Minnesota Statute 473.859 requires Water Supply Plans to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process. Additionally, Minnesota Statute 103G.291 requires all public water suppliers that serve more than 1,000 people to have a Water Supply Plan approved by the Minnesota Department of Natural Resources (DNR). An approved Water Supply Plan is required by the DNR to obtain Water Appropriations Permits.
INTRODUCTION

Woodbury’s Water Supply Plan was approved by the Metropolitan Council and the Minnesota Department of Natural Resources (DNR) in August 2017. The Water Supply Plan consists of four parts:

- Part 1: Water supply system description and evaluation
- Part 2: Emergency planning and response procedures
- Part 3: Water conservation plan
- Part 4: Metro area water suppliers

The Metropolitan Council’s required Comprehensive Plan elements for addressing water supply is the completion of a Water Supply Plan. The City of Woodbury also prepares a Water Supply, Storage and Distribution Plan (WSSDP). The WSSDP provides a detailed analysis of the existing and proposed water system and serves as a guide as Woodbury extends City water to urbanizing areas. The current WSSDP was prepared in conjunction with this document. The Water Supply Plan is an appendix of the WSSDP.

The purpose of this chapter is to identify the Water Supply Guiding Principles, existing conditions and issues to be addressed and summarize the implementation plan developed in the WSSDP.

WATER SUPPLY GUIDING PRINCIPLES

“One Water” vision - The City of Woodbury recognizes the connection between surface water, groundwater, and drinking water and the importance of considering impacts to all water resources when making decisions.

Resilience is a key component of the 2040 Comprehensive Plan and is addressed in this chapter. For purposes of the Comprehensive Plan, all water issues are put into one of three categories: Quantity; Quality; or Planning for the Future.

The Guiding Principles are organized by the four categories - resilience, quantity, quality and planning for the future. Policies are provided to support the principles where appropriate.

Resilience

Develop the water supply in a manner that minimizes detrimental impacts on natural resources, provides water for current and future generations, and safeguards against climatic changes and natural disasters.

Policies:

» Plan for emergency response and preparedness, engaging multiple departments within the City, as well as County, regional and State government.

Quantity

Provide abundant, safe drinking water for current and future generations of residents by protecting and managing groundwater.
Policies:

» Strive toward flat total annual water usage through 2030.

» Promote water efficiency efforts based on best management practices and public awareness of sustainable water usage.

Quality

Continuously provide safe, reliable, and clean drinking water that meets all state and federal quality standards and guidelines. High quality water also requires adequate pressure and flow.

Policies:

» Failure to address chloride levels before reaching the wastewater treatment plant will impact downstream surface waters if removing chloride is not possible. If processes to remove chloride are added to wastewater treatment plants, then the failure to address chloride levels in the City may result in higher costs passed from the Metropolitan Council onto Woodbury residents.

Planning for the Future

Maintain drinking water quantity and quality at an affordable cost and expand service to new development. The City will continue to fund water system operation and maintenance through appropriate usage charges and plan for the replacement of aging components of the water system. In addition, the City will fund construction of new trunk facilities, wells and storage through area and connection charges and provide water service for developing areas in a manner consistent with the WSSDP and this Comprehensive Plan’s Land Use Chapter.

Policies:

» Continue to phase development based on the availability on municipal services.

» Develop water supply infrastructure along with the sanitary sewer system in an efficient and orderly manner.

» Continue to operate the system optimally, avoiding deferred or emergency maintenance, and fund the system appropriately.

Terms/Abbreviations

DNR - Department of Natural Resources
DWSMA - Drinking Water Supply Management Area
EPA - Environmental Protection Agency
GPCD – gallons per capita per day
GWMA - Groundwater Management Area
HBV - Health Based Value
HRI - Health Risk Index
HRL - Health Risk Limits
MDH - Minnesota Department of Health
MGD - million gallons per day
MnTAP - Minnesota Technical Assistance Program
PFBA – Perfluorobutyrate
PFAS - Monitor per- and polyfluoroalkyl substances
PFOA - Perfluoroctanoic acid
PFOS - Perfluorooctane Sulfonate
SWWD - South Washington Watershed District
WHPP - Wellhead Protection Plan
WRPP - Water Resources Policy Plan
WSSDP - Water Supply, Storage and Distribution Plan

MN STATUTE

Minn. Stat. § 103G.291 PUBLIC WATER SUPPLY PLANS; APPROPRIATION DURING DEFICIENCY.

Subdivision 3. Water supply plans; demand reduction.

(a) Every public water supplier serving more than 1,000 people must submit a water supply plan to the commissioner for approval by January 1, 1996. In accordance with guidelines developed by the commissioner, the plan must address projected demands, adequacy of the water supply system and planned improvements, existing and future water sources, natural resource impacts or limitations, emergency preparedness, water conservation, supply and demand reduction measures, and allocation priorities that are consistent with section 103G.281. Public water suppliers must update their plan and, upon notification, submit it to the commissioner for approval every ten years.

(b) The water supply plan in paragraph (a) is required for all communities in the metropolitan area, as defined in section 473.121, with a municipal water supply system and is a required element of the local comprehensive plan required under section 473.859.

(c) Public water suppliers serving more than 1,000 people must encourage water conservation by employing water use demand reduction measures, as defined in subdivision 4, paragraph (a), before requesting approval from the commissioner of health under section 144.383, paragraph (a), to construct a public water supply well or requesting an increase in the authorized volume of appropriation. The commissioner of natural resources and the water supplier shall use a collaborative process to achieve demand reduction measures as a part of a water supply plan review process.

(d) Public water suppliers serving more than 1,000 people must submit records that indicate the number of connections and amount of use by customer category and volume of water unaccounted for with the annual report of water use required under section 103G.281, subdivision 3.

(e) For the purposes of this section, “public water supplier” means an entity that owns, manages, or operates a public water supply, as defined in section 144.382, subdivision 4.
EXISTING CONDITIONS

Resilience

For the City to provide an adequate supply of clean drinking water to residents, now and in the future, consideration of climate change and other threats facing infrastructure is necessary. Trend analysis has revealed that the region is experiencing greater frequency and intensity of precipitation events. Large rain events may lead to flooding, posing a risk to the power grid and transportation network, which would increase the difficulty to respond to a water emergency.

As stated above, the City has an approved Water Supply Plan. Part two of the Plan includes an emergency response plan, operational contingency plan, and emergency response procedures.

Additional issues when considering water system resilience include:

» Groundwater recharge capacity and sustainable withdrawal
» Emergency response protocol, particularly for vulnerable populations
» Adequate power supply for infrastructure, particularly during severe weather and associated power outages
» Impacts of chloride and other contaminants on surface water and groundwater

Quantity

Figure 11-1 shows the existing City water system including watermains, wells, storages tanks (elevated and ground) and booster stations.

The key to evaluating the needs of the future water infrastructure is to determine the future water demand projections through 2040 (Table 11-1). For this analysis, an aspirational goal has been created which the City intends to utilize to guide the creation and implementation of water conservation initiatives. For future infrastructure planning and to meet the water needs through 2040, the City has identified the projected maximum daily demand.

<table>
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<tr>
<th>Year</th>
<th>Projected Total Population (1)</th>
<th>Projected Population served</th>
<th>Projected Total Per Capita Water Demand (GPCD)**</th>
<th>Projected Average Daily Demand (MGD)**</th>
<th>Aspirational Maximum Daily Demand Goal (MGD) (2)</th>
<th>Projected Maximum Daily Demand (MGD) (2)</th>
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<td>123</td>
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<td>19.5</td>
<td>28.2</td>
</tr>
</tbody>
</table>

Table 11-1. Water Demand Projections
Figure 11-1. Existing Water Distribution System

Existing Water Distribution System - Figure 11-1

Legend

- Booster
- Existing Wells
- Exiting Interconnect
- Ground Storage Tanks
- Towers
- Lakes
- Parcels
- County Boundaries
- Woodbury Boundary
- Unserved Area

Existing Pipe Sizes

- 6 - 8
- 10
- 12
- 16
- 18
- 20
- 24
- 30

Updated: January 2019

Woodbury 2040 Comprehensive Plan

August 2019

WATER SUPPLY
Permitted Wells

The City is within the North and East Metro Groundwater Management Area (GWMA) as defined by the DNR. GWMAs are established in a specific area where all suppliers are using a common aquifer and share similar concerns, particularly water quantity. The GWMA provides a framework for a comprehensive approach to ensuring that groundwater supplies are adequate to meet human needs now and in the future, while protecting lakes, streams, wetlands and other water resources.

The White Bear Lake lawsuit, filed in 2014 and appealed by the DNR in 2017, has the potential to impact the permitting of new withdrawals in the North and East Metro GWMA. Most of Woodbury is outside of the current five mile radius of White Bear Lake as specified in the Ramsey County judge’s order, August 2017. However, the original lawsuit and subsequent appeals will likely impact groundwater permitting and use decisions across the entire state, not just within the North and East Metro GWMA.

Woodbury operates nineteen wells in three well fields: the Tamarack Well Field, the East Well Field and the South Well Field. The East Well Field currently includes three wells; however, the DNR is concerned that these wells may impact the baseflow of Valley Creek, a trout stream with its headwaters in close proximity to the East Well Field. Based on this, the amount of water that can be pumped from the East Well Field is limited by permit and the City is not proposing additional wells in this area. As part of the City’s appropriation permit to operate these wells, the City owns and maintains a network of groundwater monitoring wells and submits bi-annual reports on Valley Creek flows to the DNR.

The newest well (Well 19) and future wells will be located in the southern portion of the City. Due to location, the South Well Field has the potential to create conflict with private wells, adjacent municipal wells and is closer to groundwater contamination plumes than the City’s other well fields. Development in this area is projected to need additional supply, and its existing land use authority allows the City to protect supply through limiting infiltration and other best management practices.

Sustainable Water Future for Woodbury – Quantity

Council adopted the Sustainable Water Future for Woodbury Strategic Initiative for 2015-2017 and 2017-2019. Additional information regarding the Strategic Initiative can be found in Chapter 9, Natural Resources.

The desired outcome of the initiative related to water quantity is:

Strive towards flat total annual water usage (community-wide aquifer withdrawal including contamination mitigation and private wells) through 2030 (based on a five year rolling average, with 2014 as the base).

Strategies to achieve this outcome include:

1. Implement water conservation and efficiency programs, including monitoring, reporting, and marketing.

2. Use the Water Supply Plan, the Comprehensive Plan, the Surface Water Management Plan, and other long-range planning tools to set the vision and goals of City water infrastructure systems.

3. Participate and be a leader in regional groundwater policy discussions.

4. Establish the City’s position and involvement level on water-related legal issues and monitor associated cases.

5. Be proactive in the legislative process, including but not limited to, groundwater
management and protection, technology and emerging issues.

**Water Efficiency**

Water efficiency is a critical component of the Strategic Initiative described above. Efficiency is smart water usage that employs various tactics to reduce water consumption. Education, outreach and incentives are important tools for public awareness of efficient water usage, as well as for affecting behavior. Since 2014, the City has taken steps to provide stable funding for water efficiency programming, as well as acquiring grant funding from partner organizations that share in water efficiency goals. The timeline below details steps taken between 2014 and the writing of this plan.

Two programs were approved in 2016 and 2017 by the City Council: the Commercial Irrigation Cost Share and the Residential Irrigation Controller Program. Both programs were designed and tested through pilot studies. The water efficiency incentive programs have been funded by small rate increases to customers eligible for participation. Future efficiency programs will follow a similar process and may target indoor water efficiency, sprinkler head replacements or other efficiency improvements. Continuation and extension of the water efficiency incentive program and its funding will allow the City to assist different groups in improving water use efficiency. This program relies on partners that share in the City’s commitment to responsibly managing groundwater, including Washington County,

**TIMELINE OF WATER EFFICIENCY PROGRAMS**

- **City staff completes internal water summit planning meeting.**
- **City receives Environmental Assistance grant from PCA to increase education efforts.**
- **City Council adopts Water Resources Policy Statement and Strategies.**

- **Minnesota Technical Assistance Program (MnTAP) sponsors intern with the City to study water efficiency of commercial irrigation systems.**
- **South Washington Watershed District (SWWD) provides cost share funding for 2-year pilot study of homeowners association irrigation retrofit program.**
- **City receives funding from Metropolitan Council and Washington County to update city-owned irrigation systems with efficiency technology.**

- **MnTAP sponsors intern with the City to study homeowner irrigation controller efficiency programming.**
- **City Council adopts Council Directive: Water Efficiency Incentive Program (CD-ENGPW4.11) and authorizes the first program for commercial and homeowners association irrigation system upgrades.**
- **City Council approves rate increases to commercial and homeowners association irrigation systems to fund efficiency programs.**

- **SWWD and Washington County provides funding for homeowner irrigation system pilot study.**
- **City Council approves second program under CD-ENGPW4.11, establishing the Residential Irrigation Controller Program.**
- **City Council approves second rate increase for commercial and homeowner association irrigation customers and rate adjustment for residential water users to help fund efficiency programs.**
- **Eagle Valley Golf Course irrigation system was updated to improve efficiency.**
- **City Council updated City Code to comply with Minnesota State Statutes regarding the installation of moisture-sensing technology on all irrigation systems and the requirement that new irrigation controllers be WaterSense certified.**
Washington Conservation District, watershed districts, the Metropolitan Council and State agencies. The City will also continue to provide educational resources through the City website and other communication tools on water efficiency topics such as landscaping and lawn watering tips.

The Woodbury City Council has adopted a lawn watering policy that permits an odd/even watering schedule and bans watering between noon and 5 p.m. each day. This policy was established in 2007 and may need updating to include reference to current technology or changes in response to water demand or drought. Additionally, City Ordinance has been modified to comply with Minn. Stat. § 103G.298 and requires the installation of a WaterSense certified controller for all newly installed irrigation controllers. Additional implementation, enforcement and further ordinance updates will be pursued as necessary.

Quality

Sustainable Water Future for Woodbury - Quality

The desired outcome of the initiative related to water quality is to:

> Continuously provide safe, reliable, clean water that meets all state and federal standards and guidelines for quality.

Strategies to achieve this outcome include:

» Monitor per- and polyfluoroalkyl substances (PFAS) contamination, and plan for consequences of emerging issues.

» Continue the wellhead protection program and reflect its goals in the Comprehensive Plan.

» Manage surface water to protect the aquifer.

PFAS Contamination

The Minnesota Department of Health (MDH) has been monitoring the City’s municipal wells for PFASs, a family of manmade chemicals that have been used for decades to make products that resist heat, oil, stains, grease and water. A specific type of PFAS – PFBA – was originally reported in Woodbury wells in 2007. As a result of advancements in detection technology, monitoring began identifying the presence of other PFASs in 2012. The concentrations of all PFASs detected were below the Health Risk Limits (HRL) established by MDH at the time.

PFASs were produced and introduced to the environment years before their potential to harm human health was understood or regulated. Continued advances in detection technology results in new chemicals being identified through monitoring (including PFASs not currently monitored). The City of Woodbury

As this plan was bring written, the State of Minnesota settled its lawsuit against 3M Company, filed in 2010, in return for a grant of $850 million. The top two priorities for use of the settlement funds are to ensure safe drinking water and to enhance natural resources. Nine cities, including Woodbury, and two townships in the east metropolitan area were named in the settlement as the communities damaged. The Minnesota Pollution Control Agency and Department of Natural Resources were granted the funds with the intent that the state agencies will work with the eleven communities to accomplish the priorities of the settlement.
must continue to work with State agencies to provide safe and reliable water.

In 2016, the U.S. Environmental Protection Agency (EPA), and subsequently the MDH, reduced their drinking water protective guidance level for two PFASs - PFOA and PFOS. As a result of these changes, MDH notified the City that water from five of Woodbury’s 19 municipal wells exceeded either a PFAS Health Based Value (HBV) or a Health Risk Index (HRI) value, or both. Several of these instances exceeded the HBV or HRI value only slightly and had been below on previous sampling events. MDH indicated that by the time water reaches users in Woodbury, the amount of PFAS in the water is under the HBV and HRI. This is due to mixing of water from various wells within the distribution system, reduced use of the impacted wells and rotation in well operation.

**Wellhead Protection Plan**

The City has completed and is actively implementing a Wellhead Protection Plan (WHPP) in accordance with *Minnesota Rules Chapter 4720* and MDH requirements. Wellhead protection is a means of safeguarding public water supply wells by preventing specific contaminants from entering the area that contributes water to the wellfield over a specific period of time. These plans are updated every 10 years or when a new well is installed. Wellhead protection plans consist of two parts. The first part of the WHPP includes a delineation of the capture zones of the aquifer that contribute water to wells and an assessment of well vulnerability. This delineation produces the Drinking Water Supply Management Area (DWSMA), seen in Figure 11-2. Woodbury’s wells are considered vulnerable to contamination, as defined by MDH, due to the time it takes for water to move from the land to the aquifer. *City Code, Chapter 27 Section 8*, identifies restrictions for land uses in proximity to existing or future well sites in an effort to protect the quality of the groundwater resource. The second part of the WHPP involves the creation of goals, objectives, an action plan, evaluation program, and contingency plan.

As the water system grows, and areas around wells develop and redevelop, it is the City’s responsibility to continue to update the WHPP. Additionally, future modeling may show that Woodbury’s DWSMA extends into other municipalities or that DWSMAs of other municipalities extend further into Woodbury. This overlap is most likely to occur with the City of Cottage Grove. As more jurisdictions share water supply capture zones, more collaboration will be required to secure safe drinking water. Additionally, the City will continue to restrict land use and stormwater infiltration practices around wells to ensure safe drinking water and encourage programs such as abandoned well sealing and storage tank and pipeline management.

**Water Treatment**

The current treatment of the City’s water consists of chlorinating and fluoridating the water supply before entering the distribution system. Additionally, two wells are treated with low levels of polyphosphate to sequester minerals present in the groundwater supply.

There is growing concern around the Twin Cities Metropolitan Area that chloride levels are rising in surface waters and shallow groundwater. Snow and ice management is one of two significant sources of these chlorides. The other source is individual residential water softeners. While the water used inside homes does go to a wastewater treatment plant, these plants are not designed for chloride removal. The only known methods of removing chloride in water is through reverse osmosis and distillation, which is generally considered to be costly and impractical for treatment plants. Failure to address chloride levels before reaching
Figure 11-2. Drinking Water Supply Management Area (DWSMA)

Legend:
- Booster
- Existing Wells
- Exiting Interconnect
- DWSMA
- Lakes
- Parcels
- County Boundries
- Woodbury Boundary

Area has not been delineated yet for well 19
the wastewater treatment plant will impact downstream surface waters if removing chloride is not possible. If processes to remove chloride are added to wastewater treatment plants, then the failure to address chloride levels in the City may result in higher costs passed from the Metropolitan Council onto Woodbury residents.

Planning for the Future

Sustainable Water Future for Woodbury – Planning for the Future

The desired outcome of the initiative related to planning for the future is:

Maximize options and opportunities to maintain water quality and availability in the face of threats to water resources.

Strategies to achieve this outcome include:

» Use the Water Supply Plan, the Comprehensive Plan, the Surface Water Management Plan, the Wellhead Protection Plan, and other long-range planning tools to set the vision and goals of City water infrastructure systems.

» Explore interconnect options with other cities, future well location options, alternative water sources and private well considerations for existing and new wells.

» Participate and be a leader in regional groundwater policy discussions, including continued participation in the Washington County Municipal Water Coalition.

» Establish the City’s position and involvement level on water-related legal issues and monitor associated cases.

» Be proactive in the legislative process regarding groundwater management and protection.

Funding

The water supply system of Woodbury will need to be robust and resilient to meet the needs of the existing and future population. In addition to the challenges detailed elsewhere in this chapter, the City will need to finance installation of new infrastructure and the inspection, maintenance and replacement of the existing water system.

It is City policy that new infrastructure is paid for by development through the use of area and connection charges. Replacement and rehabilitation are paid for by existing users through usage charges. These charges must be regularly evaluated...
and modified to ensure inspection, maintenance, replacement and efficiency is properly funded.

**Private Wells**

Private wells are used in areas of the City that are not connected to the municipal water supply. There are around 600 private wells within the City. As the water supply and sewer systems are extended into developing areas, it is important to review the location of private wells and the ability to serve those areas with municipal services. The City must review the potential of providing services to areas where infrastructure was not envisioned and is not currently proposed, but may be desired in the future, such as the southwest corner of the City.

The installation and removal of private wells can also impact wellhead protection planning, and the installation of municipal wells can negatively impact private wells through drawdown. Additionally, inspection and maintenance of private wells is the responsibility of the homeowners. Neither the City nor the State require regular testing of these wells. The safety of individual wells, including PFAS contamination, is a concern for current and future private well users.

**Alternative Water Sources**

Managing Woodbury’s existing potable water supply has resulted in system-wide operational modifications and efficiency programs to ensure quality and reliability. These operational changes include limiting production of the East Well Field to protect high value natural resources, limiting production from five Tamarack Well Field wells due to existing contamination, and implementing robust water efficiency programs to minimize the overall draw on the potable water supply.

Transitioning to a regional supply system using surface water as the drinking water source has been proposed for parts of the North and East Metro GWMA, however this is not the City-preferred solution to the water supply challenges the
City currently faces.

**IMPLEMENTATION**

**Resilience**

» Manage water resources through the “One Water” vision, including proper management of surface water runoff to protect drinking water and promote groundwater recharge without contamination.

» Continue to monitor and prepare for threats to the water supply, storage and distribution system.

» Implement and update the City’s Water Supply Plan as necessary.

» Collaborate with DNR, MDH, Metropolitan Council and other agencies on best management practices related to resilience of the water supply, storage and distribution system and sustainable use of the aquifer.

» Develop programs to minimize water usage during periods of prolonged drought.

» Work with partners to evaluate relationships between aquifer withdrawals and surface water features, and respond appropriately with proper management, monitoring and analysis.

» Pursue shared services and interconnections where feasible to add resilience for each community involved.

» Sustain the City’s water supply through conservation by reducing the demand for water, improving the efficiency of water use and reducing loss and waste of water.

» Work with partners to identify opportunities for sharing information, reducing duplicate work, and partnering on projects that improve understanding about aquifer productivity and extent.

» Partner with DNR and neighboring communities to use water in accordance with the approved Groundwater Management Area plan.

» Support collaborative efforts to periodically review local water supply risks and potential alternatives to mitigate those risks. Technical advances, regulatory adjustments and sub-regional developments can present new opportunities to enhance the resiliency, sustainability, and affordability of providing water services.

More information on implementation of resilience planning can be found in
Chapter 9. Natural Resources

Quantity

Make improvements (wells, treatment, storage, etc.) to the system based on water demand projections in Table 11-1, to serve future development and redevelopment.

Permitted Wells

» Apply for permits from the DNR as new water supply wells are needed. The actual number of wells and locations will depend on factors such as land use changes, PFAS contamination, efficiency improvements, capacity of proposed wells, storage and the ability to obtain permits for new water supply wells.

» Strive to decrease water supply demand, as much as possible, to minimize the number of new municipal production wells necessary.

» Continue to invest in efficiency opportunities.

» Evaluate future water supply sources, being proactive in the regulatory process that impacts groundwater management.

Sustainable Water Future for Woodbury – Quantity

» Strive towards flat total annual (community-wide aquifer withdrawal including contamination mitigation and private wells) water usage through 2030 (based on a 5-year rolling average with 2014 as the base).

» Implement water conservation and efficiency programs, including monitoring, reporting, and marketing.

» Require infiltration practices that promote the recharge of groundwater where appropriate.

Water Efficiency

» Continue to encourage responsible water use by residents, businesses and homeowner associations.

» Encourage alternative landscaping techniques and other water conservation efforts.

» Continue to implement the Water Efficiency Incentive Program with efforts that target specific users to decrease annual average water use.

» Assess and adjust water utility rates and rate structures to create a disincentive to waste water and generate revenue to incentivize customers to update technology or change behaviors to use less water.

» Pilot and administer efforts under the Water Efficiency Incentive Program that address water wasted from indoor water fixtures, sprinkler heads, mismanaged irrigation systems, and other opportunities for water efficiency.

» Fund water efficiency measures in an effort to decrease demand on the water supply and increase funding as necessary.

» Continue to engage and partner with other local agencies that share responsibility to properly manage the groundwater resource.

» Educate community members on water efficiency best practices through the City newsletter, website, social media and other platforms.

» Review and update City lawn watering policy and related ordinances.
» Continue and improve enforcement of policies and ordinances that reduce water use.

Quality

Sustainable Water Future for Woodbury - Quality

» Continuously provide safe, reliable, clean water that meets all state and federal standards and guidelines for quality.

» Monitor PFAS contamination, as well as emerging issues, such as chlorides. Respond to issues as solutions become available.

» Collaborate with partners, including MDH, to support local actions that prevent the spread of contamination. This may include implementation of source-water protection plan measures to mitigate public health risks.

» Operate the system to minimize customer complaints due to National Secondary (aesthetic) Drinking Water Regulations.

» Continue implementation of the Wellhead Protection Program. The City’s Implementation program for these items is described in more detail below.

» Provide educational opportunities for residents regarding the proper use of lawn fertilizers.

» Regulate land use adjacent to existing and proposed well locations to protect the groundwater resource.

Wellhead Protection Plan (WHPP)

» Implement the City of Woodbury’s approved WHPP, and update as needed.

» The following implementation items are included in the WHPP Part II document, approved in 2015:
  • Implement an aquifer monitoring plan.
  • Incorporate Wellhead Protection Planning in and around the Drinking Water Supply Management Area (DWSMA).
  • Consider wellhead protection as the water system is expanded for growth.
  • Manage groundwater wells to mitigate impacts to the DWSMA.
  • Manage material storage tanks identified within the DWSMA.
  • Cooperate with Washington County to manage individual sewage treatment systems.
  • Consider wellhead protection when reviewing stormwater planning within the DWSMA.
  • Use public education to raise awareness regarding proper disposal of household hazardous wastes, turf management, and shallow disposal wells.

Wellhead Protection Plan

In 2018, the City began the Amendment Process for the WHPP to include Well 19 and the South Well Field into the Plan.
• Develop guidance for City staff on day-to-day decisions that may affect the wellhead protection program.

**Water Treatment**

» Consider installation of water treatment facilities as deemed necessary to protect public health. Additional treatment facilities may include the following, dependent on water quality:

- Chemical addition of phosphate solution at additional wells to sequester iron and manganese.
- Construction of iron and manganese removal filter plant(s).
- Filtration of iron and manganese followed by softening process to remove hardness. Softening accomplished with either lime softening or reverse osmosis. This process would eliminate the need for individual home water softeners, limiting the addition of chlorides to wastewater treatment plants.

» Monitor and further explore the costs and benefits to system-wide softening and advanced treatment options, such as reverse osmosis.

» Monitor the progression, and actions taken by municipalities, regarding chloride contamination.

» Complete cost-benefit assessment of building a softening plant or promoting high efficiency water softeners for better management of individual softening.

» Educate community members to decrease chloride use, with a focus on individual water softeners and snow and ice management.

» Continue to partner with local organizations that offer training and incentives to improve chloride management strategies that limit the use and protect resources.

» Improve City operations and encourage the County and Minnesota Department of Transportation to limit the amount of chloride entering surface and groundwater systems from annual snow and ice management.

» Acquire parcels through the development process to locate potential future treatment facilities. Size parcels for multiple treatments but install facilities as needed.

**PFAS Contamination Treatment**

» Continue to track and monitor PFAS levels and contaminants of emerging concern in City wells, in partnership with MDH.

» Investigate treatment options to remove PFASs from drinking water.

» Work to ensure no, or limited, decrease in service for water utility customers.
» Partner with neighboring communities to treat water if feasible.

Planning for the Future

Sustainable Water Future for Woodbury – Planning for the Future

» Complete infrastructure projects systematically to handle growth and provide water to all users within the water system.

» Continue to build a water supply system that is robust and resilient.

Future Water System

The future water system will include new distribution lines, wells and storage. The general location of these is shown in Figure 11-3. It should be noted that the exact locations likely will be different than shown due to the way in which development occurs, the size of developments, and availability of land. The final locations will be adjusted based on size and layouts of developments and in coordination with adjacent communities, as appropriate. All developments will occur according to the staging plan, and in compliance with Section 21-16 of the City Code, the “Premature subdivision prohibited” ordinance, infrastructure will be provided as planned.

For future residential developments, 8-inch diameter piping will be sufficient for most of the watermains. Some 12-inch and larger trunks are shown going through larger developments, between developments, and for non-residential areas.

The water system as planned includes reserve capacity to accommodate the future connection of rural areas in the southwest and Bailey Lake areas of the City. It should be emphasized that these rural areas are not part of the proposed urban area in the 2040 Land Use Plan. Rather, it is proposed to oversize trunk pipes in the southwest area and to provide additional storage at the proposed south water tower site. Woodbury would likely build these trunk pipes and storage in the near term, and this oversizing would allow flexibility if, at some point, changing conditions prompted the City to serve the southwest rural estate areas with water and sewer. Additional wells to provide supply would not be constructed in the near term – these would be added only if the area is served in the future.

Depending on development, additional storage is planned in the northeast and south to provide required pressure and capacity. Facilities may be upsized to
provide additional storage, which may limit the number of new wells required.

New wells are also planned to support future growth and potential removal of existing wells from the current system. Several potential future well sites are shown on Figure 11-3, as exact number and locations of wells are not yet known. The City will also look for creative solutions to meet the long-term (2040) supply demands, beyond adding new wells. Co-location, or shared water supply wells with adjacent communities, is a possibility that provides additional supply, helping meet firm demand requirements while reducing the number of wells needed. Final siting for wells shall consider potential for interference or drawdown of municipal water supply wells.

Future treatment is also possible and it is anticipated that treatment facilities would be centered within the well fields to minimize the amount of raw water piping required. Potential locations are noted in Figure 11-3.

The City prioritizes decreasing water use per capita due to quantity and quality concerns, the analysis performed for the WSSDP included modeling with 95 and 105 gallons capita per day (GPCD). The results show no significant changes in pressure throughout the City between the two scenarios. The model indicates that the City’s water system is able to provide enough water even if the future per capita day use is greater than anticipated.

The City will continue to manage development based on the availability of existing and future services for water and sewer. Development will occur in an orderly manner as City infrastructure becomes available, per the land use and phasing plan.

**Funding**

- Operate system efficiently so that water is affordable.
- Continue to use the Capital Improvement Plan for projects related to major water supply infrastructure including wells, storage, treatment, and the distribution system.
- Review and adjust rates to ensure a cost effective and equitable system when making improvements to water supply infrastructure.
- Fund construction of new trunk facilities, wells and towers through area and connection charges.
- Fund construction of new lateral system through assessments to the benefited properties.
- Fund water system operation, maintenance, renewal and replacement through
appropriate water usage charges.

**Aging Infrastructure**

» Maintain and replace infrastructure to have a robust and resilient water system.

» Maintain viability of the aging system by planning for and replacing services at the end of useful life.

» Plan for replacement of aging infrastructure such as wells, well houses, towers and water mains in coordination with street or roadway projects, in addition to making improvements based exclusively on infrastructure need.

» Continue to review the condition of the water infrastructure under roadways so that necessary repairs can be made along with the roadway repairs. This approach minimizes disruption to residents and is cost effective.

» Plan for future replacement of older water system facilities.

» Provide water service for developing areas in a manner consistent with the WSSDP.

**Private Wells**

» Encourage residents with private wells to participate in Washington County’s private well testing program.

» Continue to analyze issues surrounding private wells (drawdown, contamination, etc.) during the life cycle of this Comprehensive Plan and update ordinances and policies, as appropriate.

**Alternative Water Supply**

» Continue to be the water provider for residents and businesses within the community to ensure a high quality of water supply and distribution service. If this cannot be accomplished due to outside circumstances, collaboration with neighboring communities is a viable option.

» Explore options such as sharing well fields with neighboring communities, increased water restrictions, and more aggressive efficiency efforts including additional changes to usage rates and structures.

» Continue to participate in the Washington County Municipal Water Coalition or future groups that share the City’s goals for water supply.