



APPENDIX E
Local Water Supply Plan

Local Water Supply Plan Template Third Generation for 2016-2018

Revised April 10, 2017

Formerly called Water Emergency & Water Conservation Plan



Cover photo by Molly Shodeen



For more information on this Water Supply Plan Template, please contact the DNR Division of Ecological and Water Resources at (651) 259-5034 or (651) 259-5100.

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DEPARTMENT OF NATURAL RESOURCES – DIVISION OF ECOLOGICAL AND WATER RESOURCES AND METROPOLITAN COUNCIL

INTRODUCTION TO WATER SUPPLY PLANS (WSP)

Who needs to complete a Water Supply Plan

Public water suppliers serving more than 1,000 people, large private water suppliers in designated Groundwater Management Areas, and all water suppliers in the Twin Cities metropolitan area are required to prepare and submit a water supply plan.

The goal of the WSP is to help water suppliers: 1) implement long term water sustainability and conservation measures; and 2) develop critical emergency preparedness measures. Your community needs to know what measures will be implemented in case of a water crisis. A lot of emergencies can be avoided or mitigated if long term sustainability measures are implemented.

Groundwater Management Areas (GWMA)

The DNR has designated three areas of the state as Groundwater Management Areas (GWMAs) to focus groundwater management efforts in specific geographies where there is an added risk of overuse or water quality degradation. A plan directing the DNR's actions within each GWMA has been prepared. Although there are no specific additional requirements with respect to the water supply planning for communities within designated GWMAs, communities should be aware of the issues and actions planned if they are within the boundary of one of the GWMAs. The three GWMAs are the North and East Metro GWMA (Twin Cities Metro), the Bonanza Valley GWMA and the Straight River GWMA (near Park Rapids). Additional information and maps are included in the [DNR Groundwater Management Areas webpage](#).

Benefits of completing a WSP

Completing a WSP using this template, fulfills a water supplier's statutory obligations under M.S. [M.S.103G.291](#) to complete a water supply plan. For water suppliers in the metropolitan area, the WSP will help local governmental units to fulfill their requirements under M.S. 473.859 to complete a local comprehensive plan. Additional benefits of completing WSP template:

- The standardized format allows for quicker and easier review and approval
- Help water suppliers prepare for droughts and water emergencies.
- Create eligibility for funding requests to the Minnesota Department of Health (MDH) for the Drinking Water Revolving Fund.
- Allow water suppliers to submit requests for new wells or expanded capacity of existing wells.
- Simplify the development of county comprehensive water plans and watershed plans.
- Fulfill the contingency plan provisions required in the MDH wellhead protection and surface water protection plans.
- Fulfill the demand reduction requirements of Minnesota Statutes, section 103G.291 subd 3 and 4.

- Upon implementation, contribute to maintaining aquifer levels, reducing potential well interference and water use conflicts, and reducing the need to drill new wells or expand system capacity.
- Enable DNR to compile and analyze water use and conservation data to help guide decisions.
- Conserve Minnesota's water resources

If your community needs assistance completing the Water Supply Plan, assistance is available from your area hydrologist or groundwater specialist, the MN Rural Waters Association circuit rider program, or in the metropolitan area from Metropolitan Council staff. Many private consultants are also available.

WSP Approval Process

10 Basic Steps for completing a 10-Year Water Supply Plan

1. Download the DNR/Metropolitan Council Water Supply Plan Template from the [DNR Water Supply Plan webpage](#).
2. Save the document with a file name with this naming convention:
WSP_cityname_permitnumber_date.doc.
3. The template is a form that should be completed electronically.
4. Compile the required water use data (Part 1) and emergency procedures information (Part 2)
5. The Water Conservation section (Part 3) may need discussion with the water department, council, or planning commission, if your community does not already have an active water conservation program.
6. Communities in the seven-county Twin Cities metropolitan area should complete all the information discussed in Part 4. The Metropolitan Council has additional guidance information on their [Water Supply webpage](#). All out-state water suppliers **do not** need to complete the content addressed in Part 4.
7. Use the Plan instructions and Checklist document from the [DNR Water Supply Plan webpage](#) to insure all data is complete and attachments are included. This will allow for a quicker approval process.
8. Plans should be submitted electronically using the [MPARS website](#) – no paper documents are required.
9. DNR hydrologist will review plans (in cooperation with Metropolitan Council in Metro area) and approve the plan or make recommendations.
10. Once approved, communities should complete a Certification of Adoption form, and send a copy to the DNR.

Complete Table 1 with information about the public water supply system covered by this WSP.

Table 1. General information regarding this WSP

Requested Information	Description
DNR Water Appropriation Permit Number(s)	1974-5226
Ownership	<input checked="" type="checkbox"/> Public or <input type="checkbox"/> Private
Metropolitan Council Area	<input checked="" type="checkbox"/> Yes or <input type="checkbox"/> No (and county name) – Hennepin County
Street Address	5755 Country Club Road
City, State, Zip	Shorewood, MN, 55331
Contact Person Name	Larry Brown, PE
Title	Public Works Director
Phone Number	952-474-3236
MDH Supplier Classification	Municipal

PART 1. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION

The first step in any water supply analysis is to assess the current status of demand and availability. Information summarized in Part 1 can be used to develop Emergency Preparedness Procedures (Part 2) and the Water Conservation Plan (Part 3). This data is also needed to track progress for water efficiency measures.

A. Analysis of Water Demand

Complete Table 2 showing the past 10 years of water demand data.

- Some of this information may be in your Wellhead Protection Plan.
- If you do not have this information, do your best, call your engineer for assistance or if necessary leave blank.

If your customer categories are different than the ones listed in Table 2, please describe the differences below:

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Table 2. Historic water demand (see definitions in the [glossary](#) after Part 4 of this template)

Year	Pop. Served	Total Connections	Residential Water Delivered (MG)	C/I/I Water Delivered (MG)	Agriculture Water Delivered (MG)	Total Water Delivered (MG)	Total Water Pumped (MG)	Water Supplier Services (WSS) (MG)	Percent Unmetered/Unaccounted	Average Daily Demand (MGD)	Max. Daily Demand (MGD)	Date of Max. Demand	Residential Per Capita Demand (GPCD)	Total per capita Demand (GPCD)
2005	3,463	1,195	138.750	9.893	-	154.422	152.250	5.778	-	0.417	n/a	n/a	110	120
2006	3,423	1,195	163.364	27.866	-	191.230	180.059	-	-	0.493	n/a	n/a	131	144
2007	3,383	n/a	n/a	n/a	-	n/a	n/a	-	n/a	n/a	n/a	n/a	n/a	n/a
2008	3,343	1,221	169.361	7.379	-	176.740	176.244	-	-	0.483	n/a	n/a	139	144
2009	3,751	1,320	161.274	9.415	-	170.690	177.666	-	3.93%	0.487	4.296	5/26/2009	118	130
2010	3,721	1,329	120.762	15.281	-	136.043	141.085	-	3.57%	0.387	0.617	7/16/2010	89	104
2011	3,721	1,332	141.162	10.695	-	162.709	164.404	10.852	1.03%	0.450	1.039	7/5/2011	104	121
2012	3,634	1,300	167.421	12.888	-	182.339	186.329	2.030	2.14%	0.510	1.396	7/11/2012	126	140
2013	3,562	1,374	142.013	12.025	-	156.013	156.013	1.975	0.00%	0.427	1.194	8/14/2013	109	120
2014	3,853	1,372	138.588	6.730	-	145.318	145.318	-	0.00%	0.398	1.404	8/7/2014	99	103
2015	3,865	1,388	110.807	5.481	2.465	130.238	133.228	11.484	2.24%	0.365	0.593	7/23/2015	79	94
2016	3,870	1,400	103.226	6.990	1.423	111.639	123.763	12.124	0.00%	0.339	0.853	8/3/2016	73	88
Avg. 2012-2016	3,757	1,367	132.411	8.823	1.944	145.109	148.930	6.903	0.88%	0.408	1.088	-	97	109

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

See [Glossary](#) for definitions. A list of [Acronyms and Initialisms](#) can be found after the Glossary.

Complete Table 3 by listing the top 10 water users by volume, from largest to smallest. For each user, include information about the category of use (residential, commercial, industrial, institutional, or wholesale), the amount of water used in gallons per year, the percent of total water delivered, and the status of water conservation measures.

Table 3. Large volume users

Customer	Use Category (Residential, Industrial, Commercial, Institutional, Wholesale)	Amount Used (Gallons per Year)	Percent of Total Annual Water Delivered	Implementing Water Conservation Measures? (Yes/No/Unknown)
1. KRAUS-ANDERSON, INC.	COMMERCIAL	1,600,000	1.29%	UNKNOWN
2. CUB FOODS	COMMERCIAL	1,096,000	0.89%	UNKNOWN
3. MINNETONKA SCHOOL DISTRICT NO. 276	SCHOOL	1,052,900	0.85%	UNKNOWN
4. SHOREWOOD PONDS HOMEOWNERS ASSOCIATION	RESIDENTIAL	715,262	0.58%	UNKNOWN
5. SHOREWOOD OAKS PARTNERSHIP	RESIDENTIAL	677,000	0.55%	UNKNOWN
6. 28005 BOULDER BRIDGE DRIVE	RESIDENTIAL	540,512	0.44%	UNKNOWN
7. WATERFORD CENTER LLP	COMMERCIAL	504,000	0.41%	UNKNOWN
8. 5905 BOULDER BRIDGE LANE	RESIDENTIAL	485,291	0.39%	UNKNOWN
9. NEW HORIZON ACADEMY	COMMERCIAL	484,102	0.39%	UNKNOWN
10. 5960 BOULDER BRIDGE LANE	RESIDENTIAL	457,444	0.37%	UNKNOWN

B. Treatment and Storage Capacity

Complete Table 4 with a description of where water is treated, the year treatment facilities were constructed, water treatment capacity, the treatment methods (i.e. chemical addition, reverse osmosis, coagulation, sedimentation, etc.) and treatment types used (i.e. fluoridation, softening, chlorination, Fe/MN removal, coagulation, etc.). Also describe the annual amount and method of disposal of treatment residuals. Add rows to the table as needed.

Table 4. Water treatment capacity and treatment processes

Treatment Site ID (Plant Name or Well ID)	Year Constructed	Treatment Capacity (GPD)	Treatment Method	Treatment Type	Annual Volume of Residuals	Disposal Process for Residuals	Do You Reclaim Filter Backwash Water?
Well 1	1973	750	Chemical Addition	Chlorination, fluoridation	N/A	N/A	N/A
Well 3	1981	750	Chemical addition	Chlorination, fluoridation	N/A	N/A	N/A
Well 4	1981	500	Chemical addition	Chlorination, fluoridation	N/A	N/A	N/A
Well 5	1981	500	Chemical addition	Chlorination, fluoridation	N/A	N/A	N/A
Well 6	1982	100	Chemical addition	Chlorination, fluoridation	N/A	N/A	N/A
Well 7	1986	1,000	Chemical addition, Iron Filters	Chlorination, fluoridation, iron removal	N/A	N/A	N/A
Total	N/A	3,600	N/A	N/A	N/A	N/A	N/A

Complete Table 5 with information about storage structures. Describe the type (i.e. elevated, ground, etc.), the storage capacity of each type of structure, the year each structure was constructed, and the primary material for each structure. Add rows to the table as needed.

Table 5. Storage capacity, as of the end of the last calendar year

Structure Name	Type of Storage Structure	Year Constructed	Primary Material	Storage Capacity (Gallons)
West Water Tower	Elevated storage	1995	Steel	500,000
East Water Tower	Elevated storage	1986	Steel	400,000
Total	N/A	N/A	N/A	900,000

Treatment and storage capacity versus demand

It is recommended that total storage equal or exceed the average daily demand.

Discuss the difference between current storage and treatment capacity versus the water supplier’s projected average water demand over the next 10 years (see Table 7 for projected water demand):

The City’s distribution network has three separate systems: two major systems known as the West and East systems, and a smaller system in the center of the City that is serviced by the City of Chanhassen. Each major system has 3 production wells and 1 elevated storage tanks. The West system’s elevated storage tank has an existing capacity of 500,000 gallons while the East system’s elevated storage tank has an existing capacity of 400,000 gallons. It is recommended that a system’s total storage capacity equal or exceed its average day demand. The West system’s storage capacity of 500,000 gallons exceeds its projected 2040 average day demand of 203,000 gallons. The East system’s storage capacity of 400,000 gallons also exceeds its projected 2040 average day demand of 229,000 gallons. Thus, both systems satisfy the storage recommendations individually.

It is generally recommended that a City’s treatment or production capacity be equal to the maximum daily demand with the largest production well out of service (firm capacity). The West System’s firm capacity is 1,000 gallons per minute (gpm) and the daily demand for this system is projected to reach a maximum of 341 gpm within the next ten years. The East System’s firm capacity is 850 gpm and the daily demand for this system is projected to reach a maximum of 412 gpm within the next ten years. Thus, both systems satisfy the production capacity recommendations individually.

C. Water Sources

Complete Table 6 by listing all types of water sources that supply water to the system, including groundwater, surface water, interconnections with other water suppliers, or others. Provide the name of each source (aquifer name, river or lake name, name of interconnecting water supplier) and the Minnesota unique well number or intake ID, as appropriate. Report the year the source was installed or established and the current capacity. Provide information about the depth of all wells. Describe the status of the source (active, inactive, emergency only, retail/wholesale interconnection) and if the source facilities have a dedicated emergency power source. Add rows to the table as needed for each installation.

Include copies of well records and maintenance summary for each well that has occurred since your last approved plan in **Appendix 1**.

Table 6. Water sources and status

Resource Type (Groundwater, Surface water, Interconnection)	Resource Name	MN Unique Well # or Intake ID	Year Installed	Capacity (Gallons per Minute)	Well Depth (Feet)	Status of Normal and Emergency Operations (active, inactive, emergency only, retail/wholesale interconnection))	Does this Source have a Dedicated Emergency Power Source? (Yes or No)
Groundwater	Well 1	232331	1973	750	528	Active	No
Groundwater	Well 3	161414	1982	750	359	Active	No
Groundwater	Well 4	171020	1981	500	640	Active	No
Groundwater	Well 5	171023	1981	500	640	Active	No
Groundwater	Well 6	122298	1982	100	280	Active	No
Groundwater	Well 7	416160	1986	1,000	415	Active	No

Limits on Emergency Interconnections

Discuss any limitations on the use of the water sources (e.g. not to be operated simultaneously, limitations due to blending, aquifer recovery issues etc.) and the use of interconnections, including capacity limits or timing constraints (i.e. only 200 gallons per minute are available from the City of Prior Lake, and it is estimated to take 6 hours to establish the emergency connection). If there are no limitations, list none.

The City of Shorewood has explored a possible interconnection with the City of Excelsior and has identified potential locations for that interconnection.

D. Future Demand Projections – Key Metropolitan Council Benchmark

Water Use Trends

Use the data in Table 2 to describe trends in 1) population served; 2) total per capita water demand; 3) average daily demand; 4) maximum daily demand. Then explain the causes for upward or downward trends. For example, over the ten years has the average daily demand trended up or down? Why is this occurring?

Since 2005, the City has seen an 11% increase in the population served. Although the population served increased, the total per capita water demand decreased by over 21%, resulting in a 12.5% decrease in average daily demand. From 2010 to 2015, the maximum daily demand decreased by 3.5%. It is likely that improved appliances, reduced irrigation, general attitudes toward conservation, rainfall, and climate all play a role in these trends.

A total per capita water demand of 109 gallons per capita per day, calculated from the average 2012-2016 demand shown in Table 2, was used to project daily demands. A peaking factor of 2.6, which is the City’s average 2012-2016 peaking factor, was applied to project maximum day demands through the year 2040. In ten years, the maximum day demand is expected to reach 1.12 MG. Daily demand (both average and maximum) is projected to increase linearly over the next ten years, due to an expected linear increase in population for the City of Shorewood through the planning period.

Use the water use trend information discussed above to complete Table 7 with projected annual demand for the next ten years. Communities in the seven-county Twin Cities metropolitan area must also include projections for 2030 and 2040 as part of their local comprehensive planning.

Projected demand should be consistent with trends evident in the historical data in Table 2, as discussed above. Projected demand should also reflect state demographer population projections and/or other planning projections.

Table 7. Projected annual water demand

Year	Projected Total Population	Projected Population Served	Projected Total Per Capita Water Demand (GPCD)	Projected Average Daily Demand (MGD)	Projected Maximum Daily Demand (MGD)	East System: Projected Maximum Demand (MGD)	West System: Projected Maximum Demand (MGD)
2018	7,621	3,890	109	0.424	1.102	0.593	0.466
2019	7,631	3,900	109	0.425	1.115	0.594	0.469
2020	7,641	3,910	109	0.426	1.108	0.594	0.472
2021	7,651	3,920	109	0.427	1.111	0.594	0.474
2022	7,661	3,930	109	0.428	1.114	0.594	0.477
2023	7,671	3,940	109	0.429	1.117	0.594	0.479
2024	7,681	3,950	109	0.431	1.119	0.595	0.482
2025	7,691	3,960	109	0.432	1.122	0.595	0.485
2030	7,741	4,010	109	0.437	1.136	0.596	0.498
2040	7,841	4,110	109	0.448	1.165	0.598	0.524

GPCD – Gallons per Capita per Day

MGD – Million Gallons per Day

Projection Method

Describe the method used to project water demand, including assumptions for population and business growth and how water conservation and efficiency programs affect projected water demand:

Population projections in Table 7 were calculated using the Metropolitan Council estimated rate of growth through the year 2040 for the City of Shorewood and the known population and population served values from 2016. It is assumed that, as of 2016, any new population growth will be serviced by the municipal water system. A maximum day peaking factor of 2.6 and a total per capita water demand of 109 gallons per capita per day were determined from the City’s historic water use data from 2012-2016.

It is important to note that there are several connections located in the south-central part of Shorewood that receive water from Chanhassen. The population served by these connections is estimated to be approximately 151. Given the peaking factor and the total per capita water demand used in this study, the connections supplied by Chanhassen require an estimated maximum day demand of 0.043 million gallons per day. This maximum demand flow was removed from the city-wide maximum demand displayed in Table 7 prior to distributing total maximum demand between the east and west systems.

Historical water pumping data was used to divide the existing maximum day demand between systems. Expected increase in maximum day demand through the year 2040 was assigned to each system based on the location of expected development or redevelopment in the City’s Land Use Plan. The sum of the East and West System

demands is not equal to the total demand because of the small central system that is supplied by the City of Chanhassen.

E. Resource Sustainability

Monitoring – Key DNR Benchmark

Complete Table 8 by inserting information about source water quality and quantity monitoring efforts. The list should include all production wells, observation wells, and source water intakes or reservoirs. Groundwater level data for DNR’s statewide network of observation wells are available online through the [DNR’s Cooperative Groundwater Monitoring \(CGM\) webpage](#).

Table 8. Information about source water quality and quantity monitoring

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
Well 1 - 232331	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input checked="" type="checkbox"/> routine MDH sampling <input type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input type="checkbox"/> monthly <input type="checkbox"/> quarterly <input checked="" type="checkbox"/> annually	<input type="checkbox"/> SCADA <input checked="" type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
Well 3 - 161414	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input checked="" type="checkbox"/> routine MDH sampling <input type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input type="checkbox"/> monthly <input type="checkbox"/> quarterly <input checked="" type="checkbox"/> annually	<input type="checkbox"/> SCADA <input checked="" type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
Well 4 - 171020	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input checked="" type="checkbox"/> routine MDH sampling <input type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input type="checkbox"/> monthly <input type="checkbox"/> quarterly <input checked="" type="checkbox"/> annually	<input type="checkbox"/> SCADA <input checked="" type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
Well 5 - 171023	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input checked="" type="checkbox"/> routine MDH sampling <input type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input type="checkbox"/> monthly <input type="checkbox"/> quarterly <input checked="" type="checkbox"/> annually	<input type="checkbox"/> SCADA <input checked="" type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
Well 6 - 122298	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input checked="" type="checkbox"/> routine MDH sampling <input type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input type="checkbox"/> monthly <input type="checkbox"/> quarterly <input checked="" type="checkbox"/> annually	<input type="checkbox"/> SCADA <input checked="" type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
Well 7 - 416160	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input checked="" type="checkbox"/> routine MDH sampling <input type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input type="checkbox"/> monthly <input type="checkbox"/> quarterly <input checked="" type="checkbox"/> annually	<input type="checkbox"/> SCADA <input checked="" type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge

Water Level Data

A water level monitoring plan that includes monitoring locations and a schedule for water level readings must be submitted as **Appendix 2**. If one does not already exist, it needs to be prepared and submitted with the WSP. Ideally, all production and observation wells are monitored at least monthly.

Complete Table 9 to summarize water level data for each well being monitored. Provide the name of the aquifer and a brief description of how much water levels vary over the season (the difference between the highest and lowest water levels measured during the year) and the long-term trends for each well. If water levels are not measured and recorded on a routine basis, then provide the static water level when each well was constructed and the most recent water level measured during the same season the well was constructed. Also include all water level data taken during any well and pump maintenance. Add rows to the table as needed.

Groundwater hydrographs illustrate the historical record of aquifer water levels measured within a well and can indicate water level trends over time. For each well in your system, provide a hydrograph for the life of the well, or for as many years as water levels have been measured. Include the hydrographs in **Appendix 3**. An example of a hydrograph can be found on the [DNR's Groundwater Hydrograph webpage](#). Hydrographs for DNR Observation wells can be found in the [CGM](#) discussed above.

Table 9. Water level data

Unique Well Number or Well ID	Aquifer Name	Seasonal Variation (Feet)	Long-term Trend in water level data	Water level measured during well/pumping maintenance
Well 1 - 232331	Prairie du Chien – Jordan	Monitoring pending	<input type="checkbox"/> Falling <input type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
Well 3 - 161414	St. Peter – Jordan	Monitoring pending	<input type="checkbox"/> Falling <input type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
Well 4 - 171020	Tunnel City - Wonewoc	Monitoring pending	<input type="checkbox"/> Falling <input type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
Well 5 - 171023	Tunnel City – Wonewoc	Monitoring pending	<input type="checkbox"/> Falling <input type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____

Unique Well Number or Well ID	Aquifer Name	Seasonal Variation (Feet)	Long-term Trend in water level data	Water level measured during well/pumping maintenance
Well 6 - 122298	Prairie Du Chien Group	Monitoring pending	<input type="checkbox"/> Falling <input type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY: ____ MM/DD/YY: ____ MM/DD/YY: ____
Well 7 - 416160	Prairie Du Chien – Jordan	Monitoring pending	<input type="checkbox"/> Falling <input type="checkbox"/> Stable <input type="checkbox"/> Rising	MM/DD/YY: ____ MM/DD/YY: ____ MM/DD/YY: ____
DNR Observation Well: 27045 – unique no. 42150	Prairie du Chien - Jordan	Approx. 13-feet	<input type="checkbox"/> Falling <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Rising	N/A

Potential Water Supply Issues & Natural Resource Impacts – Key DNR & Metropolitan Council Benchmark

Complete Table 10 by listing the types of natural resources that are or could potentially be impacted by permitted water withdrawals in the future. You do not need to identify every single water resource in your entire community. The goal is to help you triage the most important water resources and/or the water resources that may be impacted by your water supply system – perhaps during a drought or when the population has grown significantly in ten years. This is emerging science, so do the best you can with available data. For identified resources, provide the name of specific resources that may be impacted. Identify what the greatest risks to the resource are and how the risks are being assessed. Identify any resource protection thresholds – formal or informal – that have been established to identify when actions should be taken to mitigate impacts. Provide information about the potential mitigation actions that may be taken, if a resource protection threshold is crossed. Add additional rows to the table as needed. See the glossary at the end of the template for definitions.

Some of this baseline data should have been in your earlier water supply plans or county comprehensive water plans. When filling out this table, think of what are the water supply risks, identify the resources, determine the threshold and then determine what your community will do to mitigate the impacts.

Your DNR area hydrologist is available to assist with this table.

For communities in the seven-county Twin Cities metropolitan area, the [Master Water Supply Plan Appendix 1 \(Water Supply Profiles\)](#), provides information about potential water supply issues and natural resource impacts for your community.

Steps for completing Table 10

1. Identify the potential for natural resource impacts/issues within the community

First, review available information to identify resources that may be impacted by the operation of your water supply system (such as pumping).

Potential Sources of Information:

- County Geologic Atlas
- Local studies

- Metropolitan Council System Statement (for metro communities)
- Metropolitan Council Master Water Supply Plan (for metro communities)

ACTION: Check the resource type(s) that may be impacted in the column “Resource Type”

2. Identify where your water supply system is most likely to impact those resources (and vice versa).

Potential Sources of Information:

- Drinking Water Supply Management Areas
- Geologic Atlas - Sensitivity
- If no WHPA or other information exists, consider rivers, lakes, wetlands and significant within 1.5 miles of wells; and calcareous fens and trout streams within 5 miles of wells

ACTION: Focus the rest of your work in these areas.

3. Within focus areas, identify specific features of value to the community

You know your community best. What resources are important to pay attention to? It may be useful to check in with your community’s planning and zoning staff and others.

Potential Sources of Information:

- Park plans
- Local studies
- Natural resource inventories
- Tourist attractions/recreational areas/valued community resource

ACTION: Identify specific features that the community prioritizes in the “Resource Name” column (for example: North Lake, Long River, Brook Trout Stream, or Green Fen). If, based on a review of available information, no features are likely to be at risk, note “None”.

4. Identify what impact(s) the resource is at risk for

Potential Sources of Information:

- Wellhead Protection Plan
- Water Appropriation Permit
- County Geologic Atlas
- MDH or PCA reports of the area
- Metropolitan Council System Statement (for metro communities)
- Metropolitan Council Master Water Supply Plan (for metro communities)

ACTION: Check the risk type in the column “Risk”. If, based on a review of available information, no risk is identified, note “None anticipated”.

5. Describe how the risk was assessed

Potential Sources of Information:

- Local studies
- Monitoring data (community, WMO, DNR, etc.)
- Aquifer testing
- County Geologic Atlas or other hydrogeologic studies

- Regional or state studies, such as DNR’s report ‘Definitions and Thresholds for Negative Impacts to Surface Waters’
- Well boring logs

ACTION: Identify the method(s) used to identify the risk to the resource in the “Risk Assessed Through” column

6. Describe protection threshold/goals

What is the goal, if any, for protecting these resources? For example, is there a lower limit on acceptable flow in a river or stream? Water quality outside of an accepted range? A lower limit on acceptable aquifer level decline at one or more monitoring wells? Withdrawals that exceed some percent of the total amount available from a source? Or a lower limit on acceptable changes to a protected habitat?

Potential Sources of Information:

- County Comprehensive Water Plans
- Watershed Plans or One Watershed/One Plan
- Groundwater or Aquifer Plans
- Metropolitan Master Plans
- DNR Thresholds study
- Community parks, open space, and natural resource plans

ACTION: Describe resource protection goals in the “Describe Resource Protection Threshold” column or reference an existing plan/document/webpage

7. If a goal/threshold should trigger action, describe the plan that will be implemented.

Identify specific action, mitigation measures or management plan that the water supplier will implement, or refer to a partner’s plan that includes actions to be taken.

Potential Sources of Information:

- County Comprehensive Water Plans
- Watershed Plans or One Watershed/One Plan
- Groundwater or Aquifer Plans
- Metropolitan Master Plans
- Studies such as DNR Thresholds study

ACTION: Describe the mitigation measure or management plan in the “Mitigation Measure or Management Plan” column.

8. Describe work to evaluate these risks going forward.

For example, what is the plan to regularly check in to stay current on plans or new data?

Identify specific action that the water supplier will take to identify the creation of or change to goals/thresholds, or refer to a partner’s plan that includes actions to be taken.

Potential Sources of Information:

- County Comprehensive Water Plans

- Watershed Plans or One Watershed/One Plan
- Groundwater or Aquifer Plans
- Metropolitan Master Plans
- Studies such as DNR Thresholds study

ACTION: Describe what will be done to evaluate risks going forward, including any changes to goals or protection thresholds in the “Describe how Changes to Goals are monitored” column.

Table 10. Natural resource impacts (*List specific resources in Appendix 12)

Resource Type	Resource Name	Risk	Risk Assessed Through *	Describe Resource Protection Threshold or Goal *	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
<input type="checkbox"/> River or stream	N/A	<input type="checkbox"/> None anticipated <input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input type="checkbox"/> Modeling <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> WRAPS or other watershed report <input type="checkbox"/> Proximity (<1.5 miles) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> No data available <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input type="checkbox"/> Other: _____
<input type="checkbox"/> Calcareous fen	N/A	<input type="checkbox"/> None anticipated <input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input type="checkbox"/> Modeling <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> WRAPS or other watershed Report <input type="checkbox"/> Proximity (<5 miles) <input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input type="checkbox"/> Other: _____

Resource Type	Resource Name	Risk	Risk Assessed Through *	Describe Resource Protection Threshold or Goal *	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
<input checked="" type="checkbox"/> Lake	Lake Minnetonka and Lake Christmas	<input type="checkbox"/> None anticipated <input type="checkbox"/> Flow/water level decline <input checked="" type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input type="checkbox"/> Modeling <input checked="" type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> WRAPS or other watershed report <input type="checkbox"/> Proximity (<1.5 miles) <input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Additional data is needed to establish <input checked="" type="checkbox"/> See report: Surface Water Management Plan <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input checked="" type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input checked="" type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input type="checkbox"/> Other: _____
<input type="checkbox"/> Wetland	N/A	<input type="checkbox"/> None anticipated <input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input type="checkbox"/> Modeling <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> WRAPS or other watershed report <input type="checkbox"/> Proximity (<1.5 miles) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input type="checkbox"/> Other: _____

Resource Type	Resource Name	Risk	Risk Assessed Through *	Describe Resource Protection Threshold or Goal *	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
<input type="checkbox"/> Trout stream	N/A	<input type="checkbox"/> None anticipated <input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> WRAPS or other watershed report <input type="checkbox"/> Proximity (< 5 miles) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input type="checkbox"/> Other: _____
<input checked="" type="checkbox"/> Aquifer	Prairie Du Chien – Jordan	<input type="checkbox"/> None anticipated <input checked="" type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input checked="" type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> Proximity (obwell < 5 miles) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input checked="" type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input checked="" type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input checked="" type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input type="checkbox"/> Other: _____

Wellhead Protection (WHP) and Source Water Protection (SWP) Plans

Complete Table 11 to provide status information about WHP and SWP plans.

The emergency procedures in this plan are intended to comply with the contingency plan provisions required in the Minnesota Department of Health’s (MDH) Wellhead Protection (WHP) Plan and Surface Water Protection (SWP) Plan.

Table 11. Status of Wellhead Protection and Source Water Protection Plans

Plan Type	Status	Date Adopted	Date for Update
WHP	<input type="checkbox"/> In Process <input checked="" type="checkbox"/> Completed <input type="checkbox"/> Not Applicable	December 2015	December 2025
SWP	<input type="checkbox"/> In Process <input type="checkbox"/> Completed <input checked="" type="checkbox"/> Not Applicable	N/A	N/A

WHP – Wellhead Protection Plan **SWP** – Source Water Protection Plan

F. Capital Improvement Plan (CIP)

Please note that any wells that received approval under a ten-year permit, but that were not built, are now expired and must submit a water appropriations permit.

Adequacy of Water Supply System

Complete Table 12 with information about the adequacy of wells and/or intakes, storage facilities, treatment facilities, and distribution systems to sustain current and projected demands. List planned capital improvements for any system components, in chronological order. Communities in the seven-county Twin Cities metropolitan area should also include information about plans through 2040.

The assessment can be the general status by category; it is not necessary to identify every single well, storage facility, treatment facility, lift station, and mile of pipe.

Please attach your latest Capital Improvement Plan as **Appendix 4**.

Table 12. Adequacy of Water Supply System

System Component	Planned action	Anticipated Construction Year	Notes
Wells/Intakes	<input type="checkbox"/> No action planned - adequate <input checked="" type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition	2018, 2019, 2020	Well Controls, Water Meters, Well Motors and controls, Well Dehumidifier.
Water Storage Facilities	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		
Water Treatment Facilities	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		
Distribution Systems (Pipes, valves, etc.)	<input type="checkbox"/> No action planned - adequate <input checked="" type="checkbox"/> Repair/replacement <input checked="" type="checkbox"/> Expansion/addition	2018	Water main maintenance and expansion

System Component	Planned action	Anticipated Construction Year	Notes
Pressure Zones	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		
Other:	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		

Proposed Future Water Sources

Complete Table 13 to identify new water source installation planned over the next ten years. Add rows to the table as needed.

Table 13. Proposed future installations/sources

Source	Installation Location (approximate)	Resource Name	Proposed Pumping Capacity (gpm)	Planned Installation Year	Planned Partnerships
Groundwater	N/A				
Surface Water	N/A				
Interconnection to another supplier	Beehrl Ave & Oak St, Excelsior Blvd & Christmas Lake Rd	Excelsior Interconnection	TBD	TBD	City of Excelsior

Water Source Alternatives - Key Metropolitan Council Benchmark

Do you anticipate the need for alternative water sources in the next 10 years? Yes No

For metro communities, will you need alternative water sources by the year 2040? Yes No

If you answered yes for either question, then complete table 14. If no, insert NA.

Complete Table 14 by checking the box next to alternative approaches that your community is considering, including approximate locations (if known), the estimated amount of future demand that could be met through the approach, the estimated timeframe to implement the approach, potential partnerships, and the major benefits and challenges of the approach. Add rows to the table as needed.

For communities in the seven-county Twin Cities metropolitan area, these alternatives should include approaches the community is considering to meet projected 2040 water demand.

Table 14. Alternative water sources

Alternative Source Considered	Source and/or Installation Location (approximate)	Estimated Amount of Future Demand (%)	Timeframe to Implement (YYYY)	Potential Partners	Benefits	Challenges
<input type="checkbox"/> Groundwater	N/A					

Alternative Source Considered	Source and/or Installation Location (approximate)	Estimated Amount of Future Demand (%)	Timeframe to Implement (YYYY)	Potential Partners	Benefits	Challenges
<input type="checkbox"/> Surface Water	N/A					
<input type="checkbox"/> Reclaimed stormwater	N/A					
<input type="checkbox"/> Reclaimed wastewater	N/A					
<input type="checkbox"/> Interconnection to another supplier	N/A					

PART 2. EMERGENCY PREPAREDNESS PROCEDURES

The emergency preparedness procedures outlined in this plan are intended to comply with the contingency plan provisions required by MDH in the WHP and SWP. Water emergencies can occur as a result of vandalism, sabotage, accidental contamination, mechanical problems, power failings, drought, flooding, and other natural disasters. The purpose of emergency planning is to develop emergency response procedures and to identify actions needed to improve emergency preparedness. In the case of a municipality, these procedures should be in support of, and part of, an all-hazard emergency operations plan. Municipalities that already have written procedures dealing with water emergencies should review the following information and update existing procedures to address these water supply protection measures.

A. Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act, (Public Law 107-188, Title IV- Drinking Water Security and Safety) requires community water suppliers serving over 3,300 people to prepare an Emergency Response Plan. MDH recommends that Emergency Response Plans are updated annually.

Do you have an Emergency Response Plan? Yes No

Have you updated the Emergency Response Plan in the last year? Yes No

When did you last update your Emergency Response Plan? 2011

Complete Table 15 by inserting the noted information regarding your completed Emergency Response Plan.

Table 15. Emergency Response Plan contact information

Emergency Response Plan Role	Contact Person	Contact Phone Number	Contact Email
Emergency Response Lead	Larry Brown	lbrown@shorewoodpw.com	952.960.7913

B. Operational Contingency Plan

All utilities should have a written operational contingency plan that describes measures to be taken for water supply mainline breaks and other common system failures as well as routine maintenance.

Do you have a written operational contingency plan? Yes No

At a minimum, a water supplier should prepare and maintain an emergency contact list of contractors and suppliers.

C. Emergency Response Procedures

Water suppliers must meet the requirements of MN Rules 4720.5280. Accordingly, the Minnesota Department of Natural Resources (DNR) requires public water suppliers serving more than 1,000 people to submit Emergency and Conservation Plans. Water emergency and conservation plans that have been approved by the DNR, under provisions of Minnesota Statute 186 and Minnesota Rules, part 6115.0770, will be considered equivalent to an approved WHP contingency plan.

Emergency Telephone List

Prepare and attach a list of emergency contacts, including the MN Duty Officer (1-800-422-0798), as **Appendix 5**. An [Emergency Contact List template](#) is available at the [MnDNR Water Supply Plans webpage](#).

The list should include key utility and community personnel, contacts in adjacent water suppliers, and appropriate local, state and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list and date it. Thereafter, update on a regular basis (once a year is recommended). In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the Emergency Manager for that community. Responsibilities and services for each contact should be defined.

Current Water Sources and Service Area

Quick access to concise and detailed information on water sources, water treatment, and the distribution system may be needed in an emergency. System operation and maintenance records should be maintained in secured central and back-up locations so that the records are accessible for emergency purposes. A detailed map of the system showing the treatment plants, water sources, storage facilities, supply lines, interconnections, and other information that would be useful in an emergency should also be readily available. It is critical that public water supplier representatives and emergency response personnel communicate about the response procedures and be able to easily obtain this kind of information both in electronic and hard copy formats (in case of a power outage).

Do records and maps exist? Yes No

Can staff access records and maps from a central secured location in the event of an emergency?

Yes No

Does the appropriate staff know where the materials are located?

Yes No

Procedure for Augmenting Water Supplies

Complete Tables 16 – 17 by listing all available sources of water that can be used to augment or replace existing sources in an emergency. Add rows to the tables as needed.

In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Municipalities are encouraged to execute cooperative agreements for potential emergency water services and copies should be included in **Appendix 6**. Outstate Communities may consider using nearby high capacity wells (industry, golf course) as emergency water sources.

WSP should include information on any physical or chemical problems that may limit interconnections to other sources of water. Approvals from the MDH are required for interconnections or the reuse of water.

Table 16. Interconnections with other water supply systems to supply water in an emergency

Other Water Supply System Owner	Capacity (GPM & MGD)	Note Any Limitations On Use	List of services, equipment, supplies available to respond
City of Minnetonka (at Vinehill and Shady hills rd.	1,000 gpm	Emergency Use Only	Interconnect
City of Minnetonka (at Vinehill @ waterford place)	1,000 gpm	Emergency Use Only	Interconnect
City of Chanhassen (at Silver Lake Trail)	1,000 gpm	Emergency Use Only	Interconnect
City of Victoria (at Smithtown Road)	1,000 gpm	Emergency Use Only	Interconnect
City of Tonka Bay (at CSAH 19 and Glen Rd.)	1,000 gpm	Emergency Use Only	Interconnect
City of Tonka Bay (200' east of CSAH 19 and Smithtown Road)	1,000 gpm	Emergency Use Only	Interconnect

GPM – Gallons per minute **MGD** – million gallons per day

Table 17. Utilizing surface water as an alternative source

Surface Water Source Name	Capacity (GPM)	Capacity (MGD)	Treatment Needs	Note Any Limitations On Use
Insert name of surface water source here	N/A			
Add rows as needed	N/A			

If not covered above, describe additional emergency measures for providing water (obtaining bottled water, or steps to obtain National Guard services, etc.)

In the event that interconnections with surrounding cities cannot be used during the emergency, the City would obtain and distribute bottled water in the case of a short-term emergency. For a long-term emergency, bulk water distribution would be set up at public facilities.

Allocation and Demand Reduction Procedures

Complete Table 18 by adding information about how decisions will be made to allocate water and reduce demand during an emergency. Provide information for each customer category, including its priority ranking, average day demand, and demand reduction potential for each customer category. Modify the customer categories as needed, and add additional lines if necessary.

Water use categories should be prioritized in a way that is consistent with Minnesota Statutes 103G.261 (#1 is highest priority) as follows:

1. Water use for human needs such as cooking, cleaning, drinking, washing and waste disposal; use for on-farm livestock watering; and use for power production that meets contingency requirements.
2. Water use involving consumption of less than 10,000 gallons per day (usually from private wells or surface water intakes)
3. Water use for agricultural irrigation and processing of agricultural products involving consumption of more than 10,000 gallons per day (usually from private high-capacity wells or surface water intakes)
4. Water use for power production above the use provided for in the contingency plan.
5. All other water use involving consumption of more than 10,000 gallons per day.
6. Nonessential uses – car washes, golf courses, etc.

Water used for human needs at hospitals, nursing homes and similar types of facilities should be designated as a high priority to be maintained in an emergency. Lower priority uses will need to address water used for human needs at other types of facilities such as hotels, office buildings, and manufacturing plants. The volume of water and other types of water uses at these facilities must be carefully considered. After reviewing the data, common sense should dictate local allocation priorities to protect domestic requirements over certain types of economic needs. Water use for lawn sprinkling, vehicle washing, golf courses, and recreation are legislatively considered non-essential.

Table 18. Water use priorities

Customer Category	Allocation Priority	Average Daily Demand (GPD)	Short-Term Emergency Demand Reduction Potential (GPD)
Residential	1	357,500	*
Commercial	2	22,100	*
Irrigation	3	6,800	*
Non-Essential	4		263,500
TOTAL	NA	386,400	263,500

GPD – Gallons per Day; 2013-2015 Water Use Data; *Non-essential calculated as increased summer demand between all customer categories

Tip: Calculating Emergency Demand Reduction Potential

The emergency demand reduction potential for all uses will typically equal the difference between maximum use (summer demand) and base use (winter demand). In extreme emergency situations, lower priority water uses must be restricted or eliminated to protect priority domestic water requirements. Emergency demand reduction potential should be based on average day demands for customer categories within each priority class. Use the tables in Part 3 on water conservation to help you determine strategies.

Complete Table 19 by selecting the triggers and actions during water supply disruption conditions.

Table 19. Emergency demand reduction conditions, triggers and actions (Select all that may apply and describe)

Emergency Triggers	Short-term Actions	Long-term Actions
--------------------	--------------------	-------------------

Emergency Triggers	Short-term Actions	Long-term Actions
<input checked="" type="checkbox"/> Contamination <input checked="" type="checkbox"/> Loss of production <input checked="" type="checkbox"/> Infrastructure failure <input checked="" type="checkbox"/> Executive order by Governor <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Supply augmentation through interconnection <input checked="" type="checkbox"/> Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. <input checked="" type="checkbox"/> Water allocation through emergency action of City Council <input type="checkbox"/> Meet with large water users to discuss their contingency plan.	<input checked="" type="checkbox"/> Supply augmentation through interconnection <input checked="" type="checkbox"/> Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. <input checked="" type="checkbox"/> Water allocation through emergency action of City Council <input checked="" type="checkbox"/> Meet with large water users to discuss their contingency plan.

Notification Procedures

Complete Table 20 by selecting trigger for informing customers regarding conservation requests, water use restrictions, and suspensions; notification frequencies; and partners that may assist in the notification process. Add rows to the table as needed.

Table 20. Plan to inform customers regarding conservation requests, water use restrictions, and suspensions

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
<input checked="" type="checkbox"/> Short-term demand reduction declared (< 1 year)	<input checked="" type="checkbox"/> Website <input type="checkbox"/> Email list serve <input checked="" type="checkbox"/> Social media (e.g. Twitter, Facebook) <input checked="" type="checkbox"/> Direct customer mailing, <input checked="" type="checkbox"/> Press release (TV, radio, newspaper), <input type="checkbox"/> Meeting with large water users (> 10% of total city use) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input checked="" type="checkbox"/> Monthly <input type="checkbox"/> Annually	City staff; Neighboring communities; Local news outlets
<input checked="" type="checkbox"/> Long-term Ongoing demand reduction declared	<input checked="" type="checkbox"/> Website <input type="checkbox"/> Email list serve <input checked="" type="checkbox"/> Social media (e.g. Twitter, Facebook) <input checked="" type="checkbox"/> Direct customer mailing, <input checked="" type="checkbox"/> Press release (TV, radio, newspaper), <input type="checkbox"/> Meeting with large water users (> 10% of total city use) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input checked="" type="checkbox"/> Annually	City staff; Neighboring communities; Local news outlets
<input checked="" type="checkbox"/> Governor’s critical water deficiency declared	<input checked="" type="checkbox"/> Website <input type="checkbox"/> Email list serve <input checked="" type="checkbox"/> Social media (e.g. Twitter, Facebook) <input checked="" type="checkbox"/> Direct customer mailing,	<input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually <input checked="" type="checkbox"/> As needed	City staff; Neighboring communities; Local news outlets

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
	<input checked="" type="checkbox"/> Press release (TV, radio, newspaper), <input type="checkbox"/> Meeting with large water users (> 10% of total city use) <input type="checkbox"/> Other: _____		

Enforcement

Prior to a water emergency, municipal water suppliers must adopt regulations that restrict water use and outline the enforcement response plan. The enforcement response plan must outline how conditions will be monitored to know when enforcement actions are triggered, what enforcement tools will be used, who will be responsible for enforcement, and what timelines for corrective actions will be expected.

Affected operations, communications, and enforcement staff must then be trained to rapidly implement those provisions during emergency conditions.

Important Note:

Disregard of critical water deficiency orders, even though total appropriation remains less than permitted, is adequate grounds for immediate modification of a public water supply authority’s water use permit (2013 MN Statutes 103G.291)

Does the city have a critical water deficiency restriction/official control in place that includes provisions to restrict water use and enforce the restrictions? (This restriction may be an ordinance, rule, regulation, policy under a council directive, or other official control) Yes No

If yes, attach the official control document to this WSP as **Appendix 7**.

If no, the municipality must adopt such an official control within 6 months of submitting this WSP and submit it to the DNR as an amendment to this WSP.

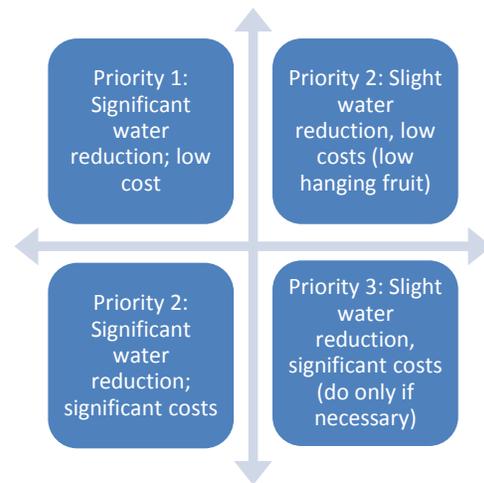
Irrespective of whether a critical water deficiency control is in place, does the public water supply utility, city manager, mayor, or emergency manager have standing authority to implement water restrictions? Yes No

If yes, cite the regulatory authority reference: City Code, Chapter 602 – Emergency Management.

If no, who has authority to implement water use restrictions in an emergency?

PART 3. WATER CONSERVATION PLAN

Minnesotans have historically benefited from the state's abundant water supplies, reducing the need for conservation. There are however, limits to the available supplies of water and increasing threats to the quality of our drinking water. Causes of water supply limitation may include: population increases, economic trends, uneven statewide availability of groundwater, climatic changes, and degraded water quality. Examples of threats to drinking water quality include: the presence of contaminant plumes from past land use activities, exceedances of water quality standards from natural and human sources, contaminants of emerging concern, and increasing pollutant trends from nonpoint sources.



There are many incentives for conserving water; conservation:

- reduces the potential for pumping-induced transfer of contaminants into the deeper aquifers, which can add treatment costs
- reduces the need for capital projects to expand system capacity
- reduces the likelihood of water use conflicts, like well interference, aquatic habitat loss, and declining lake levels
- conserves energy, because less energy is needed to extract, treat and distribute water (and less energy production also conserves water since water is used to produce energy)
- maintains water supplies that can then be available during times of drought

It is therefore imperative that water suppliers implement water conservation plans. The first step in water conservation is identifying opportunities for behavioral or engineering changes that could be made to reduce water use by conducting a thorough analysis of:

- Water use by customer
- Extraction, treatment, distribution and irrigation system efficiencies
- Industrial processing system efficiencies
- Regulatory and barriers to conservation
- Cultural barriers to conservation
- Water reuse opportunities

Once accurate data is compiled, water suppliers can set achievable goals for reducing water use. A successful water conservation plan follows a logical sequence of events. The plan should address both conservation on the supply side (leak detection and repairs, metering), as well as on the demand side (reductions in usage). Implementation should be conducted in phases, starting with the most obvious and lowest-cost options. In some cases, one of the early steps will be reviewing regulatory constraints to water conservation, such as lawn irrigation requirements. Outside funding and grants may be available for implementation of projects. Engage water system operators and maintenance staff and customers in brainstorming opportunities to reduce water use. Ask the question: "How can I help save water?"

Progress since 2006

Is this your community's first Water Supply Plan? Yes No

If yes, describe conservation practices that you are already implementing, such as: pricing, system improvements, education, regulation, appliance retrofitting, enforcement, etc.

If no, complete Table 21 to summarize conservation actions taken since the adoption of the 2006 water supply plan.

Table 21. Implementation of previous ten-year Conservation Plan

2006 Plan Commitments	Action Taken?
Change water rates structure to provide conservation pricing	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water supply system improvements (e.g. leak repairs, valve replacements, etc.)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Educational efforts	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
New water conservation ordinances	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Rebate or retrofitting Program (e.g. for toilet, faucets, appliances, showerheads, dish washers, washing machines, irrigation systems, rain barrels, water softeners, etc.)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Enforcement	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Describe other	<input type="checkbox"/> Yes <input type="checkbox"/> No

What are the results you have seen from the actions in Table 21 and how were results measured?

Although the City has not conducted a water audit in recent years, the City has seen a trend in per capita water use over the past decade likely occurring due to conservation actions taken by the City and its habitants.

A. Triggers for Allocation and Demand Reduction Actions

Complete table 22 by checking each trigger below, as appropriate, and the actions to be taken at various levels or stages of severity. Add in additional rows to the table as needed.

Table 22. Short and long-term demand reduction conditions, triggers and actions

Objective	Triggers	Actions
Protect surface water flows	<input type="checkbox"/> Low stream flow conditions <input checked="" type="checkbox"/> Reports of declining wetland and lake levels <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Increase promotion of conservation measures <input checked="" type="checkbox"/> Other: consider water reuse/stormwater irrigation projects
Short-term demand reduction (less than 1 year)	<input checked="" type="checkbox"/> Extremely high seasonal water demand (more than double winter demand) <input checked="" type="checkbox"/> Loss of treatment capacity <input checked="" type="checkbox"/> Lack of water in storage <input checked="" type="checkbox"/> State drought plan <input checked="" type="checkbox"/> Well interference <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Adopt (if not already) and enforce the critical water deficiency ordinance to restrict or prohibit lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. <input checked="" type="checkbox"/> Supply augmentation through emergency interconnection <input checked="" type="checkbox"/> Water allocation through emergency interconnection <input type="checkbox"/> Meet with large water users to discuss user's contingency plan.
Long-term demand reduction (>1 year)	<input checked="" type="checkbox"/> Per capita demand increasing <input type="checkbox"/> Total demand increase (higher population or more industry). Water level in well(s) below elevation of _____ <input checked="" type="checkbox"/> Other: Declared emergency	<input checked="" type="checkbox"/> Develop a critical water deficiency ordinance that is or can be quickly adopted to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. <input checked="" type="checkbox"/> Enact a water waste ordinance that targets overwatering (causing water to flow off the landscape into streets, parking lots, or similar), watering impervious surfaces (streets, driveways or other hardscape areas), and negligence of known leaks, breaks, or malfunctions. <input type="checkbox"/> Meet with large water users to discuss user's contingency plan. <input checked="" type="checkbox"/> Enhanced monitoring and reporting: audits, meters, billing, etc.
Governor's "Critical Water Deficiency Order" declared	<input checked="" type="checkbox"/> Describe: Governor Declaration as needed	<input checked="" type="checkbox"/> Describe: take action as directed by the governor

B. Conservation Objectives and Strategies – Key benchmark for DNR

This section establishes water conservation objectives and strategies for eight major areas of water use.

Objective 1: Reduce Unaccounted (Non-Revenue) Water loss to Less than 10%

The Minnesota Rural Water Association, the Metropolitan Council and the Department of Natural Resources recommend that all water uses be metered. Metering can help identify high use locations and times, along with leaks within buildings that have multiple meters.

It is difficult to quantify specific unmetered water use such as that associated with firefighting and system flushing or system leaks. Typically, water suppliers subtract metered water use from total water pumped to calculate unaccounted or non-revenue water loss.

Is your five-year average (2005-2014) unaccounted Water Use in Table 2 higher than 10%?

Yes No

What is your leak detection monitoring schedule? (e.g. Monitor 1/3rd of the city lines per year)

A full-system leak survey is completed every year.

Water Audits - are designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. The American Water Works Association (AWWA) has a recommended water audit methodology which is presented in [AWWA's M36 Manual of Water Supply Practices: Water Audits and Loss Control Programs](#). AWWA also provides a free spreadsheet-based water audit tool that water suppliers can use to conduct their own water audits. This free water audit tool can be found on AWWA's [Water Loss Control webpage](#). Another resource for water audit and water loss control information is [Minnesota Rural Water Association](#).

What is the date of your most recent water audit? Unknown

Frequency of water audits: yearly other (specify frequency) As needed

Leak detection and survey: every year every other year periodic as needed

Year last leak detection survey completed: 2017

If Table 2 shows annual water losses over 10% or an increasing trend over time, describe what actions will be taken to reach the <10% loss objective and within what timeframe

Metering -AWWA recommends that every water supplier install meters to account for all water taken into its system, along with all water distributed from its system at each customer's point of service. An effective metering program relies upon periodic performance testing, repair, maintenance or replacement of all meters. Drinking Water Revolving Loan Funds are available for purchase of new meters when new plants are built. AWWA also recommends that water suppliers conduct regular water audits to account for unmetered unbilled consumption, metered unbilled consumption and source water and customer metering inaccuracies. Some cities install separate meters for interior and exterior water use, but some research suggests that this may not result in water conservation.

Complete Table 23 by adding the requested information regarding the number, types, testing and maintenance of customer meters.

Table 23. Information about customer meters

Customer Category	Number of Customers	Number of Metered Connections	Number of Automated Meter Readers	Meter testing intervals (years)	Average age/meter replacement schedule (years)
Residential	1,392	1,392	1,392	As requested by owner	As issues arise
Irrigation meters	1	1	1	As requested by owner	As issues arise
Institutional	N/A				___ / ___
Commercial	6	6	0	As requested by owner	As issues arise
Industrial	N/A				___ / ___
Public facilities	N/A				___ / ___
Other					___ / ___
TOTALS	1,399	1,399	1,393	NA	NA

For unmetered systems, describe any plans to install meters or replace current meters with advanced technology meters. Provide an estimate of the cost to implement the plan and the projected water savings from implementing the plan.

The City does not have any unmetered connections.

Table 24. Water source meters

	Number of Meters	Meter testing schedule (years)	Number of Automated Meter Readers	Average age/meter replacement schedule (years)
Water source (wells/intakes)	6	As needed	6	As issues arise
Treatment plant	N/A			___ / ___

Objective 2: Achieve Less than 75 Residential Gallons per Capita Demand (GPCD)

The 2002 average residential per capita demand in the Twin Cities Metropolitan area was 75 gallons per capita per day.

Is your average 2012-2016 residential per capita water demand in Table 2 more than 75? Yes No

What was your 2012-2016 five-year average residential per capita water demand? 97 g/person/day

Describe the water use trend over that timeframe:

The City of Shorewood’s five-year average residential per capita water demand was 97 gallons per capita per day. The 2012-2016 average residential per capita water demand shows a decreasing trend with its lowest value being approximately 73 gallons per capita per day during 2016.

Complete Table 25 by checking which strategies you will use to continue reducing residential per capita demand and project a likely timeframe for completing each checked strategy (Select all that apply and add rows for additional strategies):

Table 25. Strategies and timeframe to reduce residential per capita demand

Strategy to reduce residential per capita demand	Timeframe for completing work
<input checked="" type="checkbox"/> Revise city ordinances/codes to encourage or require water efficient landscaping.	Ongoing
<input checked="" type="checkbox"/> Revise city ordinance/codes to permit water reuse options, especially for non-potable purposes like irrigation, groundwater recharge, and industrial use. Check with plumbing authority to see if internal buildings reuse is permitted	Annually
<input checked="" type="checkbox"/> Revise ordinances to limit irrigation. Describe the restricted irrigation plan:	3-6 years following adoption of this plan
<input type="checkbox"/> Revise outdoor irrigation installations codes to require high efficiency systems (e.g. those with soil moisture sensors or programmable watering areas) in new installations or system replacements.	
<input checked="" type="checkbox"/> Make water system infrastructure improvements	Ongoing
<input type="checkbox"/> Offer free or reduced cost water use audits) for residential customers.	
<input type="checkbox"/> Implement a notification system to inform customers when water availability conditions change.	
<input checked="" type="checkbox"/> Provide rebates or incentives for installing water efficient appliances and/or fixtures indoors (e.g., low flow toilets, high efficiency dish washers and washing machines, showerhead and faucet aerators, water softeners, etc.)	1-3 years following the adoption of this plan
<input checked="" type="checkbox"/> Provide rebates or incentives to reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	1-3 years following the adoption of this plan
<input type="checkbox"/> Identify supplemental Water Resources	
<input checked="" type="checkbox"/> Conduct audience-appropriate water conservation education and outreach.	Ongoing
<input type="checkbox"/> Describe other plans	

Objective 3: Achieve at least 1.5% annual reduction in non-residential per capita water use

(For each of the next ten years, or a 15% total reduction over ten years.) This includes commercial, institutional, industrial and agricultural water users.

Complete Table 26 by checking which strategies you will used to continue reducing non-residential customer use demand and project a likely timeframe for completing each checked strategy (add rows for additional strategies).

Where possible, substitute recycled water used in one process for reuse in another. (For example, spent rinse water can often be reused in a cooling tower.) Keep in mind the true cost of water is the amount on the water bill PLUS the expenses to heat, cool, treat, pump, and dispose of/discharge the water. Don't just calculate the initial investment. Many conservation retrofits that appear to be prohibitively expensive are actually very cost-effective when amortized over the life of the equipment. Often reducing water use also saves electrical and other utility costs. Note: as of 2015, water reuse, and is not allowed by the state plumbing code, M.R. 4715 (a variance is needed). However, several state agencies are addressing this issue.

Table 26. Strategies and timeframe to reduce institutional, commercial industrial, and agricultural and non-revenue use demand

Strategy to reduce total business, industry, agricultural demand	Timeframe for completing work
<input checked="" type="checkbox"/> Conduct a facility water use audit for both indoor and outdoor use, including system components	Annually
<input checked="" type="checkbox"/> Install enhanced meters capable of automated readings to detect spikes in consumption	Ongoing
<input type="checkbox"/> Compare facility water use to related industry benchmarks, if available (e.g., meat processing, dairy, fruit and vegetable, beverage, textiles, paper/pulp, metals, technology, petroleum refining etc.)	
<input checked="" type="checkbox"/> Install water conservation fixtures and appliances or change processes to conserve water	Ongoing
<input checked="" type="checkbox"/> Repair leaking system components (e.g., pipes, valves)	Ongoing
<input checked="" type="checkbox"/> Investigate the reuse of reclaimed water (e.g., stormwater, wastewater effluent, process wastewater, etc.)	Annually
<input checked="" type="checkbox"/> Reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	Ongoing
<input checked="" type="checkbox"/> Train employees how to conserve water	Ongoing
<input type="checkbox"/> Implement a notification system to inform non-residential customers when water availability conditions change.	
<input type="checkbox"/> Nonpotable rainwater catchment systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, industrial processes, water features, vehicle washing facilities, cooling tower makeup, and similar uses shall be approved by the commissioner. Plumbing code 4714.1702, Published October 31, 2016	
<input type="checkbox"/> Describe other plans:	

Objective 4: Achieve a Decreasing Trend in Total Per Capita Demand

Include as **Appendix 8** one graph showing total per capita water demand for each customer category (i.e., residential, institutional, commercial, industrial) from 2005-2014 and add the calculated/estimated linear trend for the next 10 years.

Describe the trend for each customer category; explain the reason(s) for the trends, and where trends are increasing.

There is a decreasing trend in per capita water demand over the last ten years for the City of Shorewood for both the residential and commercial/industrial/intuitional categories.

Objective 5: Reduce Ratio of Maximum day (peak day) to the Average Day Demand to Less Than 2.6

Is the ratio of average 2005-2014 maximum day demand to average 2005-2014 average day demand reported in Table 2 more than 2.6? Yes No

Calculate a ten-year average (2005 – 2014) of the ratio of maximum day demand to average day demand: 3.3

The position of the DNR has been that a peak day/average day ratio that is above 2.6 for in summer indicates that the water being used for irrigation by the residents in a community is too large and that efforts should be made to reduce the peak day use by the community.

It should be noted that by reducing the peak day use, communities can also reduce the amount of infrastructure that is required to meet the peak day use. This infrastructure includes new wells, new water towers which can be costly items.

Objective 6: Implement Demand Reduction Measures

Water Conservation Program

Municipal water suppliers serving over 1,000 people are required to adopt demand reduction measures that include a conservation rate structure, or a uniform rate structure with a conservation program that achieves demand reduction. These measures must achieve demand reduction in ways that reduce water demand, water losses, peak water demands, and nonessential water uses. These measures must be approved before a community may request well construction approval from the Department of Health or before requesting an increase in water appropriations permit volume ([Minnesota Statutes, section 103G.291, subd. 3 and 4](#)). Rates should be adjusted on a regular basis to ensure that revenue of the system is adequate under reduced demand scenarios. If a municipal water supplier intends to use a Uniform Rate Structure, a community-wide Water Conservation Program that will achieve demand reduction must be provided.

Current Water Rates

Include a copy of the actual rate structure in **Appendix 9** or list current water rates including base/service fees and volume charges below.

Volume included in base rate or service charge: 5,000 gallons or ___ cubic feet ___ other

Frequency of billing: Monthly Bimonthly Quarterly Other: _____

Water Rate Evaluation Frequency: every year every ___ years no schedule

Date of last rate change: 2017

Table 27. Rate structures for each customer category (Select all that apply and add additional rows as needed)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
Residential	<input type="checkbox"/> Monthly billing <input checked="" type="checkbox"/> Increasing block rates (volume tiered rates) <input type="checkbox"/> Seasonal rates <input type="checkbox"/> Time of use rates <input type="checkbox"/> Water bills reported in	<input type="checkbox"/> Uniform <input type="checkbox"/> Odd/even day watering	<input type="checkbox"/> Service charge based on water volume <input type="checkbox"/> Declining block <input type="checkbox"/> Flat <input type="checkbox"/> Other (describe)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
	gallons <input type="checkbox"/> Individualized goal rates <input type="checkbox"/> Excess use rates <input type="checkbox"/> Drought surcharge <input type="checkbox"/> Use water bill to provide comparisons <input type="checkbox"/> Service charge not based on water volume <input type="checkbox"/> Other (describe)		
Commercial/Industrial/Institutional	<input type="checkbox"/> Monthly billing <input checked="" type="checkbox"/> Increasing block rates (volume tiered rates) <input type="checkbox"/> Seasonal rates <input type="checkbox"/> Time of use rates <input type="checkbox"/> Water bills reported in gallons <input type="checkbox"/> Individualized goal rates <input type="checkbox"/> Excess use rates <input type="checkbox"/> Drought surcharge <input type="checkbox"/> Use water bill to provide comparisons <input type="checkbox"/> Service charge not based on water volume <input type="checkbox"/> Other (describe)	<input type="checkbox"/> Uniform	<input type="checkbox"/> Service charge based on water volume <input type="checkbox"/> Declining block <input type="checkbox"/> Flat <input type="checkbox"/> Other (describe)
<input type="checkbox"/> Other			

*** Rate Structures components that may promote water conservation:**

- **Monthly billing:** is encouraged to help people see their water usage so they can consider changing behavior.
- **Increasing block rates (also known as a tiered residential rate structure):** Typically, these have at least three tiers: should have at least three tiers.
 - The first tier is for the winter average water use.
 - The second tier is the year-round average use, which is lower than typical summer use. This rate should be set to cover the full cost of service.
 - The third tier should be above the average annual use and should be priced high enough to encourage conservation, as should any higher tiers. For this to be effective, the difference in block rates should be significant.
- **Seasonal rate:** higher rates in summer to reduce peak demands
- **Time of Use rates:** lower rates for off peak water use
- **Bill water use in gallons:** this allows customers to compare their use to average rates
- **Individualized goal rates:** typically used for industry, business or other large water users to promote water conservation if they keep within agreed upon goals. **Excess Use rates:** if water use goes above an agreed upon amount this higher rate is charged
- **Drought surcharge:** an extra fee is charged for guaranteed water use during drought
- **Use water bill to provide comparisons:** simple graphics comparing individual use over time or compare individual use to others.
- **Service charge or base fee that does not include a water volume** – a base charge or fee to cover universal city expenses that are not customer dependent and/or to provide minimal water at a lower rate (e.g., an amount less than the average residential per capita demand for the water supplier for the last 5 years)

- **Emergency rates** -A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

****Conservation Neutral****

- **Uniform rate:** rate per unit used is the same regardless of the volume used
- **Odd/even day watering** –This approach reduces peak demand on a daily basis for system operation, but it does not reduce overall water use.

***** Non-Conserving *****

- **Service charge or base fee with water volume:** an amount of water larger than the average residential per capita demand for the water supplier for the last 5 years
- **Declining block rate:** the rate per unit used decreases as water use increases.
- **Flat rate:** one fee regardless of how much water is used (usually unmetered).

Provide justification for any conservation neutral or non-conserving rate structures. If intending to adopt a conservation rate structure, include the timeframe to do so:

N/A

Objective 7: Additional strategies to Reduce Water Use and Support Wellhead Protection Planning

Development and redevelopment projects can provide additional water conservation opportunities, such as the actions listed below. If a Uniform Rate Structure is in place, the water supplier must provide a Water Conservation Program that includes at least two of the actions listed below. Check those actions that you intent to implement within the next 10 years.

Table 28. Additional strategies to Reduce Water Use & Support Wellhead Protection

<input type="checkbox"/>	Participate in the GreenStep Cities Program, including implementation of at least one of the 20 “Best Practices” for water
<input type="checkbox"/>	Prepare a master plan for smart growth (compact urban growth that avoids sprawl)
<input type="checkbox"/>	Prepare a comprehensive open space plan (areas for parks, green spaces, natural areas)
<input checked="" type="checkbox"/>	Enforce the water use restriction ordinance (lawn irrigation, car washing, pools, etc.)
<input checked="" type="checkbox"/>	Enforce the outdoor lawn irrigation ordinance
<input type="checkbox"/>	Adopt a private well ordinance (private wells in a city must comply with water restrictions)
<input type="checkbox"/>	Implement a stormwater management program
<input type="checkbox"/>	Adopt non-zoning wetlands ordinance (can further protect wetlands beyond state/federal laws- for vernal pools, buffer areas, restrictions on filling or alterations)
<input type="checkbox"/>	Adopt a water offset program (primarily for new development or expansion)
<input checked="" type="checkbox"/>	Consider implementing a water conservation outreach program
<input type="checkbox"/>	Hire a water conservation coordinator (part-time)
<input checked="" type="checkbox"/>	Consider implementing a rebate program for water efficient appliances, fixtures, or outdoor water management
<input type="checkbox"/>	Other

Objective 8: Tracking Success: How will you track or measure success through the next ten years?

The City will continue to monitor water usage by customer category to determine the efficacy of conservation efforts. The City will monitor and document the water levels in their active production wells.

Tip: The process to monitor demand reduction and/or a rate structure includes:

- a) The DNR Hydrologist will call or visit the community the first 1-3 years after the water supply plan is completed.
- b) They will discuss what activities the community is doing to conserve water and if they feel their actions are successful. The Water Supply Plan, Part 3 tables and responses will guide the discussion. For example, they will discuss efforts to reduce unaccounted for water loss if that is a problem, or go through Tables 33, 34 and 35 to discuss new initiatives.
- c) The city representative and the hydrologist will discuss total per capita water use, residential per capita water use, and business/industry use. They will note trends.
- d) They will also discuss options for improvement and/or collect case studies of success stories to share with other communities. One option may be to change the rate structure, but there are many other paths to successful water conservation.
- e) If appropriate, they will cooperatively develop a simple work plan for the next few years, targeting a couple areas where the city might focus efforts.

C. Regulation

Complete Table 29 by selecting which regulations are used to reduce demand and improve water efficiencies. Add additional rows as needed.

Copies of adopted regulations or proposed restrictions or should be included in **Appendix 10** (a list with hyperlinks is acceptable).

Table 29. Regulations for short-term reductions in demand and long-term improvements in water efficiencies

Regulations Utilized	When is it applied (in effect)?
<input checked="" type="checkbox"/> Rainfall sensors required on landscape irrigation systems	<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared Emergencies
<input type="checkbox"/> Water efficient plumbing fixtures required	<input type="checkbox"/> New development <input type="checkbox"/> Replacement <input type="checkbox"/> Rebate Programs
<input checked="" type="checkbox"/> Critical/Emergency Water Deficiency ordinance	<input checked="" type="checkbox"/> Only during declared Emergencies
<input checked="" type="checkbox"/> Watering restriction requirements (time of day, allowable days, etc.)	<input type="checkbox"/> Odd/even <input type="checkbox"/> 2 days/week <input type="checkbox"/> Only during declared Emergencies <input checked="" type="checkbox"/> Irrigation restricted 11:00 am to 4:30 pm from May 1 st to September 30 th
<input type="checkbox"/> Water waste prohibited (for example, having a fine for irrigators spraying on the street)	<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared Emergencies
<input type="checkbox"/> Limitations on turf areas (requiring lots to have 10% - 25% of the space in natural areas)	<input type="checkbox"/> New development

Regulations Utilized	When is it applied (in effect)?
	<input type="checkbox"/> Shoreland/zoning <input type="checkbox"/> Other
<input type="checkbox"/> Soil preparation requirements (after construction, requiring topsoil to be applied to promote good root growth)	<input type="checkbox"/> New Development <input type="checkbox"/> Construction Projects <input type="checkbox"/> Other
<input type="checkbox"/> Tree ratios (requiring a certain number of trees per square foot of lawn)	<input type="checkbox"/> New development <input type="checkbox"/> Shoreland/zoning <input type="checkbox"/> Other
<input type="checkbox"/> Permit to fill swimming pool and/or requiring pools to be covered (to prevent evaporation)	<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared Emergencies
<input type="checkbox"/> Ordinances that permit stormwater irrigation, reuse of water, or other alternative water use (Note: be sure to check current plumbing codes for updates)	<input type="checkbox"/> Describe

D. Retrofitting Programs

Education and incentive programs aimed at replacing inefficient plumbing fixtures and appliances can help reduce per capita water use, as well as energy costs. It is recommended that municipal water suppliers develop a long-term plan to retrofit public buildings with water efficient plumbing fixtures and appliances. Some water suppliers have developed partnerships with organizations having similar conservation goals, such as electric or gas suppliers, to develop cooperative rebate and retrofit programs.

A study by the AWWA Research Foundation (Residential End Uses of Water, 1999) found that the average indoor water use for a non-conserving home is 69.3 gallons per capita per day (gpcd). The average indoor water use in a conserving home is 45.2 gpcd and most of the decrease in water use is related to water efficient plumbing fixtures and appliances that can reduce water, sewer and energy costs. In Minnesota, certain electric and gas providers are required (Minnesota Statute 216B.241) to fund programs that will conserve energy resources and some utilities have distributed water efficient showerheads to customers to help reduce energy demands required to supply hot water.

Retrofitting Programs

Complete Table 30 by checking which water uses are targeted, the outreach methods used, the measures used to identify success, and any participating partners.

Table 30. Retrofitting programs (Select all that apply)

Water Use Targets	Outreach Methods	Partners
<input type="checkbox"/> Low flush toilets, <input type="checkbox"/> Toilet leak tablets, <input type="checkbox"/> Low flow showerheads, <input type="checkbox"/> Faucet aerators;	<input type="checkbox"/> Education about <input type="checkbox"/> Free distribution of <input type="checkbox"/> Rebate for <input type="checkbox"/> Other	<input type="checkbox"/> Gas company <input type="checkbox"/> Electric company <input type="checkbox"/> Watershed organization
<input checked="" type="checkbox"/> Water conserving washing machines, <input type="checkbox"/> Dish washers, <input type="checkbox"/> Water softeners;	<input type="checkbox"/> Education about <input type="checkbox"/> Free distribution of <input checked="" type="checkbox"/> Rebate for <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Gas company <input checked="" type="checkbox"/> Electric company <input type="checkbox"/> Watershed organization

Water Use Targets	Outreach Methods	Partners
<input checked="" type="checkbox"/> Rain gardens, <input checked="" type="checkbox"/> Rain barrels, <input type="checkbox"/> Native/drought tolerant landscaping, etc.	<input checked="" type="checkbox"/> Education about <input type="checkbox"/> Free distribution of <input type="checkbox"/> Rebate for <input type="checkbox"/> Other	<input type="checkbox"/> Gas company <input type="checkbox"/> Electric company <input checked="" type="checkbox"/> Watershed organization

Briefly discuss measures of success from the above table (e.g. number of items distributed, dollar value of rebates, gallons of water conserved, etc.):

E. Education and Information Programs

Customer education should take place in three different circumstances. First, customers should be provided information on how to conserve water and improve water use efficiencies. Second, information should be provided at appropriate times to address peak demands. Third, emergency notices and educational materials about how to reduce water use should be available for quick distribution during an emergency.

Proposed Education Programs

Complete Table 31 by selecting which methods are used to provide water conservation and information, including the frequency of program components. Select all that apply and add additional lines as needed.

Table 31. Current and Proposed Education Programs

Education Methods	General summary of topics	#/Year	Frequency
Billing inserts or tips printed on the actual bill	Yearly inserts included with billing materials	1	<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Consumer Confidence Reports	Yearly Consumer Confidence Reports prepared	1	<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Press releases to traditional local news outlets (e.g., newspapers, radio and TV)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Social media distribution (e.g., emails, Facebook, Twitter)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Paid advertisements (e.g., billboards, print media, TV, radio, web sites, etc.)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
Presentations to community groups			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Staff training			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Facility tours			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Displays and exhibits			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Marketing rebate programs (e.g., indoor fixtures & appliances and outdoor practices)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Community news letters			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Direct mailings (water audit/retrofit kits, showerheads, brochures)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Information kiosk at utility and public buildings	Information available at public works	N/A	<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Public service announcements			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Cable TV Programs			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Demonstration projects (landscaping or plumbing)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
K-12 education programs (Project Wet, Drinking Water Institute, presentations)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
Community events (children's water festivals, environmental fairs)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Community education classes			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Water week promotions			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Website (include address: http://www.ci.shorewood.mn.us/)	Water billing rates, wellhead protection information available, water conservation strategies and restrictions.		<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Targeted efforts (large volume users, users with large increases)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Notices of ordinances			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Emergency conservation notices			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Other:			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies

Briefly discuss what future education and information activities your community is considering in the future:

The City will consider incorporating water conservation and wellhead protection education at City events and in staff training.

PART 4. ITEMS FOR METROPOLITAN AREA COMMUNITIES

Minnesota Statute 473.859 requires WSPs to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process.



Much of the information in Parts 1-3 addresses water demand for the next 10 years. However, additional information is needed to address water demand through 2040, which will make the WSP consistent with the Metropolitan Land Use Planning Act, upon which the local comprehensive plans are based.

This Part 4 provides guidance to complete the WSP in a way that addresses plans for water supply through 2040.

A. Water Demand Projections through 2040

Complete Table 7 in Part 1D by filling in information about long-term water demand projections through 2040. Total Community Population projections should be consistent with the community's system statement, which can be found on the Metropolitan Council's website and which was sent to the community in September 2015.

Projected Average Day, Maximum Day, and Annual Water Demands may either be calculated using the method outlined in *Appendix 2* of the *2015 Master Water Supply Plan* or by a method developed by the individual water supplier.

B. Potential Water Supply Issues

Complete Table 10 in Part 1E by providing information about the potential water supply issues in your community, including those that might occur due to 2040 projected water use.

The [Master Water Supply Plan](#) provides information about potential issues for your community in *Appendix 1 (Water Supply Profiles)*. This resource may be useful in completing Table 10.

You may document results of local work done to evaluate impact of planned uses by attaching a feasibility assessment or providing a citation and link to where the plan is available electronically.

C. Proposed Alternative Approaches to Meet Extended Water Demand Projections

Complete Table 12 in Part 1F with information about potential water supply infrastructure impacts (such as replacements, expansions or additions to wells/intakes, water storage and treatment capacity, distribution systems, and emergency interconnections) of extended plans for development and redevelopment, in 10-year increments through 2040. It may be useful to refer to information in the community's local Land Use Plan, if available.

Complete Table 14 in Part 1F by checking each approach your community is considering to meet future demand. For each approach your community is considering, provide information about the amount of

future water demand to be met using that approach, the timeframe to implement the approach, potential partners, and current understanding of the key benefits and challenges of the approach.

As challenges are being discussed, consider the need for: evaluation of geologic conditions (mapping, aquifer tests, modeling), identification of areas where domestic wells could be impacted, measurement and analysis of water levels & pumping rates, triggers & associated actions to protect water levels, etc.

D. Value-Added Water Supply Planning Efforts (Optional)

The following information is not required to be completed as part of the local water supply plan, but completing this can help strengthen source water protection throughout the region and help Metropolitan Council and partners in the region to better support local efforts.

Source Water Protection Strategies

Does a Drinking Water Supply Management Area for a neighboring public water supplier overlap your community? Yes No

If you answered no, skip this section. If you answered yes, please complete Table 32 with information about new water demand or land use planning-related local controls that are being considered to provide additional protection in this area.

Table 32. Local controls and schedule to protect Drinking Water Supply Management Areas

Local Control	Schedule to Implement	Potential Partners
<input type="checkbox"/> None at this time		
<input checked="" type="checkbox"/> Comprehensive planning that guides development in vulnerable drinking water supply management areas	Wellhead Protection Plan; Comprehensive Plan update	City of Chanhassen, Eden Prairie, Excelsior, Minnetonka, and Tonka Bay
<input type="checkbox"/> Zoning overlay		
<input type="checkbox"/> Other:		

Technical assistance

From your community’s perspective, what are the most important topics for the Metropolitan Council to address, guided by the region’s Metropolitan Area Water Supply Advisory Committee and Technical Advisory Committee, as part of its ongoing water supply planning role?

- Coordination of state, regional and local water supply planning roles
- Regional water use goals
- Water use reporting standards
- Regional and sub-regional partnership opportunities
- Identifying and prioritizing data gaps and input for regional and sub-regional analyses
- Others: _____

GLOSSARY

Agricultural/Irrigation Water Use - Water used for crop and non-crop irrigation, livestock watering, chemigation, golf course irrigation, landscape and athletic field irrigation.

Average Daily Demand - The total water pumped during the year divided by 365 days.

Calcareous Fen - Calcareous fens are rare and distinctive wetlands dependent on a constant supply of cold groundwater. Because they are dependent on groundwater and are one of the rarest natural communities in the United States, they are a protected resource in MN. Approximately 200 have been located in Minnesota. They may not be filled, drained or otherwise degraded.

Commercial/Institutional Water Use - Water used by motels, hotels, restaurants, office buildings, commercial facilities and institutions (both civilian and military). Consider maintaining separate institutional water use records for emergency planning and allocation purposes. Water used by multi-family dwellings, apartment buildings, senior housing complexes, and mobile home parks should be reported as Residential Water Use.

Commercial/Institutional/Industrial (C/I/I) Water Sold - The sum of water delivered for commercial/institutional or industrial purposes.

Conservation Rate Structure - A rate structure that encourages conservation and may include increasing block rates, seasonal rates, time of use rates, individualized goal rates, or excess use rates. If a conservation rate is applied to multifamily dwellings, the rate structure must consider each residential unit as an individual user. A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

Date of Maximum Daily Demand - The date of the maximum (highest) water demand. Typically this is a day in July or August.

Declining Rate Structure - Under a declining block rate structure, a consumer pays less per additional unit of water as usage increases. This rate structure does not promote water conservation.

Distribution System - Water distribution systems consist of an interconnected series of pipes, valves, storage facilities (water tanks, water towers, reservoirs), water purification facilities, pumping stations, flushing hydrants, and components that convey drinking water and meeting fire protection needs for cities, homes, schools, hospitals, businesses, industries and other facilities.

Flat Rate Structure - Flat fee rates do not vary by customer characteristics or water usage. This rate structure does not promote water conservation.

Industrial Water Use - Water used for thermonuclear power (electric utility generation) and other industrial use such as steel, chemical and allied products, paper and allied products, mining, and petroleum refining.

Low Flow Fixtures/Appliances - Plumbing fixtures and appliances that significantly reduce the amount of water released per use are labeled "low flow". These fixtures and appliances use just enough water to be effective, saving excess, clean drinking water that usually goes down the drain.

Maximum Daily Demand - The maximum (highest) amount of water used in one day.

Metered Residential Connections - The number of residential connections to the water system that have meters. For multifamily dwellings, report each residential unit as an individual user.

Percent Unmetered/Unaccounted For - Unaccounted for water use is the volume of water withdrawn from all sources minus the volume of water delivered. This value represents water "lost" by miscalculated water use due to inaccurate meters, water lost through leaks, or water that is used but unmetered or otherwise undocumented. Water used for public services such as hydrant flushing, ice skating rinks, and public swimming pools should be reported under the category "Water Supplier Services".

Population Served - The number of people who are served by the community's public water supply system. This includes the number of people in the community who are connected to the public water supply system, as well as people in neighboring communities who use water supplied by the community's public water supply system. It should not include residents in the community who have private wells or get their water from neighboring water supply.

Residential Connections - The total number of residential connections to the water system. For multifamily dwellings, report each residential unit as an individual user.

Residential Per Capita Demand - The total residential water delivered during the year divided by the population served divided by 365 days.

Residential Water Use - Water used for normal household purposes such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. Should include all water delivered to single family private residences, multi-family dwellings, apartment buildings, senior housing complexes, mobile home parks, etc.

Smart Meter - Smart meters can be used by municipalities or by individual homeowners. Smart metering generally indicates the presence of one or more of the following:

- Smart irrigation water meters are controllers that look at factors such as weather, soil, slope, etc. and adjust watering time up or down based on data. Smart controllers in a typical summer will reduce water use by 30%-50%. Just changing the spray nozzle to new efficient models can reduce water use by 40%.
- Smart Meters on customer premises that measure consumption during specific time periods and communicate it to the utility, often on a daily basis.
- A communication channel that permits the utility, at a minimum, to obtain meter reads on demand, to ascertain whether water has recently been flowing through the meter and onto the premises, and to issue commands to the meter to perform specific tasks such as disconnecting or restricting water flow.

Total Connections - The number of connections to the public water supply system.

Total Per Capita Demand - The total amount of water withdrawn from all water supply sources during the year divided by the population served divided by 365 days.

Total Water Pumped - The cumulative amount of water withdrawn from all water supply sources during the year.

Total Water Delivered - The sum of residential, commercial, industrial, institutional, water supplier services, wholesale and other water delivered.

Ultimate (Full Build-Out) - Time period representing the community's estimated total amount and location of potential development, or when the community is fully built out at the final planned density.

Unaccounted (Non-revenue) Loss - See definitions for "percent unmetered/unaccounted for loss".

Uniform Rate Structure - A uniform rate structure charges the same price-per-unit for water usage beyond the fixed customer charge, which covers some fixed costs. The rate sends a price signal to the customer because the water bill will vary by usage. Uniform rates by class charge the same price-per-unit for all customers within a customer class (e.g. residential or non-residential). This price structure is generally considered less effective in encouraging water conservation.

Water Supplier Services - Water used for public services such as hydrant flushing, ice skating rinks, public swimming pools, city park irrigation, back-flushing at water treatment facilities, and/or other uses.

Water Used for Nonessential Purposes - Water used for lawn irrigation, golf course and park irrigation, car washes, ornamental fountains, and other non-essential uses.

Wholesale Deliveries - The amount of water delivered in bulk to other public water suppliers.

Acronyms and Initialisms

AWWA – American Water Works Association
C/I/I – Commercial/Institutional/Industrial
CIP – Capital Improvement Plan
GIS – Geographic Information System
GPCD – Gallons per capita per day
GWMA – Groundwater Management Area – North and East Metro, Straight River, Bonanza,
MDH – Minnesota Department of Health
MGD – Million gallons per day

MG – Million gallons
MGL – Maximum Contaminant Level
MnTAP – Minnesota Technical Assistance Program (University of Minnesota)
MPARS – MN/DNR Permitting and Reporting System (new electronic permitting system)
MRWA – Minnesota Rural Waters Association
SWP – Source Water Protection
WHP – Wellhead Protection

APPENDICES TO BE SUBMITTED BY THE WATER SUPPLIER

Appendix 1: Well records and maintenance summaries

Go to [Part 1C](#) for information on what to include in appendix

Appendix 2: Water level monitoring plan

Go to [Part 1E](#) for information on what to include in appendix

Appendix 3: Water level graphs for each water supply well

Go to [Part 1E](#) for information on what to include in appendix

Appendix 4: Capital Improvement Plan

Go to [Part 1E](#) for information on what to include in appendix

Appendix 5: Emergency Telephone List

Go to [Part 2C](#) for information on what to include in appendix

Appendix 6: Cooperative Agreements for Emergency Services

Go to [Part 2C](#) for information on what to include in appendix

Appendix 7: Municipal Critical Water Deficiency Ordinance

Go to [Part 2C](#) for information on what to include in appendix

Appendix 8: Graph of Ten Years of Annual Per Capita Water Demand for Each Customer Category

Go to [Objective 4 in Part 3B](#) for information on what to include in appendix

Appendix 9: Water Rate Structure

Go to [Objective 6 in Part 3B](#) for information on what to include in appendix

Appendix 10: Ordinances or Regulations Related to Water Use

Go to [Objective 7 in Part 3B](#) for information on what to include in appendix

Appendix 11: Implementation Checklist

Provide a table that summarizes all the actions that the public water supplier is doing, or proposes to do, with estimated implementation dates.

Appendix 12: Sources of Information for Table 10

Provide links or references to the information used to complete Table 10. If the file size is reasonable, provide source information as attachments to the plan.

Appendix 1

Well Records and Maintenance Summaries

232331

County Hennepin
 Quad Excelsior
 Quad ID 105A

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 08/24/1991
 Update Date 06/11/2015
 Received Date

Well Name SHOREWOOD 1	Township 117	Range 23	Dir Section W 25	Subsection BCDDAB	Well Depth 528 ft.	Depth Completed 528 ft.	Date Well Completed 09/21/1973
Elevation 985 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Cable Tool	Drill Fluid	
Address					Use community supply(municipal)	Status Active	
Contact 5755 COUNTRY CLUB RD SHOREWOOD MN 55331					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/> From To		
Well KNIGHTS BRIDGE RD SHOREWOOD MN 55331					Casing Type Step down Joint		
Stratigraphy Information					Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/> Above/Below		
Geological Material	From	To (ft.)	Color	Hardness	Casing Diameter Weight		
SAND & GRAVEL	0	16			16 in. To	244 ft.	lbs./ft.
CLAY	16	38			20 in. To	204 ft.	lbs./ft.
SAND & GRAVEL	38	193					
CLAY-SILTY	193	234					
SHALE & SANDROCK-	234	280					
LIMEROCK SHAKOPEE-	280	435					
JORDAN SANDROCK	435	524					
ST. LAWRENCE SHALE	524	528					
					Open Hole From 244 ft. To 528 ft.		
					Screen? <input type="checkbox"/> Type Make		
					Static Water Level		
					114 ft. land surface Measure 09/21/1973		
					Pumping Level (below land surface)		
					117 ft. hrs. Pumping at 700 g.p.m.		
					Wellhead Completion		
					Pitless adapter manufacturer Model		
					<input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade		
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
					Nearest Known Source of Contamination		
					feet Direction Type		
					Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input type="checkbox"/> Not Installed Date Installed		
					Manufacturer's name		
					Model Number HP Volt		
					Length of drop pipe ft Capacity g.p. Typ		
					Abandoned		
					Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Variance		
					Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Miscellaneous		
					First Bedrock St.Peter Sandstone Aquifer Prairie Du Chien-		
					Last Strat St.Lawrence Formation Depth to Bedrock 234 ft		
					Located by Minnesota Department of Health		
					Locate Method GPS SA Off (averaged)		
					System UTM - NAD83, Zone 15, Meters X 457484 Y 4973547		
					Unique Number Verification Information from Input Date 01/01/1990		
					Angled Drill Hole		
					Well Contractor		
					Bergerson-Caswell 27058		
					Licensee Business Lic. or Reg. No. Name of Driller		

171020

County Hennepin
 Quad Mound
 Quad ID 105B

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 08/24/1991
 Update Date 02/10/2016
 Received Date

Well Name SHOREWOOD 4	Township 117	Range 23	Dir Section W 31	Subsection DBCDBC	Well Depth 640 ft.	Depth Completed 640 ft.	Date Well Completed 03/18/1981
Elevation 945 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Non-specified Rotary	Drill Fluid	
Address					Use community supply(municipal)	Status Active	
Contact 5755 COUNRTY CLUB RD SHOREWOOD MN 55331					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/> From To		
Well SHOREWOOD MN 55331					Casing Type Single casing Joint Welded		
Stratigraphy Information					Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/> Above/Below 2 ft.		
Geological Material	From	To (ft.)	Color	Hardness	Casing Diameter	Weight	Hole Diameter
CLAY	0	6	YELLOW		12 in. To	398 ft. 49.5 lbs./ft.	12 in. To 640 ft.
CLAY & GRAVEL	6	41	YELLOW				
GRAVEL & SOME BIND	41	59	DK. GRY				
CLAY & GRAVEL	59	65	GRAY				
BOULDER	65	70	BLACK				
CLAY & GRAVEL 50	70	130	GRAY				
CLAY & GRAVEL 70	130	137	GRAY				
BOULDERS & ROCKS	137	139	DARK				
SAND	139	142	VARIED				
ROCKS	142	144	DARK				
SAND & GRAVEL	144	190	VARIED				
GRAVEL	190	208	DARK				
GRAVEL & CLAY	208	240	GRAY				
GRAVEL	240	260	VARIED				
GRAVEL	260	300	GRAY				
BROKEN SANDSTONE	300	309	GRAY				
MUSHY CLAY &	309	311	GRAY				
BROKEN SANDSTONE	311	335	WHITE				
SANDSTONE	335	341	TAN				
SANDSTONE WHITE &	341	360	WHT/TAN				
SANDSTONE	360	365	WHITE				
PINK SANDSTONE &	365	371	PNK/BLU				
SANDSTONE & SHALE	371	381	WHITE				
SANDSTONE	381	399	PINK				
SANDSTONE & SHALE	399	400	GRN/WHT				
SANDSTONE & SHALE	400	415	GRN/WHT				
FRANCONIA	415	435					
FRANCONIA	435	581					
IRONTON GALESVILLE	581	629	WHITE				
IRONTON GALESVILLE	629	640	WHITE				
SANDSTONE & SHALE	640	640					
Remarks					Open Hole From 398 ft. To 640 ft.		
BOULDER BRIDGE WELL A.					Screen? <input type="checkbox"/> Type Make		
M.G.S. NO. 1735. GAMMA LOGGED 3-20-1981.					Static Water Level		
					64 ft. land surface Measure 06/01/1988		
					Pumping Level (below land surface)		
					100 ft. 20 hrs. Pumping at 750 g.p.m.		
					Wellhead Completion		
					Pitless adapter manufacturer BAKER Model		
					<input type="checkbox"/> Casing Protection <input checked="" type="checkbox"/> 12 in. above grade		
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
					Material Amount From To		
					neat cement 11 Cubic yards 0 ft. 398 ft.		
					Nearest Known Source of Contamination		
					feet Direction Type		
					Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input type="checkbox"/> Not Installed Date Installed		
					Manufacturer's name		
					Model Number HP Volt		
					Length of drop pipe ft Capacity g.p. Typ Turbine		
					Abandoned		
					Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Variance		
					Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Miscellaneous		
					First Bedrock St.Lawrence Formation Aquifer Tunnel City-		
					Last Strat Eau Claire Formation Depth to Bedrock 400 ft		
					Located by Minnesota Department of Health		
					Locate Method GPS SA On (averaged)		
					System UTM - NAD83, Zone 15, Meters X 449923 Y 4971598		
					Unique Number Verification Information from Input Date 10/01/1999		
					Angled Drill Hole		
					Well Contractor		
					Renner E.H. & Sons 02015		
					Licensee Business Lic. or Reg. No. Name of Driller		

122298

County Hennepin
 Quad Excelsior
 Quad ID 105A

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 08/24/1991
 Update Date 06/11/2015
 Received Date

Well Name SHOREWOOD 6	Township 117	Range 23	Dir Section W 25	Subsection CBAADB	Well Depth 326 ft.	Depth Completed 326 ft.	Date Well Completed 11/00/1982
Elevation 978 ft.	Elev. Method LiDAR 1m DEM (MNDNR)				Drill Method Non-specified Rotary	Drill Fluid	
Address					Use community supply(municipal)	Status Active	
Contact 5755 COUNTRY CLUB RD SHOREWOOD MN 55331					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/> From To		
Well SHOREWOOD MN 55331					Casing Type Single casing Joint Welded		
Stratigraphy Information					Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Above/Below 1 ft.		
Geological Material	From	To (ft.)	Color	Hardness	Casing Diameter Weight Hole Diameter		
CLAY	0	21	BROWN		8 in. To	276 ft. 28.5 lbs./ft.	8 in. To 326 ft.
SAND	21	47	VARIED				
SAND WITH CLAY	47	57	GRAY				
SAND & GRAVEL	57	111	VARIED				
FINE SAND	111	167	BROWN				
COARSE SAND	167	169	VARIED				
FINE SAND	169	190	BROWN				
CLAY & FINE SAND	190	195	GRAY				
CLAY	195	232	GRAY				
SHALE	232	243	GREEN				
ST. PETER	243	274	RED/GRN				
SHAKOPEE	274	281	RED				
SHAKOPEE &	281	299	GRAY				
SHAKOPEE	299	326	RED/GRY				
					Open Hole From 276 ft. To 326 ft.		
					Screen? <input type="checkbox"/> Type Make		
					Static Water Level		
					117 ft. land surface Measure 11/00/1982		
					Pumping Level (below land surface)		
					136 ft. 8 hrs. Pumping at 330 g.p.m.		
					Wellhead Completion		
					Pitless adapter manufacturer Model		
					<input type="checkbox"/> Casing Protection <input checked="" type="checkbox"/> 12 in. above grade		
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
					Material Amount From To		
					neat cement 0 ft. 276 ft.		
					Nearest Known Source of Contamination		
					feet Direction Type		
					Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input type="checkbox"/> Not Installed Date Installed 12/00/1982		
					Manufacturer's name NATIONAL		
					Model Number S6LC6A HP 10 Volt 230		
					Length of drop pipe 147 ft Capacity 100 g.p. Typ Submersible		
					Abandoned		
					Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Variance		
					Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Miscellaneous		
					First Bedrock St.Peter Sandstone Aquifer Prairie Du Chien		
					Last Strat Prairie Du Chien Group Depth to Bedrock 243 ft		
					Located by Minnesota Department of Health		
					Locate Method Digitization (Screen) - Map (1:24,000)		
					System UTM - NAD83, Zone 15, Meters X 457471 Y 4973392		
					Unique Number Verification Information from Input Date 01/01/1990		
					Angled Drill Hole		
					Well Contractor		
					Renner E.H. & Sons 02015 RENNER, R.		
					Licensee Business Lic. or Reg. No. Name of Driller		

242150

County Hennepin
 Quad Excelsior
 Quad ID 105A

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 03/25/1992
 Update Date 11/20/2017
 Received Date

Well Name GALPINS LAKE	Township 117	Range 23	Dir Section W 34	Subsection DAABDA	Well Depth 468 ft.	Depth Completed 362 ft.	Date Well Completed 12/03/1938
Elevation 945 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Cable Tool	Drill Fluid	
Address					Use observation well	Status Active	
Stratigraphy Information					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/>	From	To
Geological Material	From	To (ft.)	Color	Hardness	Casing Type Single casing <input type="checkbox"/> Joint <input type="checkbox"/>		
LOAM	0	1			Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/> Above/Below		
SANDY CLAY	1	20	YELLOW		Casing Diameter 6 in. To 199 ft. lbs./ft.		
SANDY CLAY	20	30	BLUE		Open Hole From 199 ft. To 362 ft.		
BLUE CLAY MIXED	30	35			Screen? <input type="checkbox"/> Type Make		
SANDY CLAY	35	55	BLUE		Static Water Level 65 ft. land surface Measure 01/09/1939		
SAND AND COARSE	55	115			Pumping Level (below land surface)		
FINE SAND AND	115	120			Wellhead Completion Pitless adapter manufacturer Model		
FINE SAND SOME	120	130			<input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade		
VERY FINE SAND	130	180			<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
FINE SAND	180	190			Grouting Information Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
SAND AND GRAVEL	190	195			Nearest Known Source of Contamination feet Direction Type		
LIMESTONE	195	204			Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No		
SANDSTONE AND	204	261			Pump <input type="checkbox"/> Not Installed Date Installed		
LIMESTONE	261	264			Manufacturer's name		
LIMESTONE AND SAND	264	270			Model Number HP \bar{Q} Volt		
LIMESTONE	270	350			Length of drop pipe ft Capacity g.p. Typ		
JORDAN SANDSTONE	350	460			Abandoned Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
SANDY SHALE	460	468			Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Remarks CASING DEPTH/OPEN HOLE LENGTH FROM DNR COOPERATIVE GROUNDWATER MONITORING SITE					Miscellaneous First Bedrock Prairie Du Chien Group Aquifer St.Peter-Jordan Last Strat St.Lawrence Formation Depth to Bedrock 195 ft Located by Minnesota Geological Survey Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table) System UTM - NAD83, Zone 15, Meters X 455369 Y 4971760 Unique Number Verification Information from Input Date 01/01/1990		
Angled Drill Hole					Well Contractor Layne Well Co. 27010 Licensee Business Lic. or Reg. No. Name of Driller		
Minnesota Well Index Report				242150	Printed on 03/22/2018 HE-01205-15		

Appendix 2

Water Level Monitoring Plan

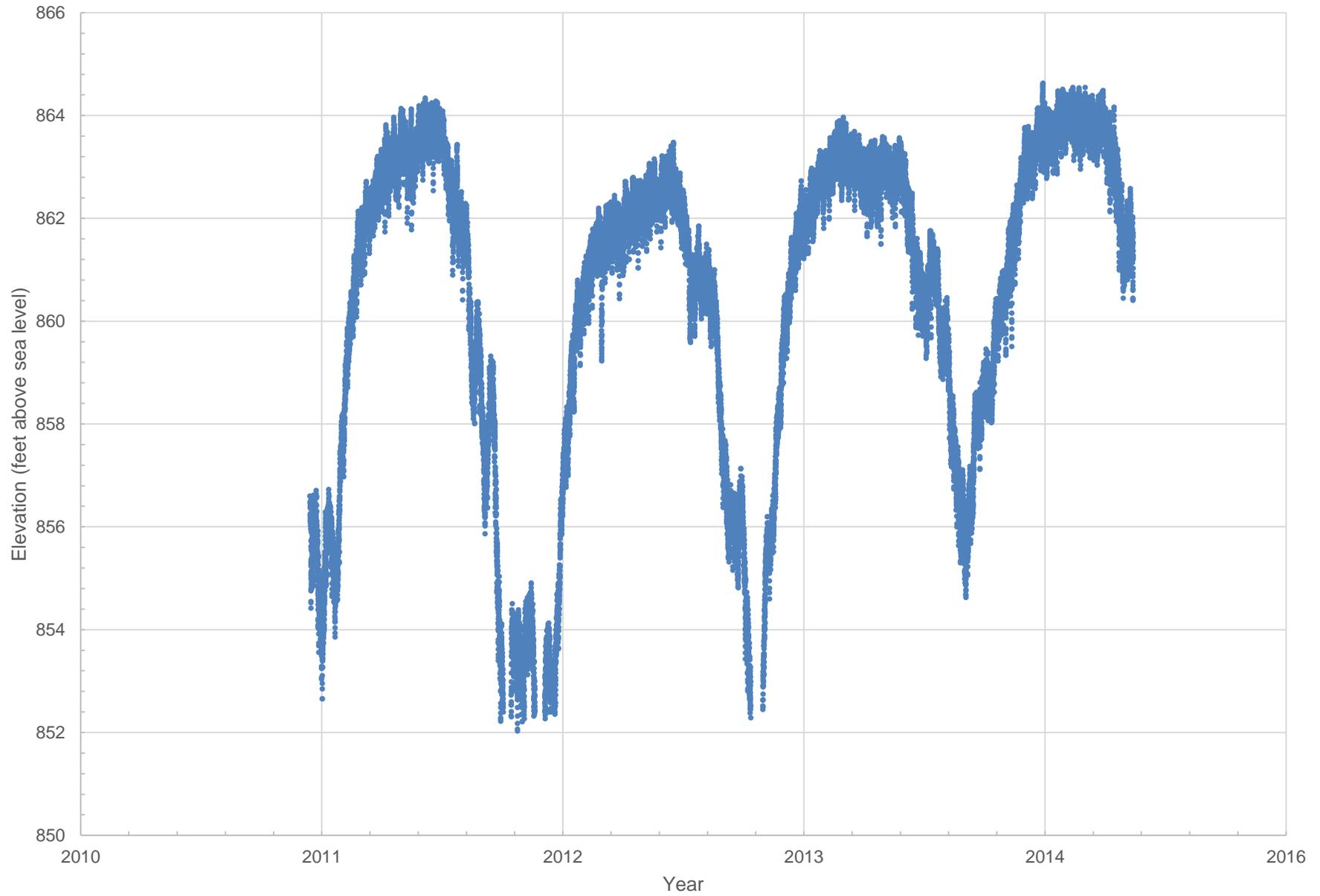
City of Shorewood Future Water Level Monitoring Plan

Source	Monitoring Type	Frequency
Well 1	SCADA	Continuous
Well 3	SCADA	Continuous
Well 4	SCADA	Continuous
Well 5	SCADA	Continuous
Well 6	SCADA	Continuous
Well 7	SCADA	Continuous

Appendix 3

Water Level Graphs for Production and Observation Wells

DNR Observation Well (Unique Well ID 242150)



Appendix 4

Capital Improvements Plan

City of Shorewood, Minnesota
Capital Improvement Program
 2016 thru 2025

PROJECTS BY FUNDING SOURCE

Source	#	Priority	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
--------	---	----------	------	------	------	------	------	------	------	------	------	------	-------

402 - Park Improvements

Freeman Plaza	P0100	5				5,000							5,000
Freeman North Playground Equipment	P0102	4					100,000						100,000
Freeman South Parking Lot	P0103	5		60,000									60,000
Freeman Skating Lights, Warning House & Grading	P0104	5		40,000									40,000
Freeman Park - Eddy Station	P0108	4							3,000				3,000
Caticart Park - Resurface Tennis/Basketball Courts	P0200	1			9,000			9,000					28,000
Caticart Park Hockey Boards	P0201	3					150,000						150,000
Caticart Park Tot Lot	P0202	5			100,000								100,000
Badger Park - Phase I	P0300	3	640,000	400,000									1,040,000
Badger Park Tennis Courts	P0301	2			200,000			9,500					219,500
Badger Park - Phase 2	P0302	n/a				747,000					10,000		747,000
Manor Park - Shelter Outside Floor & Stoops	P0402	1					5,400						5,400
Silverwood Park-Resurface 1/2 court	P0500	2			2,500			2,500					8,000
Silverwood Park Equipment	P0501	3									3,000		100,000
Skate Park Rehab for Pickleball	P0600	3		50,000									100,000
402 - Park Improvements Total			640,000	550,000	311,500	752,000	255,400	21,000	3,000	100,000	23,000		2,655,900

403 - Equipment Replacement Fund

UTV - replace unit 34	034	5					14,100						14,100
Tractor - Ford 3910	035	5		55,300									55,300
Flatbed - 4 x 2 Replace unit 49	049	5			39,200								39,200
Loader - Cat 930H	056	5											210,400
Trailer 18' replace unit 59	059	5					15,700						15,700
Sand Pro 3000 - replace Unit 64	064	2				9,000							9,000
Trailer 12' replace unit 69	069	5					5,000						5,000

Source	#	Priority	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Generator - Generac 163 KW	071	5											75,600
Groundmaster Mower- Toro 328D - replace unit 75	075	2		27,100							32,300	75,600	59,400
Pickup 4x4 - Replace Unit 76	076	3			27,800								27,800
Pickup - 350 4x4 replace unit 81	081	5	30,400										30,400
Mower - Replace Unit 86	086	4											32,000
2010 4x4 Ford F350	090	5					33,600						33,600
Pickup 350 4x4 - replace unit 91	091	5							39,500				39,500
Dump Truck - Freightliner	092	5											221,200
Groundmaster Mower replace unit 93	093	5		28,000								35,000	63,000
Loader - Cat 930H	094	5											250,000
Skid Steer - replace unit 97	097	5						37,600					37,600
Boom Truck	100	5	84,000										84,000
Chipper	101	5	45,000										45,000
MultiOne Trail Machine	103	1	54,900										54,900
Wash Bay	104	1	18,000										18,000
Cab for mower - replace A02	A02	3			7,600								7,600
Ag Tractor & Flail Mower	A06	4		41,200									41,200
Attach - Plow for Groundmaster	A08	4			6,200								6,200
Engine/Transmission Analysis Station	A09	n/a			4,500								4,500
Replace Sander	A10	3				9,500							9,500
Plow Blade & Snow Kit for Skid Steer	A11	3											4,700
Broom Attachment - Skid Steer replace A13	A13	5	5,600										5,600
Broom Attachment for MultiOne	A14	5	3,700										3,700
South Shore Community Center	PF-11-01	n/a	2,500	43,000	41,000			2,000					88,500
Public Works Roof	PF-12-01	n/a											81,000
City Hall LED Lighting	PF-16-01	n/a	38,000			81,000							38,000
Color Copier Replacement	T-13-03	2	20,000					10,000					20,000
Building Permit Software	T-16-01	2											29,400
800 Mhz Radio Replacement	T-19-01	2				9,500	9,800	10,100					29,400
Computer Upgrades	T-99-99	1	10,000	10,000	10,000	10,000	10,000	10,000					80,000
403 - Equipment Replacement Fund Total			312,100	204,600	136,300	119,000	88,200	101,700	54,500	475,100	67,300	296,800	1,855,600

404 - Street Reconstruction Fund

Summit Avenue	LR-15-06	5		32,000									32,000
Amlee Road	LR-16-01	5											332,000
													332,000

Source	#	Priority	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Garden Road	LR-16-02	5	42,000										42,000
Gillette Curve	LR-16-03	5	35,000										35,000
Manitou Lane	LR-16-04	5						317,000					317,000
McKinley Place N & S	LR-16-05	5	65,000										65,000
Shady Hills Circle	LR-16-06	5	51,000										51,000
Glen Road East	LR-16-07	5						1,024,000					1,024,000
Lake Linden Dr - Guardrail	LR-16-08	5	30,000										30,000
Excelsior Blvd - Guardrail	LR-16-09	5	15,000										15,000
Echo Road	LR-17-01	5		71,000									71,000
Howards Point Road	LR-17-02	5		180,000									180,000
Kathleen Court	LR-17-03	5		22,000									22,000
Oak Ridge Circle	LR-17-04	5		29,000									29,000
Riviera Lane	LR-17-05	5		371,000									371,000
Shorewood Lane	LR-17-06	5		455,000									455,000
Mann Lane	LR-18-01	5		444,000									444,000
Maple Street	LR-18-02	5		100,000									100,000
Bayswater Road	LR-19-01	5				100,000							100,000
Boulder Circle	LR-19-02	5				49,000							49,000
Christmas Lane W	LR-19-03	5				32,000							32,000
Lilac Lane	LR-19-05	5			1,140,000	46,000							1,186,000
Strawberry Lane & W 62nd	LR-19-06	5											
Vine Street	LR-19-07	5				33,000							33,000
Eureka Road N	LR-19-08	5				260,000							260,000
Birch Bluff Road	LR-20-01	5					107,000						107,000
Excelsior Blvd	LR-20-02	5				19,000							19,000
Seamans Drive	LR-20-03	5				629,000							629,000
West Lane	LR-20-04	5				32,000							32,000
Christmas Lane E	LR-21-01	5					21,000						21,000
Christmas Lake Road	LR-21-02	5					107,000						107,000
Country Club Road	LR-21-03	5					95,000						95,000
Chestnut Court & Chestnut Terrace	LR-22-01	5						58,000					58,000
Murray St	LR-22-02	5						82,000					82,000
Rampart Ct	LR-22-03	5						24,000					24,000
Silver Lake Trail	LR-22-04	5						47,000					47,000
Smithtown Circle	LR-22-05	5						25,000					25,000
Shady Island Circle, Point & Road	LR-23-01	5	116,000										116,000
Shady Island Trail	LR-23-02	5	128,000										128,000
Sywan Lane	LR-23-03	5								28,000			28,000

Source	#	Priority	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Wild Rose Lane E & W	LR-23-04	5								842,000			842,000
Dellwood Lane	LR-24-01	5		42,000									42,000
Enchanted Cove	LR-24-02	5		24,000									24,000
Enchanted Drive	LR-24-03	5		72,000									72,000
Enchanted Lane	LR-24-04	5		127,000									127,000
Street Sign Replacement	LR-99-001	2	7,200	7,500	7,800	8,100	8,400	8,700	9,000	9,300	9,600		75,800
Maintenance-Bituminous Sealcoating	LR-99-100	1	245,000	184,000	238,000	305,000	274,000	255,000	248,000	275,000	323,000		2,347,000
404 - Street Reconstruction Fund Total			490,200	1,860,500	1,929,800	833,100	1,069,400	2,159,700	493,000	1,154,300	332,600		10,322,600

405 - MSA Road Reconstruction Fund

Vine Hill Road Intersection Improvements	MSA-1701	n/a		200,000									200,000
05 - MSA Road Reconstruction Fund Total				200,000									200,000

406 - Trails

Galpin Lake Rd Sidewalk	7003	1			1,330,000								1,330,000
Mill Street Trail	7004	1									735,000		735,000
From 744 to Chanhassen Trail	7005	1									123,750		123,750
Smithtown from Co Rd 19 to Regional Trail	7006	1	1,340,000										1,340,000
Strawberry Lane & W 62nd	7007	1			852,000								852,000
County Road 19 from Pub Works to Excessor	7008	1							472,500				472,500
St. Albans Bay Rd	7009	1								405,000			405,000
Edgewood Road	7010	1								855,000			855,000
Grant Lorenz - Edgewood to Smithtown	7011	1								596,250			596,250
Howards Point Road - Smithtown to Edgewood	7012	1								900,000			900,000
Vine Hill Road - Waterford to Hwy 7	7013	1								596,250			596,250
County Club Rd - Smithtown to Yellowstone	7014	1								517,500			517,500
406 - Trails Total			1,340,000		2,182,000					4,583,750	517,500		8,723,250

601 - Water Fund

Air Compressor-Replace unit 38	038	3									20,000		20,000
Dump Truck - replace unit 72	072	5									90,450		90,450
Utility Truck w/crane & toolbox replace unit 76	076	5	40,000										40,000

Source	#	Priority	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Utility Vehicle - replace unit 77	077	4	18,700										18,700
Pick-up - 4 x 4 150 Replace Unit 80	080	5											18,700
Radio/ISP Communications System	W-10-01	1	80,000										27,500
Boulder Bridge Well Controls	W-12-03	5	175,000										80,000
SE Well - Exterior & Compressor	W-16-01	3	45,000										175,000
Boulder Bridge Building	W-17-01	3		85,000									45,000
Well House Water Meters	W-17-02	3		12,000	6,000	12,000	6,000						85,000
SE Well Dehumidifier	W-17-03	3		5,000									36,000
Boulder Bridge Well Motor	W-18-01	3			45,000								5,000
Boulder Bridge Daumidifier	W-19-01	3				5,000							45,000
601 - Water Fund Total			358,700	192,450	51,000	44,500	6,000	20,000					672,650

611 - Sanitary Sewer Fund													
Sewer Jetter - replace unit 60	080	5	140,000										140,000
Dump Truck - replace unit 72	072	5		90,450									90,450
Utility Truck w/crane & toolbox replace unit 76	076	5	60,000										60,000
Radio/ISP Communications - Lift Station Retrofit	SS-10-10	1	32,000										60,000
Lift Station 11 Rehab - 20465 Radisson Rd.	SS-13-01	3	190,000	81,000									32,000
Lift Station 10 Rehab - 4773 Lakeway Terrace	SS-15-01	3		90,000	5,000								190,000
Lift Station 20 Rehab - 26550 Noble Road	SS-16-01	3				135,000							90,000
Lift Station 7 Rehab - 5600 Woodside Road	SS-16-02	3			120,000								135,000
Lift Station 18 Rehab - 4996 Shady Island Point	SS-17-01	3		10,000									120,000
Infiltration and Inflow Reduction	SS-99-05	1	70,000										90,000
611 - Sanitary Sewer Fund Total			492,000	260,450	190,000	205,000	70,000	70,000	70,000	70,000	70,000	70,000	1,497,450

631 - Stormwater Management Fund													
4" pump replace unit 50	050	5											45,500
Galpin Lake Rd Trail Stormwater	SS003	1											230,000
Ambee Road	STM-16-01	4											45,500
Manitou Lane	STM-16-02	4											78,000
Glen Road East	STM-16-03	4											75,000
Riveria Lane	STM-17-01	4		87,000									75,000
Shorewood Lane	STM-17-02	4		99,000									241,000
													87,000
													99,000

Source	#	Priority	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Mann Lane	STM-18-01	4			105,000								105,000
Maple St	STM-18-02	4			24,000								24,000
Eureka Road N	STM-19-01	4				452,000							452,000
Strawberry & W 62nd	STM-19-02	4			283,000								283,000
Seamans Drive	STM-20-01	4					148,000						148,000
Rampart Ct Drainage	STM-22-01	1							11,880				11,880
631 - Stormwater Management Fund Total			186,000	642,000	452,000	193,500	394,000	11,880					1,879,380
GRAND TOTAL			3,633,000	3,454,000	5,442,600	2,405,600	1,682,500	2,766,400	632,380	1,799,400	5,176,650	814,300	27,806,830

Appendix 5
Emergency Telephone List

Emergency Telephone List City of Shorewood

Emergency Response Team	Name	Work Telephone	Alternate Telephone
Emergency Response Lead	Larry Brown	952-960-7913	
Alternate Emergency Response Lead			
Water Operator			
Alternate Water Operator			
Public Communications	Julie Moore	952-960-7906	

State and Local Emergency Response Contacts	Name	Work Telephone	Alternate Telephone
State Incident Duty Officer	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
County Emergency Director	Hennepin County	612-596-0250	
National Guard	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
Mayor/Board Chair	Scott Zerby		
Fire Chief	Scott Gerber	952-960-1650	
Sheriff			
Police Chief	Mike Meehan	952-474-3261	
Ambulance	Ridgeview Medical Center	911	
Hospital	Ridgeview Medical Center	911	
Doctor or Medical Facility	Ridgeview Medical Center	952-442-2191	

State and Local Agencies	Name	Work Telephone	Alternate Telephone
MDH District Engineer	James Loveland	651-201-3710	
MDH	Drinking Water Protection	651-201-4700	
State Testing Laboratory	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
MPCA	Chuck Regan	651-757-2866	
DNR Area Hydrologist	Kate Drewry	651-259-5753	
County Water Planner	Joel Settles	612-348-6157	

Utilities	Name	Work Telephone	Alternate Telephone
Electric Company	Xcel Energy	1-800-895-4999	
Gas Company	CenterPoint Energy	612-372-4727	
Telephone Company			
Gopher State One Call	Utility Locations	800-252-1166	651-454-0002
Highway Department			

Mutual Aid Agreements	Name	Work Telephone	Alternate Telephone
Neighboring Water System	Chanhassen – Paul Oehme	952-227-1169	
Neighboring Water System	Minnetonka – Jim Malone	952-988-8410	
Emergency Water Connection	Chanhassen – Paul Oehme	952-227-1169	
Emergency Water Connection	Minnetonka – Jim Malone	952-988-8410	
Materials			

Technical/Contracted Services/Supplies	Name	Work Telephone	Alternate Telephone
MRWA Technical Services	MN Rural Water Association	800-367-6792	
Well Driller/Repair	E.H. Renner	763-427-6100	
Pump Repair			
Electrician			
Plumber			
Backhoe			
Chemical Feed			

Meter Repair			
Generator			
Valves			
Pipe & Fittings			
Water Storage			
Laboratory			
Engineering firm	WSB & Associates, Inc. Paul Hornby	952-960-7910	

Communications	Name	Work Telephone	Alternate Telephone
News Paper	Lakeshore Weekly News	952-843-0890	
Radio Station	MPR	651-290-1500	
School Superintendent	Dennis Peterson	952-401-5004	
Property & Casualty Insurance			

Critical Water Users	Name	Work Telephone	Alternate Telephone
Hospital Critical Use:	Ridgeview Medical Center	952-442-2191	
Nursing Home Critical Use:	BeeHive Homes of Excelsior	952-300-3275	
Public Shelter Critical Use:	Crisis Nursery	763-591-0400	

Appendix 6

Cooperative Agreements for Emergency Services

(No formal intercommunity agreements exist at this time.)

Appendix 7

Municipal Critical Water Deficiency Ordinance

City of Shorewood Critical Water Deficiency Ordinances

903.11 AUTHORIZED WATER SHUT OFFS.

In case of fire or alarm of fire, water may be shut off to insure a supply for the fire fighting; or in making repairs or construction of new works, water may be shut off at any time and kept shut off as long as necessary.

903.12 CONSERVATION MEASURES.

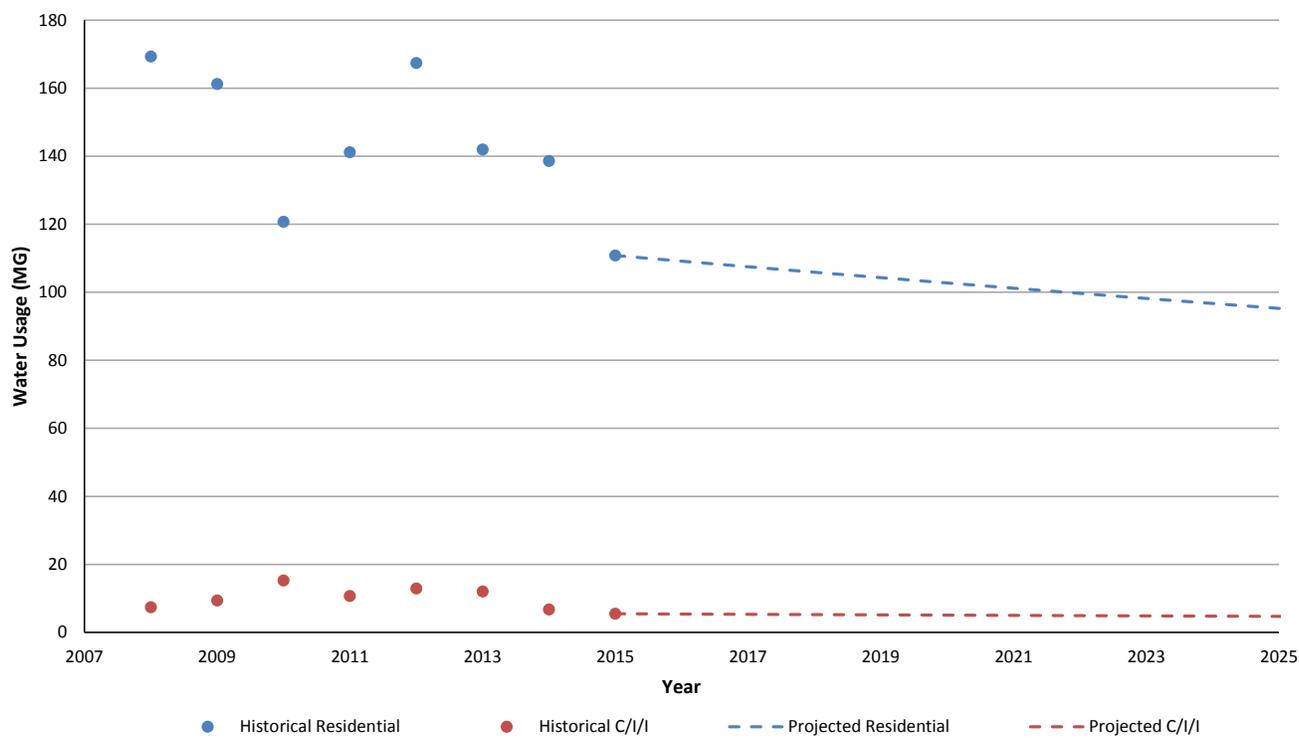
Subd. 1. Whenever the City Council shall determine that a shortage of water supply threatens the city, it may, by resolution, limit the time and hours during which water may be used from the water system for lawn and garden sprinkling, irrigation, car washing and other uses specified therein. Appropriate notice of the limitation shall be given prior to the enforcement thereof.

Subd. 2. To conserve water resources, prevent the wasteful and harmful effects of sprinkling during midday hours, and allow the city's water system adequate opportunity to replenish the water supply in the city's water storage tanks, certain limitations must be placed on the use of the city's water supply. During the period of May 1 through September 30 of any year, a person may only sprinkle or irrigate lawns, sod, seeded areas, gardens, shrubs, or other vegetation with city water in the city before 11:00 a.m. and after 4:30 p.m. Watering activities such as play toys, car washing and hand watering of flower beds are exempt, as long as the activity is continuously human attended.

Appendix 8

Graph Showing Historical and Projected Annual Water Demand for
Each Customer Category

City of Shorewood Historical and Projected Water Use By Customer Category



Appendix 9
Water Rate Structure

Water Rate Structure
City of Shorewood, MN

Water meters are read each quarter and the amount used is rounded to the nearest 1,000 gallons of usage and billed accordingly.

Quarterly Volume	Rate
Up to 5,000 gallons	\$17.50 base rate
5,000 – 50,000 gallons	\$2.95 per 1,000 gallons in excess of 5,000 gallons
Over 50,000 gallons	\$4.25 per 1,000 gallons in excess of 50,000 gallons

Appendix 10

Adopted or Proposed Regulations to Reduce Demand or Improve Water Efficiency

City of Shorewood Ordinances or Regulations Related to Water Use

903.06 INSTALLATION AND CONSTRUCTION REQUIREMENTS AND SPECIFICATIONS.

...

Subd. 4. *Separate connections and meters.* No more than one housing unit or building shall be supplied from one service connection except by special permission of the City Council. Whenever two or more parties are supplied from one pipe, connecting with the distribution main, each building or part of the building must have a separate stop box and a separate meter.

...

903.08 METERS.

Subd. 1. *Meter use required.* Except for extinguishing of fire, no person except authorized city employees shall use water from the water supply system or permit water to be drawn therefrom unless the same be metered by passing through a meter supplied by the city.

...

903.09 WATER RATES AND CHARGES.

Subd. 1. *Rates and charges established.*

a. *Water service rates - quarterly rates.* The water rate due and payable to the city by each water user for water taken from the municipal water system shall be at a quarterly rate established by a ordinance of the City Council. Where service is for less than a quarterly period, the quarterly charge will be prorated on a monthly basis.

b. *Meter charges.* A charge for a water meter shall be made by the city. Property owners or users shall pay in advance before delivery of the water meter for installation. The charge shall be as established by the City Council by ordinance.

c. *Water turn on.* The established turn-on fee will be charged for turning on water where service has been shut off for nonpayment of water billings, failure to repair a leak, discontinuance of service, or other reason specified in this chapter.

d. *Estimated and adjusted rates.*

(1) In the event the water meter servicing any property is found to be operating in a faulty manner or to have become inoperative, the amount of water will be estimated in accordance with the amount previously used in comparable periods of the year.

(2) The City Council shall be authorized to make adjustments in water charges when the amount billed is erroneous due to a meter deficiency or other mistake.

e. *Rates outside city limits.* Rates due and payable by each water user located beyond the territorial boundaries of the city shall be determined by special contract.

Subd. 2. *Listing of accounts.* All accounts shall be kept on the books of the city in the name of the owner of the property served. All bills and notices sent out by the city shall be sent to the address of the property served. If nonresident owners or agents desire personal notice sent to a different address, they shall file an application therefore with the city. Any error in address shall be promptly reported to the city.

Subd. 3. *Bills for services, delinquencies, discontinuance, tax assessments.*

a. *Billing.* Statements for charges for water service for a quarterly period shall be mailed to each property owner or user on or before the tenth day of the first month following the end of the quarter and shall be due and payable on or before the last day of the months of January, April, July and October

following the quarterly period covered by the statement.

b. *Delinquencies.* After the last day of the month in which payment is due, a penalty of 10% of the unpaid account balance will be assessed and added to the amount due on the account. If the balance due on the account is not paid in full within 45 days of the day on which the account became due, a notice shall be sent to the property owner or user informing the property owner or user that the account is delinquent and that unless the account balance is paid in full within 15 days, the water may be shut off and the prescribed shut-off fee will be assessed.

c. *Discontinuance of service.* If the property owner or user does not respond to the notice given above, prior to the date indicated in the notice, and the statement remains unpaid, the water may be shut off at the curb stop. Prior to the water being turned back on again, the property owner or user shall be required to pay all delinquent charges, plus penalties and shut-off fees, and the prescribed turn-on fee.

d. *Appeals to discontinuance of service.* The property owner or user may appeal the notice to the City Council during the 15 day period set forth in Subd. 3(b). Water service shall continue to the appealing property owner or user pending the decision of the Council on the appeal. Upon the determination of the Council, the water may be shut off pursuant to Subd. 3(c) as set forth above.

e. *Tax assessments.* All delinquent accounts may be certified by the Clerk who shall prepare an assessment roll each year providing for assessment of the delinquent accounts against the respective property served. This assessment roll shall be delivered to the City Council for adoption prior to November 30 of each year and upon approval thereof, the Clerk shall certify to the County Auditor the amount due, plus a certification fee as established by ordinance of the City Council, and the County Auditor shall thereupon enter the amount as part of the tax levy on the premises to be collected during the ensuing year. The action may be optional or subsequent to taking legal action to collect delinquent accounts.

903.10 WATER CONNECTIONS SERVED BY ADJACENT MUNICIPALITIES.

The City Council has heretofore and will in the future enter into contracts with adjacent municipalities to provide water service to properties located within the city. All permits to be issued under this chapter shall comply with the terms of the agreements. In instances where the cost of the water hook-up from the supplying city is included in full or in part as a quarterly charge, then shall be added to the billing for the minimum quarterly water charge to be paid by the recipient.

903.11 AUTHORIZED WATER SHUT OFFS.

In case of fire or alarm of fire, water may be shut off to insure a supply for the fire fighting; or in making repairs or construction of new works, water may be shut off at any time and kept shut off as long as necessary.

903.12 CONSERVATION MEASURES.

Subd. 1. Whenever the City Council shall determine that a shortage of water supply threatens the city, it may, by resolution, limit the time and hours during which water may be used from the water system for lawn and garden sprinkling, irrigation, car washing and other uses specified therein. Appropriate notice of the limitation shall be given prior to the enforcement thereof.

Subd. 2. To conserve water resources, prevent the wasteful and harmful effects of sprinkling during midday hours, and allow the city's water system adequate opportunity to replenish the water supply in the city's water storage tanks, certain limitations must be placed on the use of the city's water supply. During

the period of May 1 through September 30 of any year, a person may only sprinkle or irrigate lawns, sod, seeded areas, gardens, shrubs, or other vegetation with city water in the city before 11:00 a.m. and after 4:30 p.m. Watering activities such as play toys, car washing and hand watering of flower beds are exempt, as long as the activity is continuously human attended.

903.13 RESTRICTED AND PROHIBITED ACTS.

Subd. 1. *Unauthorized turn on or shut off.* No person, except an authorized city employee or agent, shall turn on or off any water supply at the curb stop. A turn-on or shut-off fee in an amount equivalent to twice the prescribed fee shall be charged for the unauthorized turn on or shut off of any connection to the municipal water system.

Subd. 2. *Unauthorized use of hydrants, interference with system.* No person, other than employees or agents of the city, shall operate fire hydrants or interfere in any way with the water system.

Subd. 3. *Supplying water to others.* No person shall permit water from the water system to be used for any purpose except upon his own premises unless written consent is first obtained from the city.

903.14 DISCONTINUANCE OF SERVICE.

Water service may be shut off at any curb stop connection whenever:

Subd. 1. The owner or occupant of the premises served, or any person working on any pipes or equipment thereon which are connected with the water system, has violated, threatens to violate or causes to be violated, any of the provisions of this chapter.

Subd. 2. Any charge for water, service, meter or other financial obligation imposed on the present or former owner or occupant of the premises served is unpaid.

Subd. 3. Fraud or misrepresentation by the owner or occupant of the premises served in connection with an application for service.

903.15 MANDATORY HOOK UP, COMMERCIAL AND MULTIPLE-FAMILY RESIDENTIAL USERS AND CERTAIN RESIDENTIAL DEVELOPMENTS.

The owner of a property used for commercial purposes or for multiple-family residential purposes, involving four or more dwelling units, situated within the city and abutting on any street, alley or right-of-way in which there is located a municipal water trunk or lateral facility, is hereby required at its expense to connect to the facility in accordance with the provisions of this chapter within 90 days after the date of official written notice by the City Council to so connect. Single-family residential developments of more than three lots shall be required to connect to the municipal water system, at the developer's expense, based upon a determination by the City Engineer that the connection is feasible. The connection is considered feasible if the cost of providing water to the property line of the lots within the development does not exceed the connection charges, set forth in § 903.04, subd. 3. of this code, times the number of lots in the development.

903.16 RIGHT OF ENTRY POWERS.

Authorized city employees shall have free access at reasonable hours of the day to all parts of every building and premises connected to the water system necessary for reading of meters and inspection. City employees shall be properly identified and shall display the identification upon seeking admittance to the building.

1201.25 P.U.D., PLANNED UNIT DEVELOPMENT DISTRICT.

...

Subd. 4. *General requirements and standards.*

...

i. *Utility connections.*

(1) *Water connections.* Where more than one property is served from the same service line, a shutoff valve must be located in a way that each unit's service may be shut off by the city, in addition to the normally supplied shut-off at the street.

...

1201.26 S, SHORELAND DISTRICT.

...

Subd. 6. *Development regulations.*

...

c. *Water supply.* Any private supply of water for domestic purposes shall conform to Minnesota Department of Health Standards for water quality. Private wells shall be placed in areas not subject to flooding and up slope from any source of contamination. Wells already existing in areas subject to flooding shall be floodproofed in accordance with city standards.

...

Subd. 10. *Variance.* Variances may be granted by the City Council upon application as required in § 1201.05 of this chapter in extraordinary cases, but only when the proposed use is determined to be in the public interest and no variance shall be granted which the Council determines will or has a tendency to:

...

b. Result in compatible land uses or which would be detrimental to the protection of surface and ground water supplies;

Appendix 11
Implementation Checklist



CITY OF SHOREWOOD

City of Shorewood Implementation Spreadsheet

Action	Description	Timeframe				
		ongoing	annually	1-3 yrs	1-5 yrs	3-6 yrs
Review city ordinances/codes	To encourage or require water efficient landscaping.	✓				
Review city ordinance/codes	To permit water reuse options, especially for non-potable purposes like irrigation, groundwater recharge, and industrial use.		✓			
Revise ordinances to limit irrigation	Review outdoor irrigation installations codes to require high efficiency systems (e.g. those with soil moisture sensors or programmable watering areas) in new installations or system replacements					✓
Make water system infrastructure improvements		✓				
Provide rebates or incentives for installing water efficient appliances and/or fixtures	e.g. low flow toilets, high efficiency dish washers and washing machines, showerhead and faucet			✓		
Provide rebates or incentives to reduce outdoor water use	e.g. turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use			✓		
Conduct audience-appropriate water conservation education and outreach		✓				
Conduct a facility water use audit	For both indoor and outdoor use, including system components		✓			
Install enhanced meters	Capable of automated readings to detect spikes in consumption	✓				
Install water conservation fixtures and appliances or change processes to conserve water	Toilets, faucets, etc.	✓				
Repair leaking system components	(e.g., pipes, valves)	✓				
Investigate the reuse of reclaimed water	(e.g., stormwater, wastewater effluent, process wastewater, etc.)		✓			
Reduce outdoor water use	(e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	✓				
Train employees how to conserve water	Include for new employee training	✓				
Increasing block rates billing strategy	Rate structure for Residential, Commercial, Industrial, and Institutional customers	✓				
Consider participating in the GreenStep Cities Program	Voluntary program to aid cities in achieving their sustainability and quality-of-life goals			✓		

Rainfall sensors required on landscape irrigation systems	Conserve water and reduce utility bill when there is a sufficient moisture for landscape area.	✓				
Watering restriction requirements	Odd/Even day watering	✓				
Billing inserts or tips printed on the actual bill	Educational information supplied as billing insert	✓				
Consumer Confidence Reports	Report of City's water quality		✓			
Direct mailings (water audit/retrofit kits, showerheads, brochures)	City is looking into using direct mailings to further educate residents on the benefits of water conservation.	✓				
K-12 Education programs (Project Wet, Drinking Water Institute, presentations)	Making programs to educate school age children on water resources.		✓			

Appendix 12

Sources of Information for Table 10

Lake Minnetonka Historic Levels

