



# **WELLHEAD PROTECTION PLAN PART 2**

JUNE 27, 2013

STANTEC FILE 193800408



## **Table of Contents**

---

PUBLIC WATER SUPPLY PROFILE .....	i
DOCUMENTATION LIST .....	ii
EXECUTIVE SUMMARY.....	iii
CHAPTER 1 – DATA ELEMENTS; ASSESSMENT (4720.5200).....	1
CHAPTER 2 – IMPACT OF CHANGES ON PUBLIC WATER SUPPLY WELL (4720.5220) .....	7
CHAPTER 3 – ISSUES, PROBLEMS, AND OPPORTUNITIES (4720.5230).....	12
CHAPTER 4 – WELLHEAD PROTECTION GOALS (4720.5240) .....	16
CHAPTER 5 – OBJECTIVES AND PLANS OF ACTION (4720.5250).....	17
CHAPTER 6 – EVALUATION PROGRAM (4720.5270) .....	22
CHAPTER 7 – ALTERNATIVE WATER SUPPLY, CONTINGENCY STRATEGY (4720.5280) .....	23

### **LIST OF TABLES**

TABLE 1 – WATER SUPPLY WELL INFORMATION, CITY OF MAPLE PLAIN.....	4
TABLE 2 – WELL INVENTORY, CITY OF MAPLE PLAIN WELLHEAD PROTECTION PLAN.....	6

### **LIST OF FIGURES**

FIGURE 1 –WHPA AND DWSMA .....	2
FIGURE 2 – WELLS IN DWSMA .....	3
FIGURE 3 – CITY OF MAPLE PLAIN LAND USE .....	8
FIGURE 4 – CITY OF MAPLE PLAIN 2030 LAND USE.....	9

### **LIST OF APPENDICES**

APPENDIX A	PART 1 WELLHEAD PROTECTION PLAN
APPENDIX B	WELL LOGS
APPENDIX C	CORRESPONDENCE
APPENDIX D	DOCUMENTATION OF PUBLIC HEARING

## **Public Water Supply Profile**

---

### PUBLIC WATER SUPPLY

NAME: City of Maple Plain PWSID #: 1270021  
ADDRESS: 1620 Maple Avenue, Maple Plain, MN 55359  
TELEPHONE NUMBER: (763) 479–0515  
E–MAIL: publicworks@mapleplain.com FAX #: (763) 479–0519

### WELLHEAD PROTECTION MANAGER

NAME: Brent Mickolich, Public Works  
ADDRESS: 1620 Maple Avenue, Maple Plain, MN 55359  
TELEPHONE NUMBER: (763) 479–0525  
E–MAIL: publicworks@mapleplain.com FAX #: (763) 479–0519

### CONSULTANT/TECHNICAL ASSISTANCE

NAME: Mark Janovec, Stantec  
ADDRESS: 2335 West Highway 36, St. Paul, MN 55113  
TELEPHONE NUMBER: (651) 604–4831  
E–MAIL: mark.janovec@stantec.com FAX #: (651) 636–1311

## **Documentation List**

---

<u>STEP</u>	<u>DATE PERFORMED</u>
Part 1 Approval Notice Received from MDH	September 23, 2011
Scoping 2 Meeting Held (4720.5349, subp. 1)	March 5, 2012
Scoping 2 Decision Notice Received (4720.5340, subp. 2)	April 3, 2012
Remaining Portion of Plan Submitted to Local Units of Government (LGU's) (4720.5350, subp. 1 & 2)	March 13, 2013
Review Received From Local Units of Government (4720.5350, subp. 2)	May 2013
Review Considered (4720.5350, subp. 3)	May 2013
Public Hearing Conducted (4720.5350, subp.4)	June 10, 2013
Remaining Portion WHP Plan Submitted (4720.5360, subp. 1)	June 27, 2013
Approved Review Notice Received	

## **Executive Summary**

---

This portion of the wellhead protection (WHP) plan for the City of Maple Plain includes:

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

Wells covered under this WHP Plan are listed in Table 1 on Page 4.

Part 1 of the wellhead protection plan presented the delineation of the wellhead protection areas (WHPA) and the drinking water supply management areas (DWSMA) and the vulnerability assessments for the system's wells and the aquifer within the DWSMA. Part 1 of the WHP plan was submitted to the Minnesota Department of Health (MDH) and approved on September 23, 2011. The Part 1 plan is included in this report as Appendix A. The boundaries of the WHPA and DWSMA are shown in Figure 1 on Page 2.

The **vulnerability assessment for the aquifer within the DWSMA** was performed using available information and indicates that the aquifer used by the City is not considered to be vulnerable to contamination because it is covered by fine-grained geologic materials that hydraulically separate it from surface water. Consequently, the principle potential sources of contamination to the aquifer are other wells that reach or penetrate it. This information was presented to the WHP team during the Scoping 2 Meeting held with the MDH on March 5, 2012 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** indicates that Well No. 3 is considered non-vulnerable to contamination, based on the well construction information and geologic data recorded at the time the well was drilled.

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 the MDH in the Scoping 2 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 aquifers providing drinking water for this system are most likely to be vulnerable to other wells that penetrate the same aquifer.

Chapter 2 addresses the possible impacts that changes in the physical environment, land use, and water resources have on the public water supply. The City of Maple Plain 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 non-vulnerable status of the aquifer, and the good quality of water currently produced by the system's wells leaves only two major concerns: other wells located within the DWSMA that could become pathways for contamination to enter the aquifer; and 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).

The drinking water protection goals that the City of Maple Plain would like to achieve with this plan are listed in Chapter 4. In essence, the City would like to maintain or improve on the current drinking water quality, increase public awareness of groundwater protection issues, protect the aquifer, and collect data to support future efforts in wellhead protection planning.

The objectives and action plans for managing the potential sources of contamination (wells that penetrate the aquifer utilized by the water system for their drinking water source) 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 Maple Plain will be evaluated every two years.

The existing emergency/contingency plan is referenced to address the possibility that the water supply system is interrupted due to either emergency situations or drought. Chapter 7 references the Water Conservation Plan approved by the DNR and the EPA certified Vulnerability Assessment and Emergency Response Plan.

## **Chapter 1 – Data Elements; Assessment (4720.5200)**

---

### **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 for and is presented in the first part of the WHP Plan. Geologic data presented in the first part of the WHP Plan (attached as Appendix A) are generally sufficient. Geologic data collected during the construction of new wells or through future publicly documented geologic studies will be considered when the Plan is updated.

The main impact of geology on the development of the Part 2 Wellhead Protection Plan pertains to the level of vulnerability assigned to the aquifers from which the City of Maple Plain obtains its water supply. The level of geologic protection over these aquifers was sufficient to classify these aquifers as being “low” in vulnerability. The vulnerability level influences the degree to which the DWSMA should be managed.

3. Soils – 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.

4. Water Resources – 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.

#### **B. Land Use Data Elements**

1. Land Use – A map showing the boundaries of land parcels within the WHPA/DWSMA is included as Figure 1 of this report. Due to the information contained in Part 1, which indicate that the public water supply is not vulnerable to most land use activities, only an inventory of other wells (including shallow disposal wells and large septic systems serving 20 or more people) located within the DWSMA is required. A map showing the locations of wells inventoried within the DWSMA is provided as Figure 2. Well data are provided in Appendix B.



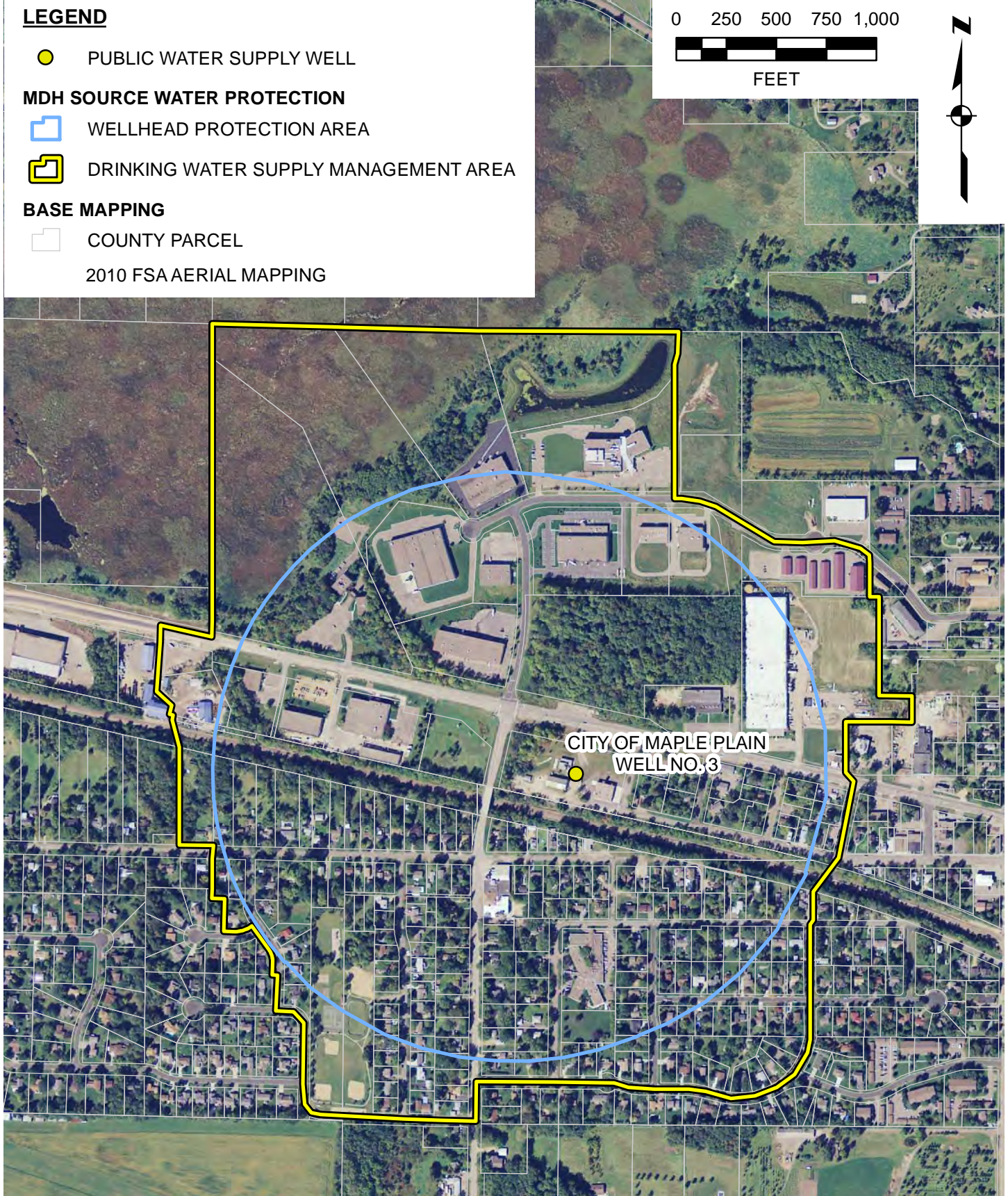


FIGURE 1 - WELLHEAD PROTECTION AREA AND DRINKING WATER SUPPLY MANAGEMENT AREA



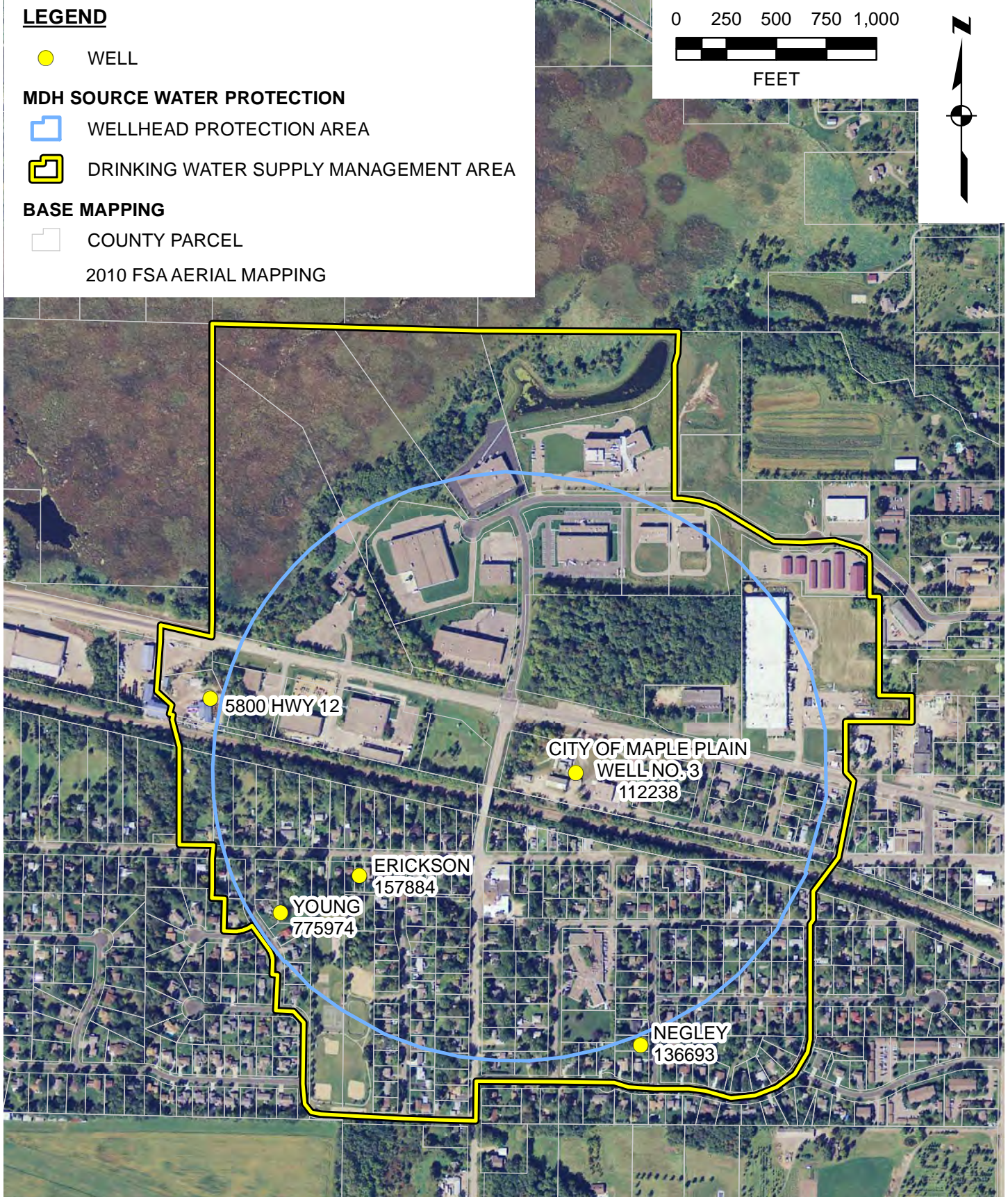


FIGURE 2 - WELLS IN DRINKING WATER SUPPLY MANAGEMENT AREA

CITY OF MAPLE PLAIN  
WELLHEAD PROTECTION PLAN

193800408

DEC 2012



Other information relating to land use such as political boundary maps, a comprehensive land use map and a zoning maps for the area located within the DWSMA were specifically required in the Scoping Decision notice to be included with this plan despite the low vulnerability of the aquifer within the DWSMA (See Chapter 2 for land use maps). This information can be helpful to decision makers during future planning efforts by keeping awareness of WHP and groundwater quality issues in consideration.

2. Public Utility Services – Records of well construction and maintenance apply to this data element. This information was provided in Part 1 of the Plan. The City of Maple Plain's public water supply well covered by this Plan is presented in Table 1.

**Table 1 – Water Supply Well information, City of Maple Plain**

Well Name	Unique Number	Aquifer	Casing Depth	Well Depth	Date Constructed/ Reconstructed	Vulnerability Status
Well No. 3	112238	Mt. Simon	534 ft	580 ft	1978/1994	Not Vulnerable

#### 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 Maple Plain currently is permitted for under the groundwater appropriations program that is administered by the Minnesota Department of Natural Resources (DNR). There are currently are no other high capacity wells within or near the DWSMA for which well interference complaints with the City wells have been documented. At this time, there appears to be sufficient groundwater quantity based upon existing pumping capacity of all wells completed in the aquifer used by the City.

#### 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 – This data element applies to this portion of the Plan for the City of Maple Plain. At present, there is no isotopic data from the existing well to indicate the age of the water being pumped. However, an analysis of the local geology indicates a sufficient thickness of fine-grained geologic deposits between the land surface and the aquifer to suggest that travel time from water infiltrating from the surface is very slow. As

such, there is a low probability that current land use has a direct impact on the quality of drinking water. Additional groundwater quality information should be collected over the ten year life of the plan, including collection of isotopic data to better define the age of the water in the well.

Based on the low vulnerability of the aquifer underlying the DWSMA, it was determined that other wells are the primary potential sources (or pathways) for contaminants that need to be inventoried and managed in this plan. Any observed changes in the general chemistry of the well water may indicate that the aquifer is receiving recharge from different pathways such as improperly constructed or sealed wells or through different geological materials.

## **ASSESSMENT OF DATA ELEMENTS**

### **A. Use of the Well**

General information describing this public water supply system is presented in Part 1 of this Plan (Appendix A).

### **B. Wellhead Protection Area Delineation Criteria**

See Part 1 of this Plan (Appendix A) for documentation regarding how the following delineation criteria were applied to determining the boundaries of the WHPA:

1. Time of Travel – 10 years
2. Flow Boundaries – geologic information
3. Daily Volume – provided by the City
4. Ground Water Flow Field – groundwater models
5. Aquifer Transmissivity – aquifer test plan

### **C. Quality and Quantity of Water Supplying the Public Water Supply Well**

Water quality monitoring results indicate no evidence of contamination from: human origin such as fuel and fuel break down products, pesticides, or commercial fertilizer; or naturally occurring contaminants such as arsenic and boron. At this time problems with water quality are not an issue as the system has enjoyed water quality that meets or exceeds standards in the Federal Safe Drinking Water Act.

**D. The Land and Groundwater Uses in the Drinking Water Management Area**

An inventory of water wells, shallow disposal wells and large septic systems within the DWSMA was compiled. A listing of the wells found in the DWSMA is provided in Table 2. Besides the City of Maple Plain water supply wells, all other wells are domestic use wells. The inventory does not include properly sealed wells and borings. However, it is possible that other unknown or abandoned/unsealed wells exist within the DWSMA.

**Table 2 – Well Inventory, City of Maple Plain Wellhead Protection Plan**

Well Owner	Unique Number	Address	Depth	Aquifer	Well Type	Date Drilled	Status
City of Maple Plain	112238	1645 Pioneer Avenue	580 ft	Mt. Simon	Municipal	1978	Active
Negley	136693	1459 Prairieland Avenue	157 ft	-	Domestic	1977	Active
Erickson	157884	5687 Main Street	114 ft	-	Domestic	1979	Active
Young	775974	1554 Parkview Road	300 ft	-	Irrigation	2010	Active
Unknown	-	5800 Hwy 12	-	-	Domestic	-	Active

No known Class V injections well were identified within the DWSMA. No large septic systems were identified within the DWSMA. The management strategies selected and documented in Chapter 5 of this Plan will focus in on activities that have the most potential to impact the aquifers this public water supply system is using for its drinking water supply.

## **Chapter 2 – Impact of Changes on Public Water Supply Well (4720.5220)**

---

### **CHANGES IDENTIFIED**

#### **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. The geologic conditions that protect the water supply are such that changes in physical environment should have little to no effect on the aquifer within the DWSMA.

#### **B. Land Use**

Existing and future land use was reviewed as prepared for the City of Maple Plain 2030 Comprehensive Plan, finalized in June 2008. Current land use in the DWSMA is illustrated in Figure 3. Future planned land use is shown in Figure 4. No major land use changes are expected based on the existing and future land use in the City comprehensive plan. The northern portion of the DWSMA includes some additional industrial and mixed use growth to fill in currently undeveloped parcels. The southern half of the DWSMA is expected to remain relatively unchanged, as this area is already developed as single family residential. Due to the low vulnerability of the aquifer, land use changes in the DWSMA will likely have little impact on the aquifer unless additional wells are developed or water demand is increased to the point that additional loss in hydraulic head occurs within the aquifer used by the public water supply. Constructing additional wells into the aquifer(s) may increase the points of entry or draw naturally occurring or human caused contaminants towards the PWS wells.

It is not anticipated that new domestic wells will be installed in areas under development or to be developed in the DWSMA. If new wells are installed and constructed according to Minnesota Well Rules, they are not expected to pose a threat to aquifer water quality. Withdrawal rates from domestic wells are not high enough to have a significant impact on the groundwater flow field or the wellhead protection area.

#### **C. Surface Water**

There appears to be no direct 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.



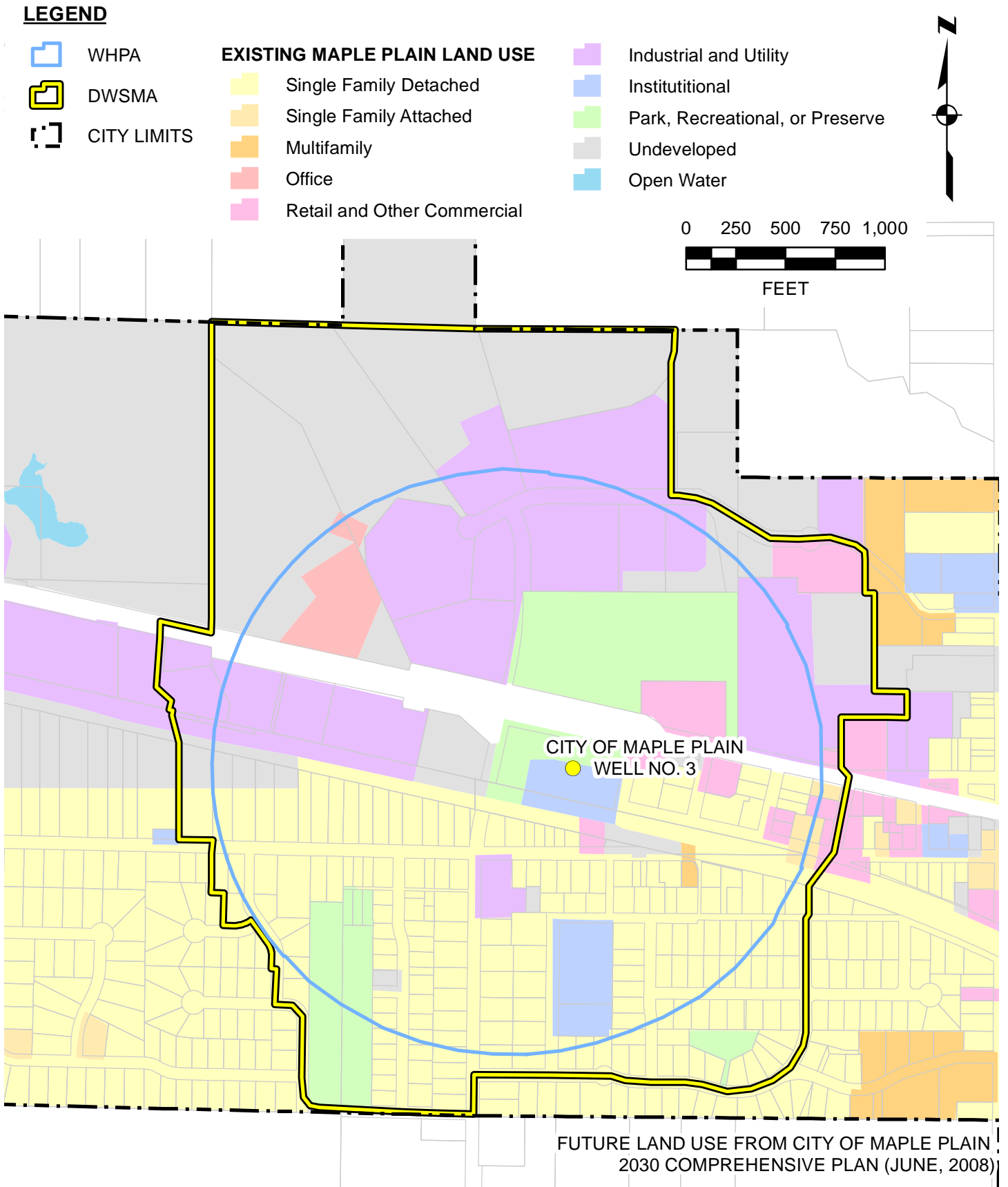


FIGURE 3 - CITY OF MAPLE PLAIN EXISTING LAND USE

## LEGEND



WHPA



DWSMA



CITY LIMITS

## COMPREHENSIVE PLAN LAND USE



LOW DENSITY RESIDENTIAL



MEDIUM DENSITY RESIDENTIAL



HIGH DENSITY RESIDENTIAL



DOWNTOWN MIXED USE



MIXED USE



INDUSTRIAL



OFFICE PARK

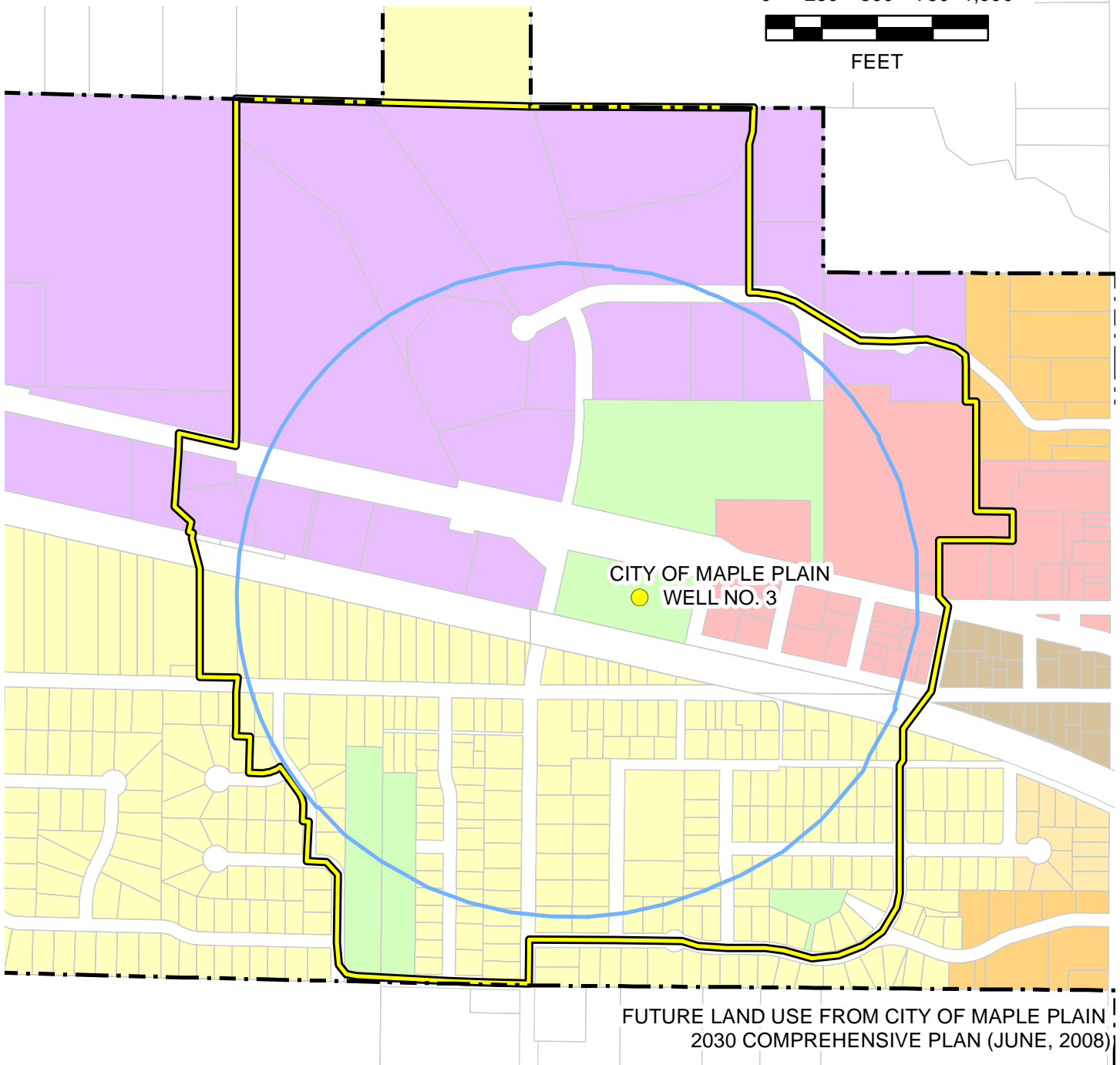


PUBLIC/SEMI PUBLIC

0 250 500 750 1,000



FEET



FUTURE LAND USE FROM CITY OF MAPLE PLAIN  
2030 COMPREHENSIVE PLAN (JUNE, 2008)

FIGURE 4 - CITY OF MAPLE PLAIN FUTURE LAND USE

CITY OF MAPLE PLAIN  
WELLHEAD PROTECTION PLAN

193800408

DEC 2012

#### D. Groundwater

The public water supply system's well has historically provided groundwater of sufficient quality and quantity. Well No. 3 became the primary water source after the City completed a water treatment plant for removal of radium in 2008. Water needs will increase slightly with an estimated 2030 served population of 2,510. The City has developed agreements with neighboring communities to serve certain properties adjacent to the Maple Plain's City limits.

Water use has increased steadily over the years; however there has been a decrease in the last few years due to the loss of a wet commercial/industrial user. Additionally, the City's adoption of the mandated conservation rate structure and other rate increases have led to a decrease in consumption. Maple Plain currently pumps an average of 230,000 gallons each day. Over the past 10 years, the maximum day occurred in 2001, with 0.57 million gallons per day (MGD) being pumped. The projected water demand for 2030 is a daily average of 0.33 MGD with an estimated daily maximum of 0.82 MGD. A single future well is recommended to meet projected 2030 water demands.

Construction of a future well will necessitate an update to the Wellhead Protection Plan before the ten year life of this Plan has expired. A future well near Well No. 3 is anticipated as a near term improvement. Vulnerability of the aquifer for the future well may be higher than the vulnerability of the DWSMA at Well No. 3. As such, updates to the Wellhead Protection Plan may need to inventory and manage more than just groundwater wells.

### IMPACT OF CHANGES

#### A. Expected Changes in Water Use

The addition of new wells automatically places a water supplier at the top of the wellhead protection scoping list. This Plan will be updated if new wells are scoped in before the ten year life of this Plan has expired. It is expected that this plan will need to be updated before ten years, as construction of Well No. 4 is in the near term capital improvements plan.

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

Recognizing that the State Well Code has sole authority in permitting wells, the City of Maple Plain and Hennepin County have existing land use ordinances that could be revised in the future to address new private wells within the DWSMA. However, there is no discussion, or intention at this time of requiring additional regulation related to managing wells within the City's DWSMA. Hennepin County Environmental Services will assist with addressing additional unused/unsealed wells as they are identified.

The US EPA sets requirements regarding Class V injection wells, which include shallow disposal wells. Federal rules regarding injection wells are contained in CFR–40, Part 144. Shallow waste disposal systems (dry well, cesspool, septic system, French drain, etc.) that receive or have received fluids from vehicular repair or maintenance activities are banned in approved Drinking Water Supply Management Areas. US EPA may allow owners and operators to seek a waiver from the ban and obtain a permit, however. Although a federal ban on large capacity cesspools will also go into effect, these have not been permitted in Minnesota for many years. No significant changes in Class V injection well regulations or programs are anticipated at this time.

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

The City of Maple Plain has supported wellhead protection efforts. A budget will be established to implement tasks identified in this plan.

Hennepin County Environmental Services provides funding to help achieve the goals set forth in this Plan through their well sealing cost share grant program, and MDH provides assistance with determining the correct measures for sealing unused wells, constructing new wells, and requiring the sealing of unused wells if this becomes necessary.

The Wellhead Protection Manager will be responsible for implementation of wellhead protection plans of action and regular evaluations of the implementation of this Plan.

## **Chapter 3 – Issues, Problems, and Opportunities (4720.5230)**

---

### **LAND USE ISSUES, PROBLEMS, AND OPPORTUNITIES**

#### **A. Aquifer**

The non-vulnerable aquifer, identified as the sources of the City's water supply, should be relatively unaffected by land use activities with the exception of other wells that penetrate the same aquifers.

#### **B. Well Water**

The wellhead protection plan is primarily concerned with other water supply wells located within the DWSMA. The potential contaminant source inventory performed by the Wellhead Protection Team shows the inventoried wells in Table 2. Some of these wells may extend into the aquifers that supply the City with its water. These wells, if maintained improperly, 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 or near the DWSMA may have an impact on groundwater availability to all users, increased risk that contamination may enter the part of the aquifer used by the community water supply wells, or the delineation of the wellhead protection areas.

#### **C. Drinking Water Supply Management Area**

The principal concern is to ensure that consistent and long term management of water wells, environmental bore holes, and observation wells occur within the DWSMA. The entire DWSMA is located within the corporate limits of Maple Plain, making management of the affected areas somewhat easier in this regard.

Changes in land use that increase pumping of the aquifer used by the City's well will need to be assessed for possible impacts on water availability and quality. Since the majority of the increased pumping will likely be to supply future well fields within the City, Maple Plain has some flexibility to manage impacts of the increased pumping.

Finally, the City has no regulatory authority over water appropriations and must rely on the State of Minnesota to address issues and concerns related to pumping. The opportunity exists to develop a management plan with input from local units of government and state agencies.



**OTHER PROBLEMS AND OPPORTUNITIES****A. Problems and Opportunities Disclosed at Public Meetings and in Written Comments**

At the beginning of the planning process other Local Units of Government (LUGs) were identified and informed that the City was beginning the wellhead protection planning process. Each unit of government was also sent a copy of the City's delineated WHPA and DWSMA and vulnerability assessment for the wells and DWSMA. Also, LUGs were given a copy of the draft Part 2 plan for a 60 day review period that ran from March 2013 to May 2013. No comments were received from local units of government during this period.

The general public was also given opportunities to participate in the planning process and to comment at the Public Informational Meeting and at a Public Hearing held on June 10, 2013 (see Appendix D). No comments were received from the general public during the public hearing.

**B. Data Elements**

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 City's WHPA and DWSMA and to determine the vulnerability of the aquifer to possible contamination, come from 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.

The direction of groundwater flow was evaluated to address concerns that the current amount of subsurface information does not permit an unquestioned determination of local groundwater flow conditions toward the City water supply wells. As a result, delineation of the WHPA represents a composite of capture zones generated by varying aquifer properties as approved by the Minnesota Department of Health.

The City plans to utilize public education opportunities, both existing and proposed, to address potential contamination of the aquifer by other wells. Additionally, the City will work in cooperation with Hennepin County Environmental Services to utilize the well sealing cost share program currently available. The City will set high priority on well sealing for existing wells that are unused or not properly maintained.

The City will work with MDH to identify proposed wells that may present these additional concerns, ensure these wells are properly constructed, and identify water use and

conservation requirements that the DNR may specify with the groundwater appropriations permit.

The City plans to continue to focus its data collection efforts on the following activities throughout the 10 year life of this plan:

1. The City will work with MDH to identify new wells that are constructed within the DWSMA and to verify their locations.
2. The City will inform MDH when any of the City wells are repaired so that information regarding well construction, static water level, and pumping capacity can be verified or updated.
3. The City will collect water samples on a biennial basis from each well and analyze the well water for total anions and cations. The results of this monitoring will be used to determine trends in natural water quality.
4. The City and MDH will inform each other of additional high capacity wells that are to be constructed within the DWSMA or within a mile of its boundary. MDH will determine with the DNR whether the applicant for a water appropriations permit needs to conduct an aquifer test to evaluate the long term pumping impacts on the City water supply wells.
5. Inform MDH of any wells that are to be properly sealed within the DWSMA so that the Minnesota Geological Survey can be notified and determine whether it can run a borehole geophysical survey of the well.
6. Inform MDH if the City is considering the construction of a new water supply well so that MDH can determine whether any potential sites for the new well present concerns over well interference or the movement of existing contamination plumes toward existing City or private water supply wells.

#### C. Status and Adequacy of Official Controls, Plans, and Other Local, State, and Federal Programs on Water Use and Land Use

There are many tools available to the City and other 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, Hennepin County, the DNR and the City of Maple Plain 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
- Class V injection wells (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. These include public education, adoption of best management practices for well maintenance and water conservation, and good communication with other landowners within the DWSMA.

Hennepin County Environmental Services has been contacted to determine the availability of cost share funds to assist with the sealing of identified unused/unsealed wells within the DWSMA.

## **Chapter 4 – Wellhead Protection Goals (4720.5240)**

---

The public water supply is located deep underground and is classified as non-vulnerable based on the geologic characteristics in the area that tend to confine the aquifer and protect it from contamination resulting from land use activities. Consequently, this WHP Plan will focus on addressing the placement and usage of other wells that may be used for domestic, public or commercial purposes. The overall goal is to prevent contamination of the aquifer and 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 that through the implementation of this WHP Plan to continue supplying safe, potable water for its customers into the future.

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

1. Maintain or improve the current level of water quality which meets or exceeds all state and federal standards.
2. Educate public officials, landowners, and the general public about the importance of wellhead protection to protect the public drinking water supply.
3. Assess the impact on the City's aquifers from existing and planned wells within the DWSMA.
4. Address priority action regarding identification and inventory of wells within the DWSMA.
5. Maintain an active, community wide, water conservation program.

## **Chapter 5 – Objectives and Plans of Action (4720.5250)**

---

### **ESTABLISHING PRIORITIES**

The aquifers supplying the system's drinking water supply have been identified as non-vulnerable to contamination from typical land use activities, with the exception of other wells that penetrate the confining layers to reach into the aquifer(s). 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
- Administrative, legal, technical, and financial resources needed

The Wellhead Protection Planning Team would like to concentrate management efforts on the following factors to create awareness of groundwater protection and help prevent future contamination of the aquifer:

- A. Manage wells
- B. Inform the public about groundwater issues
- C. Collect additional data relating to local groundwater issues
- D. Conserve water



**A. WELL MANAGEMENT**

**Objective A1 – Identify and seal abandoned/unused wells and automotive disposal wells located within the DWSMA.**

**WHP Measure A1–1:** Provide MDH with a list of abandoned and unsealed well locations as City staff discover them

Source of Action: City of Maple Plain staff, Wellhead Protection Manager  
Cooperators: MDH, Carver County, neighboring communities  
Time Frame: Ongoing, as wells are discovered  
Estimated Cost: City staff time  
Goal achieved: Abandoned and unsealed wells will be registered with the regulating authority.

**WHP Measure A1–2:** Work with the Hennepin County Environmental Services and MDH to encourage sealing of abandoned/unused wells through the County well sealing cost share program and MDH source water protection grants.

Source of Action: City of Maple Plain staff  
Cooperators: Hennepin County, MDH, property owners  
Time Frame: Ongoing  
Estimated Cost: City staff time, existing County program funds  
Goal achieved: Providing cost share funds will help encourage property owners to seal abandoned/unused wells.

**WHP Measure A1–3:** Provide a list of automotive disposal wells (and other Class V wells) to MDH as City staff discovers them and inform property owners of their reporting responsibilities.

Source of Action: City of Maple Plain staff  
Cooperators: MDH, U.S. EPA  
Time Frame: Ongoing, as wells are discovered  
Estimated Cost: City staff time  
Goal achieved: Cooperate with MDH and EPA to develop means to reduce impacts to groundwater of shallow disposal wells.

**Objective A2 – Educate the public about wells and well management.**

**WHP Measure A2–1:** Use existing programs (City newsletter, flyers, and/or direct mailings) to educate property owners about well management techniques.

Source of Action: City of Maple Plain staff, Wellhead Protection Manager  
Cooperators: MDH  
Time Frame: Annually  
Estimated Cost: City staff time  
Goal achieved: Well owners learn about well maintenance. Informed well owners may be more likely maintain their wells and seal abandoned wells.

**Objective A3 – Manage the 200 foot radius Inner Wellhead Management Zones to prevent contaminants from entering the area immediately surrounding the wells.**

**WHP Measure A3–1:** Continue to monitor setbacks for all new potential sources of contamination located within the IWMZ.

Source of Action: City Staff  
Cooperators: MDH  
Time Frame: Annually  
Estimated Cost: Staff time  
Goal Achieved: New regulated activities will meet the required setbacks.

**B. PUBLIC EDUCATION**

**Objective B1 – Educate the public about wellhead protection management.**

**WHP Measure B1–1:** Use existing programs (newsletters, flyers, website, and postings) to inform the public about wellhead protection management techniques.

Source of Action: City of Maple Plain staff  
Cooperators: MDH  
Time Frame: Annually  
Estimated Cost: City staff time  
Goal achieved: The general public and property owners become better informed about wellhead protection and groundwater principles. Coverage will extend beyond the DWSMA to encompass areas that may be part of future updates to the wellhead protection delineations.

## **C. DATA COLLECTION**

**Objective C1 – Evaluate the water quality monitoring strategy and results to ensure consistency with federal and state requirements yet also take into account local conditions.**

**WHP Measure C1–1:** Maintain water quality sampling requirements mandated by MDH and analyze trends in water chemistry, looking for any possible degradation of water quality in the City's wells.

Source of Action: City of Maple Plain staff  
Cooperators: MDH  
Time Frame: Ongoing  
Estimated Cost: City staff time  
Goal achieved: Identify changes or trends in water chemistry.

**Objective C2 – Maintain up to date information about wells and potential contaminant sources within the DWSMA.**

**WHP Measure C2–1:** In cooperation with state and/or local programs, create and maintain a database of wells and shallow disposal wells within the DWSMA.

Source of Action: City of Maple Plain staff  
Cooperators: MDH, U. S. EPA, City's engineering and environmental consultant  
Time Frame: Revise every two years  
Estimated Cost: City staff time  
Goal achieved: Water wells and Class V shallow disposal wells along with parcel identification numbers will be in the database, which enables the City to determine which property owners to target with any particular WHP educational materials.

**WHP Measure C2–2:** Conduct a written survey of property owners in and near the DWSMA to inquire whether a well is located on their property and, if so, the status of the well(s). Record whether or not each property owner responds.

Source of Action: City of Maple Plain staff  
Cooperators: Property owners  
Time Frame: Within two years of adoption of this Plan.  
Estimated Cost: City staff time, copying and postage costs.  
Goal achieved: The survey results will provide more accurate information about the number and status of wells in the DWSMA.

**WHP Measure C2–3:** Request that MDH inform the City of any proposed high capacity wells and request that DNR inform the City of any changes in appropriations to existing wells that may impact the capture zones for the City of Maple Plain’s public supply wells.

Source of Action: City of Maple Plain staff  
Cooperators: MDH, DNR  
Time Frame: Within one year of adoption of this Plan  
Estimated Cost: City staff time  
Goal achieved: The City will be informed when a significant change in water appropriations occurs that may alter the groundwater flow field and/or water availability near the DWSMA.

**WHP Measure C2–4:** Request assistance from the MDH to conduct age dating isotope testing on the City’s existing well. If another City well has been constructed by the time testing occurs, request that well also be considered for testing.

Source of Action: City of Maple Plain staff  
Cooperators: MDH  
Time Frame: Within one year of adoption of this Plan  
Estimated Cost: City staff time  
Goal achieved: The City and MDH will have isotope data necessary to determine the relative age of groundwater in the aquifer(s). This information will be needed for updates to the Part 1 Wellhead Protection Plan.

## **D. WATER CONSERVATION**

### **Objective D1 – Maintain an active, community wide water conservation program.**

**WHP Measure D1–1:** Implement long term and short term (as needed) conservation measures included in the Water Supply Plan.

Source of Action: City of Maple Plain  
Time Frame: Already implemented  
Estimated Cost: No additional costs  
Goal achieved: The City has a plan to reduce rate of growth in water demand.

## **Chapter 6 – Evaluation Program (4720.5270)**

---

The success of the wellhead protection source management program must be evaluated in order to determine whether the plan is actually accomplishing what the City of Maple Plain 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
  - Determine the adequacy of financial resources and staff availability to carry out the management strategies planned
1. The City will continue to cooperate with the Minnesota Department of Health 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 that must be addressed.
  2. The Wellhead Protection Manager will make a written report every two years to the MDH regarding progress in implementing the wellhead protection management objectives of this Plan. The reports will be compiled and used to review the overall progress in implementing source management strategies when the City's wellhead protection plan is updated in 10 years (or as the MDH mandates updates due to new well construction). A copy of the reports will be sent to the Minnesota Department of Health Source Water Protection Unit in St. Paul, MN and another copy will be placed in the City's Wellhead Protection file.



## **Chapter 7 – Alternative Water Supply, Contingency Strategy (4720.5280)**

---

The City of Maple Plain Water Emergency and Conservation Plan was submitted in 2007 to the MN DNR Division of Waters Appropriation Permit Program and the Metropolitan Council and approval was received in 2009. Notice of approval of this plan is provided in Appendix C. This approved plan contains the required elements of the MN Wellhead Protection Rule and is accepted as an equivalent to an Alternative Water Supply/Contingency Plan as defined in 4720.5280. Implementation of the Plan has begun with the aid and assistance of local emergency management agencies. A copy of the Plan is available for review at by contacting the Wellhead Protection Manager (Contact information is provided on page i).

The Water Emergency and Conservation Plan includes the following sections: water supply system description and evaluation, emergency response procedures, water conservation planning, and Metropolitan Land Use Planning. Updates to the Water Emergency and Conservation Plan, when they occur, will be incorporated into this WHP if required.

**Stantec**

**CITY OF MAPLE PLAIN**

**WELLHEAD PROTECTION PLAN – PART 2**

June 2013

## **Appendix A Part 1 Wellhead Protection Plan**

---

# **Wellhead Protection Plan**

## **Part I**

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

**Prepared for**

**The City of Maple Plain**

**March 2011**



Amal M. Djerrari, P.E., Hydrologist  
Minnesota Department of Health

## Table of Contents

	Page
Glossary of Terms.....	i
Acronyms.....	ii
1 Introduction.....	1
2 Assessment of the Data Elements.....	1
3 General Descriptions .....	3
3.1 Description of the Water Supply System.....	3
3.2 Description of the Hydrogeologic Setting .....	3
4 Delineation of the Wellhead Protection Area.....	5
4.1 Delineation Criteria .....	5
4.2 Method Used to Delineate the Wellhead Protection Area.....	7
4.3 Results of Model Calibration and Sensitivity Analysis.....	8
4.4 Addressing Model Uncertainty.....	9
5 Delineation of the Drinking Water Supply Management Area .....	10
6 Vulnerability Assessments.....	10
6.1 Assessment of Well Vulnerability .....	10
6.2 Assessment of Drinking Water Supply Management Area Vulnerability.....	10
7 Selected References .....	11

### List of Tables

Table 1: Assessment of Data Elements.....	1
Table 2: Water Supply Well Information .....	4
Table 3: Description of the Hydrogeologic Setting at Maple Plain Well 3 (112238) .....	4
Table 4: Description of WHPA Delineation Criteria.....	5
Table 5: Annual Volume of Water Discharged from Water Supply Wells .....	6

## Table of Contents - Continued

List of Figures	Page
Figure 1: Drinking Water Supply Management Area .....	13
Figure 2a: Modeled Groundwater Flow Field and Spatial Distribution of Modeling Errors - Franconia-Ironton-Galesville Aquifer .....	14
Figure 2b: Modeled Ambient Groundwater Flow Field - Mt. Simon Aquifer.....	15
Figure 3: Geologic Cross-Sections Locations .....	16
Figure 4a: Geologic Cross-Section A–A' .....	17
Figure 4b: Geologic Cross-Section B–B' .....	18
Figure 5: Refined Model Calibration Statistics - FIG Aquifer.....	19

## Glossary of Terms

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

**Drinking Water Supply Management Area (DWSMA).** The area delineated using identifiable land marks that reflects the scientifically calculated wellhead protection area boundaries as closely as possible (Minnesota Rules, part 4720.5100, subpart 13).

**Drinking Water Supply Management Area Vulnerability.** An assessment of the likelihood that the aquifer within the DWSMA is subject to impact from land and water uses within the wellhead protection area. It is based upon criteria that are specified under Minnesota Rules, part 4720.5210, subpart 3.

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

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

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

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

**Well Vulnerability.** An assessment of the likelihood that a well is at risk to human-caused contamination, either due to its construction or indicated by criteria that are specified under Minnesota Rules, part 4720.5550, subpart 2.



## **Acronyms**

**CWI** - County Well Index

**DNR** - Minnesota Department of Natural Resources

**EPA** - United States Environmental Protection Agency

**FSA** - Farm Security Administration

**MDA** - Minnesota Department of Agriculture

**MDH** - Minnesota Department of Health

**MGS** - Minnesota Geological Survey

**MnDOT** - Minnesota Department of Transportation

**MnGEO** - Minnesota Geospatial Information Office

**MPCA** - Minnesota Pollution Control Agency

**NRCS** - Natural Resource Conservation Service

**SWCD** - Soil and Water Conservation District

**UMN** - University of Minnesota

**USDA** - United States Department of Agriculture

**USGS** - United States Geological Survey

## 1. Introduction

The Minnesota Department of Health (MDH) developed Part I of the wellhead protection (WHP) plan at the request of the city of Maple Plain (public water supply identification number 1270021). The work was performed in accordance with the Minnesota Wellhead Protection Rule, parts 4720.5100 to 4720.5590.

This report presents the delineation of the wellhead protection area (WHPA), the drinking water supply management area (DWSMA), and the vulnerability assessments for the public water supply well and DWSMA. Figure 1 shows the boundaries for the WHPA and the DWSMA. The WHPA is defined by a 10-year time of travel. Figure 1 also shows the emergency response area (ERA), which is defined by a 1-year time of travel. An inner wellhead management zone (IWMZ), which is the area within a 200-foot radius around the well, serves as the wellhead protection area for emergency wells and is also displayed on Figure 1. Definitions of rule-specific terms that are used are provided in the “Glossary of Terms.”

This report also documents the technical information that was required to prepare this portion of the WHP plan in accordance with the Minnesota Wellhead Protection Rule. Additional technical information is available from MDH.

The wells included in the WHP plan are listed in Table 2.

## 2. Assessment of the Data Elements

MDH staff met with representatives of the public water supplier on August 17, 2010, for a scoping meeting that identified the data elements required to prepare Part I of the WHP plan. Table 1 presents the assessment of these data elements relative to the present and future implications of planning items that are specified in Minnesota Rules, part 4720.5210.

**Table 1 - Assessment of Data Elements**

Data Element	Present and Future Implications				Data Source
	Use of the Well s	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
<b>Precipitation</b>					
<b>Geology</b>					
Maps and geologic descriptions	M	H	H	H	MGS
Subsurface data	M	H	H	H	MGS, MDH, CWI
Borehole geophysics	M	H	H	H	MGS
Surface geophysics	L	L	L	L	
Maps and soil descriptions					
Eroding lands					

Data Element	Present and Future Implications				Data Source
	Use of the Well s	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Water Resources					
Watershed units					
List of public waters					
Shoreland classifications					
Wetlands map					
Floodplain map					
Land Use					
Parcel boundaries map	L	H	L	L	Metropolitan Council
Political boundaries map	L	L	L	L	
PLS map	L	H	L	L	MDH
Land use map and inventory	M	H	M	M	
Comprehensive land use map	L	L	L	L	
Zoning map	L	L	L	L	
Public Utility Services					
Transportation routes and corridors					
Storm/sanitary sewers and PWS system map					
Oil and gas pipelines map					
Public drainage systems map or list					
Records of well construction, maintenance, and use	H	H	H	H	City, CWI, MDH files
Surface Water Quantity					
Stream flow data					
Ordinary high water mark data					
Permitted withdrawals					
Protected levels/flows					
Water use conflicts					
Groundwater Quantity					
Permitted withdrawals	H	H	H	H	DNR
Groundwater use conflicts	H	H	H	H	Not Applicable
Water levels	H	H	H	H	DNR, MDH, City
Surface Water Quality					
Stream and lake water quality management classification					
Monitoring data summary					

Data Element	Present and Future Implications				Data Source
	Use of the Well s	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Groundwater Quality					
Monitoring data	H	H	H	H	MDH
Isotopic data	H	H	H	H	MDH, UMN
Tracer studies	H	H	H	H	Not Available
Contamination site data	M	M	M	M	
Property audit data from contamination sites					
MPCA and MDA spills/release reports					

#### Definitions Used for Assessing Data Elements:

- High (H)** - the data element has a direct impact
- Moderate (M)** - the data element has an indirect or marginal impact
- Low (L)** - the data element has little if any impact
- Shaded** - the data element was not required by MDH for preparing the WHP plan

### 3. General Descriptions

#### 3.1 Description of the Water Supply System

The city of Maple Plain obtains its drinking water supply from one primary well and two emergency wells (Table 2). Information about the primary well is used to define the ERA, WHPA, and DWSMA.

#### 3.2 Description of the Hydrogeologic Setting

The description of the hydrologic setting for the aquifer that is used to supply drinking water is presented in Table 3.

Figures 3, 4a and 4b show the distribution of the aquifer and its stratigraphic relationships with adjacent geologic materials. They were prepared using well record data that is contained in the County Well Index (CWI) database. The geological maps and studies that were used to further define local hydrogeologic conditions are provided in the “Selected References” section of this report.

**Table 2 - Water Supply Well Information**

Local Well Name	Unique Number	Use/Status	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Well Vulnerability	Aquifer	
Well 1	207090	Emergency	10	238	418	1939	Not Vulnerable	Bedrock	Franconia-Iron-Galesville
Well 2	207407	Emergency	16	241	435	1959	Not Vulnerable	Glacial Deposits	Franconia-Iron-Galesville
Well 3	112238	Primary <sup>1</sup>	18	534	580	1978/1994	Not Vulnerable	Bedrock	Mt. Simon

<sup>1</sup> Well 3 is the primary well since February 20, 2009; after the construction of the new treatment plant in December 2008.

**Table 3 - Description of the Hydrogeologic Setting at Maple Plain Well 3 (112238)**

Aquifer	Attribute	Descriptor	Data Source
Mt. Simon Sandstone (CMTS)	Aquifer Material	Sandstone	Well Logs
	Primary Porosity	0.20	Metro Council (2009)
	Aquifer Thickness (ft)	122	Estimated from Hilltop Elementary School Well Log (207002)
	Stratigraphic Top Elevation	527	Well Logs
	Stratigraphic Bottom Elevation	405	Well Logs and Estimated Thickness of Aquifer
	Hydraulic Confinement	Confined	Well Logs
	Transmissivity (T)	774 ft <sup>2</sup> /day	The aquifer test plan was approved on September 13, 2010, and T was determined from a specific capacity test at Well 3 (112238).
	Hydraulic Conductivity	6.3 ft/day	The value was obtained from the reference transmissivity value and the estimated aquifer thickness at Well 3 (112238).
	Groundwater Flow Field	Flow to the southeast. Hydraulic Gradient: $8.0 \times 10^{-3}$ feet/ft	Hennepin County Atlas

## 4. Delineation of the Wellhead Protection Area

### 4.1 Delineation Criteria

The boundaries of the WHPA for the public water supplier are shown in Figure 1. Table 4 describes how the delineation criteria that are specified under Minnesota Rules, part 4720.5510, were addressed.

**Table 4 - Description of WHPA Delineation Criteria**

<b>Criterion</b>	<b>Descriptor</b>	<b>How the Criterion was Addressed</b>
Flow Boundary	Mississippi, Minnesota, and Crow Rivers	The rivers provide boundary conditions to the original regional model that extends to these natural boundaries. They were included in the original regional model and set the regional groundwater flow (See Section 4.2).
Flow Boundary	Other High-Capacity Wells	There are no other high-capacity wells within two miles that pump in the same aquifer as the public water supplier and that may have an impact on the public water supplier's well capture zone. Other high-capacity wells, located further away, were included in the regional model.
Daily Volume of Water Pumped	See Table 5	Pumping information was obtained from the Minnesota Department of Natural Resources Appropriations Permit 1977-6403. The annual pumped volumes were converted to a daily volume pumped by a well.
Groundwater Flow Field	See Figure 2	The model calibration process addressed the relationship between the calculated versus observed groundwater flow field.
Aquifer Transmissivity	See Table 3	The aquifer test plan was approved on September 13, 2010. The transmissivity was determined from a specific capacity test at Well 3 (112238). Uncertainty regarding aquifer transmissivity values was addressed using a range in transmissivity values to reflect changes in aquifer composition and thickness as well as uncertainties related to the quality of existing aquifer test data, as described in Section 4.3.
Time of Travel	10 years	The public water supplier selected a 10 year time of travel.

Information provided by the public water supplier was used to identify the maximum volume of water pumped annually by each well over the previous five-year period, as shown in Table 5. Previous pumping values have been reported to the DNR, as required by the city's Groundwater Appropriation Permit No. 1977-6403. The estimated future pumping amounts for the next five years are also shown. The maximum daily volume of discharge used as an input parameter in the model was calculated by dividing the greatest annual pumping volume by 365 days.



**Table 5 - Annual Volume of Water Discharged from Water Supply Wells**

Well Name	Unique Number	Use Status	Total Annual Withdrawal <sup>1</sup> (gal/yr)					Projected 2014 Withdrawal (gal/yr)	Withdrawal Used in WHPA (gal/yr)
			2005	2006	2007	2008	2009 <sup>2</sup>		
1	207090	Emergency	668,500	337,800	821,600	<b>1,778,000</b>	771,400	0	0
2	207407	Emergency	<b>87,894,300</b>	80,172,300	83,835,000	68,454,700	39,200	0	0
3	112238	Primary	7,854,000	1,866,700	153,200	3,415,400	<b>69,045,500</b>	96,416,800	96,416,800
4	Proposed	Not Applicable						30,000,000 <sup>2</sup>	
<b>Totals</b>			<b>96,416,800</b>	82,376,800	84,809,800	73,648,100	69,856,100	126,416,800 <sup>3</sup>	96,416,800

<sup>1</sup>Bolding indicates greatest annual pumping volume. Source: The DNR State Water Use Database System Permit No. 1977-6403.

<sup>2</sup>Data provided by the city.

<sup>3</sup>Used in future Scenario Analysis.

## 4.2 Method Used to Delineate the Wellhead Protection Area

The WHPA for the city of Maple Plain was determined using an existing regional MODFLOW Model that was developed by Barr Engineering Company for the Metropolitan Council (Metro Council, 2009). MODFLOW is a 3D, cell-centered, finite difference, saturated flow model developed by the U.S. Geological Survey (McDonald and Harbaugh, 1988; Harbaugh et al., 2000).

The regional Metro Model consists of nine layers that represent the major aquifers and aquitards within the seven-county metropolitan area. These layers represent, from top to bottom, the following units: (1) surficial aquifer of glacial deposits; (2) St. Peter Sandstone or Quaternary Buried Artesian Aquifer; (3) Prairie du Chien Group; (4) Jordan Sandstone; (5) St. Lawrence Formation (aquitard); (6) Franconia Formation; (7) Ironton-Galesville Aquifer, (8) Eau Claire Formation (aquitard); and (9) Mt. Simon Sandstone. The regional groundwater model was calibrated to steady-state water levels and river base flows.

A regional model was constructed to model flow in the lower four aquifers/aquitard: (1) Franconia Formation; (2) Ironton-Galesville Sandstones, (3) Eau Claire Formation (aquitard); and (4) Mt. Simon Sandstone Aquifer. This model was constructed in a two-step procedure:

- First, a nine-layer regional model limited to Hennepin and Carver Counties was extracted from the regional seven-county model. This model extends to the natural hydraulic boundaries, the Mississippi River to the north and east, the Minnesota River to the south, and the Crow River to the northwest. These river boundaries, along with wells, lakes, and infiltration, provided the model boundary conditions.
- Second, a four-layer Hennepin/Carver regional model was constructed. This four-layer model has the same extent as the nine-layer Hennepin/Carver model. Hydraulic heads, extracted from the Hennepin/Carver model were applied to head-specified cells located along the edge of the model. Leakage to and from the bottom of the St. Lawrence Formation was extracted from the nine-layer Hennepin/Carver model, and applied as recharge on top of the Franconia Formation in the Hennepin/Carver four-layer regional model.

The model grid was also refined around the city of Maple Plain wells. Variable grid spacing was used, ranging from 1 meter near the city of Maple Plain wells to 250 meters at the edge of the grid. This refinement was required for an accurate computation of the particles flow paths for determining the WHPA delineation.

Prior to their use in the delineations, the following modifications were incorporated in the refined models:

- A local area of modified horizontal conductivity was included in the model to reflect the transmissivity in Table 3.
- The pumping rates from Table 5 were assigned to the city of Maple Plain wells.

The delineation was performed by backtracking particles from the wells to a 10-year time of travel using the particle tracking MODPATH Code. A series of 50 particles were launched at each well. A porosity of 20 percent was used for the Franconia Formation, Ironton-Galesville Sandstones, and Mt. Simon Sandstone. A porosity of 40 percent was used for the Eau Claire confining unit.

The resulting WHPA boundaries (Figure 1) are a composite of the 10-year capture zones calculated using this model for the base-case parameters and the parameter values used in the sensitivity and the future scenario analysis, and discussed in the following section. The input files for all model runs are available upon request at MDH.

### 4.3 Results of Model Calibration and Sensitivity Analysis

**Model calibration** is a procedure that compares the results of a model based on estimated input values to measured or known values. This procedure can be used to define model validity over a range of input values, or it helps determine the level of confidence with which model results may be used. As a matter of practice, groundwater flow models are usually calibrated using water elevation or flux.

The regional Metro Model was calibrated to the CWI database water level targets and stream flow targets by the Metropolitan Council (2009). The calibration of the regional model was performed applying an automated calibration procedure using PEST, a parameter estimation code that automatically adjusts the recharge rates and hydraulic conductivity values and compares modeled piezometric heads against measured values at observation well locations until a satisfactory fit is obtained.

The calibrated regional Metro Model provided the boundary conditions at the head-specified cells at the boundaries of the four-layer Hennepin/Carver refined model. After construction, the refined MODFLOW Model calibration was verified by comparing modeled head results to the static water elevations in wells that were selected from the CWI database. The selected wells were completed in the aquifers used by the city of Maple Plain for which observed data is readily available (i.e., the Franconia-Ironton-Galesville Aquifer). A similar calibration check was not performed for the Mt. Simon Aquifer because of the scarcity of local water level data.

The graph of computed versus observed piezometric heads for wells in the Franconia-Ironton-Galesville Aquifer, along with the calibration statistics, are displayed in Figure 5. The standard deviation of the model prediction error represented less than 10 percent of the total change in measured heads across the model domain, which is within an acceptable range for a calibrated model. The model residuals and the modeled groundwater elevation contour map are depicted in Figures 2a and 2b. No residuals are shown in Figure 2b because of the scarcity of local water level data in the Mt. Simon Aquifer.

**Model sensitivity** is the amount of change in model results caused by the variation of a particular input parameter. The direction and extent of the modeled capture zone may be very sensitive to any of the input parameters:

- The pumping rate directly affects the volume of the aquifer that contributes water to the well. An increase in pumping rate leads to an equivalent increase in the volume of aquifer within the capture zone, proportional to the porosity of the aquifer materials. However, the pumping rate is based on the results presented in Table 5 and, therefore, is not a variable factor that will influence the delineation of the WHPA.
- The direction of groundwater flow determines the orientation of the capture area. Variations in the direction of groundwater flow will not affect the size of the capture zone but are important for defining the areas that are the source of water to the well. The ambient groundwater flow field that is defined in Figure 2b provides the basis for determining the extent to which each model run reflects the conceptual understanding of the orientation of the capture area for a well.

- A hydraulic gradient of zero produces a circular capture zone, centered on the well. As the hydraulic gradient increases, the capture zone changes into an elliptical shape, with the well centered on the down-gradient focal point. The hydraulic gradient was determined by calibrating the model to water level elevations that were taken from wells that have verified locations (Figure 2a). Generally, the accuracy of the hydraulic gradient determination is directly proportional to the amount of available data that describes the distribution of hydraulic head in the aquifer.
- The aquifer thickness, permeability, and porosity influence the size and shape of the capture zone. A decrease in either thickness or porosity causes a linear, proportional increase in the areal extent of the capture zone; whereas permeability defines the relative proportions of the capture zone width to length. A decrease in permeability decreases the length of the capture zone and increases the distance to the stagnation point, making the capture zone more circular in shape and centered on the well.

#### 4.4 Addressing Model Uncertainty

Using computer models to simulate groundwater flow involves representing a complicated natural system in a more simplified manner. Local geologic conditions likely vary within the capture area of the well, but existing information for the area around the city of Maple Plain wells is not sufficiently detailed to define this. In addition, the current capabilities of groundwater flow models may not be sufficient to represent the natural flow system exactly. As a result, the MODFLOW Model cannot represent the natural flow system exactly, but the results are valid within a range defined by the reasonable variation of input parameters for this delineation setting. This is accomplished by performing an uncertainty analysis to evaluate uncertainties in the hydrogeologic data that may affect the size and shape of the capture zone for the well.

The following discussion identifies the model input parameters that have the most significant impacts on the well capture zone analyses direction and extent the modeled capture zone may be sensitive.

- Horizontal hydraulic conductivities could have an impact on the WHPA delineation. In the base case scenario, the transmissivity estimated from the specific capacity test conducted at Well 3 (112238) was used in the local model to delineate the 10 year time of travel capture zones. Because no pump tests were conducted in the Maple Plain Mt. Simon well, the uncertainty of the transmissivity can be great. To evaluate the impact of this uncertainty on the WHPA delineation, the horizontal hydraulic conductivity was increased by a factor of two. Increasing the hydraulic conductivity did not affect the length and shape of the capture zone.
- Pumping rates could have an impact on the WHPA delineation. The city of Maple Plain also plans to add one Franconia-Ironton-Galesville well to their well field, near the existing Mt. Simon Well 3 (112238) well. The city of Maple Plain provided the approximate location, and estimated the projected pumping volume from this well to be 30 millions gallons per year. This well was added to the model and its 10-year capture zone was delineated. Because of its location and its smaller annual pumping rate, its 10-year zone of capture was completely contained by that of Well 3 (112238). Adding this well did not alter the Well 3 (112238) capture zone.

**Addressing Model Uncertainty** - A composite of the results was used to delineate the capture zone for the primary well used by the city of Maple Plain (Figure 1). This provided a conservative approach to addressing model uncertainty and produced a capture zone that will most likely be protective of public health.

## **5. Delineation of the Drinking Water Supply Management Area**

The boundaries of the DWSMA were defined by the public water supplier using the following features (Figure 1):

- Public Land Survey coordinates; and
- Property or fence lines.

## **6. Vulnerability Assessments**

The Part I wellhead protection plan includes the vulnerability assessments for the public water supply wells and DWSMA. These vulnerability assessments are used to help define potential contamination sources within the DWSMA and to select appropriate measures for reducing the risk that they present to the public water supply.

### **6.1 Assessment of Well Vulnerability**

The vulnerability assessment for each well used by the city of Maple Plain is listed in Table 2 and is based upon the following conditions:

- 1) Well construction meets current state Well Code specifications (Minnesota Rules 4725) and the wells themselves do not provide a pathway for contaminants to enter the aquifers used by the public water supplier;
- 2) The geologic conditions at the well sites include a cover of clay-rich geologic materials and/or a thick shale confining unit over the aquifers that is sufficient to retard or prevent the vertical movement of contaminants; and
- 3) Except for nitrate that was detected in all three city of Maple Plain wells at a very low concentration (i.e., less than 0.6 mg/L), concentrations likely representative of naturally occurring nitrate, none of the human-caused contaminants regulated under the federal Safe Drinking Water Act have been detected at levels indicating that any well serves to draw contaminants into the aquifers as a result of pumping.

None of the city of Maple Plain wells are vulnerable.

### **6.2 Assessment of Drinking Water Supply Management Area Vulnerability**

The vulnerability of the DWSMA is very low and is based upon the following information:

- 1) Isotopic and water chemistry data from wells located within the DWSMA indicate that the aquifers contain water that has no detectable levels of tritium.
- 2) Review of the geologic logs contained in the CWI database and geological maps and reports indicate that the aquifers exhibit a low geologic sensitivity throughout the DWSMA and are isolated from the direct vertical recharge of surface water.

## 7. Selected References

Balaban, N.H., (Ed.) (1989), *Geologic atlas of Hennepin County, Minnesota*, County Atlas Series, C-4, Minnesota Geological Survey, St. Paul, Minn., 9 plates, scale 1:100,000 and smaller.

Geologic Sensitivity Project Workgroup (1991), *Criteria and guidelines for assessing geologic sensitivity of ground water resources in Minnesota*, Minnesota Department of Natural Resources, Division of Waters, St. Paul, Minn., 122 p.

Harbaugh, A.W., Banta, E.R., Hill, M.C., and McDonald, M.G. (2000), *MODFLOW-2000, the U.S. Geological Survey modular ground-water model--user guide to modularization concepts and the ground-water flow process*, Open-File Report, 00-92, U.S. Geological Survey, Reston, Va., 121 p.

Kanivetsky, R. (1989), Bedrock hydrogeology, in *Geologic atlas of Hennepin County, Minnesota*, Balaban, N.H., (Ed.), County Atlas Series, C-4, Plate 6, Minnesota Geological Survey, St. Paul, Minn., scale 1:150,000.

McDonald, M.G., and Harbaugh, A.W. (1988), *A modular three-dimensional finite-difference ground-water flow model*, Techniques of Water-Resource Investigation, 06-A1, U.S. Geological Survey, 576 p.

Metro Council (2009), *Twin cities metropolitan area groundwater flow model (metro model)*, <http://www.metrocouncil.org/environment/WaterSupply/metrogroundwatermodel.htm>.

Minnesota Department of Health (2010), Minnesota public land survey system quarter-quarter sections (derived from section corners) [computer file]. St. Paul, Minn.

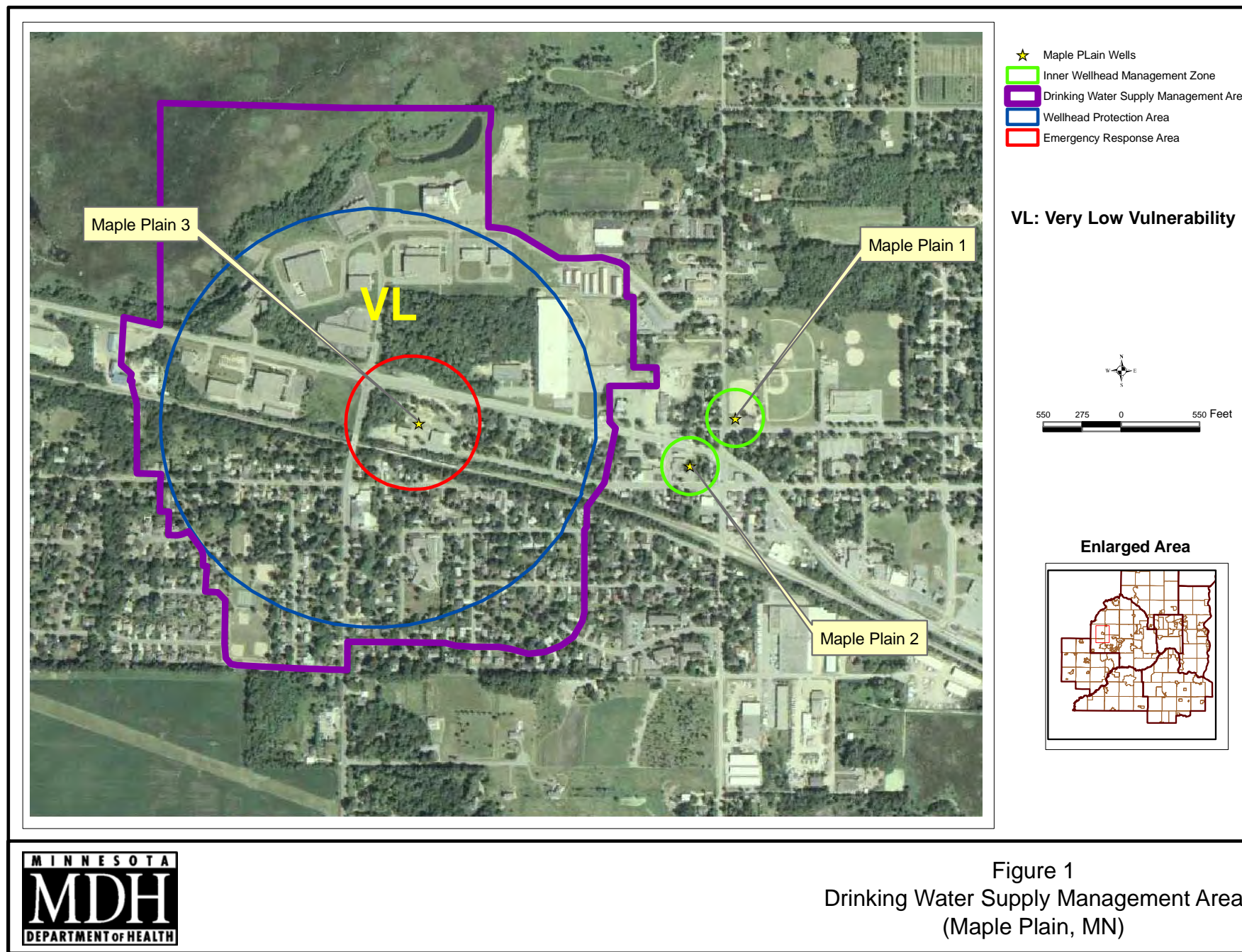
Piegat, J. (1989), Sensitivity of ground-water systems to pollution, in *Geologic atlas of Hennepin County, Minnesota*, Balaban, N.H., (Ed.), County Atlas Series, C-4, Plate 7, Minnesota Geological Survey, St. Paul, Minn., scale 1:100,000.

Runkel, A.C., Tipping, R.G., Alexander, E.C. Jr., Alexander, S.C. (2006), *Hydrostratigraphic characterization of intergranular and secondary porosity in part of the Cambrian sandstone aquifer system of the cratonic interior of North America: improving predictability of hydrogeologic properties*, *Sedimentary Geology*, 184, p. 281-304.

Steffen, K. (2004), *Soil survey of Hennepin County, Minnesota*, Soil Survey, U.S. Department of Agriculture, Soil Conservation Service, Washington, D.C., 1059 p., 64 sheets, scale 1:12,000.



# Figures

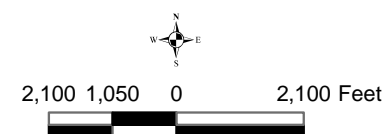








— Modeled Groundwater  
Elevation Contours  
(in feet above MSL)



Enlarged Area

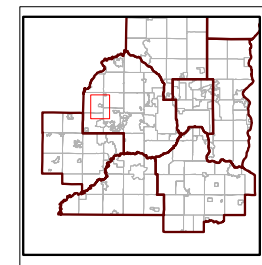
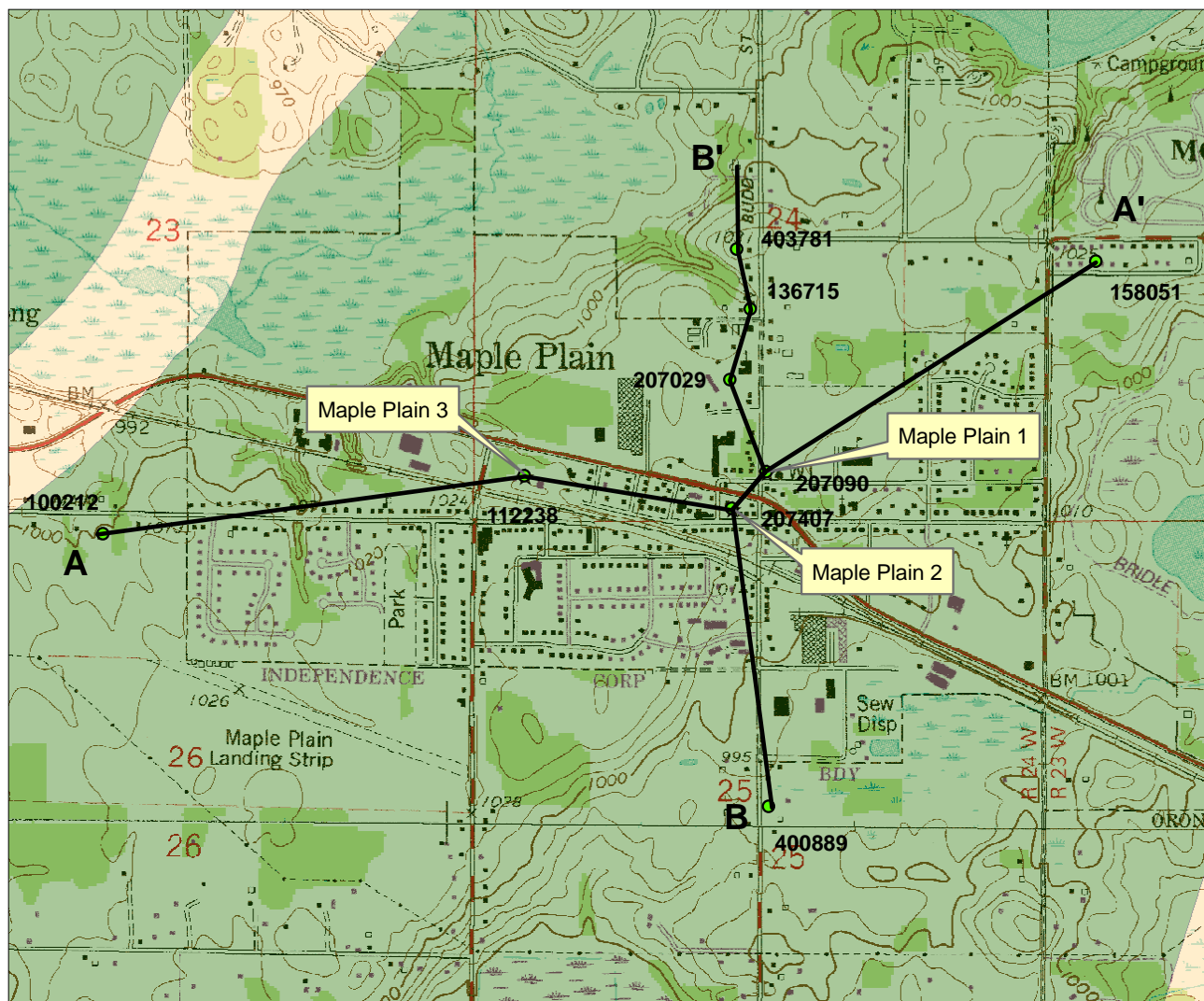


Figure 2b  
Modeled Ambient Groundwater Flow Field  
Mt. Simon Aquifer  
(Maple Plain, MN)





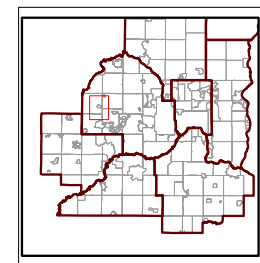
### Bedrock Geology

- St. Lawrence- Franconia
- Ironton - Galesville

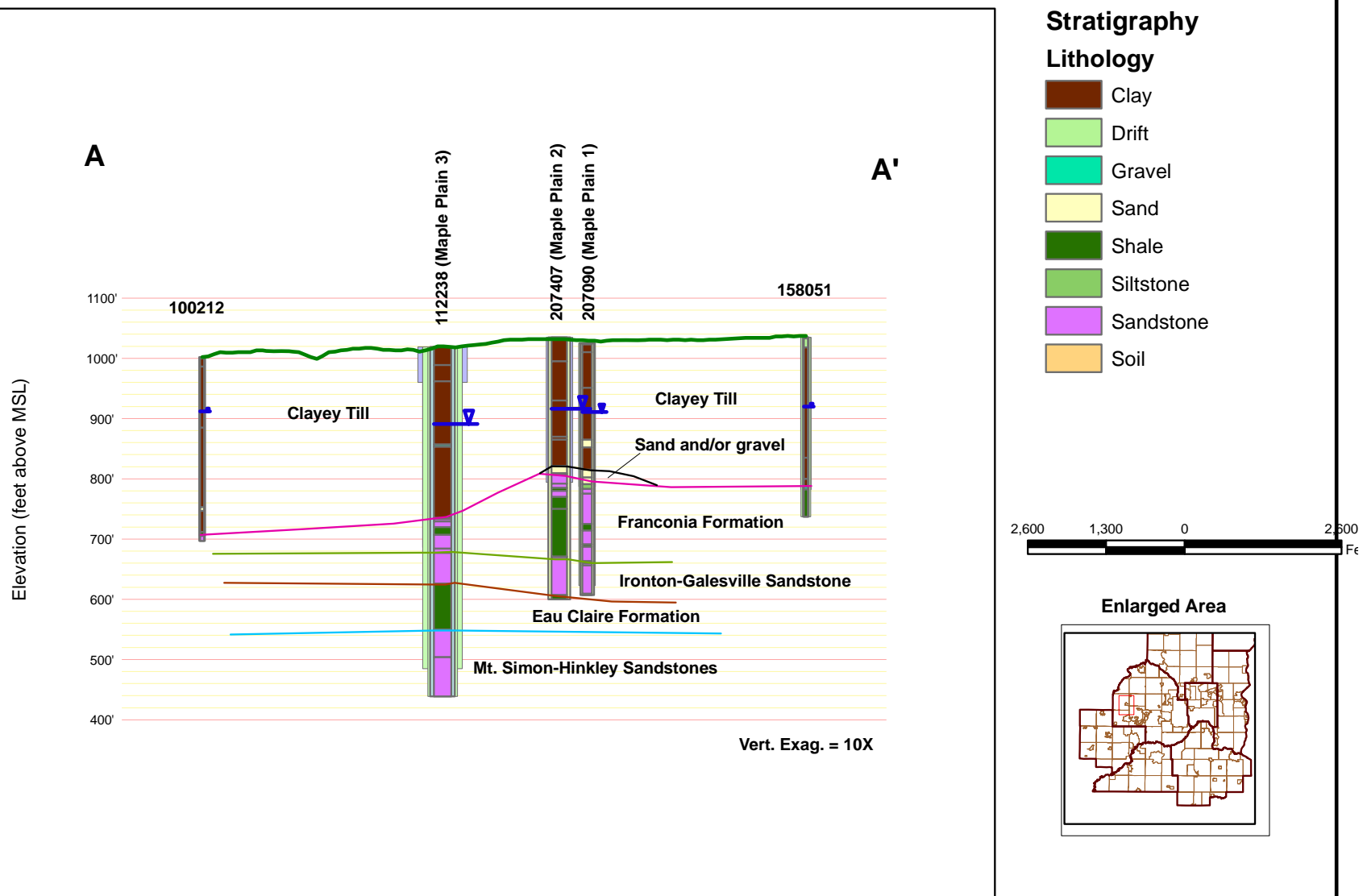


900 450 0 900 Feet

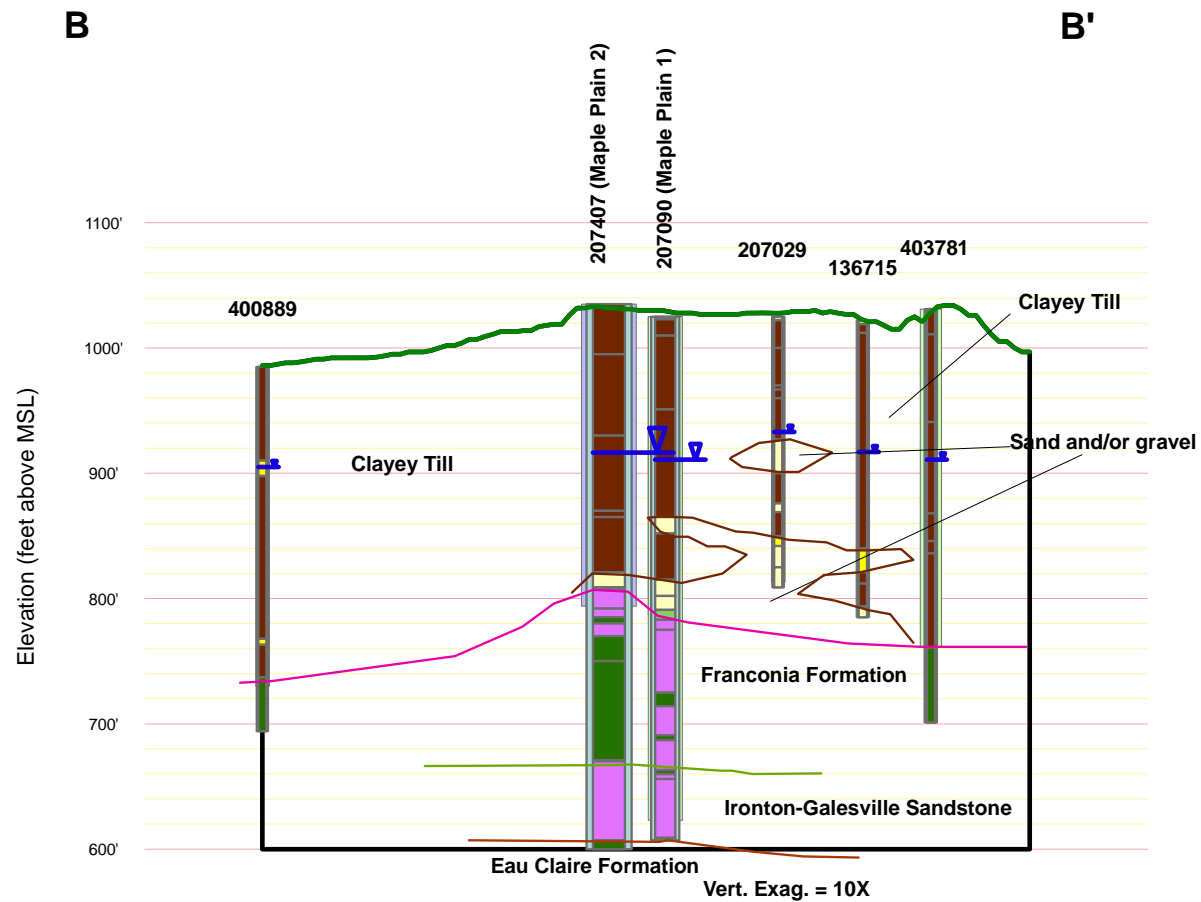
### Enlarged Area



**Figure 3**  
**Geologic Cross-Sections Locations**  
**(Maple Plain, MN)**







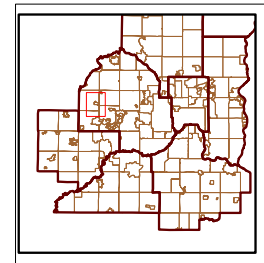
## Stratigraphy

### Lithology

- Clay
- Drift
- Gravel
- Sand
- Shale
- Siltstone
- Sandstone
- Soil

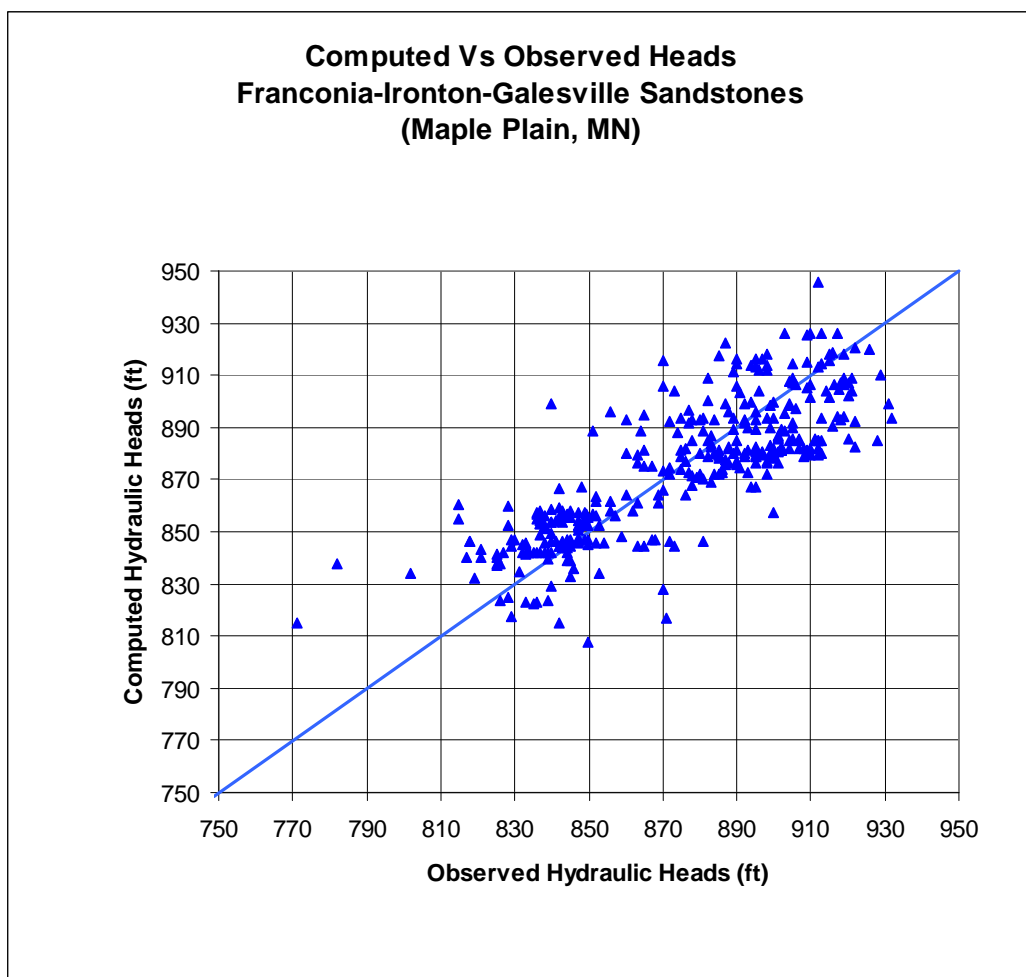
5,000 2,500 0 5,000  
Feet

### Enlarged Area



**Figure 4b**  
**Geologic Cross-Section B-B'**  
**(Maple Plain, MN)**

# Refined Model



## Refined Model Calibration Statistics

Residual Mean (ft)	0.53
Coefficient of Correlation	0.860
Coefficient of Determination	0.74
number of observations	365
Absolute Max Head	932.00
Absolute Min Head	705.00
Residual Standard Dev.	20.391
Res Std Dev./Range	8.98%



Figure 5  
Refined Model Calibration Statistics  
FIG Aquifer  
City of Maple Plain, MN

**Stantec**

**CITY OF MAPLE PLAIN**

**WELLHEAD PROTECTION PLAN – PART 2**

June 2013

## **Appendix B Well Logs**

---

Minnesota Unique Well No.

**112238**County Hennepin  
Quad Rockford  
Quad ID 121CMINNESOTA DEPARTMENT OF HEALTH  
**WELL AND BORING RECORD**  
*Minnesota Statutes Chapter 103I*Entry Date 08/24/1991  
Update Date 02/06/2012  
Received Date

Well Name MAPLE PLAIN 3		Well Depth	Depth Completed	Date Well Completed
Township Range Dir Section Subsections Elevation		580 ft.	580 ft.	04/20/1978
118 24 W 24 CCCACD Elevation Method		7.5 minute topographic map (+/- 5 feet)		
Drilling Method		Cable Tool		
Well Address		Drilling Fluid		
MAPLE PLAIN MN 55359		Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No From Ft. to Ft.		
Geological Material		Use Community Supply PWS ID 1270021 Source S03		
CLAY	Color	Hardness	From	To
SANDY CLAY	BLUE		0	30
CLAY	BLUE		30	57
GRAVEL			57	162
CLAY	BLUE		162	166
HARD-PACKED GRAVEL		HARD	166	284
HARD PACKED GRAVEL		HARD	284	286
SAND, SHALE, AND LIME			286	290
SHALE STICKY			290	299
SAND, SHALE, AND LIME			299	312
SHALEY SANDROCK			312	335
SHALEY, SANDROCK			335	342
SHALEY, SANDROCK			342	393
EAU CLAIRE-MT. SIMON TRANSITION	GRAY	SOFT	393	469
MT. SIMON	WHITE	SOFT	469	515
			515	580
Casing Type		Steel (black or low carbon) Joint Welded Drive Shoe? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Above/Below 2 ft.				
Casing Diameter		Weight	Hole Diameter	
30 in. to 59 ft.		lbs./ft.	24 in. to 534 ft.	
24 in. to 333 ft.		lbs./ft.	18 in. to 580 ft.	
18 in. to 534 ft.		lbs./ft.		
Open Hole from 534 ft. to 580 ft.				
Screen YES Make Type				
Diameter		Slot/Gauze	Length	Set Between
Static Water Level				
128 ft. from Land surface Date Measured 09/27/1994				
PUMPING LEVEL (below land surface)				
220 ft. after hrs. pumping 650 g.p.m.				
Well Head Completion				
Pitless adapter manufacturer Model				
<input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade				
<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)				
REMARKS				
GAMMA LOGGED 5-13-1993 & 7-14-1993 AFTER GRAVEL PACK REMOVED.				
IN 1994 SCREEN WAS PULLED AND THE WELL WAS DEEPEMED.				
M.G.S. NO. 3619.				
MAPLE PLAIN MUNI #3 MP=2.25				
WELL GRAVEL PACKED HAS 70 FT. OF SCREEN AND 60 FT. OF LEADER PIPE.				
Located by: Minnesota Department of Health		Method: GPS SA On (averaged)		
Unique Number Verification: Information from owner		Input Date: 04/06/1999		
System: UTM - Nad83, Zone15, Meters		X: 447662 Y: 4984133		
Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Grout Material: Neat Cement from 0 to 534 ft. 36 yds.				
Grout Material: Neat Cement from 0 to 60 ft. 0				
Nearest Known Source of Contamination				
_feet _direction _type				
Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Pump <input checked="" type="checkbox"/> Not Installed Date Installed 00/07/1994				
Manufacturer's name JOHNSTON Model number TK-61554A HP 125 Volts 240				
Length of drop Pipe 280 ft. Capacity 650 g.p.m Type Turbine Material Steel (black or low carbon)				
Abandoned Wells Does property have any not in use and not sealed well(s)? <input type="checkbox"/>				
Yes <input type="checkbox"/> No				
Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Well Contractor Certification				
Bergerson-Caswell		27058	MANTHIE, D.	
License Business Name		Lic. Or Reg. No.	Name of Driller	
Cuttings Yes Borehole Geophysics Yes				
First Bedrock Franconia		Aquifer Mt.Simon		
Last Strat Mt.Simon Sandstone		Depth to Bedrock 286 ft.		
County Well Index Online Report		112238		Printed 12/13/2012 HE-01205-07

Minnesota Unique Well No.

136693

County Hennepin  
 Quad Rockford  
 Quad ID 121C

MINNESOTA DEPARTMENT OF HEALTH  
**WELL AND BORING RECORD**  
*Minnesota Statutes Chapter 103I*

Entry Date 08/24/1991  
 Update Date 09/11/1991  
 Received Date

Well Name WILLIAM NEGLEY					Well Depth 157 ft.		Depth Completed 157 ft.		Date Well Completed 06/18/1977	
Township Range Dir Section Subsections Elevation 1035 ft.					Drilling Method --					
118 24 W 25 BBDBCD Elevation Method 7.5 minute topographic map (+/- 5 feet)										
Well Address 1459 PRAIRIELAND AV MAPLE PLAIN MN					Drilling Fluid --		Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No From Ft. to Ft.			
					Use Domestic					
Geological Material					Color		Hardness		From To	
TOPSOIL					YELLOW		HARD		0 1	
CLAY					BLUE		SOFT		1 24	
CLAY + GRAVEL									24 66	
COARSE GRAVEL									66 79	
COARSE SAND					GRAY				79 105	
CLAY + GRAVEL					GRAY				105 115	
MUCKY SAND					RED				115 148	
SAND					GRY/YEL				148 157	
					Casing Type		Joint No Information		Drive Shoe? <input type="checkbox"/> Yes <input type="checkbox"/> No	
					No Above/Below 0 ft.					
					Casing Diameter		Weight		Hole Diameter	
					4 in. to ft.		lbs./ft.			
					Open Hole from ft. to ft.					
					Screen YES		Make JOHNSON		Type stainless steel	
					Diameter		Slot/Gauze		Length Set Between	
					4		15		4 0 ft. and ft.	
					Static Water Level					
					68 ft. from Land surface Date Measured 06/18/1977					
					PUMPING LEVEL (below land surface)					
					0 ft. after hrs. pumping 80 g.p.m.					
					Well Head Completion					
					Pitless adapter manufacturer Model					
					<input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade					
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)					
REMARKS NORTH 0.5 SECT.					Grouting Information Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No					
Located by: Minnesota Geological Survey Method: Digitization (Screen) - Map (1:24,000)					Nearest Known Source of Contamination					
Unique Number Verification: N/A Input Date: 12/11/2001					_feet _direction _type					
System: UTM - Nad83, Zone15, Meters X: 447760 Y: 4983721					Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No					
					Pump <input checked="" type="checkbox"/> Not Installed Date Installed					
					Manufacturer's name DEMPSTER Model number D175B HP 0.5 Volts 230					
					Length of drop Pipe 81 ft. Capacity g.p.m. Type Submersible Material					
					Abandoned Wells Does property have any not in use and not sealed well(s)? <input type="checkbox"/>					
					Yes <input type="checkbox"/> No					
					Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No					
					Well Contractor Certification					
					Stevens Well Co.		27194			
First Bedrock					License Business Name		Lic. Or Reg. No.		Name of Driller	
Last Strat sand										
Aquifer Quat. Buried Unconf. Aquife										
Depth to Bedrock ft.										
County Well Index Online Report					136693		Printed 12/13/2012 HE-01205-07			

Minnesota Unique Well No.

157884

County Hennepin  
 Quad Mound  
 Quad ID 105B

MINNESOTA DEPARTMENT OF HEALTH  
**WELL AND BORING RECORD**  
 Minnesota Statutes Chapter 103I

Entry Date 07/05/1991  
 Update Date 01/03/2007  
 Received Date

Well Name ERICKSON, DOUGLAS					Well Depth	Depth Completed	Date Well Completed
Township Range Dir Section Subsections Elevation					114 ft.	114 ft.	05/31/1979
118 24 W 25 ABB Elevation Method							
					Drilling Method Non-specified Rotary		
<b>Geological Material</b> TOPSOIL CLAY CLAY SANDY CLAY GRAVEL SAND					Drilling Fluid		Well Hydrofractured? <input type="checkbox"/> Yes <input type="checkbox"/> No
					--		From Ft. to Ft.
					Use Domestic		
					Casing Type Steel (black or low carbon) Joint Threaded Drive Shoe? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					No Above/Below ft.		
					Casing Diameter		Weight
					4 in. to 106 ft.		11 lbs./ft.
					Hole Diameter		
					6.25 in. to 114 ft.		
					Open Hole from ft. to ft.		
Screen YES Make JOHNSON Type stainless steel							
Diameter					Slot/Gauze	Length	Set Between
4					18	8	106 ft. and 114 ft.
Static Water Level							
79 ft. from Land surface Date Measured 05/31/1979							
PUMPING LEVEL (below land surface)							
ft. after hrs. pumping 20 g.p.m.							
Well Head Completion							
Pitless adapter manufacturer Model							
<input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade							
<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)							
NO REMARKS					Grouting Information Well Grouted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Nearest Known Source of Contamination		
					_feet _direction _type		
					Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Pump <input type="checkbox"/> Not Installed Date Installed 06/07/1979							
Manufacturer's name DEMPSTER Model number MF3-50-S2 HP 0.5 Volts 230							
Length of drop Pipe 90 ft. Capacity 15 g.p.m. Type Submersible Material Galvanized							
Abandoned Wells Does property have any not in use and not sealed well(s)? <input type="checkbox"/>							
Yes <input type="checkbox"/> No							
Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No							
Well Contractor Certification							
Stevens Well Co. 27194 DVORAK, J.							
License Business Name Lic. Or Reg. No. Name of Driller							
First Bedrock							
Last Strat							
Aquifer							
Depth to Bedrock ft.							
County Well Index Online Report					157884		Printed 12/13/2012 HE-01205-07

Minnesota Unique Well No.

**775974**County Hennepin  
Quad  
Quad IDMINNESOTA DEPARTMENT OF HEALTH  
**WELL AND BORING RECORD**  
*Minnesota Statutes Chapter 103I*Entry Date 09/02/2011  
Update Date 11/30/2012  
Received Date 01/18/2011

Well Name YOUNG, JERRY Township Range Dir Section Subsections Elevation 118 24 W 26 AAB Elevation Method					Well Depth 300 ft.		Depth Completed 300 ft.		Date Well Completed 11/03/2010	
<b>Well Address</b> 1554 PARKVIEW RD MAPLE PLAIN MN 55359					Drilling Fluid Bentonite		Well Hydrofractured? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No From Ft. to Ft.			
<b>Geological Material</b>					Use Irrigation					
<b>Color</b>					Casing Type Plastic Joint Welded Drive Shoe? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Above/Below ft.					
<b>Hardness</b>					<b>Casing Diameter</b>		<b>Weight</b>		<b>Hole Diameter</b>	
<b>From To</b>					4 in. to 280 ft.		lbs./ft.		8 in. to 20 ft.	
CLAY BROWN MEDIUM 0 32					Open Hole from ft. to ft.					
CLAY GRAY SOFT 32 68					Screen YES Make SLOTTED Type plastic					
SANDY CLAY GRAY SOFT 68 162					<b>Diameter</b>		<b>Slot/Gauze</b>		<b>Length</b>	
CLAY GRAY MEDIUM 162 252					4		10		20	
SANDY CLAY GRAY MEDIUM 252 272					Set Between		280 ft. and 300 ft.			
SAND VARIED SOFT 272 300					Static Water Level					
					109 ft. from Land surface Date Measured 10/15/2010					
					PUMPING LEVEL (below land surface)					
					280 ft. after 3 hrs. pumping 35 g.p.m.					
					<b>Well Head Completion</b>					
					Pitless adapter manufacturer Model					
					<input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade					
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)					
<b>REMARKS</b> 10-R-28226.					<b>Grouting Information</b> Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
					Grout Material: Bentonite		from 0 to 60 ft.		4 bags	
					<b>Nearest Known Source of Contamination</b>					
					_feet _direction _type					
					Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No					
					<b>Pump</b> <input type="checkbox"/> Not Installed Date Installed 11/03/2010					
					Manufacturer's name AERMOTOR Model number		HP 1 Volts 220			
					Length of drop Pipe 140 ft. Capacity 12 g.p.m. Type Submersible Material					
					<b>Abandoned Wells</b> Does property have any not in use and not sealed well(s)? <input type="checkbox"/>					
					Yes <input checked="" type="checkbox"/> No					
					<b>Variance</b> Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
					<b>Well Contractor Certification</b>					
					Bergerson Caswell, Inc.		1767		SCHULTZ, C.	
					License Business Name		Lic. Or Reg. No.		Name of Driller	
<b>County Well Index Online Report</b>					<b>775974</b>		Printed 12/13/2012 HE-01205-07			

**Stantec**

**CITY OF MAPLE PLAIN**

**WELLHEAD PROTECTION PLAN – PART 2**

June 2013

## **Appendix C Correspondence**

---



Minnesota Department of Natural Resources  
Central Region Waters - 1200 Warner Road, St. Paul, MN 55106-6793  
Telephone: (651) 259-5845 Fax: (651) 772-7977



November 2, 2009

Dennis Nelsen  
City of Maple Plain  
1620 Maple Avenue  
Maple Plain, MN 55359

RE: APPROVAL OF CITY OF MAPLE PLAIN'S WATER SUPPLY PLAN

Dear Mr. Nelsen:

We are in receipt of your faxed letter of July 6, 2009, in which you provided additional information and commitments regarding well monitoring and water use record keeping in connection with the City's Water Supply Plan, as requested in Kate Drewry's letter of June 19, 2009.

Based on the information and commitments outlined in your letter, I am pleased to advise you that in accordance with Minnesota Statutes, Section 103G.291, Subdivision 3, and on behalf of the Commissioner of Natural Resources, your Plan is hereby approved. **This approval is effective upon the Department's receipt of a completed copy of the enclosed "Certification of Adoption" form.** The form is to be returned to my office when it has been completed and signed.

Note that this approval is contingent upon the City incorporating the monitoring plan proposed in your letter into the final version of the Water Supply Plan officially adopted by the City. Please submit the well measurement data quarterly in an Excel spreadsheet to the DNR Ground Water Level Monitoring Coordinator at [gwlevelcoordinator@dnr.state.mn.us](mailto:gwlevelcoordinator@dnr.state.mn.us), along with surveyed land surface and well measure-point elevations. If you have questions regarding data reporting and to obtain a reporting form template, please email the Monitoring Coordinator.

Also, as you have been previously notified, *Minnesota Statutes*, Section 103G.291 was amended last year to require all public water suppliers in the metropolitan area serving over 1000 people to adopt a conservation rate structure by 2010. This approval of the City's Water Supply Plan does not eliminate that statutory requirement.

Thank you for your efforts in completing the Water Supply Plan and your commitment to water conservation.

Sincerely,

A handwritten signature in black ink that reads 'Dale E. Homuth'.

Dale E. Homuth  
Regional Hydrologist

Enclosure

c: Jason Ziemer, City of Maple Plain  
Metropolitan Council, Sara Smith  
Mike MacDonald, Observation Well Program

Laurel Reeves, Water Appropriation Program Manager  
Kate Drewry, Area Hydrologist

April 3, 2010

Mr. Dennis Nelsen  
Water Superintendent - City of Maple Plain  
P.O. Box 97  
Maple Plain, Minnesota 55359-0097

Dear Mr. Nelsen:

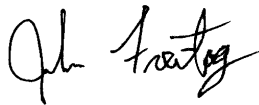
Subject: Second Scoping Decision Notice for the City of Maple Plain - PWSID 1270021

This letter provides notice of the results of a scoping meeting I held with you and Jason Ziemer (city of Maple Plain) and Mark Janovec (Stantec Consulting Service) on March 5, 2012, at Maple Plain City Hall regarding wellhead protection (WHP) planning. During the meeting we discussed the data elements that must be included and used to prepare the part of the WHP plan related to the management of potential contaminants in the approved drinking water supply management area. The enclosed Scoping 2 Decision Notice lists the data elements that were discussed at the meeting.

Maple Plain has met the requirements to distribute copies of the first part of the wellhead protection plan to local units of government and hold an informational meeting for the public. The city of Maple Plain will have until February 16, 2013, to complete its wellhead protection plan.

If a data element is marked on the enclosed notice as a data element that must be used and it does not exist, it is helpful if your plan notes this. Stantec Consulting Service will be working with you to develop a draft of the remainder of the wellhead protection plan. I will be contacting you to review the progress of the development of Part II of your plan. If you have any questions regarding the enclosed notice, contact me by email at [john.freitag@state.mn.us](mailto:john.freitag@state.mn.us) or by phone at 651/201-4669.

Sincerely,



John J. Freitag, Principal Planner  
Environmental Health Division  
P.O. Box 64975  
St. Paul, Minnesota 55164-0975

JJF:kmc  
Enclosures

cc: Isaac Bradlich, MDH Engineer, Snelling Office Park  
Byron Adams, Water Monitoring Section, Minnesota Pollution Control Agency  
Joe Richter, Division of Waters, Minnesota Department of Natural Resources  
Brian Williams, Pesticide & Fertilizer Mgmt. Division, Minnesota Department of Agriculture  
Eric Mohring, Hydrologist, Board of Water and Soil Resources  
Jason Ziemer, City Administrator, City of Maple Plain  
Mark Janovec, Stantec Consulting Services Inc.

## SCOPING 2 DECISION NOTICE

### 3 Remainder of the Wellhead Protection Plan

Name of Public Water Supply:		Date:
City of Maple Plain                      PWSID 1270021		April 3, 2012
Name of the Wellhead Protection Manager:		
Mr. Dennis Nelsen, Water Superintendent		
Address: 1620 Maple Avenue P.O. Box 97	City:  Maple Plain	Zip:  55359-0097
Unique Well Numbers:  112238 (Well 3), 207407 (Well 2 - Emergency*), 207090 (Well 1 - Emergency*)		Phone:  763/479-0525

\*Emergency wells only use the IWMZ Form for data collection.

### Instructions for Completing the Scoping 2 Form

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

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

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

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

## DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT

PRECIPITATION			
N	R	S	An existing map or list of local precipitation gauging stations.
X			
<b>Technical Assistance Comments:</b>			
N	R	S	An existing table showing the average monthly and annual precipitation in inches for the preceding five years.
X			
<b>Technical Assistance Comments:</b>			
GEOLOGY			
N	R	S	An existing geologic map and a description of the geology, including aquifers, confining layers, recharge areas, discharge areas, sensitive areas as defined in Minnesota Statutes, section 103H.005, subdivision 13, and groundwater flow characteristics.
	X		
<b>Technical Assistance Comments:</b> The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	Existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department.
	X		
<b>Technical Assistance Comments:</b> The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	Existing borehole geophysical records from wells, borings, and exploration test holes.
	X		
<b>Technical Assistance Comments:</b> The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
N	R	S	Existing surface geophysical studies.
	X		
<b>Technical Assistance Comments:</b> The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.			
SOILS			
N	R	S	Existing maps of the soils and a description of soil infiltration characteristics.
X			
<b>Technical Assistance Comments:</b>			
N	R	S	A description or an existing map of known eroding lands that are causing sedimentation problems.
X			
<b>Technical Assistance Comments:</b>			

WATER RESOURCES			
N	R	S	An existing map of the boundaries and flow directions of major watershed units and minor watershed units.
X			
Technical Assistance Comments:			
N	R	S	An existing map and a list of public waters as defined in Minnesota Statutes, section 103G.005, subdivision 15, and public drainage ditches.
X			
Technical Assistance Comments:			
N	R	S	The shoreland classifications of the public waters listed under subitem (2), pursuant to part 6120.3000 and Minnesota Statutes, sections 103F.201 to 103F.221.
X			
Technical Assistance Comments:			
N	R	S	An existing map of wetlands regulated under chapter 8420 and Minnesota Statutes, section 103G.221 to 103G.2373.
X			
Technical Assistance Comments:			
N	R	S	An existing map showing those areas delineated as floodplain by existing local ordinances.
X			
Technical Assistance Comments:			

### DATA ELEMENTS ABOUT THE LAND USE

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

N	R	S	A map and an inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources.
	X	X	
<p><b>Technical Assistance Comments:</b> The inventory, mapping, and management of land uses and potential sources of contamination for all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements, as follows:</p> <p><u>Low Vulnerability</u> - 1) All potential contaminant sources and facility designations as listed on the attachment, 2) a land use/land cover map and table, and 3) an inventory of the Inner Wellhead Management Zone (IWMZ).</p> <p>As a starting point, MDH will provide a 1992 or 2001 land cover map and table from federal data bases. This data set must be used unless an alternative electronic data set that is more current and detailed is available.</p> <p>Management strategies must be developed for all land uses and potential sources of contamination.</p>			
N	R	S	An existing comprehensive land-use map.
	X	X	
<p><b>Technical Assistance Comments:</b> The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element. Include any urban fringe planning areas.</p>			
N	R	S	Existing zoning map.
	X	X	
<p><b>Technical Assistance Comments:</b> The management of all the Drinking Water Supply Management Area(s) must reflect what is known about this data element.</p>			
<b>PUBLIC UTILITY SERVICES</b>			
N	R	S	An existing map of transportation routes or corridors.
X			
<p><b>Technical Assistance Comments:</b></p>			
N	R	S	An existing map of storm sewers, sanitary sewers, and public water supply systems.
X			
<p><b>Technical Assistance Comments:</b></p>			
N	R	S	An existing map of the gas and oil pipelines used by gas and oil suppliers.
X			
<p><b>Technical Assistance Comments:</b></p>			
N	R	S	An existing map or list of public drainage systems.
X			
<p><b>Technical Assistance Comments:</b></p>			
N	R	S	An existing record of construction, maintenance, and use of the public water supply well(s) and other wells within the drinking water supply management area.
	X		
<p><b>Technical Assistance Comments:</b> The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.</p>			

## DATA ELEMENTS ABOUT WATER QUANTITY

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

## DATA ELEMENTS ABOUT WATER QUALITY

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



## **Appendix D Documentation of Public Hearing**

---

*(Note: Appendix to be completed following public hearing, scheduled to be held in May 2013.)*

[Download Google Chrome](#) The free browser that lets you do more of what you like on the web! [www.google.com/chrome](http://www.google.com/chrome)

[Buy Home For Taxes Owed](#) Or Get 18-36% Interest! Watch 8min Video That Explains All. [USTaxLienAssociation.com/FreeCourse](http://USTaxLienAssociation.com/FreeCourse)

[Waste Management](#) Andrea J. Granger - Expert In Waste Mgmt, Reclamtion & Remediation! [www.worldwidewhoswhy.com](http://www.worldwidewhoswhy.com) AdChoices



Currently 73°	Tonight 61°	Tomorrow 81°
------------------	----------------	-----------------

Exclusively available at **FLEET FARM**

The Laker - The Pioneer

[Home](#) [News](#) [Sports](#) [Schools](#) [Columns & Opinion](#) [Community](#) [Classifieds](#) [Public Notices](#)

## Legal notice: City of Maple Plain

By **The Pioneer & The Laker** on June 6, 2013 at 5:21 pm

### LEGAL NOTICE CITY OF MAPLE PLAIN

#### NOTICE OF PUBLIC HEARING

Notice is hereby given that the City Council of the City of Maple Plain will conduct a public hearing at 7 p.m. on Monday, June 10, 2013 at City Hall, 1620 Maple Avenue, to review the City's Part 2 Wellhead Protection Plan. The Plan is designed to help protect the City's drinking water supply by identifying and managing potential sources of contamination which could threaten local groundwater resources.

A brief presentation will provide background information on the request. Following the presentation, the City Council will accept oral statements from the public. Written comments may also be submitted, but must be received no later than 4:30 p.m. on Monday, June 10, 2013. Written comments may be mailed to: Maple Plain City Hall, 1620 Maple Avenue, P.O. Box 97, Maple Plain, MN 55359; or e-mailed to [jziemer@mapleplain.com](mailto:jziemer@mapleplain.com), and must include name and address of person(s) submitting statement(s).

Jason Ziemer  
City Administrator

*(Published in The Pioneer newspaper June 1 and 8, 2013)*

**Tags:** Maple Plain, Pioneer

#### Related posts:

- Legal notice: City of Maple Plain
- Legal notice: City of Maple Plain
- Legal notice: City of Maple Plain
- Legal notice: City of Maple Plain
- Legal notice: City of Maple Plain

#### Leave a Reply

Your email address will not be published. Required fields are marked \*

Search...

**Kidspo** come play with us!  
KIDS & family expo 9.28.13

replay

Earn up to **1,000** Bonus AIR MILES® reward miles.

Enough for a select flight\*.

Enjoy your first year free! [Apply now](#)

\* Terms apply.

**Credit Card Debt Help**

"Thank you for helping me get my credit back in order..."

[CLICK HERE](#)

**CONSOLIDATED**  
CREDIT COUNSELING SERVICES OF CANADA, INC.™  
When debt is the problem, we are the solution.

**LP** The Laker & Pioneer  
Like 58

**AGENDA**  
**MAPLE PLAIN CITY COUNCIL – REGULAR MEETING**  
**MAPLE PLAIN CITY HALL**  
**JUNE 10, 2013**  
**7:00 PM**

**I. SPECIAL PRESENTATIONS**

- A. Centerpoint Energy Community Partnership grant.
- B. Step to It Challenge winner.

**II. CALL TO ORDER**

**III. PLEDGE OF ALLEGIANCE**

**IV. ADOPT AGENDA**

**V. CONSENT AGENDA**

- A. Approve May 28, 2013 regular meeting minutes.
- B. Accounts payable.
- C. Maple Plain Days event stage rental.
- D. Wenck & Associates project extension request.
- E. Fire Department suburban equipment purchase.

**VI. VISITORS TO BE HEARD**

*Note: This is a courtesy extended to persons wishing to address the council who are not on the agenda. A completed public comment form should be presented to the city administrator prior to the meeting; presentations will be limited to 3 minutes. This session will be limited to 15 minutes.*

**VII. PUBLIC HEARINGS**

- A. Maple Plain wellhead protection plan.

**VIII. ADMINISTRATIVE REPORTS**

**IX. OLD BUSINESS**

- A. Highway 12 red light pedestrian crossing project.
- B. Public Works iPad.

**X. NEW BUSINESS**

- A. Park and pool monument sign.
- B. Maple Avenue watermain project.
- C. Budd Avenue sanitary sewer.

**XI. LEGISLATIVE/INTERGOVERNMENTAL AFFAIRS**

**XII. COUNCIL REPORTS & OTHER BUSINESS**

**XIII. CLOSED SESSION**

**XIV. ADJOURNMENT**

**Regular Meeting of the Maple Plain City Council**  
**Meeting Minutes**  
**June 10, 2013**  
**Maple Plain City Hall**  
**7:00 PM**

**I. SPECIAL PRESENTATIONS**

**A. Centerpoint Energy Community Partnership Grant**

Mayor Hackbarth introduced Steve Marsh of Centerpoint Energy. Marsh congratulated the City on receiving grant funds from the Community Partnership Grant and presented a check for \$1,800 to the City. The grant money went towards the purchasing of two Automated External Defibrillators (AEDs); one of which will be placed at the Maple Plain Fire Station and one at City Hall.

**B. Step to it Challenge winner**

Assistant to the City Administrator Margaret McCallum announced City of Maple Plain resident Shauna Shurson as the top stepper for the 2013 Hennepin County Step to It Challenge. McCallum explained that Shurson had a total step count of 792,085. McCallum presented Shurson with 2 tickets to the upcoming June 11 Twins game where Shurson and the top steppers from other participating communities will be recognized at the game.

McCallum recognized Maple Plain's other top ten steppers for the challenge: Sherry Zimmermann, Stephen Shurson, Jenna Mandler, Kevin Lewandowski, Kathy Quandt, Mary Plucinski, Joshua Kitsmann, Mark Lenz and Wayne Marshall.

McCallum announced Stacey Fix as the recipient of the Step to It Challenge helmet and bike prize, courtesy of the West Hennepin Chamber of Commerce. Bobbi Henrich, President/Treasurer of the West Hennepin Chamber of Commerce presented Fix with the prize. Fix's name was randomly drawn from a pool of participants who both participated in the Maple Plain Step to It Challenge kickoff on April 29 and logged steps for all four weeks of the challenge.

McCallum thanked all who participated in the Challenge this year.

**II. CALL TO ORDER**

**Mayor Hackbarth called the meeting to order at 7:09 p.m.**

Present: Mayor Roger Hackbarth, and Councilmembers Michael DeLuca, Dave Eisinger, Justin McCoy and Jerry Young; Assistant to the City Administrator Margaret McCallum; City Attorney Jeff Carson; and City Engineer Dan Boyum (Stantec).

**III. PLEDGE OF ALLEGIANCE**

**IV. ADOPT AGENDA**

**Councilmember McCoy moved to adopt the Agenda as amended; Councilmember Eisinger seconded. Motion passed 5-0.**

## **V. CONSENT AGENDA**

Councilmember DeLuca requested that consent agenda item E, Fire Department suburban equipment purchase, be pulled for further discussion

**Councilmember McCoy moved to approve the Consent Agenda as amended; Councilmember Young seconded. Motion passed 5-0.**

Items approved under the Consent Agenda:

- A. Approve May 28, 2013 regular meeting minutes.
- B. Accounts payable.
- C. Maple Plain Days event stage rental.
- D. Wenck & Associates project extension request.
- E. Fire Department suburban equipment purchase.

Councilmember DeLuca asked for an explanation as to the changes in the cost for the Fire Department suburban and equipment.

Councilmember/Fire Chief Eisinger explained that the suburban was purchased the following week for \$38,693.26. He stated that a cap of \$45,000 was originally set for the purchase. He specified that before the purchase, the Truck Committee consulted with Action Fleet Incorporated, who explained that lighting and other equipment on the current truck could be reused and transferred to the new vehicle. Eisinger said that after the new truck was purchased, Action Fleet reassessed the situation and decided that it would be better to purchase new equipment instead of reusing the old. He stated that the Fire Partnership agreed to buy new equipment. Eisinger stated that with the sale of the old equipment, the Department is hoping to not exceed the \$45,000 cap by much.

**Councilmember DeLuca moved to approve consent agenda item E, Fire Department equipment purchase; Councilmember McCoy seconded. Motion passed 5-0.**

## **VI. VISITORS TO BE HEARD**

None.

## **VII. PUBLIC HEARINGS**

- A. Maple Plain wellhead protection plan.

Hydrogeologist, Mark Janovec, with Stantec, highlighted the history of and the City's participation in the Minnesota Department of Health's wellhead protection program. Janovec explained that the City had recently completed part one of the program, which helped to identify the City's 10-year capture zone for the City's wells; the wells that provide the City's water supply. He stated that part one of the program also sought to identify any vulnerable areas related to the aquifer. Janovec explained that the research findings suggest that Maple Plain's aquifer has low vulnerability partially due to a protective clay shell surrounding it.

Janovec explained that with part one of the program complete, he would be involved in part two of the program, which involved looking at possible contamination risks to the aquifer. He said that one potential risk of contamination was old private wells that were not properly sealed when abandoned. Janovec explained that four private wells were located in the City; however that he would perform additional research and provide some public awareness education as a means to locate any additional undocumented wells. He stated that the information would then be directed to the Minnesota Department of Health for review and approval. Janovec said that after review and approval of the plan by the Minnesota Department of Health, the City would begin to implement the plan and be eligible to grant funding that would assist private well owners in sealing any unused wells.

**Hackbarth opened the public hearing at 7:25 p.m.**

**Councilmember McCoy moved to close the public hearing at 7:26 p.m.; Eisinger seconded. Motion passed 5-0.**

## **VIII. ADMINISTRATIVE REPORTS**

Mayor Hackbarth mentioned that tomorrow night, a joint Council meeting with the City of Independence would be held to swear in a new police officer, Joshua Brodzek, at West Hennepin Public Safety at 6:30 p.m.

Mayor Hackbarth mentioned that Active-Living Hennepin County had scheduled a partnership meeting for June 17<sup>th</sup> at Brooklyn Center from 9:00 a.m. to 11:00 a.m. He explained that the meeting would focus on policies, strategies and incentives for bicycle parking.

## **IX. OLD BUSINESS**

### **A. Highway 12 red light pedestrian crossing project**

City Engineer Boyum reported on engineering information that was requested from the Council at the previous Council meeting and workshop meeting. Boyum stated that the engineering cost for the HAWK project would not exceed \$26,000. He informed the Council that the cost of the installation of decorative street lights, by Xcel Energy, would be about \$27,500 for two lights and \$77,376 for eight.

Boyum provided technical details on the possible installation of an advanced warning signal to the east of the crosswalk as a means to better prepare west-bound commuters. Boyum explained that the recommended distance away from the signal is 180 feet.

Boyum asked Council for direction regarding:

1. Getting estimates for the sidewalk work,
2. Whether the project should include two or eight decorative lights, and
3. Whether the advanced warning lights should be included in the project.

Boyum explained that the financial information for the project would be discussed at the next Council meeting on June 24.

Mayor Hackbarth inquired into the cost difference between two decorative lights versus eight decorative lights; \$27,500 to \$77,376. Boyum explained that there was likely a fixed wiring cost that doesn't exponentially change with the addition of more lights; thus bringing the cost of each individual light down when more are added.

Councilmember Eisinger stated that even if engineering was not involved in the sidewalks, he was confident and comfortable with the work of vendors that the City has previously worked with. Boyum explained that the sidewalk plans designed by Stantec could be used as a reference.

**Councilmember McCoy moved to approve to fund the full amount of \$258,640 for the HAWK signal project, which includes costs for the signal, street lights, sidewalk, engineering and contingencies; Councilmember Deluca seconded. Motion passed 5-0.**

#### B. Public Works iPad

Assistant to the City Administrator McCallum introduced the Public Works agenda iPad item. McCallum stated that staff is recommending the purchase of an iPad for Public Works. The iPad would replace the laptop of which Public Works is currently using. She explained that this laptop would replace the old laptop at City Hall. McCallum explained that the iPad would allow Public Works to do their job more efficiently, by having the iPad with them as work and software programs would allow them quicker access to information and the ability to record information on site.

Councilmember Young expressed concern over the iPad being compatible with the software Public Works planned to use. McCallum stated that she would gather additional information.

**Young moved to approve the purchase of an iPad for Public Works, pending the confirmation that the software they will use is compatible; Councilmember Eisinger seconded. Motion passed 5-0.**

### X. NEW BUSINESS

#### A. Park and Pool monument sign.

City Engineer Boyum reviewed the bids for Park and Pool monument sign project. Boyum reported that City staff sent bid proposals to about 10-12 sign contractors and received 3 bids back. He noted that the bid from Serigraphics Sign Systems was not applicable because it did not meeting a project requirement. Signation Sign Group was the low bidder at \$1,850, the highest being Nordquist Sign at \$7,440. Boyum stated that the project engineer from MnDOT reviewed the proposals and approved both of the applicable bids. Boyum said that the sign cost would be covered with grant money received from MnDOT in 2010. Boyum stated that staff recommended approving Signation Sign Group bid proposal.

**Councilmember Young moved to award the Park and Pool monument sign project to the lowest bidder, Signation Sign Group; Eisinger Seconded.**

Mayor Hackbarth questioned why there was such a big difference between the lowest and the highest bid. McCallum stated that Nordquist Sign included a portion of the sign that was not supposed to be included in the proposal, thus bringing up the cost a little bit.

Mayor Hackbarth expressed concern over what would happen to the sign when MnDOT changes the Park and Pool site into a Bus Station.

Councilmember McCoy stated that the project engineer from MnDOT did research on all of the bids and recommended the approval of Signation Sign's bid. McCoy explained that they should trust that recommendation.

Councilmember DeLuca inquired into why Serigraphics Sign Systems was eliminated from the bidding process. Boyum explained that Serigraphics's bid did not incorporate "prevailing wages" into its pricing; something that is required for all state funded projects.

**Motion passed 5-0.**

**B. Maple Plain water main project.**

City Engineer Boyum explained that as part of the last Council work session meeting, on June 5, Council discussed the replacement of the water main that broke earlier in the year at Maple Avenue.

Boyum stated that the Council had previously discussed with how to proceed with the water main project. Boyum stated that at the previous work session, Council was considering one of two options: to replace only the area of concern or to replace a larger section of the water main. He explained that the larger project would include the replacement of the water main from Maple Avenue, under Highway 12, through to Delano Avenue. The cost would be \$191,350. Replacement of the smaller problem area would cost \$36,100, excluding any street patching. Boyum said that staff was seeking Council's approval to have Stantec draw up specs and plans for the project, which would then be presented at the July 8<sup>th</sup> meeting.

Councilmember Young suggested holding off on the drawing of specs and plans until the Council discusses how to finance the project. Councilmember DeLuca agreed to wait two weeks until the next Council meeting to discuss the project when at that time financing would be discussed.

**Councilmember Young moved to wait until the next meeting to discuss the drawing of the specs and plans for the Maple Avenue water main project; Hackbarth seconded. Motion passed 5-0.**

**C. Budd Avenue sanitary sewer.**

City Engineer Boyum explained that a section of the sanitary sewer system along Budd has a sag in the line and has required regular maintenance. Boyum stated that the line was televised this spring and a hole was discovered in the sag area. He explained that the hole is an issue in that it can start to undermine the soils below the pipe if not fixed. Boyum stated that staff is recommending that the line be replaced. He explained that if the pipe is replaced, staff recommends increasing the size of the pipe from an eight inch



pipe to a ten inch pipe to prepare for any future growth in that area. Boyum estimated the cost to replace the sewer and patch the street to be around \$227,000.

Councilmember McCoy stated that it would make more sense to do a total overlay of the road instead of just patching half of the street.

Councilmember Young explained that previous work on the Budd sanitary sewer line was held off because the City was able to maintain and monitor it. He stated that now that it had a hole in it, it needed to be fixed.

**Councilmember McCoy moved to approve Resolution No. 13-0610-3 ordering the preparation of plans and specifications for the Budd Avenue sanitary sewer project; Young seconded. Motion passed 5-0.**

Councilmember Young asked Boyum to take a look at the footage of the hole in the Budd Avenue sanitary sewer line and provide Council with some insight at the next Council meeting.

## **XI. LEGISLATIVE/INTERGOVERNMENTAL AFFAIRS**

Assistant to the City Administrator McCallum stated that staff had made a request to meet with state legislators, however at this time had not heard back. She stated that staff would continue to work at scheduling a meeting.

## **XII. COUNCIL REPORTS & OTHER BUSINESS**

Councilmember Eisinger asked staff if any additional steps had been taken to get the sign fixed on Highway 12 entering from the east. McCallum stated that staff was working with the artist who designed and constructed the signs to get them fixed. She added that he had been out of the country and that staff was in contact with him.

**DeLuca moved to have city staff take the necessary steps to fix the signs; Young seconded. Motion passed 5-0.**

McCallum explained that staff would like to reschedule the Council retreat for some time in early July. McCallum asked the Council to discuss and determine if there would be a day that would work for them. Councilmember McCoy recommended cancelling the regular meeting for July 8 and hold the retreat in its place. DeLuca asked McCallum to send an email to Councilmembers detailing possible dates for the retreat. DeLuca explained that the recent scheduling and planning of meetings has been disorganized and inconsistent, stating that meetings needed to be better planned for and communicated in advance and that they were too often getting changed.

McCallum said that staff was looking to schedule a first budget meeting of the year to begin to discuss the 2014 budget. She explained that staff was looking to schedule something at the beginning of July and suggested having the meeting as a workshop. Young asked McCallum to send an email to Councilmembers as a means to coordinate a date for the budget meeting.

Boyum asked Council members to offer advice as to what would be the best way for him to communicate information asked of him from previous meetings. Councilmember Young stated that email is an efficient way to relay information.

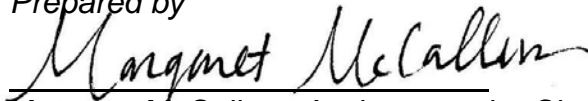
**XIII. CLOSED SESSION**

None.

**XIV. ADJOURNMENT**

**Councilmember Young moved to Adjourn; Councilmember Eisinger seconded. Motion passed 5-0. Meeting adjourned at 8:43 p.m.**

*Prepared by*

A handwritten signature in cursive script, reading "Margaret McCallum". The signature is written in black ink and is positioned above a horizontal line.

Margaret McCallum, Assistant to the City Administrator