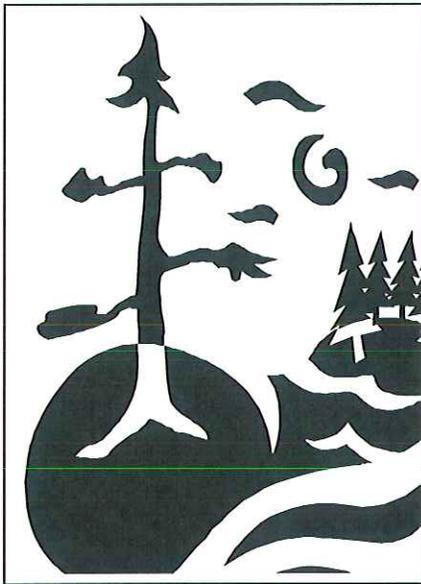


# City of Big Falls Wellhead Protection Plan

## Part II



**\*Inventory of Potential Contaminant Sources**

**\* Plan of Action to Manage Potential Contaminant Sources**

**\* Alternate Water Supply & Contingency Strategy**

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## Public Water Supply Profile

### Public Water Supply

Name City of Big Falls

Address P.O. Box 196

Big Falls, MN 56627

Telephone Number 218-276-2282 Fax Number 218-276-2282

E-Mail bigfalls@citlink.net

Population Served 267 PWS ID Number 1360001

### General Information

Unique Well Number(s) and Name(s) for Primary Well(s) \_\_\_\_\_

122348 – Well #3

734748 – Well #4

Unique Well Number(s) and Name(s) for Emergency Well(s) NA

### Wellhead Protection Manager

Name Ms. Joan Nelson

Address P.O. Box 196

Big Falls, MN 56627

Telephone Number 218-276-2282 Fax Number 218-276-2282

E-Mail bigfalls@citlink.net

## Documentation List

<u>Step</u>	<u>Date Performed</u>
Scoping 2 Meeting 2 (4720.5340, subp. 1)	<u>September 8, 2008</u>
Scoping 2 Decision Notice (4720.5340, subp. 2)	<u>September 24, 2008</u>
Remaining Portion of Plan Submitted to Local Government Units (LGUs) (4720.5350)	<u>May 6, 2009</u>
Review Received From Local Government Units (4720.5350, subp. 2)	<u>July 13, 2009</u>
Consider Comments from Local Government Units (4720.5350, subp. 3)	<u>July 13, 2009</u>
Public Hearing Conducted on Part I and Part II WHP Plan (4720.5350, subp.4)	<u>July 13, 2009</u>
Part II WHP Plan Submitted to MDH (4720.5360, subp. 1)	<u>July 19, 2009</u>

## City of Big Falls Part II 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 Potential Contaminant Source Management Strategy,
- 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 well(s) and the aquifer within the DWSMA. Part 1 of the WHP plan was submitted to the Minnesota Department of Health (MDH) and approved on July 15, 2008. The boundaries of the WHPA/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, September 8, 2008, when the necessary requirements for the content of Part 2 were outlined and discussed in detail.

The vulnerability assessment for the public water supply system's well(s) indicates that Well #3 (122348) and Well #4 (734748) wells are considered to have a low well sensitivity because they meet all construction standards required by the State Well Code.

The information and data contained in Chapters 1-4 of this part of the WHP Plan (hereafter referred to as 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 data's degree of reliability. Pertinent data elements include information about the geology, water quality and water quantity. 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. Water quality monitoring indicates that arsenic has been detected at levels near the drinking water standard. However, it is most likely that the arsenic is naturally occurring, and no other contaminants have been detected in the city's water supply. Thus, although arsenic is present, the water supply meets all potability standards of the Safe Drinking Water Act.

Chapter 2 addresses the possible impacts that changes in the physical environment, land use, and water resources have on the public water supply. No significant changes are anticipated within the next ten-year period, and the City of Big Falls has evaluated the support necessary to implement its wellhead protection plan.

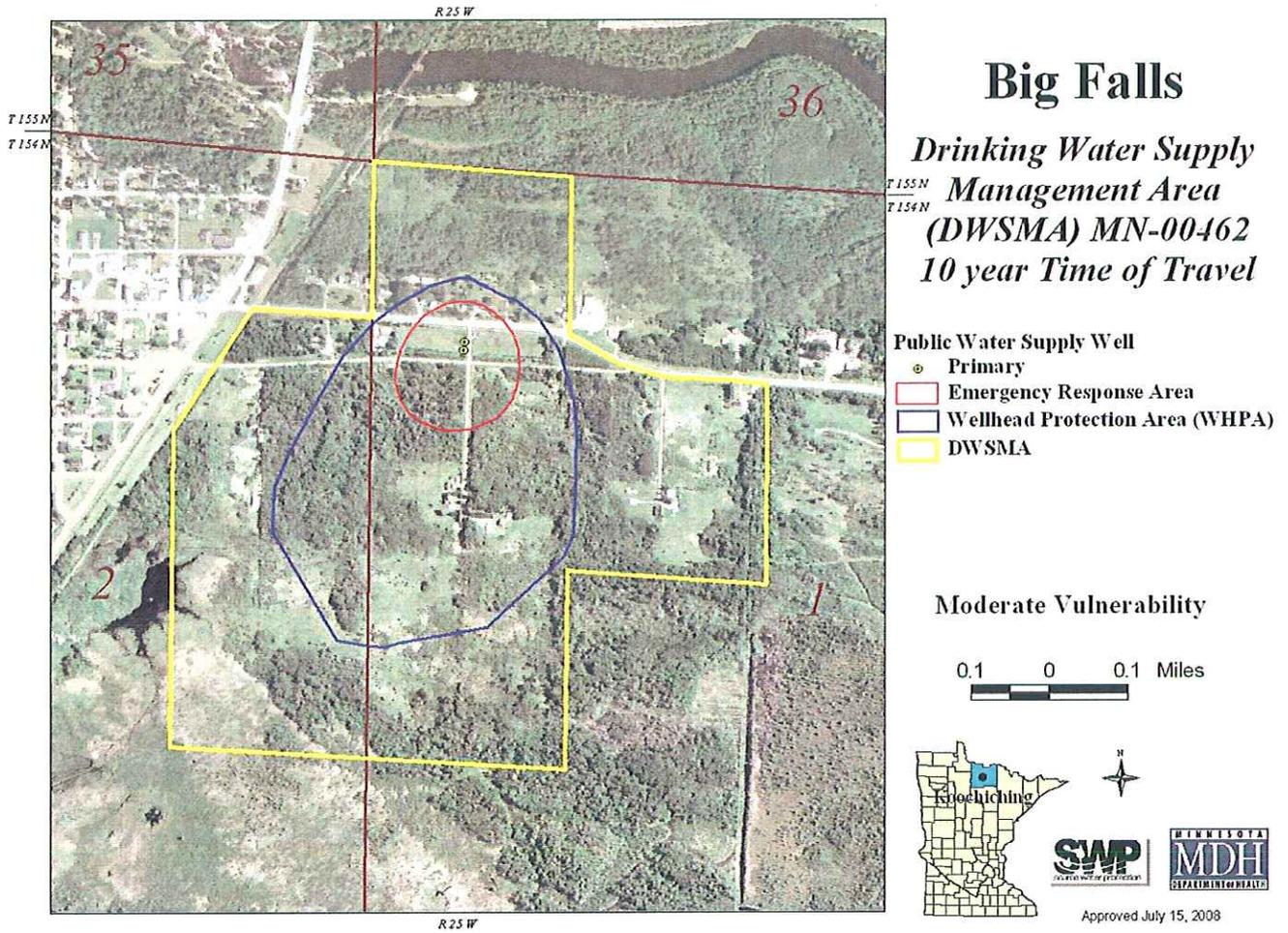
The problems and opportunities concerning land use issues relating to the aquifer, well water, and the DWSMA and those issues identified at public meetings, are addressed in Chapter 3. The moderately vulnerable status of the aquifer and the quality of water currently produced by the system's well(s) leaves five 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 public water supply well(s); 3) underground or above-ground storage tanks that may release contaminants into groundwater; 4) shallow disposal-type wells; and 5) evaluation and identification of alternative aquifers due to the levels of arsenic in the aquifer the city is currently using.

The drinking water protection goals that the public water supplier (PWS) would like to achieve with this plan are listed in Chapter 4. In essence, the PWS would like to 1) maintain or improve on the current drinking water quality, 2) increase public awareness of groundwater protection issues, 3) protect the aquifer, and 4) continue to collect data to supplement the existing geologic and hydrogeologic knowledge of the area, confirming where all wells and contamination sources are located within the DWSMA and support future efforts in wellhead protection planning.

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 issues, gathering information about other wells, 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 for the City of Big Falls will be evaluated on an annual basis prior to the system's budgeting process.

An emergency/contingency plan is included to address the possibility that the water supply system is interrupted due to either emergency situations or drought. Chapter 7 contains details about the water supply distribution system, emergency contact numbers, equipment listings as well as other information to assist the system in responding quickly and effectively in emergency situations.



**Figure 1**  
**City of Big Falls Wellhead Protection Area and  
 Drinking Water Supply Management Area**

# Chapter 1

## Data Elements and Assessment (4720.5200)

### I. Required Data Elements

#### A. Physical Environment Data Elements

1. **Precipitation -**

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.

2. **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.

In addition, the Part I WHP Plan offered recommendations to enhance the understanding of local hydrogeologic conditions including: 1) addressing deficiencies in the distribution and quality of subsurface geologic information, and 2) addressing the occurrence of arsenic in the city wells. These recommendations have been translated into management strategies contained in the city's plan of action.

3. **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.

4. **Water Resources -**

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

#### B. Land Use Data Elements

1. **Land use -**

These data elements include information about political boundaries, parcel boundaries, potential contaminant sources, land use maps, and zoning maps. The entire DWSMA is located within city boundaries (see Exhibit 1) although it lies to the southwest of the town's developed areas. The city does not have a comprehensive plan or land use controls in effect at this time. A parcel map was

prepared by Koochiching County and used by the WHP Team when conducting the potential contaminant source inventory (see Exhibit 2). Land use within the DWSMA consists primarily of undeveloped land including deciduous forest and other open space. The development that does exist in the DWSMA is defined as low density. A generalized land use map and summary table is included as Exhibit 3 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 4. The only potential contaminant sources identified within the IWMZ consist of a gravel pocket receiving clear drainage from the well house, a test well that was drilled when the city was exploring for a new well, and old city Well # 2(239913). The test well has been properly sealed. The pump and all piping have been removed from Well #2 and the city will explore permanently sealing the well. Management strategies for potential contaminant sources located within the IWMZ are included in Chapter 5.

As part of this planning process the MDH supplied the city with a summary report on all the public water supply wells the city has used over the years to supply drinking water to city residents. The WHP Team determined the status and location of all wells contained in the MDH report. The city had two different wells that were referred to as City Well #1. The original old city well No. 1 (228811) is located in the current firehouse and former city employees were questioned about its status. To the best of anyone's knowledge, the well was abandoned in 1951 but not sealed. The "other old City Well #1" is located at First St. near the SW corner of Lot 1, Block 8, original plat of the village of Big Falls, and was sealed in 1009 (sealing record 30914). Old City Well #2 (239913) is located near the existing city wells and the city will explore permanently sealing this well.

A WHP Team, comprised of the utility operator, city mayor, and city clerk and the MDH WHP planner conducted the Potential Contaminant Source Inventory. Initially, the WHP Team reviewed the land use and potential contaminant source inventory requirements identified in the Scoping 2 Decision Notice. The next step taken was to work with the MDH provided data. The WHP Team confirmed, corrected, and deleted information from the Preliminary PCSI List and Map provided by MDH. The next step was to expand the data set using local knowledge. The county provided parcel data and aerial images were used to identify land use on parcels outside the city limits and potential contaminant sources usually associated with that type of land use (i.e., residences were listed with individual septic systems, private wells, and turf management issues). After expanding the data set, the WHP Team reviewed and compared the vicinity PCSI data from MDH so there was not a duplication of entries. The last steps were to: 1) compare the Inventory results with the Scoping 2 inventory requirements to ensure all land uses and potential contaminant sources were considered, 2) complete a Final PCSI Map and List, 3) complete a final land use map and table, and 4) write this narrative describing the process that was used to conduct the Inventory. Due to the moderately vulnerable designation of the DWSMA determined during the Part 1 WHP planning process, only an inventory of other wells, storage tanks, potential contamination sites, solid waste sites, storage and preparation areas for chemicals and fuels, and shallow

disposal wells located within the DWSMA is required. A complete listing of potential contaminant sources inventoried within the DWSMA and a map showing their locations are included in the Appendix as Exhibit 5. At this time no shallow disposal wells have been identified.

2. **Public utility services -**

Records of well construction and maintenance are used to support the development of Chapter 7 of this plan, which details an emergency/conservation plan for this system.

C. Water Quantity Data Elements

1. **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.

2. **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.

D. Water Quality Data Elements

1. **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.

2. **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 contamination studies. A general overview of water quality data can be found in the city's Consumer Confidence Report, which is included in the Appendix as Exhibit 6. It is important to note that these water quality results do pertain to the water after treatment. Arsenic has been detected at levels near the drinking water standard of 10 parts per billion in water samplers collected from the city wells. However, it is most likely that the arsenic is naturally occurring, and no other contaminants have been detected in the city's water supply. Other existing information consists of isotopic and chemical analyses and indicates that the aquifer used by the PWS 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, indicating there is some component of

'young' water recharging the aquifer used by the system. Tritium samples taken from Wells 3 (122348) and 4 (734748) on July 21, 2006, showed 1.4 and 3.7 tritium units, indicating that water from the wells is a mixture, composed of predominately pre-1953 water mixed with roughly 15 to 40 percent younger water.

## II. Assessment of Data Elements

### A. Use of the Well -

General information describing this public water supply system is presented in the Source Water Assessment (SWA) found 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 28,000 gallons of water per day on average. The city has one elevated storage tower with 40,000 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.

### B. 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. However, the wells are considered susceptible to contamination from a variety of sources. These include contaminants that may persist in groundwater for long periods of time and which are not susceptible to retardation or removal by movement through fine-grained sediment.

A naturally-occurring contaminant, arsenic, has been detected in the city's supply. At this time the system has water quality that meets standards in the Federal Safe Drinking Water Act. However, it is advisable for the city to assess the distribution of arsenic in the Big Falls area. This information could be used for future siting of additional city wells, or help manage the arsenic at the existing wells. In particular, the bedrock aquifer underlying the city's aquifer should be sampled for arsenic and the results compared.

Quantity of water is considered adequate for the city's needs.

### C. The Land and Groundwater Uses in the Drinking Water Supply Management Area -

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 aquifer. The management strategies selected and documented in Chapter 5 of this Plan will focus on activities that have the most potential to impact the aquifer this PWS is using for its drinking water supply. The following tables summarize the potential contaminant sources identified during the course of an inventory.

**Table 1. Types of Wells Inventoried in the Drinking Water Supply Management Area**

<b>TYPE of WELL</b>	<b>NUMBER</b>
Public Water Supply	3
Ag. Irrigation	0
Non-Ag. Irrigation	0
Industrial	0
Commercial	0
Dewatering	0
Domestic	4
Unknown Status	0
Observation	0
Unused/Unsealed	2
Sealed/Reported to MDH	1
Class 5 Automotive	0
Monitoring	0

**Table 2. Types of Storage Tanks Inventoried in the Drinking Water Supply Management Area**

<b>TYPE of STORAGE TANK</b>	<b>NUMBER</b>	<b>STATUS</b>
Underground Storage Tank	0	NA
Aboveground Storage Tank	3	Active - 3

**Table 3. Summary of Potential Contaminant Sources Inventoried in the Drinking Water Supply Management Area**

<b>POTENTIAL CONTAMINANT SOURCE</b>	<b>NUMBER</b>
Aboveground Storage Tank	3
Wells	10

## Chapter 2

### Impact of Changes on Public Water Supply Well(s) (4720.5220)

#### I. Identify and Describe Expected Changes In:

- A. **Physical Environment** - Large-scale changes in the physical environment within the DWSMA are not anticipated during the 10-year period that this Plan is in effect. As discussed previously, the confining layer protecting the city's aquifer is considered "leaky" and long-lived contaminants can travel through the confining layer and reach the aquifer.
- B. **Land Use** – The city expects little to minimal change in the land uses within the DWSMA. Most of the "developable" land has already been developed for residential use and much of the remainder is considered low and not suitable for development. However, even land uses that result in additional water wells in the DWSMA will 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 public water supply, 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 PWS well(s). Currently the city does not have any land use controls in place and consequently would not be able to influence or regulate land uses that may allow underground or above-ground storage tanks within the DWSMA.

Land Use inside the Inner Wellhead Management Zone: The land within the 200-foot radius is partly publicly owned by the city and partly privately owned and is undeveloped. Large scale land use changes are not expected to occur during the next 10 years within the IWMZs. Changes in land uses should be closely monitored due to the susceptibility of the aquifer to be contamination from some types of activities at the land surface.

- C. **Surface Water** - There appears to be either no direct, or a limited, hydraulic connection between surface water and the aquifer used by the public water supply system as a drinking water source. Therefore, any changes to the conditions of surface waters will have little or no impact on the quality or quantity of the public water supply.
- D. **Groundwater** - The public water supply well(s) has historically provided groundwater of excellent quality and quantity with the exception of the naturally-occurring contaminant, arsenic. Exploration of an alternative aquifer, specifically the bedrock aquifer underlying the city's aquifer, should be considered. As of the date of Plan approval, the PWS system does not anticipate a large increase in water use or 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** - Only moderate to small changes are expected in land use and likely will not have significant impacts on the aquifer. Neither surface water or groundwater changes are expected to impact 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 Minnesota Pollution Control Agency 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 Health Department staff in determining potential impacts to drinking water sources. The Koochiching County Soil and Water Conservation District administers cost share dollars for well sealing. The Koochiching County Local Water Management Plan has identified the protection of groundwater based drinking water sources as a priority.

There is no discussion, or intention at this time, of requiring additional regulation related to managing wells or storage tanks within the system's DWSMA. The City does have an ordinance prohibiting the connection of any private wells to a plumbing system so that it interconnects with the public water supply distribution system.

**C. Administrative, Technical, and Financial Considerations -** The City of Big Falls assembled a Wellhead Protection Team early in the process of developing this Plan. (See Exhibit 7 in the Appendix). Many of the activities during the planning process have been accomplished through efforts of this group, with assistance from studies provided by other units of government. For this Plan to be effective:

The PWS will need to raise public awareness of the issues affecting the quality or quantity of its drinking water supply through public educational programs.

Administrative duties will remain with the Wellhead Protection Manager who will report to the governing authority, coordinate implementation of wellhead protection management action plans, and conduct regular meetings.

The City has limited funds available for new programs and implementation of wellhead protection activities will be funded with the water supply's operating fund for miscellaneous uses, as is feasible. Furthermore, the city will explore establishing a WHP budget line item during the next budgeting process. Other sources of funding or in-kind services to help achieve the goals set forth in this Plan's Chapter 4 include 1) the Koochiching County Soil and Water Conservation District and their well sealing cost-share program; 2) the MDH, who will assist with determining the correct measures for sealing unused wells, constructing new wells, and requiring the sealing of unused wells if this becomes necessary; and 3) the Minnesota Rural Water Association providing technical assistance during the wellhead protection implementation phase.

The costs of implementing Wellhead Protection activities will be evaluated on an annual basis to determine whether the original cost estimates match 1) the scope of the management practices identified in this part of the Plan, 2) changes in the status of the well(s) listed in the potential contaminant source inventory, and 3) actual costs related to proper sealing of unused/unsealed wells. The system will discuss changes in plan implementation costs with MDH to determine the availability of state or federal funding for offsetting increased costs to plan implementation.

## Chapter 3

### Issues, Problems and Opportunities (4720.5230)

#### I. Identify Water Use and Land Use Issues, Problems, and Opportunities Related To:

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 system was beginning the wellhead protection planning process. (See Exhibit 8 in the Appendix for a list of LUGs.) Each unit of government was also sent a copy of the system's delineated WHPA and DWSMA and vulnerability assessment for the well(s) 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 Serving the Public Water Supply Well(s)** - 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 and tanks, 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. The 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. To foster awareness of wellhead protection by the council the mayor was a member of the WHP Team. 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.

Three active petroleum storage tanks were identified within the boundaries of the DWSMA. All three are smaller nonregulated tanks for private residential use. Regarding other potential storage tanks, the system will continue to work with MPCA, MDA and MDH to 1) track current and likely future locations of tanks, 2) promote best management practices for all tanks, and 3) provide educational material to tank owners/operators.

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 provide the well owners with educational materials regarding the use or management of these types of wells.

There are many tools available to the regulating agencies that may be used to achieve the wellhead protection planning goals identified by the wellhead planning team. State and local governmental units, such as MDH, Hubbard 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 wellhead protection planning team recommends that no additional regulations be imposed at this time and are confident that local issues may be adequately addressed through existing processes. Processes include public education, adoption of best management practices for different types of wells, tank maintenance, water conservation and good communication with other landowners within 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 public water supply system means that it will be a challenge to implement the WHP Plan. The WHP Team will focus its efforts on fostering partnerships to help achieve wellhead protection goals. The Minnesota Rural Water Association was identified as a valuable potential partner.

## Chapter 4

### Wellhead Protection Goals (4720.5240)

The public water supply is considered to be moderately vulnerable to contamination because there appears to be some likelihood that a small amount of recharge from the surface is occurring. Consequently, the principal potential sources of contamination to the aquifer are:

- 1) other wells that reach or penetrate it,
- 2) shallow disposal-type wells, and
- 3) above-ground or underground storage tanks.

Consequently, this WHP Plan will focus on addressing the location and status of other wells that may be used for domestic, public or commercial purposes, storage tanks and shallow disposal wells. The overall goal is to a) prevent contamination of the aquifer and, b) manage the aquifer cooperatively to assure sustainable water supplies for all users.

The public water supply system has enjoyed a sufficient and safe water supply in the past and proposes, through the implementation of this WHP Plan, to further protect water quality and quantity.

The WHP team identified the following goals to be achieved with the action items contained in this Plan:

- **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 5 Objectives and Plan of Action (4720.5250)

### I. Establishing Priorities for the Plan of Action

The aquifer supplying the system's drinking water supply has been identified as moderately vulnerable to contamination from land use activities, such as various types of wells and storage tanks. Action items 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 action items can be implemented at the same time, so the WHP team assigned priority to each. A number of factors must be considered when WHP measures are selected and prioritized (part 4720.5250, subpart 3). Such factors include:

- Contamination of a public water supply well;
- Quantities of the potential contamination sources;
- Location of the source in relation to the well;
- Capability of the geologic material to absorb a contaminant;
- Existence and effectiveness of existing official controls;
- Time required to obtain cooperation; and
- Administrative, legal, technical, and financial resources needed.

Based upon these factors, the WHP team has identified action items that will be implemented by the City of Big Falls over the 10-year period that its WHP plan is in effect. The action items fall into the following categories:

- **Public Education and Outreach**
- **Data Collection**
- **Potential Contaminant Source Management**
- **IWMZ Management**
- **Contingency Planning**
- **Reporting**

*An "At A Glance" summary of action items is presented in the appendix as Exhibit 9.*

II. Management Plan of Action for Potential Contaminant Sources

**Category: Public Education and Outreach**

**Objective A -**

Educate the public about Wellhead Protection

**WHP Measure A1: Create an article for “The Ripple”, a monthly community newspaper, regarding wellhead protection.**

Source of Action: WHP Manager  
Cooperator(s): MRWA, MDH  
Time Frame: 2009, 2012, 2016  
Estimated Cost: \$45.00

**WHP Measure A2: Present wellhead protection information to the city council to brief new members and refresh existing members on an intermittent basis.**

Source of Action: WHP Manager  
Cooperator(s): MDH  
Time Frame: 2011, 2013, 2015, 2017  
Estimated Cost: Staff Time

**WHP Measure A3: Work with the Minnesota Department of Transportation to place Wellhead Protection signs on State Highway 6 as it enters town from the east and State Highway 71 on the north and south sides of town.**

Source of Action: Water Operator  
Cooperator(s): MNDOT  
Time Frame: 2010  
Estimated Cost: \$150.00

**WHP Measure A4: Place information about the city’s wellhead protection plan and drinking water protection activities on the city’s web page and update at regular intervals.**

Source of Action: WHP Manager  
Cooperator(s): None  
Time Frame: 2010, 2012, 2014, 2016, 2018  
Estimated Cost: Staff Time

**Category: Data Collection**

**Objective B -**

Enhance future delineation efforts and gain additional knowledge about the aquifers available for city water supply purposes in the area

**WHP Measure B1: Inventory newly constructed wells located within two miles of the DWSMA.**

Source of Action: WHP Team

Cooperator(s): MDH

Time Frame: 2014, 2018

Estimated Cost: \$100.00

**WHP Measure B2: Work with the MDH to assess the distribution of arsenic in the Big Falls area by sampling wells completed in the bedrock. City staff will collect samples and the MDH will be responsible for analytical costs and will assist with sample collection.**

Source of Action: Water Operator

Cooperator(s): MDH

Time Frame: 2009, 2010

Estimated Cost: \$25.00

**Category: Potential Contaminant Source Management**

**Objective C -**

Increase awareness about the importance of wellhead protection for ensuring a safe and adequate drinking water supply

**WHP Measure C1: Mail printed information to property owners about well management techniques.**

Source of Action: WHP Manager

Cooperator(s): MDH, MRWA

Time Frame: 2011, 2014, 2017

Estimated Cost: \$50.00

**WHP Measure C2: Mail a letter and brochure explaining cost share programs available to seal unused, unsealed wells.**

Source of Action: Water Operator

Cooperator(s): MDH

Time Frame: 2012

Estimated Cost: \$20.00

**WHP Measure C3: Obtain cost estimates to seal old municipal Well #1 (228811) and Well # 2 (239913).**

Source of Action: WHP Manager  
Cooperator(s): None  
Time Frame: 2011  
Estimated Cost: \$50.00

**WHP Measure C4: Explore potential funding opportunities to seal old municipal Well #1 (228811) and Well # 2 (239913).**

Source of Action: Water Operator  
Cooperator(s): MDH  
Time Frame: 2013  
Estimated Cost: \$50.00

**WHP Measure C5: Manage old municipal Well #1 (228811) and Well # 2 (239913) by permanently sealing if adequate outside funding can be obtained or alternatively explore obtaining maintenance permit from the Minnesota Department of Health.**

Source of Action: WHP Manager  
Cooperator(s): MDH  
Time Frame: 2015  
Estimated Cost: Unknown

**WHP Measure C6: Use information packets to educate tank owners on the importance of preventing leaks from tanks.**

Source of Action: WHP Manager  
Cooperator(s): MDH, MRWA, MPCA  
Time Frame: 2012, 2016  
Estimated Cost: \$50.00

**WHP Measure C7: Potential locations of Class V Wells (i.e. un-sewered commercial areas, rural automotive repair shops, public facilities such as bus garages, etc.) will be inventoried through direct personal contact with the operator of the business or landowner in the DWSMA. At that time, a Fact Sheet on Class V Wells and reporting requirements will be provided to the landowner describing what a Class V well is and the impacts they can have on groundwater quality.**

**EPA reporting forms are available at: [www.epa.gov/safewater/uic/7520s.html](http://www.epa.gov/safewater/uic/7520s.html)**

Source of Action: WHP Manager  
Cooperator(s): MDH, MRWA  
Time Frame: As Needed  
Estimated Cost: \$50.00

**Category: Inner Wellhead Management Zone**

**Objective D –**

Effectively manage the Inner Wellhead Management Zone (IWMZ) to reduce the likelihood of contaminants from entering the well at a level to cause human health impacts.

**WHP Measure D1: Review and update the IWMZ survey for all wells in the system.**

Source of Action: WHP Manager  
Cooperator(s): MDH, MRWA  
Time Frame: 2012, 2015, 2018  
Estimated Cost: \$150

**WHP Measure D2: Monitor setbacks for all new potential sources of contamination located within the IWMZ.**

Source of Action: WHP Manager/Team  
Cooperator(s): MDH, MRWA  
Time Frame: Annually  
Estimated Cost: \$500

**WHP Measure D3: Implement the WHP measures identified in the IWMZ Inventory (see Exhibit 4 in the Appendix).**

Source of Action: WHP Manager/Team  
Cooperator(s): MDH, MRWA  
Time Frame: Annually  
Estimated Cost: \$500

**Category: Contingency Planning**

**Objective E –**

Improve the readiness of the city to respond to drinking water emergencies.

**WHP Measure E1: Review and update the city's WHP contingency plan every five years.**

Source of Action: WHP Team  
Cooperator(s): City Council  
Time Frame: 2014  
Estimated Cost: \$100

**Category: Reporting**

**Objective F -**

**Provide for an evaluation program of the city's wellhead protection program.**

**WHP Measure F1: Prepare an annual summary of wellhead protection efforts to present to the city council and interested citizens.**

Source of Action: WHP Manager/Team  
Cooperator(s): None  
Time Frame: Annually  
Estimated Cost: \$50

**WHP Measure F2: Prepare an assessment of WHP plan implementation efforts every 2.5 years using the results under the annual reports noted above.**

Source of Action: WHP Manager/Team  
Cooperator(s): MDH  
Time Frame: 2011, 2013, 2015, 2017  
Estimated Cost: \$200

**WHP Measure F3: Summarize WHP plan implementation efforts in a report to MDH in year 8 of plan implementation.**

Source of Action: WHP Manager/Team  
Cooperator(s): None  
Time Frame: 2016  
Estimated Cost: \$100

## **Chapter 6**

### **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 public water supply system 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) Members of the wellhead protection team, the governing authority, and the WHP plan manager will travel through the drinking water supply management area on a regular basis to identify any changes in land use or potential contaminant source management practices which may adversely impact the public water supply.
  - 3) The wellhead protection team will meet on an as-needed basis, with a minimum of one annual meeting, to review the results of each strategy implemented during the previous plan year and identify and discuss whether modifications are needed for those strategies, and additional strategies for the coming plan year.
  - 4) The wellhead protection plan manager will make an annual written report to the governing authority regarding progress in implementing the wellhead protection management objectives of this Plan. The annual reports will be compiled and used to review the overall progress in implementing source management strategies when the system's wellhead protection plan is updated.
  - 5) The city of Big Falls will prepare an internal assessment of plan implementation every two and one half years and will summarize its progress with plan implementation in the eighth year when the plan amendment process begins. A copy of the report will be sent to the Minnesota Department of Health Source Water Protection Unit in St. Paul and another copy will be placed in the system's Wellhead Protection file.

## Chapter 7

### Alternative Water Supply; Contingency Strategy (4720.5280)

#### A. PURPOSE

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

#### B. PUBLIC WATER SUPPLY CHARACTERISTICS

##### Current Supply Source -

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
Well Capacity (gpm)	100 gpm	100 gpm
Well Production (gpm)	37 gpm	70 gpm

##### 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.

##### Storage and Distribution -

Storage consists of an elevated water tower with 40,000 gallons of storage . The city uses approximately 28,000 gallons per day on average.

##### Maps/Plans -

Maps and plans are on file in the city offices and in the city maintenance pickup.

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

Priority Group and Rank	Maximum Daily Use (gpd)	Minimum Daily Use (gpd)
Residential--#1	34,000	24,000
Institutional--#2	NA	NA
Commercial--#3	NA	NA
Industrial--#4	NA	NA
Irrigation--#5	NA	NA
Unaccounted	NA	NA
Wholesale	NA	NA

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

In the event of a malfunction of the city’s well(s) or in response to a situation where potable water is not available, the City of Big Falls will enact the water contingency plan.

**D. ALTERNATIVE WATER SUPPLY OPTIONS**

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. The Minnesota National Guard may be able to provide emergency treatment of surface water for human consumption. In the event of significant water disruption emergency the following procedure is recommended.

- A. Contact the Koochiching County Sheriff at (218)283-4416 to request assistance from the Minnesota National Guard.
- B. The Koochiching County Sheriff will contact the Minnesota National Guard; Division of Emergency Management, State Duty Officer (800)422-0798 to request assistance for the District.
- C. The Minnesota National Guard can provide a portable ROWPU (Reverse Osmosis Water Purification System) capable of supplying 900 gph or 15 gpm.

Bottled water supplies, delivery and distribution.

Bottled water is available in Bemidji and International Falls. Distributors that could provide quantities of bottles water 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

System interconnects with other water supplies.

There are no interconnects available.

New well.

No other wells are planned at this time.

Emergency or backup wells.

The city has two wells, which can each individually supply needs adequately.

Source Management (blending).

Blending is probably not a viable option as both wells are finished in the same aquifer.

No other water supply alternatives have been identified at this time.

## E. INVENTORY OF AVAILABLE EMERGENCY EQUIPMENT AND MATERIALS

The following table contains a list of services, equipment and supplies that are available to the public water supply 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.

Description	Owner	Telephone	Location	Acquisition Time
Well Repair	North Star Drilling	218-751-8399	Bemidji, MN	One Day
Pump Repair	North Star Drilling	218-751-8399	Bemidji, MN	One Day
Electrician	Crunden Electric	218-766-4611	Backduck, MN	One Day
Plumber	Shannon's Plumbing	218-283-9372	International Falls, MN	1.0 hr.
Backhoe	City of Big Falls	218-276-2282	Big Falls, MN	Immediate
Chemical Feed	Hawkins Inc.	701-293-9618	Fargo, ND	One Day
Meter Repair	NA	NA	NA	NA
Generator	Ziegler Cat	218-258-3232	Buhl, MN	One-Two Days
Valves	NWS	800-437-4362	Fargo, ND	One Day
Pipe & Fittings	NWS	800-437-4362	Fargo, ND	One Day

## F. EMERGENCY IDENTIFICATION PROCEDURES

### Procedural Operations

Incident	Response Procedure & Comments
Identify Disruption	Person identifying disruption contacts Wellhead Protection Manager (WHP), or mayor
Notify Response Personnel (Coordinator)	Notify the WHP Manager and Mayor
Identify Incident Direction and Control	Response Personnel Coordinator assesses situation and determines incident direction and control, begins solving problem
Identify Internal Communication	Response Personnel Coordinator contacts mayor, clerk and City Council to inform of situation
Inform Public	Response Personnel Coordinator contacts appropriate organizations to inform public of problem
Assess Incident on Continual Basis	Response Personnel Coordinator continue to monitor/solve problem
Assess Contamination Disruption	Response Personnel Coordinator determines if water supply is contaminated. Monitor/solve problem as needed
Assess Mechanical Disruption	Response Personnel Coordinator assesses mechanical disruption. Monitor and solve disruption as needed.

Provide Alternate Water Supply	If needed, alternate water supply is located and provided
Impose Water Use Restrictions	If needed, city council may impose water use restrictions

## NOTIFICATION PROCEDURES

### Agency Notification

The following table 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.

### Agency Emergency Contact Listing

Personnel	Name	Home Telephone	Work Telephone
Mayor/Board Chair	Shawn Pritchard	218-276-2506	218-244-7611
Council Members	Scott Gates	218-276-2282	
Council Members	Marta Lindemanis	218-276-2339	
Council Members	Laura Larson	218-276-2398	218-283-2531
Council Members	Beth Pihlaja	218-276-2046	
Response Coordinator	Joan Nelson	218-276-2438	218-276-2282
Alt. Response Coordinator	Terrence Baird	218-276-2501	218-556-4827
State Incident Duty Officer	NA	NA	800-422-0798
County Emergency Director	Bruce Grotberg	218-278-4313	218-283-4416
Fire Chief	Dave Larsen	218-276-2398	218-757-3177
Sheriff	Brian Youso	NA	218-283-4416
Local Deputy	John Mastin	218-276-2340	218-283-4416
System Operator	Terrence Baird	218-276-2501	218-556-4827
Alt. System Operator	Ken Warner	218-276-2290	NA
School Superintendent	NA	NA	NA
Ambulance	Little Fork Ambulance	911	218-276-4870
Hospital	Big Fork Valley	218-743-3232	218-743-3177
Doctor or Medical Facility	Big Falls Clinic	NA	218-276-2403
Power Company	North Star Electric	218-278-6658	888-668-8243
Highway Department	Koochiching County	218-276-2381	218-283-1185
MPCA Groundwater Division	Duluth Regional Office	NA	218-302-6656
MRWA Technical Services	Mike Roers	NA	218-685-5197
MDH District Engineer	Todd Johnson	NA	218-308-2110
MDH Source Water Protection	Beth Kluthe	NA	218-308-2115

**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>	Shawn Pritchard	Coordinate actions to address emergency
<b>Water Operator</b>	Terrence Baird	Direct or contact entities to resolve issue
<b>Alternate Water Operator</b>	Ken Warner	Direct or contact entities to resolve issue
<b>Public Relations</b>	Joan Nelson	Contact residents to inform them of emergency
<b>Alternate Public Relations</b>	Shawn Pritchard	Contact residents to inform them of emergency
<b>Public Health/Medical</b>	Big Falls First Responders, Fire Dept., Hospital and Ambulance Service, Local Deputy	Assist Big Falls as needed to address emergency
<b>Alternate Public Health/Medical</b>	Koochiching County Public Health	Assist Big Falls as needed to address emergency

**Public Information Plan**

- a) Public relations center: Big Falls City Office  
 Public information center location during emergency: Big Falls City Office  
 Times available: 8 a.m. to 4 p.m. or open as needed
- 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

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

## H. MITIGATION AND CONSERVATION PLAN

### Mitigation

- a. Infrastructure maintenance/upgrades/maps: Infrastructure upgrades are not possible at this time due to budgetary constraints. The system is flushed on a routine basis. Maps are available in city offices.
- b. Regular inspection of tower, well(s), pump house: All of these items are inspected on a regular basis. The well house and chemical storage area have keyed entries and are locked.
- c. Staff training: Staff receives training through Minnesota Rural Water Association, American Waterworks Association, and the Vermillion Technological College.
- d. System security analysis: All facilities are locked and have keyed entries.
- e. Site new backup well: No new well is planned at this time.
- f. System valving to isolate problems: The water system is valved to isolate problems.
- g. Sanitation procedures for construction/repairs: All disinfection procedures are performed per State specifications.

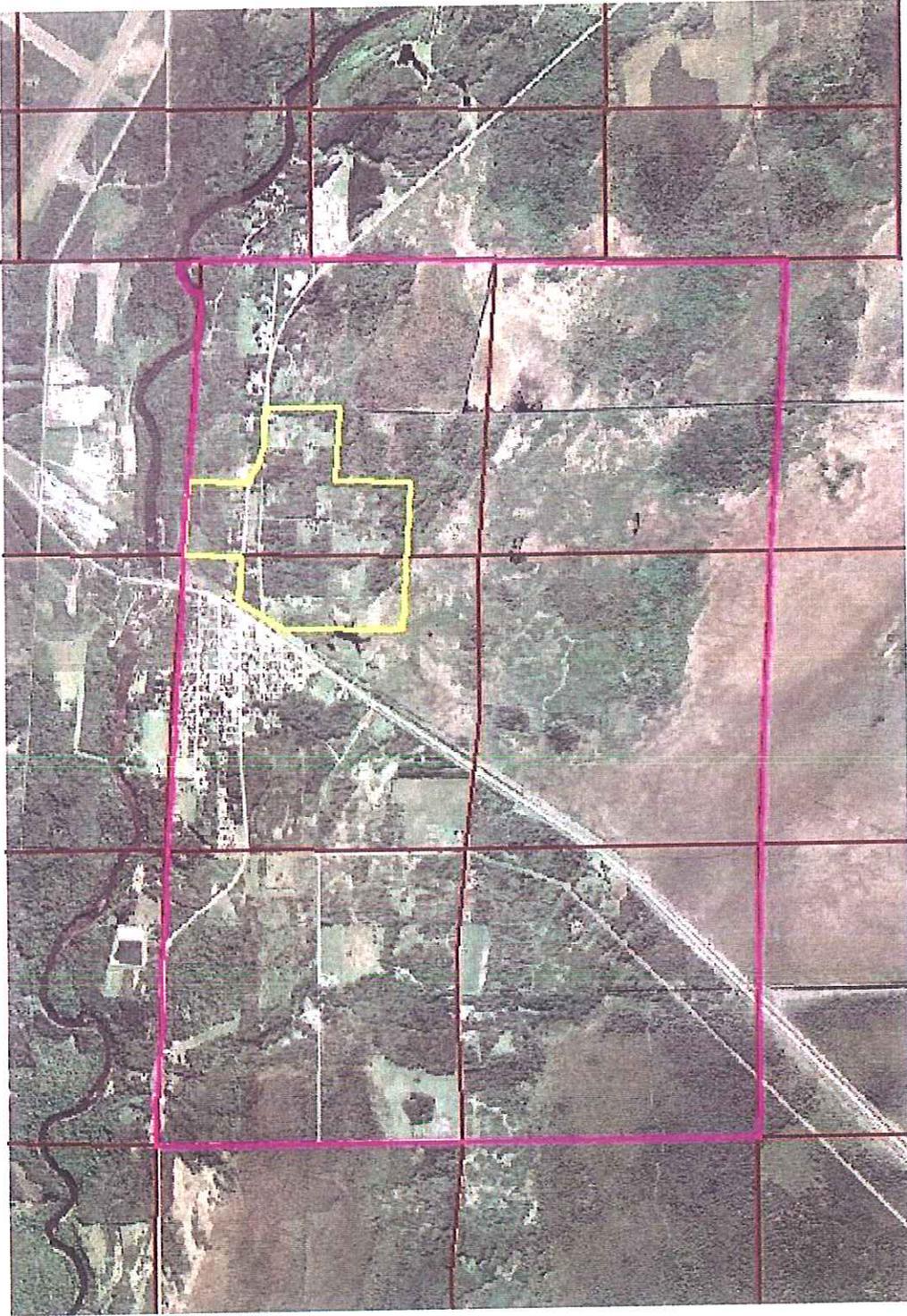
### Conservation

Public education: The city will incorporate water conservation education into wellhead protection management strategies.

**Appendix A**  
**Referenced Data for Part II**

**Exhibit 1: Municipal Boundaries Map**

# City of Big Falls City Limits



0.3 0 0.3 0.6 Miles



City of Big Falls City Limits  
DWSMA



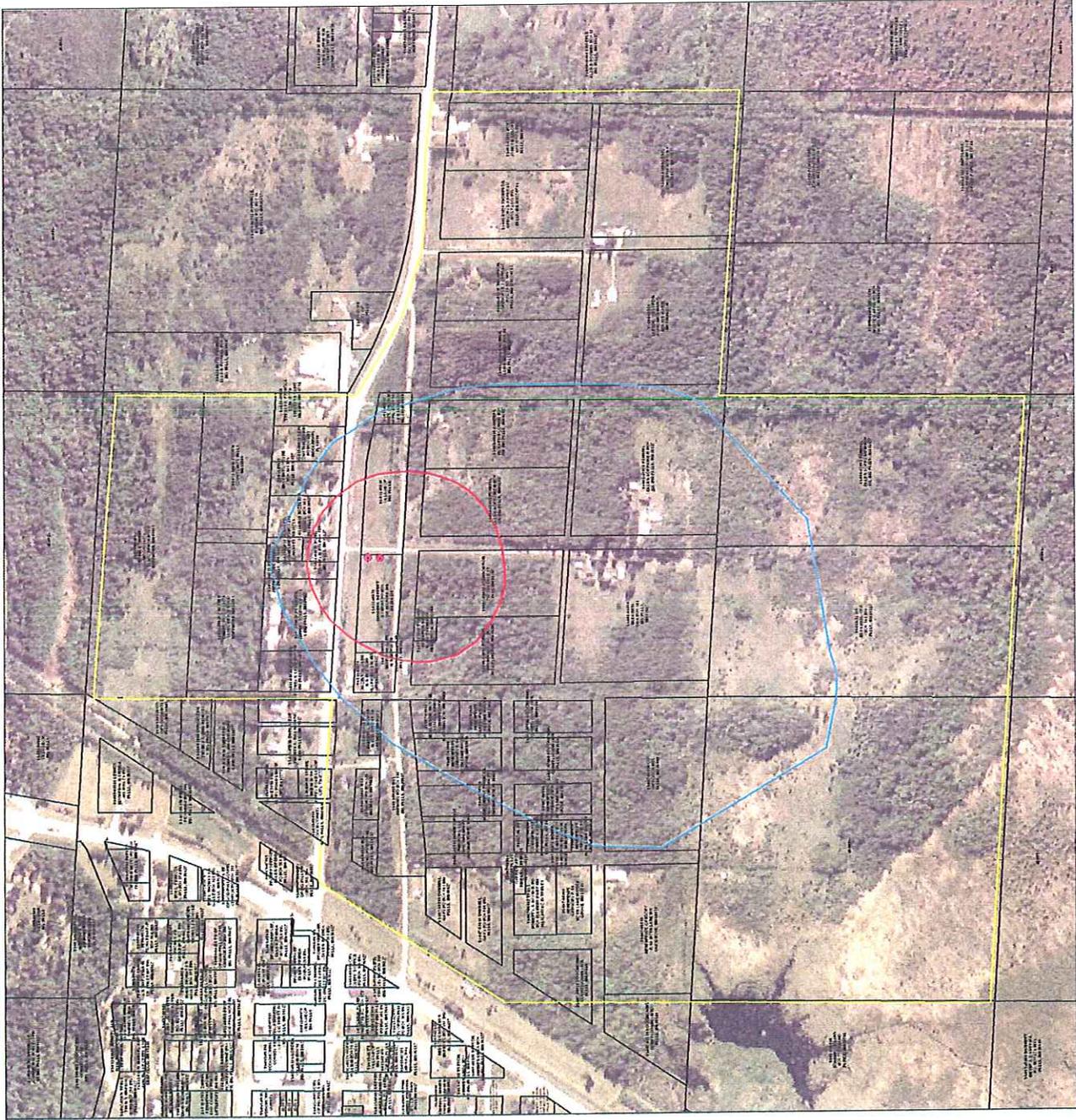
## **Exhibit 2: Parcel Map**

# Big Falls Drinking Water Supply Management Area

DWSMA MN-00462

## Legend

- Primary
- Emergency Response Area
- Wellhead Protection Area
- DWSMA

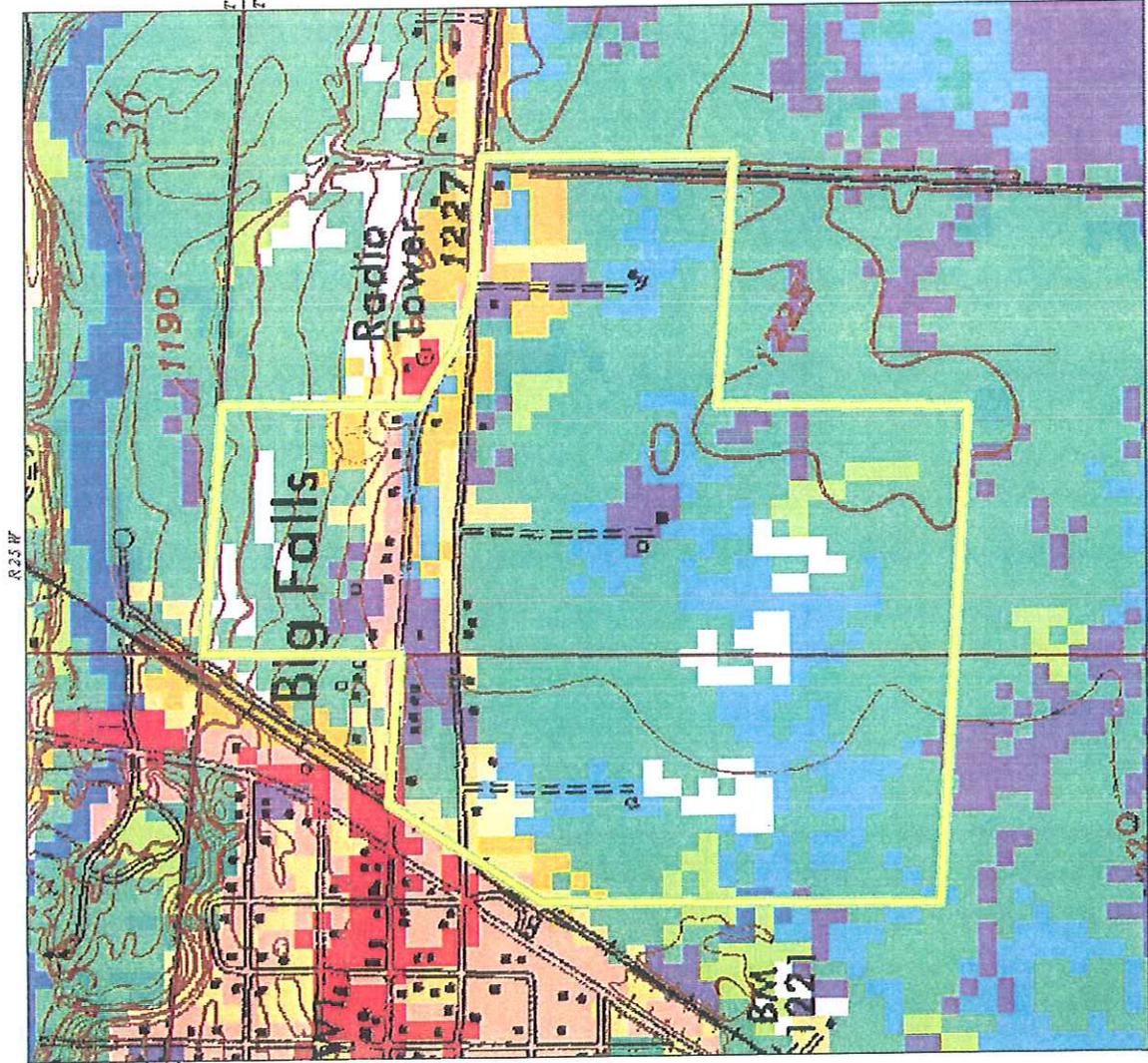


**Exhibit 3:**  
**Land Use Map and Summary Table**

# Big Falls

Drinking Water Supply  
Management Area

(DWSMA) MN-00462  
10 year Time of Travel



- DWSMA
- Land Cover 2001
- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands
- No Data

0.1 0 0.1 Miles



Approved July 15, 2008

## Big Falls DWSMA (MN-00462) Land Cover Statistics

LAND COVER	ACRES	PERCENT	YEAR
Low Intensity Residential	6.41	2.57	1992
Commercial/Industrial/Transportation	10.38	4.17	1992
Deciduous Forest	66.26	26.60	1992
Evergreen Forest	1.10	0.44	1992
Mixed Forest	9.94	3.99	1992
Pasture/Hay	100.05	40.16	1992
Row Crops	12.36	4.96	1992
Urban/Recreational Grasses	2.43	0.98	1992
Woody Wetlands	33.35	13.39	1992
Emergent Herbaceous Wetlands	6.84	2.75	1992
Total	249.14	100.00	1992

**Exhibit 4:**  
**Inner Wellhead Management Zone (IWMZ) Forms**

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

**PUBLIC WATER SYSTEM INFORMATION**

**COMMUNITY**

**PWS ID:** 1360001  
**NAME:** Big Falls  
**ADDRESS:** Big Falls Water Superintendent, P.O. Box 196, Big Falls, MN 56627

**FACILITY (WELL) INFORMATION**

**NAME:** #3  
**FACILITY ID:** S03  
**UNIQUE WELL NO:** 122348  
**COUNTY:** Koochiching

**CONSTRUCTION INFORMATION**

Well Information Collected from:  Well Log (if available, please attach a copy of the well log.)  Verbal  
 Date Constructed: \_\_\_\_\_ Serviced By: \_\_\_\_\_

**PWS ID / FACILITY ID:** 1360001 S03      **UNIQUE WELL NO:** 122348

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensi- tive Well*	Within 200 Feet Y / N / U	Dist. from Well	Est. (?)
		Community	Noncomm- unity				
<b><i>Agricultural Related</i></b>							
ACP	Agricultural chemical storage or prep. area, > 25 gals. or 100 lbs.dry weight	150	150		N		
ACS	Agricultural chemical storage or prep. area with safeguards	100	100		N		
ACT	Agricultural chemical supply tank	50	50		N		
ACR	Agricultural chemical storage or prep. area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well	50	50		N		
AAT	Anhydrous ammonia tank	50	50		N		
AFL	Animal feedlot	50	50	100	N		
APB	Animal or poultry building	50	50	100	N		
MSA	Animal manure storage area	100	100	200	N		
AMA	Animal manure application (storage or stockpile)	50	100		N		
ABS	Animal burial site	50	50		N		
FWP	Feeding or watering area within a pasture	50	50	100	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SKY	Stockyard	50	50		N		
<b><i>Class V Injection Wells</i></b>							
GPR	Gravel pocket receiving clear water drainage	30	N/A		Y	84	N**
IWD	Industrial waste disposal	use discretion	use discretion		N		
LCC	Large capacity cesspools	illegal	illegal		N		
MVW	Motor vehicle waste disposal	illegal	illegal		N		
<b><i>ISTS Related</i></b>							
CSP	Cesspool	75	75	150	N		
DRA	Drainfield - above or below grade	50	50	100	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
HTK	Holding tank	50	50		N		
PRV	Privy	50	50	100	N		
SET	Septic tank	50	50		N		
SLS	Sewage lift station	50	50		N		
SSW	Sewage sump, watertight	50	20		N		
SSN	Sewage sump, non-watertight	50	50		N		
SBA	Sewer buried, approved, air tested	50	20		N		
SBM	Sewer, buried collector, municipal, pressurized, open jointed, or unapproved materials	50	50		N		
SBP	Sewer buried, pressure, approved, air tested serving a single family residence	50	20		N		
<b><i>Land Application</i></b>							
FWS	Food waste (note distance from well)	use discretion	use discretion		N		
SPT	Septage (note distance from well)	50	50		N		
SSG	Sewage sludge	50	50		N		
WAS	Waste	50	50		N		

PWS ID / FACILITY ID:	1360001 S03	UNIQUE WELL NO:	122348
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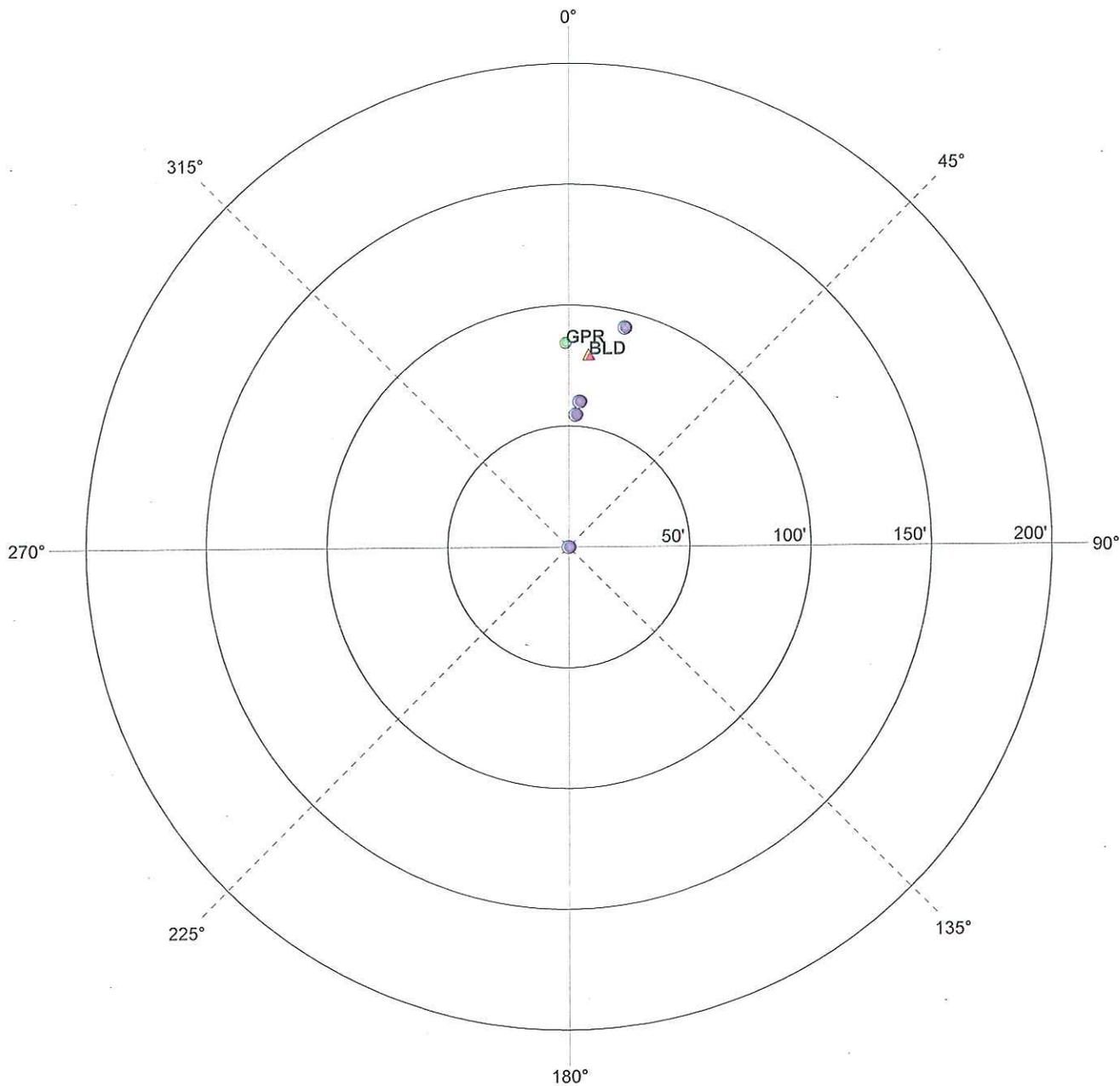
PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensi- tive Well*	Within 200 Feet Y / N / U	Dist. from Well	Est. (?)
		Community	Noncomm- unity				
<b>Solid Waste Related</b>							
COS	Composting site (public/commercial)	50	50		N		
CBL	Construction debris/demolition landfill	50	50		N		
DMP	Dump	150	150		N		
SVY	Salvage yard	50	50		N		
SLF	Sanitary landfill	150	150		N		
SWT	Solid waste transfer station	50	50		N		
<b>Storm Water Related</b>							
SWD	Storm water drain pipe, 12 inches or greater	50	20		N		
SWR	Storm water retention basin greater than 1000 gals.	50	50		N		
SWB	Storm water infiltration basin greater than 1000 gals.	50	50		N		
SWI	Storm water injection well	50	50		N		
<b>Wells</b>							
WEL	Operating well	use discretion	use discretion		N		
UUW	Unused, unsealed well or boring	50	50		N		
MON	Monitoring well	use discretion	use discretion		N		
<b>General</b>							
PLM	Contaminant plume	50	50		N		
DWT	Discharge of water treatment chemical waste	50	50		N		
DRD	Drainage ditch (holds water six months or more)	50	50		N		
GRV	Grave	50	50		N		
HSP	Hazardous substance storage or prep. area, > 25 gals., or 100 lbs. dry weight	150	150		N		
HSS	Hazardous substance storage tank with safeguards	100	100		N		
IWS	Interceptor (waste)	50	50		N		
PSP	Petroleum storage or prep. area, > 25 gals., or 100 lbs. dry weight	150	150		N		
PSS	Petroleum storage tank with safeguards	100	100		N		
PSU	Petroleum storage tank, underground, less than 1100 gals.	50	50		N		
PSA	Petroleum storage tank, above ground, less than 1100 gals.	50	20		N		
LPN	LP Tank	5/10	5/10		N		
PIT	Pit	50	20		N		
PCH	Pollutant, contaminant, or hazardous substance	50	50		N		
REN	Rendering plant (note distance from well)	use discretion	use discretion		N		
RSS	Road salt storage	50	50		N		
WAT	Stream, river, pond, lake, wetland	50	50		N		
SPI	Swimming pool, in-ground	50	20		N		
UFS	Unfilled space	50	20		N		
WSP	Waste stabilization pond	150	150		N		
<b>Miscellaneous (The items in this section need to be recorded but not indicated on the map.)</b>							
BLD	Building (does not contain any actual or potential contaminant sources.)	3	3		Y	80	Y
BPO	Building projection, overhang	3	3		N		
ETL	Electric transmission line	5/10	5/10		N		
ETE	Electric transmission line in excess of 50 kv	25	25		N		
FFH	Fire or flushing hydrant	10	N/A		N		
FPH	Frost proof yard hydrant	10	10		N		
GSP	Gas pipe	5/10	5/10		N		
HWF	Highest water or flood level	50	N/A		N		
PLE	Property line or easement	50	N/A		N		
<b>Additional Sources (If there is more than one source listed above, please indicate here.)</b>							

\* A sensitive well has less than 50 feet of watertight casing and less than 10 feet of impervious material between the well intake and the land surface.  
 \*\* Asterisks indicate that this Potential Contaminant was digitized based on an adjacent well. The Distance from Well is the distance from the current well.

PWS ID / FACILITY ID:	1360001	S03	UNIQUE WELL NO:	122348
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**SETBACK DISTANCES**

All potential contaminant sources must be noted on sketch.  
Diagram the location and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code." Include a slope indicator and property lines.



INSPECTOR:	Kluthe, Beth	DATE:	12/03/2008
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**INNER WELLHEAD MANAGEMENT ZONE (IWMZ) -  
POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) FORM**

**PUBLIC WATER SYSTEM INFORMATION**

**COMMUNITY**

**PWS ID:** 1360001  
**NAME:** Big Falls  
**ADDRESS:** Big Falls Water Superintendent, P.O. Box 196, Big Falls, MN 56627

**FACILITY (WELL) INFORMATION**

**NAME:** #4  
**FACILITY ID:** S04  
**UNIQUE WELL NO:** 734748  
**COUNTY:** Koochiching

**CONSTRUCTION INFORMATION**

Well Information Collected from:  Well Log (if available, please attach a copy of the well log.)  Verbal  
 Date Constructed: \_\_\_\_\_ Serviced By: \_\_\_\_\_

**PWS ID / FACILITY ID:** 1360001 S04      **UNIQUE WELL NO:** 734748

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensi- tive Well*	Within 200 Feet Y / N / U	Dist. from Well	Est. (?)
		Community	Noncomm- unity				
<b><i>Agricultural Related</i></b>							
ACP	Agricultural chemical storage or prep. area, > 25 gals. or 100 lbs.dry weight	150	150		N		
ACS	Agricultural chemical storage or prep. area with safeguards	100	100		N		
ACT	Agricultural chemical supply tank	50	50		N		
ACR	Agricultural chemical storage or prep. area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well	50	50		N		
AAT	Anhydrous ammonia tank	50	50		N		
AFL	Animal feedlot	50	50	100	N		
APB	Animal or poultry building	50	50	100	N		
MSA	Animal manure storage area	100	100	200	N		
AMA	Animal manure application (storage or stockpile)	50	100		N		
ABS	Animal burial site	50	50		N		
FWP	Feeding or watering area within a pasture	50	50	100	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SKY	Stockyard	50	50		N		
<b><i>Class V Injection Wells</i></b>							
GPR	Gravel pocket receiving clear water drainage	30	N/A		Y	30	
IWD	Industrial waste disposal	use discretion	use discretion		N		
LCC	Large capacity cesspools	illegal	illegal		N		
MVW	Motor vehicle waste disposal	illegal	illegal		N		
<b><i>ISTS Related</i></b>							
CSP	Cesspool	75	75	150	N		
DRA	Drainfield - above or below grade	50	50	100	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
HTK	Holding tank	50	50		N		
PRV	Privy	50	50	100	N		
SET	Septic tank	50	50		N		
SLS	Sewage lift station	50	50		N		
SSW	Sewage sump, watertight	50	20		N		
SSN	Sewage sump, non-watertight	50	50		N		
SBA	Sewer buried, approved, air tested	50	20		N		
SBM	Sewer, buried collector, municipal, pressurized, open jointed, or unapproved materials	50	50		N		
SBP	Sewer buried, pressure, approved, air tested serving a single family residence	50	20		N		
<b><i>Land Application</i></b>							
FWS	Food waste (note distance from well)	use discretion	use discretion		N		
SPT	Septage (note distance from well)	50	50		N		
SSG	Sewage sludge	50	50		N		
WAS	Waste	50	50		N		

PWS ID / FACILITY ID: 1360001 S04      UNIQUE WELL NO: 734748

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensi- tive Well*	Within 200 Feet Y / N / U	Dist. from Well	Est. (?)
		Community	Noncomm- unity				

**Solid Waste Related**

COS	Composting site (public/commercial)	50	50		N		
CBL	Construction debris/demolition landfill	50	50		N		
DMP	Dump	150	150		N		
SVY	Salvage yard	50	50		N		
SLF	Sanitary landfill	150	150		N		
SWT	Solid waste transfer station	50	50		N		

**Storm Water Related**

SWD	Storm water drain pipe, 12 inches or greater	50	20		N		
SWR	Storm water retention basin greater than 1000 gals.	50	50		N		
SWB	Storm water infiltration basin greater than 1000 gals.	50	50		N		
SWI	Storm water injection well	50	50		N		

**Wells**

WEL	Operating well	use discretion	use discretion		N		
UUW	Unused, unsealed well or boring	50	50		N		
MON	Monitoring well	use discretion	use discretion		N		

**General**

PLM	Contaminant plume	50	50		N		
DWT	Discharge of water treatment chemical waste	50	50		N		
DRD	Drainage ditch (holds water six months or more)	50	50		N		
GRV	Grave	50	50		N		
HSP	Hazardous substance storage or prep. area, > 25 gals., or 100 lbs. dry weight	150	150		N		
HSS	Hazardous substance storage tank with safeguards	100	100		N		
IWS	Interceptor (waste)	50	50		N		
PSP	Petroleum storage or prep. area, > 25 gals., or 100 lbs. dry weight	150	150		N		
PSS	Petroleum storage tank with safeguards	100	100		N		
PSU	Petroleum storage tank, underground, less than 1100 gals.	50	50		N		
PSA	Petroleum storage tank, above ground, less than 1100 gals.	50	20		N		
LPN	LP Tank	5/10	5/10		N		
PIT	Pit	50	20		N		
PCH	Pollutant, contaminant, or hazardous substance	50	50		N		
REN	Rendering plant (note distance from well)	use discretion	use discretion		N		
RSS	Road salt storage	50	50		N		
WAT	Stream, river, pond, lake, wetland	50	50		N		
SPI	Swimming pool, in-ground	50	20		N		
UFS	Unfilled space	50	20		N		
WSP	Waste stabilization pond	150	150		N		

**Miscellaneous (The items in this section need to be recorded but not indicated on the map.)**

BLD	Building (does not contain any actual or potential contaminant sources.)	3	3		Y	25	Y**
BPO	Building projection, overhang	3	3		N		
ETL	Electric transmission line	5/10	5/10		N		
ETE	Electric transmission line in excess of 50 kv	25	25		N		
FFH	Fire or flushing hydrant	10	N/A		N		
FPH	Frost proof yard hydrant	10	10		N		
GSP	Gas pipe	5/10	5/10		N		
HWF	Highest water or flood level	50	N/A		N		
PLE	Property line or easement	50	N/A		N		

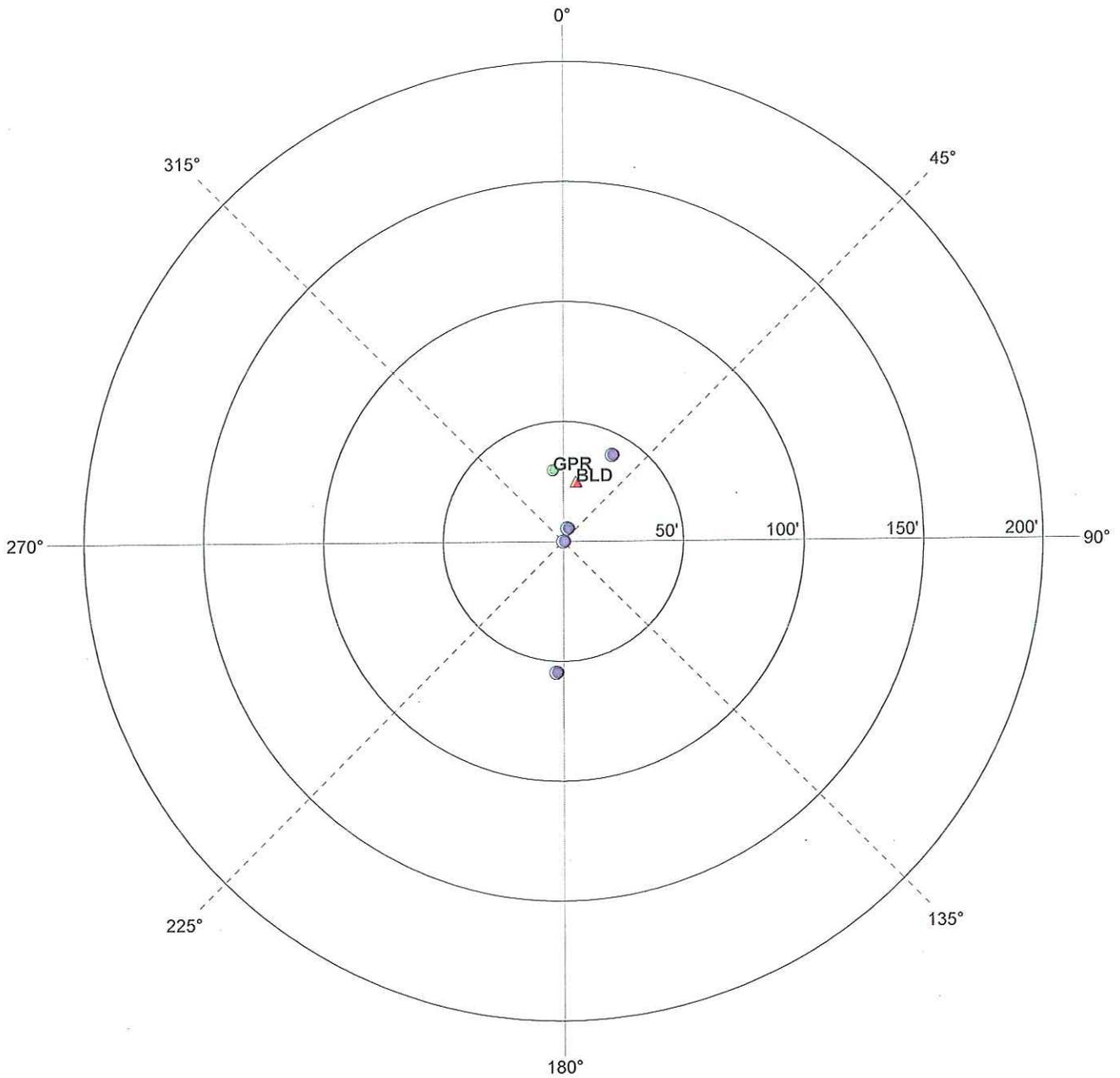
**Additional Sources (If there is more than one source listed above, please indicate here.)**


\* A sensitive well has less than 50 feet of watertight casing and less than 10 feet of impervious material between the well intake and the land surface.  
 \*\* Asterisks indicate that this Potential Contaminant was digitized based on an adjacent well. The Distance from Well is the distance from the current well.

PWS ID / FACILITY ID:	1360001	S04	UNIQUE WELL NO:	734748
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**SETBACK DISTANCES**

All potential contaminant sources must be noted on sketch.  
 Diagram the location and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code." Include a slope indicator and property lines.



INSPECTOR:	Kluthe, Beth	DATE:	12/03/2008
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<b>PWS ID / FACILITY ID:</b> 1360001 S04	<b>UNIQUE WELL NO:</b> 734748
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Recommended Wellhead Protection Measures	Wellhead Protection Measure Implemented?	Date Verified
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		
Explore the feasibility of permanently sealing Well #2 (239913).		

<b>Isolation distances maintained for new sources of contamination?</b>	Y	N	N/A
<b>Monitoring existing nonconforming sources of contamination?</b>	Y	N	N/A

**Comments:**

For further information, please contact the Minnesota Department of Health, Source Water Protection Unit, at:  
 - Unit Receptionist - 651/201-4700 or 800/818-9318  
 - TDD (651) 201-5797 or for Greater Minnesota through the Minnesota Relay Service at 1-800-627-3529 (ask for [651] 201-5000)

**Exhibit 5:  
Potential Contaminant Source Inventory  
List and Map**

**DRINKING WATER SUPPLY MANAGEMENT AREA  
FINAL POTENTIAL CONTAMINANT SOURCE INVENTORY**

**THIS LIST IS BASED ON THE FOLLOWING INFORMATION - Sorted by Facility Name & ID, and Feature Type & ID  
DWSMA: Big Falls (Verified records only)**

Facility Name		Facility ID	Address	PIN/PID	PLS Info		Loc. Date /
Feature ID	Type	Type Description	ID Code	Source	Stat*	Accuracy (m)	
<b>Bakkenta, Lorraine</b>		398761	P.O. Box 141, Big Falls 56627	9100603020	T154 R25W 1		4/13/2007 25
950181	ISTS	Individual sewage treatment system	703748	CWI	A		4/13/2007 200
491616	WEL	Well - Bakkenta, Lorraine	703748	CWI	A		4/13/2007 25
775883	WLL	Well log	703748	CWI	A		4/13/2007 25
<b>Big Falls PWS Well #2</b>		262286	P.O. Box 196, Big Falls 56627	9101106040	T154 R25W 1		8/24/2005 25
997672	PWS	Public water supply	1360001S02	MNDWIS	I		8/24/2005 200
963148	SWUDS	State water use permit	792182-2	SWUDS			8/24/2005 200
355141	WEL	Well - Big Falls PWS Well #2	239913	CWI	I		8/24/2005 25
639408	WLL	Well log	239913	CWI	I		8/24/2005 25
<b>Big Falls PWS Well #3</b>		251321	P.O. Box 196, Big Falls 56627	9101106040	T154 R25W 1		12/18/2006 25
996952	PWS	Public water supply	1360001S03	MNDWIS	A		12/18/2006 200
963149	SWUDS	State water use permit	792182-3	SWUDS			12/18/2006 200
344176	WEL	Well - Big Falls PWS Well #3	122348	CWI	A		12/18/2006 25
628443	WLL	Well log	122348	CWI	A		12/18/2006 25
<b>Big Falls PWS Well #4</b>		1020279	P.O. Box 196, Big Falls 56627	9101106040	T154 R25W 1		12/18/2006 25
2029517	WEL	Well - Big Falls Well #4	734748	CWI	A		12/18/2006 25
2029518	WLL	Well log	734748	CWI	A		12/18/2006 25
<b>Big Falls Test Well</b>		1025891	P.O. Box 196, Big Falls 56627	9101106040	T154 R25W 1		4/13/2007 25
2042379	WEL	Well - Sealed H229759	723060	CWI	SL		4/13/2007 25
2042380	WLL	Well log	723060	CWI	SL		4/13/2007 25
<b>Boes, Jim</b>		1080102	1109 Hwy. 6, Big falls 56627	9100601010	T154 R25W 1		12/3/2008 200
2169456	WEL	Well			A		12/3/2008 200
<b>Holt, Angela</b>		1080101	504 Hwy. 6, Big Falls 56627	9001104012	T154 R25W 1		12/3/2008 200
2169454	WEL	Well - Unused, unsealed well			I		12/3/2008 200
<b>Lund, John</b>		1025883	308 4th Avenue South, Big Falls 56627	9100601030	T154 R25W 1		4/13/2007 25
2042361	ISTS	Individual sewage treatment system	474747	CWI	A		4/13/2007 200
2042359	WEL	Well	474747	CWI	A		4/13/2007 25
2042360	WLL	Well log	474747	CWI	A		4/13/2007 25
<b>Rissanen, Rodney &amp; Linda</b>		1080104	P.O. Box 155 State Hwy. 6, Big Falls 56627	9101104040	T154 R25W 1		12/3/2008 200
2169459	AST	Aboveground storage tank Fuel oil			A		12/3/2008 200
<b>Sanders, Richard</b>		1080103	P.O. Box 336 State Hwy. 6, Big Falls 56627	9100603010	T154 R25W 1		12/3/2008 200
2169458	WEL	Well - Unused, unsealed well			I		12/3/2008 200
<b>Stradtman, Mike and Deedee</b>		1080100	802 State Hwy. 6 State Hwy. 6, Big Falls 56754	9101105010	T154 R25W 1		12/3/2008 200
2169452	AST	Aboveground storage tank Fuel oil			A		12/3/2008 200
2169453	AST	Aboveground storage tank Fuel oil			A		12/3/2008 200
2169451	WEL	Well			A		12/3/2008 200

\* Status Codes: A = Active; I = Inactive; SL = Sealed; U = Unknown

# Big Falls

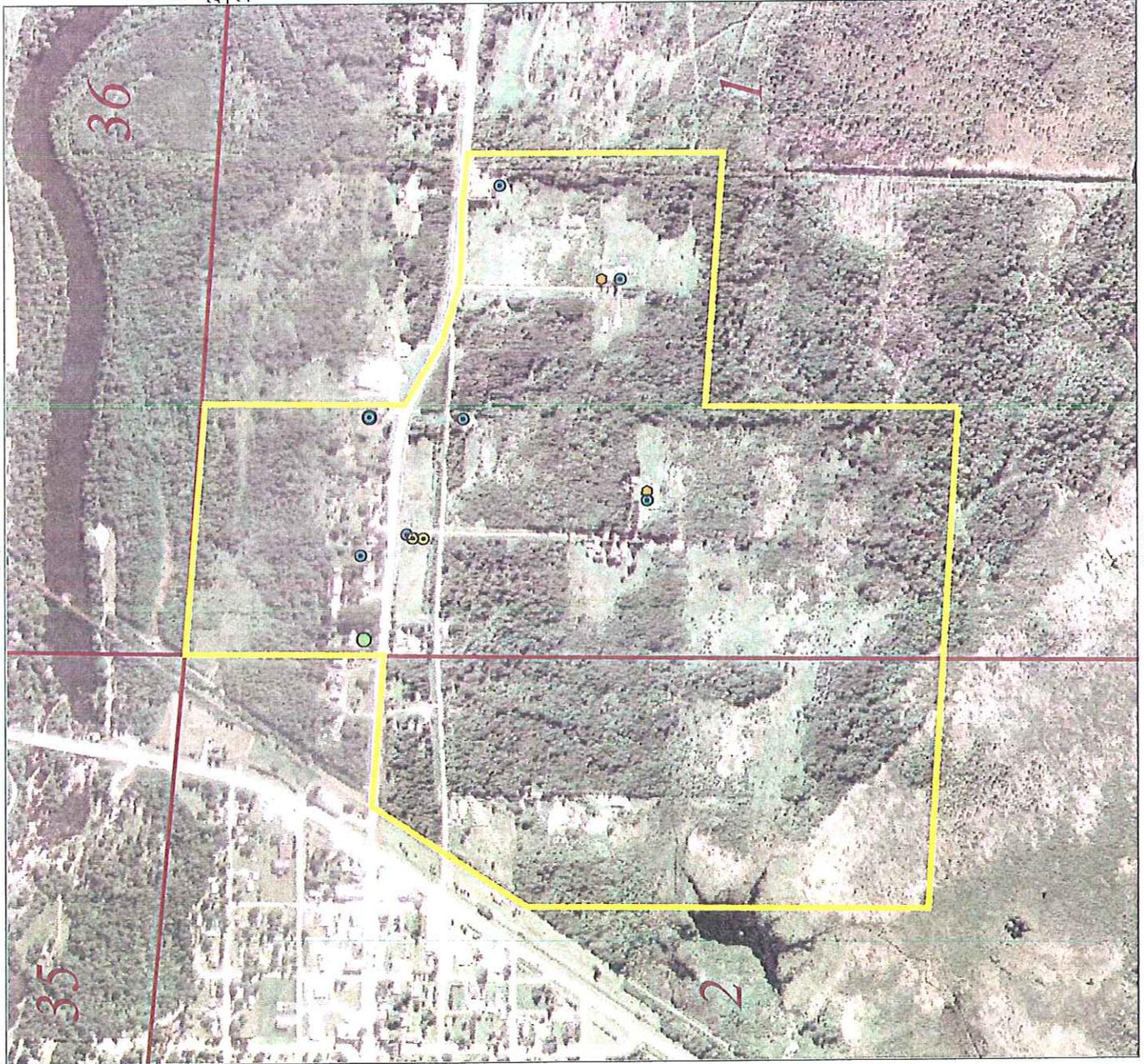
## Drinking Water Supply Management Area (DWSMA) MN-00462 10 year Time of Travel

T 155 N  
T 154 N

R 25 W

T 155 N  
T 154 N

R 25 W



Public Water Supply Well

- Primary
- Final PCSI
- Above Ground Storage Tank
- Individual Sewage Treatment System
- Well
- DWSMA



MINNESOTA  
MDH  
DEPARTMENT OF HEALTH

MSWF  
MINNESOTA STATE WATER FOUNDATION

PCSI Approved February 12, 2009

**Exhibit 6:**  
**Consumer Confidence Report**

# CONSUMER CONFIDENCE REPORT

PWSID: 1360001

## City of Big Falls 2007 Drinking Water Report

The City of Big Falls is issuing the results of monitoring done on its drinking water for the period from January 1 to December 31, 2007. The purpose of this report is to advance consumers' understanding of drinking water and heighten awareness of the need to protect precious water resources.

### Source of Water

The City of Big Falls provides drinking water to its residents from a groundwater source: two wells ranging from 85 to 93 feet deep, that draw water from the Quaternary Buried Artesian aquifer.

The water provided to customers may meet drinking water standards, but the Minnesota Department of Health has also made a determination as to how vulnerable the source of water may be to future contamination incidents. If you wish to obtain the entire source water assessment regarding your drinking water, please call 651-201-4700 or 1-800-818-9318 (and press 5) during normal business hours. Also, you can view it on line at [www.health.state.mn.us/divs/eh/water/swp/swa](http://www.health.state.mn.us/divs/eh/water/swp/swa).

Call ~~218-206-2282~~ if you have questions about the City of Big Falls drinking water or would like information about opportunities for public participation in decisions that may affect the quality of the water.

### Results of Monitoring

No contaminants were detected at levels that violated federal drinking water standards. However, some contaminants were detected in trace amounts that were below legal limits. The table that follows shows the contaminants that were detected in trace amounts last year. (Some contaminants are sampled less frequently than once a year; as a result, not all contaminants were sampled for in 2007. If any of these contaminants were detected the last time they were sampled for, they are included in the table along with the date that the detection occurred.)

#### Key to abbreviations:

MCLG—Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MCL—Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MRDL—Maximum Residual Disinfectant Level.

MRDLG—Maximum Residual Disinfectant Level Goal.

# CONSUMER CONFIDENCE REPORT

PWSID: 1360001

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

90th Percentile Level—This is the value obtained after disregarding 10 percent of the samples taken that had the highest levels. (For example, in a situation in which 10 samples were taken, the 90th percentile level is determined by disregarding the highest result, which represents 10 percent of the samples.) Note: In situations in which only 5 samples are taken, the average of the two with the highest levels is taken to determine the 90th percentile level.

pCi/l—PicoCuries per liter (a measure of radioactivity).

ppb—Parts per billion, which can also be expressed as micrograms per liter ( $\mu\text{g/l}$ ).

ppm—Parts per million, which can also be expressed as milligrams per liter ( $\text{mg/l}$ ).

N/A—Not Applicable (does not apply).

Contaminant (units)	MCLG	MCL	Level Found		Typical Source of Contaminant
			Range (2007)	Average /Result*	
Arsenic (ppb) (10/02/2006)	0	10	N/A	9.5	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.
Barium (ppm) (10/16/2003)	2	2	N/A	.05	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
Fluoride (ppm)	4	4	.52-1.4	.93	State of Minnesota requires all municipal water systems to add fluoride to the drinking water to promote strong teeth; Erosion of natural deposits; Discharge from fertilizer and aluminum factories.
Haloacetic Acids (HAA5) (ppb) (08/23/2005)	0	60	N/A	4.3	By-product of drinking water disinfection.
TTHM (Total trihalomethanes) (ppb) (08/23/2005)	0	80	N/A	3.1	By-product of drinking water disinfection.

# CONSUMER CONFIDENCE REPORT

PWSID: 1360001

Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

Contaminant (units)	Level Found		Typical Source of Contaminant
	Range (2007)	Average/Result*	
Radon (pCi/l) (11/08/2005)	N/A	143	Erosion of natural deposits.

\*This is the value used to determine compliance with federal standards. It sometimes is the highest value detected and sometimes is an average of all the detected values. If it is an average, it may contain sampling results from the previous year.

Radon is a radioactive gas which is naturally occurring in some groundwater. It poses a lung cancer risk when gas is released from water into air (as occurs during showering, bathing, or washing dishes or clothes) and a stomach cancer risk when it is ingested. Because radon in indoor air poses a much greater health risk than radon in drinking water, an Alternative Maximum Contaminant Level (AMCL) of 4,000 picoCuries per liter may apply in states that have adopted an Indoor Air Program, which compels citizens, homeowners, schools, and communities to reduce the radon threat from indoor air. For states without such a program, the Maximum Contaminant Level (MCL) of 300 pCi/l may apply. Minnesota plans to adopt an Indoor Air Program once the Radon Rule is finalized.

Contaminant (units)	MRDLG	MRDL	****	*****	Typical Source of Contaminant
Chlorine (ppm)	4	4	N/A	1	Water additive used to control microbes.

\*\*\*\*Highest and Lowest Monthly Average.

\*\*\*\*\*Highest Quarterly Average.

Contaminant (units)	MCLG	AL	90% Level	# sites over AL	Typical Source of Contaminant
Copper (ppm) (07/27/2005)	N/A	1.3	.09	0 out of 5	Corrosion of household plumbing systems; Erosion of natural deposits.
Lead (ppb) (07/27/2005)	N/A	15	1.5	0 out of 5	Corrosion of household plumbing systems; Erosion of natural deposits.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. City of Big Falls is responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing

# CONSUMER CONFIDENCE REPORT

PWSID: 1360001

components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

Some contaminants do not have Maximum Contaminant Levels established for them. These unregulated contaminants are assessed using state standards known as health risk limits to determine if they pose a threat to human health. If unacceptable levels of an unregulated contaminant are found, the response is the same as if an MCL has been exceeded; the water system must inform its customers and take other corrective actions. In the table that follows are the unregulated contaminants that were detected:

Contaminant (units)	Level Found		Typical Source of Contaminant
	Range (2007)	Average/Result	
Sodium (ppm) (11/08/2005)	N/A	28	Erosion of natural deposits.
Sulfate (ppm) (11/08/2005)	N/A	62.1	Erosion of natural deposits.

## Compliance with National Primary Drinking Water Regulations

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

Contaminants that may be present in source water include:

*Microbial contaminants*, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

*Inorganic contaminants*, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

*Pesticides and herbicides*, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

*Organic chemical contaminants*, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

*Radioactive contaminants*, which can be naturally-occurring or be the result of oil and gas production and mining activities.

# CONSUMER CONFIDENCE REPORT

PWSID: 1360001

In order to ensure that tap water is safe to drink, the U. S. Environmental Protection Agency (EPA) prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

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

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

## **Exhibit 7: WHP Team Members**

Shawn Pritchard, City of Big Falls Mayor  
Joan Nelson, City Clerk/Treasurer  
Terry Baird, Water Superintendent-Wastewater Plant Operator

**Technical Assistance Provided by**  
Beth Kluthe – Minnesota Department of Health

## **Exhibit 8: Local Unit of Government (LUG) List**

Koochiching County Board  
715 4<sup>th</sup> Street  
International Falls, MN 56649

Koochiching County Water Planner  
Richard Lehtinen  
715 4<sup>th</sup> Street  
International Falls, MN 56649

Bigfork River Board Advisory Committee  
Dale Olson  
715 4<sup>th</sup> Street  
International Falls, Mn 56649

Koochiching County Soil and Water Conservation District  
Pam Tomevi  
715 4<sup>th</sup> Street  
International Falls, MN 56649

Arrowhead Regional Development Commission  
330 Canal Park Drive  
Duluth, Minnesota 55802

**Exhibit 9:**

**“At A Glance”**

**City of Big Falls Wellhead Protection Action Strategies**

**“At A Glance”  
City of Big Falls’ Wellhead Protection Action Strategies**

Year	Action Strategy	Responsible Party	Date Completed
2009	Create an article for “The Ripple” about wellhead protection. (A1)	WHP Manager	
	Collect water samples in cooperation with MDH to assess arsenic in bedrock aquifer. (B2)	Water Operator	
	Maintain isolation distances for new potential contaminant sources in the IWMZ. (D2)	WHP Manager/Team	
	Implement WHP measures in IWMZ (D3)	WHP Manager/Team	
	Prepare annual summary for city council about wellhead protection actions during the year. (F1)	WHP Manager/Team	
2010	Work with MNDOT to place WHP signs along state highways. (A3)	Water Operator	
	Place information about WHP activities on the city’s web page. (A4)	WHP Manager	
	Continue to work with MDH to assess arsenic levels in the bedrock aquifer. (B2)	Water Operator	
	Maintain isolation distances for new potential contaminant sources in the IWMZ. (D2)	WHP Manager/Team	
	Implement WHP measures in IWMZ (D3)	WHP Manager/Team	
	Prepare annual summary for city council about wellhead protection actions during the year. (F1)	WHP Manager/Team	
2011	Present WHP information to city council to brief new members and refresh existing members. (A2)	WHP Manager	
	Mail printed well management information to well owners in DWSMA. (C1)	WHP Manager	
	Obtain cost estimates to seal old municipal Well #1 (228811) & Well #2 (239913) (C3)	WHP Manager	
	Notify MDH if a Class V well is inventoried in the DWSMA and provide information materials to owner. (C7)	WHP Manager	
	Maintain isolation distances for new potential contaminant sources in the IWMZ. (D2)	WHP Manager/Team	
	Implement WHP measures in IWMZ (D3)	WHP Manager/Team	
	Prepare annual summary for city council about wellhead protection actions during the year. (F1)	WHP Manager/Team	
	Prepare an assessment of WHP Plan implementation efforts. (F2)	WHP Manager/Team	

Year	Action Strategy	Responsible Party	Date Completed	
2012	Create an article for "The Ripple" about wellhead protection. (A1)	WHP Manager		
	Update the city's webpage regarding wellhead protection activities. (A4)	WHP Manager		
	Mail a letter and brochure about well sealing to effected property owners in DWSMA. (C2)	Water Operator		
	Educate tank owners in DWSMA about spill prevention using information packets. (C6)	WHP Manager		
	Review and update the IWMZ inventory. (D1)	WHP Manager/Team		
	Maintain isolation distances for new potential contaminant sources in the IWMZ. (D2)	WHP Manager/Team		
	Implement WHP measures in IWMZ (D3)	WHP Manager/Team		
	Prepare annual summary for city council about wellhead protection actions during the year. (F1)	WHP Manager/Team		
	2013	Present WHP information to city council to brief new members and refresh existing members. (A2)	WHP Manager	
		Explore potential funding opportunities to help seal old municipal wells #1 (22811) and #2 (239913). (C5)	Water Operator	
Maintain isolation distances for new potential contaminant sources in the IWMZ. (D2)		WHP Manager/Team		
Implement WHP measures in IWMZ (D3)		WHP Manager/Team		
Prepare annual summary for city council about wellhead protection actions during the year. (F1)		WHP Manager/Team		
2014		Prepare an assessment of WHP Plan implementation efforts. (F2)	WHP Manager/Team	
		Update the city's webpage regarding wellhead protection activities. (A4)	WHP Manager	
		Inventory newly constructed wells within two miles of DWSMA. (B1)	WHP Team	
		Mail printed well management information to well owners in DWSMA. (C1)	WHP Manager	
		Maintain isolation distances for new potential contaminant sources in the IWMZ. (D2)	WHP Manager/Team	
	Implement WHP measures in IWMZ (D3)	WHP Manager/Team		
	Review and update contingency chapter in WHP Plan. (E1)	WHP Team		
	Prepare annual summary for city council about wellhead protection actions during the year. (F1)	WHP Manager/Team		

2015	Present WHP information to city council to brief new members and refresh existing members. (A2)	WHP Manager
	Manage old municipal wells #1 (228811) and #2 (239913) by either permanently sealing or explore obtaining a well maintenance permit from MDH. (C5)	WHP Manager
	Review and update the IWMZ inventory. (D1)	WHP Manager/Team
	Maintain isolation distances for new potential contaminant sources in the IWMZ. (D2)	WHP Manager/Team
	Implement WHP measures in IWMZ (D3)	WHP Manager/Team
	Prepare annual summary for city council about wellhead protection actions during the year. (F1)	WHP Manager/Team
	Prepare an assessment of WHP Plan implementation efforts. (F2)	WHP Manager/Team
2016	Create an article for "The Ripple" about wellhead protection. (A1)	WHP Manager
	Update the city's webpage regarding wellhead protection activities. (A4)	WHP Manager
	Educate tank owners in DWSMA about spill prevention using information packets. (C6)	WHP Manager
	Maintain isolation distances for new potential contaminant sources in the IWMZ. (D2)	WHP Manager/Team
	Implement WHP measures in IWMZ (D3)	WHP Manager/Team
	Prepare annual summary for city council about wellhead protection actions during the year. (F1)	WHP Manager/Team
	Summarize WHP Plan implementation efforts in a report to MDH. (F3)	WHP Manager/Team
2017	Present WHP information to city council to brief new members and refresh existing members. (A2)	WHP Manager
	Mail printed well management information to well owners in DWSMA. (C1)	WHP Manager
	Maintain isolation distances for new potential contaminant sources in the IWMZ. (D2)	WHP Manager/Team
	Implement WHP measures in IWMZ (D3)	WHP Manager/Team
	Prepare annual summary for city council about wellhead protection actions during the year. (F1)	WHP Manager/Team
	Prepare an assessment of WHP Plan implementation efforts. (F2)	WHP Manager/Team
2018	Update the city's webpage regarding wellhead protection activities. (A4)	WHP Manager
	Inventory newly constructed wells within two miles of DWSMA. (B1)	WHP Team
	Review and update the IWMZ inventory. (D1)	WHP Manager/Team
	Maintain isolation distances for new potential contaminant sources in the IWMZ. (D2)	WHP Manager/Team
	Implement WHP measures in IWMZ (D3)	WHP Manager/Team
	Prepare annual summary for city council about wellhead protection actions during the year. (F1)	WHP Manager/Team