VILLAGE OF GREENVILLE

OUTAGAMIE COUNTY, WISCONSIN

WATER SYSTEM MASTER PLAN

DECEMBER 2021

1696 BELLEVUE STREET
GREEN BAY, WI 54311

PROJECT NO. 05992-0051

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1 INTRODUCTION

1.1 Purpose

The purpose of this Water System Evaluation is to provide an overall, comprehensive look at the existing water system operations, equipment, and components in order to make recommendations for long-term planning within the Village of Greenville (Village). The Village must provide adequate water supply at all times, with the additional capacity required to meet the increasing demands of its residents and commercial areas within the service area.

1.2 Project Description

The Village has previously completed a Water Study in 2006 to evaluate water demands and system expansions required for future water customers. This latest update to the water supply system will update the operations and develop a hydraulic model to assess current system capabilities to meet future needs within the study area. The study area consists of the Village's service area, with the addition of future development within the Village limits.

Future projections for population and water demands will be calculated for a 30-year planning period, until year 2051. The location of projected demands will be based on the Village's indicated areas of expected growth. Proposed necessary improvements will be established from results of the hydraulic model and future demand requirements.

1.3 Scope

The scope of this study includes the following:

A. Review of available land use plans and population projections provided by the Village and ECWRPC.

B. Review of available water usage information for existing and projected demands.

C. Identification of water component demands for residential, commercial, industrial and firefighting purposes.

D. Create a hydraulic model of the existing system from the Village's GIS files.

E. Utilize the hydraulic model to review of existing water system infrastructure, including the design limits for watermain diameters and reservoir storage capacities.

F. Provide projected water supply and demand requirements for 30-year planning period.

G. Provide evaluation of water system for future projected demands.

H. Provide recommendations for an improvement plan to correct deficient water system facilities.

I. Develop schedule of implementation.

J. Provide cost estimates of alternatives.

K. Provide written report describing all phases of the study, including basis of design evaluation findings, proposed alternatives, and recommended option implementation.

2 BACKGROUND CHARACTERISTICS

The following information provides the background characteristics relevant of the study area for the Village of Greenville's Water System Master Plan. It discusses physical environment, environmentally sensitive areas, and population projections.

2.1 General Information

To provide planning for the long-range development of a public water system, proper consideration of physical and economic factors influencing the growth in the service area must be made. Physical characteristics of importance to the study area include topography, soils, and climate. Economic characteristics of interest include commerce, industry, agriculture, transportation, and utilities. Together, these factors have a bearing on land use patterns, population growth, and consequently affect the location, design and operation of water supply facilities. This chapter summarizes information related to the physical and economic characteristics pertinent to the Village's water supply.

2.2 Geographic Location

The Village of Greenville is bordered by the Town of Grand Chute on the east, the Town of Ellington on the north, the Town of Clayton and Village of Fox Crossing to the south, Dale and Hortonia to the west. (Reference Figure 2-1.)

The Village is located in the southwest portion of Outagamie County, Wisconsin. The current Village boundaries are North Mayflower Drive to the east, County Highway JJ to the north, and County Highway BB to the south. The western border is Greendale Road. (Reference Figure 2-2.)

2.3 Topography

In general, the Village drains to the northeast into Bear Creek, except for the southeastern portion near the airport which drains towards the Fox River to the southeast. Western portion drains to the Rat River.

Elevations in the Village range from approximately 920 feet above sea level at the northernmost and south-central part of Municipal Drive, down to 790 feet above sea level at Bear Creek, north of Everglade Road.

Figure 2-3 is a topographic map of the Village. The topographic maps were created using Outagamie County LIDAR data and should be considered approximate.

2.4 Land Use

The Village's Year 2040 Comprehensive Plan, completed by the East Central Wisconsin Regional Planning Commission (ECWRPC), provided a map of expected land use designations within the Village's boundary for the year 2040. The existing land use map shows the Village has approximately one-third undeveloped land, primarily agricultural, located in the north of Everglade Road to the Village limits and in the central west area of the Village.

Single family residential areas account for the majority of the developed land and is focused along the eastern center of the Village, along STH-15 and surrounding area of St. Mary School. Future residential areas are grouped into three separate "tiers" based on the expected population density of these areas. Future residential population densities and tiers are summarized as:

- Tier 1 2.55 homes/acre
- Tier 2 0.75 homes/acre
- Tier 3 0.20 homes/acre

Commercial land is generally located within various areas of the STH-15 corridor and areas around the Appleton International Airport. The Appleton International Airport accounts for a large fraction of Village land located in the southern-most area of the Village.

Industrial usage comprises more land than commercial usage. Multiple industrial lots exist on the northeast side of the airport and a small industrial park is located to the north of the Municipal Drive and Greenville Drive intersection.

The usage designations referenced on the ECWRPC map and Comprehensive Plan were used as a basis for the planning of future population projections, further discussed in Section 2.9.3. The Comprehensive Plan for year 2040 within the Village projected a decrease in overall undeveloped/agricultural land and projected a large increase in residential land. All commercial and industrial growth was expected to occur within the Village boundaries, mainly along the STH-15 corridor or in the existing industrial parks to the northeast of the airport. It is anticipated that these predicted trends in the Comprehensive Plan will continue through current design year 2051.

2.5 Environmentally Sensitive Areas

Environmentally sensitive areas are defined by the Wisconsin DNR as "areas such as wetlands, steep slopes, waterways, underground water recharge areas, shores, and natural plant and animal habitats that are easily disturbed by development." In review of WDNR Surface Water Data Viewer, there are wetlands primarily surrounding Bear Creek within the block of Everglade Road, North Mayflower Road, Municipal Drive, and County Highway JJ; along the northwestern-most corner of the Village; and also along the southwest corner of the intersection of Greenville Drive and Municipal Drive. These areas are generally indicated by the "Open Space & Natural

Resource" land use designation shown on the Village's Land Use Map (reference 2040 Comprehensive Plan).

In review of FEMA Flood Plains, the flood-prone areas within the Village are the surrounding areas of Bear Creek. The flood plains cover the majority of the entire block of Everglade Road, Municipal Drive, County Highway JJ, and extend to the northeast of North Mayflower Road.

2.6 Climate

The climate of the Village is classified as a northern continental climate. There are extreme differences in climate temperatures from summer to winter. The median date of last frost, signalizing the start of spring is between May 21st–31st. Spring is often slow in arriving and is a mixture of warm and cold periods. As summer approaches, precipitation is less frequent, but increases in intensity. Hot and humid periods can occur in summer; however, they are short in duration. Peak average daily summer temperatures occur in July and are around 81-degrees F. Cool temperatures can occur in any summer month. On average, there are 187 sunny days per year in Greenville.

The median date of first frost, signalizing the start of fall is between October 1st–10th. Fall typically lasts until mid-November. Nearly every year, after the first killing frost, there are short periods of days that are abnormally warm. The change from fall to winter is abrupt. The lowest average winter daily temperatures are around 9-degrees F.

Rainfall precipitation falls predominately in the five-month period from May to September. The Village receives an average of 32 inches per year of rainfall. The United States average is 38 inches per year. Snowfall precipitation falls predominately between November to March. For this five-month period, an average of 41 inches falls per year. The United States average is 28 inches per year. On average, Greenville receives some kind of precipitation on 112 days per year.

2.7 Neighboring Water Systems

The Village pumps its groundwater from a confined, deep sandstone aquifer, between 500 to 700 feet below the surface. The aquifer is not continuous. It has a thick shale layer which acts as a regional confining unit, separating the deep Cambrian-Ordovician bedrock below from the shallow Silurian bedrock above. Groundwater moves slowly through the pores and cracks in underground layers of unconsolidated material and rock. As it moves through the aquifer, minerals and other elements, including radium, can be dissolved out of the rock into the groundwater. Some rock more effectively transfers radium into groundwater than others. Eventually, the water can be drawn into nearby drinking water wells as the water is pumped.

Outagamie County has 16 municipal water systems and 18 non-transient/other than municipal wells registered with the Wisconsin DNR. The closest municipal water system that pumps well water from the same aquifer as the Village is the Village of Hortonville which is about 6 miles

west of the Village. The nearest water system is the Grand Chute Sanitary District, but they do not pump their own well water. Rather, they purchase water from the City of Appleton. Appleton is located approximately 15 miles east of the Village. Appleton also does not pump well water; instead, Appleton sources surface water.

To keep municipal water systems safe for public consumption, wellhead protection plans (WHPPs) are developed to achieve groundwater pollution prevention with public wellhead areas. All new municipal wells are required to have a WHPP. Ordinances govern the zoning and implements the plan by controlling land uses within the WHPP area. The Village of Greenville does have an active WHPP. The Village's newest well was constructed in 2018 and a new WHPP was updated and approved in 2019.

2.8 Economic Environment

The economic environment of the study area defines the growth and development of the Village. Land use and population growth patterns govern the long-term planning efforts. Future growth can only be defined by a best estimate of these economic factors.

Growth within different communities can rarely be directly compared to another individual community. Therefore, projected population and land use factors are essential in the development of design criteria to adequately provide for additionally capacity of future demands when elevating water facilities.

A 30-year planning period was used to define the long-term goals of the Village, until year 2051.

2.9 Population

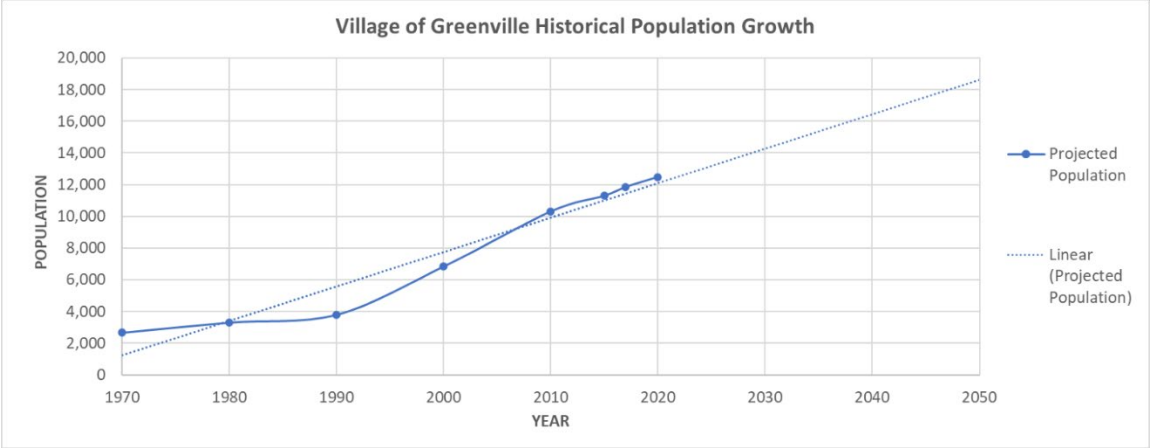
Population is the main factor in determining the study's water system requirements. There is a close relationship between a community's population and the total water demand. Long-range planning must be based on the best possible projections of population growth. The projection must, in turn, be based on solid factors of current analysis in past population trends.

2.9.1 Historical Population Trends

The Wisconsin Department of Administration (WDOA) makes annual population estimates and periodic population projections based on prior U.S. Census data and analysis of contemporary data such as housing units, automobile registrations, dormitory and institutional populations, and other indicators of population changes.

Graph 2-1 depicts the population growth for the Village since 1970, based on U.S. Census and Wisconsin Department of Administration (WDOA) data. The WDOA's 2020 population estimate for the Village, as of January 1, 2020, was 12,450 people. This projection is for the Village of Greenville as a whole and is not necessarily representative of the current water distribution

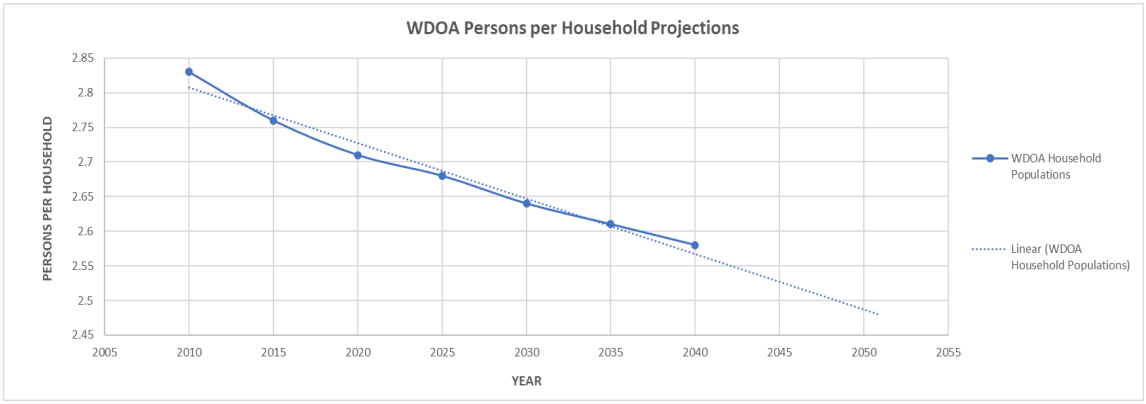
area. In general, the Village is one of the fastest growing communities within the Fox Cities metropolitan area.



Graph 2-1.
Historical Population Growth

According to the 2040 Comprehensive Plan, referenced in Section 2.4, it is estimated that there were approximately 4,662 housing units in the Village as of 2020, with most of the population living in single-family homes. Based on this ratio, the approximate persons per household for the Village for 2020 was calculated as 2.67.

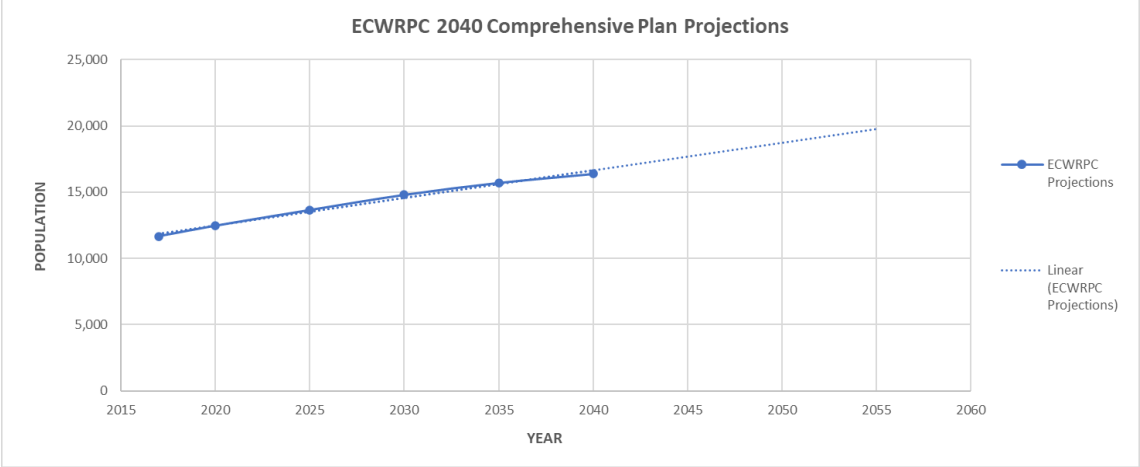
Graph 2-2 evaluates the Wisconsin DOA people per household data. The people per household is shown to follow a generally consistent declining trend. Extrapolated out, this factor was calculated to be about 2.4 people per household. This factor was used for future projection calculations.



Graph 2-2.
Projected Persons Per Household

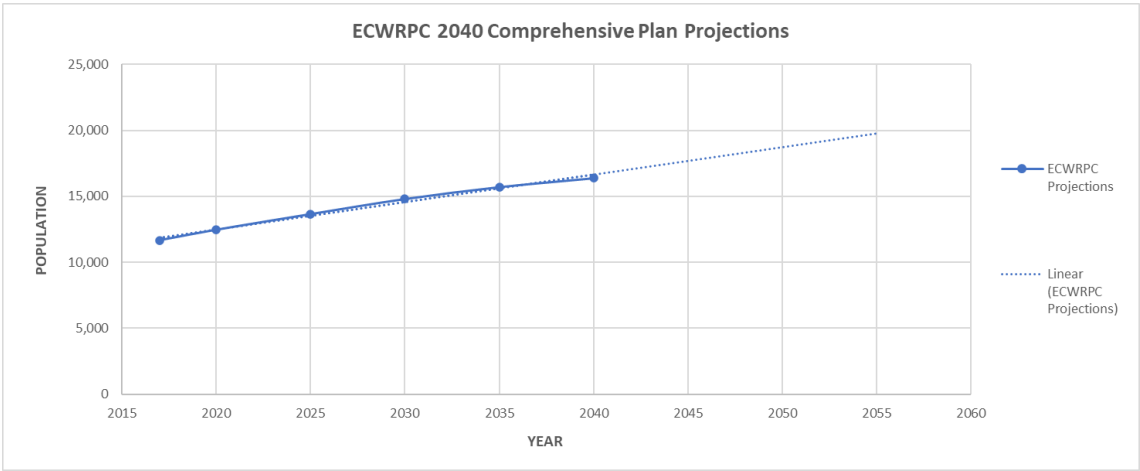
2.9.2 Future Projected Population Trends

The East Central Wisconsin Regional Planning Commission (ECWRPC) created a *Comprehensive Plan* for the Village of Greenville in July 2019. This Plan contained population estimates and projections based on the WDOA. The WDOA calculates annual population estimates and population projections in accordance with Wisconsin Statue 16.96.



Graph 2-3 below shows the estimated and projected WDOA populations. The Comprehensive Plan estimated the year 2020 population to be 12,450 people and the year 2040 population to be 16,390 people. The 20-year residential population was expected to increase by 3,940 people.

Population projections beyond the year 2040 have not yet been published by the WDOA; however, projected population growth for the Village generally follows a linear trend and can be extrapolated for future years.



Graph 2-3.
Plan Projected Population Growth

To estimate the 30-year design population for the Village, the existing projections were extrapolated to the year 2051. Based on this, the Village population for the year 2051 is estimated to be 18,951 people, corresponding to a growth of 6,501 people over the 30-year period.

Using the combination of the WDOA and ECWRPC data, a Village population increase of 6,501 people with 2.4 people per household would result in a total addition of 2,708 new homes. This would be an increase of approximately 210 people per year to the Village.

2.9.3 Population Projections for Full Development

Utilizing the ECWRPC land use information, full development projection estimates were calculated. The Comprehensive Plan for year 2040 within the Village projected a decrease in overall undeveloped (agricultural) land and projected a large increase in residential land. All commercial and industrial growth was expected to occur within the Village boundaries, mainly along the STH-15 corridor or in the existing industrial parks to the northeast of the airport. It is anticipated that these predicted trends in the Comprehensive Plan will continue through the design year 2051.

To calculate the future full development, the entirety of the Village was divided into sections and subsections based on topography. Each section and subsection were referenced for its intended land use. Each section and subsection were measured in acres, determined for density, and then population growth was calculated. Figure 2-4 is a map showing the distinct sections for the full development calculations.

Specific assumptions and calculations of greater detail should be referenced in Appendices A–D of the sewer study report titled *Wastewater System Master Plan* (2021, Cedar Corporation).

Herein this Water Study, similar section and subsection areas were evaluated. The section and subsection calculations referenced the same land use and same densities as the Wastewater Master Plan. Please refer to *Appendix A* in this study for these detailed calculations by section.

Table 2-1 is a summarization of the projected residential growth by the year 2051.

Table 2-1.
Full Development Residential Projections

RESIDENTIAL GROWTH CLASSIFICATION	EXISTING HOUSEHOLDS	ANTICIPATED NEW HOUSEHOLDS	TOTAL FULL DEVELOPMENT NUMBER OF HOUSEHOLDS
TIER 1	122	2,185	2,307
TIER 2	526	415	941
TIER 3	102	111	213
POPULATION @ 2.4 PEOPLE PER HOUSEHOLD	**1,800**	**6,506**	**8,306**

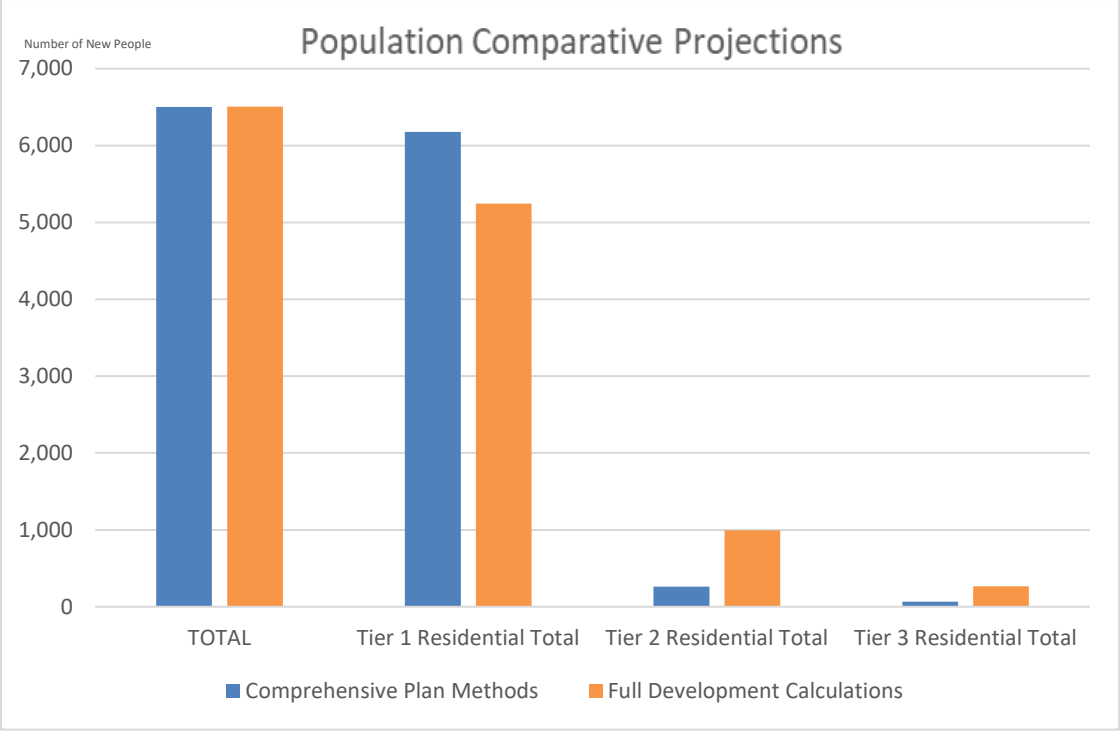
2.9.4 Comparative and Final Projections

To further confirm the population projections within the Village, the WDOA and ECWRPC projections were compared to the calculations made at the Village's full development. Full development is expected by year 2051.

- The WDOA and ECWRPC projected an additional population growth of 6,501 people.
- The projected growth at full development as an additional population growth of 6,506 people.

For future planning of this report, this careful consideration of comparative numbers was evaluated for accuracy. Conclusions from this comparison were used as the primary basis for residential water demands. Figure 2-4 combines both projection data sets into one graphic image.

For the purposes of this report, the full development projections were used in the calculations of future water demand and in the hydraulic modeling.



Graph 2-4.
Projected Population Growth

3 EXISTING WATER SYSTEM INFRASTRUCTURE

3.1 General

It is necessary to begin a water system evaluation by understanding the design intent and current condition of the existing facilities. This helps determine the facility's present and future usefulness. This chapter is devoted to a discussion of the various components of the existing water supply, storage, and distribution facilities for the Village of Greenville. The Village's water distribution map is shown in Figure 3-1.

The Village's water system consists of the following facilities:

- Four groundwater wells (Well 5 was recently put back into service);
- Four water treatment facilities (one located at each well);
- Three elevated water storage tanks;
- One pump station;
- A network of transmission and distribution water mains;
- One pressure zone;
- Water services with meters (as needed individual pressure reducing valves (PRVs) .

3.2 Existing Water Well Supply

The Village must provide a safe and reliable water source for its customers. The Village's municipal water supply is from groundwater wells. The water system consists of four supply wells within the Village's limits.

A summary of the well pumping capacities is provided in Table 3-1. It is expressed in gallons per minute (GPM). *Appendix B* contains copies of construction information for each well.

Table 3-1.
Summary of Water Supply Wells

WELL NUMBER	TOTAL DEPTH (FEET BELOW SURFACE)	STATIC WATER LEVEL (FEET BELOW SURFACE)	PUMPING CAPACITY (GPM)
2	500	117	400
3	600	120	700
4	700	117	1,000
5	540	111	800

When all wells are operating, the Village can produce approximately 2,900 gpm. If Well #4 was out of service, (as the largest producing well) this would be a firm supply of 1,900 gpm.

Well #2 was originally constructed in 1986. The well was replaced in 2006 with the existing high capacity well. It is located near the Appleton International Airport on Discovery Drive. Well #2 has an 18-inch casing from surface to a depth of 56 feet, a 12-inch casing extending to a depth of 64 feet, and an 8-inch carbon steel liner extending to a depth of 310 feet. The well is grouted with concrete to a depth of 310 feet below the surface. The well is drilled to a total depth of 500 feet. The static water level is 117 feet below the surface. Water is pumped with a 60-HP submersible pump with a design flowrate of 400 gpm at 403 feet total dynamic head (TDH). The well feeds Tank #1 (South/Airport) directly and must be pumped again before entering the distribution system.

Well #3 was originally constructed in 1995. The well had rehabilitation completed in 2019. It is located in the Town of Ellington on County Highway JJ. Well #3 has a 22-inch steel casing from the surface to a depth of 37 feet and a 16-inch casing to a depth of 120 feet. The well is grouted with concrete to a depth of 120 feet below the surface. The well is drilled to a total depth of 600 feet. The static water level is 119 feet below the surface. Water is pumped with a 100-HP vertical turbine pump with a design flowrate of 700 gpm at 300 feet TDH. The well is currently pumping at 700 gpm. The well feeds both Tank #2 (North/JJ) and the distribution system. Well #3 and well #4 run concurrently.

Well #4 was originally constructed in 2003. It is on Mayflower Drive along the most eastern Village limits. Well #4 has a 20-inch casing from surface to a depth of 312 feet and is grouted with concrete to a depth of 312 feet below the surface. The well is drilled to a total depth of 700 feet. The static water level is 117 feet below the surface. Water is pumped with a 200-HP vertical turbine pump with a design flowrate of 1,000 gpm at 550 feet TDH. The well feeds the distribution system. Well #3 and well #4 run concurrently.

Well #5 was constructed in 2019. It is located on STH 96 west of STH 76. Well #5 has an 8-inch casing from surface to a depth of 320 feet and is grouted with concrete to a depth of 320 feet below the surface. The well is drilled to a total depth of 540 feet. The static water level is 111 feet below the surface. Water is pumped with a 150-HP submersible pump with a design flowrate of 800 gpm around 450 feet TDH. The well is designed to feed into the distribution system. Well #5 was rehabilitated in 2021 to seal the bottom from a sand aquifer and appears to be pumping with reliable capacity.

3.2.1 Well Water Quality

Wisconsin Administrative Code *NR140* and *NR809* and the Environmental Protection Agency (EPA) govern primary drinking water standards for the public health of drinking water. The Wisconsin DNR requires regular sampling at the distribution entry points for a number of containment constituents, based on those government regulations.

The Village must test a full panel of volatile organics, inorganics, nitrates, and radioactivity samples each year. The below data shows the range of raw water results before treatment and

before entering the distribution system. A summary of the raw water quality is provided in Table 3-2.

Table 3-2.
Raw Water Quality at Wells
(Supply and Treatment Schematic)

PARAMETER	SAMPLE DATE	ENTRY POINT	LEVELS DETECTED	MCL
RADIUM (226+228), PCI/L	5/11/2021	WELL 2	4.026	5
RADIUM (226+228), PCI/L	2/26/2020	WELL 3	2.009	5
RADIUM (226+228), PCI/L	5/11/2021	WELL 4	3.31	5
RADIUM (226+228), PCI/L	2/2/2021	WELL 5	3.46	5

Before the raw water can enter the distribution system, it must be treated. Each of the Village's wells has a treatment filter. All wells are treated for iron, and Wells 2, 4, and 5 are treated for manganese and radium as well. The Village's water supply and treatment schematic is shown in Figure 3-2.

Groundwater from Well #2 is filtered for Iron, Manganese and Radium. A pilot study and treatment upgrades were completed in 2017. This is provided by a pressure sand filter and chemical addition of permanganate. The water is also aerated for iron removal. The water is finally treated with chlorine and is then pumped directly into Tank #1 (South/Airport Tank). Water is pumped from the tank to enter into the distribution system.

Groundwater from Well #3 is treated for high levels of iron bacteria. This is provided by a rapid sand filter that was replaced in 2012. The water is also aerated for further iron removal. The water is finally treated with fluoride and chlorine and is then pumped into Tank #2 (North/JJ Tank) and the distribution system.

Groundwater from Well #4 is filtered for Iron, Manganese and Radium. This is provided by a pressure sand filter and chemical addition of permanganate. The water is also aerated for iron removal. The water is finally treated with fluoride and chlorine and is then pumped into the distribution system.

Well #5 is filtered for Iron, Manganese and Radium. This is provided by vertical pressure filters with OXIPLUS75™ Media. The water is also treated with permanganate for further iron removal. The water is finally treated with fluoride and chlorine and is then pumped into the distribution system.

3.3 Existing Water Storage

Water storage tanks are familiar sights in many communities. They serve three basic purposes:

- Must meet the water needs of customers
- Equalize operating pressures
- Accommodate fire-fighting and emergency storage purposes
- In addition, water storage can reduce the demands of water supply pumping capacities.

Water storage facility can be of several types or styles. Generally, storage facilities are constructed of steel or reinforced concrete. Local topography typically determines the style of reservoir to be constructed. Because the area of the Village of Greenville has generally flat to rolling terrain, the use of elevated water storage is suggested to create a desirable hydraulic grade line for system pressures.

The Village has three elevated water storage tanks. While the overflow elevations are different for each individual reservoir, they all operate at approximately 1,035 feet above grade as the system's hydraulic grade line (HGL).

Tank #1 is located by the airport and is the most southern tank in the water system by Well #2. The steel elevated tank was constructed in 1986 and has a capacity of 300,000 gallons. The tank operates between 23 to 27 feet seasonally. It has a much lower hydraulic grade line than the other storage reservoirs. Thus, it must be pumped and the pressure boosted to enter the distribution system. The booster pump has a VFD drive and is operated once a day. The current pumping capacity is set at 80% of the maximum and is operating at approximately 440 gpm with 178 TDH. The pumping pressure into the distribution system is between 75 to 77 psi.

Tank #2 is located along County Highway JJ on the most northern limits of the Village by Well #3. The steel elevated tank was constructed in 1995 and was lowered in 2012 when the two water pressure zones were combined into one. It has a capacity of 300,000 gallons. The tank operates between 24 feet to 27.5 feet seasonally.

Tank #3 is located on Julius Drive along the most western side of the Village. The concrete hydropillar elevated tank was constructed in 2010 and has a capacity of 750,000 gallons. The tank operates between 34.5 feet to 37 feet seasonally.

A summary of the storage facilities is presented in Table 3-3.

Table 3-3.
Summary of Storage Reservoir Information

TANK NAME	LOCATION	STORAGE TYPE	CAPACITY (GAL)	OVERFLOW ELEVATION	YEAR CONSTRUCTED
#1 SOUTH	AIRPORT / WELL #2	SPHEROID	300,000	1,007 FT USGS ^BOOSTER PUMP	1986
#2 NORTH	CTH JJ / WELL #3	SPHEROID	300,000	*LOWERED TO 1,044 FT USGS	1995 *LOWERED IN 2012
#3 JULIUS	JULIUS DRIVE / GREENVILLE DRIVE	HYDROPILLAR	750,000	1,038 FT USGS	2010

3.4 Existing Water Distribution System

The function of the water distribution system is to deliver water from the supply sources to the customer and to storage in an adequate quantity and at an acceptable pressure. The water distribution system consists of water main piping, valves, hydrants, meters, and other appurtenances.

3.4.1 Meters and Services

It is the policy of the Village of Greenville to meter all water connections. Each meter is classified by customer type (as residential, commercial, industrial, or public authority). As reported to the Public Service Commission (PSC) for the year 2020, the following service sizes and types are summarized in Table 3-4.

Table 3-4.
Summary of Meters and Customer Types

METER SIZE (INCHES)	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	PUBLIC AUTHORITY	TOTAL
¾	3,517	114	89	17	**3,737**
1	2	27	31	6	**66**
1-1/2	3	10	19	7	**39**
2	-	11	9	9	**29**
3	-	3	2	3	**8**
4	-	1	1	-	**2**
8	-	-	-	1	**1**
10	-	-	-	1	**1**
TOTAL	**3,522**	**166**	**151**	**44**	**3,883**

3.4.2 Pipeline Network

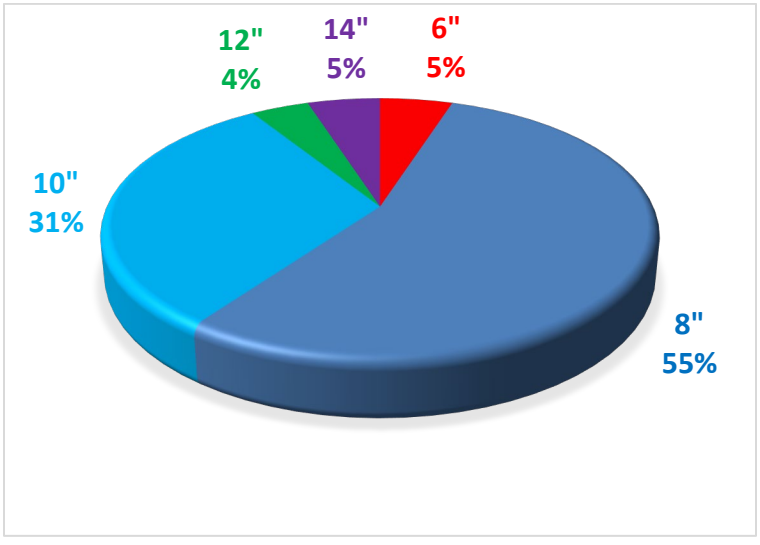
The Village's distribution system pipeline was initial constructed in the 1980's. The Village has almost 80 miles of water distribution piping. The majority of the water main piping is made of PVC material. Water main has an average bury of depth at six (6) feet. The distribution system connects to 831 fire hydrants and has 1,445 valves in service. In the year 2020, 365 valves were operated.

The current water main inventory is summarized in Table 3-5 is part of the *2020 Public Servcie Commission Report: Water Section*. The Village has a small amount of 16" water main in the system but has not been incorporated into the PSC Annual Report. The amount is negligible.

Table 3-5.
Summary of Water Mains

DIAMETER (INCHES)	PVC (FEET)	PERCENTAGE
6	18,553	5%
8	223,905	55%
10	128,544	31%
12	15,091	4%
14	22,206	5%
TOTAL	**408,299**	**100%**

Approximately 95% of the Village's water distribution system is 8-inches or larger in diameter.



Graph 3-1.
Summary of Water Mains

4 WATER DEMAND

4.1 General

The analysis of present and past water use and the projection of future water use trends are basic to the development of water supply and distribution system improvement programs. This information, when applied to the land use and population data as defined in Chapter 2, will ultimately calculate the water demand requirements.

Several factors must be considered in the evaluation of a water system. This evaluation uses the following terms for water demand:

- **Per Capita Demand** – The average volume of water used per person. This is calculated by diving the average daily demand by the population served in the water system. It is typically expressed in gallons per capita per day (GPCD).
- **Average Day Demand** – The volume of water used on a typical day. This is calculated by dividing the total annual water demand by the number of days in a year. It is typically expressed in gallons per day (GPD). The average daily demand is used to determine the total volume of water that must be produced annually from the available water supply sources and the minimum amount of water in storage that should be provided.
- **Maximum Day Demand** – The largest volume of water used on any given day. This factor typically ranges from 1.8 to 2.8 times the average day demand. It is also expressed in GPD. The maximum day demand is used to determine the required design storage volume.
- **Peak Hour Demand** – The hour of the day when the most water is used. This is often difficult to determine unless there are comprehensive records of hourly water pumped. This factor typically ranges between 2.5 to 4.0 times the average day demand. It is expressed in gallons per minute (GPM). The peak hour demand is used to determine the pumping requirements required for operational fluctuations.

4.2 Average Day Demand and Maximum Day Demand

The Village's average day and maximum day pumping demands were obtained from PSC records for the years of 2015 to 2020. The annual total water pumped increased every year, year over year. Over the evaluation period from 2015 to 2020, the water pumped demand increased by more than 100 million gallons. This is a 147% increase from 2015 to 2020.

The Village's demand rates are shown in Table 4-1.

Table 4-1.
Average Day and Maximum Day Pumping Demands

YEAR	ANNUAL GROUNDWATER PUMPED (1,000 GALLONS)	AVERAGE DAY PUMPED (GPD)	MAXIMUM DAY PUMPED (GALLONS)	PEAKING FACTOR	MAXIMUM DAY REASON
2015	221,946	608,071	1,011,000	1.7	NEW CONSTRUCTION
2016	231,561	634,414	999,000	1.6	LAWN WATERING
2017	239,175	655,274	900,000	1.4	WATER MAIN LEAK
2018	276,198	756,707	1,016,000	1.3	FLUSHING HYDRANTS
2019	283,994	778,066	1,643,000	2.1	FLUSHING HYDRANTS
2020	326,378	894,186	1,378,000	1.5	NEW CONSTRUCTION
AVERAGE				**1.6**	

Table 4-1 shows that the Village's maximum day demands ranged from 1.3 to 2.1 times the average daily demand, for a variety of operational and consumption reasons. The calculated average maximum day demand for the period of 2015 to 2020 was determined to be a 1.6 peaking factor.

No information was reviewed for the peak hour demand. The 2006 water report estimated the peak hour demand to be 1.6 times the maximum day demand. Because of large residential growth in the Village since that report, a generally accepted value was used to calculate the peak hour rate at 2.0 times the maximum day demand, in gallons per minute, over an 18-hour pumping period.

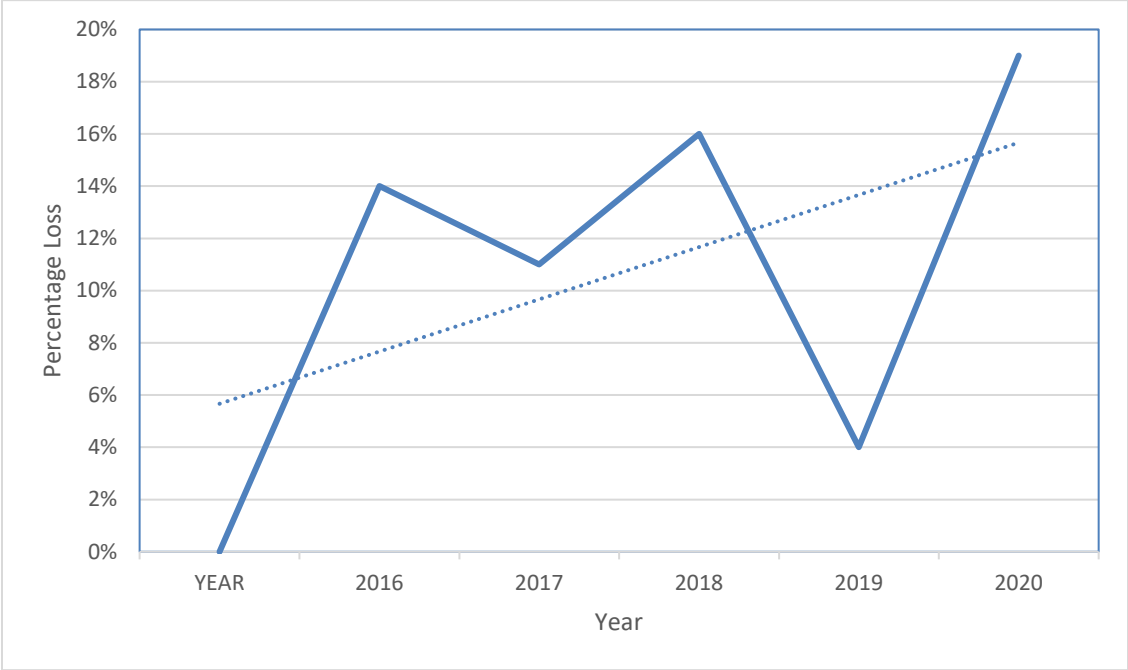
4.3 Water Loss

The PSC records were consulted to report the difference between the total water pumped into the system and the total water sold to customers. This is called unaccounted for water loss volume. The percentage of unaccounted for water loss is summarized in Table 4-2, for the last five years.

Table 4-2.
Unaccounted For Water Loss

YEAR	2016	2017	2018	2019	2020
PERCENTAGE OF WATER LOSS	14%	11%	16%	4%	19%

Values around 10% are considered average. Whenever the amount of unaccounted for water loss exceeds 20%, the losses are considered potentially excessive and the situation should be investigated.



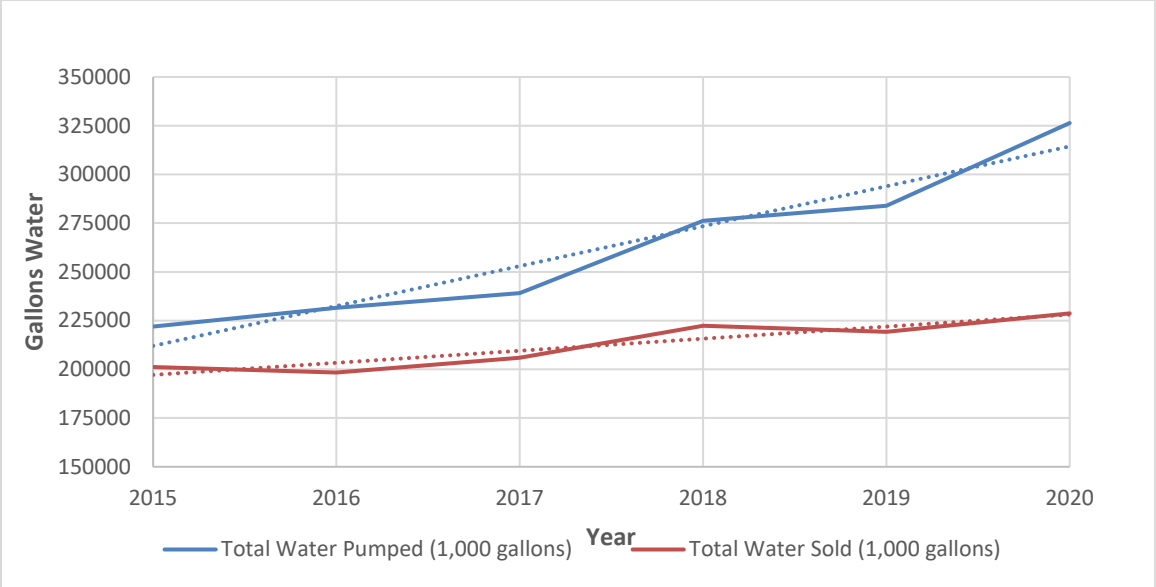
Graph 4-1.
Water Loss Trending

In Graph 4-1 upon review of the data trendline, it appears the Village's water loss is increasing year over year.

4.4 Pumped Water and Sold Water

From the PSC records for the last five years, the Villages annual amount of water pumped from the wells was compared to the water sold to customers. During the evaluation period, the gap between gallons pumped and gallons sold also increased.

The Village's historical water demand is shown in Graph 4-2 over the years of 2015 to 2020.



Graph 4-2.
Historical Water Demand

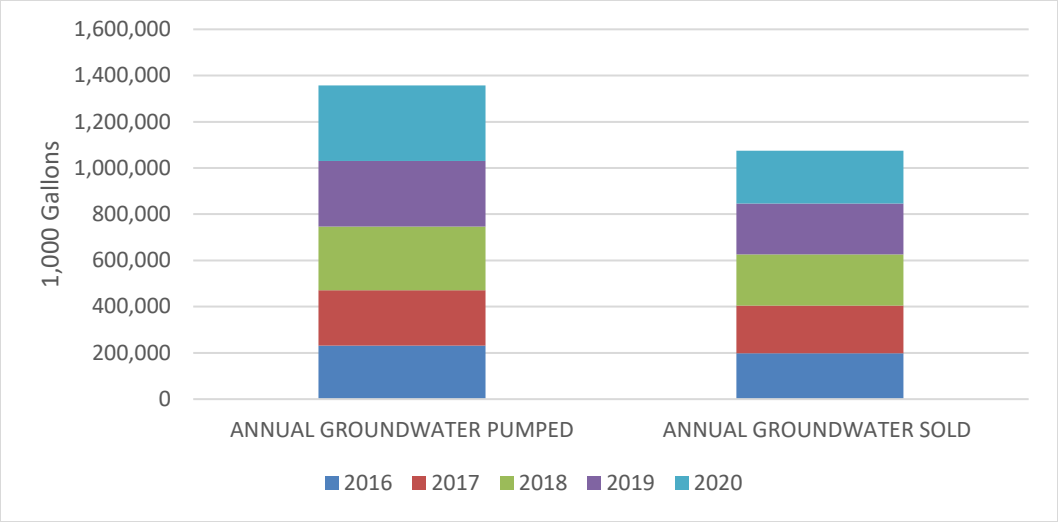
The Village's consumption demands of pumped and sold water totals are shown below in Table 4-3. On average over the last five years, the ratio of water pumped to water sold was calculated at approximately 1.3.

Table 4-3.
PSC* Reported Water Pumped and Sold

YEAR	ANNUAL GROUNDWATER PUMPED (1,000 GALLONS)	ANNUAL GROUNDWATER SOLD (1,000 GALLONS)	RATIO OF PUMP : SOLD
2016	231,561	198,361	1.2
2017	239,175	205,936	1.2
2018	276,198	222,312	1.2
2019	283,994	219,270	1.3
2020	326,378	228,709	1.4
AVERAGE			**1.3**

* Public Service Commission (PSC).

A portion of the water loss can be attributed to hydrant flushing and system maintenance. Overall, the Village generally seems to be within acceptable parameters for a well-maintained distribution system. A comparison of the Village's pumped and sold volumes is presented on Graph 4-3.



Graph 4-3.
Water Pumped and Sold Comparison

4.5 Historical User Type Demands

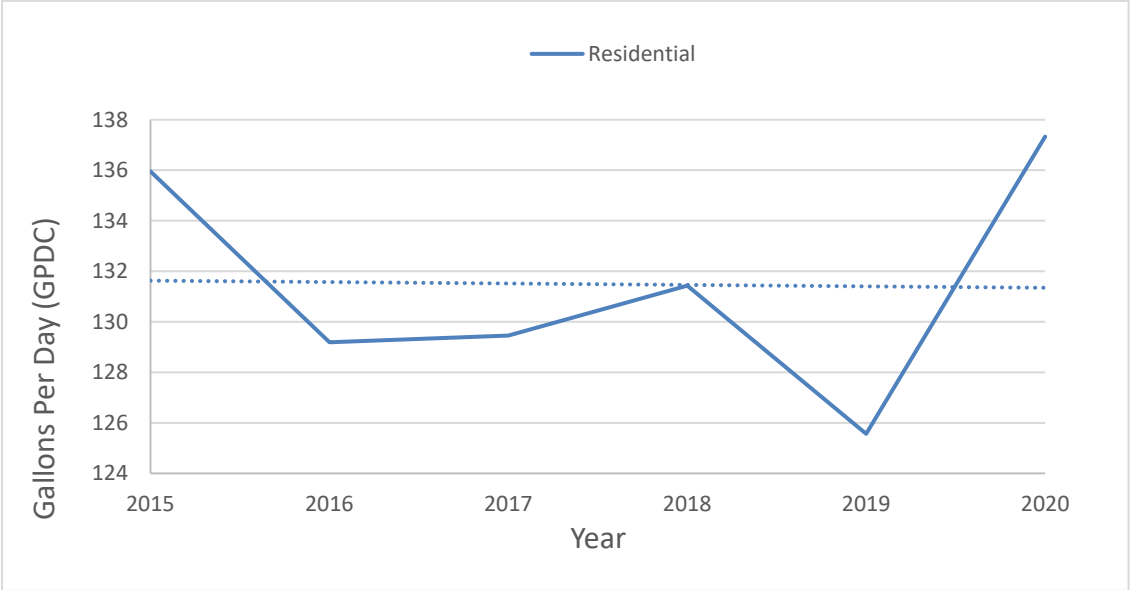
Sold water can be further broken down into specific customer types. These include residential, commercial, industrial, and public authority. It is helpful to determine each user demand to effectively project future water usage on specific growth patterns.

4.5.1 Residential

Table 4-4 shows the annual number of residential customers and annual volume of water sold to each residential customer. The residential water sold data and the number of customers was used to calculate the average day of water sold in gallons per day by customer (GPDC). The residential demand per customer is shown on Graph 4-4. In this study, future projections used the average gallons per day sold from year 2015 to year 2020 of 131.5 GPD.

Table 4-4.
Historical Residential Water Usage

YEAR	ANNUAL RESIDENTIAL SOLD (1,000 GALLONS)	NUMBER OF RESIDENTIAL CUSTOMERS (METERS)	AVERAGE DAY SOLD (GPDC)
2015	156,755	3,159	135.9
2016	154,953	3,286	129.2
2017	158,104	3,346	129.5
2018	163,018	3,398	131.4
2019	159,999	3,491	125.6
2020	175,944	3,510	137.3
AVERAGE			**131.5**



Graph 4-4.
Residential Demand Per Customer

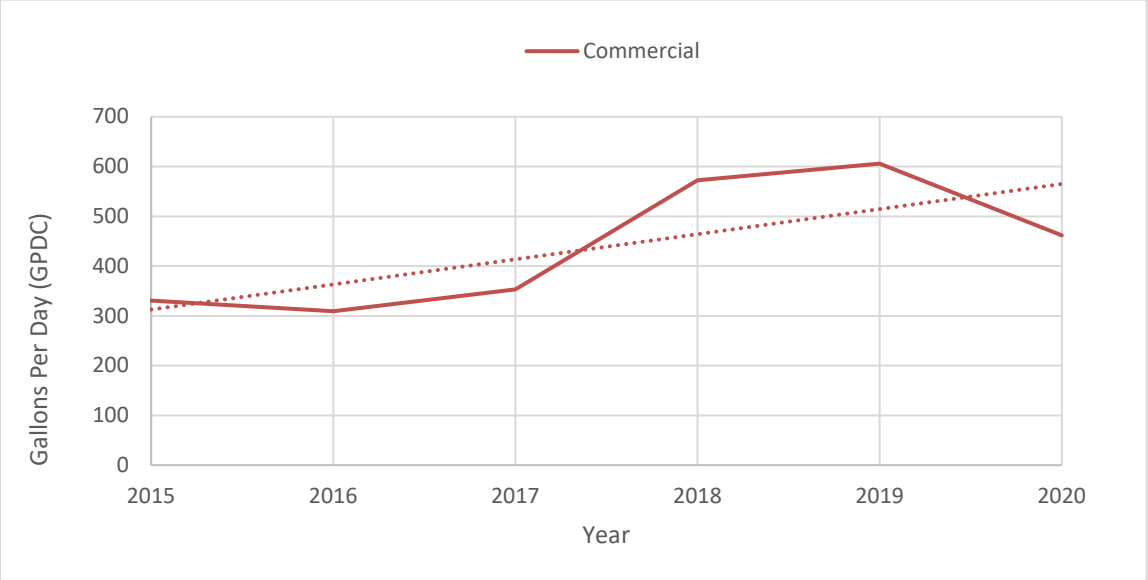
4.5.2 Commercial

Table 4-5 shows the annual number of commercial customers and annual volume of water sold to each commercial customer. The commercial water sold data and the number of customers was used to calculate the average day of water sold in gallons per day by customer (GPDC). The commercial demand per customer is shown on Graph 4-5.

**The year 2020 was in the midst of the COVID-19 pandemic. Commercial businesses were forced to shut or reduce staffing, which likely decreased the regular demand in water volume. Because of this, the average water sold per customer is likely skewed to be lower usual. In this report, future projections used the year 2019 commercial demand rate of 605.9 GPD.*

Table 4-5.
Historical Commercial Water Usage

YEAR	ANNUAL COMMERCIAL SOLD (1,000 GALLONS)	NUMBER OF COMMERCIAL CUSTOMERS (METERS)	AVERAGE DAY SOLD (GPDC)
2016	14,902	132	309.3
2017	17,399	135	353.1
2018	28,408	136	572.3
2019	31,183	141	605.9*
2020	27,413	160	469.4
AVERAGE			**460.5**



Graph 4-5.
Commercial Demand Per Customer

4.5.3 Industrial

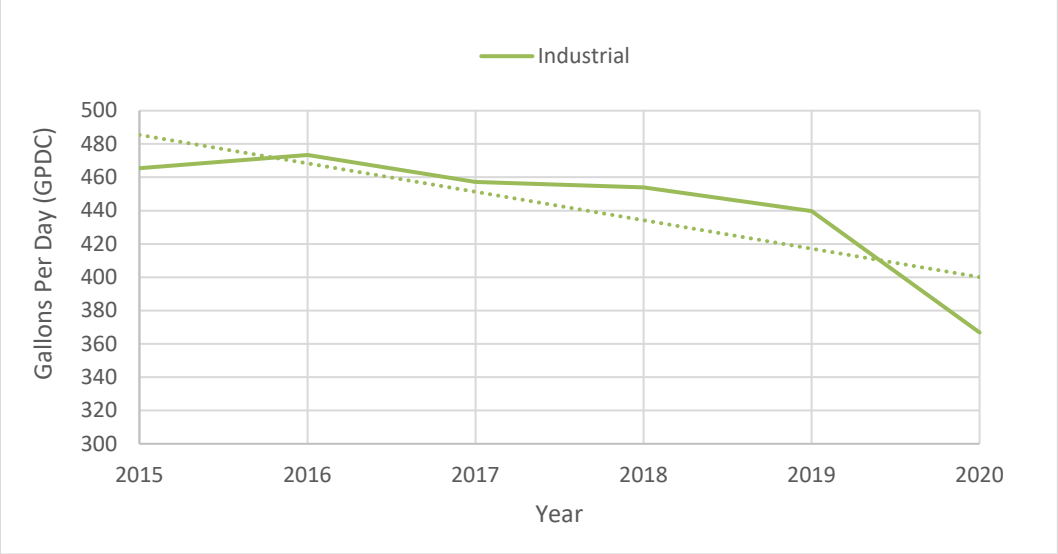
Table 4-6 shows the annual number of industrial customers and annual volume of water sold to each industrial customer. The industrial water sold data and the number of customers was used to calculate the average day of water sold in gallons per day by customer (GPDC). The industrial demand per customer is shown on Graph 4-6.

**The year 2020 was in the midst of the COVID-19 pandemic. Industrial businesses were forced to shut or reduce staffing, which likely decreased the regular demand in water volume. Because of this, the average water sold per customer is likely skewed to be lower usual. In this report,*

future projections used the average gallons per day sold from year 2015 to year 2019 of 458.0 GPD.

Table 4-6.
Historical Industrial Water Usage

YEAR	ANNUAL INDUSTRIAL SOLD (1,000 GALLONS)	NUMBER OF INDUSTRIAL CUSTOMERS (METERS)	AVERAGE DAY SOLD (GPDC)
2016	21,772	126	473.4
2017	21,363	128	457.3
2018	21,544	130	454.0
2019	21,021	131	439.6
2020	19,816	148	366.8
AVERAGE*			**438.2***



Graph 4-6.
Industrial Demand Per Customer

4.5.4 Public Authority

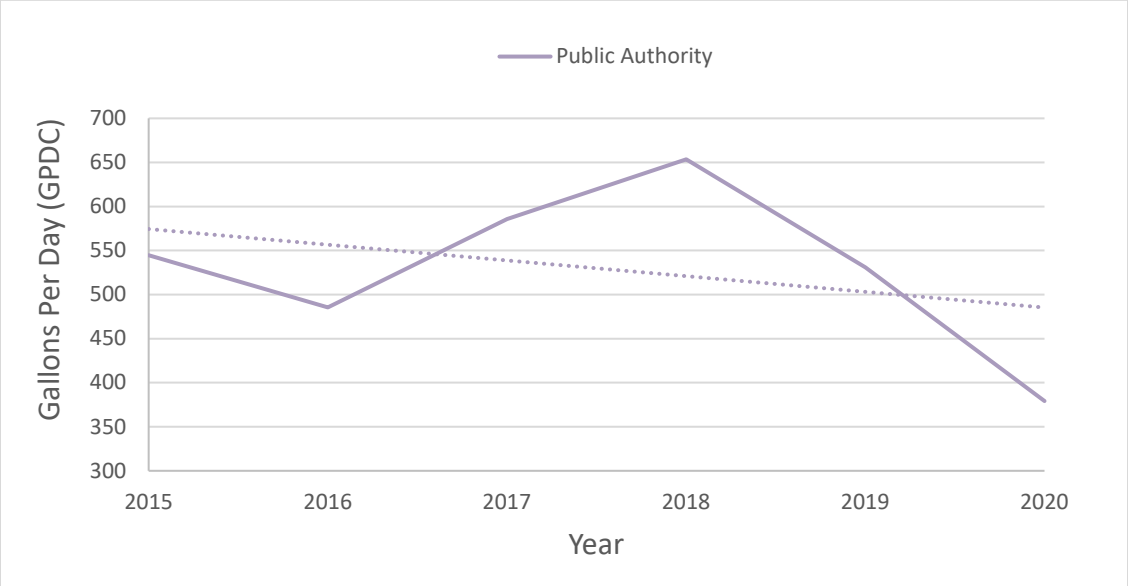
Table 4-7 shows the annual number of public authority (PA) customers and annual volume of water sold to each PA customer. The PA water sold data and the number of customers was used to calculate the average day of water sold in gallons per day by customer (GPDC). The PA demand per customer is shown on Graph 4-7.

**The year 2020 was in the midst of the COVID-19 pandemic. Public Authority offices and operations were forced to shut or reduce staffing, which likely decreased the regular demand in*

water volume. Because of this, the average water sold per meter is likely skewed to be lower usual. In this report, future projections used the average gallons per day sold from year 2015 to year 2019 of 560.0 GPD.

Table 4-7.
Historical Public Authority Water Usage

YEAR	ANNUAL P.A. SOLD (1,000 GALLONS)	NUMBER OF P.A. CUSTOMERS (METERS)	AVERAGE DAY SOLD (GPDC)
2016	6,734	38	485.5
2017	8,122	38	585.6
2018	9,064	38	653.5
2019	7,167	37	530.7
2020	5,536	40	379.2
AVERAGE*			**526.9***



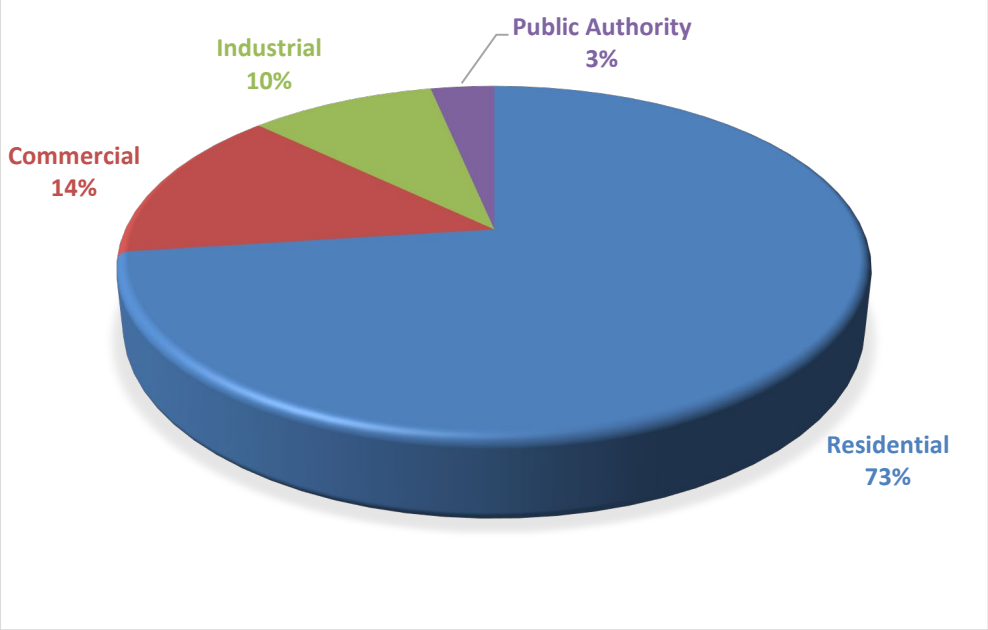
Graph 4-7.
Public Authority Demand Per Customer

Table 4-8 and Graph 4-8 compares the year 2019 total water sales by customer type. The year 2019 was used instead of 2020, because the COVID-19 pandemic skewed patterns and usages that are typically normal for the Village's demands. These results are for a single year and not an average calculated over time or for future projections.

Table 4-8.
Total Water Sold to User Type (2019)

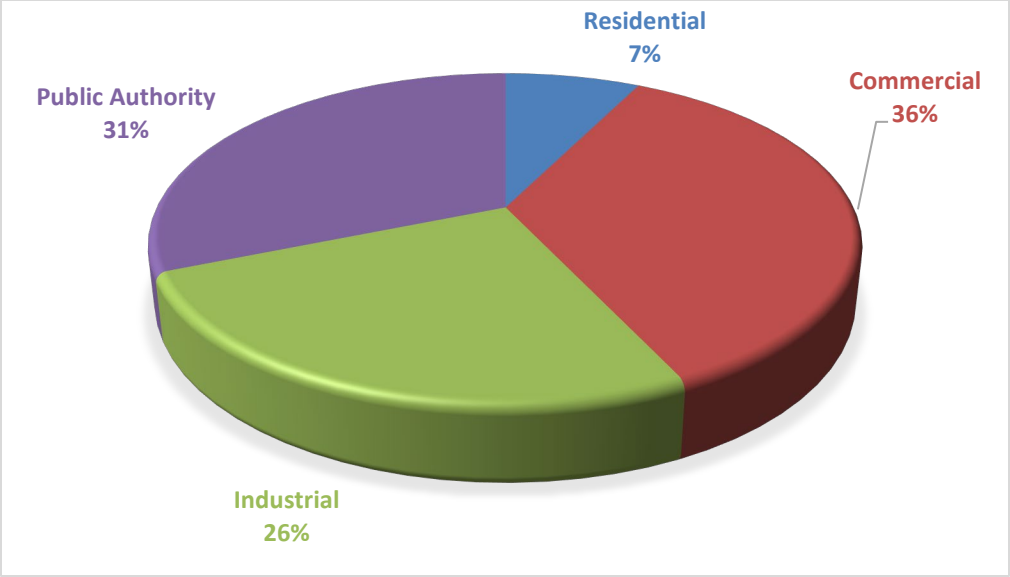
CUSTOMER TYPE	ANNUAL SOLD (1,000 GALLONS)	NUMBER OF CUSTOMERS (METERS)	CALCULATED SOLD (GPM)	AVERAGE DAY SOLD (GPDC)
RESIDENTIAL	159,999	3,491	304	126
COMMERCIAL	31,183	141	59	606
INDUSTRIAL	21,021	131	40	440
PUBLIC AUTHORITY	7,167	37	14	531

Graph 4-8 is a following pie chart displaying the percentage of consumption that each user group demanded.



Graph 4-8.
Percentage of Total Sold to User Type (2019)

Graph 4-9 compares the year 2019 per capita water sales by customer type, the following pie chart displays the percentage of GPDC sold that each user type required. The year 2019 was used instead of 2020, because the COVID-19 pandemic skewed patterns and usages that are typically normal for the Village's demands.



Graph 4-9.
Percentage of Total Sold to User Type (2019)

4.6 Projected Water Use Demands for Year 2051

A typical planning period for a water study is 20-years. In this evaluation, a 30-year period was completed until the year 2051. Population growth, household trends, business development, and per capita usage were all used to calculate the projected water usage for the planning period. Future growth can only be defined by a best estimate of these economic and consumptive factors.

For the 30-year planning period, the demands on the municipal water system will increase. The increased demands will come from future development of all types. While the future development is expected to be predominately residential in nature, a certain level of commercial and industrial development is also expected to occur.

4.6.1 Projected Average Day Demand

The Village's Comprehensive Land Use Plan detailed specific growth patterns for different customer types. The projected water usage considered all development types of residential, commercial, industrial, and public authority. Water consumption was previously determined by a per capita meter (customer) usage for each customer type. These rates are referenced in Section 4.5 of this report and each customer demand is summarized in Table 4-9 below.

Table 4-9.
Summary of Customer Demands Per Capita

CUSTOMER TYPE	AVERAGE DAY SOLD (GPDC)
RESIDENTIAL	131.5
COMMERCIAL	605.9
INDUSTRIAL	458.0
PUBLIC AUTHORITY	560.0

The above rates were used for future projections to year 2051. If the rates in Table 4-9 are compared to year 2019 per capita demands (see *Table 4-8*), in most cases the demand rates were increased for average and evaluative purposes.

The future number of customers was computed at full development build-out, as described in Section 2.9.4. (Specific computations and details are provided in *Appendix A*.) Table 4-10 shows the additional customers that are projected to be added to each customer type by year 2051.

Table 4-10.
Full Development Projections for Year 2051

CUSTOMER TYPE	EXISTING USERS (METERS)	PROJECTED NEWLY ADDED USERS (METERS)	PROJECTED NEW AVERAGE DAY DEMAND (GPD)
RESIDENTIAL	3,510	3,461	916,687
COMMERCIAL	160	22	110,274
INDUSTRIAL	148	5	70,074
PUBLIC AUTHORITY	40	0	22,400
TOTAL			**1,119,435**

4.6.2 Projected Year 2051 Water Requirements

Projected water requirements combine the entirety of the factors and rates previously determined in this report. Those calculations are summarized below:

- The population growth and new water demands were calculated in Section 4.6.1 at an average day demand of 1,119,435 GPD.
- The average water pumped to water sold ratio was determined in Section 4.4 at a ratio of 1.3 times more water pumped than sold.
- The maximum day peaking factor was determined in Section 4.2 at a ratio of 1.6.
- Section 4.2 also discussed the peak hour rate at 2.0 times the maximum day demand over an 18-hour pumping period.

Table 4-11 shows the projected water needs for year 2051 compared to actual volumes for 2019 and 2020.

**Year 2020 was in the midst of the COVID-19 pandemic and water requirements may have been less than usual, therefore year 2019 was also used in the comparison chart.*

Table 4-11.
Projected Year 2051 Water Requirements

YEAR	WATER SOLD (1,000 GALLONS)	ANNUAL PUMPAGE REQUIRED (GALLONS)	AVERAGE DAY PUMPED (GPD)	MAXIMUM DAY (GPD)	PEAK HOUR RATE (GPM)
2019	219,270	283,994,000	778,066	1,643,000	3,042
2020	228,709	326,378,000	894,186	1,378,000	2,552
2051	408,594	531,171,908	1,455,266	2,328,426	4,312

5 BASIS OF ANALYSIS

5.1 General

This chapter contains the standards and criteria governing the preliminary design of supply, storage, and distribution system improvements. Cost data is also presented to provide a basis for economic comparison of alternative plans and estimating financial requirements for the construction of the recommended improvements. All alternative projects and cost estimates developed in this evaluation conform to the criteria set forth in this chapter.

The function of this Water System Master Plan is to develop reasonable approximations of the size, location, and cost of the required facilities in sufficient detail to permit evaluation of alternatives projects. It may be expected that some changes in location and sizing of facilities will result from the detailed engineering analysis, which is made during the design-phase preparation.

5.2 Project Staging

Project staging refers to the physical sizing and design capacity of the project components as related to their expansion and useful life flexibility. Project staging has the objective of supplying long range needs for water service at the lowest practical cost.

As a general rule, areas expected to reach substantial full development in the 30-year design period are most economically served by constructing transmission mains for the area's ultimate needs. This rule is especially applicable in areas with difficult construction conditions such as shallow bedrock or high groundwater. In the case of wells, pumps stations, and reservoirs, initial construction may be based on a capacity sufficient for the 30-year period, depending on the specific situation.

5.3 Service Standards

Service standards establish the minimum requirements for water quality, quantity, and pressure. They determine the degree of fire protection and reliability the system should provide. In Wisconsin, the minimum standards are set forth by the Wisconsin DNR, the Wisconsin Administrative Code, and the Public Service Commission. Other, more restrictive standards for various phases of water supply have been set by the American Water Works Association and the International Organization for Standardization (ISO).

5.3.1 Water Quantity and Quality

With regard to water quantity, all water system improvements recommended in this evaluation conform to two basic premises. They are, first, that a water supply system shall be capable of meeting all demands during the 30-year design period without reducing pressure below an

acceptable limit; and second, that no water rationing or other customer limitations are compatible with high standards of service. Water quality is a balance between supply and storage. Having a redundant and adequate water supply will reduce storage facilities.

Desirable water quality implies that the water is clear, tasteless, odorless, free of bacteriological contamination, and in compliance with State and Federal drinking health standards. The WDNR has established minimum standards in Chapter NR 140 and NR 809 for mineral content, physical characteristic, and bacterial content of water to ensure its quality. All improvements recommended in this report are designed to meet these requirements.

5.3.2 Service Pressure

An acceptable quality of water service requires that the water be delivered to each customer within reasonable limits of minimum and maximum pressure. The Wisconsin Administrative Code NR811 requires that normal static pressures must not be less than 35 psi or be greater than 100 psi at ground level.

Higher elevation areas will have lower water system pressure. If water pressures are too low in a system, users will not receive adequate supply and fire protection. This can cause problems with system operations and tend to cause higher water consumption rates by users. Pressure below 35 psi is too low to provide satisfactory service to the upper floors of buildings over two stories high. If water pressures are too high in the system, users may complain about flow rates in home devices. Also, higher system pressures can increase water losses from leakage rates and water main breaks. Pressures greater than 100 psi increase the risk of pipe rupture and frequently cause trouble in plumbing installations.

A minimum residual water pressure of 20 psi must be maintained under all conditions of flow. Fluctuations in pressure at any point under normal conditions should be limited to about 10 psi.

5.3.3 Supply/Storage Relationship

A total volume of water is required each day. However, during the day, peak periods of water use will occur. The amount of water needed during these peak periods is a balance between supply and storage. Having a redundant and adequate water supply source will reduce storage requirements. Determination of the most economical combination of supply capacity and storage volume required to meet system demands involved consideration of such factors as the capital, annual cost of production, and the manner in which facilities are used to meet the demands.

5.3.4 Operating Storage

The amount of operating storage depends on the type and arrangement of the various storage facilities. Storage is typically provided for what is termed “peaking”, or large demands in a short period of time. Storage is also needed because the supply pumps and water aquifers cannot

sustain 24-hour pumping demands with constant pressure. Instead, a water supply well can fill the storage reservoirs and turn off to allow the aquifers to recover. Operating storage is necessary to avoid short cycling of pumps.

In the case of elevated storage, general engineering practice is to operate the range at around six feet to provide efficient control of high lift pumps.

5.3.5 Equalizing Storage

The rate at which water is used varies throughout the day. A typical demand curve for a residential community includes two peaks; one in the morning and one in the evening when residential demands are the highest. The equalizing storage represents the volume of distribution storage, which is required to meet peak hourly demands that exceed the supply capacity. The volume is dependent on the characteristics of the system. Including the number and type of customers and the amount of supply. Water quantity is a balance between supply and storage. Having a redundant and adequate water supply source reduces the amount of equalizing storage required.

For the purpose of design, the maximum equalizing storage occurs when the supply facilities are designed to meet the maximum day rate. Increasing the supply capacity over the maximum day rate decreases the amount of equalizing storage required. The minimum equalizing storage required is zero, when the supply capacity is above the peak hour demand rate. For most communities, the maximum equalizing storage required falls between 15 to 30 percent of the maximum day demand.

5.3.6 Fire Reserve

In addition to providing water for residential, commercial, industrial and other uses, the distribution system should be capable of supplying flows needed for firefighting. Capacity for fire suppression is often the controlling factor in sizing water system components, including the amount of water to be stored. The maximum firefighting reserve occurs when the supply capacity is less than or equal to the peak hour demand rate.

It is assumed that only one fire will occur at a time, but that the fire will occur on the day of maximum demand. Therefore, the firefighting reserve is in addition to the equalizing storage.

It is typically suggested to store most of the water requirements for fire flow conditions, rather than design the water supply components to pump the capacity needed for these large flow rates. A major portion of the criteria deals with the adequacy of the water supply.

In addition to the direct benefits of fire protection, a good distribution system has an indirect benefit of lowering the fire insurance rating of the community. The Insurance Services Office (ISO) has established criteria for evaluating fire-fighting capacities of a community to determine their fire rating. The recommended flows depend on the building construction and total floor area and are modified by such factors as sprinkler systems, type of occupancy, and exposure to

other buildings. Since every building could have a different recommended fire flow, an average value has been established for typical buildings. Table 5-1 summarizes the recommended fire flows from ISO.

Table 5-1.
ISO Recommended Fire Flows

CUSTOMER TYPE	RECOMMENDED FIRE FLOW (GPM)
RESIDENTIAL	500–1,000
COMMERCIAL	1,500–3,500
INDUSTRIAL	UP TO 3,500
SCHOOL	UP TO 3,500

5.3.7 Emergency System Reliability

To protect the public welfare, a water system must be reliable under all conditions. In most water systems, a substantial portion of the total investment is devoted to this purpose. Reliability can be increased by providing emergency storage, constructing duplicate piping, transmission and storage facilities, and supplying alternative sources of power.

The basic standard of reliability used in evaluation of the Village's water system is that the system should maintain normal service at average day demand for 12 hours after failure of any single system component, and still provide adequate fire protection at the end of the 12-hour period.

5.4 Design Criteria

Set forth in the following section are the design practices governing the design of all water system improvements. These criteria consider in detail all water source, pipeline network, storage reservoirs, and pumping stations. All the criteria were developed with the goal of meeting the service standards, which were established in the preceding section.

5.4.1 Supply and Storage Facilities

A municipal water system should be capable of meeting all demands expected to be imposed on the system. To achieve this goal, a combination of wells and storage must be adequate in volume and flow rate capacity.

At a minimum, the wells should have the capacity equal to the maximum day demand. Typical engineering design is to provide the maximum day demand in a 12-hour pumping period. It is also good operational design to provide a "firm water supply". A firm water supply is the ability to provide to average day demand when the largest water source is out of service.

Where extensive water treatment is required, peak demands can be economically met by a storage capacity equal to the maximum day demand together with sufficient storage volume that exceeds the maximum day rate.

5.4.2 Pipeline Network

Design criteria for the pipeline network are presented in terms of the basic criteria governing the network configuration. These criteria are in general conformity with ISO recommendations and provide water main to carry peak hour demand, maximum day demand and fire flows.

Where feasible, transmission and major distribution mains should be routed through the principal industrial and commercial areas, past schools, and along high density residential developments. Water mains should be interconnected to form looped networks that minimize dead end lines. This increases water quality by reducing stagnation and increases residual pressures by providing bi-directional flow to hydrants. These procedures maximize fire protection afforded by the distribution system.

Fire hydrants should be installed in developed areas at approximately 450-foot centers. In undeveloped area, tees should be installed every 450-feet so hydrants can be added in the future.

6 EVALUATION AND ALTERNATIVES

6.1 General

This chapter summarizes the findings from the evaluation of the Village of Greenville's water system. Each section below discusses the specific components of the water, which include:

- Water Supply
- Water Storage
- Water Distribution System

6.2 Year 2051 Water Supply Evaluation

The Village has four water supply wells currently in service that provide clean and safe drinking water. A fourth water supply well was recently placed back into service during the time of writing this report. When all wells are operating, the Village can produce approximately 2,900 gpm.

It is good engineering practice to be able to provide a "firm water supply". A firm water supply is the ability to provide the average day water demand with the largest water source out of service. The required firm water supply demand for year 2051 is 1,011 gpm. If Well #4 is out of service as the largest producing well, the remaining wells would be able to provide 1,900 gpm. Table 6-1 calculates the reliable firm supply capacity.

Table 6-1.
Reliable Supply Capacity

WELL NUMBER	PUMPING CAPACITY (GPM)	DAILY OPERATING CAPACITY (GALLONS)
2	400	576,000
3	800	1,152,000
4	1,000	1,440,000
5	700	1,008,000
TOTAL SUPPLY	2,900	4,176,000
FIRM SUPPLY (LESS WELL #4)	**1,900**	**2,736,000**

Supply evaluations were calculated following AWWA Standards and WDNR Regulations. The water supply capacity should meet at least the maximum day demand. If this is met, then the supply facilities should be considered adequate to replenish the storage reservoirs, even if there is a depletion of storage due to demands. The projected maximum day demand for year 2051 is

2,328,426 GPD. If this demand was pumped over a 24-hour period, this would be calculated as 1,617 gpm and the current total and the current firm water supply would be adequate to handle this demand. However, the maximum day demand is often calculated over a 12-hour pumping period instead. Rather, this rate would be calculated as 3,234 gpm. The Village's current well supply is not adequate to handle this demand without the addition of another well source.

The projected peak hour demand for year 2051 is 4,312 gpm, pumping over an 18-hour duration. The Village's current well supply is not adequate to handle this demand. A portion of the demand would need to utilize storage volume.

The wells receive regular maintenance and upgrades by the Village as needed. The raw water quality from the groundwater aquifer has undesirable iron, manganese and radium levels in most all the wells. Treatment processes are installed and appear to be providing water to the distribution system that is within *NR140*, *NR809*, and EPA drinking water standards. The Village is providing adequate treatment for the water supply wells.

6.3 Year 2051 Water Storage Evaluation

Storage within the water distribution system permits the water supply facilities to operate at a constant rate in advance of a customer need. The amount of water storage required is determined by customer demands and fire flow requirements. Storage must be provided for equalizing the peak-period demands and total required fire protection volumes, often delivered in a short period of time.

Equalizing storage furnishes the increments of demand which exceed the capacity of the supply infrastructure. The basis of design was that since the Village wells cannot provide the year 2051 peak-hour rate, then, additional equalization volume will be added into the storage capacity needed.

Fire-fighting reserve furnishes the increments of demand that exceed the capacity of the supply facilities imposed during a fire event. The basis of design was for a maximum fire flow rate of 3,500 gpm over a three-hour duration event. The calculated volume of flow storage required would be 630,000 gallons.

Operating storage provides a control range to stop and start pumping sources. The basis of design was calculated as 15% of the current storage volume.

Table 6-2 shows the calculated storage capacity needs. The supply volume assumes that Well #5 is repaired and in service and pumping efficiently by year 2051. The total storage volume of Tank #1 (South/Airport) was reduced because it provides capacity from a pump and not from gravity storage, from 300K gallons to 288K gallons. Reviewing the table, it shows that the Village's current combined supply and storage are adequate for the year 2051 reliable storage capacities.

Table 6-2.
Reliable Storage Capacity

STORAGE REQUIREMENTS	EXISTING SUPPLY/STORAGE	YEAR 2051 NEEDS
PEAK HOUR EQUALIZING VOLUME (GALLONS)		257,720
LESS WELL SUPPLY WITH ALL WELLS (GALLONS)	*174,000*	
OPTIMUM FIRE PROTECTION (GALLONS)		630,000
OPERATING STORAGE (GALLONS)		202,500
TOTAL EFFECTIVE STORAGE (GALLONS)	*1,338,000*	
TOTAL CAPACITIES AVAILABLE AND REQUIRED	**1,512,000**	**1,090,220**
ADDITIONAL CAPACITY REQUIRED		**0**

Emergency storage provides system reliability in the event of the supply source's failure. Storage should provide, at a minimum, the year 2051 average day water demand in emergency reserve in case of a supply failure. This can occur because of power outages or extreme storm conditions.

Table 6-3 shows the year 2051 emergency storage required. The Village's current storage volume is not adequate to meet year 2051 projected emergency storage capacity if all wells were out of service.

Table 6-3.
Emergency Storage

STORAGE REQUIREMENTS	EXISTING SUPPLY/STORAGE	YEAR 2051 NEEDS
PROJECTED AVERAGE DAY DEMAND		1,455,266
CURRENT ELEVATED STORAGE	*1,350,000*	
ADDITIONAL CAPACITY REQUIRED		**105,266**

6.4 Year 2051 Water Distribution Evaluation

The majority of the water distribution system was constructed in the 1980's. The infrastructure is beginning to age and has experienced increasing water losses. However, most of the unaccounted-for demands were due to specific construction activities and are not seen to be a system deficiency requiring massive rehabilitation. The distribution system it is still within its useful life range of the PVC and ductile iron materials it was constructed with.

The system is constructed along Village streets and County highways to connect users in a branch-like manner. Most of the network is a robust framework of backbone feeder mains ranging in sizes from 8" to 16" diameters. There are minimum dead-end pipelines on residential cul-de-sac streets. When a high flow rate is required, water can flow through several pipelines,

decreasing the volume through individual pipes; thus, decreasing overall headlosses in the system. The system has an adequate number of valves and hydrants as required by Wisconsin DNR regulations and is reliable for the users because portions of the water main can be isolated for repair while still allowing water service from other feeds.

6.4.1 Existing Hydraulic Modeling

A hydraulic model was developed for the Village's water system using a program called WaterCAD by Bentley Systems. The existing system was entered into the model from GIS data. The model was calibrated using actual fire flow testing data and hydraulic grade lines of storage and pumping facilities. The system model was run to achieve minimal differences from real life results, until the two were similar. Precise duplication of the field tests at all locations within the water system during calibration is not a realistic outcome. The goal of calibration is to minimize the error between the field and model results. The desired accuracy for the model was to be within 5-10 psi +/- of the real field recorded pressures. This desired accuracy provides a reasonably representation of the actual system.

Existing year 2020 demands were placed in the model for the as outlined in Table 6-4.

Table 6-4.
Existing Water Model Demands and Locations

DEMAND TYPE	NUMBER OF NODE LOCATIONS	DEMAND AT EACH NODE (GPM)
RESIDENTIAL	10	31.9
COMMERCIAL	1 -CINTAS	25.1
COMMERCIAL	2	18.0
INDUSTRIAL	3	14.5
PUBLIC AUTHORITY	2	6.6

The existing model total demand was calculated as 436.3 gpm, or 229,319,290 gallons annually which is similar to the 2020 annual water sold. Proposed necessary improvements were established from results of the hydraulic model for existing requirements.

6.4.2 Future Year Hydraulic Modeling

Future projections for population and water demands were previously calculated for a 30-year planning period, until year 2051. The future projected demands in Table 4-10 (Full Development Projections for Year 2051) were divided into nodes across the model. Based on the Village's anticipated growth areas, additional demands were strategically located within the model. These future projected demands were placed in the model as outlined in Table 6-5.

Table 6-5.
Existing Water Model Demands and Locations

DEMAND TYPE	NUMBER OF NODE LOCATIONS	DEMAND AT EACH NODE (GPM)
RESIDENTIAL	10	31.9
RESIDENTIAL	10	33.3
COMMERCIAL	1 -CINTAS	25.1
COMMERCIAL	3	17.6
INDUSTRIAL	4	12.3
PUBLIC AUTHORITY	2	7.8

The future year 2051 model total demand was calculated as 794.7 gpm, or 417,694,320 gallons annually which is similar to the 2051 annual water sold. Proposed necessary improvements were established from results of the hydraulic model for the future demand requirements.

As part of the evaluation, the future projections and water demands calculated for the planning period were modeled to create a network of transmission mains along the major east-west and north-south Village streets and County/State Highways to provide adequate flows and pressures for the area. (See Figure 6-2 for the water main sizes, hydrant flows and pressures at critical intersections.)

6.4.3 Water System Pressures

A water distribution system has pressures that range between 50 to 103 psi in the Village's municipal water systems. The pressures are directly dictated by the hydraulic grade line (HGL) of water stored in the elevated reservoirs. In the hydraulic model, the HGL was modeled at 1035 feet.

Figure 6-1 shows the contours of the modeled static system water pressures throughout the Village for existing average day demands.

Figure 6-2 shows the water main sizes, hydrant flows and pressures at critical intersections for the future planning areas.

6.4.4 Fire Flow Events

During a fire flow event, the water system must provide the required volume of water at a minimum residual pressure of 20 psi. Based on the hydrant flow tests conducted throughout the Village, most of the Village can receive high flow rates at this pressure requirement. The existing system model was run to calculate current fire flows and pressures. These were evaluated to identify critical areas of deficiency.

At this time, the water system can provide favorable ISO ratings in most of the system.

Table 6-6 lists the critical locations identified in the existing system model.

Table 6-6.
Existing Water Model Critical Locations

DEMAND TYPE	NODE LOCATION	DESIRED DEMAND (GPM)	MODEL DEMAND (GPM)
INDUSTRIAL	HYD-763	3,500	1,420
INDUSTRIAL	HYD-236	3,500	1,775
INDUSTRIAL	HYD-928	3,500	1,593
PUBLIC AUTHORITY	HYD-269	3,500	1,128
PUBLIC AUTHORITY	HYD-274	3,500	2,500
PUBLIC AUTHORITY	HYD-273	3,500	1,500

Critical hydrants used for calibration are presented on Figure 6-2.

Figure 6-2 shows the water main sizes, hydrant flows and pressures at critical intersections for the future planning areas.

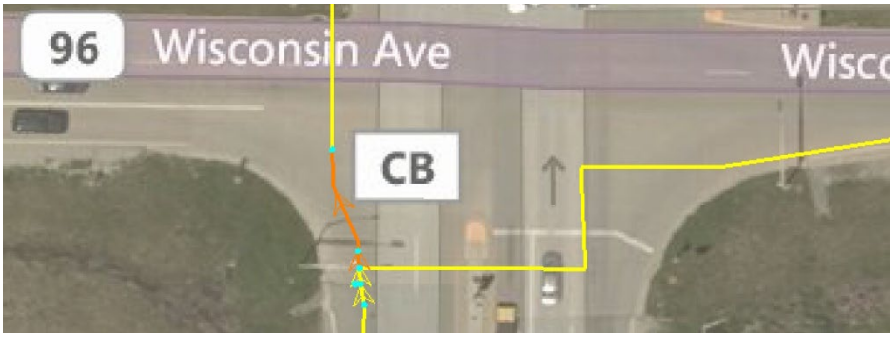
6.4.5 Alternatives

The following alternatives were evaluated for the water distribution system. Using the model, water main diameters and velocities were calculated.

6.4.5.1 Alternative 1 – STH 96 and CTH CB Intersection

Alternative 1 reviewed the water main size along County CB, from Tank #1 (Well #2) north to Wisconsin Avenue. The current diameter is 10" and the length is 2,477 feet. Hydrants along the route were calculated in the year 2051 model and achieved at least 3,500 gpm at 37 psi. The 10" water main along County CB is sized adequately.

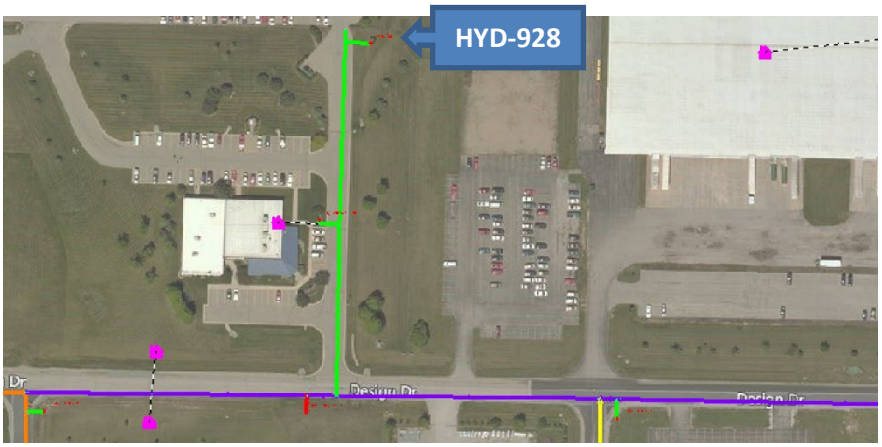
As highlighted on the picture below, it is suggested that a 40-foot section in the intersection at County CB and Wisconsin Avenue be upgraded to match the 12" diameter on the north side. Two feeder mains converge and bottleneck at this one location. The upgrade is suggested yet not critical. Velocities in the orange pipe section were shown to be approximately 6 fps, which is high but not critical.



6.4.5.2 Alternative 1.1 – Design Drive Private

Alternative 1.1 was evaluated on Design Drive, running north off Design Drive on an easement or private water main. The current diameter along this street is 8" and the length is 1,357 feet. The farthest northern hydrant (HYD-928) cannot achieve 3,500 gpm and the pipe velocity ranges from 9 to 13.4 fps.

As highlighted in the picture below, the evaluated main is green. To reduce the velocity under 10 fps in this main, it should be upgraded to 10" diameter. This reconstruction is completely optional and not necessary. Other nearby hydrants can be utilized for higher fire flows.



6.4.5.3 Alternative 2 – Greenville Drive (STH 15) and CTH CB Intersection

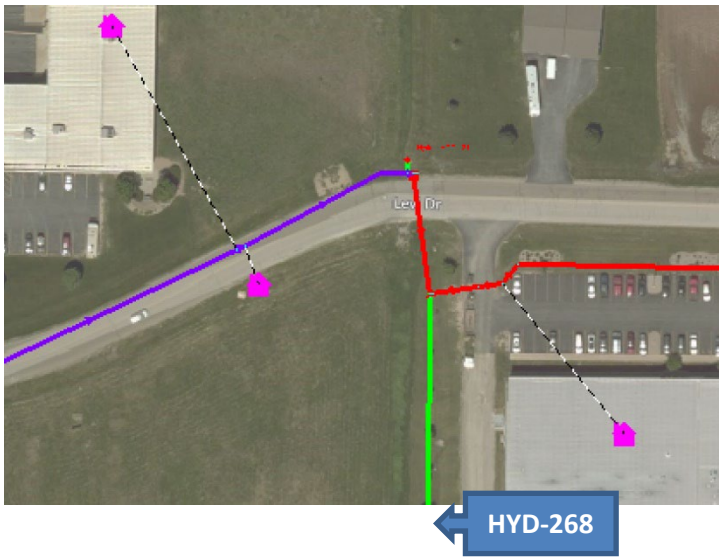
Alternative 2 reviewed the water main size along Greenville Drive, from School Road to County CB. The current diameter is 10" and the length is 1,231 feet. Hydrants along the route were calculated in the year 2051 model and achieved at least 3,500 gpm at 36 psi. The maximum velocity was approximately 8 fps.

As highlighted on the picture, the green section was evaluated. No velocities or pressures were critical. No upgrade of this water main is necessary. The 10" water main along Greenville Drive is sized adequately.

6.4.5.4 Alternative 2.1 – Levi Drive Private

Alternative 2.1 was evaluated on Levi Drive on an easement or private water main. A single north/south main connects two feeder mains to the south. The current diameter along the entirety of the street is 8" and the length is 1,476 feet. Running a fire flow calculated in the year 2051 model at HYD-268 of 3,500 gpm, the pipe velocities on Levi Drive ranges from 10.5 to 12 fps. The short north-section section had an extreme velocity of 18.7 fps.

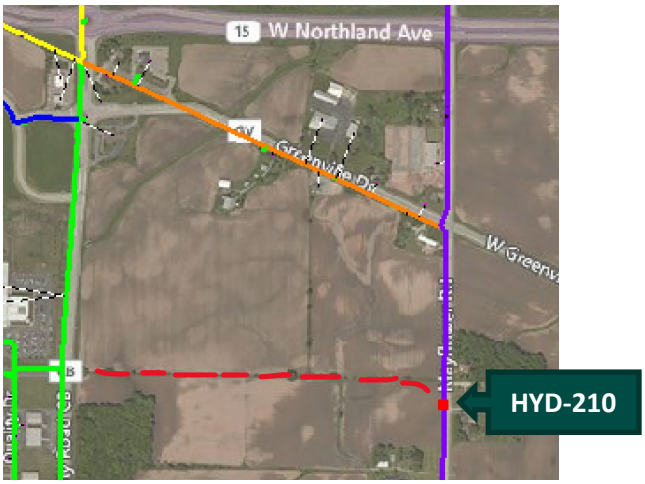
As highlighted in the picture, the evaluated main is red. To reduce the velocity in this north-south section of 100 feet length under 10 fps, it should be upgraded to 10" diameter. This reconstruction is highly recommended to reduce damaging velocities.



6.4.5.5 Alternative 3 – TID Extension CTH CB to Mayflower Drive

Alternative 3 evaluated new water main sizing across open land, from County CB to Mayflower Drive. This would be an extension to Design Drive. The water main extension correlates to new growth in subsection 16-A-1 for future commercial or industrial growth. Fire flows were evaluated at 3,500 gpm. Velocities were evaluated to size the new water main.

As highlighted on the picture below, the red dot on Mayflower Drive (HYD-210) and was calculated in the year 2051 model for a 3,500 gpm fire flow event. The red-dash line was evaluated. The new water main is proposed as a 10" diameter to keep velocities around 5 fps and is approximately 2,800 feet in length.



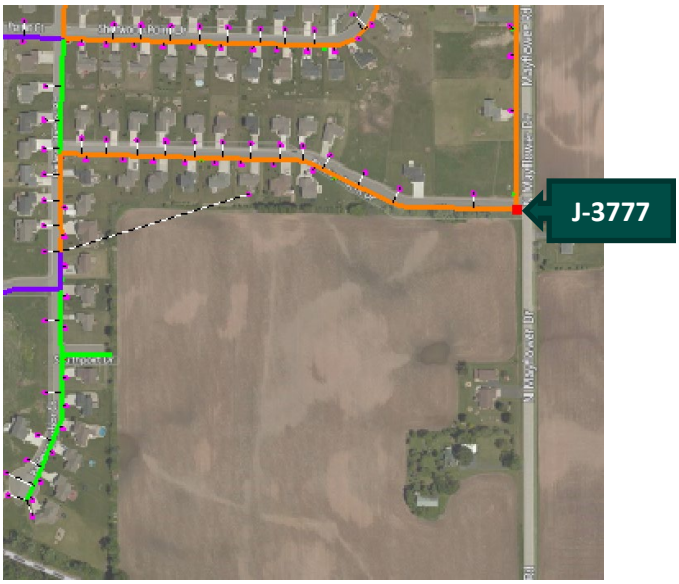
6.4.5.6 Alternative 4 – Mayflower Drive

Alternative 4 evaluated new water main north along Mayflower Drive, from Neubert Road to Rawley Point Drive. This would be an extension to Mayflower Drive. The water main extension correlates to new growth in subsection 3-A-1 for future residential growth and to provide efficiency/redundancy in a looped system. Residential fire flows were evaluated at 1,500 gpm. Velocities were evaluated to size the new water main.

The picture to the left shows the distance between the existing water system mains.

The new water main was calculated in the year 2051 model as a 10" diameter at a length of approximately 5,700 feet.

As highlighted on the picture below, the red dot on Mayflower Drive (J-3777) and was calculated for a fire flow event. Without the water main extension, this node could achieve 1,582 gpm. With the 10" diameter water main extension, this node could achieve 3,500 gpm.



The new water main is proposed to be sized as 10" diameter. The velocity for achieving 2,000 gpm fire flow along this residential main was calculated as 8 fps. If the Village believes it is within their budget, instead a 12" diameter water main is suggested to further increase available flows to the area.

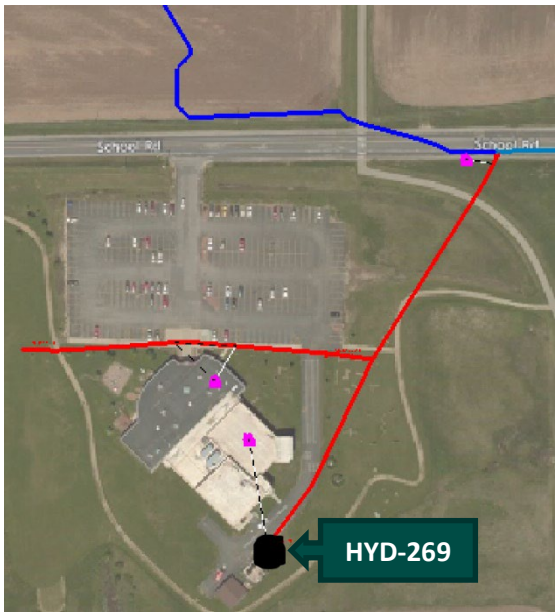
6.4.5.7 Alternative 5 – School Road – Municipal Drive West

Alternative 5 evaluated new water main along School Road that would be an extension of School Road from Municipal Drive west to complete a loop to provide efficiency/redundancy to the system. The extension correlates to new growth in subsection 14-B-1 for future residential growth. The blue segment on the picture shows the distance between the existing water system mains.

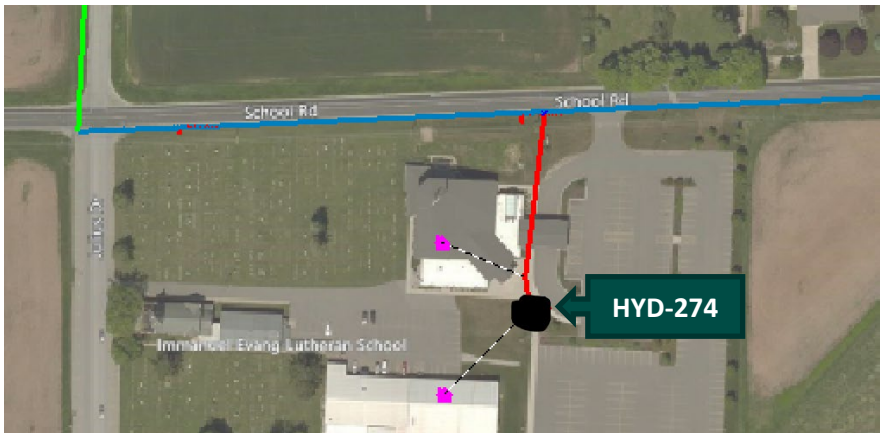
The new water main was modeled as a 10" diameter to match existing system mains. The new length was approximately 2,600 feet.

Public Authority fire flows were evaluated at 3,500 gpm because the YMCA and Lutheran School are located at each end of the extension. Velocities were evaluated to size the new water main.

As highlighted on the picture to the right, the black dot at the YMCA (HYD-269) was calculated in the year 2051 model for a fire flow event. The fire flow volume of 3,500 gpm was desired. This hydrant could only achieve 1,148 gpm at 20 psi. The next closest hydrant (HYDRANT AGO-863) could only achieve 1,414 gpm at 20 psi.



As highlighted on the picture below, the black dot at the school (HYD-274) was calculated in the year 2051 model for a fire flow event. The fire flow volume of 3,500 gpm was desired. This hydrant could only achieve 2,400 gpm at 20 psi. The next closest hydrant (HYDRANT AGO-260) could achieve the full 3,500 gpm at 38 psi.



The new water main extension was evaluated by looking at fire flows at the above two locations. The fire flows did not dramatically increase with the additional water main. The new water main extension is not suggested unless development occurs along subsection 14-A-1 or 14-B-1 to require new water service locations. Currently, this section of roadway is being upgrades to include the water main and sanitary sewer extensions to provide service to this unserved area; therefore, this area was selected to be evaluated for improvements.

6.4.5.8 Alternative 5.1 – YMCA Water Main Loop Private

Alternative 5.1 was evaluated at the YMCA to improve the available fire flow on an easement or private water main. A loop was modeled north to School Road and along School Road. As noted in Alternative 5, HYD-269 could only achieve 1,148 gpm at 20 psi. The next closest hydrant (HYDRANT AGO-863) could only achieve 1,414 gpm at 20 psi.

As highlighted in the picture below, the proposed main is blue. Modeled diameter sizes are noted on the picture. Proposed new 10” water main is 930 feet. Proposed new 8” water main is 110 feet. Proposed abandoned 8” water main is 377 feet.

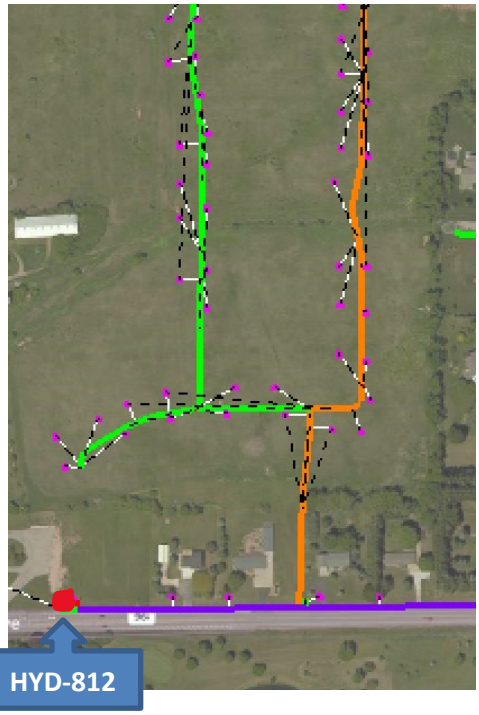
With the new water main loop as shown on an easement or private water main, HYD-269 was calculated in the year 2051 model with a 1,400 gpm at 20 psi and HYDRANT AGO-863 modeled 2,240 gpm at 20 psi. Both achieved a sizeable increase in available flows. Velocities ranged from 2.5 to 7 fps. Because of this, it is recommended that a 10" loop be built along School Road and tied into the existing YMCA fire main.

The responsibility of this section of 10" water main to complete the loop should be discussed with the Village and property owner.

6.4.5.9 Alternative 6 – Wisconsin Avenue (STH 96) – Well #5 to Municipal Drive (STH 76)

Alternative 6 evaluated new water main sizing along STH 96, to extend the existing water main to Well #5. Fire flows were evaluated for residential growth at 1,500 gpm. Velocities were evaluated to size the new water main. As highlighted on the picture below shows the distance between the existing water mains. The water main was modeled as 10" diameter with a length of 3,133 feet.

As highlighted on the picture to the right, the red dot at HYD-812 was calculated for a fire flow event. The residential fire flow volume of 1,500 gpm was desired. This hydrant was calculated in the year 2051 model at 1,830 gpm.



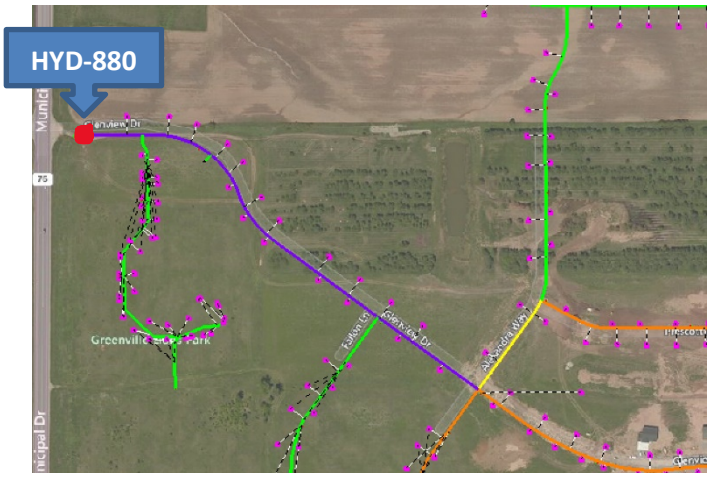
As highlighted on the picture below, the red dot at Well #5 (HYD-933) was calculated for a 1,500 gpm fire flow event. This hydrant was calculated in the year 2051 model at 1,907 gpm.

The new water main extension was evaluated by looking at fire flows at the above two locations. With the new water main extension along STH 96, HYD-812 increased flow to 2,768 gpm and HYD-933 increased flow to 3,500 gpm at 23 psi. These fire flows increased with the additional water main. Velocities ranged from 4 to 7 fps. The 10" diameter water main extension is proposed and recommended.

6.4.5.10 Alternative 7 – Well #5 – Field to Municipal Drive (STH 76)

Alternative 7 evaluated new water main in a similar area to Alternative 6. This alternative was modeled without Alternative 6 constructed. The new water main was evaluated between Municipal Drive/Glenview Drive and the Well #5 feeder main. Proposed residential growth correlated with subsections 13-B-2 and 14-A-1. Fire flows were evaluated for residential growth at 1,500 gpm. Velocities were evaluated to size the new water main.

As highlighted on the picture below, the red dashed line shows the distance between the existing water mains. The water main was modeled as 8" diameter with a length of 2,770 feet.



As highlighted on the picture to the right, the red dot at HYD-880 was calculated for a fire flow event. The residential fire flow volume of 1,500 gpm was desired. Without the new water main extension, this hydrant was calculated in the year 2051 model at 1,315 gpm which is below the residential ISO recommended volume.

With the new water main extension, HYD-880 increased flow to 2,217 gpm. This fire flow increased dramatically with the additional water main. Velocities were between 6.5 to 7.3 fps. The 8" diameter water main extension is proposed.

Alternative 7 is highly recommended and prioritized over Alternative 6 because of the reduced cost with similar fire flow increases unless development along STH 96 warrants/requests water service.

6.4.5.11 Alternative 7.1 – Alt 6 and 7 – Well #5 to Municipal Drive (STH 76)

Alternative 7.1 evaluated combining both Alternative 6 and Alternative 7 together.

- In Alternative 6, instead of sizing the 3,133 feet of water main extension along STH 96 at 10" diameter, this was reduced to 8" diameter.
- In Alternative 7, the 2,770 feet of 8" remained.

Proposed residential growth correlated to fire flows at 1,500 gpm. Velocities were evaluated to size the new water main. Calculated in the year 2051 model with both 8" diameter loops, the velocities were between 4.8 and 7.3 fps. Hydrant flows changed as listed in Table 6-7.

Table 6-7.
Alternative 7.1 Fire Flow Differences

DEMAND / HYDRANT LOCATION	FIRE FLOW WITHOUT ALT 7.1 (PSI)	FIRE FLOW WITH ALT 7.1 (PSI)	PIPE VELOCITY (FPS)
HYD-812	1,830	2,629	4.8
HYD-933	1,907	3,417	7.3
HYD-880	1,315	2,227	6.9
J-3993	3,500	3,500	4.9

Alternative 7.1 is highly recommended in addition to Alternative 7. Alternative 7 should be built first. Then the additional 8" diameter water main proposed along STH 96 should be constructed as growth continues. With this option, there is no need for Alternative 6.

6.4.5.12 Alternative 7.2 – Municipal Drive (STH 76) – Glenview Drive to Fallon Lane

Alternative 7.2 evaluated a new water main loop along Municipal Drive, from Glenview Drive to Fallon Lane. Proposed residential growth correlated to fire flows of 1,500 gpm. Velocities were evaluated to size the new water main.

As highlighted on the picture to the right, the thinner blue line shows the proposed route. The water main was modeled as 8" diameter with a length of 2,199 feet.

HYD-880 was calculated for a fire flow event. The residential fire flow volume of 1,500 gpm was desired. Without the new water main loop, this hydrant was calculated in the year 2051 model at 1,315 gpm which is below the residential ISO recommended volume. With the new water main loop, HYD-880 increased flow to 1,397 gpm. Velocities were approximately 3 fps.

Alternative 7.2 is not a priority and is not recommended until after Alternative 7 or Alternative 7.1 is constructed. However, this water main loop will increase fire flows and provide efficiency/redundancy for the Subdivision as much as possible.

6.4.5.13 Alternative 8 – Municipal Drive (STH 76) – Hummock Drive to CTH JJ

Alternative 8 evaluated the existing water main diameter on Municipal Drive, from Hummock Drive to County JJ. The current water main size is 10" diameter. The water main feeds new growth in subsections 1-A-1 and 1-B-1 for future residential development. Fire flows were evaluated at 1,500 gpm. Velocities were evaluated to size the new water main.

The existing water main sized at 10" diameter exceeds 3,500 gpm fire flows at 40 psi. Therefore, the upgrade to 12" diameter for this 2,200-foot section is not required for additional fire flow or development growth.

6.4.5.14 Alternative 8.1 – North Greenville Elementary School – Easement

Alternative 8.1 was evaluated at the North Greenville Elementary School to improve the available fire flow. A loop was modeled from Joan Street to Learning Way. As highlighted in the picture to the right, the proposed main is red and loops the hydrant main into the distribution network. The proposed new 10" water main is 900 feet.

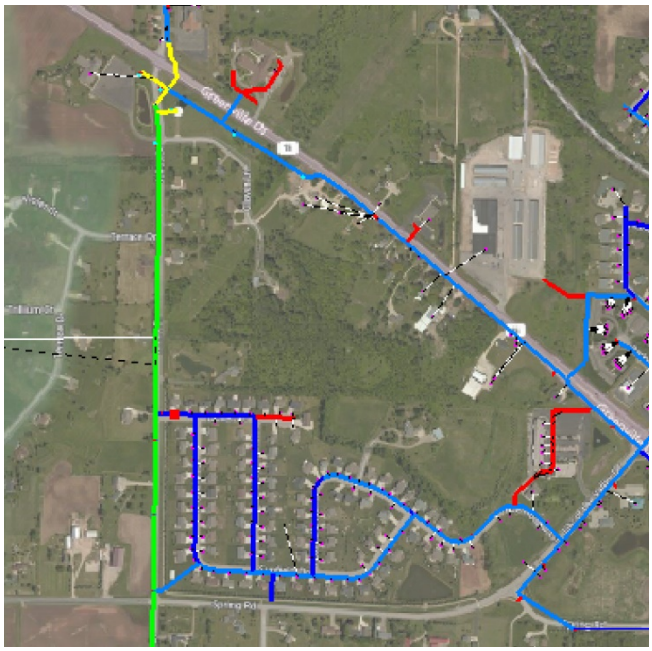
Without the loop, the school hydrant (HYD-801) was calculated in the year 2051 model to only achieve 2,155 gpm at 20 psi and a water main break on CTH JJ would close the school. This would provide efficiency/redundancy for the system.

With the new water main loop as shown, HYD-801 modeled at 2,414 gpm at 20 psi.

It is recommended that a water main loop be added to the school to increase fire flows and provide efficiency/redundancy at the School as much as possible.

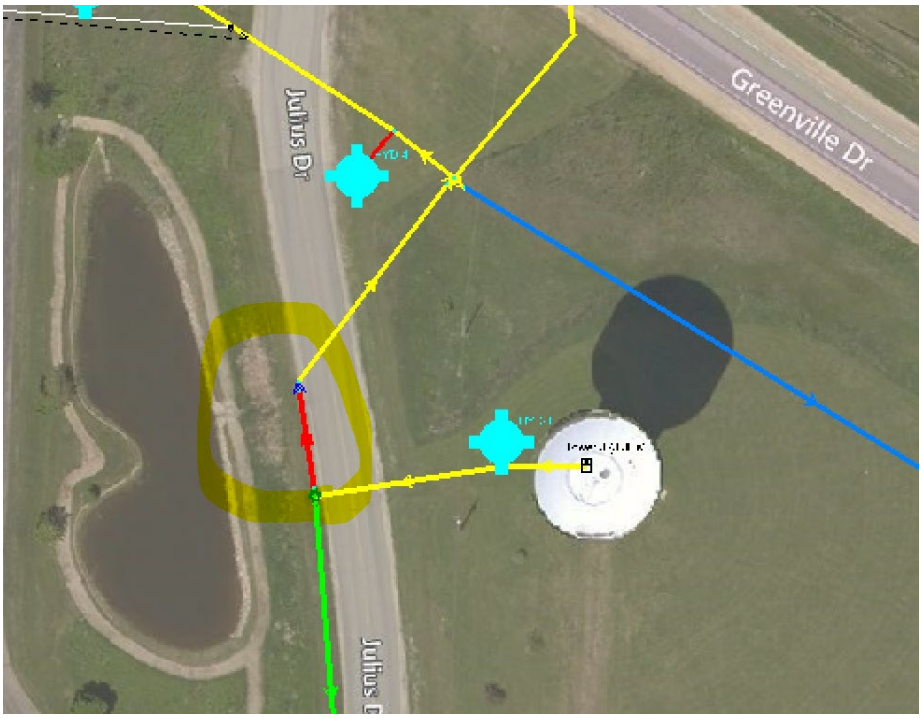
6.4.5.15 Alternative 9 – Julius Drive to Tank 3

Alternative 9 was evaluated along Julius Drive, from Spring Road to STH 15. The current diameter along this street is 10" and the length is 2,950 feet. Fire flows were evaluated for a residential demand at 1,500 gpm. Fire flows were calculated in the year 2051 model between 2,400 gpm to 3,500 gpm with the existing 10" diameter.



As highlighted in the picture, the evaluated main is green. An upgraded water main diameter from 10" to 12" was modeled and provided negligible fire flow increases. The velocity was reduced from 12.4 fps below 10 fps. Upsizing the Julius Drive water main fully is not a requirement or a priority.

Further reviewing this water main section, it was noted that a small length along the north end of roughly 55 feet was undersized compared to the connecting mains. As shown on the picture below, this small section of water main should be upgraded to connect to the Tank #3 feed line as 16" diameter.



6.4.5.16 Alternative 10 – Greenville Elementary/Middle School – Fawn Ridge Drive

Alternate 10 was evaluated due to the fire flows per the model H-273. Based on the current Site Improvements at the Facility, the water main was extended to the back of the buildings. Once this is completed, the Village should perform fire flow testing along the roadway and on the private system. These flows should be compared to the current GIS Water System Base and the Model to reflect the actual conditions and if necessary updated. Based on the conditions, additional modeling may be required for the System.

6.4.5.17 Summary of Alternatives

Figure 6-3 shows the alternatives considered within the Water System.

7 RECOMMENDATIONS

7.1 Water System Improvement Alternatives

The current capabilities and the projected long-term demands on the water system serving the Village have been presented in preceding chapters of this report. Potential improvements necessary to meet the present and future year 2051 demands have been identified and evaluated. The improvements are based on providing an adequate supply of water delivered in accordance with regulations and common engineering standards for pressure and flow capacity.

The recommendations are listed in order of priority later in this section along with estimated costs. These could change, based on proposed plans to improve the system operations, upgrade a roadway or future development requiring these services, these recommendations should be reviewed and evaluated on a yearly basis when developing the Capital Improvement Plan for the next two years. At that time, a more detailed engineering review should be completed which would include updating the estimates.

There are other areas within the Village that are included in the Capital Improvement Plan but not in this Study, those areas are being reconstructed based on the roads or other infrastructure being completed at the same time. It is more cost effective to evaluate these areas when completing the CIP planning. As those Projects are within one to two years of being completed, a preliminary design and cost estimates should be completed.

7.2 Future Supply

Additional water supply will be required for the year 2051 projected demands. As shown in Table 6-1 (Reliable Supply Capacity), the firm water supply is not adequate for the future projected demand. Additional supply will be required to handle maximum day demands over a 12-hour pumping period.

It is recommended that a new well be sited and constructed prior to year 2051. The siting of this additional water supply well will need to be evaluated with respect to the other wells and quantity/quality of water available. If the location can be on a Village owned parcel, that will be taken into account in the evaluation.

7.3 Future Storage

The amount of elevated water storage is adequate for the year 2051 volumes regarding fire flow, optimization, and peak hour equalizing.

As shown in Table 6-3 (Emergency Storage), the total emergency storage amount has a deficit of 105,266 gallons. Because the well supply has backup generator power, this volume amount can generally be considered insignificant.

7.4 Future Distribution System

The Village's water distribution system is generally robust and healthy. A few maximum fire flows are not available, but these are very isolated occurrences. Figure 7-1 shows the water main sizes, hydrant flows and pressures at critical intersections for the future planning areas.

7.4.1 Distribution Upgrades

The existing water distribution was modeled to evaluation many alternatives. The listed alternatives should be considered to upgrade the current infrastructure. This will reduce extreme pipe velocities and provide better fire flows.

The following upgrade list is provided in order of importance/priority:

1. Alternative 8.1
2. Alternative 9
3. Alternative 2.1 (Easement or Private water main)
4. Alternative 5.1 (Easement or Private water main)
5. Alternative 1.1 (Easement or Private water main)
6. Alternative 1

7.4.2 Distribution Additions

Future growth will dictate when and where new water mains will be constructed. Based on the importance of velocities and fire flows, each new water main has been sized for adequate and improved system function. The following list provides the recommended additional water main sizes:

1. Alternative 3 proposes 10" diameter.
2. Alternative 4 proposes 10" diameter, minimum; prefer 12" diameter.
3. Alternative 7 proposes 8" diameter.
4. Alternative 7.1 proposes 8" diameter.
5. Alternative 7.2 proposes 8" diameter.

8 ESTIMATES OF PROBABLE PROJECT COSTS

8.1 Summary of Estimated Total Project Cost

This section will include Preliminary Cost Estimates for the Alternates recommended to be completed to improve the Water System performance and reliability of the proposed Master Water System Plan.

These estimates are completed with the information available and intended to be preliminary due to the unknown design considerations and construction costs when the Project improvements are completed. These costs should be reviewed on a yearly basis prior to inserting into the Capital Improvement Plan and then again when the Project is scheduled to be completed. At that time, a more detailed review and a design will need to be completed to address the unknown circumstances of the site.

A summary of the Preliminary Costs are, as follows.

8.1.1 Water Supply

In order to estimate this facility, a Preliminary Engineering Study will be necessary which would include siting of the well, test wells for quality/quantity which will provide the data necessary to complete a more detailed estimate. A typical Preliminary Engineering Study is estimated to cost $30,000 to $50,000 (not including the exploratory test wells which is based on the number of wells and depths of each well).

8.1.2 Storage

Based on the Study, the amount of elevated water storage is adequate for the year 2051 volumes regarding fire flow, optimization, and peak hour equalizing.

8.1.3 Distribution System

The cost estimate for these Projects includes the following , some of the items vary from the method and location of construction.

- Topsoil stripping or pavement removal.
- Installation of the new water main (sizes will vary), hydrants and valves for the extent identified in this report.
- Select/Native backfill as required by the final location.
- Connection to the existing water mains.
- Restoration of the disturbed areas, landscape and/or asphalt pavements as necessary.

- Special construction along State Highways and Railroad corridors.
- Erosion and traffic control.
- Engineering and administrative fees.
- Contingency to reflect anticipated price changes.

8.1.3.1 Upgrades

The following upgrade list for the existing system is provided, (listed in order of importance/ priority):

1. **Alternative 8.1** – North Greenville Elementary School – Easement: $128,000
2. **Alternative 9** – Julius Drive at Tank 3: $41,000
3. **Alternative 2.1** – Levi Drive Private: $44,000
4. **Alternative 5.1** – YMCA Water Main Loop Private: $47,000
5. **Alternative 1.1** – Design Drive Private: $193,000
6. **Alternative 1** – Wisconsin Avenue (STH 96) and CTH CB intersection: $42,000

8.1.3.2 Additions

The following list of improvements would be additions to reinforce the system:

- **Alternative 5** – School Road – Municipal Drive (STH 76) to West: $561,000*

  ** In the current CIP and Design Phase for Construction in 2022.*

- **Alternative 4** – Mayflower Drive – Well 4 to Rawley Point Drive: $986,000**

  *** In the current CIP and Design Phase for Construction in 2022.*

- **Alternative 3** – TID Extension – CTH CB to Mayflower Drive: $435,000
- **Alternative 6** – Well 5 – Wisconsin Avenue (STH 96) to Municipal Drive (STH 76): $497,000
- **Alternative 7** – Well 5 Field to Municipal Drive (STH 76): $458,000

  -OR-

  Alternative 7.1 – Alternate 6 and 7 – Well 5 to Municipal Drive: $990,000
- **Alternative 7.2** – Municipal Drive (STH 76) – Glenview Drive to Fallon Lane: $390,000

8.1.4 Future Extensions

Future extension estimates can be completed at the time a Development is proposed. At that time, more details will be known—such as the locations, areas to be serviced, and the proposed schedule of the improvements.

- Preliminary Engineering will be completed to allow for a more detailed cost estimate, thus reflect the actual costs.
- Then, the determination on whom would be responsible for the costs will be discussed and finalized.

9 MASTER PLAN ADDENDUMS

Future addendums to this Master Plan which describe modifications to the layout of planning sections and construction of water system improvements, following the original publication of the Master Plan, will be provided in this section.

FIGURES

A list and description of figures provided as part of this Master Plan is stated below. All figures are included in this section of the Master Plan:

Figure 2-1. General Location Map

Figure 2-2. Boundary Map

Figure 2-3. Topographic Map

Figure 2 4. Location Map for Future Planning Sections
[Projected Full Development Sections]

Figure 3 1. Existing Water Distribution Map

Figure 3 2. Water Supply and Treatment Schematic

a. Well #2

b. Well #3

c. Well #4

d. Well #5

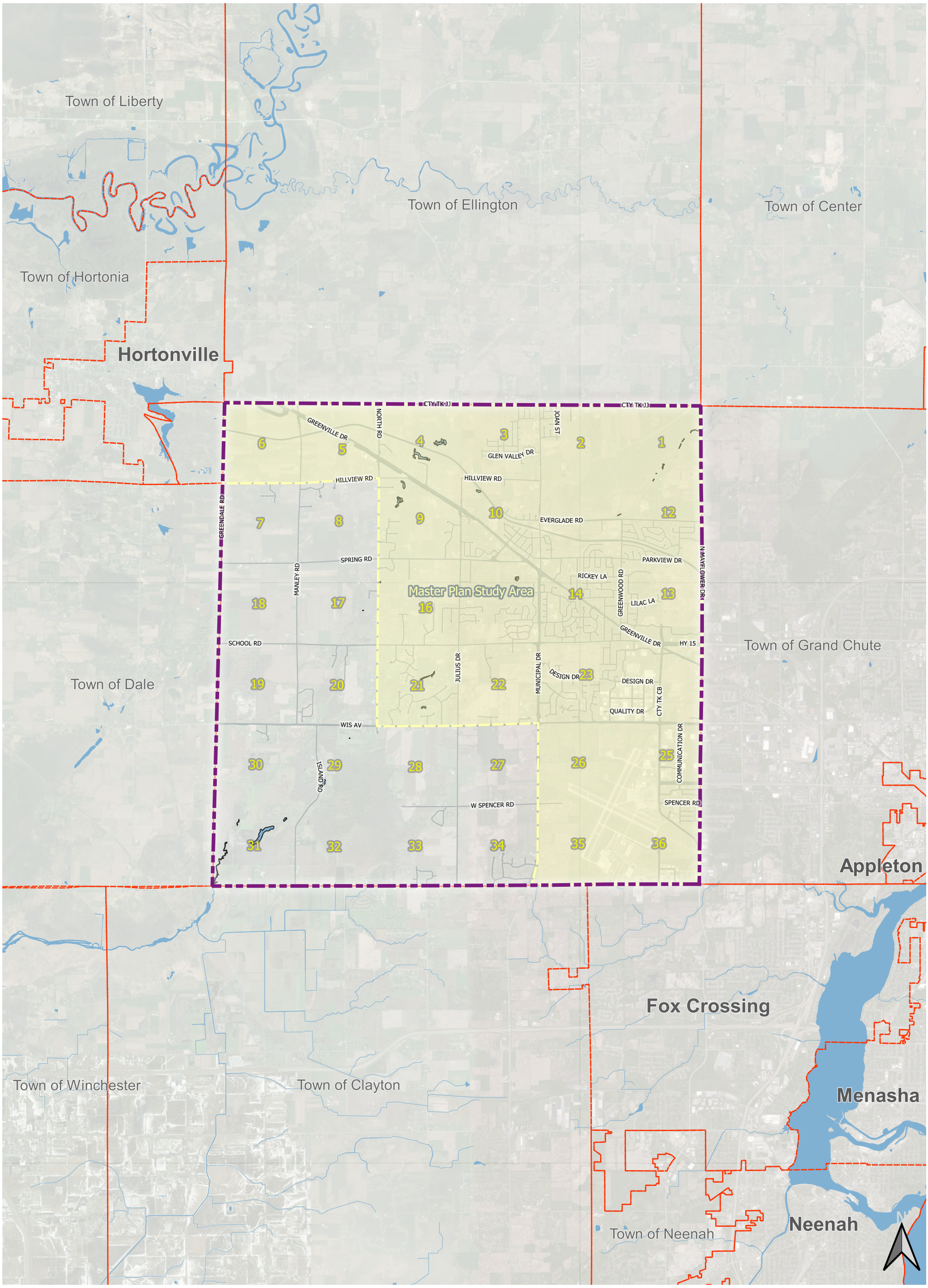
e. Tower #3 - Julius Tower

Figure 6 1. Modeled Pressure Contour Map

Figure 6-2. Critical Hydrant Map

Figure 6-3. Alternative Distribution Evaluation Map

Figure 7-1. Future Distribution System



VILLAGE OF GREENVILLE

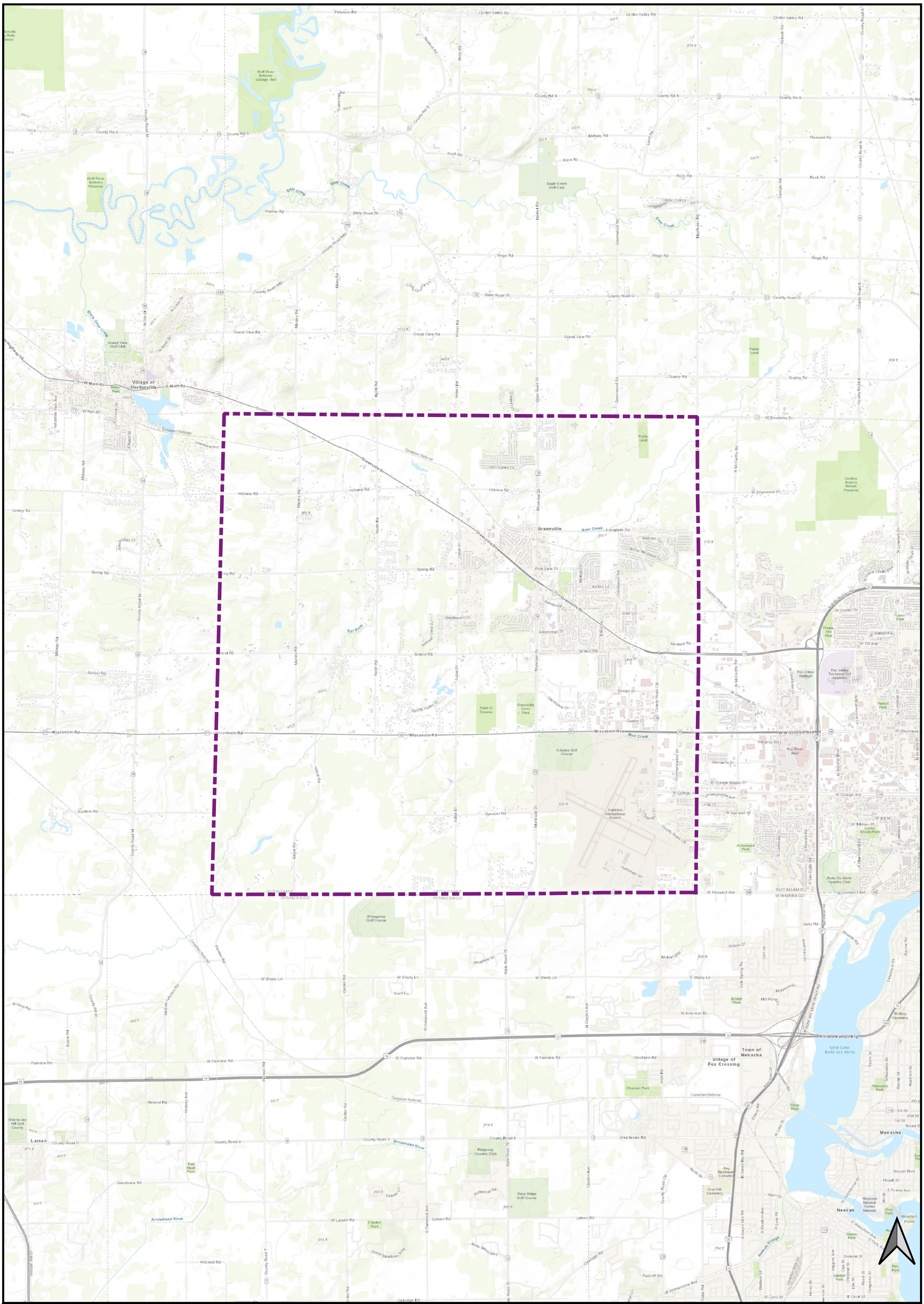
MASTER PLAN STUDY AREA

JOB NO. G5992-051	SET TYPE FINAL
DRAWN BY SIH	FIGURE NO. 2-1
CHECKED BY JMM	DATE DECEMBER 2021

0 0.5 1 mi

Village of Greenville General Location Map

Cedar Corporation



VILLAGE OF GREENVILLE

JOB NO. G5992-051	SET TYPE FINAL
DRAWN BY SIH	FIGURE NO. 2-2
CHECKED BY JMM	DATE DECEMBER 2021

Village of Greenville Boundary Map

Cedar Corporation

Town of Ellington

Hortonville

NORTH TOWER

WELL 3

NORTH RD

JULIUS TOWER

EVERGLADE RD

SPRING RD

WELL 4

Town of Dale

WELL 5

AIRPORT TOWER

WELL 2

ISLAND RD

Town of Clayton

Fox Crossing

N

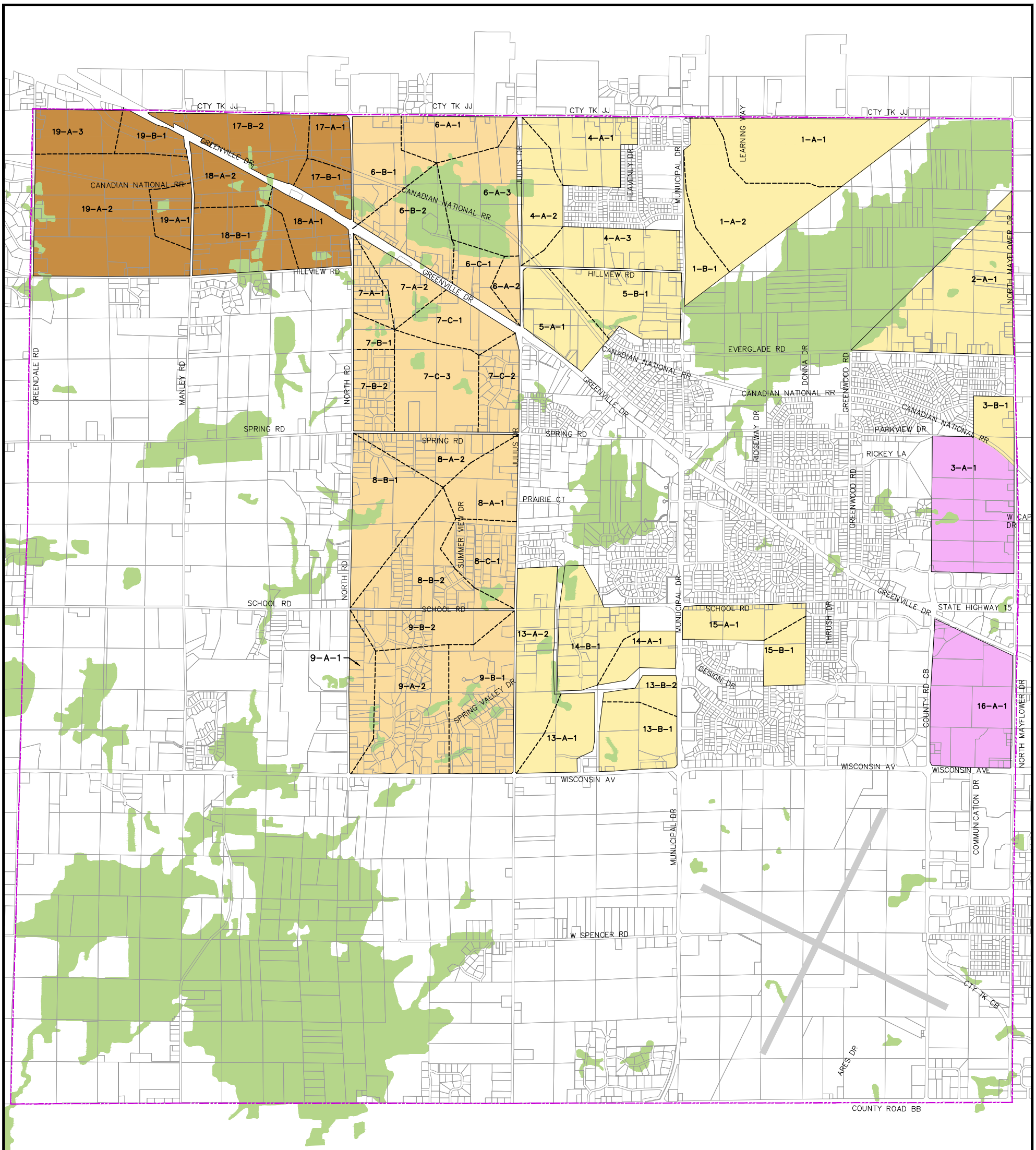
10 ft CONTOURS
6-INCH WATER MAIN
8-INCH WATER MAIN
10-INCH WATER MAIN
12-INCH WATER MAIN
14-INCH WATER MAIN
16-INCH WATER MAIN
WATER TOWER
WELL AND WTP
HYDRANT
GREENVILLE SANITARY DISTRICT
VILLAGE OF GREENVILLE
WATER FEATURES

JOB NO. G5992-051	SET TYPE FINAL
DRAWN BY SIH	FIGURE NO. 2-3
CHECKED BY JMM	DATE DECEMBER 2021

0 1,600 3,200 ft

Village of Greenville Topographic Map

Cedar Corporation



LEGEND

- PLANNING SECTION BOUNDARY
- VILLAGE OF GREENVILLE
- TIER 1 RESIDENTIAL
- TIER 2 RESIDENTIAL
- TIER 3 RESIDENTIAL
- NATURAL RESOURCE
- INDUSTRIAL/EMPLOYMENT

JOB NO. G5992-051	SET TYPE FINAL
DRAWN BY MLW	FIGURE NO. 2-4
CHECKED BY JMM	DATE DECEMBER 2021

SCALE
0 800' 1600' 3200'

VILLAGE OF GREENVILLE

LOCATION MAP FOR FUTURE PLANNING SECTIONS
OUTAGAMIE COUNTY WISCONSIN

Cedar corporation

Town of Ellington

Hortonville

NORTH TOWER

WELL 3

CTY TK JJ

JOAN ST

HILLVIEW RD

LUNDEEN DR

GREENVILLE DR

BENNETT CIR

GREENDALE RD

JULIUS TOWER

EVERGLADE RD

TERRACE DR

SWAMEE CIR

GREENWOOD RD

PARKVIEW DR

RICKEY LA

N MAYFLOWER DR

SPRING RD

MANLEY RD

Town of Dale

PRAIRIE CT

NORTH RD

CEDAR LA

CEDAR DR

LILAC LA

FAIRWINDS DR

ELLEN LA

BUMAN WAY

WELL 4

HY 15

LEVI DR

SCHOOL RD

PEACEFUL CT

RIVER DR

JULIUS DR

DESIGN DR

SPRING VALLEY DR

FALLON LA

QUALITY DR

CTY TK CB

CLEARY ST

WIS AV

WELL 5

COMMUNICATION DR

AIRPORT TOWER

WELL 2

MUNICIPAL DR

COLLEGE AV

LONG CT

SPENCER RD

W SPENCER RD

ISLAND RD

SUNSET DR

SUNRISE TR

PATHFINDER DR

ARES DR

Town of Clayton

Fox Crossing

N

- 6-INCH WATER MAIN
- 8-INCH WATER MAIN
- 10-INCH WATER MAIN
- 12-INCH WATER MAIN
- 14-INCH WATER MAIN
- 16-INCH WATER MAIN
- WATER TOWER
- WELL AND WTP
- HYDRANT
- GREENVILLE SANITARY DISTRICT
- VILLAGE OF GREENVILLE
- WATER FEATURES

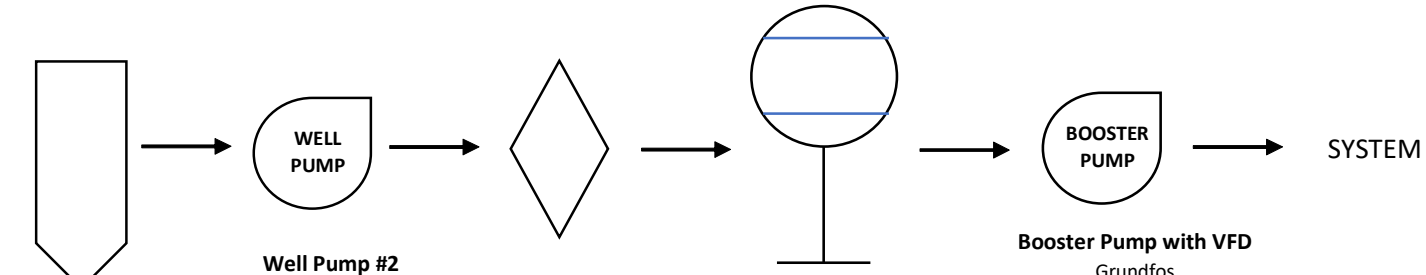
JOB NO. G5992-051	SET TYPE FINAL
DRAWN BY SIH	FIGURE NO. 3-1
CHECKED BY JMM	DATE DECEMBER 2021

0 1,600 3,200 ft

Village of Greenville Existing Water Distribution Map

Cedar Corporation

Well #2



Well ID: VL966
Ground: 858.5'
Static WL: 741.5'
Pumped WL: 726.5'

Well Pump #2
Goulds 7CLC Submersible
Ground: 858.2'
Design Q: 400 gpm
Design TDH: 403'
45 psi gauge

Controls: 1 time per day
Well kicks on at 6PM and fills to 27 feet in summer (23 feet in winter)
- Cody

Pressure Filter
OxiPlus75
Δ <2 psi
58 psi gauge to tower
Treating I/M/R

Tower #1-South Tower
Volume: 300,000 gallons
Ground: 857.0'
Base: 979.5'
Overflow Elev: 1007.0'
Summer Op. Range: 993.5' – 1,007' (14'-27.5')
Summer Levels in Model
Winter Op. Range: 993.5' – 1,003.0' (14'-24')

Booster Pump with VFD
Grundfos
Ground: 858.2'
Rated Q: 476 gpm
Rated TDH: 97.8'
80% capacity 440 gpm @ 75-77psi

Controls: "Booster pumps kick on around 5AM and pump tower down to 13 feet" - Cody

Notes:

The piping exists to allow for different configuration, but the way shown in the schematic is how Cody stated it typically runs. Summer tower levels are represented in the model. The controls for the well pump and booster pump are also in the model, but only work if the model is run in EPS. Well #2 Pump only fills Tower #2. The existing well replaced a previous well for water quality issues. A general purpose valve (GPV) is in place to account for the headloss.

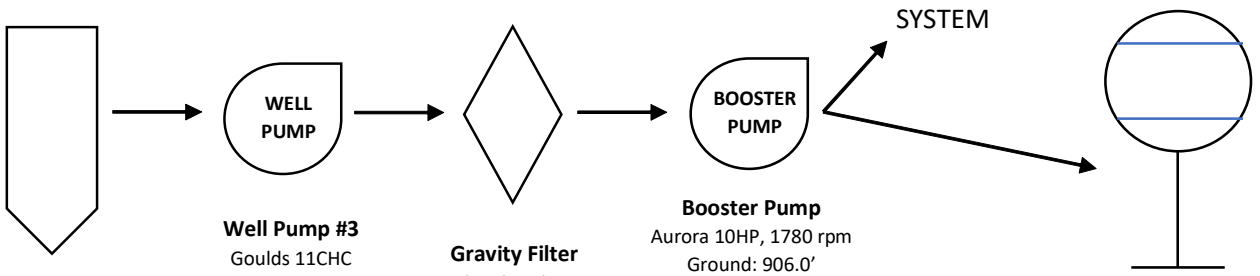
JOB NO. G5992-051	SET TYPE FINAL
DRAWN BY MLW	FIGURE NO. 3-2A
CHECKED BY JMM	DATE DECEMBER 2021
SCALE	

VILLAGE OF GREENVILLE

WATER SUPPLY AND TREATMENT SCHEMATIC
OUTAGAMIE COUNTY WISCONSIN

Cedar corporation

Well #3



Well ID: HR251
Ground: 906.0'
Static: 787.0'
Pumped: 753.0'

Well Pump #3
Goulds 11CHC
Vertical Turbine
100HP
Ground: 906.0'
Design Q: 700 gpm
Design TDH: 300'
Pumping at 640 gpm-no gauge

Controls: *Not active in model*

Gravity Filter
Sand and Anthracite
Treating Iron
Bacteria
Base: 906'
Area: 361 sqft

Booster Pump
Aurora 10HP, 1780 rpm
Ground: 906.0'
Rated Q: 700 gpm
Rated TDH: 300'
650gpm @ 54psi

Controls:
Turns ON when Tower #3 Water: 1,029.5'
Turns OFF when Tower #3 Water: 1,042.5'

Tower #2 – North Tower (JJ)
Volume: 300,000 gallons
Ground: 910.0'
Base: 1,015.5'
Overflow: 1,083.0'
Summer Op. Range:
1,029.5 – 1,043.0' (14'-27.5')
Summer Levels in Model
Winter Op. Range:
1,029.5 – 1,039.5' (14'-24')

Notes:

Well pump #3 is not active in the model since a booster pulls out of a gravity. It is modeled as the booster pump pulling out of a reservoir. The booster pump technically fills the tower and can pump into the system (as set up in the model). It was assumed the booster pump and well pump have the same design flows and TDH. No pump curve was provided for the booster pump. The well drawings that were sent by the Village show an older style of filter that has been replaced. The tower was LOWERED 39 ft. We have cut sheets of the Well #3 filter from the vendor. Saved in Support Data.

Booster pump needs to have higher flow rate than well pump, so the filter will run.

Well 3 & 4 both run at same time

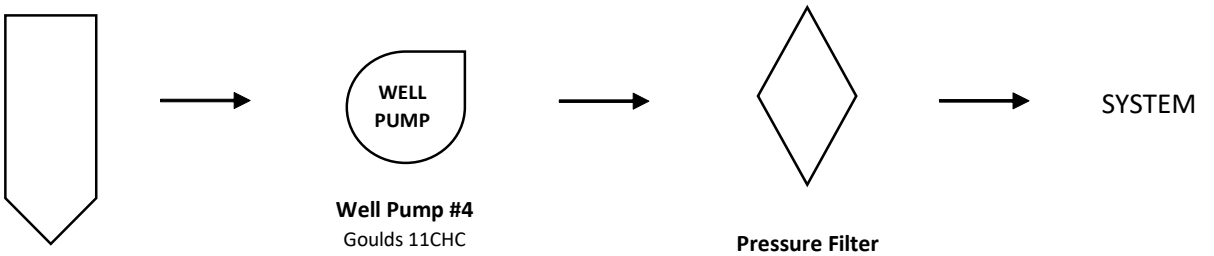
JOB NO.	SET TYPE
G5992-051	FINAL
DRAWN BY	FIGURE NO.
MLW	3-2C
CHECKED BY	DATE
JMM	DECEMBER 2021
SCALE	

VILLAGE OF GREENVILLE

WATER SUPPLY AND TREATMENT SCHEMATIC
OUTAGAMIE COUNTY WISCONSIN

Cedar corporation

Well #4



Well ID: SA852
Ground: 856.0'
Static WL: 739.5'
Pumped WL: 645.5'

Well Pump #4
Goulds 11CHC
Vertical Turbine
US Motors 200HP
Ground: 856.0'
Design Q: 1,000 gpm
Design TDH: 550'
No pressure gauge

Controls:
Turns ON when Tower #3
Water: 1,029.5'

Pressure Filter
Sand and Anthracite
Δ 5 - 10 psi
Treating I/M/R

80 psi

Notes:

Headloss accounted for by general purpose valve (GPV) in model.

Well 3 & 4 both run at same time

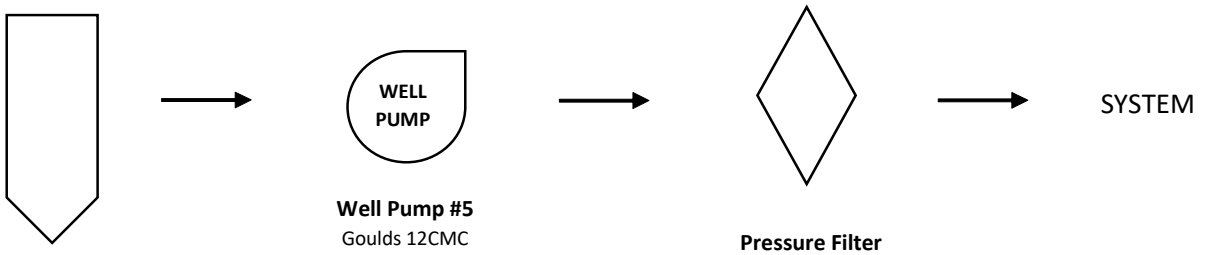
JOB NO. G5992-051	SET TYPE FINAL
DRAWN BY MLW	FIGURE NO. 3-2B
CHECKED BY JMM	DATE DECEMBER 2021
SCALE	

VILLAGE OF GREENVILLE

WATER SUPPLY AND TREATMENT SCHEMATIC
OUTAGAMIE COUNTY WISCONSIN

Cedar corporation

Well #5



Well ID: YV153
Ground: 869.4'
Static WL: 759.0'
Pumped WL: 726.0'

Well Pump #5
Goulds 12CMC
Submersible
Ground: 869.38'
Design Q: 1,000 gpm
Design TDH: 441'
61 psi

Controls:
Turns ON when Tower #3
Water: 1,029.5'
Turns OFF when Tower #3

Pressure Filter
OxiPlus75
Δ <2 psi

Treating I/M/R
8 filters with 10" SS pipe
66-72 psi

Notes:

Headloss accounted for by general purpose valve (GPV) in model.

Fracture in rock formation, and pumping sand. Rehab in process. Will likely plug and hoping to gete 300-500 gpm for planning purposes.

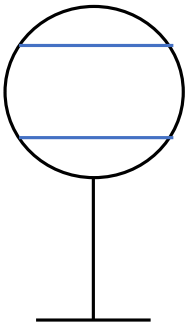
JOB NO. G5992-051	SET TYPE FINAL
DRAWN BY MLW	FIGURE NO. 3-2D
CHECKED BY JMM	DATE DECEMBER 2021
SCALE	

VILLAGE OF GREENVILLE

WATER SUPPLY AND TREATMENT SCHEMATIC
OUTAGAMIE COUNTY WISCONSIN

Cedar corporation

Tower #3 - Julius Tower



Tower #3 – Julius Tower

Volume: 750,000 gallons

Built in 2010

Altitude Valve no longer in use

Ground: 876.5’

Base: 998.0’

Overflow: 1038.0’

Gauge at 5.5’ AF = elev 882’

Summer Op. Range:

1,015 – 1,035’

(17’-37’)

Summer Levels in Model

Winter Op. Range:

1,015 – 1,032.5’

(17’-34.5’)

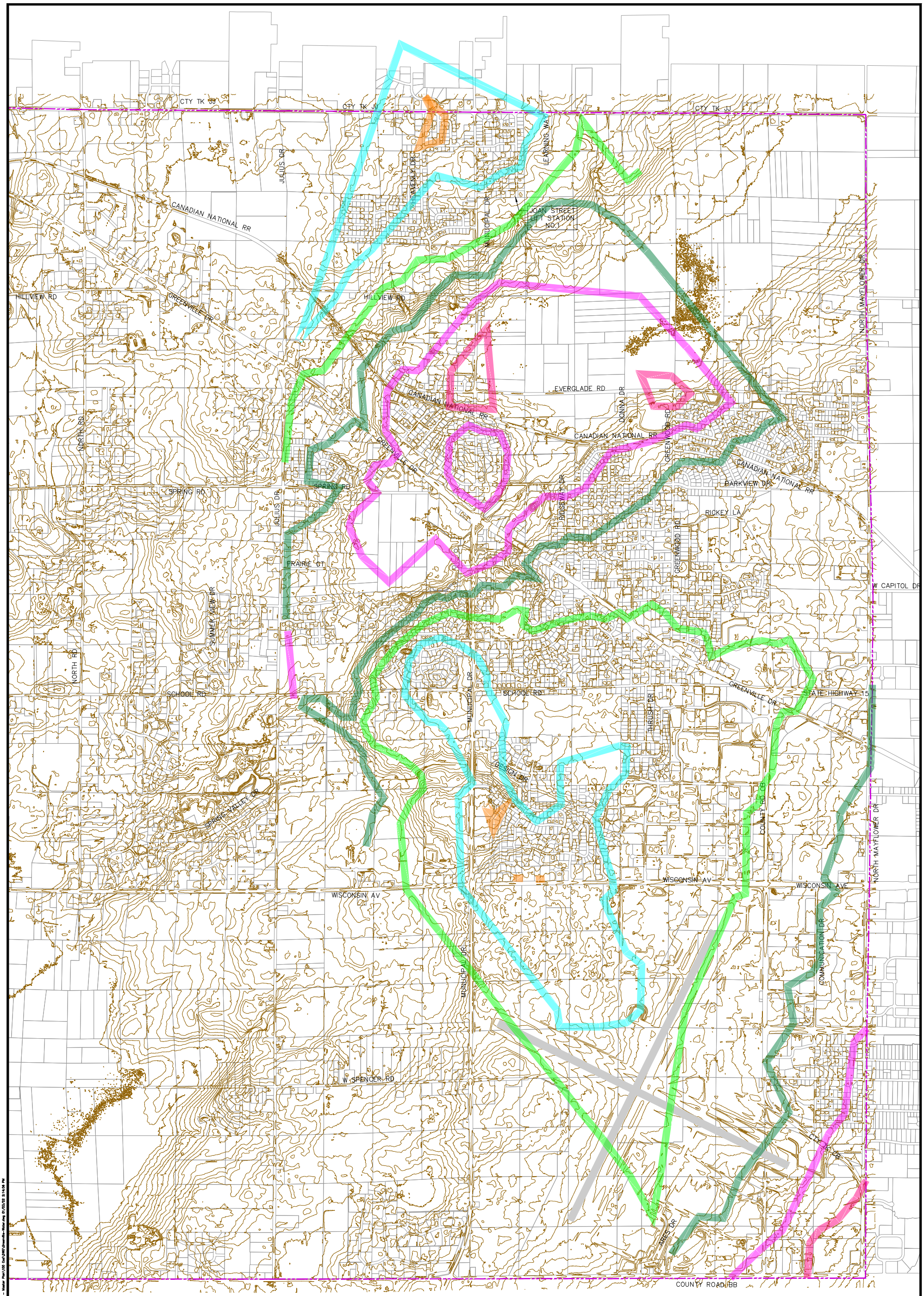
JOB NO. G5992-051	SET TYPE FINAL
DRAWN BY MLW	FIGURE NO. 3-2E
CHECKED BY JMM	DATE DECEMBER 2021
SCALE	

VILLAGE OF GREENVILLE

WATER SUPPLY AND TREATMENT SCHEMATIC

OUTAGAMIE COUNTY WISCONSIN

Cedar corporation



LEGEND

- 40 PSI
- 50 PSI
- 60 PSI
- 70 PSI
- 80 PSI
- 90 PSI
- 100 PSI
- VILLAGE BOUNDARY

JOB NO. G5992-051	SET TYPE FINAL
DRAWN BY MLW	FIGURE NO. 6-1
CHECKED BY JMM	DATE DECEMBER 2021

SCALE
0 600' 1200' 2400'

VILLAGE OF GREENVILLE

MODELED PRESSURE CONTOUR MAP
OUTAGAMIE COUNTY WISCONSIN

Cedar corporation

Town of Ellington

NORTH TOWER

JULIUS TOWER

AIRPORT TOWER

801

377

94

332

273

274

269

268

928

699

236

CTY TK JJ

HILLVIEW RD

BENNETT CIR

JOAN ST

HEAVENLY DR

EVERGLADE RD

SWANEE CTR

ELPASO DR

RAWLEY POINT DR

GREENWOOD RD

MEDINA DR

PARKVIEW DR

N MAYFLOWER DR

GREENVILLE DR

TERRACE DR

DOVER CT

IVY LA

HYACINTH LA

SPRING RD

NORTH RD

LINDA LOU DR

PRAIRIE CT

WESTHAVEN DR

RIDGEWAY DR

EMERALD LA

CEDAR LA

CEDAR DR

RICKEY LA

LILAC LA

ELLEN LA

RIDGELINE TR

SUMMER VIEW DR

BUMAN WAY

SCHOOL RD

CTY TK CB

NEUBERT RD

HY 15

LEVI DR

TECHNICAL DR

DESIGN DR

GLENNVIEW DR

FALLON LA

CRAFTSMEN DR

SPECIALTY DR

TOWER VIEW DR

QUALITY DR

PEACEFUL CT

RIVER DR

CRANDON CT

JULIUS DR

SPRING VALLEY DR

FOX SPRINGS DR

CHURCHILL RD

PASTURE PKWY

CLEARY ST

WIS AV

MUNICIPAL DR

ENDEAVOUR DR

COMMUNICATION DR

ISLAND RD

W SPENCER RD

FOXWOOD DR

SUNSET DR

SUNRISE TR

DISCOVERY DR

COLLEGE AV

AEROTECH DR

LONG CT

SPENCER RD

PRISCILLA LA

PATHFINDER DR

ARES DR

TWO MILE RD

Town of Clayton

Fox Crossing

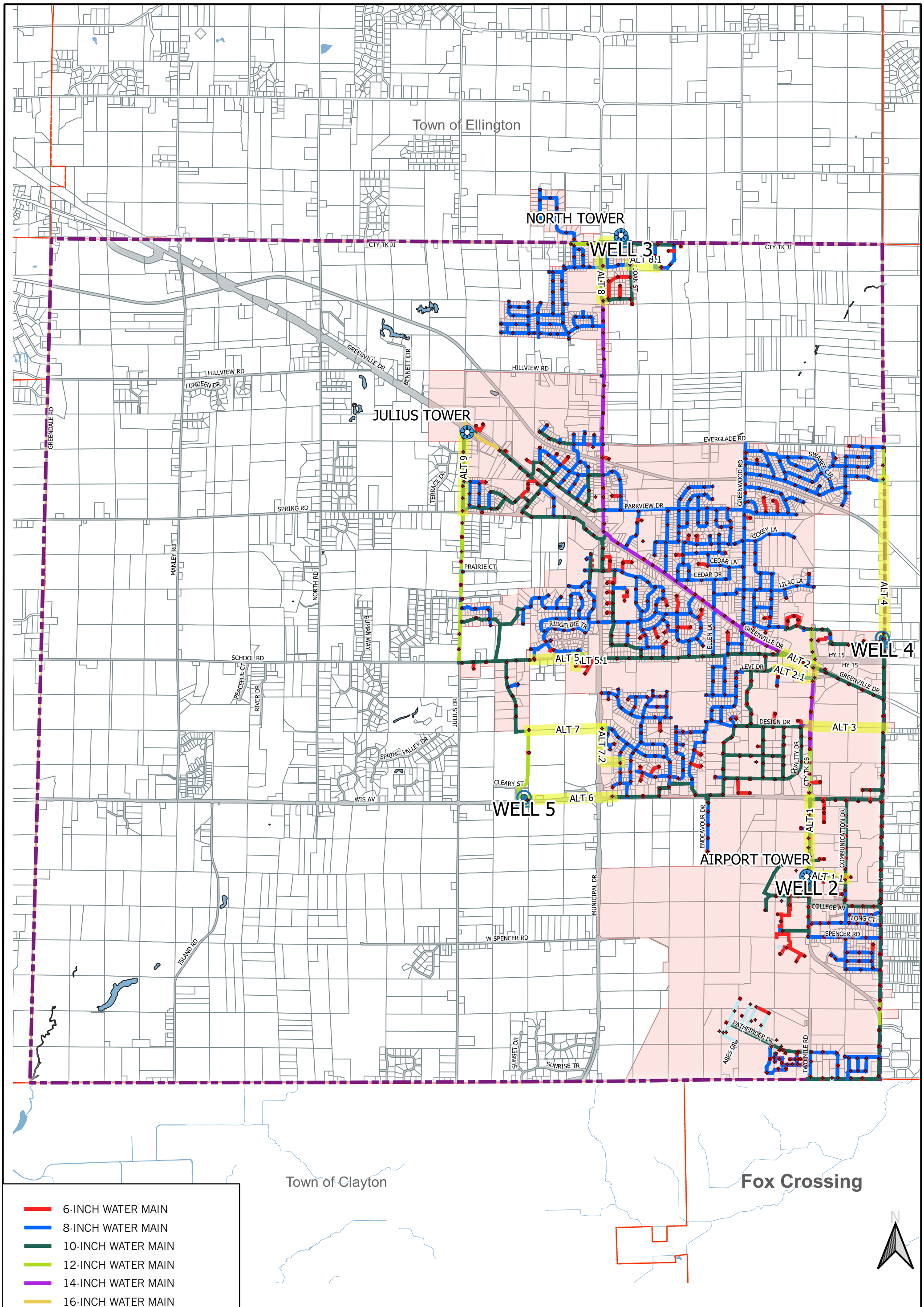
6-INCH WATER MAIN
8-INCH WATER MAIN
10-INCH WATER MAIN
12-INCH WATER MAIN
14-INCH WATER MAIN
16-INCH WATER MAIN
WATER TOWER
HYDRANT
IND Hydrant
RES Hydrant
GREENVILLE SANITARY DISTRICT
VILLAGE OF GREENVILLE

JOB NO. G5992-051	SET TYPE Final
DRAWN BY SIH	FIGURE NO. 6-2
CHECKED BY JMM	DATE DECEMBER 2021

0 1,600 3,200 ft

Village of Greenville Critical Hydrant Map

Cedar CORPORATION


Town of Ellington
NORTH TOWER
WELL 3
ALT 8.1
ALT 8
JOAN ST
CTY TK JJ
CTY TK JJ
GREENVILLE DR
BENNETT CIR
HILLVIEW RD
HILLVIEW RD
LUNDEEN DR
GREENDALE RD
JULIUS TOWER
ALT 9
TERRACE DR
EVERGLADE RD
SWANEE CIR
GREENWOOD RD
PARKVIEW DR
RICKEY LA
CEDAR LA
CEDAR DR
LILAC LA
SPRING RD
MANLEY RD
PRAIRIE CT
NORTH RD
BUNDUNWAY
RIDGELINE TR
ELLEN LA
GREENVILLE DR
ALT 4
WELL 4
HY 15
HY 15
GREENVILLE DR
SCHOOL RD
ALT 5
ALT 5.1
ALT 2
ALT 2.1
LEVI DR
PEACEFUL CT
RIVER DR
JULIUS DR
ALT 7
ALT 7.2
DESIGN DR
ALT 3
QUALITY DR
CTY TK CB
SPRING VALLEY DR
CLEARY ST
WIS AV
WELL 5
ALT 6
ENDEAVOUR DR
ALT 1
COMMUNICATION DR
AIRPORT TOWER
ALT 1.1
WELL 2
MUNICIPAL DR
COLLEGE AV
LONG CT
SPENCER RD
W SPENCER RD
ISLAND RD
SUNSET DR
SUNRISE TR
PATHFINDER DR
ARES DR
TWO MILE RD
Town of Clayton
Fox Crossing
N
6-INCH WATER MAIN
8-INCH WATER MAIN
10-INCH WATER MAIN
12-INCH WATER MAIN
14-INCH WATER MAIN
16-INCH WATER MAIN
ALTERNATIVE DISTRIBUTION
WATER TOWER
WELL AND WTP
HYDRANT
GREENVILLE SANITARY DISTRICT
VILLAGE OF GREENVILLE
JOB NO. G5992-051
SET TYPE FINAL
DRAWN BY SIH
FIGURE NO. 6-3
CHECKED BY JMM
DATE DECEMBER 2021
0 1,600 3,200 ft
Village of Greenville
Alternative Distribution
Evaluation Map
Cedar CORPORATION

Town of Ellington

NORTH TOWER

WELL 3

801

CTY TK JJ

J-6749
910
3500
53/44

J-6748
900
3500
56/42

J-6750
890
3500
61/44

J-6751
860
3500
73/40

J-6752
810
3,500
92/36

J-6753
780
3477
99/20

12"

10"

8"

12"-14"

JULIUS TOWER

HILLVIEW RD

BENNETT CIR

HEAVENLY DR

JOAN ST

377

GREENVILLE DR

EVERGLADE RD

94

SWANEE CIR

ELPASO DR

GREENWOOD RD

TERRACE DR

IVY LA

HYACINTH LA

MEDINA DR

PARKVIEW DR

332

RICKEY LA

EMERALD LA

CEDAR LA

CEDAR DR

LILAC LA

RIDGEWAY DR

ELLEN LA

273

PRAIRIE CT

WESTHAVEN DR

SPRING RD

NORTH RD

LINDA LOU DR

SUMMER VIEW DR

BUMAN WAY

RIDGELINE TR

SCHOOL RD

274

269

268

LEVI DR

TECHNICAL DR

928

DESIGN DR

GLENNVIEW DR

FUTURE PKWY

FALLON LA

CRAFTSMEN DR

SPECIALTY DR

QUALITY DR

CTY TK CB

HY 15

WELL 4

PEACEFUL CT

RIVER DR

CRANDON CT

CHURCHILL RD

SPRING VALLEY DR

FOX SPRINGS DR

JULIUS DR

CLEARY ST

WIS AV

WELL 5

MUNICIPAL DR

ENDEAVOUR DR

AIRPORT TOWER

WELL 2

699

COMMUNICATION DR

DISCOVERY DR

COLLEGE AV

AEROTECH DR

LONG CT

SPENCER RD

PRISCILLA LA

ISLAND RD

W SPENCER RD

FOXWOOD DR

PATHFINDER DR

ARES DR

TWO MILE RD

236

SUNSET DR

SUNRISE TR

N MAYFLOWER DR

NODE
ELEVATION
FIREFLOW
STD. RESIDUAL PRESSURE

890
2799
60/20

Town of Clayton

Fox Crossing

N

- FUTURE DISTRIBUTION
- 6-INCH WATER MAIN
- 8-INCH WATER MAIN
- 10-INCH WATER MAIN
- 12-INCH WATER MAIN
- 14-INCH WATER MAIN
- 16-INCH WATER MAIN
- WATER TOWER
- HYDRANT
- IND Hydrant
- RES Hydrant
- GREENVILLE SANITARY DISTRICT
- VILLAGE OF GREENVILLE

JOB NO. G5992-051	SET TYPE Final
DRAWN BY SIH	FIGURE NO. 7-1
CHECKED BY JMM	DATE DECEMBER 2021

0 1,600 3,200 ft

Village of Greenville Future Distribution Map

Cedar CORPORATION

APPENDICES

Documentation referenced in this evaluation follows:

Appendix A: Year 2051 Full Development Calculations

Appendix B: Well Construction Reports

Appendix C: *2020 Public Service Commission Report: Water Section*

Appendix A: Year 2051 Full Development Calculations

Specific computations and details are provided in this appendix.

A summary of development area population and wastewater flow calculations follow:

- Water Calculations for Development of Future Service Areas, Year 2051.

Appendix A - Water Calculations for Development of Future Service Areas

2020 Water Demand Per Residential Customer (gpd) (AVG 2015-2020):	131.5
2020 Water Demand Per Commercial Customer (gpd) (AVG 2015-2020):	606
2020 Water Demand Per Public Authority Customer (gpd) (AVG 2015-2019):	560
2020 Water Demand Per Industrial Customer (gpd) (AVG 2015-2019):	458
Wisconsin DOA 2020 Persons per House	2.396
Estimated Greenville Water Demand per Capita, gpcd	55
Peak Month Flow Factor	727622.83
AVG Peak Water Factor	1.59

ECWRPC 2020 Population:		
Year	Population	# Change
2020	12,450	
2051	18,951	6501

Total Expansion Population	Comprehensive Plan Methods	Full Development Calculations
TOTAL	6,501	6,506
Tier 1 Residential Total	6,176	5244
Tier 2 Residential Total	260	996
Tier 3 Residential Total	65	266
	6,501	*6,506*
Assumption for Developable Area		45%
Assumed New Houses per Acre	Tier 1	2.55
Assumed New Houses per Acre	Tier 2	0.75
Assumed New Houses per Acre	Tier 3	0.20

Block Number	**1A**		
Comprehensive Plan Land Use	**Tier 1 Residential**		
Sewer Main ID	1-A-1	*2 EXIST COMM/PA USERS ALREADY IN SYSTEM	
Number of Existing Dwelling along Main	1	*1 RESIDENTIAL NORTH OF JJ THAT ARE PROJECTED	
Estimated Main Service Area, acres	302		
Estimated Open/Developable Area, acres	179		
Mapped Wetland Area, acres	12.3		
Anticipated # of New Units	210		
Anticipated Existing Service Population	2		
Anticipated New Service Population	504	COMM:	
Total Service Population	**506**	***2 EXIST COMM NORTH OF JJ THAT ARE PROJECTED**	
Average Daily Demand, GPD	27,790	1212	**29,002**
Max Day Demaned, GPD	44,137	1,925	**46,061**

Sewer Main ID	1-A-2
Number of Existing Dwelling along Main	53
Estimated Main Service Area, acres	204
Estimated Open/Developable Area, acres	180
Mapped Wetland Area, acres	5
Anticipated # of New Units	211
Anticipated Existing Service Population	127
Anticipated New Service Population	506
Total Service Population	**633**
Average Daily Demand, GPD	**34,738**
Max Day Demaned, GPD	**55,171**

Block Number	**1B**
Comprehensive Plan Land Use	**Tier 1 Residential**
Sewer Main ID	1-B-1
Number of Existing Dwelling along Main	0
Estimated Main Service Area, acres	53
Estimated Open/Developable Area, acres	30
Mapped Wetland Area, acres	15
Anticipated # of New Units	36
Anticipated Existing Service Population	0
Anticipated New Service Population	87
Total Service Population	**87**
Average Daily Demand, GPD	**4,774**
Max Day Demaned, GPD	**7,583**

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**2**	
Comprehensive Plan Land Use	**Tier 1 Residential**	
Sewer Main ID	2-A-1	
Number of Existing Dwelling along Main	9	
Estimated Main Service Area, acres	320	
Estimated Open/Developable Area, acres	300	
Mapped Wetland Area, acres	2	
Anticipated # of New Units	351	
Anticipated Existing Service Population	22	
Anticipated New Service Population	841	
Total Service Population	**863**	
Average Daily Demand, GPD	**47,360**	
Max Day Demaned, GPD	**75,218**	

Block Number	**3**	
Comprehensive Plan Land Use	**Tier 1 Residential/Industrial**	***RES ONLY***
Sewer Main ID	3-A-1	
Number of Existing Dwelling along Main	6	
Estimated Main Service Area, acres	295	
Estimated Open/Developable Area, acres	270	
Mapped Wetland Area, acres	2	
Anticipated # of New Units	316	
Anticipated Existing Service Population	15	
Anticipated New Service Population	758	
Total Service Population	**773**	
Average Daily Demand, GPD	**42,421**	
Max Day Demaned, GPD	**67,373**	

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**4**	
Comprehensive Plan Land Use	**Tier 1 Residential**	
Sewer Main ID	4-A-1	
Number of Existing Dwelling along Main	11	
Estimated Main Service Area, acres	97	
Estimated Open/Developable Area, acres	88	
Mapped Wetland Area, acres	0	
Anticipated # of New Units	103	
Anticipated Existing Service Population	27	
Anticipated New Service Population	247	
Total Service Population	**274**	
Average Daily Demand, GPD	**15,037**	
Max Day Demaned, GPD	**23,881**	
Sewer Main ID	4-A-2	
Number of Existing Dwelling along Main	0	
Estimated Main Service Area, acres	97	
Estimated Open/Developable Area, acres	88	
Mapped Wetland Area, acres	7	
Anticipated # of New Units	103	
Anticipated Existing Service Population	0	
Anticipated New Service Population	247	
Total Service Population	**247**	
Average Daily Demand, GPD	**13,555**	
Max Day Demaned, GPD	**21,528**	
Sewer Main ID	4-A-3	
Number of Existing Dwelling along Main	7	*CHAPEL HILL AREA ALREADY IN EXISTING SYSTEM, 7 PROJECTED RES USERS ALONG
Estimated Main Service Area, acres	125	
Estimated Open/Developable Area, acres	105	
Mapped Wetland Area, acres	0	
Anticipated # of New Units	123	
Anticipated Existing Service Population	17	
Anticipated New Service Population	295	
Total Service Population	**312**	
Average Daily Demand, GPD	**17,122**	
Max Day Demaned, GPD	**27,193**	

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**5A**
Comprehensive Plan Land Use	**Tier 1 Residential**
Sewer Main ID	5-A-1
Number of Existing Dwelling along Main	7
Estimated Main Service Area, acres	113
Estimated Open/Developable Area, acres	25
Mapped Wetland Area, acres	0
Anticipated # of New Units	30
Anticipated Existing Service Population	17
Anticipated New Service Population	72
Total Service Population	**89**
Average Daily Demand, GPD	**4,884**
Max Day Demaned, GPD	**7,757**

Block Number	**5B**
Comprehensive Plan Land Use	**Tier 1 Residential**
Sewer Main ID	5-B-1
Number of Existing Dwelling along Main	13
Estimated Main Service Area, acres	183
Estimated Open/Developable Area, acres	104
Mapped Wetland Area, acres	5
Anticipated # of New Units	122
Anticipated Existing Service Population	32
Anticipated New Service Population	293
Total Service Population	**325**
Average Daily Demand, GPD	**17,836**
Max Day Demaned, GPD	**28,326**

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**6A**
Comprehensive Plan Land Use	**Tier 2 Residential/Open Space**
Sewer Main ID	6-A-1
Number of Existing Dwelling along Main	8
Estimated Main Service Area, acres	98
Estimated Open/Developable Area, acres	86
Mapped Wetland Area, acres	7
Anticipated # of New Units	35
Anticipated Existing Service Population	20
Anticipated New Service Population	84
Total Service Population	**104**
Average Daily Demand, GPD	**5,707**
Max Day Demaned, GPD	**9,064**
Sewer Main ID	6-A-3 (4-A-2)
Number of Existing Dwelling along Main	0
Estimated Main Service Area, acres	200
Estimated Open/Developable Area, acres	75
Mapped Wetland Area, acres	120
Anticipated # of New Units	31
Anticipated Existing Service Population	0
Anticipated New Service Population	75
Total Service Population	**75**
Average Daily Demand, GPD	**4,116**
Max Day Demaned, GPD	**6,537**
Sewer Main ID	6-A-2
Number of Existing Dwelling along Main	1
Estimated Main Service Area, acres	13
Estimated Open/Developable Area, acres	12
Mapped Wetland Area, acres	0
Anticipated # of New Units	5
Anticipated Existing Service Population	3
Anticipated New Service Population	12
Total Service Population	**15**
Average Daily Demand, GPD	**823**
Max Day Demaned, GPD	**1,307**

Block Number	**6B**
Comprehensive Plan Land Use	**Tier 2 Residential/Open Space**
Sewer Main ID	6-B-1
Number of Existing Dwelling along Main	1
Estimated Main Service Area, acres	108
Estimated Open/Developable Area, acres	98
Mapped Wetland Area, acres	8
Anticipated # of New Units	40
Anticipated Existing Service Population	3
Anticipated New Service Population	96
Total Service Population	**99**
Average Daily Demand, GPD	**5,433**
Max Day Demaned, GPD	**8,629**
Sewer Main ID	6-B-2
Number of Existing Dwelling along Main	12
Estimated Main Service Area, acres	125
Estimated Open/Developable Area, acres	25
Mapped Wetland Area, acres	71
Anticipated # of New Units	11
Anticipated Existing Service Population	29
Anticipated New Service Population	27
Total Service Population	**56**
Average Daily Demand, GPD	**3,073**
Max Day Demaned, GPD	**4,881**

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**6C**
Comprehensive Plan Land Use	**Tier 2 Residential/Open Space**
Sewer Main ID	7-C-1
Number of Existing Dwelling along Main	2
Estimated Main Service Area, acres	27
Estimated Open/Developable Area, acres	20
Mapped Wetland Area, acres	0
Anticipated # of New Units	9
Anticipated Existing Service Population	5
Anticipated New Service Population	22
Total Service Population	**27**
Average Daily Demand, GPD	**1,482**
Max Day Demaned, GPD	**2,353**

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**7A**
Comprehensive Plan Land Use	**Tier 2 Residential/Open Space**
Sewer Main ID	7-A-1
Number of Existing Dwelling along Main	26
Estimated Main Service Area, acres	65
Estimated Open/Developable Area, acres	27
Mapped Wetland Area, acres	3
Anticipated # of New Units	11
Anticipated Existing Service Population	63
Anticipated New Service Population	27
Total Service Population	**90**
Average Daily Demand, GPD	**4,939**
Max Day Demaned, GPD	**7,844**
Sewer Main ID	6-B-2
Number of Existing Dwelling along Main	1
Estimated Main Service Area, acres	60
Estimated Open/Developable Area, acres	10
Mapped Wetland Area, acres	5
Anticipated # of New Units	5
Anticipated Existing Service Population	3
Anticipated New Service Population	12
Total Service Population	**15**
Average Daily Demand, GPD	**823**
Max Day Demaned, GPD	**1,307**

Block Number	**7B**
Comprehensive Plan Land Use	**Tier 2 Residential/Open Space**
Sewer Main ID	7-B-1
Number of Existing Dwelling along Main	24
Estimated Main Service Area, acres	15
Estimated Open/Developable Area, acres	10
Mapped Wetland Area, acres	0
Anticipated # of New Units	5
Anticipated Existing Service Population	58
Anticipated New Service Population	12
Total Service Population	**70**
Average Daily Demand, GPD	**3,842**
Max Day Demaned, GPD	**6,101**
Sewer Main ID	7-B-2
Number of Existing Dwelling along Main	3
Estimated Main Service Area, acres	88
Estimated Open/Developable Area, acres	5
Mapped Wetland Area, acres	0
Anticipated # of New Units	3
Anticipated Existing Service Population	8
Anticipated New Service Population	8
Total Service Population	**16**
Average Daily Demand, GPD	**878**
Max Day Demaned, GPD	**1,395**

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**7C**	
Comprehensive Plan Land Use	**Tier 2 Residential/Open Space**	
Sewer Main ID	7-C-1	
Number of Existing Dwelling along Main	3	
Estimated Main Service Area, acres	87	
Estimated Open/Developable Area, acres	70	
Mapped Wetland Area, acres	12	
Anticipated # of New Units	29	
Anticipated Existing Service Population	8	
Anticipated New Service Population	70	
Total Service Population	**78**	
Average Daily Demand, GPD	**4,281**	
Max Day Demaned, GPD	**6,798**	
Sewer Main ID	7-C-2	
Number of Existing Dwelling along Main	46	*Questions submitted for 11 Resd on Clover Lane (Assumption included as Projecte
Estimated Main Service Area, acres	99	*Assumption 35 Resd units along Terrace/Spring as Projected
Estimated Open/Developable Area, acres	0	
Mapped Wetland Area, acres	1	
Anticipated # of New Units	0	
Anticipated Existing Service Population	110	
Anticipated New Service Population	0	
Total Service Population	**110**	
Average Daily Demand, GPD	**6,049**	
Max Day Demaned, GPD	**9,606**	
Sewer Main ID	7-C-3	
Number of Existing Dwelling along Main	28	
Estimated Main Service Area, acres	160	
Estimated Open/Developable Area, acres	120	
Mapped Wetland Area, acres	2	
Anticipated # of New Units	49	
Anticipated Existing Service Population	68	
Anticipated New Service Population	118	
Total Service Population	**186**	
Average Daily Demand, GPD	**10,207**	
Max Day Demaned, GPD	**16,211**	

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**8A**	
Comprehensive Plan Land Use	**Tier 2 Residential**	
Sewer Main ID	8-A-1	
Number of Existing Dwelling along Main	31	*Assumption 23 Resd on Spring/Prairie as Projected
Estimated Main Service Area, acres	105	*Assumption 8 Resd units along Prairie Ct as Projected
Estimated Open/Developable Area, acres	80	
Mapped Wetland Area, acres	0	
Anticipated # of New Units	33	
Anticipated Existing Service Population	74	
Anticipated New Service Population	80	
Total Service Population	**154**	
Average Daily Demand, GPD	**8,466**	
Max Day Demaned, GPD	**13,446**	

Sewer Main ID	7-C-3
Number of Existing Dwelling along Main	23
Estimated Main Service Area, acres	105
Estimated Open/Developable Area, acres	44
Mapped Wetland Area, acres	0
Anticipated # of New Units	18
Anticipated Existing Service Population	56
Anticipated New Service Population	44
Total Service Population	**100**
Average Daily Demand, GPD	**5,488**
Max Day Demaned, GPD	**8,716**

Block Number	**8B**
Comprehensive Plan Land Use	**Tier 2 Residential/Open Space**
Sewer Main ID	8-B-1
Number of Existing Dwelling along Main	13
Estimated Main Service Area, acres	189
Estimated Open/Developable Area, acres	130
Mapped Wetland Area, acres	14
Anticipated # of New Units	53
Anticipated Existing Service Population	32
Anticipated New Service Population	127
Total Service Population	**159**
Average Daily Demand, GPD	**8,726**
Max Day Demaned, GPD	**13,858**

Sewer Main ID	8-B-2
Number of Existing Dwelling along Main	59
Estimated Main Service Area, acres	172
Estimated Open/Developable Area, acres	90
Mapped Wetland Area, acres	0
Anticipated # of New Units	37
Anticipated Existing Service Population	142
Anticipated New Service Population	89
Total Service Population	**231**
Average Daily Demand, GPD	**12,677**
Max Day Demaned, GPD	**20,134**

Block Number	**8C**	
Comprehensive Plan Land Use	**Tier 2 Residential/Open Space**	
Sewer Main ID	8-C-1	
Number of Existing Dwelling along Main	36	*Assume all existing without sewer/water as projected
Estimated Main Service Area, acres	94	
Estimated Open/Developable Area, acres	14	
Mapped Wetland Area, acres	7	
Anticipated # of New Units	6	
Anticipated Existing Service Population	87	
Anticipated New Service Population	15	
Total Service Population	**102**	
Average Daily Demand, GPD	**5,598**	
Max Day Demaned, GPD	**8,890**	

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**9A**
Comprehensive Plan Land Use	**Tier 2 Residential/Open Space**
Sewer Main ID	9-A-1
Number of Existing Dwelling along Main	24
Estimated Main Service Area, acres	72
Estimated Open/Developable Area, acres	0
Mapped Wetland Area, acres	5
Anticipated # of New Units	0
Anticipated Existing Service Population	58
Anticipated New Service Population	0
Total Service Population	**58**
Average Daily Demand, GPD	**3,183**
Max Day Demaned, GPD	**5,055**

Sewer Main ID	9-A-2
Number of Existing Dwelling along Main	100
Estimated Main Service Area, acres	233
Estimated Open/Developable Area, acres	0
Mapped Wetland Area, acres	15
Anticipated # of New Units	0
Anticipated Existing Service Population	240
Anticipated New Service Population	0
Total Service Population	**240**
Average Daily Demand, GPD	**13,171**
Max Day Demaned, GPD	**20,918**

Sewer Main ID	8-B-2
Number of Existing Dwelling along Main	50
Estimated Main Service Area, acres	114
Estimated Open/Developable Area, acres	50
Mapped Wetland Area, acres	0
Anticipated # of New Units	21
Anticipated Existing Service Population	120
Anticipated New Service Population	51
Total Service Population	**171**
Average Daily Demand, GPD	**9,384**
Max Day Demaned, GPD	**14,904**

Block Number	**9B**
Comprehensive Plan Land Use	**Tier 2 Residential/Open Space**
Sewer Main ID	9-B-1
Number of Existing Dwelling along Main	35
Estimated Main Service Area, acres	54
Estimated Open/Developable Area, acres	25
Mapped Wetland Area, acres	5
Anticipated # of New Units	11
Anticipated Existing Service Population	84
Anticipated New Service Population	27
Total Service Population	**111**
Average Daily Demand, GPD	**6,092**
Max Day Demaned, GPD	**9,675**

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**10A**
Comprehensive Plan Land Use	**Tier 3 Residential**
Sewer Main ID	10-A-1
Number of Existing Dwelling along Main	17
Estimated Main Service Area, acres	117
Estimated Open/Developable Area, acres	45
Mapped Wetland Area, acres	0
Anticipated # of New Units	6
Anticipated Existing Service Population	41
Anticipated New Service Population	15
Total Service Population	**56**
Average Daily Demand, GPD	**3,073**
Max Day Demaned, GPD	**4,881**
Sewer Main ID	10-A-2
Number of Existing Dwelling along Main	5
Estimated Main Service Area, acres	246
Estimated Open/Developable Area, acres	210
Mapped Wetland Area, acres	0
Anticipated # of New Units	24
Anticipated Existing Service Population	12
Anticipated New Service Population	58
Total Service Population	**70**
Average Daily Demand, GPD	**3,842**
Max Day Demaned, GPD	**6,101**

Block Number	**10B**
Comprehensive Plan Land Use	**Tier 3 Residential**
Sewer Main ID	10-B-1
Number of Existing Dwelling along Main	5
Estimated Main Service Area, acres	104
Estimated Open/Developable Area, acres	90
Mapped Wetland Area, acres	0
Anticipated # of New Units	11
Anticipated Existing Service Population	12
Anticipated New Service Population	27
Total Service Population	**39**
Average Daily Demand, GPD	**2,140**
Max Day Demaned, GPD	**3,399**
Sewer Main ID	10-B-2
Number of Existing Dwelling along Main	3
Estimated Main Service Area, acres	152
Estimated Open/Developable Area, acres	145
Mapped Wetland Area, acres	0
Anticipated # of New Units	17
Anticipated Existing Service Population	8
Anticipated New Service Population	41
Total Service Population	**49**
Average Daily Demand, GPD	**2,689**
Max Day Demaned, GPD	**4,271**

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**11A**
Comprehensive Plan Land Use	**Tier 3 Residential**
Sewer Main ID	11-A-1
Number of Existing Dwelling along Main	39
Estimated Main Service Area, acres	198
Estimated Open/Developable Area, acres	72
Mapped Wetland Area, acres	0
Anticipated # of New Units	9
Anticipated Existing Service Population	94
Anticipated New Service Population	22
Total Service Population	**116**
Average Daily Demand, GPD	**6,366**
Max Day Demaned, GPD	**10,110**
Sewer Main ID	11-A-2
Number of Existing Dwelling along Main	5
Estimated Main Service Area, acres	172
Estimated Open/Developable Area, acres	160
Mapped Wetland Area, acres	5
Anticipated # of New Units	18
Anticipated Existing Service Population	12
Anticipated New Service Population	44
Total Service Population	**56**
Average Daily Demand, GPD	**3,073**
Max Day Demaned, GPD	**4,881**
Sewer Main ID	11-A-3
Number of Existing Dwelling along Main	2
Estimated Main Service Area, acres	40
Estimated Open/Developable Area, acres	30
Mapped Wetland Area, acres	0
Anticipated # of New Units	4
Anticipated Existing Service Population	5
Anticipated New Service Population	10
Total Service Population	**15**
Average Daily Demand, GPD	**823**
Max Day Demaned, GPD	**1,307**
Sewer Main ID	10-A-1
Number of Existing Dwelling along Main	7
Estimated Main Service Area, acres	134
Estimated Open/Developable Area, acres	115
Mapped Wetland Area, acres	2
Anticipated # of New Units	13
Anticipated Existing Service Population	17
Anticipated New Service Population	32
Total Service Population	**49**
Average Daily Demand, GPD	**2,689**
Max Day Demaned, GPD	**4,271**

Block Number	**11B**
Comprehensive Plan Land Use	**Tier 3 Residential**
Sewer Main ID	11-B-1
Number of Existing Dwelling along Main	17
Estimated Main Service Area, acres	102
Estimated Open/Developable Area, acres	56
Mapped Wetland Area, acres	10
Anticipated # of New Units	7
Anticipated Existing Service Population	41
Anticipated New Service Population	17
Total Service Population	**58**
Average Daily Demand, GPD	**3,183**
Max Day Demaned, GPD	**5,055**

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**12A**	
Comprehensive Plan Land Use	**Tier 3 Residential/Airport**	***RES ONLY***
Main ID	12-A-1	
Number of Existing Dwelling along Main	2	
Estimated Main Service Area, acres	54	
Estimated Open/Developable Area, acres	0	
Mapped Wetland Area, acres	0	
Anticipated # of New Units	0	
Anticipated Existing Service Population	5	
Anticipated New Service Population	0	
Total Service Population	**5**	
Average Daily Demand, GPD	**274**	
Max Day Demaned, GPD	**436**	

Block Number	**13A**	
Comprehensive Plan Land Use	**Tier 1 Residential**	
Sewer Main ID	13-A-1	
Number of Existing Dwelling along Main	0	
Estimated Main Service Area, acres	92	
Estimated Open/Developable Area, acres	85	
Mapped Wetland Area, acres	0	
Anticipated # of New Units	100	
Anticipated Existing Service Population	0	
Anticipated New Service Population	240	
Total Service Population	**240**	
Average Daily Demand, GPD	**13,171**	
Max Day Demaned, GPD	**20,918**	

Sewer Main ID	13-A-2 (9-B-1)	
Number of Existing Dwelling along Main	6	*6 existing Resd units as projected
Estimated Main Service Area, acres	162	*1 Public Authority User already in water sytem
Estimated Open/Developable Area, acres	80	
Mapped Wetland Area, acres	10	
Anticipated # of New Units	94	
Anticipated Existing Service Population	14	
Anticipated New Service Population	226	
Total Service Population	**240**	
Average Daily Demand, GPD	**13,192**	
Max Day Demaned, GPD	**20,951**	

Block Number	**13B**
Comprehensive Plan Land Use	**Tier 1 Residential**
Sewer Main ID	13-B-1
Number of Existing Dwelling along Main	5
Estimated Main Service Area, acres	122
Estimated Open/Developable Area, acres	60
Mapped Wetland Area, acres	4
Anticipated # of New Units	71
Anticipated Existing Service Population	12
Anticipated New Service Population	171
Total Service Population	**183**
Average Daily Demand, GPD	**10,043**
Max Day Demaned, GPD	**15,950**
Sewer Main ID	13-B-2
Number of Existing Dwelling along Main	1
Estimated Main Service Area, acres	42
Estimated Open/Developable Area, acres	30
Mapped Wetland Area, acres	0
Anticipated # of New Units	36
Anticipated Existing Service Population	3
Anticipated New Service Population	87
Total Service Population	**90**
Average Daily Demand, GPD	**4,939**
Max Day Demaned, GPD	**7,844**

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**14A**	
Comprehensive Plan Land Use	**Tier 1 Residential/Open Space**	
Sewer Main ID	14-A-1	
Number of Existing Dwelling along Main	0	
Estimated Main Service Area, acres	105	
Estimated Open/Developable Area, acres	93	
Mapped Wetland Area, acres	2	
Anticipated # of New Units	109	
Anticipated Existing Service Population	0	
Anticipated New Service Population	262	
Total Service Population	**262**	
Average Daily Demand, GPD	**14,378**	
Max Day Demaned, GPD	**22,835**	

Block Number	**14B**		
Comprehensive Plan Land Use	**Tier 1 Residential/Open Space**		
Sewer Main ID	14-B-1		
Number of Existing Dwelling along Main	3	*25 existing Resd already have water, BUT no sewer - no projected	
Estimated Main Service Area, acres	125	*Projected exist 3 Resd on School Rd	
Estimated Open/Developable Area, acres	10		
Mapped Wetland Area, acres	7.5		
Anticipated # of New Units	12		
Anticipated Existing Service Population	7		
Anticipated New Service Population	29	COMM:	
Total Service Population	**36**	***Projected 2 exist Comm on School Rd**	
Average Daily Demand, GPD	1,986	1212	**3,198**
Max Day Demaned, GPD	3,154	1,925	**5,079**

Block Number	**14C**
Comprehensive Plan Land Use	**Tier 1 Residential/Open Space**
Sewer Main ID	14-C-1
Number of Existing Dwelling along Main	0
Estimated Main Service Area, acres	0
Estimated Open/Developable Area, acres	0
Mapped Wetland Area, acres	0
Anticipated # of New Units	0
Anticipated Existing Service Population	0
Anticipated New Service Population	0
Total Service Population	**0**
Average Daily Demand, GPD	**0**
Max Day Demaned, GPD	**0**

Summary of Development Area Population and Wastewater Flow Calculations

Block Number	**15A**
Comprehensive Plan Land Use	**Tier 1 Residential/Heritage Overlay**
Sewer Main ID	15-A-1
Number of Existing Dwelling along Main	0
Estimated Main Service Area, acres	59
Estimated Open/Developable Area, acres	59
Mapped Wetland Area, acres	0
Anticipated # of New Units	70
Anticipated Existing Service Population	0
Anticipated New Service Population	168
Total Service Population	**168**
Average Daily Demand, GPD	**9,220**
Max Day Demaned, GPD	**14,643**

Block Number	**15B**
Comprehensive Plan Land Use	**Tier 1 Residential/Heritage Overlay**
Sewer Main ID	15-B-1
Number of Existing Dwelling along Main	0
Estimated Main Service Area, acres	75
Estimated Open/Developable Area, acres	75
Mapped Wetland Area, acres	0
Anticipated # of New Units	88
Anticipated Existing Service Population	0
Anticipated New Service Population	211
Total Service Population	**211**
Average Daily Demand, GPD	**11,579**
Max Day Demaned, GPD	**18,390**

Block Number	**16A**			
Comprehensive Plan Land Use	Industrial/Employment			
Main ID	16-A-1			
Number of Existing Dwelling along Main	0	*all existing units already connected		
Estimated Main Service Area, acres	215	*ASSUME FUTURE IND ON 20 ACRE SITE		
Estimated Open/Developable Area, acres	0	*ASSUME FUTURE COMM ON 5 ACRE SITE		
Mapped Wetland Area, acres	0			
Anticipated # of New Units	0	5	22	
Anticipated Existing Service Population	0			
Anticipated New Service Population	0	INDUSTR:	COMM:	
Total Service Population	**0**			
Average Daily Demand, GPD	**0**	2462	13027	**15,489**
Max Day Demaned, GPD	**0**	3,909	20,689	**24,599**

Summary of Development Area Population and Wastewater Flow Calculations

	GALLONS PER DAY
RESIDENTIAL PROJECTED DEMAND FOR 2051 (FULL BUILDOUT):	938,654
COMMERCIAL PROJECTED DEMAND FOR 2051 (FULL BUILDOUT):	112,699
INDUSTRIAL PROJECTED DEMAND FOR 2051 (FULL BUILDOUT):	70,239
PUBLIC AUTHORITY PROJECTED DEMAND FOR 2051 (FULL BUILDOUT):	22,399

TOTAL 2051 WATER SOLD:	1,143,991
AVG UNACCOUNTED FOR WATER LOSS:	19%
TOTAL 2051 WATER DEMAND:	1,356,974

Appendix B: Well Construction Reports

This appendix contains copies of construction information for each well.

Well Construction Reports (logs) are attached for the following:

- Well # BG590
- Well # VL966
- Well # HR251
- Well # SA852
- Well # YV153

Well Construction Report
WISCONSIN UNIQUE WELL NUMBER BG590

Drinking Water and Groundwater - DG/5
Department of Natural Resources, Box 7921
Madison WI 53707

Form 3300-077A

Property Owner	GREENVILLE SANITARY DISTRICT	Phone # (920)757-5151
Mailing Address	PO BOX 60	
City	GREENVILLE	State WI Zip Code 54942
County	Co. Permit #	Notification # / Completed
Outagamie		04-14-1986

1. Well Location — Fire # (if avail.)

Town of GREENVILLE

Subdivision Name | Lot # | Block #

Well Constructor (Business Name)	Lic. #	Facility ID # (Public Wells)
LAYNE CHRISTENSEN COMPANY	582	445027880

Method Code: GPS008

Address: W229 N5005 DUPLAINVI
PEWAUKEE WI 53072

Well Plan Approval #

Approval Date (mm-dd-yyyy): 10-24-1985

or Govt Lot #	Section	Township	Range
	25	21 N	16 E

2. Well Type New Well — VL966 replaces this well of previous unique well # — constructed in

Reason for replaced or reconstructed well ?

hi cap 83490

Hicap Permanent Well #	Common Well #	Specific Capacity
	002	62.5

3. Well serves # of

Municipal/Community

Heat Exchange____# of drillholes

Hicap Well ?

Hicap Property ?

Hicap Potable ?

Construction Type Drilled

4. Potential Contamination Sources - ON REVERSE SIDE

5. Drillhole Dimensions and Construction Method

Dia. (in.)	From (ft.)	To (ft.)
18	Surface	56
17.25	56	64
12	64	500

Upper Enlarged Drillhole / Lower Open Bedrock

- Rotary - Mud Circulation .....
- Yes — Rotary - Air .....
- Rotary - Air & Foam .....
- Drill-Through Casing Hammer
- Reverse Rotary
- Yes — Cable-tool Bit ____in. dia...
- Dual Rotary .....
- Temp. Outer Casing ____in. dia
- Removed? ____depth ft. (If NO explain on back side)

Geology Codes				8. Geology Type, Caving/Noncaving, Color, Hardness, etc...	From (ft.)	To (ft.)
R		C		RED CLAY	Surface	6
		Z		CLAY GRAVEL BOULDERS	6	13
		C	G	STONY CLAY	13	41
		Z		GRAVEL @ CLAY	41	56
		L		LIMESTONE PDC	56	110
	X	N	L	SANDSTONE W DOL @ SHALE PDC	110	361
	X	N	H	SANDSTONE W SHALE STREAKS	361	495
		N	Q	SANDSTONE W QUARTZ @ SAND	495	500

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
18	BLK NEW STEEL PE A53 70 59# WELDED	Surface	56
12	BLK NEW STEEL PD A53 49 56# WELDED	56	66
Dia. (in.)	Screen type, material & slot size	From (ft.)	To (ft.)

7. Grout or Other Sealing Material

Method

Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
NEAT CEMENT	Surface	64	

9. Static Water Level

100 ft. below ground surface

10. Pump Test

Pumping level 108 ft. below surface

Pumping at 500 GP M for 12 Hrs.

Pumping Method ?

11. Well Is

24 in. above grade

Developed ?

Disinfected ? Yes

Capped ? Yes

12. Notified Owner of need to fill & seal ?

Filled & Sealed Well(s) as needed?

13. Constructor / Supervisory Driller — Lic # — Date Signed

WM

Drill Rig Operator — Lic or Reg # — Date Signed

4a. Potential Contamination Sources Is the well located in floodplain ?

Comment:

Water Quality Text:

Water Quantity Text:

Difficulty Text:

Created On: 11-05-1998 Created by: HFRC LOAD Updated On: 07-01-2009 Updated by: GIFFOJ

Well Construction Report
WISCONSIN UNIQUE WELL NUMBER VL966

Drinking Water and Groundwater - DG/5
Department of Natural Resources, Box 7921
Madison WI 53707

Form 3300-077A

Property Owner: GREENVILLE, TOWN OF
Phone #: (920)757-5151
Mailing Address: W6860 PARKVIEW DRIVE
City: GREENVILLE
State: WI
Zip Code: 54942
County: Outagamie
Co. Permit #:
Notification #:
Completed: 03-30-2006

1. Well Location
Town of GREENVILLE
Fire # (if avail.)
Subdivision Name
Lot #
Block #
Section: 25
Township: 21 N
Range: 16 E
or Govt Lot #

Well Constructor (Business Name): LAYNE CHRISTENSEN COMPANY
Lic. #: 582
Facility ID # (Public Wells): 445027880
Address: W229 N5005 DUPLAINVILLE PEWAUKEE WI 53072
Well Plan Approval #: 2005-1175
Approval Date (mm-dd-yyyy): 11-18-2005
Method Code

Hicap Permanent Well #: 83490
Common Well #: 2
Specific Capacity: 25.9

2. Well Type Reconstruction
of previous unique well # BG590 constructed in 1986
Reason for replaced or reconstructed well ?
water quality

3. Well serves # of Municipality
Municipal/Community
Heat Exchange____# of drillholes
Hicap Well ? Yes
Hicap Property ? Yes
Hicap Potable ?
Construction Type Drilled

4. Potential Contamination Sources - ON REVERSE SIDE

5. Drillhole Dimensions and Construction Method

Dia. (in.)	From (ft.)	To (ft.)
18	Surface	64
12	64	500

Upper Enlarged Drillhole		Lower Open Bedrock
No	Rotary - Mud Circulation	No
Yes	Rotary - Air	No
No	Rotary - Air & Foam	No
No	Drill-Through Casing Hammer	
No	Reverse Rotary	
Yes	Cable-tool Bit ____in. dia...	No
	Dual Rotary	
No	Temp. Outer Casing ____in. dia	

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
18	EXISTING CASING	Surface	56
12	EXISTING CASING	0	64
8	ASTM A53B PE ERWI 0.322" WALL	0	310
Dia. (in.)	Screen type, material & slot size	From (ft.)	To (ft.)

7. Grout or Other Sealing Material
Method

Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
NEAT CEMENT (EXISTING)	Surface	64	
neat cement	0	310	320 S

9. Static Water Level
117 ft. below ground surface

10. Pump Test
Pumping level 132 ft. below surface
Pumping at 388 GP M for 24 Hrs.
Pumping Method ?

11. Well Is
18 in. above grade
Developed ? Yes
Disinfected ? Yes
Capped ? Yes

12. Notified Owner of need to fill & seal ?
Filled & Sealed Well(s) as needed? Yes

13. Constructor / Supervisory Driller | Lic # | Date Signed
KLM | | 03-30-2006
Drill Rig Operator | Lic or Reg # | Date Signed

4a. Potential Contamination Sources Is the well located in floodplain ? No

Comment:

Water Quality Text:

Water Quantity Text:

Difficulty Text:

Created On: 07-25-2006 Created by: WELL CONST LOAD Updated On: 04-19-2013 Updated by: PWS TRANSFER

Well Construction Report
WISCONSIN UNIQUE WELL NUMBER **HR251**

Drinking Water and Groundwater - DG/5
Department of Natural Resources, Box 7921
Madison WI 53707
Form 3300-077A

Property Owner: GREENVILLE SAN DISTRICT
Phone #: (414)585-7608
Mailing Address: PO BOX 60
City: GREENVILLE
State: WI
Zip Code: 54942

County	Co. Permit #	Notification #	Completed
Outagamie			04-17-1995

1. Well Location
Town of GREENVILLE
Fire # (if avail.)

Subdivision Name	Lot #	Block #
WELL NO 3		

Well Constructor (Business Name): MUNICIPAL WELL & PUMP INC
Lic. #: 13
Facility ID # (Public Wells): 445027880
Method Code: GPS008

Address: 20950 ENTERPRISE AVE
BROOKFIELD WI 53045-5224

Well Plan Approval #: 94-1834
Approval Date (mm-dd-yyyy): 01-23-1995

or Govt Lot #	Section	Township	Range
	35	22 N	16 E

2. Well Type New Well
of previous unique well # constructed in
Reason for replaced or reconstructed well ?

Hicap Permanent Well #	Common Well #	Specific Capacity
2884	3	20.6

3. Well serves # of MUNICIPAL WELL #3
Municipal/Community
Heat Exchange____# of drillholes

Hicap Well ? Yes
Hicap Property ? Yes
Hicap Potable ?

Construction Type Drilled

4. Potential Contamination Sources - ON REVERSE SIDE

5. Drillhole Dimensions and Construction Method

Dia. (in.)	From (ft.)	To (ft.)
22	Surface	37
19.25	37	120
15	120	600

Upper Enlarged Drillhole / Lower Open Bedrock

Yes — Rotary - Mud Circulation .....
Rotary - Air .....
Rotary - Air & Foam .....
Drill-Through Casing Hammer
Reverse Rotary
Cable-tool Bit ____in. dia...
Dual Rotary .....
Temp. Outer Casing ____in. dia
Removed? ____depth ft. (If NO explain on back side)

Geology Codes	**8. Geology** Type, Caving/Noncaving, Color, Hardness, etc...	From (ft.)	To (ft.)
D	DRIFT	Surface	35
L	LIMESTONE	35	255
N	SANDSTONE	255	600

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
22	ASTM A53 GR. B STEEL, P.E. CASING	Surface	37
16	ASTM A53 GR. B STEEL, P.E. 0.375" WALL	3	120
Dia. (in.)	Screen type, material & slot size	From (ft.)	To (ft.)

9. Static Water Level
119 ft. below ground surface

10. Pump Test
Pumping level 153 ft. below surface
Pumping at 700 GP M for 24 Hrs.
Pumping Method ?

11. Well Is
36 in. above grade
Developed ? Yes
Disinfected ? Yes
Capped ? Yes

7. Grout or Other Sealing Material
Method TREMIE, PRESS.

Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
NEAT CEMENT	Surface	120	100 S

12. Notified Owner of need to fill & seal ?
Filled & Sealed Well(s) as needed? Yes

13. Constructor / Supervisory Driller	Lic #	Date Signed
TRG		04-25-1995
Drill Rig Operator	Lic or Reg #	Date Signed
MH		04-25-1995

4a. Potential Contamination Sources Is the well located in floodplain ? No

Comment:

Water Quality Text:

Water Quantity Text:

Difficulty Text:

Created On: 03-06-2001 Created by: WELL CONST LOAD Updated On: 11-07-2013 Updated by: GIFFOJ

Well Construction Report
WISCONSIN UNIQUE WELL NUMBER **SA852**

Drinking Water and Groundwater - DG/5
Department of Natural Resources, Box 7921
Madison WI 53707
Form 3300-077A

Property Owner: TOWN OF GREENVILLE	Phone #: (920)210-2891
Mailing Address: MAYFLOWER DR	
City: GREENVILLE	State: WI Zip Code: 54942
County: Outagamie	Co. Permit #:
Notification #:	Completed: 07-09-2003

1. Well Location — Fire # (if avail.)

Town of GREENVILLE

Subdivision Name | Lot # | Block #

Well Constructor (Business Name): SAMS ROTARY DRILLERS INC	Lic. #: 370
Facility ID # (Public Wells): 445027880	
Address: PO BOX 150 RANDOLPH WI 53956-0150	
Well Plan Approval #: 2003-0152	
Approval Date (mm-dd-yyyy): 02-26-2003	
Hicap Permanent Well #: 4353	Common Well #: 004
Specific Capacity: 10.6	

Method Code: GPS008

or Govt Lot #	Section	Township	Range
	13	21 N	16 E

2. Well Type New Well

of previous unique well # constructed in

Reason for replaced or reconstructed well ?

Construction Type: Drilled

3. Well serves # of Municipality

Municipal/Community

Heat Exchange____# of drillholes

Hicap Well ? Yes

Hicap Property ? Yes

Hicap Potable ?

4. Potential Contamination Sources - ON REVERSE SIDE

5. Drillhole Dimensions and Construction Method

Dia. (in.)	From (ft.)	To (ft.)
30	Surface	18
26	18	312
19	312	500
15	500	700

Upper Enlarged Drillhole		Lower Open Bedrock
Yes	Rotary - Mud Circulation	Yes
No	Rotary - Air	No
No	Rotary - Air & Foam	No
No	Drill-Through Casing Hammer	
Yes	Reverse Rotary	
No	Cable-tool Bit ____in. dia...	No
	Dual Rotary	
Yes	Temp. Outer Casing 30in. dia	
No	Removed? 18depth ft. (If NO explain on back side)	

Geology Codes				8. Geology Type, Caving/Noncaving, Color, Hardness, etc...	From (ft.)	To (ft.)
-	-	Z	-	Clay & Gravel	Surface	16
E	H	L	-	Green, Hard/Firm, Limestone/Dolomite	16	65
T	-	L	-	Tan/Brown, Limestone/Dolomite	65	80
T	-	L	H	Tan/Brown, Limestone/Dolomite, Shaley	80	110
-	-	L	S	Limestone/Dolomite, Sandy	110	127
T	-	N	H	Tan/Brown, Sandstone, Shaley	127	138
T	-	N	H	Tan/Brown, Sandstone, Shaley	138	156
I	-	N	-	White, Sandstone	156	180
T	S	N		TAN/BROWN, SOFT/LOOSE, SANDSTONE	180	210
T		N		TAN/BROWN, SANDSTONE	210	240
T		N	H	TAN/BROWN, SANDSTONE, SHALEY	240	251
E		L	H	GREEN, LIMESTONE/DOLOMITE, SHALEY	251	268
		N	H	SANDSTONE, SHALEY	268	290
T		N		TAN/BROWN, SANDSTONE	290	320
R		N		RED, SANDSTONE	320	350
I		N		WHITE, SANDSTONE	350	365
G		N		GRAY, SANDSTONE	365	380
T	S	N		TAN/BROWN, SOFT/LOOSE, SANDSTONE	380	400
I	M	N		WHITE, MEDIUM, SANDSTONE	400	520
P		N		PINK, SANDSTONE	520	700

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
20	STD BLK PIPE, 0.375 WALL WLD JNTS A53 BUBE STEEL	Surface	312
Dia. (in.)	Screen type, material & slot size	From (ft.)	To (ft.)

9. Static Water Level
117 ft. below ground surface

10. Pump Test
Pumping level 211 ft. below surface
Pumping at 1000 GP M for 24 Hrs.
Pumping Method ?

11. Well Is
26 in. above grade
Developed ? Yes
Disinfected ? Yes
Capped ? Yes

7. Grout or Other Sealing Material

Method Bradenhead

Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
Neat cement grout	Surface	312	570 S

12. Notified Owner of need to fill & seal ?

Filled & Sealed Well(s) as needed?

4a. Potential Contamination Sources Is the well located in floodplain ? No

Comment: DRILLED UPPER DRILLHOLE W/MUD. DRILLED LOWER DRILLHOLE W/WATER AND AIR LIFT ARRANGEMENTS.

Water Quality Text:

Water Quantity Text:

Difficulty Text:

13. Constructor / Supervisory Driller	Lic #	Date Signed
JVG		08-26-2003
Drill Rig Operator	Lic or Reg #	Date Signed
JE		08-26-2003

Created On: 04-22-2004 Created by: WELL CONST LOAD Updated On: 04-19-2013 Updated by: PWS TRANSFER

Well Construction Report
WISCONSIN UNIQUE WELL NUMBER **YV153**

Drinking Water and Groundwater - DG/5 Form 3300-077A
Department of Natural Resources, Box 7921
Madison WI 53707

Property Owner: GREENVILLE, TOWN OF	Phone #: (920)757-5151
Mailing Address: W6860 PARKVIEW DRIVE	
City: GREENVILEE	State: WI Zip Code: 54942
County: Outagamie	Co. Permit #:
Notification #:	Completed: 05-10-2018
Well Constructor (Business Name): MUNICIPAL WELL & PUMP/MIDWEST WELL	Lic. #: 13
Facility ID # (Public Wells): 445027880	
Address: 1212 STORBECK DR WAUPUN WI 53963	
Well Plan Approval #: 20170906	
Approval Date (mm-dd-yyyy): 03-09-2018	
Hicap Permanent Well #: 92288	Common Well #: TW5
Specific Capacity: 15.6	

1. Well Location

Town of GREENVILLE

Fire # (if avail.):

Subdivision Name | Lot # | Block #

Method Code: GPS008

or Govt Lot #	Section	Township	Range
	22	21 N	16 E

2. Well Type New Well

of previous unique well # constructed in

Reason for replaced or reconstructed well ?

Construction Type: Drilled

3. Well serves # of TEST WELL

Municipal/Community Test Well

Heat Exchange____# of drillholes

Hicap Well ? Yes
Hicap Property ? Yes
Hicap Potable ? Yes

4. Potential Contamination Sources - ON REVERSE SIDE

5. Drillhole Dimensions and Construction Method

Dia. (in.)	From (ft.)	To (ft.)
12	Surface	320
8	320	551

Upper Enlarged Drillhole		Lower Open Bedrock
Yes	Rotary - Mud Circulation	No
No	Rotary - Air	No
No	Rotary - Air & Foam	No
No	Drill-Through Casing Hammer	
Yes	Reverse Rotary	
No	Cable-tool Bit ____in. dia...	No
Yes	Dual Rotary	No
Yes	Temp. Outer Casing 12in. dia	
Yes	Removed? 33depth ft. (If NO explain on back side)	

Geology Codes				**8. Geology** Type, Caving/Noncaving, Color, Hardness, etc...	From (ft.)	To (ft.)
R		C		R-RED C-CLAY	Surface	10
R		C	G	R-RED C-CLAY G-W/GRAVEL/COBBLES/BOULDERS/STONES	10	15
	B	G	S	B-BROKEN G-GRAVEL/COBBLES/BOULDERS/STONES S-SANDY	15	30
T	H	L	K	T-TAN/BROWN H-HARD/FIRM L-LIMESTONE/DOLOMITE K-W/BROKEN ROCK	30	60
G		N	H	G-GRAY N-SANDSTONE H-SHALEY	60	105
E		H		E-GREEN H-SHALE	105	115
R		H	S	R-RED H-SHALE S-SANDY	115	120
T	H	N	H	T-TAN/BROWN H-HARD/FIRM N-SANDSTONE H-SHALEY	120	135
R	H	L	H	R-RED H-HARD/FIRM L-LIMESTONE/DOLOMITE H-SHALEY	135	145
R	H	N	H	R-RED H-HARD/FIRM N-SANDSTONE H-SHALEY	145	175
R		H		R-RED H-SHALE	175	200
G	B	N	H	G-GRAY B-BROKEN N-SANDSTONE H-SHALEY	200	235
G	E	N		G-GRAY E-CLEAN N-SANDSTONE	235	275
G		H	K	G-GRAY H-SHALE K-W/BROKEN ROCK	275	305
T		N	K	T-TAN/BROWN N-SANDSTONE K-W/BROKEN ROCK	305	320
T		N		T-TAN/BROWN N-SANDSTONE	320	365
T		N	H	T-TAN/BROWN N-SANDSTONE H-SHALEY	365	395

Geology Codes			8. Geology Type, Caving/Noncaving, Color, Hardness, etc...	From (ft.)	To (ft.)
T		X	T-TAN/BROWN X-SAND & CLAY	395	540
R	H	N	R-RED H-HARD/FIRM N-SANDSTONE	540	551

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
8	STEEL, 28.55 PLF, A53B, IPSCO, WELDED	Surface	320
Dia. (in.)	Screen type, material & slot size	From (ft.)	To (ft.)

9. Static Water Level

111 ft. below ground surface

10. Pump Test

Pumping level 144 ft. below surface

Pumping at 515 GP M for 24 Hrs.

Pumping Method ? Test Pump

11. Well Is

24 in. above grade

Developed ? Yes

Disinfected ? Yes

Capped ? Yes

7. Grout or Other Sealing Material

Method GROUT (FLOAT) SHOE

Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
NEAT CEMENT GROUT	Surface	320	115 S

12. Notified Owner of need to fill & seal ? No

Filled & Sealed Well(s) as needed? No

13. Constructor / Supervisory Driller	Lic #	Date Signed
TG	4135	05-18-2018
Drill Rig Operator	Lic or Reg #	Date Signed
MR	7819	05-18-2018

4a. Potential Contamination Sources Is the well located in floodplain ? No

Comment:

Water Quality Text:

Water Quantity Text:

Difficulty Text:

Created On: 05-30-2018 Created by: MWPUMP Updated On: 08-17-2018 Updated by: FILBEJ

Appendix C: 2020 Public Service Commission Report

This appendix contains the *Water Section* (excerpt) from the *2020 Public Service Commission Report*.

Class C

WATER, ELECTRIC, OR JOINT UTILITY ANNUAL REPORT

OF

GREENVILLE SANITARY DISTRICT

PO BOX 139
GREENVILLE, WI 54942

For the Year Ended: DECEMBER 31, 2020

TO

PUBLIC SERVICE COMMISSION OF WISCONSIN

P.O. Box 7854
Madison, WI 53707-7854
(608) 266-3766

This form is required under Wis. Stat. Ä 196.07. Failure to file the form by the statutory filing date can result in the imposition of a penalty under Wis. Stat. Ä 196.66. The penalty which can be imposed by this section of the statutes is a forfeiture of not less than $25 nor more than $5,000 for each violation. Each day subsequent to the filing date constitutes a separate and distinct violation. The filed form is available to the public and personally identifiable information may be used for purposes other than those related to public utility regulation.

Filed: 04/09/2021

Water Service Started Date: 01/28/1986

DNR Public Water System ID: 44502788

Safe Drinking Water Information System (SDWIS) Total Population Served: 7955

I ***Lisa Beyer***, ***Treasurer*** of ***GREENVILLE SANITARY DISTRICT***, certify that I am the person responsible for accounts; that I have examined the following report and, to the best of my knowledge, information and belief, it is a correct statement of the business and affairs of said utility for the period covered by the report in respect to each and every matter set forth therein.

Date Signed: ***4/7/2021***

CLA (CliftonLarsonAllen LLP)
CLAconnect.com

Accountants' Compilation Report

The Town Board
Greenville Sanitary District #1
Greenville, Wisconsin

Management is responsible for the accompanying Wisconsin Public Service Commission Annual Report of the Greenville Sanitary District #1, Wisconsin, as of December 31, 2020, and for the year then ended, to be included in the accompanying form prescribed by the Wisconsin Public Service Commission. We have performed a compilation engagement in accordance with Statements on Standards for Accounting and Review Services promulgated by the Accounting and Review Services Committee of the American Institute of Certified Public Accountants. We did not audit or review the financial statements included in the accompanying prescribed form nor were we required to perform any procedures to verify the accuracy or completeness of the information provided by management. Accordingly, we do not express an opinion, a conclusion, nor provide any form of assurance on the Wisconsin Public Service Commission Annual Report.

The financial statements included in the accompanying prescribed form are intended to comply with the requirements of the Wisconsin Public Service Commission, and are not intended to be a presentation in accordance with accounting principles generally accepted in the United States of America.

CliftonLarsonAllen LLP

CliftonLarsonAllen LLP

Green Bay, Wisconsin
April 3, 2021

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WATER SECTION

Water Operating Revenues & Expenses

Description (a)	This Year (b)	Last Year (c)	
Operating Revenues - Sales of Water			1
Sales of Water (460-467)	1,206,115	1,168,610	2
Total Sales of Water	**1,206,115**	**1,168,610**	3
Other Operating Revenues			4
Forfeited Discounts (470)	5,035	5,462	5
Rents from Water Property (472)	71,891	75,537	6
Interdepartmental Rents (473)	0	0	7
Other Water Revenues (474)	28,437	27,579	8
Total Other Operating Revenues	**105,363**	**108,578**	9
Total Operating Revenues	**1,311,478**	**1,277,188**	10
Operation and Maintenenance Expenses			11
Source of Supply Expenses (600-605)	85,771	86,431	12
Pumping Expenses (620-625)	175,392	101,173	13
Water Treatment Expenses (630-635)	34,876	34,655	14
Transmission and Distribution Expenses (640-655)	645,488	228,047	15
Customer Accounts Expenses (901-906)	5,145	3,736	16
Sales Expenses (910)	0	0	17
Administrative and General Expenses (920-935)	465,274	381,553	18
Total Operation and Maintenenance Expenses	**1,411,946**	**835,595**	19
Other Operating Expenses			20
Depreciation Expense (403)	209,965	205,696	21
Amortization Expense (404-407)			22
Taxes (408)	29,778	26,426	23
Total Other Operating Expenses	**239,743**	**232,122**	24
Total Operating Expenses	**1,651,689**	**1,067,717**	25
NET OPERATING INCOME	**(340,211)**	**209,471**	26

Water Operating Revenues - Sales of Water

- Å Where customer meters record cubic feet, multiply by 7.48 to obtain number of gallons.
- Å Report estimated gallons for unmetered sales.
- Å Sales to multiple dwelling buildings through a single meter serving 3 or more family units should be classified multifamily residential.
- Å Account 460, Unmetered Sales to General Customers - Gallons of Water Sold should not include in any way quantity of water, i.e. metered or measured by tank of pool volume. The quantity should be estimated based on size of pipe, flow, foot of frontage, etc. Bulk water sales should be Account 460 if the quantity is estimated and should be Account 461 if metered or measured by volume. Water related to construction should be a measured sale of water (Account 461).
- Å Report average number of individually-metered accounts (meters). The amount reported should be the average meter count. E.g. if a hospital has 5 meters, a total of 5 meters should be reported on this schedule in column b (Average No. of Customers).
- Å Do not include meters or revenue billed under Schedule Am-1 (Additional Meter Rental Charge) in Account 461. Record revenues billed under Schedule Am-1 in Account 474.

Description (a)	Average No. Customer (b)	Thousand of Gallons of Water Sold (c)	Amount (d)	
Unmetered Sales to General Customers (460)				1
Residential (460.1)				2
Commercial (460.2)				3
Industrial (460.3)				4
Public Authority (460.4)				5
Multifamily Residential (460.5)				6
Irrigation (460.6)				7
Total Unmetered Sales to General Customers (460)	**0**	**0**	**0**	8
Metered Sales to General Customers (461)				9
Residential (461.1)	3,510	175,944	622,181	10
Commercial (461.2)	160	27,413	73,291	11
Industrial (461.3)	148	19,816	45,384	12
Public Authority (461.4)	40	5,536	13,812	13
Multifamily Residential (461.5)				14
Irrigation (461.6)				15
Total Metered Sales to General Customers (461)	**3,858**	**228,709**	**754,668**	16
Private Fire Protection Service (462)				17
Public Fire Protection Service (463)	3,883		451,447	18
Other Water Sales (465)				19
Sales for Resale (466)	0	0	0	20
Interdepartmental Sales (467)				21
Total Sales of Water	**7,741**	**228,709**	**1,206,115**	22

Sales for Resale (Acct. 466)

Use a separate line for each delivery point.

- - - THIS SCHEDULE NOT APPLICABLE TO THIS UTILITY- - -

Other Operating Revenues (Water)

- Report revenues relating to each account and fully describe each item using other than the account title.
- Report each item (when individually or when like items are combined) greater than $10,000 (class AB), $5,000 (class C) and $2,000 (class D and privates) and all other lesser amounts grouped as Miscellaneous.
- For a combined utility which also provides sewer service that is based upon water readings, report the return on net investment in meters charged to sewer department in Other Water Revenues (474).

Description (a)	Amount (b)	
Public Fire Protection Service (463)		1
Amount billed (usually per rate schedule F-1 or Fd-1)	451,447	2
Wholesale fire protection billed		3
Amount billed for fighting fires outside utility's service areas (usually per rate schedule F-2 or BW-1)		4
Total Public Fire Protection Service (463)	**451,447**	5
Forfeited Discounts (470)		6
Customer late payment charges	5,035	7
Total Forfeited Discounts (470)	**5,035**	8
Rents from Water Property (472)		9
Rent of tower for cellular antennas	71,891	10
Total Rents from Water Property (472)	**71,891**	11
Interdepartmental Rents (473)		12
None		13
Total Interdepartmental Rents (473)	**0**	14
Other Water Revenues (474)		15
Return on net investment in meters charged to sewer department	21,951	16
Permit Fees	6,486	17
Total Other Water Revenues (474)	**28,437**	18

Other Operating Revenues (Water)

- Å Report revenues relating to each account and fully describe each item using other than the account title.
- Å Report each item (when individually or when like items are combined) greater than $10,000 (class AB), $5,000 (class C) and $2,000 (class D and privates) and all other lesser amounts grouped as Miscellaneous.
- Å For a combined utility which also provides sewer service that is based upon water readings, report the return on net investment in meters charged to sewer department in Other Water Revenues (474).

Other Operating Revenues (Water) (Page W-04)

Explain all amounts in Account 474 in excess of $5,000.

done

Water Operation & Maintenance Expenses

- Å Each expense account that has a difference between This Year and Last Year greater than 15 percent and $10,000 (class AB), 15 percent and $5,000 (class C), 15 percent and $1,000 (class D) shall be fully explained. Please include breakdown of costs that contributed to the difference. Please reference the help document for more information.
- Å Class C and class D report all expenses in Other Expense (column c)

Description (a)	Labor Expense (b)	Other Expense (c)	Total This Year (d)	Last Year (e)	
SOURCE OF SUPPLY EXPENSES					1
Operation Labor (600)		65,161	65,161	56,822	2
Purchased Water (601)			0	0	3
Operation Supplies and Expenses (602)		19,747	19,747	11,525	4
Maintenance of Water Source Plant (605)		863	863	18,084	5
Total Source of Supply Expenses	**0**	**85,771**	**85,771**	**86,431**	6
PUMPING EXPENSES					7
Operation Labor (620)			0	0	8
Fuel for Power Production (621)			0	0	9
Fuel or Power Purchased for Pumping (622)		117,855	117,855	101,173	10
Operation Supplies and Expenses (623)			0	0	11
Maintenance of Pumping Plant (625)		57,537	57,537	0	12
Total Pumping Expenses	**0**	**175,392**	**175,392**	**101,173**	13
WATER TREATMENT EXPENSES					14
Operation Labor (630)			0	0	15
Chemicals (631)		34,876	34,876	34,655	16
Operation Supplies and Expenses (632)			0	0	17
Maintenance of Water Treatment Plant (635)			0	0	18
Total Water Treatment Expenses	**0**	**34,876**	**34,876**	**34,655**	19
TRANSMISSION AND DISTRIBUTION EXPENSES					20
Operation Labor (640)		53,055	53,055	34,704	21
Operation Supplies and Expenses (641)		22,863	22,863	24,118	22
Maintenance of Distribution Reservoirs and Standpipes (650)		5,645	5,645	1,082	23
Maintenance of Mains (651)		444,849	444,849	23,927	24
Maintenance of Services (652)		60,008	60,008	84,240	25
Maintenance of Meters (653)		15,367	15,367	5,929	26
Maintenance of Hydrants (654)		28,233	28,233	45,965	27
Maintenance of Other Plant (655)		15,468	15,468	8,082	28
Total Transmission and Distribution Expenses	**0**	**645,488**	**645,488**	**228,047**	29
CUSTOMER ACCOUNTS EXPENSES					30
Meter Reading Labor (901)		5,145	5,145	3,736	31
Accounting and Collecting Labor (902)			0	0	32
Supplies and Expenses (903)			0	0	33
Uncollectible Accounts (904)			0	0	34
Customer Service and Informational Expenses (906)			0	0	35
Total Customer Accounts Expenses	**0**	**5,145**	**5,145**	**3,736**	36
SALES EXPENSES					37
Sales Expenses (910)			0	0	38
Total Sales Expenses	**0**	**0**	**0**	**0**	39
ADMINISTRATIVE AND GENERAL EXPENSES					40

Water Operation & Maintenance Expenses

- Å Each expense account that has a difference between This Year and Last Year greater than 15 percent and $10,000 (class AB), 15 percent and $5,000 (class C), 15 percent and $1,000 (class D) shall be fully explained. Please include breakdown of costs that contributed to the difference. Please reference the help document for more information.
- Å Class C and class D report all expenses in Other Expense (column c)

Description (a)	Labor Expense (b)	Other Expense (c)	Total This Year (d)	Last Year (e)	
Administrative and General Salaries (920)		223,818	223,818	201,961	41
Office Supplies and Expenses (921)		47,066	47,066	43,346	42
Administrative Expenses Transferred--Credit (922)			0	0	43
Outside Services Employed (923)		35,409	35,409	11,308	44
Property Insurance (924)		19,812	19,812	22,689	45
Injuries and Damages (925)			0	0	46
Employee Pensions and Benefits (926)		117,154	117,154	85,872	47
Regulatory Commission Expenses (928)			0	0	48
Miscellaneous General Expenses (930)		1,305	1,305	295	49
Transportation Expenses (933)		20,710	20,710	16,082	50
Maintenance of General Plant (935)			0	0	51
Total Administrative and General Expenses	**0**	**465,274**	**465,274**	**381,553**	52
TOTAL OPERATION AND MAINTENANCE EXPENSES	**0**	**1,411,946**	**1,411,946**	**835,595**	53

Water Operation & Maintenance Expenses

- Å Each expense account that has a difference between This Year and Last Year greater than 15 percent and $10,000 (class AB), 15 percent and $5,000 (class C), 15 percent and $1,000 (class D) shall be fully explained. Please include breakdown of costs that contributed to the difference. Please reference the help document for more information.
- Å Class C and class D report all expenses in Other Expense (column c)

Water Operation & Maintenance Expenses (Page W-05)

Explain all This Year amounts that are more than 15% and $5,000 higher or lower than the Last Year amount.

#602, #605 -water superintendent is fairly new and is coding bills more accurately - meets budget expectations

#625 - Well #3 - the District had issues with well #3- Per discussion with engineer, most of the work was maintenance to determine why the pump was not working efficiently, so they did a lot of cleaning and tried to refurbish the old pump, but none of that worked, so they had to buy a new pump- the cost of the new pump and installation was recorded as capital

#640- 2020 is the first full year of having an additional employee, also depends on time allocations of what employee's are working on

#651 - water main relocation costs - no new mains

#652 - five services that were leaking and replaced in 2019. Not as much work required in 2020

#653- More work for meters replaced in 2020 compared to 2019; meets budget expectations

#654 - refer to 2019 PSC report; more hydrant repairs in 2019 than typical

#655 - more time coded to other maintenance work; payroll is allocated based upon employee timesheets and time can vary

#923- 2020 had additional costs for water studies

#926 - Increase related to water clerk joining insurance in 2020 and first full year of additional water employee

Taxes (Acct. 408 - Water)

When allocation of taxes is made between departments, explain method used.

Description of Tax (a)	This Year (b)	Last Year (c)	
Property Tax Equivalent			1
Less: Local and School Tax Equivalent on Meters Charged to Sewer Department			2
Net Property Tax Equivalent	**0**	**0**	3
Social Security	27,808	23,890	4
PSC Remainder Assessment	1,970	2,536	5
Total Tax Expense	**29,778**	**26,426**	6

Taxes (Acct. 408 - Water)

When allocation of taxes is made between departments, explain method used.

Taxes (Acct. 408 - Water) (Page W-06)

If Tax Equivalent on Meters Charged to Sewer Department is $0, an explanation must be provided for why this expense was not allocated to the sewer department.

The District does not pay a tax equivalent, so no charge to the sewer department

Water Utility Plant in Service - Plant Financed by Utility or Municipality

- All adjustments, corrections and reclassifications (including to/from plant financed by contributions) should be reported in Column (e), Adjustments.
- Explain fully as a footnote the nature of all entries reported in Column (e), Adjustments.
- For each account over $50,000 (class AB) or $25,000 (class C) or $10,000 (class D), explain in the footnotes section the dollar additions and retirements. If applicable, the footnotes should cite construction authorization, complete with PSC docket number.
- Use only the account titles listed. If the utility has subaccounts other than accounts 391.1 and 397.1, combine them into one total and detail by subaccount as a schedule footnote.
- The treatment plant accounts have changed since 2008 and that they should confirm the dollar amounts are in the right account.
- PSC Uniform System of Accounts

Accounts (a)	Balance First of Year (b)	Additions During Year (c)	Retirements During Year (d)	Adjustments Increase or (Decrease) (e)	Balance End of Year (f)	
INTANGIBLE PLANT						1
Organization (301)	0				**0**	2
Franchises and Consents (302)	0				**0**	3
Miscellaneous Intangible Plant (303)	0				**0**	4
Total Intangible Plant	**0**	**0**	**0**	**0**	**0**	5
SOURCE OF SUPPLY PLANT						6
Land and Land Rights (310)	56,842				**56,842**	7
Structures and Improvements (311)	0				**0**	8
Collecting and Impounding Reservoirs (312)	0				**0**	9
Lake, River and Other Intakes (313)	0				**0**	10
Wells and Springs (314)	409,707				**409,707**	11
Supply Mains (316)	0				**0**	12
Other Water Source Plant (317)	0				**0**	13
Total Source of Supply Plant	**466,549**	**0**	**0**	**0**	**466,549**	14
PUMPING PLANT						15
Land and Land Rights (320)	0				**0**	16
Structures and Improvements (321)	796,377				**796,377**	17
Other Power Production Equipment (323)	0				**0**	18
Electric Pumping Equipment (325)	163,344	10,521	6,500		**167,365**	19
Diesel Pumping Equipment (326)	0				**0**	20
Other Pumping Equipment (328)	0				**0**	21
Total Pumping Plant	**959,721**	**10,521**	**6,500**	**0**	**963,742**	22
WATER TREATMENT PLANT						23
Land and Land Rights (330)	0				**0**	24
Structures and Improvements (331)	609,795				**609,795**	25
Sand or Other Media Filtration Equipment (332)	1,366,850				**1,366,850**	26
Membrane Filtration Equipment (333)	0				**0**	27
Other Water Treatment Equipment (334)	0				**0**	28
Total Water Treatment Plant	**1,976,645**	**0**	**0**	**0**	**1,976,645**	29
TRANSMISSION AND DISTRIBUTION PLANT						30
Land and Land Rights (340)	0				**0**	31
Structures and Improvements (341)	0				**0**	32
Distribution Reservoirs and Standpipes (342)	555,028				**555,028**	33
Transmission and Distribution Mains (343)	770,224	48,000	28,000		**790,224**	34
Services (345)	453,142				**453,142**	35
Meters (346)	834,093	45,586	4,200		**875,479**	36

Water Utility Plant in Service - Plant Financed by Utility or Municipality

- All adjustments, corrections and reclassifications (including to/from plant financed by contributions) should be reported in Column (e), Adjustments.
- Explain fully as a footnote the nature of all entries reported in Column (e), Adjustments.
- For each account over $50,000 (class AB) or $25,000 (class C) or $10,000 (class D), explain in the footnotes section the dollar additions and retirements. If applicable, the footnotes should cite construction authorization, complete with PSC docket number.
- Use only the account titles listed. If the utility has subaccounts other than accounts 391.1 and 397.1, combine them into one total and detail by subaccount as a schedule footnote.
- The treatment plant accounts have changed since 2008 and that they should confirm the dollar amounts are in the right account.
- PSC Uniform System of Accounts

Accounts (a)	Balance First of Year (b)	Additions During Year (c)	Retirements During Year (d)	Adjustments Increase or (Decrease) (e)	Balance End of Year (f)	
Hydrants (348)	348,461				**348,461**	37
Other Transmission and Distribution Plant (349)	0				**0**	38
Total Transmission and Distribution Plant	**2,960,948**	**93,586**	**32,200**	**0**	**3,022,334**	39
GENERAL PLANT						40
Land and Land Rights (389)	0				**0**	41
Structures and Improvements (390)	14,831				**14,831**	42
Office Furniture and Equipment (391)	0				**0**	43
Computer Equipment (391.1)	21,055				**21,055**	44
Transportation Equipment (392)	149,478	14,789			**164,267**	45
Stores Equipment (393)	0				**0**	46
Tools, Shop and Garage Equipment (394)	0				**0**	47
Laboratory Equipment (395)	0				**0**	48
Power Operated Equipment (396)	0				**0**	49
Communication Equipment (397)	0				**0**	50
SCADA Equipment (397.1)	0				**0**	51
Miscellaneous Equipment (398)	151,506				**151,506**	52
Total General Plant	**336,870**	**14,789**	**0**	**0**	**351,659**	53
Total utility plant in service directly assignable	**6,700,733**	**118,896**	**38,700**	**0**	**6,780,929**	54
Common Utility Plant Allocated to Water Department	0				**0**	55
TOTAL UTILITY PLANT IN SERVICE	**6,700,733**	**118,896**	**38,700**	**0**	**6,780,929**	56

Water Utility Plant in Service - Plant Financed by Utility or Municipality

- All adjustments, corrections and reclassifications (including to/from plant financed by contributions) should be reported in Column (e), Adjustments.
- Explain fully as a footnote the nature of all entries reported in Column (e), Adjustments.
- For each account over $50,000 (class AB) or $25,000 (class C) or $10,000 (class D), explain in the footnotes section the dollar additions and retirements. If applicable, the footnotes should cite construction authorization, complete with PSC docket number.
- Use only the account titles listed. If the utility has subaccounts other than accounts 391.1 and 397.1, combine them into one total and detail by subaccount as a schedule footnote.
- The treatment plant accounts have changed since 2008 and that they should confirm the dollar amounts are in the right account.
- PSC Uniform System of Accounts

Water Utility Plant in Service - Plant Financed by Utility or Municipality (Page W-08)

Additions for one or more accounts exceed $25,000, please explain. If applicable, provide construction authorization and PSC docket number.

343- the utility replaced 6 valves during 2020- recorded additions based upon actual costs and retired 6 valves

Retirements for one or more accounts exceed $25,000, please explain.

343- the utility replaced 6 valves during 2020- recorded additions based upon actual costs and retired 6 valves

Retirements, Accounts 316 or 343, are greater than zero AND Retirements on the Water Mains schedule are zero, please explain.

the utility had no mains retired in 2020, but did retire 6 large valves, which were originally reported in 343, so the retirement was recorded in 343

Water Utility Plant in Service - Plant Financed by Contributions

- All adjustments, corrections and reclassifications (including to/from plant financed by contributions) should be reported in Column (e), Adjustments.
- Explain fully as a footnote the nature of all entries reported in Column (e), Adjustments.
- For each account over $50,000 (class AB) or $25,000 (class C) or $10,000 (class D), explain in the footnotes section the dollar additions and retirements. If applicable, the footnotes should cite construction authorization, complete with PSC docket number.
- Use only the account titles listed. If the utility has subaccounts other than accounts 391.1 and 397.1, combine them into one total and detail by subaccount as a schedule footnote.
- The treatment plant accounts have changed since 2008 and that they should confirm the dollar amounts are in the right account.
- PSC Uniform System of Accounts

Accounts (a)	Balance First of Year (b)	Additions During Year (c)	Retirements During Year (d)	Adjustments Increase or (Decrease) (e)	Balance End of Year (f)	
INTANGIBLE PLANT						1
Organization (301)	0				**0**	2
Franchises and Consents (302)	0				**0**	3
Miscellaneous Intangible Plant (303)	0				**0**	4
Total Intangible Plant	**0**	**0**	**0**	**0**	**0**	5
SOURCE OF SUPPLY PLANT						6
Land and Land Rights (310)	75,398	2,372			**77,770**	7
Structures and Improvements (311)	0	292,974			**292,974**	8
Collecting and Impounding Reservoirs (312)	0				**0**	9
Lake, River and Other Intakes (313)	0				**0**	10
Wells and Springs (314)	372,984	498,174			**871,158**	11
Supply Mains (316)	0	5,931			**5,931**	12
Other Water Source Plant (317)	0				**0**	13
Total Source of Supply Plant	**448,382**	**799,451**	**0**	**0**	**1,247,833**	14
PUMPING PLANT						15
Land and Land Rights (320)	0				**0**	16
Structures and Improvements (321)	383,330				**383,330**	17
Other Power Production Equipment (323)	0				**0**	18
Electric Pumping Equipment (325)	480,847	35,584			**516,431**	19
Diesel Pumping Equipment (326)	0				**0**	20
Other Pumping Equipment (328)	0				**0**	21
Total Pumping Plant	**864,177**	**35,584**	**0**	**0**	**899,761**	22
WATER TREATMENT PLANT						23
Land and Land Rights (330)	0	3,558			**3,558**	24
Structures and Improvements (331)	349,993	498,174			**848,167**	25
Sand or Other Media Filtration Equipment (332)	776,722	415,145			**1,191,867**	26
Membrane Filtration Equipment (333)	0				**0**	27
Other Water Treatment Equipment (334)	0	100,821			**100,821**	28
Total Water Treatment Plant	**1,126,715**	**1,017,698**	**0**	**0**	**2,144,413**	29
TRANSMISSION AND DISTRIBUTION PLANT						30
Land and Land Rights (340)	0	9,489			**9,489**	31
Structures and Improvements (341)	0				**0**	32
Distribution Reservoirs and Standpipes (342)	2,627,294				**2,627,294**	33
Transmission and Distribution Mains (343)	10,286,560	518,023			**10,804,583**	34
Services (345)	1,875,018	83,032			**1,958,050**	35
Meters (346)	7,660				**7,660**	36

Water Utility Plant in Service - Plant Financed by Contributions

- All adjustments, corrections and reclassifications (including to/from plant financed by contributions) should be reported in Column (e), Adjustments.
- Explain fully as a footnote the nature of all entries reported in Column (e), Adjustments.
- For each account over $50,000 (class AB) or $25,000 (class C) or $10,000 (class D), explain in the footnotes section the dollar additions and retirements. If applicable, the footnotes should cite construction authorization, complete with PSC docket number.
- Use only the account titles listed. If the utility has subaccounts other than accounts 391.1 and 397.1, combine them into one total and detail by subaccount as a schedule footnote.
- The treatment plant accounts have changed since 2008 and that they should confirm the dollar amounts are in the right account.
- PSC Uniform System of Accounts

Accounts (a)	Balance First of Year (b)	Additions During Year (c)	Retirements During Year (d)	Adjustments Increase or (Decrease) (e)	Balance End of Year (f)	
Hydrants (348)	1,434,838	93,838			**1,528,676**	37
Other Transmission and Distribution Plant (349)	0				**0**	38
Total Transmission and Distribution Plant	**16,231,370**	**704,382**	**0**	**0**	**16,935,752**	39
GENERAL PLANT						40
Land and Land Rights (389)	0				**0**	41
Structures and Improvements (390)	77,981				**77,981**	42
Office Furniture and Equipment (391)	0				**0**	43
Computer Equipment (391.1)	0				**0**	44
Transportation Equipment (392)	15,507				**15,507**	45
Stores Equipment (393)	0				**0**	46
Tools, Shop and Garage Equipment (394)	0				**0**	47
Laboratory Equipment (395)	0				**0**	48
Power Operated Equipment (396)	0				**0**	49
Communication Equipment (397)	0				**0**	50
SCADA Equipment (397.1)	0				**0**	51
Miscellaneous Equipment (398)	37,953				**37,953**	52
Total General Plant	**131,441**	**0**	**0**	**0**	**131,441**	53
Total utility plant in service directly assignable	**18,802,085**	**2,557,115**	**0**	**0**	**21,359,200**	54
Common Utility Plant Allocated to Water Department	0				**0**	55
TOTAL UTILITY PLANT IN SERVICE	**18,802,085**	**2,557,115**	**0**	**0**	**21,359,200**	56

Water Utility Plant in Service - Plant Financed by Contributions

- All adjustments, corrections and reclassifications (including to/from plant financed by contributions) should be reported in Column (e), Adjustments.
- Explain fully as a footnote the nature of all entries reported in Column (e), Adjustments.
- For each account over $50,000 (class AB) or $25,000 (class C) or $10,000 (class D), explain in the footnotes section the dollar additions and retirements. If applicable, the footnotes should cite construction authorization, complete with PSC docket number.
- Use only the account titles listed. If the utility has subaccounts other than accounts 391.1 and 397.1, combine them into one total and detail by subaccount as a schedule footnote.
- The treatment plant accounts have changed since 2008 and that they should confirm the dollar amounts are in the right account.
- PSC Uniform System of Accounts

Water Utility Plant in Service - Plant Financed by Contributions (Page W-09)

Additions for one or more accounts exceed $25,000, please explain. If applicable, provide construction authorization and PSC docket number.

310,311,314,316,325,330,331,332.1,332,2,340,343,345,348 - The utility completed a new well #5 project - project was funded with impact fees

the utility had two developer funded subdivision projects completed in 2020- additions were recorded in mains, services and hydrants

Age of Water Mains

- If asset management, capital improvement, or other infrastructure-related documents are not available, the utility should consult other potential sources of information: the year the utility was formed, year of initial build-out area, year in which new developments, subdivisions, etc. were added. This information can be used to develop estimated figures.
- If pipe diameter value is between those offered in the column, choose the diameter that is closest to the actual value.
- Report all pipe larger than 72òin diameter in the 72òcategory.

		Feet of Main										
	Pipe Size (a)	pre-1900 (b)	1901-1920 (c)	1920-1940 (d)	1941-1960 (e)	1961-1970 (f)	1971-1980 (g)	1981-1990 (h)	1991-2000 (i)	2001-2010 (j)	2011-2020 (k)	Total (l)	
1	6.000								15,271	2,772	510	**18,553**	1
2	8.000							3,940	87,038	98,252	34,675	**223,905**	2
3	10.000							25,436	70,808	24,694	7,606	**128,544**	3
4	12.000								2,831	7,234	5,026	**15,091**	4
5	14.000								22,136	70		**22,206**	5
6	**Total**	**0**	**0**	**0**	**0**	**0**	**0**	**29,376**	**198,084**	**133,022**	**47,817**	**408,299**	6

Describe source of information used to develop data:
two subdivisions added

Sources of Water Supply - Statistics

- Å For Raw Water Withdrawn, use metered volume of untreated water withdrawn from the source.
- Å For Finished Water Pumped, use metered volume of water pumped, adjusted for known meter errors. Describe known meter errors in Notes Section.
- Å If Finished Water is not metered, use Raw Water Withdrawn and subtract estimated water used in treatment.

	Sources of Water Supply (000's gal)						Total Gallons	
	Raw Water Withdrawn		Finished Water Pumped		Purchased Water (Imported)		Entering Distribution	
Month (a)	Ground Water (b)	Surface Water (c)	Ground Water (d)	Surface Water (e)	Ground Water (f)	Surface Water (g)	System (h)	
January	22,337	0	21,681	0	0	0	**21,681**	1
February	20,823	0	20,229	0	0	0	**20,229**	2
March	23,285	0	22,526	0	0	0	**22,526**	3
April	21,925	0	21,264	0	0	0	**21,264**	4
May	26,109	0	25,423	0	0	0	**25,423**	5
June	28,038	0	27,372	0	0	0	**27,372**	6
July	55,700	0	55,073	0	0	0	**55,073**	7
August	32,839	0	31,996	0	0	0	**31,996**	8
September	26,654	0	25,996	0	0	0	**25,996**	9
October	25,623	0	24,874	0	0	0	**24,874**	10
November	24,422	0	23,789	0	0	0	**23,789**	11
December	26,852	0	26,155	0	0	0	**26,155**	12
TOTAL	**334,607**	**0**	**326,378**	**0**	**0**	**0**	**326,378**	13

Water Audit and Other Statistics

- Where possible, report actual metered values. If water uses are not metered, estimate values for each line based on best available information. For assistance, refer to AWWA M36 Manual ï Water Audits and Loss Control Programs.
- For unbilled, unmetered gallons (line 16), include water used for system operation and maintenance and water used for non-regulated sewer utility.
- If gallons estimated due to theft, data, and billing errors is unknown, multiply net gallons entering distribution system (line 3) by .0025.

Description (a)	Value (b)
WATER AUDIT STATISTICS	
Finished Water pumped or purchased (000s)	326,378
Less: Gallons (000s) sold to wholesale customers (exported water)	0
Subtotal: Net gallons (000s) entering distribution system	**326,378**
Less: Gallons (000s) sold to retail customers (billed, metered)	228709
Less: Gallons (000s) sold to retail customers (billed, unmetered)	0
Gallons (000s) of Non-Revenue Water	**97,669**
Gallons (000s) of unbilled-metered (including customer use to prevent freezing)	27,371
Gallons (000s) of unbilled-unmetered (including unmetered flushing, fire protection)	9,300
Subtotal: Unbilled Authorized Consumption	**36,671**
Total Water Loss	**60,998**
Gallons (000s) estimated due to unauthorized consumption (includes theft) default option	0
Gallons (000s) estimated due to data and billing errors	0
Gallons (000s) estimated due to customer meter under-registration	0
Subtotal Apparent Losses	**0**
Gallons (000s) estimated due to reported leakage (mains, services, hydrants, overflows)	0
Gallons (000s) estimated due to unreported and background leakage	60,998
Subtotal Real Losses (leakage)	**60,998**
Non-Revenue Water as percentage of net water supplied	30%
Total Water Loss as percentage of net water supplied	19%
OTHER STATISTICS	
Maximum gallons (000s) pumped by all methods in any one day during reporting year	1,378
Date of maximum	08/20/2020
Cause of maximum	
Lawn watering - new construction	
Minimum gallons (000s) pumped by all methods in any one day during reporting year	528
Date of minimum	02/22/2020
Total KWH used by the utility (including pumping, treatment facilities and other utility operations)	810,758
If water is purchased:	
Vendor Name	
Point of Delivery	
Source of purchased water	
Vendor Name (2)	
Point of Delivery (2)	
Source of purchased water (2)	
Vendor Name (3)	
Point of Delivery (3)	
Source of purchased water (3)	
Number of main breaks repaired this year	0
Number of service breaks repaired this year	6

Sources of Water Supply - Well Information

- Enter characteristics for each of the utilityôs functional wells (regardless of whether it is ñin serviceò or not).
- Do not include abandoned wells on this schedule.
- All abandoned wells should be retired from the plant accounts and no longer listed in the utilityôs annual report.
- Abandoned wells should be permanently filled and sealed per Wisconsin Administrative codes Chapters NR811 and NR812.

	Utility Name/ID for Well (a)	DNR Well ID (b)	Depth (feet) (c)	Casing Diameter (inches) (d)	Yield Per Day (gallons) (e)	In Service? (f)	
1	N1094 Manley Road	WL581	460	8	57,600	Yes	1
2	N671 CTH CB	Vl 966	500	8	288,000	Yes	2
3	W6108 Neubert Road	SA 852	700	16	1,440,000	Yes	3
4	W6852 CTH JJ	HR 251	600	12	1,100,000	Yes	4
5	W7124 STH 96	YV153	540	15	1,440,000	Yes	5
6					**4,325,600**		6

Sources of Water Supply - Intake Information

- - - THIS SCHEDULE NOT APPLICABLE TO THIS UTILITY- - -

Pumping & Power Equipment

	Pump						Pump Motor or Standby Engine			
Identification (a)	Location (b)	Primary Purpose (c)	Primary Destination (d)	Year Installed (e)	Type (f)	Actual Capacity (gpm) (g)	Year Installed (j)	Type (k)	Horse-power (l)	
#2	N671 CTH CB	Primary	Distribution	2006	Submersible	400	2017	Electric	60	1
#3	W6852 CTH JJ	Primary	Distribution	2016	Vertical Turbine	800	2016	Electric	100	2
#4	W6108 NEUBERT ROAD	Primary	Distribution	2004	Vertical Turbine	1,000	2004	Electric	200	3
#5	W7124 STH 96	Primary	Distribution	2018	Submersible	1,000	2018	Electric	150	4
Crestview Municipal Well	N1094 Manley Road	Primary	Distribution	2016	Submersible	60	2016	Electric	5	5

Reservoirs, Standpipes and Elevated Tanks

Å Enter elevation difference between highest water level in Standpipe or Elevated Tank, (or Reservoir only on an elevated site) and the water main where the connection to the storage begins branching into the distribution system.

	Facility Name (a)	Facility ID Site Code (b)	Year Constructed (c)	Type (d)	Primary Material (e)	Elevation Difference in Feet (f)	Total Capacity In Gallons (g)	
Tower		#1	1986	Elevated Tank	Steel	140	300,000	1
Tower		#2	1995	Elevated Tank	Steel	140	300,000	2
Tower		#3	2010	Elevated Tank	Steel	162	750,000	3

Water Treatment Plant

- Provide a generic description for (a). Do not give specific address of location.
- Please select all that apply for (d) and (e). If Other is selected please explain in Notes (h).
- Please identity the point of application for each treatment plant for (g). For example, please list each well or central treatment facility served by this unit.

Unit Description (a)	Year Constructed (b)	Rated Capacity (mgd) (c)	Disinfection (d)	Additional Treatment (e)	Fluoridated (f)		Point of Application (g)	Notes (h)	
#2	1986	400	_ Ultraviolet Light _ Liquid Chlorine x Gas Chlorine _ Ozone _ Other _ None	_ Flocculation/Sedimentation _ Sand Filtraton _ Activated Carbon Filtration _ Membrane Filtration _ Iron Exchange x Iron/Manganese _ Nitrate Removal _ Radium Removal _ Other	No	2			1
#3	1995	800	_ Ultraviolet Light _ Liquid Chlorine x Gas Chlorine _ Ozone _ Other _ None	_ Flocculation/Sedimentation x Sand Filtraton _ Activated Carbon Filtration _ Membrane Filtration _ Iron Exchange x Iron/Manganese _ Nitrate Removal _ Radium Removal _ Other	Yes	3			2
#4	2003	1000	_ Ultraviolet Light _ Liquid Chlorine x Gas Chlorine _ Ozone _ Other _ None	_ Flocculation/Sedimentation x Sand Filtraton _ Activated Carbon Filtration _ Membrane Filtration _ Iron Exchange x Iron/Manganese _ Nitrate Removal x Radium Removal _ Other	Yes	4			3
#5	2018	1000	_ Ultraviolet Light _ Liquid Chlorine x Gas Chlorine _ Ozone _ Other _ None	_ Flocculation/Sedimentation _ Sand Filtraton _ Activated Carbon Filtration _ Membrane Filtration _ Iron Exchange x Iron/Manganese _ Nitrate Removal x Radium Removal _ Other	Yes	5			4

Water Mains

- Report mains separately by pipe material, function, diameter and either within or outside the municipal boundaries.
- Explain all reported adjustments as a schedule footnote.
- For main additions reported in column (e), as a schedule footnote:
  - Explain how the additions were funded.
  - Also report the amount assessed and the feet of main recorded under this method.
  - If installed by a developer, explain the basis of recording the cost of the additions, the total amount, and the feet of main recorded under this method.
- Report all pipe larger than 72òin diameter in the 72òcategory.

			Number of Feet					
Pipe Material (a)	Main Function (b)	Diameter (inches) (c)	First of Year (d)	Added During Year (e)	Retired During Year (f)	Adjustments Increase or (Decrease) (g)	End of Year (h)	
Other Plastic	Transmission	6	18,553				**18,553**	1
Other Plastic	Transmission	8	220,578	3,327			**223,905**	2
Other Plastic	Transmission	10	128,544				**128,544**	3
Other Plastic	Transmission	12	15,091				**15,091**	4
Other Plastic	Transmission	14	22,206				**22,206**	5
Total Within Municipality			**404,972**	**3,327**			**408,299**	6
Total Utility			**404,972**	**3,327**			**408,299**	7

Water Mains

- Report mains separately by pipe material, function, diameter and either within or outside the municipal boundaries.
- Explain all reported adjustments as a schedule footnote.
- For main additions reported in column (e), as a schedule footnote:
  - Explain how the additions were funded.
  - Also report the amount assessed and the feet of main recorded under this method.
  - If installed by a developer, explain the basis of recording the cost of the additions, the total amount, and the feet of main recorded under this method.
- Report all pipe larger than 72òin diameter in the 72òcategory.

Water Mains (Page W-21)

Added During Year total is greater than zero, please explain financing following the criteria listed in the schedule headnotes.

$48,000 were utility financed with cash on hand; $249,087 were financed with impact fees; $268,936 were financed by developers

Utility-Owned Water Service Lines

- Å The utility's service line is the pipe from the main to and through the curb stop.
- Å Explain all reported adjustments as a schedule footnote.
- Å Report in column (h) the number of utility-owned service lines included in columns (g) which are temporarily shut off at the curb box or otherwise not in use at end of year.
- Å For service lines added during the year in column (d), as a schedule footnote:
  - Ŭ Explain how the additions were financed.
  - Ŭ If assessed against property owners, explain the basis of the assessments.
  - Ŭ If installed by a property owner or developer, explain the basis of recording the cost of the additions, the total amount and the number of service lines recorded under this method.
  - Ŭ If any were financed by application of Cz-1, provide the total amount recorded and the number of service lines recorded under this method.
- Å Report service lines separately by diameter and pipe materials.

Pipe Material (a)	Diameter (inches) (b)	First of Year (c)	Added During Year (d)	Removed or Permanently Disconnected During Year (e)	Adjustments Increase or (Decrease) (f)	End of Year (g)	NOT in Use at End of Year (h)	
Copper	1.000	1,433				1,433	5	1
Other Plastic	1.000	1,368				1,368	33	2
Copper	1.250	3				3		3
Other Plastic	1.250	487	36			523	156	4
Copper	1.500	18				18		5
Other Plastic	1.500	32				32	13	6
Copper	2.000	14				14		7
Other Plastic	2.000	22				22	1	8
Other Plastic	4.000	6				6		9
Other Plastic	6.000	44				44	11	10
Other Plastic	8.000	36				36	7	11
Other Plastic	10.000	15				15		12
Utility Total		**3,478**	**36**			**3,514**	**226**	13

Utility-Owned Water Service Lines

- The utility's service line is the pipe from the main to and through the curb stop.
- Explain all reported adjustments as a schedule footnote.
- Report in column (h) the number of utility-owned service lines included in columns (g) which are temporarily shut off at the curb box or otherwise not in use at end of year.
- For service lines added during the year in column (d), as a schedule footnote:
  - Explain how the additions were financed.
  - If assessed against property owners, explain the basis of the assessments.
  - If installed by a property owner or developer, explain the basis of recording the cost of the additions, the total amount and the number of service lines recorded under this method.
  - If any were financed by application of Cz-1, provide the total amount recorded and the number of service lines recorded under this method.
- Report service lines separately by diameter and pipe materials.

Utility-Owned Water Service Lines (Page W-22)

Additions are greater than zero, please explain financing by following criteria listed in the schedule headnotes.

water services were paid for by developers

Meters

- Include in Columns (b-f) meters in stock as well as those in service.
- Report in Column (c) all meters purchased during the year and in Column (d) all meters junked, sold or otherwise permanently retired during the year.
- Use Column (e) to show correction to previously reported meter count because of inventory or property record corrections
- Totals by size in Column (f) should equal same size totals in Column (s).
- Explain all reported adjustments as schedule footnote.
- Do not include station meters in the meter inventory used to complete these tables.

Number of Utility-Owned Meters

Classification of All Meters at End of Year by Customers

Size of Meter	First of Year	Added During Year	Retired During Year	Adjust. Increase or Decrease	End of Year	Tested During Year	Residential	Commercial	Industrial	Public Authority	Multifamily Residential	Irrigation	Wholesale	Inter-Departmental	Utility Use	Additional Meters	In Stock	Total	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(0)	(p)	(q)	(r)	(s)	
5/8	8		8		0	0												**0**	1
3/4	3,700	72	18		3,754	18	3,517	114	89	17							17	**3,754**	2
1	60	1		7	68	0	2	27	31	6							2	**68**	3
1 1/2	44	2	5		41	20	3	10	19	7							2	**41**	4
2	30	2	1		31	10		11	9	9							2	**31**	5
3	6	3			9	0		3	2	1					2		1	**9**	6
4	2	2			4	0		1	1								2	**4**	7
8	0			1	1	1				1								**1**	8
10	1				1	1				1								**1**	9
Total	**3,851**	**82**	**32**	**8**	**3,909**	**50**	**3,522**	**166**	**151**	**42**					**2**		**26**	3,909	10

Meters

- Å Include in Columns (b-f) meters in stock as well as those in service.
- Å Report in Column (c) all meters purchased during the year and in Column (d) all meters junked, sold or otherwise permanently retired during the year.
- Å Use Column (e) to show correction to previously reported meter count because of inventory or property record corrections
- Å Totals by size in Column (f) should equal same size totals in Column (s).
- Å Explain all reported adjustments as schedule footnote.
- Å Do not include station meters in the meter inventory used to complete these tables.

1. Indicate your residential meter replacement schedule:

Meters tested once every 10 years and replaced as needed

X All meters replaced within 20 years of installation

Other schedule as approved by PSC

2. Indicate the method(s) used to read customer meters

X Manually - inside the premises or remote register (# of meter: 4)

X Automatic meter reading (AMR), drive or walk by technology, wand or touchpad (# of meter: 3905)

Advanced Metering Infrastructure (AMI) - fixed network

Other

Meters

- Include in Columns (b-f) meters in stock as well as those in service.
- Report in Column (c) all meters purchased during the year and in Column (d) all meters junked, sold or otherwise permanently retired during the year.
- Use Column (e) to show correction to previously reported meter count because of inventory or property record corrections
- Totals by size in Column (f) should equal same size totals in Column (s).
- Explain all reported adjustments as schedule footnote.
- Do not include station meters in the meter inventory used to complete these tables.

Meters (Page W-23)

Adjustments are nonzero for one or more meter sizes, please explain.

The District adjusted for actual inventory taken at year end

Wisconsin Administrative Code requires that meters 1 inch or smaller be tested every 10 years or replaced every 20 years. You did not meet these requirements. Please explain your program for testing and replacing meters.

We just tested some of our 1ò meters this year. We are going to start replacing our 5/8 meters next year while we do our cross connections. I am implementing a system now that we will have everything tracked. There were no records of any tests done before expect in 2016.

Wisconsin Administrative Code requires that meters 3 and 4 inches be tested or replaced every 2 years. You did not meet these requirements. Please explain your program for testing and replacing meters.

We are doing some of them this year(2021) we didnôt do any last year. I am implementing a system now that we will have everything tracked. There were no records of any tests done before expect in 2016.

Hydrants and Distribution System Valves

- Distinguish between fire and flushing hydrants by lead size.
  - Fire hydrants normally have a lead size of 6 inches or greater.
  - Record as a flushing hydrant where the lead size is less than 6 inches or if pressure is inadequate to provide fire flow.
- Explain all reported adjustments in the schedule footnotes.
- Report fire hydrants as within or outside the municipal boundaries.
- Number of hydrants operated during year means: opened and water withdrawn.
- Number of distribution valves operated during year means: fully opened and closed (exercised).

Hydrant Type (a)	Number In Service First of Year (b)	Added During Year (c)	Removed During Year (d)	Adjustments Increase or (Decrease) (e)	Number In Service End of Year (f)	
Fire - Outside Municipality	**10**				**10**	1
Fire - Within Municipality	**814**	7			**821**	2
Total Fire Hydrants	**824**	**7**	**0**	**0**	**831**	3
Flushing Hydrants	**0**				**0**	4

NR810.13(2)(a) recommends that a schedule shall be adopted and followed for operating each system valve and hydrant at least once each two years. Please provide the number operated during the year.

Number of Hydrants operated during year	763
Number of Distribution System Valves end of year	1,445
Number of Distribution Valves operated during Year	365

Hydrants and Distribution System Valves

- Distinguish between fire and flushing hydrants by lead size.
  - Fire hydrants normally have a lead size of 6 inches or greater.
  - Record as a flushing hydrant where the lead size is less than 6 inches or if pressure is inadequate to provide fire flow.
- Explain all reported adjustments in the schedule footnotes.
- Report fire hydrants as within or outside the municipal boundaries.
- Number of hydrants operated during year means: opened and water withdrawn.
- Number of distribution valves operated during year means: fully opened and closed (exercised).

Hydrants and Distribution System Valves (Page W-25)

If a value is reported for Hydrants Outside the Municipality, then value should also be reported on schedule W-07 - Water Property Tax Equivalent - Detail, Plant Outside Limits.

district not required to prepare a tax equivalent calculation

List of All Station and Wholesale Meters

- Å Definition of Station Meter is any meter in service not used to measure customer consumption.
- Å Definition of Wholesale Meter is any meter used to measure sales to other utilities.
- Å Retail customer meters should not be included in this inventory.

	Purpose (a)	Meter Size (inches) (b)	Location or Description (c)	Type (d)	Date of Last Meter Test (e)	
1	Station Meter	4	Well 2	Magnetic	06/18/2018	1
2	Station Meter	6	well 2-1	Magnetic	06/18/2018	2
3	Station Meter	6	Well 4	Magnetic	06/18/2018	3
4	Station Meter	8	well 3	Magnetic	06/18/2018	4
5	Station Meter	8	Well 4-1	Magnetic	06/18/2018	5

List of All Station and Wholesale Meters

- Å Definition of Station Meter is any meter in service not used to measure customer consumption.
- Å Definition of Wholesale Meter is any meter used to measure sales to other utilities.
- Å Retail customer meters should not be included in this inventory.

List of All Station and Wholesale Meters (Page W-26)

Wisconsin Administrative Code requires that station meters be tested for accuracy at least once every 2 years. The Utility did not meet these requirements. Please explain the Utility's program for testing and replacing meters.

the District will test their station meters in 2021; they were not tested in 2020 due to the COVID pandemic

Water Conservation Programs

- Å List all water conservation-related expenditures for the reporting year. Include administrative costs, customer outreach and education, other program costs, and payments for rebates and other customer incentives. Do not include leak detection, other water loss program costs.
- Å If the Commission has approved conservation program expenses, these should be charged to Account 186. Otherwise, these expenses are reported in Account 906 on Schedule W-05 (Account 691 for class D utilities).

Item Description (a)	Expenditures (b)	Number of Rebates (c)	Water Savings Gallons (d)	
Administrative and General Expenses				1
Program Administration	0	0	0	2
Customer Outreach & Education	0	0	0	3
Other Program Costs	0	0	0	4
Total Administrative and General Expenses	**0**	**0**	**0**	5
Customer Incentives				6
Residential Toilets	0	0	0	7
Multifamily/Commercial Toilets	0	0	0	8
Faucets	0	0	0	9
Showerheads	0	0	0	10
Clothes Washers	0	0	0	11
Dishwashers	0	0	0	12
Smart Irrigation Controller	0	0	0	13
Commercial Pre-Rinse Spray Valves	0	0	0	14
Cost Sharing Projects (Nonresidential Customers)	0	0	0	15
Customer Water Audits	0	0	0	16
Other Incentives	0	0	0	17
Total Customer Incentives	**0**	**0**	**0**	18
TOTAL CONSERVATION	**0**	**0**	**0**	19

Water Customers Served

- List the number of customer accounts in each municipality for which your utility provides retail general service. Do not include wholesale customers or fire protection accounts.
- Per Wisconsin state statute, a city, village, town or sanitary district owning water plant or equipment may serve customers outside its corporate limits, including adjoining municipalities. For purposes of this schedule, customers located ñWithin Muni Boundaryò refers to those located inside the jurisdiction that owns the water utility.

Municipality (a)	Customers End of Year (b)	
Ellington (Town)	36	1
Grand Chute (Town)	13	2
Greenville (Town) **	3,834	3
Total - Outagamie County	**3,883**	4
Total - Customers Served	**3,883**	5
Total - Outside Muni Boundary	**49**	6
Total - Within Muni Boundary **	**3,834**	7

** = *Within municipal boundary*

Privately-Owned Water Service Lines

- Å The privately owned service line is the pipe from the curb stop to the meter.
- Å Explain all reported adjustments in columns(f) as a schedule footnote.
- Å Report in column (h) the number of privately-owned service lines included in columns (g) which are temporarily shut off at the curb box or otherwise not in use at end of year.
- Å Separate reporting of service lines by diameter and pipe material.

Pipe Material (a)	Diameter (inches) (b)	First of Year (c)	Added During Year (d)	Removed or Permanently Disconnected During Year (e)	Adjustments Increase or (Decrease) (f)	End of Year (g)	Customer Owned Service Laterals Not in Use at End of Year (i)	Replaced During Year Using Financial Assistance from Utility (h)	
Copper	1.000	1,224				1,224			1
Other Plastic	1.000	1,990				1,990			2
Other Plastic	1.250	284	36			320			3
Other Plastic	1.500	30				30			4
Copper	2.000	25				25			5
Other Plastic	2.000	10				10			6
Other Plastic	4.000	5				5			7
Other Plastic	6.000	35				35			8
Other Plastic	8.000	16				16			9
Utility Total		**3,619**	**36**			**3,655**			10