging the aquifer used by the system, and Well 122348 decreased from 1.4 TU in 2006 to below detection (<0.8 TU).

The city doesn't have an existing site study and well water analysis of known groundwater contamination nor an existing property audit identifying contamination.

The city isn't aware of any groundwater tracer studies or any list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points.

## **ASSESSMENT OF DATA ELEMENTS**

### **A. Use of the Wells –**

General information describing this public water supply system is presented in the Part 1 WHP Plan. The city currently uses Well #3 (Unique #122348) and Well #4 (Unique #734748) as primary public water supply wells. Both wells are completed at similar depths and are in close geographic proximity to one another. Well # 3 and Well #4 pump approximately 15,000 gallons of water per day on average. The city has one elevated storage tower with 50,000 gallon capacity. A treatment plant provides disinfection, fluoridation and iron and manganese removal.

No other high capacity wells were identified within 2 miles of the DWSMA during the Part I WHP planning process. Therefore, there are no current or anticipated interference issues and it

is expected that the aquifer will yield sufficient quantities of water to the City of Big Falls over the life of this plan.

**Wellhead Protection Area Delineation Criteria** – See the Part 1 WHP Plan for documentation regarding how the delineation criteria were applied to determine the boundaries of the WHPA. The Part 1 WHP Plan is included as Exhibit 7 in the Appendix.

The Part I WHP Plan also discusses in detail an assessment of the data elements used for delineation purposes. The MDH Hydrologist also proposes two recommendations to improve the data set for future delineation efforts. These recommendations are included as management strategies in Chapter 5 of this plan.

**Quality and Quantity of Water Supplying the Public Water Supply Well** – Water quality monitoring results for this public water supply indicate no evidence of contamination from human origin, such as fuel and fuel break-down products, pesticides, or commercial fertilizer. Arsenic, which is naturally occurring, has been detected at levels above the maximum allowable level, however current water treatment used by the city is sufficient to reduce arsenic in the city’s water system to acceptable concentrations. At this time, problems with water quality are not an issue, as the system has enjoyed water quality that meets the Federal Safe Drinking Water Act standards.

**The Land and Groundwater Uses in the DWSMA** – Proactive management of existing wells, unsealed or unused wells, shallow disposal wells, and storage tanks are of immediate concern due to the moderately vulnerable rating of the DWSMA. The management strategies selected and documented in Chapter 5 of this Plan will focus on activities that have the most potential to protect the aquifer that the City of Big Falls is using for its drinking water supply.

An important component of the potential contaminant source inventory was the location of any known wells within the DWSMA. Since wells may penetrate confining layers that normally protect an aquifer, they are potential pathways for contaminants to rapidly enter the aquifer. A search for active and unsealed wells was undertaken for the entire DWSMA. The following sources were used to identify wells in the DWSMA:

1. Minnesota Geological Survey’s Minnesota Well Index (updated CWI)
2. Personal interviews with City staff
3. Site reconnaissance
4. Aerial photos

In general, information from the County Well Index and the City of Big Falls was used to identify known wells, while the information from the MDH was used to document unused or sealed wells. City staff and site reconnaissance was useful in identifying locations for the identified wells. The results of the well search indicated that there are 7 known wells currently in the DWSMA including the 2 municipal supply wells. A listing of these wells is provided in Table 1, and their mapped locations are depicted in Exhibit 3.

No petroleum pipelines are located within the DWSMA. Maps of the city’s storm sewers, sanitary sewers, and water distribution infrastructure are located at city hall. A map of the transportation routes is included in the Appendix as Exhibit 6.

The city’s DWSMA is located in the Big Fork River HUC8 watershed, and the City of Big Falls HUC12 watershed, with flow going north and entering the Rainy River. There are no floodplain maps for the area, and flooding is not known to occur.

**Table 1 - Potential Contamination Sources and Assigned Risk for the IWMZ**

Source Type	Total	Level of Risk
City Public Water Supply Wells	2	M

**Table 2 - Potential Contamination Sources and Assigned Risk for the Rest of the DWSMA**

Potential Source Type	Total Number	Number Within Emergency Response Area and Level of Risk		Number Within Remainder of the DWSMA and Level of Risk	
City Public Water Supply Wells	2	2	M	0	-
Located, Unused Well	2	0	-	2	H
Located, Active Well	3	0	-	3	H

## **CHAPTER TWO**

### **IMPACT OF CHANGES ON PUBLIC WATER SUPPLY WELL(S) (4720.5220)**

#### **I. CHANGES IDENTIFIED IN:**

- A. Physical Environment** -- Large-scale changes in the physical environment within the DWSMA are not anticipated during the 10-year period that the WHP Plan is in effect.
  
- B. Land Use** -- Land uses that result in additional water wells in the DWSMA are fairly unlikely, although additional wells would likely have little impact on the aquifer unless water demand is increased to the point that 1) additional loss in hydraulic head occurs within the aquifer used by the City, or 2) pumping changes the boundaries of the WHPA. Constructing additional wells into the aquifer may increase the points of entry, alter the WHPA, or draw naturally-occurring or human-caused contaminants towards the City wells. The city doesn't anticipate significant land use changes in the DWSMA.

Land use inside the Inner Wellhead Management Zone: The land within the 200-foot radius is publicly-owned, and large scale land use changes are not expected to occur during the next 10 years within the IWMZs.

- C. Surface Water** -- This data element does not apply because there is not a direct hydraulic connection between surface waters and the aquifer serving this water supply system.
  
- D. Groundwater** -- The City wells have historically provided groundwater of acceptable quality and quantity. As of the date of Plan approval, the City does not anticipate a large increase in water use and is not aware of any such water use expansions in the DWSMA or immediately adjacent area.

#### **II. IMPACT OF CHANGES – List, Describe and Assess Impacts on Aquifer From:**

##### **A. Expected Changes Identified Above -**

The WHP Team does not anticipate any changes or significant impacts on the aquifer.

##### **B. Influence of Existing Water and Land Government Programs & Regulation -**

A number of local and state programs exist that may provide assistance and benefits in managing potential contaminant sources identified in the DWSMA. Following is a brief description of the major programs that have drinking water protection interactions.

The Minnesota Department of Health regulates well construction through the Minnesota well code. Code requirements include minimum isolation distances as well as construction criteria designed to protect the well and aquifer. The MDH has a Source Water Protection grant

program to assist in covering costs associated with the protection of source water. The Minnesota Pollution Control Agency (MPCA) has a tank storage program and has developed Best Management Practices (BMPs) for tank owners to help ensure proper and safe tank operation and maintenance. In addition, the MPCA manages a petroleum remediation program that addresses leaking tanks. This program has direct interaction with MDH staff in determining potential impacts to drinking water sources. The Koochiching County SWCD administers cost share dollars for well sealing, and the Koochiching County Local Water Management Plan has identified the protection of groundwater-based drinking water sources as a priority.

The City of Big Falls does not have zoning, or a comprehensive plan, and the city requires hooking up to city utilities whenever it is available. The city has no intention at this time of requiring additional regulation related to managing wells or storage tanks within the system's DWSMA.

### **C. Administrative, Technical, and Financial Considerations -**

Many of the activities during the planning process have been accomplished through the efforts of the city's Wellhead Protection Team, with assistance from studies provided by other units of government. For the WHP Plan to be effective:

1. The City will need to raise public awareness of the issues affecting the quality or quantity of its drinking water supply through public educational programs.
2. Administrative duties will remain with the Wellhead Protection Manager who will report to the City Council, coordinate implementation of the wellhead protection management strategies, and conduct regular meetings.
3. The City has limited funds available for new programs and the implementation of wellhead protection activities. The City plans to utilize other sources of funding or in-kind services to help achieve the goals set forth in this Plan's Chapter 4 and include 1) the Koochiching County SWCD and their well sealing cost-share program; and 2) the MDH grant program for wellhead protection implementation.

# CHAPTER THREE

## ISSUES, PROBLEMS, AND OPPORTUNITIES (4720.5230)

### I. LAND USE ISSUES, PROBLEMS, AND OPPORTUNITIES

The WHP Team identified water use and land use issues, problems, and opportunities related to the:

- aquifer serving the public water supply well,
- well water, and
- drinking water supply management area.

The issues, problems, and opportunities were identified by assessing: problems and opportunities discussed at public meetings; data elements described in Chapter One; and the status and adequacy of official controls, plans, and other local, state, and federal programs on water use and land use.

At the beginning of the planning process other Local Units of Government (LUGs) were identified and informed that the City was beginning the wellhead protection planning process. Each unit of government was also sent a copy of the delineated WHPA and DWSMA and vulnerability assessment for the wells and DWSMA. To date, no comments from the LUGs have been received. The general public was also given opportunities to participate in the planning process and to comment at the Public Informational Meeting and Public Hearing. No concerns from the general public have been expressed at this time.

**A. The Aquifer** – The water supply for the city of Big Falls comes from a sand and gravel aquifer that exhibits confined hydraulic conditions throughout the city’s wellhead protection area. The aquifer is about 13 feet thick and is covered by approximately 65 feet of clay-rich till at the city wells. Generally, groundwater moves in a northerly direction in the wellhead protection.

The sensitivity of the aquifer used by the public water supplier is moderate throughout the drinking water supply management area. Significant thicknesses of clay-rich till are found between the land surface and the city’s aquifer. However, low levels of tritium have been detected in samples from the city wells, suggesting that some post-1953 water is present. This indicates that the overlying till is leaky. This moderately vulnerable aquifer, identified as the source of the system’s water supply, should be relatively unaffected by land use activities with the exception of other wells that penetrate the same aquifer, storage tanks or shallow disposal wells.

At this time the aquifer appears to have sufficient capacity to meet the city’s needs.

Two issues regarding the aquifer that were discussed more fully in the Part I WHP plan include: 1) the considerable uncertainty regarding the lateral extent of the Big Falls aquifer and possible variations in its thickness and hydraulic properties; and 2) addressing the occurrence of arsenic in the city wells. Management strategies to address both these concerns have been included in Chapter 5.

**B. The Well Water** -- The wellhead protection plan is primarily concerned with other water supply wells, storage tanks and shallow disposal wells located within the DWSMA. The potential contaminant source inventory performed by the Wellhead Protection Team indicated the types of

wells as listed in Table 3. Some of these wells may extend into the aquifer that supplies the system with its water. These wells, if improperly constructed or maintained, could convey pollutants to the aquifer.

The placement of additional high-capacity wells, increased pumping from existing wells, or significant changes in current groundwater appropriations within the DWSMA may have an impact on 1) groundwater availability to all users, 2) increased risk that contamination may enter the part of the aquifer used by the public water supply well(s), or 3) change the delineated WHP area and the DWSMA boundaries. The City of Big Falls will work with the DNR and MDH to become aware of any proposed high-capacity well within the DWSMA. The PWS will work with the well owner to minimize or eliminate potential impacts to the system's water supply.

**C. Drinking Water Supply Management Area** - The state's Wellhead Protection Rule requires that existing information be utilized in developing the initial Wellhead Protection Plan. Much of the data collected and utilized to delineate the system's WHPA and DWSMA and to determine the vulnerability of the aquifer to possible contamination comes from small-scale, or regional studies. There is a limited amount of subsurface information available to define local groundwater flow conditions and the groundwater chemistry of the aquifer within the DWSMA.

A concern expressed by the system is to ensure consistent and long-term management of water wells, environmental bore holes, and observation wells within the DWSMA. The public water supply has limited legal capabilities to regulate well construction and sealing in the DWSMA. Second, changes in land use that increase pumping of the aquifer used by the system's well(s) need to be assessed for its possible impacts on water availability and quality. Finally, the system has no regulatory authority over water appropriations and must rely on the State of Minnesota to address issues and concerns related to pumping.

The entire DWSMA lies within the city limits and is under control of the city council in regards to any future land use controls. The WHP Team assessed the current and future land use changes in the DWSMA and concluded little or benign land use changes are likely.

The system plans to utilize public education opportunities, both existing and proposed, to address potential contamination of the aquifer by other wells, storage tanks and shallow disposal wells. Additionally, the system will work in cooperation with the Koochiching County Soil & Water Conservation District to utilize the well sealing cost-share program currently available. The City currently has an ordinance in place that prohibits the cross connection between other wells and the community water supply distribution system. The City will set high priority on well sealing for existing wells that are unused or are not properly maintained.

Further, the system will work with MDH to 1) identify proposed wells that may present groundwater conflict concerns, 2) ensure these wells are properly constructed, 3) determine whether an alternative aquifer could be used, and 4) identify water-use and conservation requirements that the DNR may specify with the groundwater appropriations permit. The DWSMA lies entirely within the city limits where Koochiching County has land use authority through the County-wide SSTS Ordinance. The City of Big Falls has a Comprehensive Plan, and Zoning Ordinance. The WHP Team assessed the current and future land use changes in the DWSMA and concluded little or benign land use changes are likely.

The City plans to utilize public education opportunities, both existing and proposed, to address potential contamination of the aquifer by other wells, storage tanks, shallow disposal wells, and other contaminant sources. Additionally, the City will work in cooperation with the Koochiching County SWCD to utilize the well sealing cost-share program currently available, and/or participate in the MDH grant program.

Further, the City will work with MDH to 1) identify proposed wells that may present groundwater conflict concerns, 2) ensure these wells are properly constructed, and 3) determine whether an alternative aquifer could/should be used.

Shallow disposal wells (also called Class V Injection Wells) are regulated by the U.S. EPA. No Class V Injection Wells were identified during the potential contaminant source inventory. However, the WHP Team is aware of the drinking water protection issues connected with this type of disposal system and will be monitoring for these types of facilities during the life of the plan. If a Class V Injection Well is identified in the future, the city will inform MDH of its suspected location.

There are many tools available to the regulating agencies that may be used to achieve the wellhead protection planning goals identified by the WHP Team. State and local governmental units, such as MDH, Koochiching County, and the DNR, regulate:

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

The WHP Team recommends that no additional regulations be imposed at this time and are confident that local issues may be adequately addressed through existing processes. Processes include applicable zoning and land use, public education, adoption of best management practices for different types of wells, and communication with landowners in the DWSMA.

One issue identified by the WHP Team concerned whether there are adequate resources to implement wellhead protection activities. The small size of the City and the limited availability of time for staff indicate that it may be a challenge to implement the WHP Plan. The WHP Team will focus its efforts on fostering partnerships to help achieve the city's wellhead protection goals. The MDH, Koochiching County, SWCD, and the Minnesota Rural Water Association were identified as valuable partners.

## **CHAPTER FOUR**

### **WELLHEAD PROTECTION GOALS (4720.5240)**

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 the current level of water quality, which meets all state and federal standards.**
- **Increase awareness among public officials, land owners, and the general public about the importance of WHP in protecting the drinking water supply.**
- **Protect the aquifer from which the city draws its drinking water.**
- **Support ongoing data collection efforts to enhance future WHP activities.**

## **CHAPTER FIVE**

### **OBJECTIVES AND PLANS OF ACTION (4720.5250)**

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, 2) the potential contaminant source inventory, 3) the impacts that changes in land and water use present and 4) issues, problems, and opportunities referenced to administrative, financial, and technical considerations.

#### **Objectives**

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

1. Create awareness and general knowledge about the importance of WHP in the City of Big Falls.
2. Properly inventory and manage potential contaminant sources to protect the drinking water supply for the City of Big Falls.
3. Gather additional information within the DWSMA in order to better understand the size and vulnerability of the DWSMA.
4. Effectively track and report the implementation efforts and wellhead protection plan progress to appropriate governing authorities.
5. Manage the Inner Wellhead Management Zone to prevent contamination of the aquifer near the public supply wells.
6. Effectively prepare the City of Big Falls for disruptions to the water distribution system.

## **WHP Measures and Action Plan**

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:

1. Public Education and Outreach
2. Potential Contamination Source Management
3. Data Collection
4. IWMZ Management
5. Reporting and Evaluation
6. Water Use and Contingency Strategy

## **Establishing Priorities**

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 time, legal, financial, and technical resources.

The City of Big Falls defines a priority for implementing a WHP measure as an action that protects their drinking water supply from contamination from the potential contaminant source or any other possible threat to the quality or quantity of its drinking water supply. The following table lists each measure that will be implemented over the 10-year period that the city's WHP plan is in effect, including the priority assigned to each measure.

## WHP Plan of Action

### PUBLIC EDUCATION AND OUTREACH:

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame										
					2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
<b>WHP Measure (#1):</b> Provide residents with an article that explains the importance of WHP.	1	High	City, MDH	Staff Time	X								X		
<b>WHP Measure (#2):</b> Request a large map of the DWSMA from MDH and display at City Hall.	1	Low	City, MDH	Staff Time	X										
<b>WHP Measure (#3):</b> Send Koochiching County SWCD a map of the DWSMA and letter discussing the importance of WHP and requesting their support in protecting the city's source of drinking water. Also request that they consider and discuss the Big Falls WHP Plan when updating the Comprehensive Local Water Management Plan, and during any watershed planning and/or management efforts.	1	Medium	City, Koochiching County SWCD	Staff Time	X										

**POTENTIAL CONTAMINATION SOURCE MANAGEMENT:**

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame										
					2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
<b>WHP Measure (#4):</b> Provide property owners who have a well in the DWSMA, information on proper management of their well.	2	High	City, MDH	Staff Time		X						X			
<b>WHP Measure (#5):</b> Apply for a MDH grant or SWCD cost-share funds to pay the costs to seal the identified unused well and/or any others discovered in the DWSMA.	2	High	City, MDH, SWCD	Staff Time	As Occurs										
<b>WHP Measure (#6):</b> If funds are received, have a certified contractor seal the well(s).	2	High	City, MDH, SWCD	Based on bids received	As Occurs										
<b>WHP Measure (#7):</b> The City will collaborate with the MDH Source Water Protection Unit in the identification of new high-capacity wells that are proposed for construction within the DWSMA or within one mile of the DWSMA, via contact with the MDH Planner or Hydrologist.	2	Medium	City, MDH, DNR	Staff Time	As Occurs										
<b>WHP Measure (#8):</b> Inform MDH if a Class V well is identified within the DWSMA.	2	Medium	City, MDH	Staff Time	As Occurs										
<b>WHP Measure (#9):</b> WHP Team and Manager will update the PCSI map and table.	2	Medium	City, MDH	Staff Time					X						

**DATA COLLECTION:**

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame											
					2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
<b>WHP Measure (#10):</b> Resample wells for vulnerability parameters determined by the MDH, provided MDH will cover the costs.	3	Medium	City, MDH	Staff Time							X					
<b>WHP Measure (#11):</b> Contact MDH Hydrologist to get a list of any wells that might have been constructed within two miles of the DWSMA and verify their locations.	3	Medium	City, MDH	Staff Time								X				

**INNER WELLHEAD MANAGEMENT ZONE:**

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame											
					2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
<b>WHP Measure (#12):</b> Implement measures that are specified in the IWMZ PCSI report.	4	High	City	Staff Time	X	X	X	X	X	X	X	X	X	X	X	X
<b>WHP Measure (#13):</b> Monitor the 200 ft. radius around the wells to ensure that setback distances for new potential contamination sources are met.	4	High	City	Staff Time	X	X	X	X	X	X	X	X	X	X	X	X
<b>WHP Measure (#14):</b> Request MDH assistance to update the Inner Wellhead Management Zone Inventory for the public water supply wells.	4	High	City, MDH	Staff Time					X							X

<b>WHP Measure (#15):</b> Assess security around the wells, and apply for MDH grant funds to implement any actions the city deems appropriate. Implement security measures if funds received.	4	High	City, MDH	To be determined with bids	Ongoing
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**WATER USE AND CONTINGENCY STRATEGY:**

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame											
					2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
<b>WHP Measure (#16):</b> Update the Contingency Plan.	6	Medium	City, MDH	Staff Time					X							
<b>WHP Measure (#17):</b> If deemed necessary, work with MDH to consider drilling additional wells or look for an alternate well field. Apply for grant funds to assist in paying for associated costs.	6	Medium	City, MDH	To be determined with bids	As Needed											
<b>WHP Measure (#18):</b> The city will apply for MDH grant funds to purchase a back-up generator that can be wired into their system to provide positive water pressure in the event of a power outage. If the grant funds are awarded, the work will be completed.	6	High	City, MDH	Based on bids received		X	X									
<b>WHP Measure (#19):</b> The City intends to integrate SCADA and related technologies to the water treatment and distribution facilities. Apply for grant funds to pay the costs associated with purchasing, wiring, and setting up the technologies to be compatible with the existing system. If funding is received, have the work completed.	6	High	City, MDH	Based on bids received			X									

**REPORTING AND EVALUATION:**

Description	Objective	Priority	Responsible Party & Cooperators	Cost	Implementation Time Frame									
					2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>WHP Measure (#20):</b> Prepare an annual report of WHP plan implementation efforts that highlights the previous year’s activities and identifies the efforts to be accomplished in the coming year.	5	Low	City	Staff Time	X	X	X	X	X	X	X	X	X	X
<b>WHP Measure (#21):</b> Prepare an evaluation of WHP plan implementation efforts every 2 ½ years.	5	Low	City	Staff Time			X			X			X	
<b>WHP Measure (#22):</b> Summarize all WHP Plan implementation efforts in a report to MDH prior to the Scoping 1 meeting for the WHP Amendment.	5	Low	City, MDH	Staff Time								X		

## **CHAPTER SIX**

### **EVALUATION PROGRAM (4720.5270)**

The success of the wellhead protection management program must be evaluated in order to determine whether the plan is actually accomplishing what the City of Big Falls set out to do. The following activities will be implemented to:

- Track the implementation of the objectives identified in Chapter 5 of this Plan;
  - Determine the effectiveness of specific management strategies regarding the protection of the public water supply;
  - Identify possible changes to these strategies which may improve their effectiveness; and
  - Determine the adequacy of financial resources and staff availability to carry out the management strategies planned for the coming year.
- 1) The City will continue to cooperate with MDH in the annual monitoring of the water supply to determine whether the management strategies are having a positive effect and to identify water quality problems that may arise, which must be addressed.
  - 2) It is recommended that the WHP Team meets on an annual basis and prepares an annual report of WHP plan implementation efforts that highlights the previous year's activities and identifies the efforts to be accomplished in the coming year.
  - 3) The WHP Team will review and document each strategy implemented and compile into a written report every 2 ½ years.
  - 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.

# CHAPTER SEVEN

## WATER SUPPLY CONTINGENCY PLAN (4720.5280)

### WATER SUPPLY CONTINGENCY PLAN

City of Big Falls

### Table of Contents

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- A. PURPOSE
- B. PUBLIC WATER SUPPLY CHARACTERISTICS
  - 1. Current Supply Source
  - 2. Treatment
  - 3. Storage and Distribution
  - 4. Maps and Plans
- C. PRIORITY OF WATER USERS DURING WATER SUPPLY EMERGENCY
- D. ALTERNATIVE WATER SUPPLY OPTIONS
  - 1. Surface Water Sources and Treatment
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  - 3. System Interconnects
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- E. INVENTORY OF AVAILABLE EMERGENCY EQUIPMENT AND MATERIALS
- F. EMERGENCY IDENTIFICATION PROCEDURES
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- H. MITIGATION AND CONSERVATION PLAN
  - 1. Mitigation
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**Plan**

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

**Plan Distribution**

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

Prepared By: Joan Nelson \_\_\_\_\_

Date Approved: \_\_\_\_\_

**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 Big Falls that 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 -

**Table C-1 -Water Supply Wells**

Information	Well Number 3	Well Number 4
Supply Source	122348	734748
Well Depth (ft.)	85 feet	93 feet
Well Diameter (in.)	6 inches	6 inches
Emergency Well Capacity (gpm)	75 gpm	85 gpm

2. Treatment - The city treats for iron and manganese removal through the use of iron/manganese sequestration. Chlorine/sodium hypochlorite is added for disinfection purposes and fluoride is also added to the water supply.
3. Storage and Distribution - Storage consists of an elevated water tower with 50,000 gallons of storage. The city uses approximately 28,000 gallons per day on average.
4. Maps/Plans - Maps of the water distribution system and valving are on file at the City Hall and the Maintenance Shop.

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

**Table C-1 -Water Use Priority Grouping**

Priority Group and Rank	Maximum Daily Use (gpd)	Minimum Daily Use (gpd)
Residential--#1	45,000	10,000
Institutional--#2		
Business--#3		
<b>TOTAL</b>	45,000	15,000 Average Daily Use

**Triggers for implementing water supply reduction/allocation procedures:**

- Water exceeds State Safe Drinking Water Standards
- Water demand increase or treatment / storage capacity reduction
- Main system break or production loss

In the event of a major system disruption, failure or an emergency, conservation procedures would be enacted by the Wellhead Protection Manager.

## D. ALTERNATIVE WATER SUPPLY OPTIONS

1. Surface water sources and treatment needs: The City of Big Falls sits on the shores of the Big Fork River. The river could serve as a potential emergency water source. Volume is dependent upon available pump and treatment capacity. The Minnesota National Guard may be able to provide emergency treatment of surface water for human consumption. In the event of a significant water disruption emergency such as a catastrophic event, the following procedure is recommended:
  - i. Contact the County Sheriff at (218) 283-4416 or 911 to request assistance from the Minnesota National Guard.
  - ii. Sheriff will contact the Minnesota National Guard, Division of Emergency Management, State Duty Officer (800) 422-0798.
  - iii. The Minnesota National Guard can provide a portable Reverse Osmosis Water Purification System (ROWPU) capable of supplying 900 gph or 15 gpm.
  
1. Bottled water supplies, delivery and distribution. Large quantities of bottled water or distributors in the Big Falls area include:

Walmart, Bemidji, MN	(218) 755-6120
Ecowater Systems, Bemidji, MN	(218) 751-9326
Culligan Water, Bemidji, MN	(218) 751-2651
Coca-Cola, International Falls, MN	(218) 283-3221
  
3. System interconnects with other water supplies. No interconnects exist.
  
4. New well. No new wells are planned at this time.
  
5. Emergency or backup wells. The City of Big Falls is supplied by two wells which can each individually supply needs adequately.
  
6. Emergency treatment of water system. The City does not have a backup generator for use during a power failure.
  
7. Source Management (blending). The city has two wells, which could be blended. However, both wells are finished in the same aquifer and are located in close proximity to one another, which may limit the ability to exercise source management in the case where the aquifer is compromised.

## 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 of Big Falls 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 Emergency Equipment & Materials Contacts**

<b>Description</b>	<b>Owner</b>	<b>Telephone</b>	<b>Location</b>	<b>Acquisition Time</b>
<b>Well Repair</b>	Reed & Reed Well Drilling	218-586-2777	Bemidji, MN	½ hr
<b>Pump Repair</b>	Reed & Reed Well Drilling	218-586-2777	Bemidji, MN	½ hr
<b>Electrician</b>	Donahu Electric	218-340-9184	Littlefork, MN	½ hr
<b>Plumber</b>	Shannon's Plumbing	218-283-9372	International Falls, MN	1.0 hr.
<b>Backhoe / Excavator</b>	City of Big Falls	218-276-2282	Big Falls, MN	Immediate
<b>Chemical Feed</b>	Hawkins Water Treatment	701-293-9618	Fargo, ND	One Day
<b>Meter Repair</b>	NA	NA	NA	NA
<b>Valves Pipe &amp; Fittings</b>	NWS	800-437-4362	Fargo, ND	One Day
<b>Generator</b>	Ziegler Inc	218-258-3232	Buhl, MN	One-Two Days

## F. EMERGENCY IDENTIFICATION PROCEDURES

**Table F-1 Procedural Operations**

<b>Incident</b>	<b>Response Procedure and Comments</b>
<b>Identify Disruption</b>	Person identifying disruption contacts Wellhead Protection Manager
<b>Notify Response Coordinator</b>	Wellhead Protection Manager is the Response Coordinator or Alternate
<b>Identify Incident Direction and Control</b>	Wellhead Protection Manager / Response Coordinator or Alternate assesses situation and determine incident direction and control, begin solving problem
<b>Identify Internal Communication</b>	Wellhead Protection Manager contacts City Hall and / or Administrator/Clerk to inform of situation
<b>Inform Public</b>	Public relations personnel contacts appropriate organizations to inform public of problem
<b>Assess Incident on Continual Basis</b>	Wellhead Protection Manager or Alternate continues to monitor/solve problem
<b>Assess Contamination Disruption</b>	Wellhead Protection Manager or Alternate and MDH determine if water supply is contaminated. Monitor/solve problem as needed
<b>Assess Mechanical Disruption</b>	Wellhead Protection Manager or Alternate assesses mechanical disruption. Monitor and solve disruption as needed.
<b>Provide Alternate Water Supply</b>	If needed, alternate water supply is located and provided
<b>Impose Water Use Restrictions</b>	Wellhead Protection Manager, Administrator/Clerk and/or Mayor may impose water use restrictions.

## 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 the *emergency oversight committee*, 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	Home Telephone	Work Telephone
Wellhead Protection Manager	Joan Nelson	218-276-2438	218-276-2282
Mayor/Board Chair	Marta Lindemanis	218-276-2339	218-766-3998
Council Members	Shawn Pritchard	218-276-3040	218-244-7611
Council Members	Ken Kennedy	218-276-2281	218-244-3099
Council Members	Ken Warner	218-276-2290	218-244-6136
Council Members			
Response Coordinator	Joan Nelson	218-276-2438	218-276-2282
Alt. Response Coordinator	Marta Lindemanis	218-276-2339	218-766-3998
State Incident Duty Officer			800-422-0798
Big Falls Emergency Director	N/A		
County Emergency Director	Willi Kostiuik	218-278-4313	218-283-4416
Fire Chief	Bill Pihlaja	218-244-4010	
Sheriff	Perryn Hedlund		218-283-4416
Local Deputy	Dusty Hell	218-324-1689	218-283-4416
Water Operator	Terrence Baird	218-276-2501	218-556-4827
Assistant Water Operator	Ken Warner	218-276-2290	218-244-6136
School Superintendent	N/A	N/A	N/A
Ambulance	Little Fork Ambulance	911	218-276-4870
Hospital	Big Fork Valley	218-743-3232	218-743-3177
Power Company	North Star Electric	218-278-6658	888-668-8243
Highway Department	Koochiching County	218-276-2381	218-283-1186
Telephone Company	Paul Bunyan Telephone		218-246-8228
Neighboring Water System	City of Littlefork		218-278-6710
MRWA Technical Advisor	Bob Klug	218-685-5197	800-367-6792
MRWA Circuit Rider Contact	Bob Klug	218-685-5197	800-367-6792
MDH District Engineer	Eric Weller		218-308-2107
MDH Source Water Protection	Chris Parthun		218-308-2109

2. Critical Response Personnel

**Table G-2 Critical Response Personnel**

<b>Title</b>	<b>Name</b>	<b>Response Assignment</b>
<b>Response Coordinator</b>	Joan Nelson	Coordinate actions to address emergency
<b>Alternate Response Coordinator</b>	Marta Lindemanis	Coordinate actions to address emergency
<b>Water Operator</b>	Terrence Baird	Direct or contact firms to resolve issue
<b>Alternate Water Operator</b>	Ken Warner	Direct or contact firms to resolve issue
<b>Public Relations</b>	Joan Nelson	Contact media to inform citizens/businesses of emergency
<b>Alternate Public Relations</b>	Marta Lindemanis	Contact media to inform citizens/businesses of emergency
<b>Public Health/Medical</b>	Big Falls First Responders, Fire Dept., Hospital and Ambulance Service, Local Deputy	Assist City as needed to address emergency
<b>Alternate Public Health/Medical</b>	Koochiching County Public Health	Assist City as needed to address emergency

3. Public Information Plan

a) Public relations center and core spokesperson:

**Name: Joan Nelson**  
**Title: City Clerk**  
**Address: P.O. Box 196; Big Falls, MN. 56627**  
**Phone: 218-276-3300**

**Public information center location during an emergency is: Big Falls City Hall**

**Times the center is available are:** Regular business hours and open as needed in the event of an emergency.

**Alternate Information Center Location Site:** The Fire Hall will be used as an alternate meeting site.

b) Information checklist to be conveyed to the public and media:

- 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

Media	Name	Telephone	Location
Newspaper	Falls Daily Journal	218-285-7411	1602 Hwy. 71 Int. Falls
Television	KBJR TV	218-720-9600	246 S. Lake Ave. Duluth
Radio	KSDM	218-283-3481	519 3 <sup>RD</sup> St. Int. Falls

## H. MITIGATION AND CONSERVATION PLAN

### 1. Mitigation

a. Infrastructure maintenance/upgrades/maps:

The City water system is flushed twice per year. No new water lines were installed within the last year. Infrastructure maps are available at City Hall.

b. Regular inspection of tower, well(s), pump house:

All of these items are inspected daily. The well house and chemical rooms have keyed entries and are locked. The water tower is cleaned and inspected on a competitive bid basis, as needed.

c. Staff emergency training:

Staff receive training through Minnesota Rural Water Association.

d. System security analysis:

All facilities are locked and have keyed entries.

e. Site new backup well(s):

No new backup wells are being planned.

f. System valving to isolate problems:

The water system is adequately valved to isolate problems.

g. Sanitation procedures for construction/repairs:

All disinfecting procedures are performed per State specifications.

2. Conservation

a. Water meters:

All city water connections are presently metered.

b. Public education:

The City publishes the annual Consumer Confidence Report in March and a copy is available at City Hall or the city's website.

c. Rate structure:

Flat Fee/Base Charge:

Minimum Charge:

**APPENDIX A**

**REFERENCED DATA FOR PART 2**

**Acronym List**

**Glossary of Terms**

**Exhibit 1: Parcel Boundaries Map**

**Exhibit 2: Political Boundaries Map**

**Exhibit 3: Potential Contaminant Source Inventory List and Map**

**Exhibit 4: Land Cover Map and Statistics Table**

**Exhibit 5: Inner Wellhead Management Zone (IWMZ) Reports**

**Exhibit 6: Transportation Routes Map**

**Exhibit 7: WHP Plan Part 1**

## **Acronym List**

**BMPs – Best Management Practices**

**CCR – Consumer Confidence Report**

**DNR – Department of Natural Resources**

**DWSMA – Drinking Water Supply Management Area**

**ERA - Emergency Response Area**

**IWMZ – Inner Wellhead Management Zone**

**LUGs – Local Unit of Government**

**MDA – Minnesota Department of Agriculture**

**MDH – Minnesota Department of Health**

**MPCA – Minnesota Pollution Control Agency**

**MRWA – Minnesota Rural Water Association**

**PCSI – Potential Contaminant Source Inventory**

**PWS – Public Water Supply**

**SWCD - Soil and Water Conservation District**

**US EPA – United States Environmental Protection Agency**

**WHP - Wellhead Protection**

**WHPA – Wellhead Protection Area**

## 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 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.

**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 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 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.

## **Exhibit 1: Parcel Boundaries**

# Parcel Map



## **Exhibit 2: Political Boundaries**



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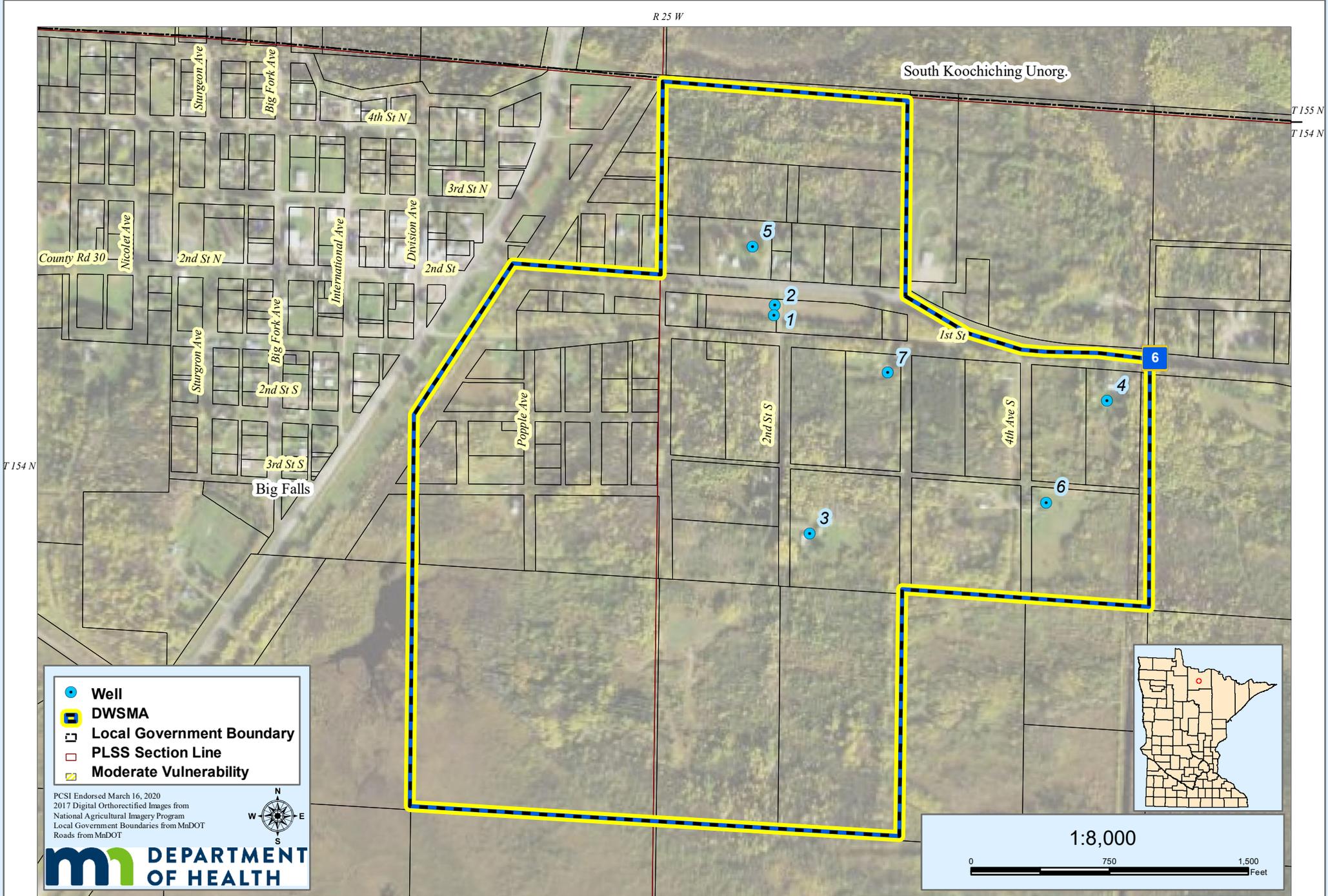
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## **Exhibit 3: Potential Contaminant Source Inventory List and Map**

# Big Falls Drinking Water Supply Management Area (DWSMA) MN-01045 - Potential Contaminant Source Inventory (PCSI)



- Well
- DWSMA
- Local Government Boundary
- PLSS Section Line
- Moderate Vulnerability

PCSI Endorsed March 16, 2020  
2017 Digital Orthorectified Images from National Agricultural Imagery Program  
Local Government Boundaries from MnDOT  
Roads from MnDOT

**DEPARTMENT OF HEALTH**

1:8,000

0 750 1,500 Feet



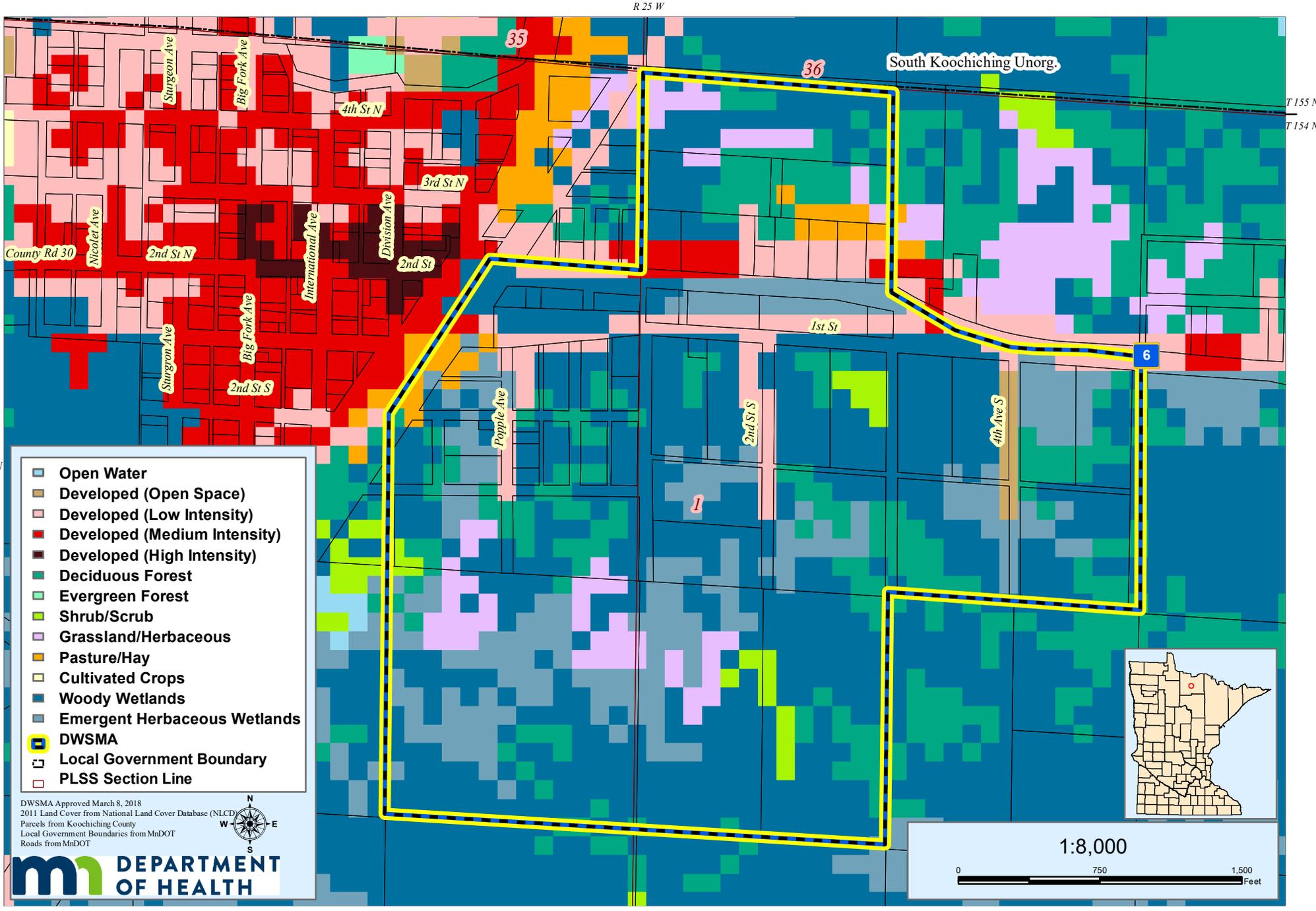
# Big Falls DWSMA (MN-01045)

## PCSI Report

<i>ID</i>	<i>PIN</i>	<i>NAME</i>	<i>ADDRESS</i>	<i>CITY</i>	<i>ZIP</i>	<i>PCSI</i>	<i>STATUS</i>	<i>MATERIAL</i>	<i>PROGRAM ID</i>	<i>TOTAL</i>	<i>COMMENT</i>
1	91-011-06040	City of Big Falls	P.O. Box 196	Big Falls	56627	WEL - Well	A - Active	-	122348	1	Well #3
2	91-011-06040	City of Big Falls	P.O. Box 196	Big Falls	56627	WEL - Well	A - Active	-	734748	1	Well #4
3	91-006-03020	Donald Boes	302 2nd Avenue South	Big Falls	56627	WEL - Well	A - Active	-	703748	1	
4	91-006-01010	Deerwood Bank	1109 Hwy 6	Big Falls	56627	WEL - Well	A - Active	-		1	
5	91-011-04012	Angela Holt	510 Hwy 6	Big Falls	56627	WEL - Well	I - Inactive	-		1	Unused unsealed sand point in 36"x18' vertical culvert
6	91-006-01030	John Lund	308 4th Avenue South	Big Falls	56627	WEL - Well	A - Active	-	474747	1	
7	91-006-03010	Richard Sanders	711 1st Street East	Big Falls	56627	WEL - Well	I - Inactive	-		1	Unused unsealed non-functioning hand pump

## **Exhibit 4: Land Cover Map and Statistics Table**

# Big Falls Drinking Water Supply Management Area (DWSMA) MN-01045 - Land Cover 2011



DWSMA Approved March 8, 2018  
2011 Land Cover from National Land Cover Database (NLCD)  
Parcels from Koochiching County  
Local Government Boundaries from MnDOT  
Roads from MnDOT



1:8,000



DWS_ID	LCOV_C	LAND_COVER	ORIG_SQM	ADJ_SQM	ACRES	PERCENT	YEAR
1045	21	Developed, Open Space	7200	7182.3932412	1.77	0.71	2011
1045	22	Developed, Low Intensity	74700	74517.3298769	18.41	7.39	2011
1045	23	Developed, Medium Intensity	13500	13466.9873272	3.33	1.34	2011
1045	41	Deciduous Forest	151200	150830.2580640	37.27	14.96	2011
1045	52	Shrub/Scrub	16200	16160.3847926	3.99	1.60	2011
1045	71	Grassland/Herbaceous	49500	49378.9535329	12.20	4.90	2011
1045	81	Pasture/Hay	18900	18853.7822580	4.66	1.87	2011
1045	90	Woody Wetlands	503100	501869.7277250	124.01	49.78	2011
1045	95	Emergent Herbaceous Wetlands	176400	175968.6344080	43.48	17.45	2011
1045	99	Total	1010700	1008228.4512300	249.14	100.00	2011

## **Exhibit 5: IWMZ Reports**

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

**PUBLIC WATER SYSTEM INFORMATION**

<b>PWS ID</b>	1360001	<b>COMMUNITY</b>
<b>NAME</b>	Big Falls	
<b>ADDRESS</b>	Big Falls Water Superintendent, 410 2nd St. NW, P.O. Box 196, Big Falls, MN 56627	

**FACILITY (WELL) INFORMATION**

<b>NAME</b>	Well #3	<b>IS THERE A WELL LOG OR          ADDITIONAL CONSTRUCTION          INFORMATION AVAILABLE?</b> <input type="checkbox"/> YES (Please attach a copy) <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
<b>FACILITY ID</b>	S03	
<b>UNIQUE WELL NO.</b>	122348	
<b>COUNTY</b>	Koochiching	

<b>PWS ID / FACILITY ID</b>	1360001    S03	<b>UNIQUE WELL NO.</b>	122348
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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				

**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 <sup>P</sup> (Class V well - illegal <sup>3</sup> )	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) <sup>2</sup>	50/300/150 <sup>4</sup>	50/300/150 <sup>4</sup>	100/600/300 <sup>4</sup>	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		

<b>PWS ID / FACILITY ID</b>	1360001 S03	<b>UNIQUE WELL NO.</b>	122348
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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				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) <sup>2</sup>	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) <sup>2</sup>	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
<b>Land Application</b>							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
<b>Solid Waste Related</b>							
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		
<b>Storm Water Related</b>							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well <sup>2</sup> (Class V well - illegal <sup>3</sup> )	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
<b>Wells and Borings</b>							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	55	
UUW	Unused, unsealed well or boring	50	50		N		
<b>General</b>							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		



PWS ID / FACILITY ID

1360001 S03

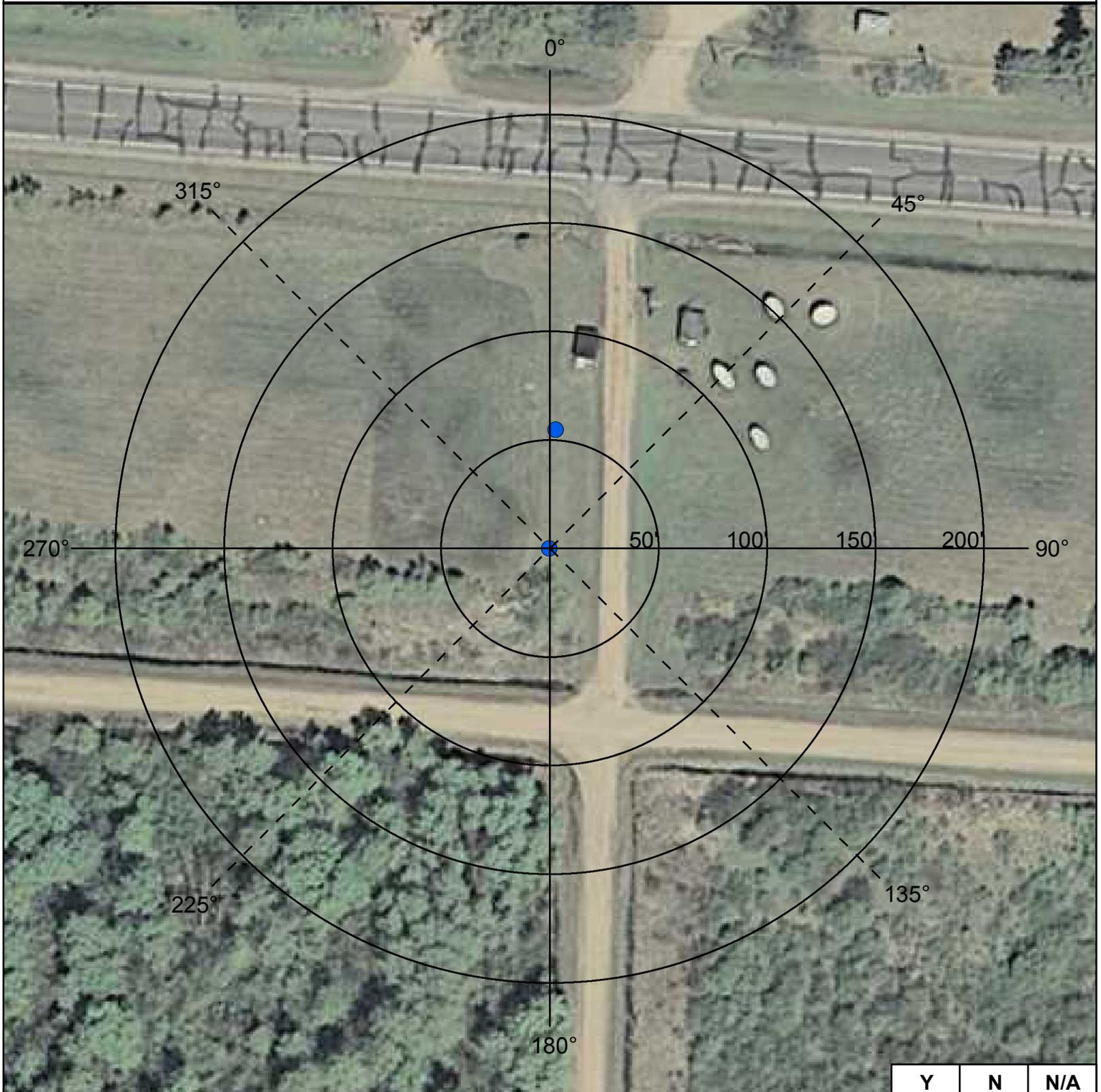
UNIQUE WELL NO.

122348

SETBACK DISTANCES

All potential contaminant sources must be noted on sketch.

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



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

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

INSPECTOR

Parthun, Christopher

DATE

8 - 14 - 2019

PWS ID / FACILITY ID	1360001 S03	UNIQUE WELL NO.	122348
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RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS

**For further information, please contact:**

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

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

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

**PUBLIC WATER SYSTEM INFORMATION**

<b>PWS ID</b>	1360001	<b>COMMUNITY</b>
<b>NAME</b>	Big Falls	
<b>ADDRESS</b>	Big Falls Water Superintendent, 410 2nd St. NW, P.O. Box 196, Big Falls, MN 56627	

**FACILITY (WELL) INFORMATION**

<b>NAME</b>	Well #4	<b>IS THERE A WELL LOG OR          ADDITIONAL CONSTRUCTION          INFORMATION AVAILABLE?</b> <input type="checkbox"/> YES (Please attach a copy) <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED
<b>FACILITY ID</b>	S04	
<b>UNIQUE WELL NO.</b>	734748	
<b>COUNTY</b>	Koochiching	

<b>PWS ID / FACILITY ID</b>	1360001    S04	<b>UNIQUE WELL NO.</b>	734748
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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				

**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 <sup>2</sup> (Class V well - illegal <sup>3</sup> )	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) <sup>2</sup>	50/300/150 <sup>4</sup>	50/300/150 <sup>4</sup>	100/600/300 <sup>4</sup>	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		

<b>PWS ID / FACILITY ID</b>	1360001 S04	<b>UNIQUE WELL NO.</b>	734748
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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				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) <sup>2</sup>	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) <sup>2</sup>	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
<b>Land Application</b>							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
<b>Solid Waste Related</b>							
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		
<b>Storm Water Related</b>							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well <sup>2</sup> (Class V well - illegal <sup>3</sup> )	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
<b>Wells and Borings</b>							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	55	
UUW	Unused, unsealed well or boring	50	50		N		
<b>General</b>							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		



PWS ID / FACILITY ID

1360001 S04

UNIQUE WELL NO.

734748

SETBACK DISTANCES

All potential contaminant sources must be noted on sketch.

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



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

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

INSPECTOR

Parthun, Christopher

DATE

8 - 14 - 2019

PWS ID / FACILITY ID	1360001 S04	UNIQUE WELL NO.	734748
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RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

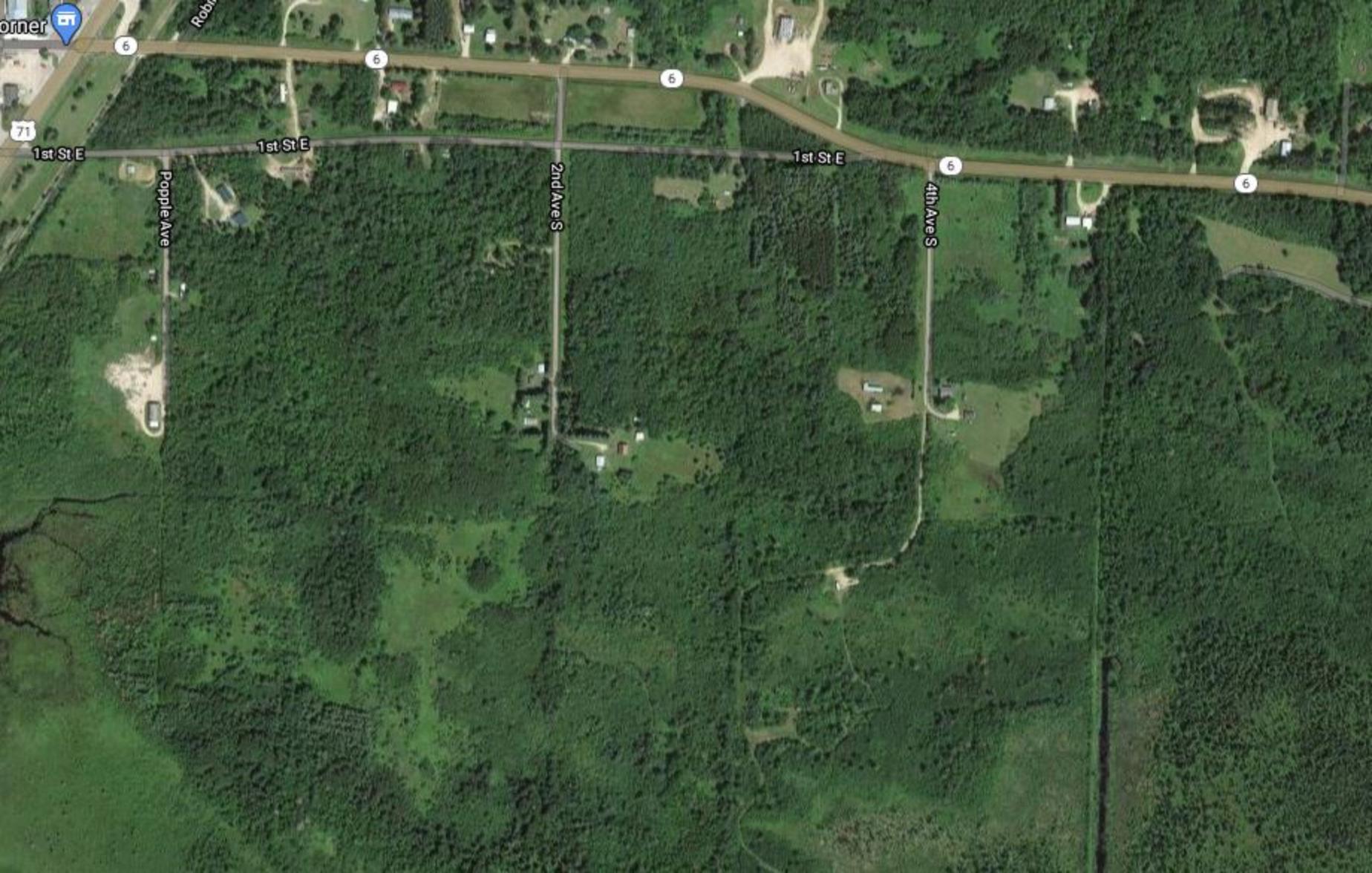
COMMENTS

**For further information, please contact:**

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

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

## **Exhibit 6: Transportation Routes**



corner



6

Robb

6

6

71

1st St E

1st St E

2nd Ave S

1st St E

6

4th Ave S

6

Popple Ave

## **Exhibit 7: WHP Plan Part 1**

**Amendment to the Wellhead Protection Plan**

**Part I**

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

**For**

**City of Big Falls**

**January 2018**



## **Introduction**

This summary documents the amended delineation of the wellhead protection area (WHPA), drinking water supply management area (DWSMA), emergency response area (ERA), and the vulnerability assessments for the city of Big Falls' drinking water supply wells and DWSMA (PWSID 1360001). These were initially prepared in March of 2008 and must now be amended as the public water supply's wellhead plan has nearly expired.

## **Protection Area Boundaries**

The city of Big Falls' DWSMA is unchanged (Figure 1). The amount of water pumped by the city has decreased significantly since the previous WHPA delineations. The WHPA now represents at least an 11 to 12-year time of travel. Note that the WHPA for emergency wells consists solely of a 200-foot radius around the well.

## **Vulnerability Assessments and Management Implications**

The DWSMA is considered to have a moderate vulnerability rating, with no change in vulnerability status. Moderately vulnerable aquifers are prone to a variety of contaminant threats, including chemical storage tanks and abandoned wells which can provide conduits for contaminants to quickly reach the city's aquifer. The remainder of the city's wellhead protection plan will outline strategies for effectively managing potential contaminant sources within the DWSMA.

## **Documentation**

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

Figure 1  
Drinking Water Supply Management Area and Vulnerability  
City of Big Falls

