

**CITY OF LAKELAND  
WASHINGTON COUNTY, MINNESOTA**

**RESOLUTION 2018-05  
ADOPTING WATER SUPPLY PLAN FOR WATER SUPPLY SYSTEM #1991-6039**

**WHEREAS**, the City of Lakeland maintains a municipal water system authorized under DNR Water Appropriation Permit #1991-6039; and

**WHEREAS**, In accordance with Minnesota State Statutes, Section 103G.291, Subdivision 3 the City of Lakeland submitted an updated Water Supply Plan [Exhibit A] for review to the Minnesota Department of Natural Resources; and

**WHEREAS**, the City of Lakeland has received approval of the submitted Water Supply Plan on behalf of the Commissioner of the Department of Natural Resources; and

**WHEREAS**, the Lakeland City Council has reviewed and approves of the criteria for the approved Water Supply Plan and;

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL FOR THE CITY OF LAKELAND** hereby authorizes the City Clerk and Public Works Commissioner to sign all documents necessary to effectuate the intent of this resolution.

Passed and adopted by the City Council for the City of Lakeland this 16<sup>th</sup> day of January 2018.

  
Richard Glasgow, Mayor

ATTESTED BY:

  
Jennifer Hutchins Farrell, City Clerk

# Local Water Supply Plan Template Third Generation for 2016-2018

*Formerly called Water Emergency & Water Conservation Plan*



**Table of contents**

INTRODUCTION TO WATER SUPPLY PLANS (WSP) .....6

    Who needs to complete a Water Supply Plan .....6

    Groundwater Management Areas (GWMA) .....6

    Benefits of completing a WSP .....6

    WSP Approval Process.....7

PART 1. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION .....9

    A. Analysis of Water Demand.....9

    B. Treatment and Storage Capacity.....11

        Treatment and storage capacity versus demand..... 12

    C. Water Sources .....12

        Limits on Emergency Interconnections ..... 13

    D. Future Demand Projections – *Key Metropolitan Council Benchmark*.....13

        Water Use Trends..... 13

        Projection Method..... 15

    E. Resource Sustainability .....15

        Monitoring – *Key DNR Benchmark* ..... 15

        Water Level Data ..... 16

        Potential Water Supply Issues & Natural Resource Impacts – *Key DNR & Metropolitan Council Benchmark*..... 17

        Wellhead Protection (WHP) and Source Water Protection (SWP) Plans..... 19

    F. Capital Improvement Plan (CIP) .....20

        Adequacy of Water Supply System.....20

        Proposed Future Water Sources.....21

Part 2. Emergency Preparedness Procedures .....23

    A. Federal Emergency Response Plan.....23

    B. Operational Contingency Plan.....23

    C. Emergency Response Procedures .....23

        Emergency Telephone List ..... 24

B. Potential Water Supply Issues.....	44
C. Proposed Alternative Approaches to Meet Extended Water Demand Projections.....	44
D. Value-Added Water Supply Planning Efforts (Optional) .....	45
Source Water Protection Strategies .....	45
Technical assistance.....	45
GLOSSARY.....	46
Acronyms and Initialisms .....	48
APPENDICES TO BE SUBMITTED BY THE WATER SUPPLIER.....	50
Appendix 1: Well records and maintenance summaries – see Part 1C.....	50
Appendix 2: Water level monitoring plan – see Part 1E .....	50
Appendix 3: Water level graphs for each water supply well - see Part 1E.....	50
Appendix 4: Capital Improvement Plan - see Part 1E .....	50
Appendix 5: Emergency Telephone List – see Part 2C .....	50
Appendix 6: Cooperative Agreements for Emergency Services – see Part 2C.....	50
Appendix 7: Municipal Critical Water Deficiency Ordinance – see Part 2C.....	50
Appendix 8: Graph showing annual per capita water demand for each customer category during the last ten-years – see Part 3 Objective 4.....	50
Appendix 9: Water Rate Structure – see Part 3 Objective 6 .....	50
Appendix 10: Adopted or proposed regulations to reduce demand or improve water efficiency – see Part 3 Objective 7 .....	50
Appendix 11: Implementation Checklist – summary of all the actions that a community is doing, or proposes to do, including estimated implementation dates – see <a href="http://www.mndnr.gov/watersupplyplans">www.mndnr.gov/watersupplyplans</a> .....	50

- 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  
[www.mndnr.gov/watersupplyplans](http://www.mndnr.gov/watersupplyplans)
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 webpage <http://www.metrocouncil.org/Handbook/Plan-Elements/Water-Resources/Water-Supply.aspx>. All out-state water suppliers do *not* need to complete the content addressed in Part 4.
7. Use the Plan instructions and Checklist document to insure all data is complete and attachments are included. This will allow for a quicker approval process. [www.mndnr.gov/watersupplyplans](http://www.mndnr.gov/watersupplyplans)
8. Plans should be submitted electronically – no paper documents are required.  
<https://webapps11.dnr.state.mn.us/mpars/public/authentication/login>
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.

## **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:

--

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 LAKELAND WATER	GOVERNMENT	1,150,567	2%	YES
2 LAKELAND PLAZA	COMMERCIAL	948,860	1.6%	YES
3 TOWER ASPHALT	COMMERCIAL	604,000	1%	YES
4 GARY MAAS	RESIDENTIAL	576,270	1%	YES
5 A-L SCHOOL	INSTITUTION	463,170	0.8%	YES
6 US BANK	COMMERCIAL	433,750	0.7%	YES
7 FIRE DEPT	GOVERNMENT	345,000	0.6%	YES
8 MDA PROPERTIES	COMMERCIAL	335,100	0.5%	YES
9 ANGIE KRAFT	RESIDENTIAL	310,300	0.5%	YES
10 MIKE HUBER	RESIDENTIAL	300,350	0.5%	YES

## 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 Amount of Residuals	Disposal Process for Residuals	Do You Reclaim Filter Backwash Water?
Plant #1	1991	1,080,000	MN,FE Removal	Pressure Filter	Limited <2,000 Gallons	Removal Via Septic Hauler	Yes
Plant #2	1996	1,080,000	MN,FE Removal	Pressure Filter	Limited <2,000 Gallons	Removal Via Septic Hauler	Yes
Total	NA	2,160,000	NA	NA	>2,000 Gal	NA	

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.

### **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.

There are no limitations on the two water supply wells except for their maximum capacity. The Lakeland Water Utility does not have any possibility with interconnecting with another system due to location constraints. This limits all emergency capacity to either bringing in bottled water or connecting a portable treatment system to the current water plant. A portable system would obviously drastically reduce our current output.

## **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?

The Lakeland Water Utility serves three cities (Lakeland, Lakeland Shores, and Lake St Croix Beach). Residents in the three cities are not required to hook to city water. The current rate of hook ups is about 10 connections per year with about 80% of all residents already connected to the system. The water utility also has the capacity to hook up St Mary's Point along with a 150 acre tract of mining pit located in the norther portion of Lakeland. Given these parameters, the assumption is that connections will move up slowly until St Mary's Point and the mining pit eventually are hooked up or develop in the case of the pit. This is indicated in the large population served jump in the year 2040. As far as water demand overall, the last five years have been fairly steady. The assumption is that this trend will remain unchanged for the near future as there are limited projected new connections. The connection of St Mary's point, the development of the mining pit, or a dry summer would likely create a spike in demand as seen in the year 2007.

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

### 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:

The projected water demand is based on past usage taking into account the connection of roughly 10 residents per year for the next 15 years. Lakeland is landlocked with very limited land available for development in the near future. Business growth is also limited due to zoning requirements and the need for a septic system as the city does not have central sewer. Please see the water use trends on the previous page for a more in depth discussion on the population demand.

Lakeland has incorporated a conservation ordinance into their water ordinances. Given the sandy soils in the St Croix Valley, conservation can be difficult during dry seasons due to high lawn watering. If multiple dry seasons do occur the demand in those years will likely increase to possible levels seen in 2007.

## E. Resource Sustainability

### Monitoring – Key DNR Benchmark

Complete Table 8 by inserting information about source water quality monitoring efforts. The list should include all production wells, observation wells, and source water intakes or reservoirs. Additional information on groundwater level monitoring program at:

[http://www.dnr.state.mn.us/waters/groundwater\\_section/obwell/index.html](http://www.dnr.state.mn.us/waters/groundwater_section/obwell/index.html) Add rows to the table as needed.

Table 8. Information about source water quality monitoring

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
420985	<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 checked="" type="checkbox"/> Routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input checked="" type="checkbox"/> daily <input type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
533517	<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 checked="" type="checkbox"/> Routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input checked="" type="checkbox"/> daily <input type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
	<input type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input 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 type="checkbox"/> annually	<input type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
	<input type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water	<input type="checkbox"/> Routine MDH sampling <input type="checkbox"/> Routine water	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input checked="" type="checkbox"/> daily	<input type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape

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 checked="" type="checkbox"/> River or stream	St. Croix River	<input checked="" 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 checked="" type="checkbox"/> Other: The small size of the Lakeland community combined with the depth of the Mt. Simon aquifer make impacts to the St. Croix River unlikely.	<input checked="" 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 checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input checked="" 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"/> Lake		<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"/> 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"/> Trout stream	Valley Branch Creek	<input checked="" 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 checked="" type="checkbox"/> Other: Pumping of the Mt. Simon aquifer does not affect the Valley Branch Creek.	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input checked="" 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: _____

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	July 17, 2012	July 17, 2022
SWP	<input type="checkbox"/> In Process <input type="checkbox"/> Completed <input type="checkbox"/> Not Applicable		

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 checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		
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		

Local Water Supply Plan Template –December 8, 2015

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						
<input type="checkbox"/> Surface Water						
<input type="checkbox"/> Reclaimed Stormwater						
<input type="checkbox"/> Reclaimed Wastewater						
<input type="checkbox"/> Interconnection to another supplier						

### **Emergency Telephone List**

Prepare and attach a list of emergency contacts, including the MN Duty Officer (1-800-422-0798), as **Appendix 5**. A template is available at [www.mndnr.gov/watersupplyplans](http://www.mndnr.gov/watersupplyplans)

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.

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	141,000	99,000
Institutional	3	3,150	3,000
Commercial	2	14,750	20,000
Industrial			
Irrigation			
Wholesale			
Non-Essential	6		
TOTAL	NA	NA	

GPD – Gallons per Day

**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
--------------------	--------------------	-------------------

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
deficiency declared	<input 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 checked="" type="checkbox"/> Meeting with large water users (> 10% of total city use) <input checked="" type="checkbox"/> Other: Water Bill Messages, City Council Meeting Messages	<input checked="" type="checkbox"/> Monthly <input type="checkbox"/> Annually	Council Members, Residents, Stillwater Gazette Newspaper

**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: \_\_\_\_\_.

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

In accordance with the ordinance as written, the decision is made by the city council by resolution.

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 type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Water Supply System Improvements (e.g. leak repairs, valve replacements, etc.) Lateral line leaks have been detected by residents and fixed immediately.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Educational Efforts Conservation Education via Newsletter, CCR Report Community Education: Elementary School Water plant Tours, Water Fair Donation	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
New water conservation ordinances	<input checked="" type="checkbox"/> Yes <input 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?

Conservation efforts are difficult to measure as the system is still experiencing water hook ups. Data appears to have flat lined as far as water usage per customer however the city still experiences high water usage during the summer due to sandy soil conditions and subsequent irrigation.
--

### 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
-----------	----------	---------

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

The water utility currently does leak detection on an as needed basis. Infrastructure is only 25 years old so no set schedule has been adopted. If current increase in unaccounted water loss continues to trend upward, the water utility will recommend a total water audit to the city council.

**Water Audits** - are intended to identify, quantify and verify water and revenue losses. The volume of unaccounted-for water should be evaluated each billing cycle. The American Water Works Association (AWWA) recommends that ten percent or less of pumped water is unaccounted-for water. Water audit procedures are available from the AWWA and MN Rural Water Association [www.mrwa.com](http://www.mrwa.com). Drinking Water Revolving Loan Funds are available for purchase of new meters when new plants are built.

What is the date of your most recent water audit?   N/A  

Frequency of water audits:    yearly        other (specify frequency) Quarterly by staff based on water sold and amount pumped

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

Year last leak detection survey completed:   N/A  

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

The water utility currently does leak detection on an as needed basis. Infrastructure is only 25 years old so no set schedule has been adopted. If current increase in unaccounted water loss continues to trend upward, the water utility will recommend a total water audit to the city council.

**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. AWWA also recommends that water suppliers conduct regular water audits to ensure accountability. 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	997	997	997	None	15 / 20
Irrigation meters					___ / ___
Institutional	1	1	1	None	15/ 20
Commercial	29	29	27	None	15/ 20

Strategy to reduce residential per capita demand	Timeframe for completing work
<input 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	
<input checked="" type="checkbox"/> Revise ordinances to limit irrigation. Describe the restricted irrigation plan:	Irrigation ordinance already implemented
<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 type="checkbox"/> Make water system infrastructure improvements	
<input type="checkbox"/> Offer free or reduced cost water use audits) for residential customers.	
<input checked="" type="checkbox"/> Implement a notification system to inform customers when water availability conditions change.	Code RED is already in place for using a call out system in case of emergencies
<input 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.)	
<input 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.)	
<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 a 1.5% per year water reduction for Institutional, Industrial, Commercial, and Agricultural GPCD over the next 10 years or a 15% reduction in ten years.** 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 type="checkbox"/> Conduct a facility water use audit for both indoor and outdoor use, including system components	
<input type="checkbox"/> Install enhanced meters capable of automated readings	

Calculate a ten year average (2005 – 2014) of the ratio of maximum day demand to average day demand: **3.2**

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 a Conservation Water Rate Structure and/or a Uniform Rate Structure with a Water Conservation Program**

**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:  0  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:  1/1/2016

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 type="checkbox"/> Increasing block rates (volume tiered rates) <input type="checkbox"/> Seasonal rates <input type="checkbox"/> Time of Use rates	<input checked="" type="checkbox"/> Uniform <input checked="" 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)

- **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:

Conservation rate structure will be adopted within 2 years.

**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 type="checkbox"/>	Adopt a Water Use Restriction Ordinance (lawn irrigation, car washing, pools, etc.)
<input type="checkbox"/>	Adopt an Outdoor Lawn Irrigation Ordinance
<input checked="" type="checkbox"/>	Adopt a Private well Ordinance (private wells in a city must comply with water restrictions)
<input checked="" 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 type="checkbox"/>	Implement a Water Conservation Outreach Program
<input type="checkbox"/>	Hire a Water Conservation Coordinator (part-time)
<input type="checkbox"/>	Implement 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?**

Regulations Utilized	When is it applied (in effect)?
	<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 <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

### B. 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

Local Water Supply Plan Template –December 8, 2015

Education Methods	General summary of topics	#/Year	Frequency
			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
Presentations to community groups			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared Emergencies
Staff training	Leak Detection Efforts in Residential Homes, Free Site Visits to Residents		<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared Emergencies
Facility tours	Elementary School Water Plant Tour	1	<input checked="" 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	Ordinance Reminders Conservation Practices	12	<input checked="" 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			<input 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,			<input type="checkbox"/> Ongoing



## 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

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

**APPENDICES TO BE SUBMITTED BY THE WATER SUPPLIER**

**Appendix 1: Well records and maintenance summaries – see Part 1C**

**Appendix 2: Water level monitoring plan – see Part 1E**

**Appendix 3: Water level graphs for each water supply well - see Part 1E**

**Appendix 4: Capital Improvement Plan - see Part 1E**

**Appendix 5: Emergency Telephone List – see Part 2C**

**Appendix 6: Cooperative Agreements for Emergency Services – see Part 2C**

**Appendix 7: Municipal Critical Water Deficiency Ordinance – see Part 2C**

**Appendix 8: Graph showing annual per capita water demand for each customer category during the last ten-years – see Part 3 Objective 4**

**Appendix 9: Water Rate Structure – see Part 3 Objective 6**

**Appendix 10: Adopted or proposed regulations to reduce demand or improve water efficiency – see Part 3 Objective 7**

**Appendix 11: Implementation Checklist – summary of all the actions that a community is doing, or proposes to do, including estimated implementation dates – see [www.mndnr.gov/watersupplyplans](http://www.mndnr.gov/watersupplyplans)**

## Appendix 1

### Well Maintenance Summary

The City of Lakeland has the following maintenance program in place for each water supply well:

Well Pumps: Annual Maintenance Inspection of Well Pumps #1 and #2

Well Pumps are Pulled every 10 years for Maintenance and Part Replacement

Well Pump #1: Pulled and Rehabilitated 2/18/2011

Well Pump #2: Pulled and Rehabilitated 4/8/2015

Minnesota Unique Well Number

420985

County Washington

Quad Hudson

Quad ID 102A

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

Entry Date 05/20/1991

Update Date 03/10/2014

Received Date

Well Name LAKELAND 1	Township 29	Range 20	Dir Section W 26	Subsection DCBDBA	Well Depth 380 ft.	Depth Completed 380 ft.	Date Well Completed 12/28/1990
Elevation 750 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Cable Tool	Drill Fluid	
Address Well LAKELAND MN 55043					Use community supply(municipal) 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 Step down Joint Welded		
TOPSOIL SANDY DRY 0 3 BLACK SOFT					Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Above/Below 2.6 ft.		
COARSE GRAVEL MED- 3 20					Casing Diameter Weight		
COARSE SAND & 20 43					14 in. To 245 ft. 54.6 lbs./ft.		
FINE SAND CLAY 43 63 GRAY SOFT					20 in. To 220 ft. 78.6 lbs./ft.		
MEDIUM TO COARSE 63 69					Open Hole From 245 ft. To 380 ft.		
FINE SAND CLAY 69 79 BROWN					Screen? <input type="checkbox"/> Type Make		
MEDIUM TO COARSE 79 105					Static Water Level		
MEDIUM TO FINE 105 145					65 ft. land surface Measure 11/08/1990		
MEDIUM TO COARSE 145 165 BROWN					Pumping Level (below land surface)		
COARSE SAND & 165 215					110 ft. 3 hrs. Pumping at 600 g.p.m.		
COARSE SAND & 215 216					Wellhead Completion		
LIMESTONE (SHELL) 216 217 BROWN HARD					Pitless adapter manufacturer Model		
SANDSTONE SHALE 217 270 GRAY SFT-MED					<input type="checkbox"/> Casing Protection <input checked="" type="checkbox"/> 12 in. above grade		
SANDSTONE 270 290 GRAY HARD					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
SANDSTONE SHALE 290 315 GRAY MEDIUM					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
SANDSTONE RED & 315 335 GRAY SFT-MED					Material Amount From To		
SANDSTONE RED & 335 365 GRAY SOFT					neat cement 11 Cubic yards 0 ft. 245 ft.		
SANDSTONE SHALE 365 380 BROWN MED-HRD					Nearest Known Source of Contamination		
					feet Direction Type		
					Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input checked="" 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 Mt.Simon Sandstone Aquifer Mt.Simon		
					Last Strat Mt.Simon Sandstone Depth to Bedrock 215 ft		
					Located by Minnesota Department of Health		
					Locate Method GPS SA On (averaged)		
					System UTM - Mad83, Zone 15, Meters X 518181 Y 4979197		
					Unique Number Verification Information from Inpute Date 06/01/1999		
					Angled Drill Hole		
					Well Contractor		
					Layne Well Co. 27010 WENDT, F.		
					Licensee Business Lic. or Reg. No. Name of Driller		
Remarks GAMMA LOGGED 10-26-1990. M.G.S. NO. 3033. NW CORNER OF GOVERNMENT LOT 4.							

Minnesota Well Index Report

420985

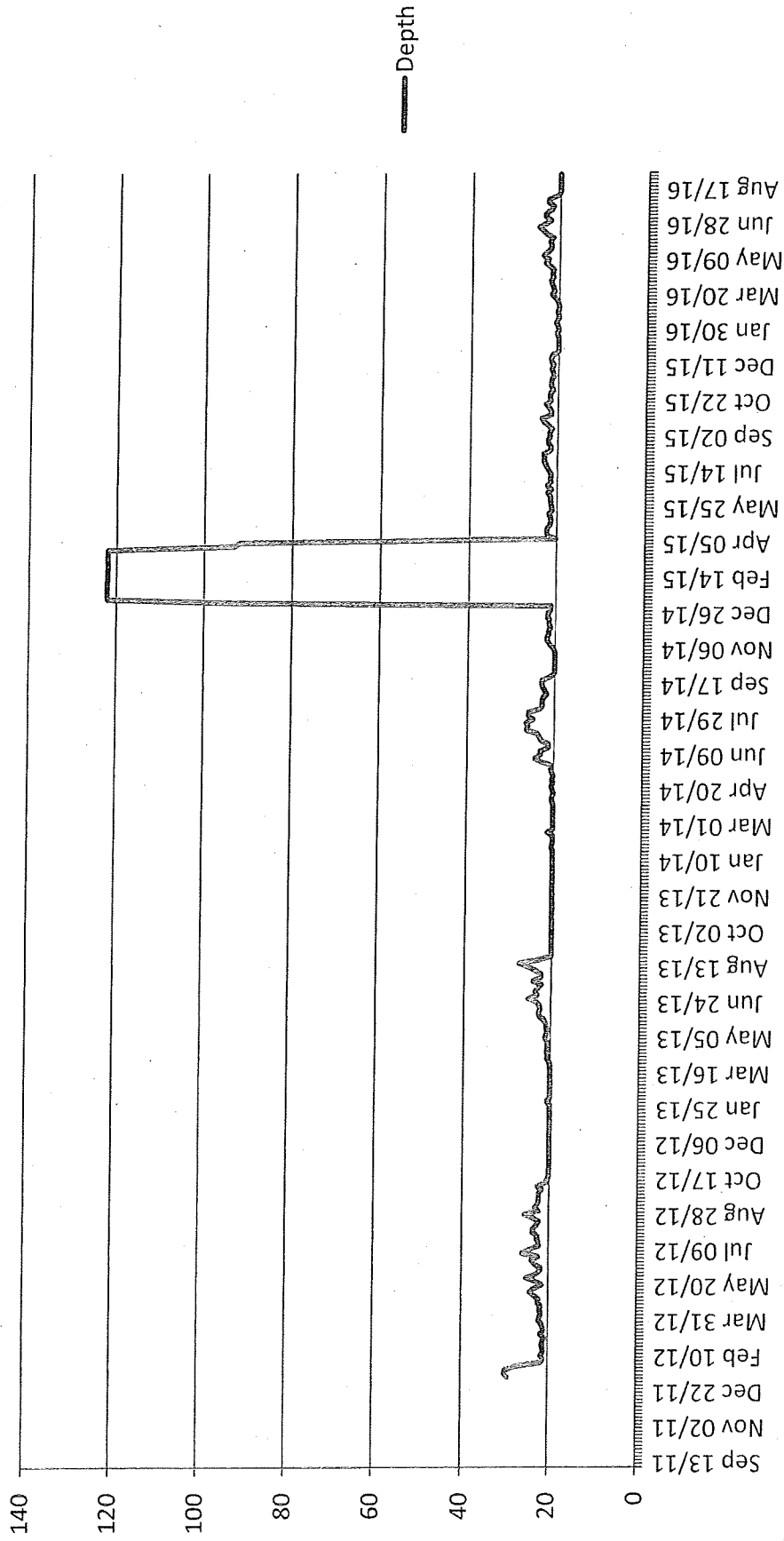
Printed on 09/13/2016

HE-01205-15

Appendix 3

**Groundwater Level Data Graphs**

# Well #2 Groundwater Level



Future Water Improvements  
Water Budget 2015 CIP

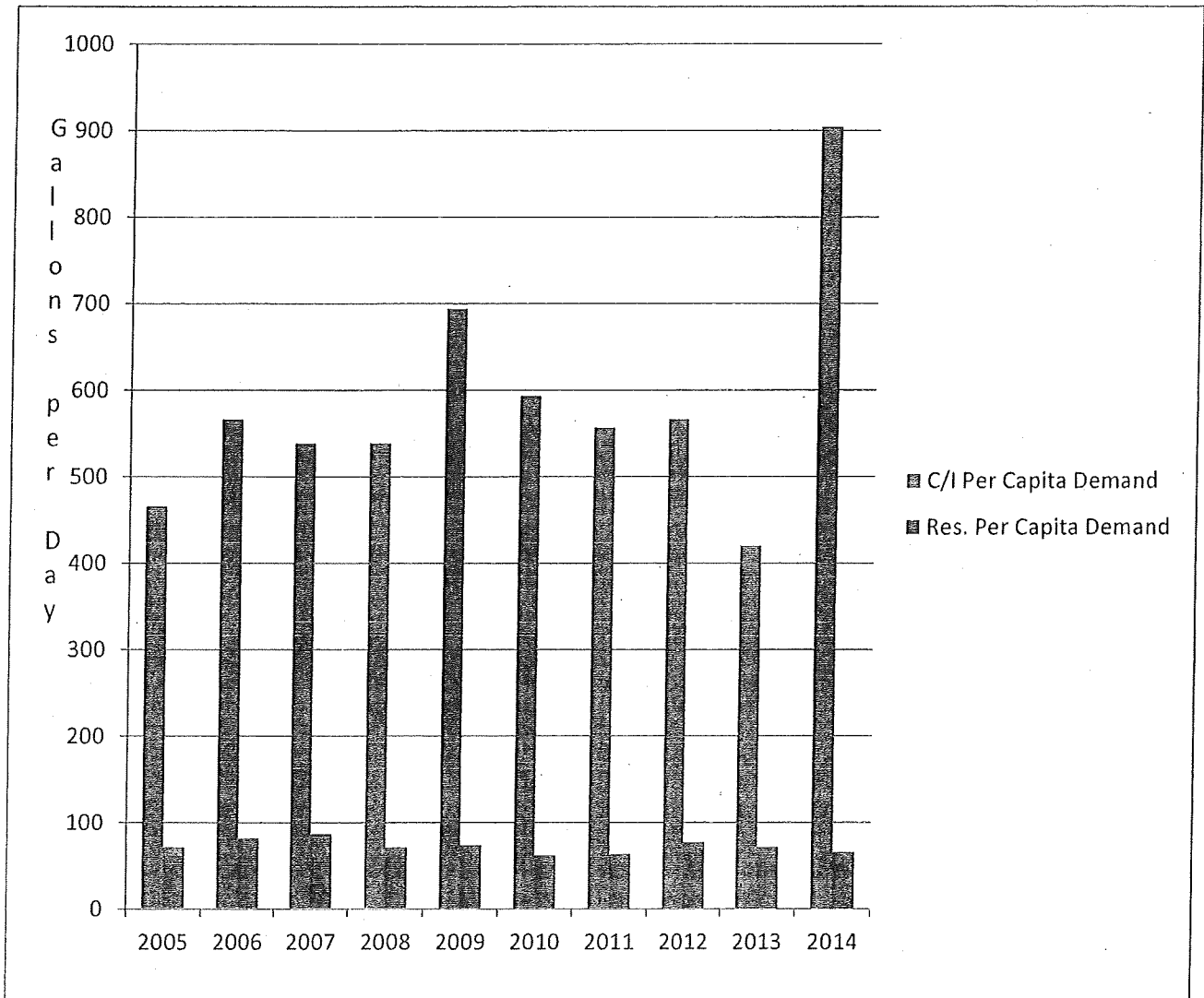
Expenditure	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Well Pump #2 Repairs (Motor Repair, Column Replacement)				15000							30000
Plant #2 Valve Replacement											
Plant #2 Fluoride Pumps	2000										
Well Pump #1 Repairs (Motor Repair, Column Replacement)					25000						
Plant #1 Valve Replacement				15000							
Plant #1 Fluoride Pumps	2000										
Plant #1 Chlorine Analyzer				4000							
SCADA Panel PLC Replacement				20000							
Tower #1 Painting											
Tower #1 Maintenance Program				5000	5000	5000	5000	5000	35000		
Tower #2 Painting							275000				
Tower #2 Maintenance Program			40000	4000	4000	4000					
Tower #2 Mixer	5000										
Truck											
Software (Civic Billing, Itron)					40000			5000			
Computers		5000									
Filter Media Plant #1 & #2 (1/2 Left over from 2006)							60000				
Plant #1 Heaters											
Plant #1 Dehumidifier											
GIS Software to Replace AutoCAD (Probably Split some costs with Streets)		10000									
Plant #2 Reroof											
Miscellaneous Expenditures	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Totals	10000	24000	45000	48000	29000	79000	345000	15000	40000	5000	35000

Plumber	Tim Thoennes	651-261-6136	
Backhoe	Mike Capra	651-248-0707	
Chemical Feed	Hawkins – Rod Besh	612-804-5427	
Meter Repair	Mid America Meter	763-478-8041	
Generator	Ziegler	952-887-4570	
Valves	MN Pipe – Adam Moulton	507-420-9292	
Pipe & Fittings	MN Pipe – Adam Moulton	507-420-9292	
Water Storage	SEH – John Parotti	715-861-4871	
Laboratory	John Engel	952-955-1800	
Engineering firm	SEH – John Parotti	612-801-4200	

Communications	Name	Work Telephone	Alternate Telephone
News Paper	Stillwater Gazette	651-439-3130	
Radio Station	WCCO	612-370-0611	
School Superintendent	Tom Hobert	651-351-6500	
Property & Casualty Insurance	LMNC Insurance Trust	651-215-4080	

Critical Water Users	Name	Work Telephone	Alternate Telephone
Hospital Critical Use:	N/A		
Nursing Home Critical Use:	N/A		
Public Shelter Critical Use:	Afton Lakeland School	651-351-6500	

# Appendix 8



## Appendix 10

1. Water efficient plumbing fixtures: MN Plumbing Code (Minnesota Administrative Rules Chapter 4714); <https://www.revisor.mn.gov/rules?id=474>

2. Emergency Water Ordinance

### § 52.05 EMERGENCY WATER CONSERVATION.

(A) The City Council may impose emergency regulations pertaining to the conservation of water by resolution of the City Council and by giving notice by publication or by posting in the City Hall and at those public places as the Council may direct.

(B) Whenever the City Council determines that a shortage of water supply threatens the city, it may, by resolution, limit the times and hours during which city water may be used for sprinkling, irrigation, car washing, and other external purposes. After publication of a notice setting for the restrictions for use of water or 2 days after mailing of a copy of the notice to each customer, no person shall use or permit water to be used in violation of the resolution and any customer who does so, shall be charged the sum as established by ordinance for each day of violation, and the charge shall be added to the customer's next water bill. Continued violation shall be cause for discontinuance of water service.

3. Watering Restrictions

### § 52.05 EMERGENCY WATER CONSERVATION.

(C) Effective July 17, 2007, the following restrictions and conservation measures with regard to the use of the city water system by its users were imposed:

(1) Until further order of the City Council, there shall be no lawn sprinkling, irrigation, or watering of vegetation using the municipal water systems between the hours of 12:00 p.m. and 5:00 p.m. on all days of the week.

(2) For all users connected to the City of Lakeland municipal water system for the Cities of Lakeland, Lakeland Shores, Lake St. Croix Beach and St. Mary's Point, there shall be no lawn or garden sprinkling allowed except for even-numbered addresses on the even days of the week and for odd- numbered addresses on the odd days of the week. All these restrictions shall be subject to the complete prohibition against the use of the municipal water system for purposes of lawn or garden sprinkling between the hours of 12:00 p.m. and 5:00 p.m. on all days.

(Res. 2007-09, passed 7-17-2007) Penalty, see § 52.99

4. MIDS

<https://stormwater.pca.state.mn.us/index.php/Calculator>

## Appendix 12

Table 10 information was obtained from the following sources:

**Rivers:** MnDNR Wild & Scenic Rivers Program, and MnDNR area hydrologist

[http://www.dnr.state.mn.us/waters/watermgmt\\_section/wild\\_scenic/index.html](http://www.dnr.state.mn.us/waters/watermgmt_section/wild_scenic/index.html)

**Aquifer:** MnDNR area hydrologist, Mt. Simon obwell at St. Croix Valley Athletic Partnership complex

**Trout Stream:** MnDNR trout stream mapping