

# CITY OF TOPPENISH

# *WATER SYSTEM PLAN*



Prepared by:



**Huibregtse, Louman Associates, Inc.**

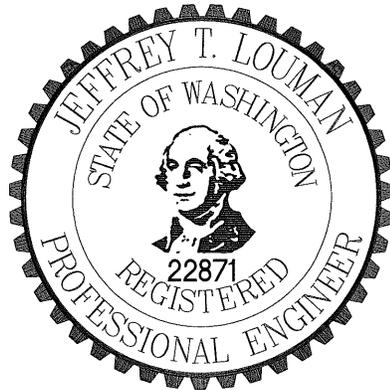
Civil Engineering • Land Surveying • Planning

**PROJECT NO. 09061**

**DECEMBER 2010**

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**INTRODUCTION**

**AND**

**EXECUTIVE SUMMARY**

## **INTRODUCTION**

The City of Toppenish is located within the eastern part of Yakima County. The City lies approximately 25 miles south of the City of Yakima, approximately 2½ miles south of Interstate 82, near the junction of State Route 97 and State Route 22. Incorporated in 1907, Toppenish lies entirely within the Yakama Nation Reservation. The City is situated on a relatively flat portion of the Yakima River flood plain, at an elevation of 740-770 feet above mean sea level. Toppenish's economy depends largely upon the agricultural industry. Produce from Yakima and the Columbia Basin is processed and shipped from facilities within Toppenish, and the City is also home to a large meat packing facility. These facilities provide much of the employment; in addition, Toppenish has a viable commercial and service business community.

Toppenish recognizes the need to improve and expand its water system if it is to meet the demands of its system users and to keep pace with other growth-oriented improvements in this vital Yakima County community. Huibregtse, Louman Associates, Inc. was authorized by the City of Toppenish to prepare this Water System Plan, which represents the culmination of planning and data collection efforts.

## **PLANNING REQUIREMENTS**

Water systems with 1,000 or more services are required to have a water system plan approved by the Washington State Department of Health (DOH) pursuant to the Washington Administrative Code, WAC 246-290-100 and WAC 246-291-140.

In order to assist water utilities in preparing their plans, the Department of Health has written a planning handbook which identifies information needed to develop a "well-conceived and clearly-stated" water system plan. The planning handbook is organized into ten major chapters, with each chapter representing a basic water system plan component. The ten chapters are:

1. Description of Water System
2. Basic Planning Data and Water Demand Forecasting
3. System Analysis
4. Water Use Efficiency Program and Water Rights
5. Source Water Protection
6. Operation and Maintenance Program
7. Distribution Facilities Design and Construction Standards
8. Improvement Program
9. Financial Program
10. Miscellaneous Documents

Each chapter is divided into several sections to address specific topics in detail. The City of Toppenish 2010 Water System Plan has been prepared in the format of the Department of Health's Planning Handbook dated April 1997.

## **OBJECTIVE**

The principal goal of water system planning is to make efficient use of available resources. This is accomplished by making decisions about water system capital improvements and operations which are in accordance with overall system policies and directions expressed in a utility's water system plan.

An equally important reason for developing a water system plan is to assure orderly growth of the system while maintaining reliable delivery of high quality water. The plan is intended to guide water utility actions in a manner consistent with other activities taking place in the community.

The water system plan is intended to look ahead at least 20 years into the future. Development of a definite improvement schedule and financial program is required for the first six-year period, while the planning approach for the second period may be more conceptual. To continually provide adequate guidance to decision makers, the plan requires updating every six years.

Once adopted by the City of Toppenish and approved by the Department of Health (DOH), the Water System Plan is considered by DOH "to be a commitment to implement the actions identified in the improvement schedule." Future water system decisions shall be in accordance with the Water System Plan.

**PROJECTED WATER DEMANDS**

To plan for Toppenish's future water needs, the following items were examined:

Basic Planning Data (Chapter 2): Land use, future service area boundary, and population growth are used to evaluate demands on the Toppenish water system. The City's 2009 population was 9,090, and the future population is projected to be 11,249 in the year 2019. Toppenish's 2009 number of single-family residential water services, both inside and outside the City limits, is 1,843, and the future number of single-family residential services is projected to be 2,280 in the year 2015.

Current Water Demands (Chapter 2): Toppenish's greatest year of water consumption in the last seven years was in 2003, when 550 million gallons of water was consumed. The maximum month of water consumption in last two years was in July 2009, when the average daily consumption for the month was 2,537,032 gallons. Maximum day consumption was 5.119 million gallons on July 29, 2009, and peak hour consumption was calculated to be 7,111 GPM.

Projected Water Demands (Chapter 2): Toppenish's water demand forecast for the year 2015, and the City's current source capacity and water rights are shown below:

	<u>Projected Year 2015 Demand</u>	<u>Current Source Capacity</u>	<u>Current Water Rights</u>
ERUs	3,528	-----	-----
Annual	626.67 MG	2,141.82 MG	1,042.65 MG
Maximum Day	6.08 MG	5.87 MG*	6.07 MG
Peak Hour	8,448 GPM	4,075 GPM	4,215 GPM

\* Total source capacity will increase to 6.73 MG with the construction of Well No. 9 in 2010.

**SUMMARY OF SYSTEM DEFICIENCIES AND RECOMMENDED IMPROVEMENTS**

The following is a listing of the major water system deficiencies and recommended improvements which have been identified in the existing water system. A more detailed description of these deficiencies and the improvements can be found in Chapter 8 of this Plan.

**SUPPLY**

Deficiency – The City owns all of its well sites, but has no recorded protective covenants, establishing the required 100-foot sanitary protective radius around each well. Protective covenants are required at all of Toppenish’s source wells.

Improvement – Protective well covenants will be produced for source wells owned by the City of Toppenish that currently do not have a protective covenant, which provides the necessary 100-foot sanitary protective radius around the wells.

Deficiency – The projected future MDD will exceed the current source capacity. This becomes especially critical if the City’s largest source of supply (Well No. 7 at 2,200 gpm) is out of service. Increasing future source capacity will be essential to improve system reliability and minimize required storage and will be possible through rehabilitation of existing sources with diminished capacity and drilling new sources of supply.

Improvement – The City has obtained a public works trust fund loan and has been granted a permit by the Yakama Nation for construction of Well No. 9, with a capacity of 600 GPM. This

improvement will reduce required storage volumes and meet MDD beyond 2015. However, based upon projected future demand, an additional source of supply with a minimum capacity of 1,400 GPM will be required by 2019.

Deficiency – Well No. 8 is experiencing sand production problems, which adds excessive wear to pump components and limits its current pumping capacity. Also, Well No. 5 has experienced some diminished capacity in recent years, which contributes to the City's source of supply deficiency.

Improvement – Well No. 8 will be inspected, rehabilitated and the well pump replaced to eliminate the production of sand, which leads to excessive maintenance costs, and improve its current capacity. Well No. 5 will also be inspected and rehabilitated to improve its current capacity and hopefully return it to its historical capacity of 950 GPM. Increased capacity from both of these improvements will help meet future demand.

Deficiency – Well No. 7, the City's largest source of supply at 2,200 gpm, has recently had some electrical issues. Though generally this well is the last called, not having it operational when needed can lead to excessive operation of the City's other sources of supply during peak demand periods. A reliable electrical and control system is critical in order to have a reliable source of supply to the system

Improvement – Well No. 7 is currently the City's largest source of supply and recently has had some electrical issues. The electrical problems will be investigated and improvements made as necessary to improve the reliability of this source.

Deficiency – Accurate source meters are necessary to provide precise data for tracking current production and for projection of future demand needs. Source meters need to be calibrated routinely, depending on meter type, and it is unknown when the City's source meters were last calibrated. Also, Well No. 5 has been reported to have an inaccurate flow meter, mostly due to its close proximity to the well discharge pipe and isolation valves.

Improvement – To improve the accuracy of water production data, the city will begin a routine source meter calibration program in 2011. Also, the Well No. 5 source meter will be relocated outside of the existing building to improve accuracy.

Deficiency – The last static water levels for most of the City's source wells were recorded in 1994. Most of the wells do not have a means of monitoring static and dynamic water levels and/or shut-in pressures to anticipate potential supply issues.

Improvement – Well No. 8 is the only source well where the city monitors static and dynamic water levels. A level transducer will be installed in the other source wells when they are rehabilitated or inspected in the future to track static and drawdown water levels, allowing the city to anticipate or troubleshoot future well capacity issues.

## STORAGE

Deficiency – The City last cleaned and inspected their storage reservoirs in 2003. Also, it is unknown when the reservoirs were last coated. Given the age and unknown condition of the existing reservoirs, it is likely that they will need to be rehabilitated and recoated in the next six years.

Improvement – The City plans to inspect two of their three storage reservoirs in 2010 and the third the following year. As discussed above, it is likely that the reservoirs will have to be rehabilitated and recoated by the year 2015. Routine inspection and maintenance of the reservoirs is necessary to extend the lifetime of these critical system components.

Deficiency – The City of Toppenish currently has adequate storage capacity with its three reservoirs, but additional storage capacity will be required by the year 2015. The need for additional storage is mostly due to the high peak demands and resulting high volume of equalizing storage that is required for the City. Installing additional sources of supply reduces this need, but future storage will still be necessary, based on projected system demands.

Improvement – Construction of a new 1.7 MG (1.0 MG effective) capacity standpipe reservoir in 2013 will provide adequate storage to meet the projected 20-year demand. The new reservoir is planned to be constructed on City owned property, near new Well No. 9, which will provide additional storage on the north side of the City, increasing system reliability.

## DISTRIBUTION

Deficiency – Several locations within the City are identified in the Plan as having insufficient fire flow capacities. Fire flow deficiencies are mainly located in areas where there are inadequate pipe sizes or insufficient looping of the pipelines. Many of these locations were also identified in the 2002 Water System Plan Update, but only improvements near the new high-school have been made.

Improvement – Water main upsizing and/or looping improvements are necessary to increase deficient fire flow capacities to the required levels. The resulting improved fire flow capacities from the recommended water main improvements are provided in Chapter 3 of this Plan.

Deficiency – A significant amount of the City's distribution system is made up of undersized and aging cast iron and asbestos cement pipes that are nearing the end of their useful life. The condition of each of these pipes is not fully known, but many are suspected to be corroded or leaking. These water mains need to be replaced to improve system flow capacity and potentially reduce distribution system leakage.

Improvement – Some of the aging and undersized water mains will be replaced with the recommended fire flow improvement projects, but the remaining water mains will be prioritized for replacement in the future. The City plans to implement a leak detection program, starting in 2011, to further investigate the condition of existing pipes and prioritize them for replacement.

Deficiency – The City began a service meter replacement program in 2007, to upgrade to new radio-read style meters. Meters that were known to be inoperable or leaking were prioritized for replacement. There are approximately 200 service meters remaining that are of the older style and have to be manually read.

Improvement – The City will complete this improvement with the replacement of approximately 200 service meters in 2010. Upgrading service meters to radio-read meters reduces the time to record meter data and improves meter data accuracy.

## **PROPOSED WATER SYSTEM FINANCIAL PROGRAM**

Recommended systematic improvements are scheduled for completion over the next six years, as shown in Table 8-1 in Chapter 8 of this Plan. Scheduling of the remaining improvements beyond this six-year period needs to be reviewed yearly as priorities and City growth patterns change and progress. Major recommended improvements for future years (2016 through 2029) have been estimated, but have not been scheduled at this time. The estimated improvement costs are provided in Table 8-1, as well as the total projected yearly cost.

In order to fund the recommended water system improvements discussed in this Plan, a proposed financial program has been developed and is provided in Table 9-5 (Operating Fund) and Table 9-6 (Capital Fund) in Chapter 9 of this Plan. The proposed financial program incorporates projected operations, improvements, and loan costs for the next six-year period. Projected revenues and expenditures of the water system include proposed revenue increases and inflation rates, as discussed in Chapter 9 of this Plan.

The City of Toppenish will continue annual reviews of the water system's financial program during their budget preparation process. The financial program will also be reviewed and revised as needed during the Water System Plan update in 2016. This continued review will allow for modifications to the proposed rate and revenue increases, should financial conditions change.