

Certification

Water Supply & Distribution System Comprehensive Plan


for

City of Brooklyn Park, Minnesota

T21.114460

November 28, 2018

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

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Date: November 28, 2018

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Appendix A – Local Water Supply Plan Template Third Generation for 2016-2018

I. INTRODUCTION

A. Purpose

Currently the City pumps, treats and distributes an average 8.2 million gallons per day (MGD) to approximately 22,900 customers. The purpose of this plan is to provide regulatory documentation for the City's Comprehensive Plan as it relates to water supply and distribution. The City's overall goal is "to provide a potable, reliable, long-lived water system with economical operations and low costs maintenance that meets quality standards and peak day water demands for rate payers and users."

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 a Water Appropriations Permit Amendment.

A Water Supply Plan was completed & submitted to the Minnesota Department of Natural Resources on December 14, 2017. It is currently under review by the State. The Metropolitan Council will also review the Plan to assure that it matches up with the City's overall Comprehensive Plan elements.

This 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 Met Council's required Comprehensive Plan elements for addressing water supply is the completion of a Water Supply Plan.

In 2006, SEH (Short Elliot Hendrickson, Inc.) completed a *Water System Supply and Treatment Master Plan* for the City of Brooklyn Park. This Plan can be found in its entirety with the City's Public Utilities Division of the Operations & Maintenance Department. It provided a detailed analysis of the existing and proposed trunk water system, including a water system model, and served as a guide as Brooklyn Park extends city water to urbanizing areas. The Master Plan performed a more thorough scientific, engineering and financial analysis of the existing and future water system than was required to meet the Met Council and DNR requirements.

The City hired Bolton & Menk, Inc. to update the water system model and Plan in 2017. Through this process, the water system model was updated to include all changes in water infrastructure since 2006. The computerized model was also updated to include scenarios through 2040 to determine where and when future infrastructure changes or additions may be required. These updates, both past and proposed, are described in the updated portions of the Plan. The updated portions of the report are on file with the City's Public Utilities Division of the Operations & Maintenance Department.

The purpose of this chapter is to plan and review the City's water supply and distribution system to accommodate current and future needs. This chapter includes sections discussing historical and future water demand, existing and proposed water system elements, and the

implementation of proposed infrastructure modifications.

The City has experienced steady growth over the past several decades. The City anticipates continued growth through 2040, but expects that the growth will be primarily commercial and high density residential rather than the traditional single family residential growth that was seen in the past.

The City is divided into six utility districts to allow for better planning throughout the City. Figure DW-01 illustrates the City's utility districts.

Insert Figure DW-01

B. Water Supply and Distribution Plan

In 2017, the City pumped, treated and distributed an average 8.9 million gallons per day (MGD) to approximately 22,700 customers. The City's goal is to provide a potable, reliable, long-lived water system with economical operations and low costs maintenance that meets quality standards and peak day water demands for rate payers and users. In 2008, the City prepared a Water System Plan updated for the northern growth area that had replaced previous plans in 1991, 1993, 1998, and 1999. This plan replaces the 2008 update.

II. EXISTING WATER SYSTEM

Figure DW-02 illustrates the City's current water distribution system, including the location of the water treatment facility, wells, reservoirs and tanks, inter-community connections, and water distribution system.

A. Water Supply

In 2017, the City has obtained 100 percent of its domestic and irrigation water from 11 ground water wells. The water was drawn from 2 aquifers: Quaternary 'glacial drift' – 89 percent, Wonewoc-Tunnel City (formerly known as Franconia-Ironton-Galesville or 'FIG') – 11 percent. The glacial drift wells are the primary supply to the system, however the quality of the raw water is low. The raw water contains manganese, iron, magnesium, calcium and other dissolved solids. The raw water is conveyed through transmission mains to the City's water treatment facility. Once at the water treatment plant, the water is brought up to drinking water standards in accordance with State and Federal regulations. The water is then pumped into the distribution system.

Recently, the regulators have been urging the City to diversity their aquifer use, and the City is working towards that goal.

B. Water (Wellhead) Protection Plan

The *Wellhead Protection Plan* is a two-part document that can be found in its entirety with the City's Public Utilities Division of the Operations & Management Department. Part 1 developed criteria which delineated an area known as the DSWMA (Drinking Water Supply Management Area) and identified the vulnerability of the available aquifer(s) to contamination. Part 1 of the plan was completed and submitted to the state and approved on August 6, 2004. Part II was approved on June 16, 2007 and an amendment was submitted on Part I December 23, 2015 and Part II January 18, 2018. Figure DW-03 shows the location of the Drinking Water Supply Management Areas for Brooklyn Park.

Overall the plan sets parameters for implementation. In general, the goals of the plan are:

- 1) Protect the aquifer, public water supply wells and promote wise land use in the DWSMA(s) and the City as a whole;
- 2) Provide a safe, potable water supply, manage the available aquifers, promote and increase public awareness of groundwater problems and monitor or restrict activities that expose the groundwater to contamination;
- 3) Educate the general public about groundwater issues;
- 4) Advocate and implement land use best management practices; and
- 5) Administer well management and collection of data relevant to wellhead protection planning.

Part II and the Amendment to Part II of the Wellhead Protection Plan include:

- 1) The results of an inventory of potential contamination sources that may impact the City of Brooklyn Parks' Public Water Supply;
- 2) Strategies to address potential contaminant sources identified;
- 3) An evaluation plan to assess implementation effectiveness of the WHP Plan; and
- 4) An Emergency/Alternative Water Supply Contingency Plan to assist the City in the event of an environmental disaster or major disruption of the water supply system.

At this time, it is the City's intention to continue to use ground water for current and future consumption demands.

*Insert Figure DW-02

***Insert Figure DW-03**

C. Water Treatment

The City has one centrally located water treatment plant. The Treatment plant removes the manganese and iron from the raw water. The hardness is removed by the customers by use of water softeners. The water treatment facility’s capacity is 26 million gallons per day (MGD) and efficiency is 96-97 percent. Waste water from the plant is disposed via the sanitary sewer system. Other chemicals such as fluoride, polyphosphate, and chlorine are added prior to delivery into the distribution system.

D. Water Storage

The City has five reservoirs which can store 15 million gallons of water, nine (9) MG is located at the water treatment plant ground reservoir in the center of the City, four (4) MG is in elevated reservoirs (3 water towers) throughout the City and the remaining two (2) MG is in the Bass Creek ground reservoir. A pressure of 50-70 pounds per square inch is maintained for fire protection.

Table DW-01		
Existing Water Supply, Treatment and Storage		
	Current	Proposed 2040
Pumping Capacity	29 MGD	34 MGD
Treatment Capacity	26 MGD	30 MGD
Storage Capacity	15 MG	17 MG
Emergency Capacity	10.0 MGD	10 MGD
(MGD) Million Gallons per Day (MG) Million Gallons		

E. Inter-Community Connections

In November of 2006, Blue Stone Engineering completed a *City of Brooklyn Park Water Main Interconnections with Adjoining Communities* report, which can be found in its entirety with the City’s Public Utilities Division of the Operations & Maintenance Department. The City has a total of 9 emergency interconnections that have a total capacity of approximately 10 million gallons per day. Table DW-02 below shows a summary of the interconnections.

Table DW-02		
City of Brooklyn Park Emergency Watermain Interconnections with Adjoining Communities		
Community	Number of Inerconnections	Service Capacity (MGD)
Maple Grove	3	2.7
Champlin	4	2.9
Brooklyn Center	1	2.7
Osseo	1	1.7
Total Emergency Capacity		10.0

III. WATER DEMAND

A. Historic Demand

Historical pumping and demand data can be seen in the table below. Brooklyn Park’s population, as well as commercial and industrial developments, have shown continuous growth for the past 50 years, and water demand has increased at a similar pace.

Table DW-03 Historic Water Demand				
Year	Population	Water Demand		Per Capita Demand
		Average Day (MGD)	Maximum Day (MGD)	
1970	26,230	N/A	N/A	N/A
1980	43,332	4.023	10.999	93
1990	56,381	6.252	18.081	111
2000	67,388	8.545	18,722	127
2010	75,781	8.57	20.840	113

B. Future Demand

Based on population projections made in conjunction with the Metropolitan Council and the City, as well as the City’s projected land use and growth areas, the table below shows projected future water demand through the year 2040. The City expects to see continued growth as in the past, but projects that growth will consist of primarily commercial and multi-residential growth, rather than single family residential growth as in the past.

Table DW-04 Project Water Demand						
Year	Population Total	Population Served	Overall gpcd	Water Demand		Estimated Water Withdrawal (MGY)
				Average Day (MGD)	Maximum Day (MGD)	
Current	81,500	80,275	112	8.99	23.38	3,281.64
2020	83,000	81,825	113	9.25	25.43	3,374.87
2030	90,000	89,200	109.5	9.77	26.86	3,565.10
2040	97,900	97,900	109.5	10.72	29.48	3,912.82

Table DW-05 below shows the 2017 water use connections broken down by land use. The majority of those connections are residential.

Table DW-05				
Water Connections by Land Use				
Water Connections		Estimated Annual Consumption (MG)	Average Daily Consumption per Connection (gallons/day)	% of Total
Land Use	Number of Connections			
Single Family	17,206	1,516	241	55.7
Townhomes	3,816	173	124	6.4
Duplex	932	63	185	2.3
Multi-family	165	339	5,629	12.5
Residential Sub-total	22,119	2,091		76.9
Commercial	441	268	1,786	9.8
Institutional	65	50	1,442	1.8
Industrial	79	40	1,387	1.5
Non-Residential Sub-total	585	358		13.1
Metered Irrigation	500	273	1,496	10.0
Total	23,204	2,722		100.0

IV. FUTURE WATER SYSTEM

This section includes discussion of projected future water needs and location of planned improvements for the City's water system.

Future additions and improvements of the water system consider the following factors:

- 1) Future land use and new development.
- 2) Water system integrity;
- 3) Location and reliability of existing water supply.

A. Water Supply

The City is anticipating the need for additional wells and the use of other aquifers to meet future demand or potential regulations that may require water source diversification by 2040. Additional State water appropriations will be necessary to meet the future water demands. Potential future water source locations can be seen in Figures DW-04 and DW-05.

B. Water Treatment and Distribution

The water treatment plant is in good condition and has sufficient capacity to provide water for the City through 2040. At this time, the City does not have plans for a water treatment expansion.

There are several planned City, County, and State roadway projects in the next few years that cover areas where the City would like to replace or install water main. Several sections have been identified in the City's *WSSTMP*. Proposed changes to trunk water mains can be seen in Figure DW-04.

C. Water Storage

Based on the expected future demand, the City anticipates there will be a need for additional water storage by approximately 2025. A two million gallon elevated water storage tank is proposed in the expected growth area to in the northwest part of the City. The proposed location for this tower can be seen on Figures DW-04 and DW-05.

Insert FiguresDW-4

* and DW-5

V. IMPLEMENTATION

A. Funding

Utility rates, water access changes, and special assessments will be used to fund the necessary water supply improvements and major maintenance of the system.

B. Conservation

The City encourages conservation and is working towards meeting conservation goals, as outlined in the *Water Supply Plan*.

C. Brooklyn Park 2025

As part of future planning, the community developed “Brooklyn Park 2025” – a plan for the future of Brooklyn Park and what the community would like the City to look like. The plan includes six goals.

Safe, dependable, and affordable drinking water can be related directly to the 4 goals listed below:

Goal #2) Beautiful spaces and quality infrastructure make Brooklyn Park a unique destination

Goal #3) A balanced economic environment that empowers business and people to thrive

Goal #4) People of all ages have what they need to feel healthy and safe

Goal #6) An effective and engaging government recognized as a leader

The City has worked to include water supply planning and to meet the 2025 goals, including providing safe, quality drinking water through well-maintained infrastructure.