Water Supply

Ensure a Safe & Sufficient Water Supply for Future Generations

One of the strategic priorities for environmental stewardship stated in the city's Vision 3.0 is to continue "to provide quality water to residents."

The St. Louis Park Water Utilities mission is to provide an uninterrupted supply of safe, high quality water to its customers. Water treatment operators pump, treat and deliver water to homes and businesses. In addition, Water Utilities staff also educate children and adults about drinking water and the system delivering it.

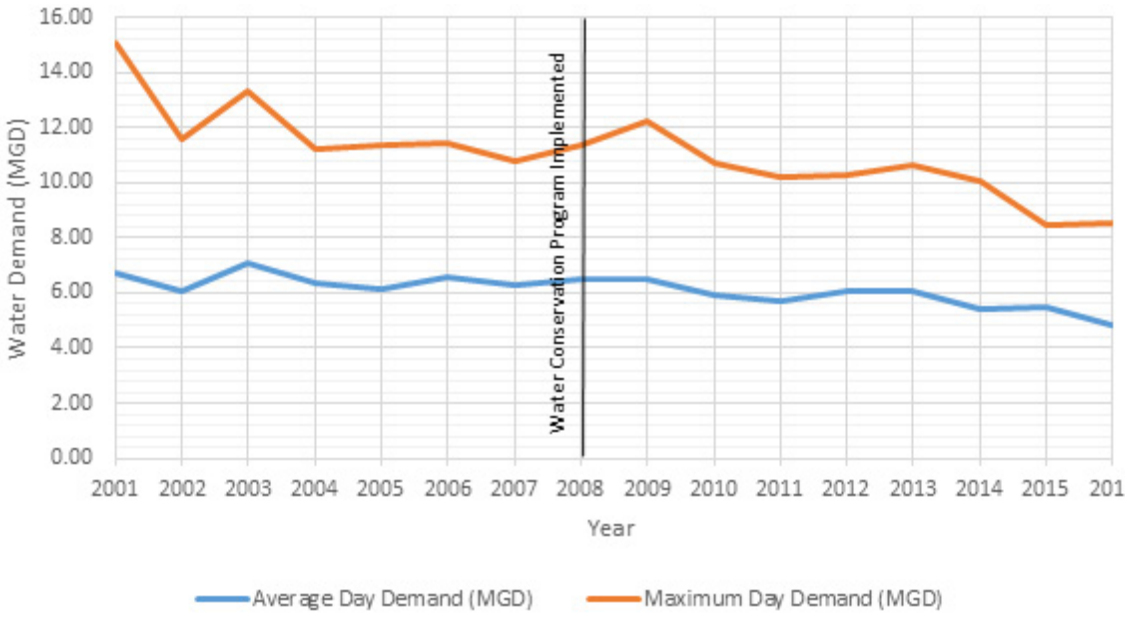
The city routinely updates its water supply plan, water rates and capital improvement plan to ensure that the plan is current and effective to meet the city's needs into the future. The purpose of the water supply plan is to ensure a safe and sufficient water supply now and in the future. The plans serve as guides for construction, operation and maintenance of the municipal water system.

Where We Have Been

Historical Water Use

St. Louis Park completed a DNR Water Emergency and Conservation Plan in October 2008 which was reviewed in conjunction with the 2030 Comprehensive Plan. Water use from 2001 to 2016 is illustrated in Figure 4-14.

Figure 4-14. Water Use, 2001-2016



More detailed information is provided in the current and previous DNR Water Supply Plans.

Trends noted over the past 10 years include:

- The population served has risen and fallen over the past 10 years ranging from 45,216 to 47,502.
- Some of the reduction in total per capita demand, average day demand and peak demand is related to loss of some commercial/industrial customers. However, most of the downward trends are likely due to the city's commitment and focus on water conservation efforts.

Growth has not occurred as rapidly as projected in previous plans, which projected the 2017 population served to be 48,610 people whereas the reported 2017 population served was approximately 47,221 people. However, future growth and increased population and resulting water demand is anticipated, as addressed in a following section.

Some key water demand factors to note include:

- Average Daily Demand: The average daily demand (total annual demand divided by 365) has begun to exhibit a downward trend over the last decade. The past five-year average is 5.3 MGD, which is a decrease from the five-year average of 6.5 MGD reported in the 2008 DNR Water Supply Plan.
- Maximum Daily Demand: Maximum daily demand over the past decade has also been exhibiting a downward trend. Maximum daily demand often occurs between June to September because of the increased water use on landscape watering, vehicle washing, and other outdoor activities. It is greatly influenced by weather patterns and drought conditions. The average maximum day was 11.6 MGD in the 2008 plan and is currently 9.3 MGD.
- Peaking Factor: The water demand peaking factor is the ratio of the average maximum day to the average day. The DNR has set a goal of reducing the average ten-year peaking factor to less than 2.6. St. Louis Park achieved this goal with a ten-year average peaking factor of 1.76 for 2008-2017. This was improvement over the previous peaking factor from 1998– 2007, which was 1.79.
- Residential Per Capita Water: The DNR has set a goal of reducing the most recent five-year average residential per capita water demand to less than 75 gallons per capita per day (gpcd). The city's recent five-year average exceeds this goal and is 60 gpcd, which was an improvement over the previous five-year average of 78 gpcd reported in the 2008 plan.
- Total Per Capita Water Demand: Total per capita water demand for St. Louis Park has begun to exhibit a downward trend since the adoption of the city's 2008 Water Conservation Plan. Over the last decade, the average total per capita water demand is 113 gpcd, which is a decline from the average of 145 gpcd reported in the 2008 plan.
- Unaccounted (Non-revenue) Loss: Unaccounted for water use is the volume of water withdrawn from all sources minus the volume of water delivered. The value represents water "lost" by miscalculated water use due to inaccurate meters, water lost through leaks or water that is used but unmetered or otherwise undocumented. The DNR has set a goal of reducing unaccounted for water to less than 10%. St. Louis Park's recent five-year average unaccounted-for water was 15%. This was an improvement over the previous five-year average of 16% reported in the 2008 plan. The unaccounted-for water has been greatly reduced the past two years due to water meter replacements and is at 7%.

Aquifer Management

From 1917 to 1972, a company in St. Louis Park operated a coal tar refinery and wood preserving plant known as the Republic Creosote Company. Releases of coal tar and creosote to the environment contaminated the soil and groundwater around the site with polycyclic aromatic hydrocarbons (PAH). Low levels of PAH were detected in some of the St. Louis Park municipal water supply wells. Six wells were closed prior to 1981 and the area was eventually declared an EPA Superfund site. Under the terms of a 1986 Consent Decree and Remedial Action Plan, municipal wells (SLP-4, SLP-10, and SLP-15) have since been reopened with granular activated carbon (GAC) filtration units that effectively remove PAH from the drinking water. The 1986 Consent Decree required the continuous pumping of municipal wells SLP-4 and SLP-10 or SLP-15. The program of continuous pumping coupled with GAC treatment effectively controlled the spread of contamination and allowed the city to use the wells to produce safe high quality water to meet the demands of residents.

Where We Are Today

Aquifer Management

The city is engaged with the Minnesota Pollution Control Agency (MPCA), the Minnesota Department of Health (MDH), and U.S. Environmental Protection Agency (EPA) to amend the 1986 Consent Decree and Remedial Action Plan. One of the key changes being implemented is the use of current, risk-based water quality standards for PAH to replace outdated water quality criteria from 1986. Because of this change the city will be able to operate its water supply system based on water demand without a need for continuous pumping to control PAH contamination. If state or federal water quality standards change in the future, the amended Consent Decree and Remedial Action Plan requires that those new standards be used to assess water quality.

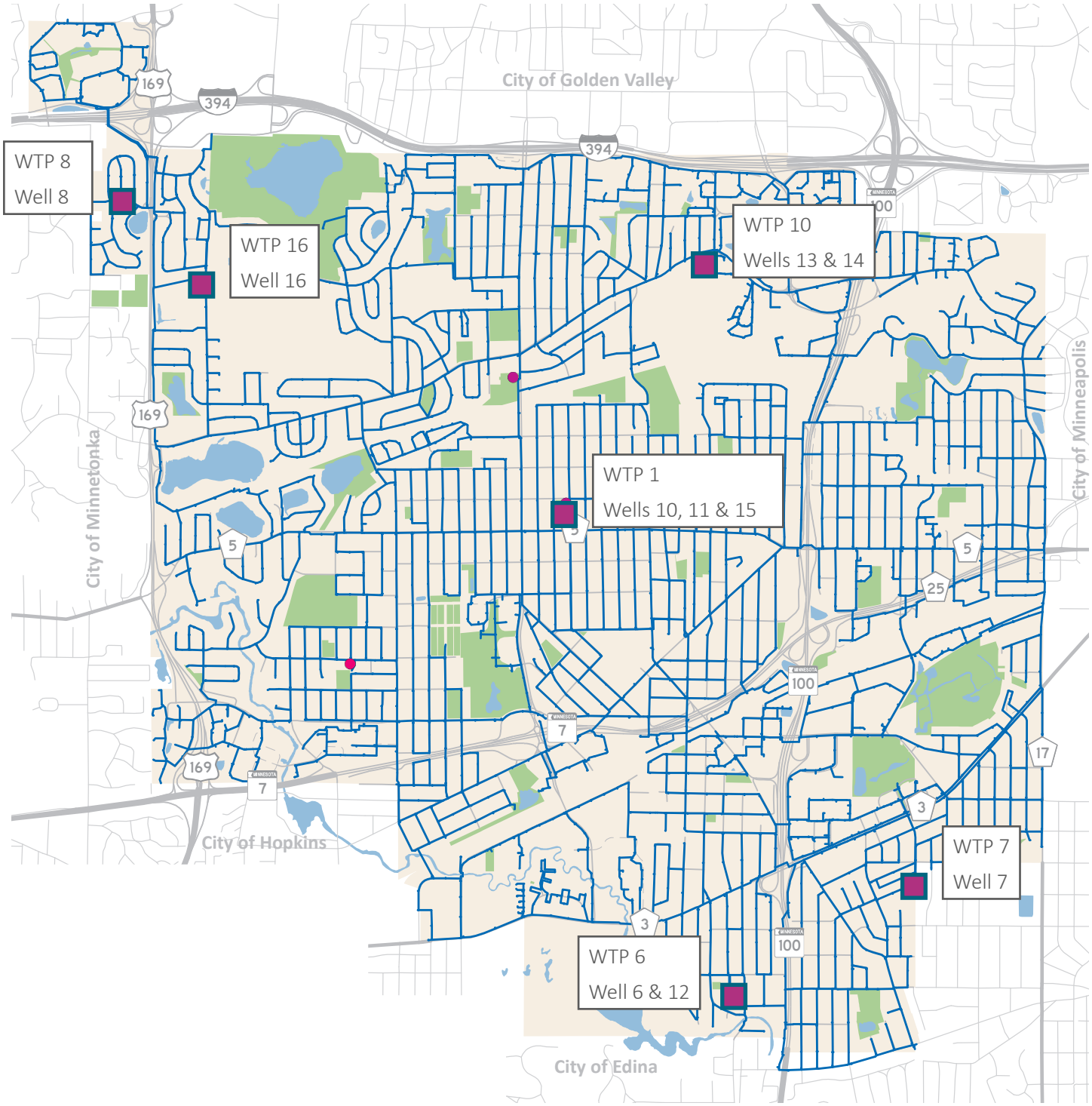
Water Facilities

The St. Louis Park water system consists of 10 wells, six treatment plants, four reservoirs, three elevated water towers, and distribution components including pipes, valves, and hydrants, as shown in Table 4-9, Figure 4-15, and Figure 4-16.

Table 4-9. Summary of Well Data

WELL NO.	AQUIFER	CAPACITY (GALLONS PER MINUTE)	STATUS OF OPERATIONS
Well 3	Platteville- St. Peter	NA	Abandoned
Well 4	Prairie du Chien- Jordan	1200	Active
Well 5	Prairie du Chien- Jordan	NA	Inactive-Water Level Monitoring
Well 6	Prairie du Chien- Jordan	1200	Not operational- Requires WTP Upgrade
Well 7	Prairie du Chien- Jordan	NA	Water Level Monitoring
Well 8	Prairie du Chien- Jordan	1200	Active
Well 9	Prairie du Chien- Jordan	N/A	Not Operational. May be sealed.
Well 10	Prairie du Chien- Jordan	1250	Active
Well 11	Mt. Simon- Hinckley	1200	Active
Well 12	Mt. Simon- Hinckley	1150	Active
Well 13	Mt. Simon- Hinckley	1200	Active
Well 14	Prairie du Chien- Jordan	1100	Active
Well 15	Prairie du Chien- Jordan	1250	Alternate
Well 16	Prairie du Chien- Jordan	1150	Active
Well 17	Mt. Simon- Hinckley	NA	Abandoned
Total Capacity of Active & Alternate Wells – 9600 gpm/ 13.8 MGD* Firm Capacity (Largest well out of service) – 8400 gpm/ 12.1 MGD *When Wells 10 & 15 are both running their combined capacity is 1400 gpm			

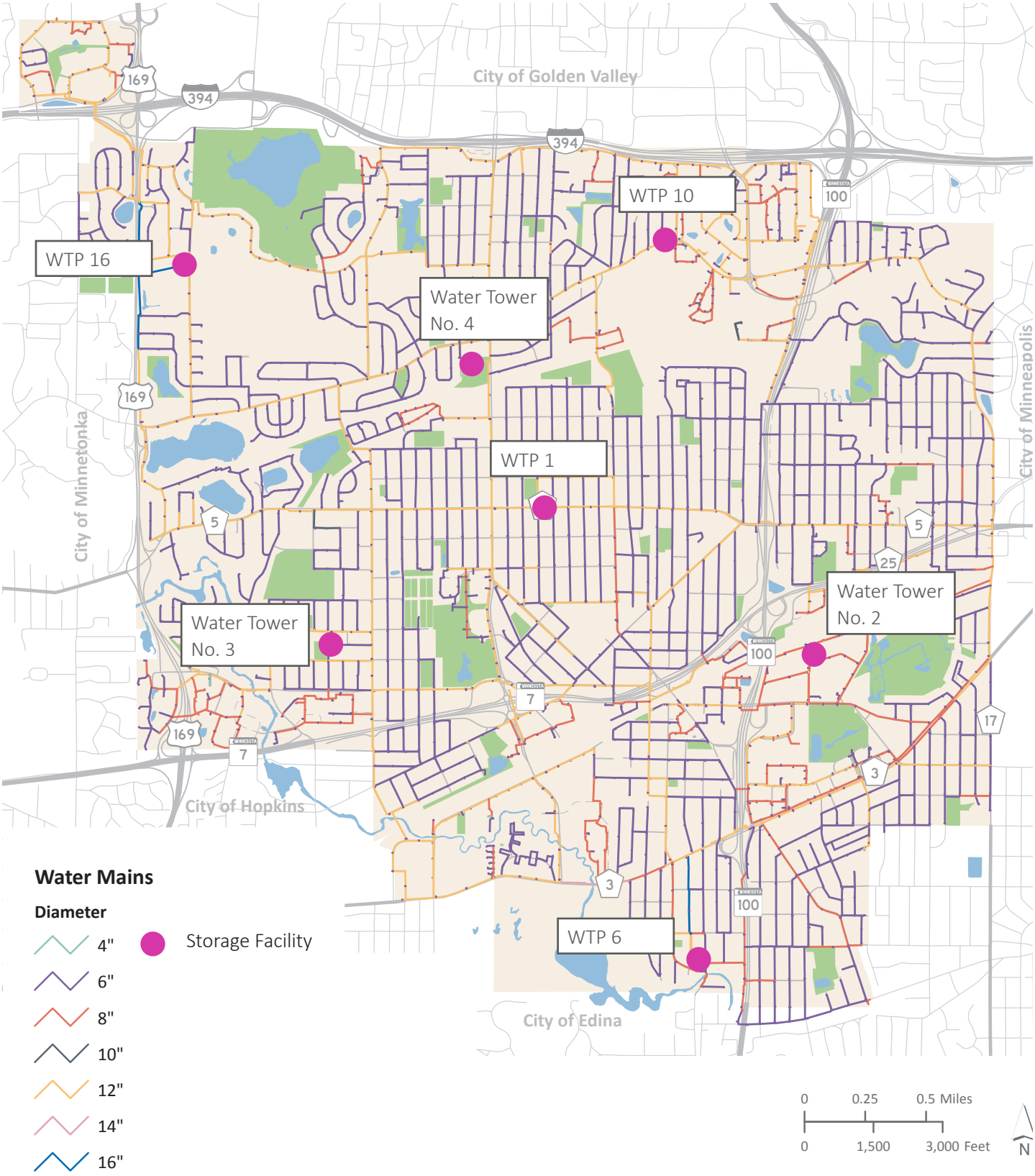
Figure 4-15. Water Treatment Plants



Source: City of St. Louis Park

2017 City of St. Louis Park

Figure 4-16. Water Distribution System



Source: City of St. Louis Park

2017 City of St. Louis Park

Water Supply

The City of St. Louis Park derives its supply of water from a series of 10 active wells that draw on the Prairie Du Chien-Jordan and Mount Simon-Hinckley aquifers. The wells are located throughout the city. The total water production capacity of the city's active and alternate wells is 9600 gpm (13.8 MGD). The firm capacity of the system, which assumes the largest well out of service, is 8,400 gpm (12.1 MGD). To meet the needs of the system, firm capacity should equal or exceed the maximum day demand in accordance with American Water Works Association recommendations. The current firm well capacity exceeds the most recent 5 year average maximum day demand of 9.3 MGD.

Water Treatment

The city has six treatment plants (WTPs) that are located near city wells. The city's ground water contains many minerals that affect overall water quality, and its treatment plants are designed to remove the nuisance minerals iron and manganese through a filtration process. Some of the wells contain elevated levels of radium, and these wells require filtration and additional chemical injection to reduce the amount of radium to acceptable levels. Two wells also require additional treatment to remove organic contamination.

Currently, the city is treating the contaminated ground water at WTP 1 with granular activated carbon (GAC), which lowers the levels of contaminants to trace levels that meet all state and federal requirements established in remedial action programs. GAC is no longer needed at WTP 4. In addition, chlorine is added at all WTPs to the water to prevent contamination from microorganisms; and to improve taste and odor. Minnesota statutes also require the addition of fluoride for the protection of children's teeth.

The city was advised in early 2016 of exceedances of health risk levels, set by the MDH and at much lower limits than those of the EPA, for some types of volatile organic compounds (VOCs) at WTP 4. Before receiving the advisory, the city was already working with MDH to develop a short-term solution to lower VOC levels at WTP 4. This short-term solution lowered certain VOC levels, including vinyl chloride, at WTP 4, but other VOCs such as trichloroethene (TCE) continued to increase, prompting the city to install an air stripping process at WTP 4.

Operators check the treatment system every day for proper operation of the filtration and chemical systems to ensure that water quality standards are met. The operation of the water treatment process is controlled by a programmable logic controller (PLC) that transmits operational data to a system control and data acquisition system (SCADA) which allows the treatment plants and wells to be remotely operated and monitored.

Water treatment plant capacity is 9600 gpm (13.8 MGD) and exceeds the most recent 5 year average maximum day demand of 9.3 MGD.

Table 4-10. Water Treatment Plan Capacity and Maximum Day Demand

MAXIMUM WTP CAPACITY	MAXIMUM DAY DEMAND (AVG. LAST 5 YEARS)
9600 gpm/ 13.8 MGD	9.3 MGD

Water Storage

The city's water storage capacity is 9.5 million gallons and the system consists of three, one-million gallon elevated water tanks, two underground concrete reservoirs with a capacity of 3.5 million gallons, and two ground level steel reservoirs with a capacity of three million gallons. It is recommended that total storage equal or exceed the average daily demand of 5.3 MGD. The total capacity of 9.5 million gallons provides the city with sufficient capacity in the event one or more storage facilities needs to be taken out of service without compromising the city's ability to meet demand. The ground and underground reservoirs are located at the WTPs with high capacity pumps that put water into the system. The elevated tanks are strategically located in the city to maintain equal pressure throughout the water system.

Table 4-11. Water Storage Capacity and Demand

TOTAL STORAGE CAPACITY	AVERAGE DAY DEMAND (OF LAST 5 YEARS)
9,500,000 Gallons	5,300,000 Gallons per day

Table 4-12. Water Storage Structures

STRUCTURE NAME	TYPE OF STORAGE STRUCTURE	STORAGE CAPACITY (GALLONS)
Tower 2	Elevated storage	1,000,000
Tower 3	Elevated storage	1,000,000
Tower 4	Elevated storage	1,000,000
WTP No. 1	Ground storage	1,500,000
WTP No. 6	Ground storage	1,500,000
WTP No. 16	Underground	1,500,000
WTP No. 10	Underground	2,000,000
Total		9,500,000

Water Distribution System

The water distribution system consists of watermain ranging in size from 6 inch to 12 inch in diameter and located throughout the city. The strategic location of the elevated tanks and WTPs provides the city with a consistent pressure. The system is designed with 12-inch and 10-inch trunk lines and six-inch branch lines that deliver water to most of the city's residential areas. A hydraulic model of the distribution system was initially completed in 2000 and updated in 2013. It is used as a dynamic tool for development and redevelopment planning and supports policy makers in decision making to address infrastructure needs. The hydraulic model will be continuously updated to reflect changes made within the distribution system as well as in response to changes in water system demands.

Alternate Water Sources

Six Interconnections with adjacent distribution systems have been established and can be used for emergency and auxiliary water supply. All six emergency interconnections are subject to water availability. They are utilized only with prior authorization and coordination with the requesting city.

The City of St. Louis Park currently has interconnections with the cities of Minnetonka, Plymouth, Golden Valley, Hopkins, and Edina. The interconnects are not metered and a valve is manually opened and closed for emergency water supply between cities.

Table 4-13. Alternate Water Sources

OTHER WATER SUPPLY SYSTEM OWNER	CONNECTION SIZE (INCHES)
Plymouth	8" Plymouth main connected to a 12" SLP main (Betty Crocker Drive)
Minnetonka	6" Minnetonka main to 6" SLP main (Ford Road)
Golden Valley	6" 1300 Flag
Golden Valley	6" Douglas & Ottawa
Hopkins	8" Excelsior & Powell
Edina	8" Wooddale & 44th

Water Conservation

The city implemented a Water Conservation Plan in 2008 through the DNR Water Emergency and Conservation Plan. The plan addressed both conservation on the supply side (leak detection and repairs, metering), as well as on the demand side (reductions in usage). In the past 10 years the city has revised its water rates structure to provide conservation pricing, conducted on-going water supply system improvements such as meter improvements and leak detection, and participated in educational efforts.

Results of conservation efforts are measured based on the water demand, water losses, and peak demand trends. The residential per capita per day values, peaking factor and unaccounted-for water values have each shown a downward trend since conservation efforts were implemented in 2008. The residential per capita demand has been reduced from an average of 78.5 gpcd in 2008 to 60 gpcd currently. The peaking factor has been reduced from an average of 1.79 in 2008 to 1.76 currently. Unaccounted water has been reduced from an average of 16.1% in 2008 to 15% currently, and 7% in the last 2 years.

Where We Are Headed

Aquifer Management

The city continues to use a comprehensive sampling program to monitor water quality of the aquifers and track trends of contaminants of concern set by the MDH. Providing modern, robust drinking water treatment plants will limit the spread of contamination from an affected well. The city also maintains drinking water treatment plans "on the shelf" so upgrades can occur quickly if needed.

Water Demand Projections

The projected annual water demand through 2040 is summarized in Table 4-14. The Metropolitan Council provided the projected populations for the years 2020, 2030, and 2040. The population projections for all other years were extrapolated.

The Metropolitan Council projects a population increase from 45,250 in 2010 to 49,600 in 2020. Additionally, the population is projected to increase to 52,350 in 2030 and 54,520 in 2040. Growth is anticipated to occur at a steady rate per year between MCES future projections.

The population served by the city's water system is reported annually with every DNR Water Use Report. For projection of 2018 through 2019, the increase between the reported population served and the projected 2020 population was averaged and incrementally added annually. A similar method was used to project populations from 2020-2030 and 2030-2040. The Metropolitan Council "Thrive MSP 2040 Forecasts" indicate that the anticipated total population and population served are equal.

As discussed previously, over the last decade the total per capita water demand has trended downwards. The projected total per capita demand is based on the average total per capita demand over the last ten years and is equal to 123 gpcd. The most recent five-year average total demand is 113 gpcd. The city considered reducing the total per capita demand estimate in the projections due to this lower five-year average, but felt it may not be sustainable depending on water usage of future commercial and industrial establishments.

The projected average day demand is equal to the total per capita per day times the projected population. This is then divided by one million to get the average day demand in MGD. The maximum day demand is based on the average annual peaking factor over the last ten years, which was found to be 1.76. For each year the average day demand is multiplied by the peaking factor to obtain the maximum day demand in MGD.

Table 4-14. Projected Annual Water Demand

Year	Projected Population and Population Served	Tot. Per Capita Water Demand (GPCD)	Avg. Daily Demand (MGD)	Max. Daily Demand (MGD)
2018	48,730	123	6.0	10.5
2019	49,165	123	6.0	10.6
2020	49,600	123	6.1	10.7
2021	49,875	123	6.1	10.8
2022	50,150	123	6.2	10.9
2023	50,425	123	6.2	10.9
2024	50,700	123	6.2	11.0
2025	50,975	123	6.3	11.0
2026	51,250	123	6.3	11.1
2027	51,525	123	6.3	11.2
2030	52,350	123	6.4	11.3
2040	54,520	123	6.7	11.8

GPCD – Gallons per Capita per Day
MGD – Million Gallons per Day

The 2030 Comprehensive Planning effort projected significantly higher water demands due to population projections and higher per capita water use projections. The 2008 projections, were based on demand of 145.3 gpcd and a peaking factor of 1.79. Water conservation and efficiency programs have been effective in reducing the key parameters used in calculating water projections. The comparison between previous planning effort projections and the current ones are summarized in Table 4-15.

Table 4-15. 2030 and 2040 Comprehensive Plan Comparison

YEAR	POPULATION SERVED	AVERAGE DAY DEMAND (MGD)	MAX DAY DEMAND (MGD)
Previous 2030 Projection	51,500	7.48	13.39
Current 2030 Projection	52,350	6.4	11.3
Previous Ultimate	51,500	7.48	13.39
Current 2040 Projection	54,520	6.7	11.8

Future Water System Needs

The city's future water utility will need to meet future growth and the resulting increase in water demand. Current well, water treatment plant, and storage capacities are compared to the future demand projections in Table 4-16, Table 4-17, and Table 4-18. The current firm capacity of the wells is 12.1 MGD, and current capacity of the treatment plants is 13.82 MGD. Well and the water treatment capacity must be able to meet or exceed the maximum day demand, which is projected to range from 10.3 to 11.8 MGD between now and 2040. The current firm well capacity of 12.1 exceeds the needed capacity in 2040 by 3% and the water treatment plant capacity of 13.82 will exceed the needed capacity by 17%. The total storage capacity of the existing storage structures equals 9.5 MGD. The projected average day water demand between now and 2040 ranges from 6.0 to 6.7 MGD. The current storage volume exceeds the future average day demand in 2040 by 42%. In summary, the capacity of current wells, water treatment plants, and storage facilities meet the future demands based on the 2040 population projections.

Table 4-16. Well Capacity and Demand Projections

WELLS	CURRENT CAPACITY (MGD)	2040 MAXIMUM DAY DEMAND (MGD)	REMAINING CAPACITY (MGD)
Firm Capacity	12.1	11.8	0.3

Table 4-17. Water Treatment Plant Capacity and Demand Projections

WATER TREATMENT PLANT	CURRENT CAPACITY (MGD)	2040 MAXIMUM DAY DEMAND (MGD)	REMAINING CAPACITY (MGD)
WTP Capacity	13.8	11.8	2.0

Table 4-18. Water Storage Facilities Capacity and Demand Projections

WATER STORAGE FACILITIES	CURRENT CAPACITY (MGD)	2040 AVERAGE DAY DEMAND (MGD)	REMAINING CAPACITY (MGD)
Total Storage	9.5	6.7	2.8

Water Conservation Plan

An updated Water Conservation Plan is included in the 2018 DNR Water Supply (See Appendix to this Comprehensive Plan). The city plans to continue the water conservation techniques employed over the last 10 years and annually evaluate and expand them as appropriate. The city employs conservation billing strategies for water and rates are evaluated annually.

The city plans to participate in outreach efforts such as consumer confidence reports, billing inserts, social media distribution, presentation to community groups and schools, facility tours, and community events such as the Fall Open House and Eco Fair. In addition, the city plans on-going staff training on conservation techniques.

Capital Improvement Plan & Preventative Maintenance

The city is committed to capital reinvestment of the Water Utility to achieve the goals and policies set forth and maintain the long-term sustainability of the Utility. A Capital Improvement Plan (CIP) is in place to cover expansion (if needed) and repair of the water system and is updated annually.

As discussed in this plan, the capacity of current wells, water treatment plant, and storage facilities meet the future demands based on the 2040 population projections and land use map. If significant changes were to occur, such as the addition of a large water user, the water plan and resulting CIP would be updated.

The current water treatment plants are meeting government regulations related to water quality. Although not anticipated, if a currently unregulated water constituent becomes regulated or existing regulations become more stringent, the future planning efforts and CIPs would also need to be adjusted.

Preventative maintenance is extremely important in the life of a water supply and distribution system. Preventative maintenance is scheduled as follows:

- Production wells pulled every 6-8 years.
- Water treatment plant GAC replacement and rehabilitation as needed.
- Leak detection monitoring occurs for the entire water system each year.
- Valve operation program - scheduled as time permits.
- Hydrant flushing and inspection program - semi-annual program spring and fall
- Storage facility maintenance: warranty inspection at 2 years, touch up repairs at 10 to 12 years, total reconditioning at 20 to 25 years.
- Valve, meter, equipment, etc. upgrades and replacements are budgeted and scheduled as necessary.

Water Supply Goals and Strategies

1. Provide an uninterrupted supply of safe, high quality water to St. Louis Park customers through proper operation and maintenance of the water supply system.

Strategies

A. Continue the current preventive maintenance on all water supply and treatment equipment to prevent unexpected breakdowns.

B. Continue to evaluate the basic maintenance and operational guidelines to provide responsive and cost-effective maintenance of the Water Supply System.

C. Continue to implement the Wellhead Protection Plan.

2. Provide for the treatment and delivery of water in the most energy efficient manner.

Strategies

A. Continue to participate in the Xcel Energy time-of-day energy program.

B. Conduct periodic reviews of the energy use to insure the energy saving equipment is operating at peak performance.

C. Continue to research energy conservation techniques that may apply to the water treatment and delivery system.

D. Continue to install variable frequency drives at wells and high service pumps to conserve energy and enhance operational control.

3. Encourage reduced water consumption.

Strategies

A. Continue to enforce the mandatory sprinkling restriction through education and enforcement.

B. Continue education programs related to responsible personal use of water.

C. Continue the system-wide leak-detection program.

D. Continue to enforce the installation of water saving fixtures.

4. Provide education to consumers on water supply, treatment and conservation.

Strategies

A. Continue presentations to community groups and schools, facility tours, and community events.

B. Continue other outreach efforts such as consumer confidence reports, billing inserts, distribution of information through social media.

C. Continue to partner with local and national organizations that specialize in water related education.