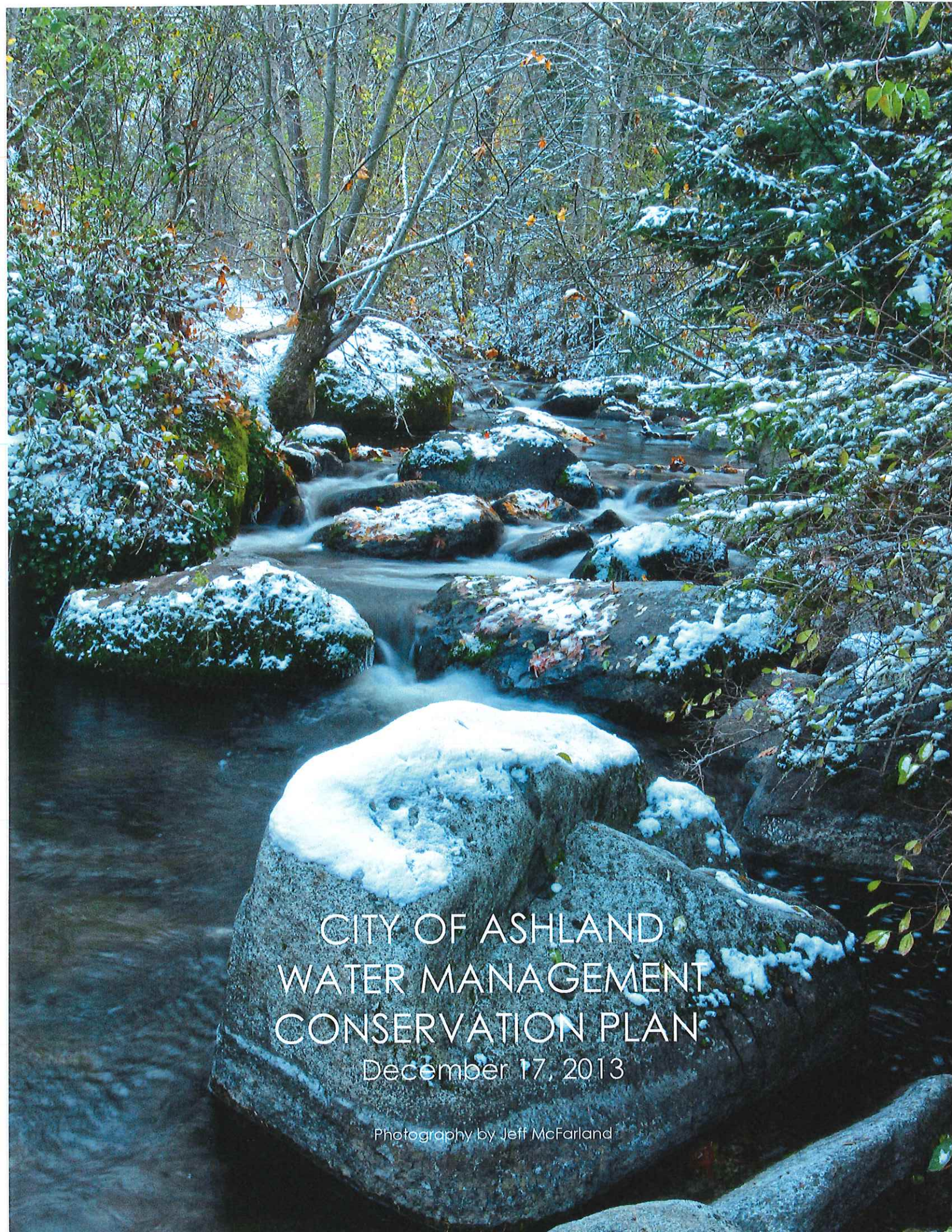

CITY OF ASHLAND WATER MANAGEMENT CONSERVATION PLAN

December 17, 2013

Photography by Jeff McFarland

2013 WATER MANAGEMENT & CONSERVATION PLAN (WMCP)

Public Works Project #2011-38
December 17, 2013

Prepared by:
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CITY OF ASHLAND

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Record of Changes

Δ	Date	Pages	Description of Changes	Name	Status
0	2012.11.26	All	Review copy to OHA	Pieter Smeenk	A
1	2013.12.17	All	Final copy to OHA	Pieter Smeenk	A
2					
3					
Status Abbreviations: A=accepted, P=proposed, T=tabled, N=include in next revision cycle					

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9	Lisa Jaramillo	Oregon Health Authority (OHA) Plan Reviewer
10	Scott Curry	OHA Regional Engineer

Table of Contents

Table of Sources

OAR	Sec.	Description	Source
690-086-0140	(1)	Description of supplier's sources	2011 WCRS TM5,Sec 2
	(2)	Delineation of current service area	2012 WMP Ch 1.3, (& Fig1-1)
	(3)	Assessment of adequacy and reliability of existing supplies	2011 WCRS TM5.Sec 5.4
	(4)	Quantification of present and historic use	2011 WCRS TM2.Sec,1
	(5)	Summary of water rights held	2011 WCRS TM12
	(6)	Description of customers served and water use summary	2012 WMP 5.3
	(7)	Identification of interconnections with other suppliers	2012 WMP 5.3
	(8)	System schematic	2012 WMP 5.3
	(9)	Quantification of system leakage	2011 WCRS 3.5?WMP 4.5
690-086-0150	(4)(b)	Full metering of systems	2012 WMP
	(4)(c)	Meter testing and maintenance program	2012 WMP 8.5.
	(4)(a)	Annual water audit	2011 WCRS 3.5
	(4)(e)	Leak detection program	2012 WMP 8.5.?
	(6)(a)	Leak repair or line replacement program	2012 WMP 8.5, 7.2.9
	(4)(d)	Rate structure based on quantity of water metered	WMP Ch4 Appx 1c **
	(6)(d)	Rate structure & billing practices encouraging conservation	WMP Ch 4 Appx 1d *
	(4)(f)	Public education program	WMP 4.9-10
	(6)(b)	Technical and financial assistance programs	WMP Ch 4 Appx 1e *
	(6)(c)	Retrofit/replacement of inefficient fixtures	WMP Ch 4 Appx 1e *
	(6)(e)	Reuse, recycling, non-potable opportunities	WMP Ch 4 Appx 1e *
	(6)(f	Other measures, if identified by supplier	WMP Ch 4 Appx 1e *
	(1)	Progress report on previous WMCP	No Previous WMCP
	(2)	Documentation of water use measurement & reporting	
	(3)	Measures already implemented or required under contract	WMP Ch 4 Appx 1e *
**90-086-0160	(1)	Assessing water supply	WMP 4.8.2
	(2)	Stages of alert	WMP Ch4 Appx 1c **
	(3)	Triggers for each stage of alert	WMP Ch4 Appx 1c **
	(4)	Curtailment actions	WMP Ch4 Appx 1c **
690-086-017	(1)	Delineation of Current & Future Service Areas	COA Land Use Map
	(1)	Population projections for service area	WMP 3.1 2011 2.1.2WCRS2.1.2
	(2)	Prepare schedule to fully exercise each permit	2011 WCRS TM12
	(3)	Prepare demand forecast	2011 WCRS TM2
	(4)	Comparison of projected need and available sources	2011 WCRS TM2.1.2
	(5),(8)	Analysis of alternative sources	2011 WCRS TM7-TM14
	(6)	Quantification of maximum rate and monthly volume	
	(7)	Mitigation actions under state and federal law	

***(AMC Res. 3011) **(AMC14.06.080)**

Executive Summary

1. Introduction

The City of Ashland has developed this Water Management and Conservation Plan (WMCP) to guide the development, financing, and implementation of water management and conservation programs and policies to ensure sustainable use of water resources while the City plans for its future water needs. This WMCP:

- Establishes a prioritized list of conservation measures and practices to meet regulatory benchmarks and self-imposed performance targets
- Guides the City's future investments in conservation programs
- Describes the actions the City will take if water shortages occur
- Provides a blueprint for the City's long-term water supply

This WMCP fulfills the requirements of the Oregon Administrative Rules (OAR) adopted by the Oregon Water Resources Commission in November 2002 (OAR Chapter 690, Division 86). It describes water management, water conservation, and curtailment programs to guide the wise use and stewardship of the City's water supply.

The Plan is organized in five sections, each addressing specific requirements of the rules in OAR Chapter 690, Division 86. Section 2 is a self-evaluation of the City's water supply, water use, water rights, and water system. The information developed for Section 2 is the foundation for the sections that follow. The later sections use this information to consider how the City can improve its water conservation and water supply planning efforts.

2. Water Supplier Description

Ashland's service area includes all of the area inside the city limits as well as properties inside its surrounding urban growth area that have agreed to annex. It also includes several governmental facilities just outside of its urban growth boundary in the unincorporated area of Jackson County.

Currently, the City's primary water source is the Ashland Creek Watershed above the City. Raw water is collected in Reeder Reservoir, a 20 acre manmade lake impounded by Hosler Dam, which is carried by a penstock to the City's Water Treatment Plant and distribution system. The City has a dry season irrigation water supply connection to the Talent Irrigation District (TID). It also plans to construct an emergency intertie connection with the City of Talent, which receives treated water from Big Butte Springs and Lost Creek Lake via the Medford Water Commission (MWC). The City has leased stored water capacity from the USACE at Lost Creek Reservoir and reserved transmission capacity from the Talent Ashland Phoenix (TAP) consortium. The City plans to purchase treated water directly from the MWC on an emergency-only basis.

During 2005 through 2009, the City's average day demand (ADD) averaged 3.35 million gallons per day (MGD). The City's maximum day demand (MDD) ranged from 6.5 MGD in 2008 to 7.17 MGD in 2009, with an average of 6.92 MGD. The City estimates that it provides water to approximately 21,485 people within the Ashland service area. This population is served through approximately 8900 service connections. These connections serve residential areas, commercial establishments, and industrial customers.

The City's residential customers' water consumption averaged approximately 66 percent of the City's total metered production, with 51 percent attributed to single-family residences and 15 percent attributed

to multi-family residential accounts. The City's commercial used another 15 percent, and governmental customers accounted for another 5% percent of annual consumption, with metered irrigation representing the remaining 14% percent.

The City holds two primary senior water rights that authorize a total use of up to 15 cubic feet per second (CFS) of Ashland Creek Water for municipal purposes. In addition, the City holds permits to utilize 1369 acre-feet (AF) of seasonally available TID water for domestic and municipal use from storage reservoirs in the Cascades operated be the Bureau of Reclamation. The City has reserved and paid for municipal rights for1000 AF of reservoir storage in Lost Creek Reservoir but currently does not use water under this permit. Finally, the City holds a very limited water right for a "sulphur" spring used to supply its "Lithia Water" to two historic facilities, one in Lithia Park, and the other on the downtown Plaza.

3. Water Conservation

Five-Year Benchmarks for Other Conservation Measures

OAR 690-086-0150(3) requires a description of all conservation measures other than those required in OAR 690-086-0150(4) . The following paragraphs present descriptions of the City's implementation to date and 5-year benchmarks for these measures.

(a) Technical and Financial Assistance. The City provides technical assistance to residential and multi-residential customers that encourages and assists implementation of water conservation measures. This technical assistance includes providing free water use audits for both indoor and outdoor water conservation. In addition, articles are written for the City's newsletters, "City Source", as well as conservation information in the annual Water Quality Report.

Five-year Benchmark:
• The City will continue to provide technical assistance to residential and multi-residential customers, which comprise the majority of the City's water use.
• The City will investigate opportunities to provide technical assistance to commercial and industrial customers.

(b) Rebates for Replacement of Inefficient Fixtures. Over the past decade, the City implemented a reimbursement program for residential customers who replace existing toilets with high efficiency toilets. The reimbursement provided cash rebates for each toilet replaced. Similar programs for water conserving washing machines, and dishwashers were also implemented, and irrigation controllers may be reimbursed in a similar manner. The Smart Controller Pilot project is scheduled to begin in the spring of 2015, and is intended to help reduce peak summer demand for water and improve outdoor watering efficiency. Qualifying products and services will likely include "Watersense" qualified weather based controllers and switches, and hose timers.

Five-year Benchmark:
• The City will continue to offer the above-described reimbursements and will evaluate the effectiveness of its current program.
• The City will retrofit the remaining public facilities, such as public park restrooms during the next 5 years.

(c) Reuse, Recycling, and Non-potable Water Opportunities. The City's ability to reuse treated water is subject to the authority of Oregon Department of Environmental Quality. The City uses reclaimed water next to a wastewater treatment plant and also attempted to utilize effluent on a private golf course proposed on the north end of Ashland. The City has extensively investigated using reclaimed water for other uses, but DEQ has been resistant to permit this use of reclaimed water because of its need to meet

in-stream flows during the peak irrigation season. In response to public interest, the City has also developed information about grey-water and rainwater catchment systems.

Five-year Benchmark:
• The City will continue to forward customer and business inquiries on water reuse and recycling to Clean Water Services.
• The City will provide information to the public regarding rainwater and greywater catchment systems.

(d) Other Measures. The City has retrofitted toilets in City public facilities and parks restrooms with new "Watersense" qualified valves instead of the existing valves. Many of these toilets have an auto flush system. Urinals in City public facilities and parks restrooms have begun retrofitting with 0.5 GPM flush water valves instead of the existing 3.0 GPM valves. As part of this retrofitting project, the City installed faucets with 1.0 GPM aerators, and most have been installed with an auto shut off system. The City anticipates completing the retrofitting project by installing auto flush and auto shut off systems for the remaining toilets, urinals, and faucets. The City has a full-time conservation specialist who devotes fifty percent of her assigned duties to overseeing the City's water conservation projects.

1) Shave Peak Period Consumption
Residential turf watering:
Incentive-Based Water Rates.
Public Information and Education.
Density Bonus for Water Conservation.
Regulation for Low Water Use Landscape.
Acquisition of Additional Water Rights.
Summer water use of largest non-residential consumers:
Incentive Based Water Rates.
Large Customer Audit.

2) Reduce Base load Consumption
Unaccounted-for-Water in system:
System Leak Detection and Repair.
Commercial and residential base load use:
Showerhead Replacements.
Toilet Rebate.
Plumbing Code Support**.**

Five-Year Benchmarks for Conservation Measures

OAR 690-086-0150(4) requires all municipal water suppliers to implement a particular set of conservation measures. The following paragraphs present descriptions of the City's implementation to date and 5-year benchmarks for these measures.

(a) Annual Water Audits. The City documents water production and consumption on a monthly basis to monitor the City's water demands. The City conducts an annual year water audit, which compares monthly system demand to stream flow and reservoir storage. The City also uses billings-based spreadsheet to estimate system leakage.

Five-year Benchmark:
• The City will continue to conduct annual water audits and to track non-revenue water and system leakage.

(b) System Metering. The City's water system is fully metered.

*Five-year Benchmark***:**

• The City will continue metering all new connections and investigate unusual demand situations in order to detect leaks or other unintended water use.

(c) Meter Testing and Maintenance. The City's water meter maintenance and replacement program focuses on meters that record unusual water use. Utility billing employees contact meter reading staff when unusual use is detected, and meter readers inspect and re-read the meter to verify usage. This approach yields the greatest conservation cost/benefit ratio. All meter maintenance is tracked using a GIS based-management system. Water meters not recording within the manufacturer's specifications are repaired in the field or replaced, as needed. For smaller meters, the City replaces meters that are determined to be inoperable by inspection as part of the meter reading process. The City has recently added a CIP annual budget line item for phasing in the use of radio read meters. Approximately 1800 radio read meters have already been installed.

Five-year Benchmark:
• The City will continue its current meter replacement and maintenance program.
• The City will seek to increase funding to replace standard meters with radio read meters.

(d) Rate Structures and Billing Schedules. The City's rate structure is based on the quantity of water consumed through metered connections and, therefore, encourages conservation. The City currently bills its customers on a monthly basis.

Five-year Benchmark:
• During the next 10 years, the City plans to implement a rate structure and rate stabilization program intended to encourage water conservation by eliminating the need to raise rates when revenues decline as a result of conservation.
• This came about as a result of recently-completed water conservation and reuse study. The City requested and received from its consultants a cost/benefit analysis regarding the current rate structure and sought recommended changes.
• The results of the actions will be reviewed and adjusted annually by the City Council.

(e) Leak Detection. The City monitors water audit results based on a 5-year running average as part of its master plan updates. City policy is to begin leak detection measures if the average billing exceeds 10 percent. Based on this most recent Water Audit, the current 5-year average is 8.2 percent. Visual leaks reported by the public or public works personnel are investigated and leaks are repaired immediately.

Five-year Benchmark:
• The City will continue the current leak detection program as described.

(f) Public Education. The City's conservation program includes a significant public education element. The education program is composed of a wide variety of activities, and has included in-class presentations, videos, interactive games, and funding to staff the monthly Conservation Commission meetings, as well as the various other functions involved in permitting, development review, and inspection of construction of water consuming components.

City conservation staff also participates in community events such as Earth Day and the Bear Creek Festival to provide conservation information. The City's website contains conservation information, indoor and outdoor conservation tips, a description of educational tools available to schools and teachers, instructions on how to water lawns, a frequently asked questions (FAQ) section, downloadable application for appliance rebate programs, and an information request form for materials such as kits, calendars, or information regarding water conservation and water quality. In addition, water conservation displays are set up at the Ashland Library and Public Works Building. Furthermore, the City mails its utility customers a monthly newsletter titled City Source" (see appendix 3) that addresses seasonally

appropriate water issues. Finally, the conservation program has produced a utility bill insert to inform customers about the importance of water conservation throughout the summer.

Five-year Benchmark:
• The City will continue to use a wide variety of methods to provide water conservation information to the public.
• The City will continue sponsoring classes and events to educate its citizens about new technologies and methods of creative water conservation.

4. Water Curtailment

ln the event of a water shortage, the City needs a detailed response plan based on predetermined objective criteria. The curtailment plan describes how the City will respond to specific water-shortage conditions. The City's curtailment plan presented in this WMCP has four distinct levels, each of which is triggered by one or more events. The four levels, increasing in order of severity, are summarized below. Any of the initiating conditions described below will trigger the appropriate curtailment level. Initiating conditions and response actions are described in detail in Section 4 of this WMCP.

Curtailment Level

Initial Determination of potential water shortage
• Voluntary Curtailment may or may not be requested depending on conditions.
Stage 1
• Private users pay surcharge of 400% for excessive use as defined by AMC 14.06.010a • Public Sector agencies must pay surcharge if use exceeds 80% of previous year's use.
Stage 2
• Private users pay surcharge of 400% for excessive use as defined by AMC 14.06. • Public Sector agencies must pay surcharge if use exceeds 70% of previous year's use
Stage 3
• Private users pay surcharge of 400% for excessive use as defined by AMC 14.06. • Public Sector agencies must pay surcharge if use exceeds 60% of previous year's use.
Stage 4 – Emergency
• Private irrigation & residential users pay surcharge of 400% for all water used. • Private commercial users pay surcharge of 400% for excessive use as defined by AMC 14.06. • Public Sector agencies must pay surcharge if use exceeds 50% of previous year's use

5. Water Supply

Data from the recently completed Water Conservation and Reuse Study were used to project the 20 year and 50 year population projections within the City's urban services boundary (USB). A summary is presented in the figure below:

Population Growth

Year	Population
2009	21,505
2020	22,846
2030	24,716
2060	30,326

To project the future water demands for the City's USB, it was assumed that the following per capita demand factors would remain constant throughout the 20-year projection period:

- Ashland USB ADD per capita = 137 gallons per capita day in 2009
- Ashland USB MDD per capita = 313 gallons per capita day in 2009

These per capita demand values were multiplied by the projected future populations for the City to obtain the future ADD and MDD. The resulting ADD and MDD projections for 2019 and 2030 for the Ashland water service area are summarized as follows:

Water Use Projections (MGD)

Year	ADD	MDD
2019	3.59	7.40
2030	3.88	7.99

The City is fully using its Ashland Creek water rights to meet its ADD. During drought years, Ashland Creek provides only a portion of the City's ADD and MDD. Consequently, the City must currently rely on its TID contract to meet its drought year demand. The City has purchased 1000 AC ft of additional water supply from Lost Creek Dam for future use to meet its drought year and eventually its growth related demand. It has begun to decide how and when it will begin to deliver and use this new water supply. It is assumed that the City will pursue a new connection with the Medford Water Commission (MWC) through the Talent Ashland Phoenix (TAP) intertie to use as an emergency water supply initially. At some point in the future, it will contract with the MWC to deliver water annually when growth in demand required ongoing additional supply.

1. Introduction

This section addresses the requirements of OAR 690-086-0125.

Overview

The City of Ashland (City) meets part of its water needs from its Senior Ashland Creek water rights and part from TID irrigation flows. The majority of its water supply is furnished by Ashland Creek, but TID is assumed to be available as supplementary potable supply in years when Ashland Creek cannot meet the full need. TID is used every year as a non-potable supply source for irrigation.

The City has an existing connection with Talent Irrigation District (TID) that allows the City to use a portion of the TID supply as a raw water source for potable water. Most years TID is used only to supply non-potable supply, but when supply runs short in summer months, TID is also pumped to the WTP.

Additionally, the City has initiated a new treated water interconnection with the adjacent municipal water supply system, the Medford Water Commission (MWC). The City has agreements with adjacent municipalities and irrigation districts that allow it to meet its water supply needs and to obtain water on an emergency basis.

Plan Organization

This Water Management and Conservation Plan (WMCP) fulfills the requirements of the Oregon Administrative Rules (OAR) Chapter 690, Division 86, which were adopted by the Oregon Water Resources Commission (Commission) in November 2002. It describes water conservation and curtailment programs to guide planning and operation of the City's water system.

The plan is organized into five sections, each addressing a specific section of OAR Chapter 690, Division 86:

Section 1 – Introduction OAR 690-086-0125
Section 2 – Water Supplier Description OAR 690-086-0140
Section 3 – Water Conservation OAR 690-086-0150
Section 4 – Water Curtailment OAR 690-086-0160
Section 5 – Water Supply OAR 690-086-0170

Affected Local Governments

In addition to the City of Ashland, the WMCP may affect the following local governmental agencies:

- Jackson County
- City of Talent
- City of Phoenix
- City of Medford
- Talent Irrigation District (TID)

Plan Update Schedule

The City anticipates submitting an update to this WMCP within 10 years of plan approval.

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2. Water Supplier Description

This section satisfies the requirements of OAR 690-086-0140.

Water Sources:

Currently, the City's primary water source is Ashland Creek. The City's owns and operates a water treatment plant located above Ashland, as well as Hosler Dam, which impounds 860 Ac-ft of Ashland Creek water in Reeder Reservoir.

Interconnections with Other Systems:

The City's drinking water system is not currently interconnected with other systems. The City does have a secondary irrigation supply connection to the Talent Irrigation District (TID) canal that is used intermittently during low water years to supplement the Ashland Creek supply. The City has also purchased water rights and has leased water storage capacity from the US Army Corp of Engineers at Lost Creek Reservoir. It has participated with two adjacent communities (Phoenix & Talent) in a joint venture known as TAP, which has constructed an intertie pipeline that already brings water from Medford to Phoenix and Talent, and is sized to be capable of supplying up to 3 MGD of water to Ashland in the future. It is beginning discussions with the Medford Water Commission to purchase future wholesale water from the MWC. Finally, the City plans to investigate the possibility of using existing large capacity wells within the City to augment supply during flooding and other emergencies.

Intergovernmental Agreements:

The City can obtain water from other water providers under various situations. A summary of current intergovernmental agreements in force for wholesale water supply from the TAP Project is as follows:

- Intergovernmental Cooperation Agreement-Medford Water Intertie Project, signed by Talent, Ashland, and Phoenix signed October 18, 1995.
- Intergovernmental Cooperation Agreement-Medford Water Intertie Project, signed by Talent, Ashland, and Phoenix signed October 27, 2000 and Amendment No. I signed March 20, 25, 27, 2002 and Amendment No. 2.
- Pump Station Maintenance Agreement between the cities of Phoenix, Talent and Ashland and the Medford Water Commission - dated October 18, 2000 and amended on May 7, 2002.
- Agreement and Contract for Mutually Granted Easements at Medford Sports and Community Park.
    - Intergovernmental agreement between the Cities of Talent and Ashland for the Provision of Emergency Water Services dated April 19, 2006.
- Addendum to TAP Project Intergovernmental Agreement signed by Talent, Ashland, and Phoenix May 15, 2007.

Service Area and Service Population Description:

Drawing W1, which can be found in attachment section 2, shows Ashland's water service area. It includes the City Limits of Ashland plus the urban growth boundary area located within unincorporated Jackson County.

Figure 5.11 Historic population estimates obtained from the Portland State University (PSU) Population Research Center were used to determine the historical population trends in Ashland. These figures were

recently adjusted downward based on census polling to obtain a current estimate of the population in Ashland after this analysis had been completed. This water use analysis was not, however, adjusted to reflect this downward population adjustment because the plan assumed a fixed growth of 187 individuals per year as the growth rate, regardless of the actual population growth. The figure of 187 individuals comes from the City's Comprehensive Plan. The actual historic water use data based on sales, production, and meter type was then projected forward to predict future water use. **Figure 2-2** shows the number of accounts by customer category for the City in 2010.

Meters by Customer Category (2012)

Customer Class	Number of Meters
Single-Family Residential	6851
Commercial/ Industrial	650
Governmental/Other	1202
Irrigation Only	356
Total	**9059**

Records of Water Use:

Terminology

Production refers to the quantity of water delivered to a distribution system from a water treatment plant or wholesale supplier. By definition, production equals system demand. Production (demand) includes metered consumption (for example, residential, commercial, industrial, public, and irrigation customers), unmetered public uses (fire fighting, hydrant flushing, other), and water lost to leakage, reservoir overflow, and evaporation. Consumption is equal to the metered water use. Production minus consumption equals non-revenue water. Non-revenue water is equal to the sum of un-metered uses (for example, hydrant flushing), leakage, overflows, evaporation, and inaccuracies of measurement at the production or customer meters. Generally, production and consumption in municipal systems are expressed in MGD. They also may be expressed in cubic feet per second (CFS) or gallons per minute (GPM). One MGD is equivalent to 1.55 CFS or 694 GPM. For annual or monthly values, it is typical to refer to the total quantity of water in million gallons (MG). Water use per person (per capita use) is expressed in gallons per capita per day (GPCD). The following terms are used to describe specific values of system demands:

- Average day demand (ADD) = total annual production divided by 365 days.
- Maximum day demand (MDD) = highest system demand that occurs on any single day during a calendar year. It is also called the one-day MDD or peak day demand.
- Monthly demand = total volume of water produced in a month divided by the number of days in the month.
- Maximum monthly demand (MMD) = the highest demand in one of the 12 months of a calendar year.
- Peaking factors are the ratios of one demand value to another. The most common and important peaking factor is the ratio of the MDD to the ADD.

Historical Water Demands

Below is a tabular summary of demand records for the period 2005 through 2009. Data are based on total demand and include the ADD, MDD, MMD, and the MDD to ADD peaking factors. (Demand excludes water used for ASR recharge, but includes recovered groundwater.)

Summary of Annual Demand Data

Year	Annual Volume (MG)	Average Day Demands[1] (MGD)	Max Day Demands[1] (MGD)	Peaking Factor (Max Day/Avg Day)
2005	1215	3.33	7.17	2.15
2006	1256	3.44	7.04	2.04
2007	1215	3.33	6.96	2.09
2008	1197	3.28	6.50	1.98
2009	1070	2.93	6.74	2.30
2010	941	2.47	5.36	2.17
2011	952	2.58	5.14	2.28
2012		2.52	6.74	2.67
Average[(2)]	1223	3.35	6.92	2.21

Notes:

- Source: Ashland Water Treatment Plant production data for finished water; this number includes Unaccounted For Water, or losses.
- Excluding 2009 because of voluntary and mandatory curtailment in that year.

MG = million gallons
MGD = million gallons per d

The table below shows the monthly demand from all sources for 2008, a typical recent year. As expected, demand peaks in the summer months, when weather is hot and dry and water is used for irrigation, swimming pools, etc., and is lower during the rest of the year.

Indoor versus Outdoor Use (2008 in MG)

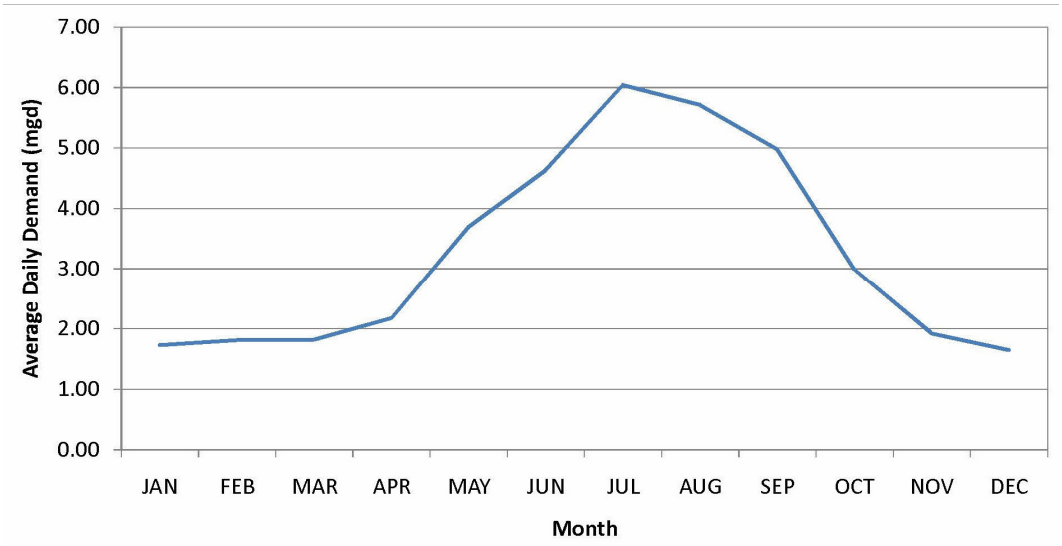
Month	Total Demands[1]	Indoor Use[2]	Outdoor Use
January	53.6	51.3	2.3
February	50.8	46.3	4.4
March	56.7	51.3	5.4
April	65.3	49.6	15.6
May	114.6	51.3	63.3
June	139.2	49.6	89.5
July	187.5	51.3	136.2
August	177.2	51.3	125.9
September	149.5	49.6	99.8
October	92.6	51.3	41.3
November	57.8	49.6	8.2
December	51.3	51.3	0.00
Total	1196	604	592

Notes:
(1) Source: 2008 Water Treatment Plant production data for a typical year for finished water; this number includes Unaccounted For Water.
(2) Assumes the minimum daily use in December is representative of indoor use through the year. Monthly indoor use is calculated by multiplying the minimum daily use (the average daily use during the month of December) by the number of days in the month.

Total Monthly Demand from All Sources

Municipal MDDs are generally more variable from year to year than are ADDs because MDDs are sensitive to weather patterns. Unusually hot weather or the combination of hot and dry weather increases outdoor irrigation, which in turn increases the MDD. During 2005 through 2009, the City's ADD averaged 3.35 MGD. The MDD ranged from 6.05 MGD in 2008 to 7.17 MGD in 2005, with an average of 6.92 MGD. The MDD to ADD peaking factor for the period averaged 2.06. **Figure 2-6** shows the City's average daily metered production in 2008. The table below further estimates the indoor versus outdoor use.

City of Ashland Average Daily Metered Production (2008)



Annual Consumption and Non-revenue Water:

Consumption is equal to the metered or otherwise accounted for water use within the system. Non-revenue water is equal to the difference between production and metered consumption, and represents the sum of unmetered uses (hydrant flushing, for example), leakage, overflows, evaporation, and inaccuracies of measurement at the production or customer meters. When this difference is divided by the production value, non-revenue water is expressed as a percentage of total demand. The OWRD's WMCP rules set a goal for system leakage (a potential portion of non-revenue water) of 15 percent or, if feasible, to 10 percent or less. The figure below lists annual total production and metered consumption values for 2002 through 2007, and percentage of non-revenue water.

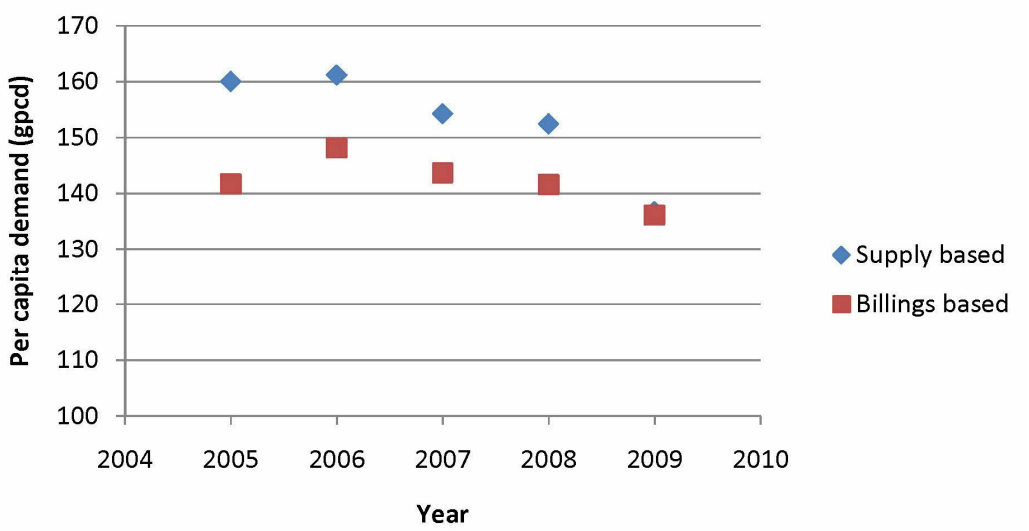
Historic Unaccounted For Water

Year	Water Produced[1] (MG)	Water Billed[2] (MG)	Unaccounted For Water[3] (%)
2005	1220	1080	11.5
2006	1261	1159	8.1
2007	1218	1134	6.9
2008	1196	1111	7.1
2009	1073	1069	0.5
2010	941	965	2.5
2011	952	932	2.1
Average[4]	1224	1121	8.4

Notes:

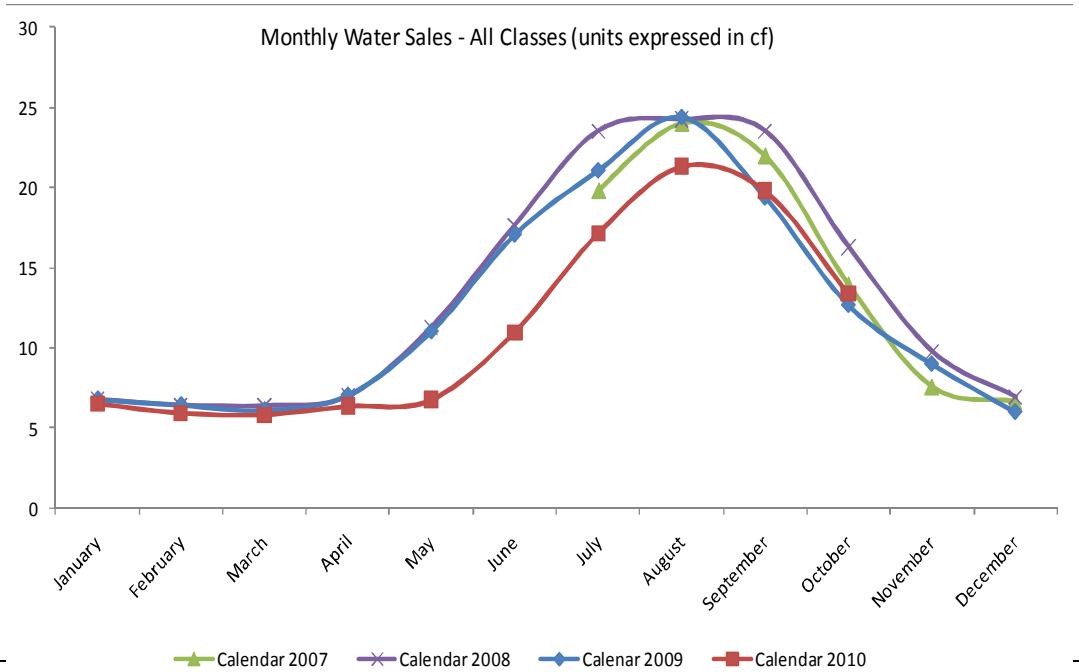
(1) Source: Water Treatment Plant production data.
(2) City billing data.
(3) Calculated percentage of losses.
(4) The average does not include data from 2009 because of voluntary and mandatory curtailments in that year.

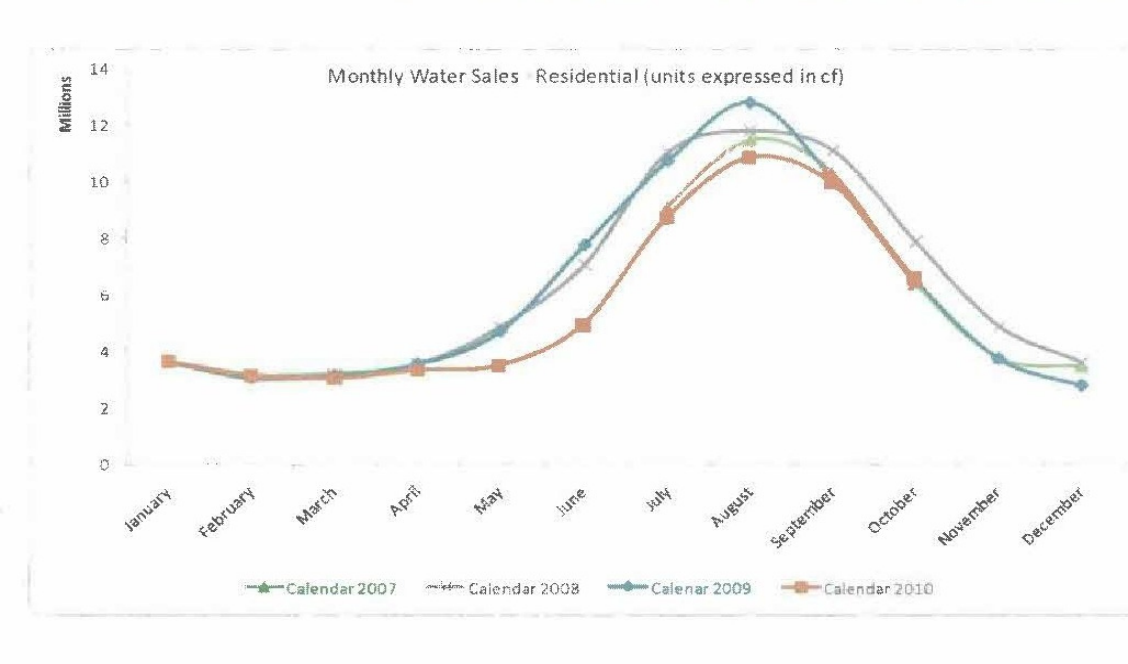
The figure below displays the percentage of non-revenue water data, graphically. As shown in the previous figures and this one, the City's non-revenue water has ranged from -0.5 percent to 11 percent and has averaged 8.4 percent during 2005 through 2009 considered here.



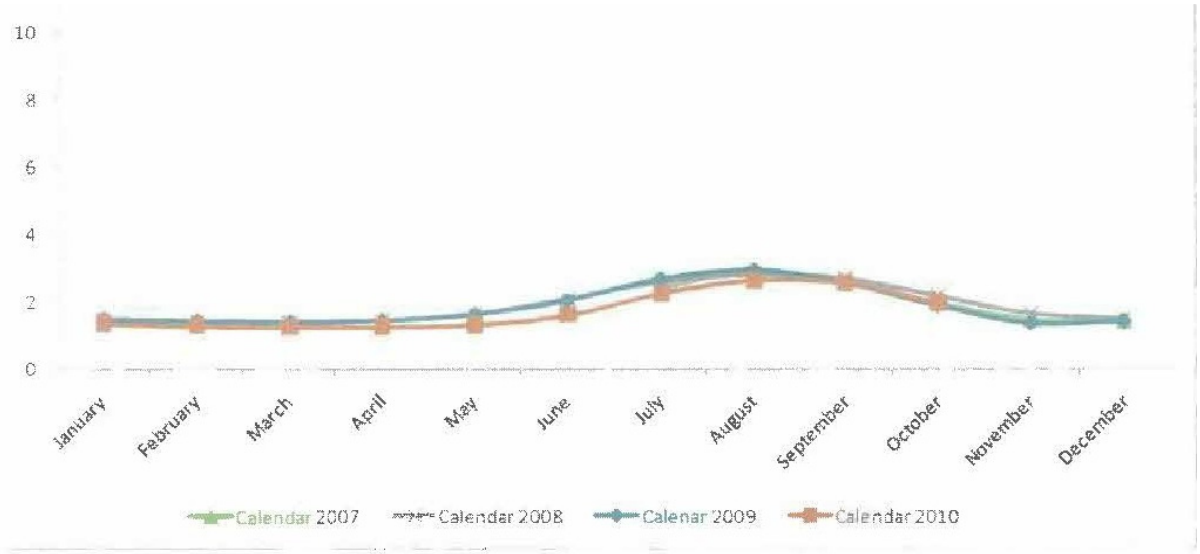
Customer Characteristics and Use Patterns:

Consumption data presented here reflect bill date. Therefore, peak months may be offset (delayed) by approximately 1 month from demand data.

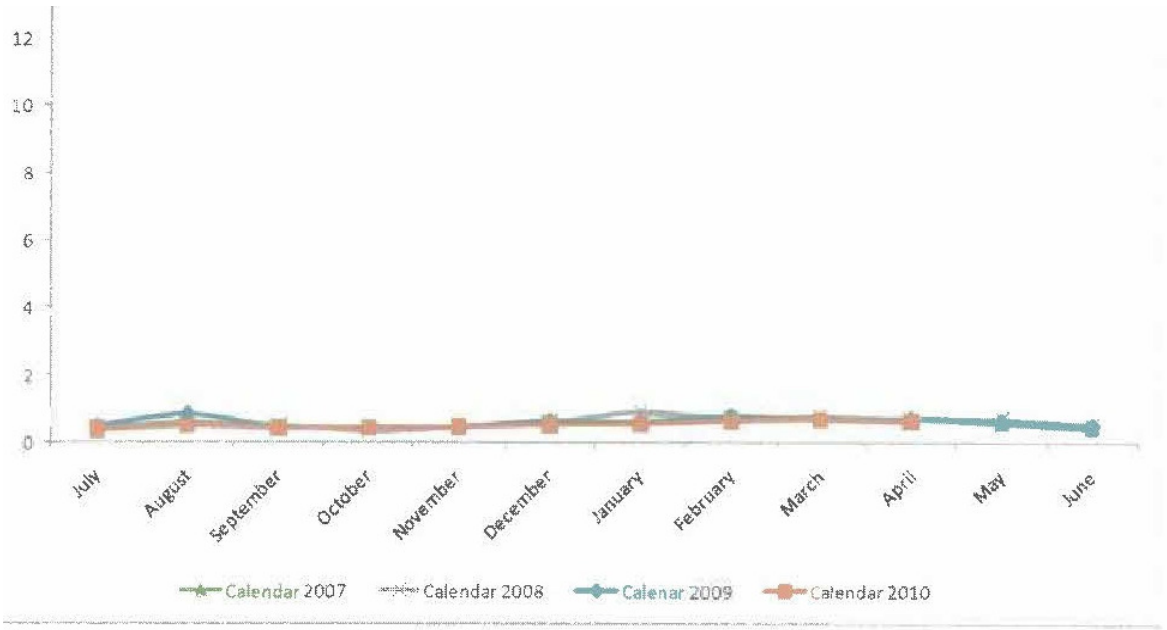




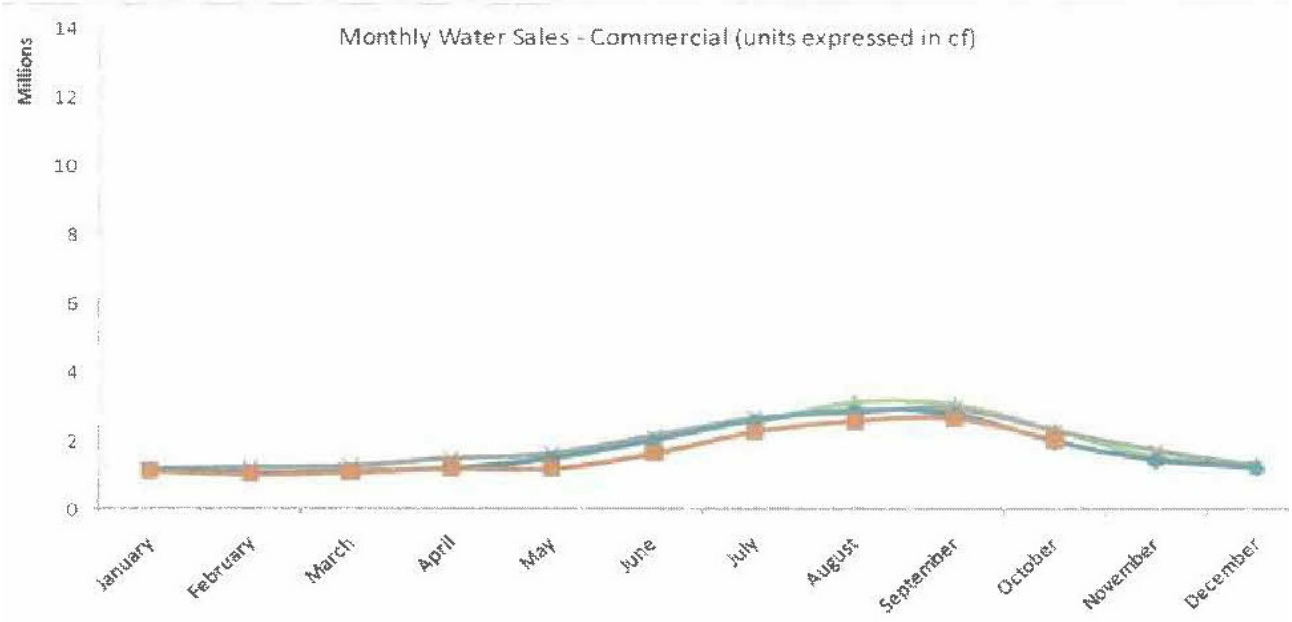
Single Family Residential use generates about 51% of system use



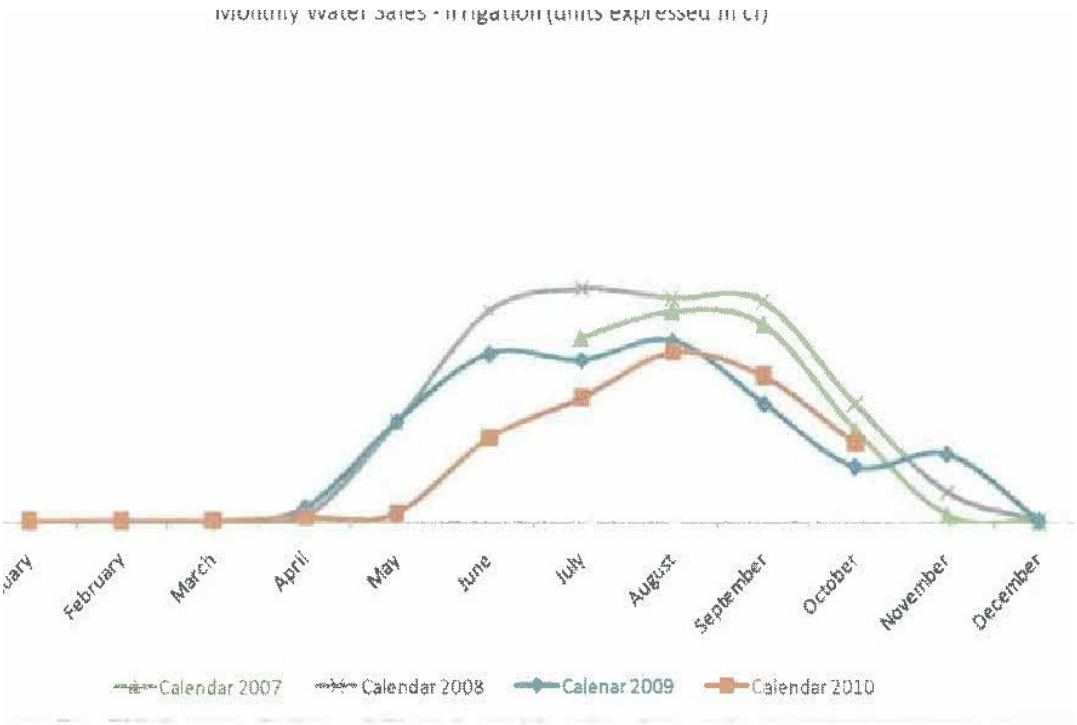
Multi-family generates about 15% of total system use.



Commercial generates about 15% of total system use.



Government generates about 5% of total system use.



Separately Metered Irrigation generates about 14% of total system use.

Ten Largest Potable Water Users

Customer Name	2011 Consumption (CF)
SOU Physical Plant	1420127
City of Ashland Parks	749481
Pacific Properties	670106
Ashlander Apartments	439700
Ashland Community Health Care System	394721
City of Ashland (remainder)	260410
CPM Real Estate Services Inc	239235
Ashland Public Schools	216354
Ashland Springs Hotel	212250
Oregon Shakespeare Festival	186041

Aquatic Resource Concerns

A number of anadromous fish species are present in the Ashland Creek watershed as well as the Rogue River, including Chinook and coho salmon and winter and summer steelhead. Only coho are listed as threatened (under the federal Endangered Species Act). However, the limit to their distribution is more than a mile downstream from the Reeder Reservoir diversions. Coho are not present in the reservoir. The reach of the Rogue River at the Duff WTP is important for coho spawning and rearing, and the MWCs resource concerns can be found in their WMCP Exhibit 2.32.

Threatened, Endangered, & Candidate Species in Oregon

The State of Oregon and the federal government maintain separate lists of threatened and endangered (T&E) species. These are species whose status is such that they are at some degree of risk of becoming extinct.

Under State law (ORS 496.171-496.192) the Fish and Wildlife Commission through ODFW maintains the list of native wildlife species in Oregon that have been determined to be either "threatened" or "endangered" according to criteria set forth by rule (OAR 635-100-0105).

Plant listings are handled through the Oregon Department of Agriculture.

Most invertebrate listings are handled through the Oregon Natural Heritage Program.

Under federal law the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration share responsibility for implementing the federal Endangered Species Act of 1973 (Public Law 93-205, 16 U.S.C. § 1531), as amended. In general, USFWS has oversight for land and freshwater species and NOAA for marine and anadromous species. In addition to information about species already listed, the USFWSOregon Field Office maintains a list of Species of Concern.

Additional information about the federal programs in place in Oregon can be found at the following websites: U.S. Fish and Wildlife-Oregon (http://www.fws.qov/oreqonfwo)
. Northwest Region of NOAA-Fisheries (http://www.nwr.nmfs.noaa.!=)ov)

Threatened, Endangered, and Candidate Fish and Wildlife Species in Oregon (T=threatened, E=endangered, S-V=sensitive-vulnerable, N/A= not applicable)

Common Name	Scientific Name	State status	Federal status
Chinook Salmon	*Oncorhynchus tshawytscha*	S-V	N/A
Coho Salmon	*Oncorhvnchus kisutch*	S-V	T
Steelhead	*Oncorhynchus mykiss*	S-V	N/A
Western Brook Lamprey	*Lampetra richardsoni*	S-V	N/A
Pacific Lamprey	*Lampetra tridentate*	S-V	N/A

Water Quality Parameters

According to the Oregon Department of Environmental Quality's (DEQ) web site, Ashland Creek is listed on the Oregon Department of Environmental Quality's 303(d) list as water quality limited for dissolved oxygen, E. *Coli,* and temperature from its mouth to the Water Treatment Plan downstream of Reeder Reservoir. The stream assessment and TMDLs for Ashland Creek is shown in the table below, and a full list of water quality limiting parameters for all other Oregon streams can be found in DEQ's Water Quality Assessment Oregon's 2004/2006 Integrated Report Database at

http://www.deq.state.or.us/wq/assessment/rpt0406/search.asp

Ashland Creek TMDLs (* RM = river mile distance from the mouth at Bear Creek)

RM*	Parameter	Season	Criteria	Beneficial Uses	Status
0 to 2.8	**Ammonia**	Spring Summer Fall	Table 20 Toxic Substances	Anadromous fish passage, Drinking water, Resident fish and aquatic life	TMDL approved
0 to 2.8	**Fecal Coliform**	Fall Winter Spring	Fecal coliform log mean of 200 organisms per 100 ml; no more than 10% > 400 per 100 ml	Water contact recreation	303(d)
0 to 2.8	**Fecal Coliform**	Summer	Fecal coliform log mean of 200 organisms per 100 ml; no more than 10% > 400 per 100 ml	Water contact recreation	303(d)
0 to 2.8	**Phosphorus**	Spring Summer Fall	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Aesthetics	TMDL approved
4.9 to 5.4	**Sediment**	Not Defined	The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.	Resident fish and aquatic life, Salmonid fish rearing, Salmonid fish spawning	303(d)

Evaluation of Water Rights/Supply: 690-086-0140(3)

Water Law Introduction

Under Oregon water law, with a few exceptions, the use of public water requires a water right from the Oregon Water Resources Department (OWRD). The administration of water rights by OWRD is based on the doctrine of prior appropriation. Under this doctrine, in times of shortage the first person to have obtained a water right permit (the senior appropriator) is the last to be limited in low water conditions. The date of application for the water right permit usually establishes the priority date or place in line of an appropriator. In water-short times, the senior appropriator can demand the full amount of their water right regardless of the needs of junior appropriators. If there is surplus beyond the needs of the senior appropriator, the next most senior appropriator can take as much as needed to satisfy their right and so on down the line until there is no surplus. A state officer (OWRD Watermaster) oversees which junior appropriators must stop using water so that senior users can be satisfied.

The right to use water is typically first granted in the form of a water use permit. The permit describes the priority date, amount of water that can be used, point of diversion, type of water use, and place of use. (It should be noted that the place of use for municipal water rights is more flexible than for other water rights, and municipalities can serve water outside of their places of use.) Permits also often contain a number of water use conditions. The permit allows the water user to develop the infrastructure needed to put the water to full beneficial use. When the report of beneficial use, called a claim of beneficial use (COBU), is approved by OWRD, a water right certificate is issued confirming the status of the right. Obtaining a water right certificate is the best way to ensure the protection of the water use because municipal water use certificates generally are not subject to cancellation as a result of non-use and are not subject to legislative and administrative changes affecting undeveloped uses.

There are two different administrative processes that allow modification of a water right. When a water right is in the permit phase (still being developed), the permit holder may modify the water use by changing the location of use and the point where water is appropriated through an application for a permit amendment. When a water right has a certificate, the water right holder can modify the location of use, the point where water is diverted, and the type of use made under the water right through an application for a water right transfer.

Water right permits typically have timelines for making full beneficial use of the water. If more time is needed than provided in the permit, the permit holder may request an extension of time from OWRD. In the past, extensions of time were routinely granted by OWRD. Under current rules, an extension of time may involve an analysis of what would happen to state and federally listed fish species if the undeveloped portion of the permit were to be used.

An exception to the requirement that water users must have a water right from OWRD is a claim of a water right pre-dating Oregon's water code. These claims are based on an assertion that water use began before February 24, 1909, when the water code went into effect. The validity of these claims is determined through an adjudication, after which OWRD issues certificates for the claims determined to be valid. The Rogue River and its tributaries above the Illinois River have been adjudicated.

3. City of Ashland Water Supply

The City obtains its water supply from two sources: water diverted from Ashland Creek under municipal water rights held by the City and water provided by TID pursuant to contracts with TID or the federal government. The following discussion describes both supply sources. In addition, this section describes municipal water rights that are held by the City, but currently are not used. Appendix

2 Municipal Water Rights Table summarizes the City's rights in tabular form recommended by OWRD.

A. Inventory and Analysis of Water Rights Held by the City

The City holds numerous water rights for municipal purposes. The majority of these water rights authorize the use of water from Ashland Creek. However, the City also holds water rights that it currently does not use. Currently unused rights include those authorizing the use of water from Sulphur Spring and Lost Creek Reservoir. The Municipal Water Right Table in Appendix 2 summarizes all of these water rights.

As stated above, Ashland Creek (and Reeder Gulch Reservoir) provide the primary source of water for the City. The City holds a water right authorizing the storage of water from Ashland Creek in a reservoir (Reeder Gulch Reservoir) and a secondary right authorizing the use of the water stored in Reeder Gulch Reservoir as well as live flow (water from the stream that is not released stored water) from Ashland Creek. The City also holds an additional 23 water rights for the use of live flow from Ashland Creek for municipal purposes. All of these water rights are in certificate status. These rights, which previously authorized the use of water for irrigation, were acquired by the City and transferred to authorize the use of water for municipal use. In addition to its Ashland Creek water rights, the City also holds a certificated water right authorizing the use of water from Sulphur Spring, which is a tributary of Neil Creek. Finally, the City holds a currently-unused water use permit authorizing the use of stored water from Lost Creek Reservoir. These rights are described in more detail below.

1. Application R-11489 Permit, R-596, Certificate 10843
Priority date: May 20, 1927
Source: Ashland Creek Volume:
800 *acre-feet*

In May 1927, the City applied for a permit to store water in Reeder Gulch Reservoir for municipal water supply. In July 1927, the State Engineer issued the City Permit R-596 authorizing the storage of up to 800 acre-feet of water in the reservoir for municipal use. The City developed this water use and in September 1934 received a certificate (10843) confirming the right to store up to 800 acre-feet of water from Ashland Creek to be appropriated under Permit 7985. The certificate does not contain any conditions limiting the use of water under this right.

Certificate 10843 is a water right certificate held by a City for municipal purposes. As such, it is a very secure water right. According to the local OWRD Watermaster, the City is typically able to fill the reservoir each year. Thus, Certificate 10843 appears to be a highly secure and reliable water right. Nonetheless, according to the OWRD Watermaster, the volume of water the City can store under this right does not provide a sufficient water supply to meet the City's needs through the high water demand season.

2. Application S-11518, Permit S-7985, Certificate 10856
Priority date: May 31, 1927
Source: Ashland Creek and Reeder Gulch Reservoir
Rate: 15 *cubic feet per second*

In May 1927, the City applied for a permit to use water from Ashland Creek and the water stored in Reeder Gulch Reservoir for municipal water supply. In July 1927, the State Engineer issued the City Permit S-7985 authorizing the diversion of up to 15 cubic feet per second (CFS) from Ashland Creek and Reeder Gulch Reservoir for municipal use. The City developed this water use and in September 1934 received a certificate (10856) confirming the right to divert up to 15 CFS of water from Ashland Creek and Reeder Gulch Reservoir for municipal use. The place of use for the certificate is described as Sections 3, 4, 9 and 10, Township 39 South, Range 1 East W.M. being within the City of Ashland. The

certificate does not contain any conditions limiting the use of water under this right.

Certificate 10856 is a water right certificate held by a City for municipal purposes. As such, it is a very secure water right. Although the City now covers more area than that identified in the place of use for this water right, this is not a significant limitation on the water right. As described above, municipalities can serve water outside of the place of use identified in their water rights as long as it does not interfere with or impair other water rights. As a result, the place of use identified in Certificate 10856 is not likely to be a limitation on the City's use of water under this right. The City could, however, file a transfer application to change the place of use in the water right to reflect its current service area.

This right does not provide a reliable water supply during the high water demand season. During times of low stream flow, Ashland Creek does not contain sufficient water to meet the needs of all of the water right holders with water rights from that source. There are water rights with downstream points of diversion on Ashland Creek that are senior to (have earlier priority dates than) Certificate 10856. These senior water rights are entitled to receive the full rate to which they are entitled before the City takes water under this water right. We understand from the local Watermaster that the City has been allowing approximately 3 CFS of water to pass its point of diversion to meet the needs of these senior water right holders. The City has been limiting its diversion of water based on the Ashland Creek stream flow according to a July 5, 1973, letter from OWRD. Since the time that the 1973 letter was written, the City has acquired an additional eight water rights and transferred the rights to its point of diversion for municipal purposes. Although the rights authorize the combined diversion of up to approximately 0.4 CFS from Ashland Creek, the local Watermaster has stated that he does not expect the later transfers to increase the amount of water that the City could divert from Ashland Creek as a result of demands of downstream senior water users. The City may want to work with the local Watermaster to better understand OWRD's analysis in the 1973 letter and to clarify if the later transfers have any actual implications for the City's need to bypass water at its point of diversion.

3. Additional 23 Ashland Creek Water Right Certificates
Priority date: December 31, 1854 to *December* 31, 1885
Source: Ashland Creek
Combined Maximum Rate: 14.06 *cubic feet per second*

The City has acquired 23 additional water rights from Ashland Creek. These rights are described in more detail in the Municipal Water Right Table in Attachment 1. The combined maximum authorized rate for these rights is 14.06 CFS. The maximum authorized rates for the individual rights range from 0.011 CFS to 0.315 CFS. The priority dates for these water rights range from December 31, 1854 to December 31, 1885, which pre-date Oregon's 1909 water code. Consequently, the rights originally were granted through the Rogue River adjudication and decree. The rights originally authorized the use of water for irrigation purposes. After acquiring the rights, the City filed transfer applications to change the authorized use to municipal purposes. The transfers also changed the place of use to within the corporate limits of the City of Ashland or identified sections within Township 39 South, Range 1 East W.M. The transfers also changed the point of diversion for these rights to the SE % SE %, Section 20, Township 39 South, Range 1 East W.M, which is also the point of diversion for the City's Certificate 10856. Twelve of these certificated water rights allow the use of water year around and the remaining allow use only during the irrigation season (April 1 to November 1).

Because these water rights are all evidenced by water right certificates and are held by a City for municipal purposes, they are very secure water rights. As with Certificate 10856, the reliability of these water rights is limited by the lack of stream flow in Ashland Creek during the high water demand season. These water rights are senior to the City's other water rights from Ashland Creek. As a result, the acquisition of these rights presumably has increased the City's ability to obtain water from Ashland Creek during times of low flow.

4. Application S-85733, Permit S-54337
Priority date: August 11, 2003
Source: Lost Creek Reservoir
Volume: 1,000 *acre-feet*

As previously described, the City has obtained, but is not currently using, Permit S-54337.

In August 2003, the City applied for a permit to use stored water from Lost Creek Reservoir for municipal use. In September 2006, the OWRD issued to the City Permit S-54337 authorizing the diversion of up to 1,000 acre-feet of stored water from Lost Creek Reservoir each year. The permit does not limit the rate at which this stored water can be diverted. The permit allows diversion year-around for use within the City's service area. The point of diversion for this permit is location in Section 26, Township 33 South, Range 1 East, W.M. (the location where the water is released from the reservoir into the Rogue River at the dam). Although the permit does not contain a point of re-diversion where the water will be diverted from the Rogue River, we understand that the City intends to divert the water at the Medford Water Commission's (MWC) Duff water treatment plant (WTP). Although there does not appear to be a written agreement in place, we understand that the MWC has agreed to treat and convey to the City between 1.5 and 3 million gallons per day (mgd).

The permit requires the City to install a meter or measuring device before diverting water under this water right. The permit also requires fish screens and by-pass devices at the point of diversion. (As stated above, the identified point of diversion in the permit is the dam. It is likely, however, that OWRD would interpret this provision to require a fish screen at the point where the water is to be redirected (at the Duff WTP).) The permit also states that water use under the permit is subject to the terms and conditions of the Water Storage Agreement between the United States of America and the City of Ashland, Oregon for Water Storage Space in Lost Creek Lake Project, Oregon, approved July 26, 2002 (or a satisfactory replacement). The City is required to complete construction and to put the water to beneficial use by **September 7, 2021**. 1£ use is not completed by this date; the City could seek an extension of time from OWRD.

This permit is expected to be relatively reliable but, for several reasons, is less reliable than the water right certificates under which the City currently diverts water. A permit is inherently less secure than a water right certificate because it is subject to possible administrative or legislative changes affecting undeveloped water rights. The need to have a contract with the federal government can create some uncertainty because of numerous federal regulatory processes that can come into play. In addition, the City will need to have an agreement with the MWC, which also can create some uncertainty.

The water source for Permit 54337 appears to be reasonably reliable. To date, the stored water in Lost Creek Reservoir historically has been sufficient to meet the needs of water users with rights to use the stored water.

5. Application S-15342, Permit S-11243, Certificate 11090
Priority date: April 25, 1934 *Source:*
Sulphur Spring
Rate: 0.035 *cubic foot per second*

As previously described, the City has obtained, but is not currently using, Certificate 11090.

In April 1934, the City applied for a permit to use water from Sulphur Spring for drinking purposes or irrigation of City-owned land. In May 1934, the State Engineer issued the City Permit S-11243 authorizing the diversion of up to 0.035 CFS from Sulphur Spring for municipal use. The City developed this water use and in January 1935 received a certificate (11090) confirming the right to divert up to 0.035 CFS of water from Sulphur Spring for municipal use. The place of use for the

certificate is described as Sections 3, 4, 9, 10, and 15 Township 39 South, Range 1 East W.M. or on any other land owned by the city, whether within or without the limits of the city. The certificate does not contain any conditions limiting the use of water under this right.

We understand from the local Watermaster that the City currently does not have a point of diversion in place that would allow it to divert water under Certificate 11090. Nonetheless, as a water right certificate held by a City for municipal purposes, it is a very secure water right (Unlike other types of water rights, OWRD does not have authority to cancel municipal water rights for non-use.). Given the small amount of water that could be diverted under this right, it appears unlikely that the City would develop a point of diversion to allow diversion of water under this right.

Although the City now covers more area than that identified in the place of use for this water right, this is not a significant limitation on the water right. As described above, municipalities can serve water outside of their place of use. As a result, the place of use identified in Certificate 11090 is not likely to be a limitation on the City's use of water under this right. The City could, however, file a transfer application to change the place of use in the water right to reflect its current service area.

B. Talent Irrigation District

In addition to obtaining water from Ashland Creek (and Reeder Gulch Reservoir), the City also receives water from TID. According to Jim Pendleton, the manger of TID, the City has a permanent contract with TID to receive 769 acre-feet of water for domestic purposes. The water provided under this contract is stored water from Hyatt Reservoir, and is delivered by TID to the City via the Ashland Canal.

In addition, the City has an annual contract with the U.S. Bureau of Reclamation (BOR) to receive 600 acre-feet of water. According to TID, this water is stored water from Howard Prairie Reservoir, which is delivered to the City by TID via the Ashland Canal. Although this contract has been renewed annually, TID indicated that the BOR would be willing to provide the City with a long-term contract. The City currently is negotiating with BOR for a long-term contract.

The TID measures the water that it provides to the City at the Starlite measuring station. According to TID, the district does not have contracts with any water users on the City's side of that measuring station.

The need for contracts makes this water supply potentially less secure than an existing water right certificate. Additionally, the need for an annual contract with BOR for 600 ace-feet increases the level of uncertainty because of the need to obtain a new contract each year and the potential for the use to be affected by federal regulatory processes.

C. Discussion

The City's Ashland Creek municipal water rights authorize a combined maximum appropriation of up to 28.88 CFS. The City's ability to use these rights, however, is limited by its water system capacity and by the stream flow in Ashland Creek. The City's water treatment plant has a capacity of 7.5 mgd or 15.47 CFS. As a result, the City's ability to divert water from Ashland Creek is limited to the 15.47 CFS capacity of its water treatment plant. The stream flow in Ashland Creek and downstream competing water rights are also limiting factors on the City's ability to use its Ashland Creek water rights. The City supplements this live stream flow with releases of stored water from Reeder Gulch Reservoir. Reeder Gulch Reservoir, however, does not store enough water to provide sufficient supply to meet the City's demands. As a result, the City is required to meet its additional water supply needs by obtaining water delivered by TID via the Ashland Canal.

The City provided the consultant GSI Water Solutions,Inc.(GSI) with a map showing tax lots that

reportedly receive TID water, either from the district or from the City. The City requested that GSI determine whether the tax lots reported to receive TID water from the City (shown in purple on the map provided by the City, which is in Attachment 2) held individual water rights. The TID manager indicated that TID does not deliver water to water users along the Ashland Canal beyond the Starlite Measuring Station, and that all of the water that passes the measuring station is considered to be part of the City's water supply. This measuring station is upstream from the tax lots at issue. Further, GSI used OWRD's on-line plat card system to review the water rights in areas reported to receive TID water from the City.3 OWRD's plat card system did not report any individually-held water rights in the areas considered. Only municipal water rights were reported in these areas. Consequently, it appears that any diversions of water for irrigation of the tax lots shown in purple on the City's map are occurring under the City's existing municipal water rights and are acquiring a share of the City's municipal water supply delivered by TID via the Ashland Canal. This irrigation is, consequently, reducing the amount of water available to the City for municipal purposes

System Description

This section satisfies the requirements of OAR 690-086-0140(8)

1.1 Existing facilities

The Ashland water system comprises Reeder Reservoir, the Water Treatment Plant, four reservoirs, four pump stations, 32 pressure-reducing valve (PRV) stations, and over 126 miles of distribution piping. Attachment 2 drawing W1 shows the location of these facilities and all pipes over 4 inches in diameter. Drawing W2 shows the system pressure zones and PRV locations, and drawing W3 presents a hydraulic profile of the existing system. The following sections provide a brief description of these system components.

Pipes

Table 1.1 presents a summary of the materials and diameters of pipe in the City's distribution system. The City documents pipe data in its Geographical Information Systems (GIS) database. As seen in the table, the pipe sizes range from 2 to 30 inches in diameter; over 50 percent of the system is 6- and 8-inch diameter piping. The piping system is constructed of a wide range of materials, with 80 percent of the water system constructed of ductile iron and cast iron pipe.

In 2007, the City replaced the raw water transmission pipeline from Reeder Reservoir to the WTP with a 30-inch diameter ductile-iron pipeline, and replaced the 24-inch diameter "main feeder" pipeline from the WTP to Crowson Reservoir, the initial point of distribution to the south end of the system.

Three pipes are connected to the 24-inch diameter transmission line between the WTP and Crowson Reservoir. A 16-inch diameter line conveys flow to Granite Reservoir, and a 24-inch diameter line continues down Glenview Drive, crosses Lithia Park and Ashland Creek, and eventually connects to the Strawberry Pump Station and Fallon Reservoir. A third 24-inch diameter pipe continues down Glenview Drive and turns east to connect to a pipe in Ashland Street.

Two distribution pipes deliver flows from the Crowson Reservoir. A 24-inch diameter pipe, serving as an overflow, connects Crowson Reservoir to Granite Reservoir, 250 vertical feet below it. A 20-inch diameter pipe leaving Crowson Reservoir to the northwest diverges into a 16-inch and two 24-inch pipes. The 16-inch line follows the TID right-of-way to the southeast, and serves the southeast area of the City, including the Alsing Reservoir. The Park Estates Pump Station draws from this line. One of the two 24-inch pipes continues north on Terrace Street, conveying water to the central area of the City. The second 24-inch pipe creates a loop by connecting back to the 24-inch pipe in Glenview Drive.

Figure 2-19 Existing Pipe Lengths by Diameter and Material (Length in feet)

Pipe Diam	Asbestos Cement (AC)	Cast Iron Pipe (CIP)	Copper Tubing	Ductile Iron (DIP)	Galvanized Steel	HDPE Plastic	PVC	el	Tile	Unknown (*)	Total	(%)
¾"										2,298	**2,298**	0.3
2"		594	30	72	5,828		15,868			9,594	**31,986**	4.8
3"										180	**180**	0.0
4"	996	93,924		5,115	687			2,061		11,914	**114,696**	17.2
6"	7,907	115,187		74,770				1,020	19	14,787	**213,690**	32.1
8"		32,718		125,969			1,204	84		16,947	**176,922**	26.6
10"		4,595		11,379				786		489	**17,248**	2.6
12"		2,917		42,740				6,623		4,462	**56,742**	8.5
14"								1,927		612	**2,539**	0.4
16"				19,627				3,726		45	**23,397**	3.5
18"										92	**92**	0.0
20"				3,384							**3,384**	0.5
24"				9,769		1,084		1,533		526	**12,912**	1.9
30"				4,899							**4,899**	0.7
*										5,280	**5,280**	0.8
Total	**8,903**	**249,936**	**30**	**297,724**	**6,515**	**1,084**	**17,072**	**17,759**	**19**	**67,225**	**666,267**	100
(%)	1.3	37.5	.1	44.7	1.0	0.2	2.6	2.7	.1	10.1	100	

Reservoirs

The City's storage facilities provide 7.1 MG of treated water storage and include the Crowson, Granite, Fallon, and Alsing Reservoirs. Table 1.2 presents a summary of the reservoirs. Storage is generally provided on the south side of the City, which is higher in elevation than the rest of the City. As stated above, the Crowson Reservoir is the initial point of distribution to the entire City, and provides emergency and peak storage for the Crowson Zones 1 through 6 in the south-central area of the City. The oldest reservoir, the Granite Reservoir is located near Ashland Creek, in the upper area of Lithia Park, and provides emergency and peak storage to the downtown and north-central Ashland area. Located at the top of Hitt Road, the Fallon Reservoir (also referred to as Strawberry Reservoir) serves Fallon Zones 1 and 2 in the northwest area of the City.

Located in the far south of the City, the Alsing Reservoir is filled by the Hillview Pump Station, about a mile and a half away. This reservoir serves Alsing Zones 1 & 2 in the southeast area of the City.

Storage Reservoirs

Name	Vol. (MG)	Type	Year Built	Diam. (ft)	Height. (ft)	Grade Elev. (ft)	Overflow Elev.(ft)	Altitude Valve Setpoint
Crowson	2.1	Buried Tank	1997	(1)	19.9	2,406	2,425	N/A
Alsing	2.1	Above-Ground Tank	1984	107	31	2,530	2,559	N/A
Fallon	0.5	Above-Ground Tank	1994	58	25.5	2,560	2,586	N/A
Granite	2.1	Above-Ground Tank	1948	134	28	2,145	2,173	2,169
WTP Clearwell	0.07	Above-Ground Tank	194	N/A	4.5	2,443	2,439	N/A
TOTAL	6.8	(1) Reservoir has oval shape with a cross-sectional area of 13,813 SF.						

Pump Stations

The City's four distribution system pump stations are summarized in Table 1.3 below. The Hillview Pump Station maintains pressure in Alsing Zone 1 in the southeast of the City, and serves the Alsing Reservoir. The South Mountain Pump Station boosts water to serve several homes in Crowson Zone 4. The Strawberry Pump Station boosts water to Fallon Zone 1 in the hilly northwest area of the City. Lastly, the Park Estates Pump Station serves residents in Crowson Zone 8, along Ashland Loop Road and Morton Street.

Pump Stations

No pump stations are equipped with onsite power generation. Emergency power is provided by a connection to an auxiliary power source.

Name & Service Area	#	(hp)	ated Cap.* (gpm)	Rated Head* (ft)	Firm Cap.** (gpm)	Pump Mfg. (Model No.)	Pump Speed (rpm)	Motor Mfg. (Model No.)
Hillview	1	30	350/650	300/200	650	Queen Pump HE Vertical	1760	GE 5K6235XM546R
Alsing Resv. & Zone 1	2	30	350/650	300/200		Queen Pump HE Vertical	1760	GE 5K6235XM546R
South Mountain	1	15	100/145	270/220	145	Berkley BI ½ ZPH	3490	US Motors C524AUO4UO5OR136F
Crowson Zone 4	2	40	400/600	260/200		Cornell 2 ½ YHB-40-2	3535	GE 5K286JL1101A
Strawberry	1	40	200	192	200	PACO UM93B00 18801B	1760	BALDOR M2539T-B
Fallon Zones 1& 2	2	40	200	192		PACO UM93B00 18801A	1760	BALDOR M2539T-B
Park Estates	1	10	50	215	150	PACO 10-1595.1 LC	3500	BALDOR EJMM3312T
Crowson Zone 8	2	15	100	215		PACO B2MAGYGP60522	3515	BALDOR SK2150LI538A
	3	40	500	215		PACO 02GYGP60521	3525	BALDOR 40E171144

Notes:
* indicates at design point.
**Firm capacity is the total capacity with the largest pump out of service.

Pressure Zones

As seen in Figure 1.3, the City's water system comprises five major service areas, named after the storage tanks that serve them. The boundaries of the pressure zones in each of the service areas are defined by a combination of PRV stations, closed valves, and booster pump stations. Crowson Zones 1 through 8 are served from the Crowson Reservoir, Granite Zones 1 through 3 are served from the Granite Reservoir, Alsing Zones 1 and 2 are served from the Alsing Reservoir, and Fallon Zones 1 and 2 are served from the Fallon Reservoir. The WTP Direct Zone is served from the 24-inch pipe that extends down Granite Street, bypassing the Granite Reservoir. The zones are delineated based on properties served by pipes within that pressure zone. Figure 1.4 presents the relative elevations of the hydraulic grade line (HGL) of each pressure zone.

Pressure Reducing Valves

PRV (by downstream zone)[1]	Elevation (ft)	Size (Inch)	Downstream Pressure Setpoint (psi)	Location; Comments
PRV-01	1,866	3	127	Water & B St.
PRV-02	1,800	4	76	Elizabeth & Otis
		1.5	83	
PRV-03	1,791	4	80	Laurel & Randy
		2	87	
PRV-04	1,824	6	74	Helman & Orange
PRV-05	1,845	4	60	Oak & Hersey
		1.5	67	
PRV-06	1,834	6	55	Crispin & Oak
		1.5	60	
PRV-08	2,093	8	38	Grandview & Scenic
		3	45	
PRV-09	2,095	6	38.5	Walnut & Wimer
PRV-11	2,306	8	70	Westwood
		4	75	
PRV-12	2,377	4	83	Morton & Waterline Rd.
		2	90	
PRV-13	2,168	8	45	Iowa &Terrace
		2	54	
PRV14	1,988	6	65	Gresham & Allison
PRV-15	1,978	8	85	Union & Allison
PRV-16	1,975	6	81	Morton & Iowa
PRV-17	2,059	10	90	1067 Ashland
		6	98	
PRV-18	2,017	6	56	Walker & Siskiyou
		2	63	
PRV-19	2,057	2	93	Harmony & Siskiyou
PRV-20	2,060	6	55	Normal & Siskiyou

		2	60	
PRV-21	2,236	6	77	Bellview & Miranda
PRV-22	2,208	8	95	Tolman & Moranda
PRV-23	1,990	6	92	842 Clay St.
		2	98	
PRV-24	2,137	10	30	Crowson Road
		4	35	
PRV-25	1,998	6	85	Washington & Ivy
		2	90	
PRV-26	2,086	10	90	Mistletoe Road
		4	97	
PRV-27	2,078	4	93	Faith & Siskiyou
		1.5	100	
PRV-28	2,110	8	70	Meade & Iowa
		4	76	
PRV-29	1,841	10	90	Hersey Street
		3	105	
PRV-30	1,789	6	120	Mountain Ave
		2	135	
PRV-31	1,809	6	82	Fair Oaks
		2	87	
PRV-32	1,793	6	82	Nevada
		2	85	

Notes:

- Data updated by survey of PRVs in June 2010 by Terra Survey, Inc.

System Operational Control

Source	Called By	Winter On	Winter Off	Summer On	Summer Off
Hillview – Pump 1	Alsing Res	8 ft	10 ft	18 ft	22 ft
Hillview – Pump 2	Alsing Res	8 ft	10 ft	18 ft	22 ft
South Mtn – Pump 1	Pressure in Crowson Zone 4	N/A	N/A	N/A	N/A
South Mtn – Pump 2	Pressure in Crowson Zone 4	N/A	N/A	N/A	N/A
Strawberry – Pump 1	Strawberry Res	19 ft	22 ft	19 ft	22 ft
Strawberry – Pump 2	Strawberry Res	14 ft	22 ft	22 ft	22 ft
Park Estates – Pump 1	Pressure in Crowson Zone 8	N/A	N/A	N/A	N/A
Park Estates – Pump 2	Pressure in Crowson Zone 8	N/A	N/A	N/A	N/A
Park Estates – Pump 3	Pressure in Crowson Zone 8	N/A	N/A	N/A	N/A

3. Water Conservation

This section addresses the requirements of OAR 690□086□0150 (1) – (6).

Status Report on Previous WMCP

This section addresses the requirements of OAR 690-086-150(1)

This is the first WMCP the City has submitted. The City has, however, implemented a large number of water conservation measures in the past 20 years, based largely on recommendations contained in a Water Demand Side Resource Study prepared by Synergic Resources Corp and HDR Engineering in 1991.

Water Use Measurement and Reporting Program

This section addresses the requirements of OAR 690-086-150(2).

The City has a water use measurement and reporting program that complies with the measurement standards in OAR Chapter 690, Division 85. The City has a meter at each supply source and records its water use. The City's water use records can be found on the City's web page at:

Additional Conservation Measures

This section addresses the requirements of OAR 690-086-150(3).

(a) Technical and Financial Assistance. The City provides technical assistance to residential and multi-residential customers that encourages and assists implementation of water conservation measures. This technical assistance includes the following services:

- Water Wise Landscaping Website.
- Watering Hotline.
- Water Conservation Web Page.
- Landscaping and Irrigation Plan Review.
- Earth Advantage Home Review.
- Brochures on selecting a landscape and/or irrigation systems.
- Articles are written for the City's newsletter, as well as the annual Water Quality Report reminding residents to take advantage of conservation technical assistance.
- Plumbing Code Support: Work with trade allies to encourage production and installation of water efficient fixtures in accordance with Oregon's plumbing code regulations.

Five-year Benchmark: The City will continue to provide technical assistance to residential and multi-residential customers, which comprise the majority of the City's water use. During the next five years, the City also will investigate opportunities to provide technical assistance to commercial and industrial customers, as well as offering residential irrigation audits to be conducted by the conservation coordinator.

(b) Rebates for Replacement of Inefficient Fixtures.

Washing Machine Rebates

Rebates are given to customers who purchase resource efficient clothes washers. These machines use up to *40%* less water and up to *50%* less energy. Clothes washers with the *ENERGY STAR* label qualify for up to $80 City rebate if the home has an electric water heater and $50 if the home has a gas water heater. Customers are refered to Oregon Dept. of Energy's list of models to select from the more efficient clothes washers listed as qualifying for state tax credits.

Dishwasher Rebates
Rebates are given to customers who purchase resource efficient dishwashers. These models use up to 30% less water than standard models. Dishwashers with the ENERGY STAR label qualify for a $25 rebate.

Toilet Rebates
Rebates are given to customers who replace existing toilets (1.6 gallons per flush or greater) with ultra-low flow toilets meeting the Water Sense Standard, 1.28 gallons or less per flush: $45 for the first toilet, $35 for the second and $25 for the third all located in the same house or business.

Indoor Water Analyses
A Water Conservation Analyst will visit your home to evaluate the efficiency of your plumbing fixtures and will replace the showerheads, faucet aerators, and check toilets for leaks to reduce water used.

Irrigation Analysis
Summer water use typically increases by as much as 300% due to landscaping watering. The city will review your landscape irrigation system and offer suggestions on improvements which could save you money and improve the health of your landscape investment.

Evaluations are offered during the summer months and consist of a comprehensive assessment of the design, operation and management of your sprinkler system. Assistance with sprinkler controllers and watering schedules will also be provided. A brief report outlining general observations of your sprinkler system as well as suggestions for future use will be mailed following the evaluation.

Five-year Benchmark: The City will continue to offer the above-described reimbursements and assessments.

(c) Reuse, Recycling, and Non-potable Water Opportunities. The City's ability to reuse treated water is subject to the authority of Oregon Department of Environmental Quality. The City uses reclaimed water next to a wastewater treatment plant and also attempted to utilize effluent on a private golf course proposed on the north end of Ashland. The City has extensively investigated using reclaimed water for other uses, but DEQ has been resistant to permit this use of reclaimed water because of its need to meet in-stream flows during the peak irrigation season. In response to public interest, the City has also developed information about grey-water and rainwater catchment systems.

Five-year Benchmark:
• The City will continue to forward customer and business inquiries on water reuse and recycling to Clean Water Services.
• The City will provide information to the public regarding rainwater and greywater catchment systems.

(d) Other Measures

1) Shave Peak Period Consumption

Target: Residential Turf Watering

Utilize Incentive-based Water Rates: Provide an economic incentive to reduce water consumption.

Current water rates are based on the costs of treatment and maintenance of the system. These rates do not reflect the cost of new supplies. When water demand begins to approach the available supply for an agency, modifying water rates closer to the cost of new water supplies is indicated. Higher rates, and rates that provide signals to decrease certain types of peak usage can be very effective in providing conservation rates in the summer season, when water consumption is high due to landscape irrigation

encourages conservation. The program recommends rate modifications for all sectors.

Public Information and Education: Use media campaigns and teaching materials to educate consumers and students on water usage issues and promote water conservation.

Water conservation information campaigns increase consumer's awareness of habits or procedures that waste water, as well as their awareness or water scarcity, available sources, system capacity, and treatment and distribution issues. Residential, commercial, and or industrial customer segments can be targeted, but the coverage is usually universal. Public information and education campaigns are an essential part of any comprehensive conservation program, and a broad-based campaign is included in this set of packages for Ashland. However, it should be recognized that education programs themselves do not produce water conservation -- rather it is the actions that customers take that lead to the reductions. The savings directly attributed to the education program by itself are low, but the program is essential to realizing the savings that are separately accounted for in each of the other programs in this section.

Density Bonus: Ashland's current density bonus that allows additional houses or apartments if the design meets water and energy efficiency criteria to allow additional units only if the design meets both energy and water conservation criteria.

Since 1980, Ashland has included a density bonus for energy efficient housing. This program offers a 15 % increase in the number of houses or apartments permitted by the zoning code if the housing is designed to exceed building code minimums. Under this program, the City would tie the density bonus to both energy and water efficiency. System Development Charge rebates would also be available to new buildings meeting water efficiency standards. The new housing constructed would be required to exceed state code in energy and water efficiency, and install low water-use landscaping.

Landscape Regulation: Revise Ashland's current landscaping regulations to significantly reduce the water use of most landscapes.

Landscaping plans are required for new apartment, commercial, and industrial developments. The current regulations do not require water efficiency in plant selection or irrigation systems. Significant reductions in water usage can be achieved through using principles like: good landscape planning and design; limiting turf areas; use of low water using plants to reduce transpiration; efficient irrigation systems and scheduling; soil improvement where necessary; use of mulches to reduce evaporation; and appropriate maintenance.

Acquisition of Water Rights: Investigate extending the City's access to Talent Irrigation District (TID) water to relieve the municipal water system's summertime residential irrigation load.

Ashland has over 2,000 households that irrigate with TID water delivered through a series of ditches. However, new subdivisions have not been permitted to extend this system. This source could provide significant relief from City resources during the summertime residential irrigation loads. The City can lobby for extending access to this water for subdivisions; purchasing land with existing TID allocations before the land is subdivided; or investigates the possibility of purchasing TID allotments alone without the land. In addition, this water may be able to be diverted to the water treatment plant when it is needed in severe droughts. This program will be targeted at residential and non-residential customers with TID allotments.

Target: Summer Water Use of Largest Non-residential Consumers

Large Customer Audit: Provide water audits to provide suggested measure for more efficient water usage among the largest customers.

An analysis of the City's water billing records revealed that the 50 largest consumers account for 35 percent of the City's water sales. These large customers are all non-residential and include the City itself, the College, and several large hotels and apartments. A consumer visit and brief audit, or an extensive inspection and analysis of water using processes, can determine process or operational changes that may be more water efficient, or suggest implementation of measures that lead to more efficient use of water. Irrigation audits can provide landscape managers with information for more effective water usage. The target audience is the City's largest customers. Depending on the intensity of the audit, either City staff volunteer or an engineering consultant would conduct the audits.

2.) Reduce Base load Consumption

Target Unaccounted-for- Water in City System

System leak detection and repair: Reduce system losses through investigation and mitigation of system leaks and other measures.

To reduce the amount of Unaccounted-for- Water and to make more efficient use of water production, the City can investigate the feasibility of undertaking a program to reduce system leaks. Recommended actions include: calibrating water treatment plant flow meter; continued monitoring of municipal uses of water (street washing and fire department uses); setting up a meter testing program for meters larger than one inch; monitoring Unaccounted-for-Water annually through a system audit; minimizing overflows at the Granite Street Reservoir, and documenting/metering the overflows; obtaining estimates for a leak detection survey prioritizing and implementing recommendations from the survey.

Target: Commercial and Residential Baseload Use
Showerhead Kit Retrofit: Encourage conservation by providing households with an inexpensive set of measures that reduce leakage and usage in the home.

In this program, the City provides door-to-door drop-off or optional audit and installation of a set of three conservation devices, including: 1) a toilet leak detection tablet; 2) 1.5 gallon per minute showerhead; and 3) 1.0 gallon per minute faucet aerator. These measures are very cost effective and yield significant water conservation benefits. This program is targeted at the residential sector.

Required Conservation Measures

This section addresses the requirements of OAR 690-086-150(4).

OAR 690-086-0150(4) requires all municipal water suppliers to implement a particular set of conservation measures. The following paragraphs present descriptions of the City's implementation to date and 5-year benchmarks for these measures.

a. **Annual Water Audit.** The City documents water production and consumption on a monthly basis to monitor the City's water demands. The City conducts an annual year water audit, comparing monthly system demand to plant production, as well as stream flow and reservoir storage. The City uses billings-based spreadsheet to estimate system leakage by comparing billed usage to plant production.

Five-year Benchmark: The City will continue to conduct annual water audits and to track non-revenue water and system leakage.

b. **Metering.** The City is fully metered.

Five-year Benchmark: The City will continue to meter all new connections.

c. **Meter Testing and Maintenance.** The City's water meter maintenance and replacement program is focused on replacing mechanical meters with radio read meters. This approach yields the greatest conservation cost/benefit ratio. The City conducts annual in-field testing and repair for these meters. Water meters not recording within the manufacturer's specifications are repaired in the field or replaced as needed. For smaller meters, the City replaces meters that are determined to be inoperable by inspection as part of the meter reading process. Out of a total of 9100 meters, about 1200 radio read meters have been installed, and approximately $50,000 per year has budgeted for meter replacement.

Meter Replacement Schedule

FY	meters replaced	3/4" ($188)	1" ($283)	1 .5" ($465)	2" ($648)	3" ($915)	4" ($1325)	Total cost (2012 $)
2001	474	432	29	6	7			$96,749
2002	319	286	24	6	2	1		$65,561
2003	399	358	27	4	10			$83,285
2004	431	374	41	10	4		2	$91,807
2005	358	307	40	5	6			$75,249
2006	369	299	62	6	1	1		$78,111
2007	361	297	54	7	3			$76,317
2008	320	291	27	2				$63,279
2009	373	339	32	2				$73,718
2010	196	163	27	4	2			$41,441
2011	318	279	29	9	1			$65,492
2012	181	158	13	4	6	1	2	$42,696

The City also maintains a number of source production meters to monitor treatment plant flows, as well as to verify TID supply and demand. At the water treatment plant, multiple redundant meters are installed and cross checked to verify reasonable accuracy. Measurements are routinely compared to verify flows. TID flows are manually measured as weir structure readings made separately by City Staff and TID staff.

Five-year Benchmark: The City will continue its current meter testing and maintenance program. The City will seek to sustain or increase funding to replace inaccurate or inoperable meters with radio read meters.

d. **Rate Structure.** The City's rate structure is based on the quantity of water consumed through metered connections and, therefore, encourages conservation. In addition the rates are scheduled to be increased by 10% in 2014, and significant increases will continue annually until 2018 to pay for new infrastructure.

*Five-year Benchmark: T*he City will conduct a rate study for the purpose of encouraging water conservation. The decision to implement recommended actions will be made by the City Council.

e. **Leak Detection.** The City monitors water audit results based on a 5-year running average. City policy is to begin leak detection measures if the average exceeds 10 percent. Based on the most recent Water Audit Report (February 2008), the current 5- year average is 8.4 percent. Visual leaks reported by the public or public works personnel are investigated. Leaks are repaired immediately.

Despite the fact that its system unaccounted-for (or nonrevenue) water percentage is less than 10 percent, the City currently is conducting various programs to reduce unaccounted-for water within the distribution system. These programs include small pipe replacement and meter assembly replacement. Numerous leaks have been identified and corrected through this program, which has been effective in reducing

system water losses. Ashland also has a policy to adjust the leak portion of a customer's bill, if the customer repairs the leak within 10 days after being notified of the leak. The program is designed to encourage customers to identify and repair leaks in a timely manner.

Five-year Benchmark: The City will continue the current system-wide leak repair program to maintain less than 10 percent unaccounted-for water.

f. **Public Education.** The City's conservation program includes a significant public education element. The Conservation Division spearheads a program that includes North Mountain Park Nature Center in its outreach. The center provides a wide variety of activities, including in-class presentations, videos, interactive games, and booths at various festivals to promote water conservation and water quality. The City's conservation coordinator provides a display of conservation information and/or a related activity as well as program promotions. The conservation program will provide staff and materials as needed for events in general. The City's website contains seasonal conservation articles, indoor and outdoor conservation tips, instructions on how to water lawns 1 inch per week, a frequently asked questions (FAQ) section, a downloadable application for the reimbursement programs, and an information request form for materials regarding water conservation and water quality. Water conservation displays are set up at the Ashland Library and Public Works Building. These seasonal displays provide informational brochures depending on the time of the year. During peak water use periods, brochures on the reimbursement program and outdoor water conservation tips are available. During the wetter months, the conservation calendar and indoor conservation information are available. The conservation program has produced a utility bill insert to inform customers about the importance of water conservation throughout the summer.

Five-year Benchmark: The City will continue to use a variety of methods to provide water conservation information to the public. The City will continue sponsoring events and will explore opportunities to provide additional customer services, both among customers and in schools, to encourage creative water conservation.

Expanded Use under Extended Permits

This section addresses the requirements of OAR 690-086-150(5) & (6).

The City proposes to initiate diversion of water from the Rogue River under an extended permit for which resource issues have been identified. As a result, the following activity descriptions and five year benchmarks for implementation are required:

(a) System Leak Detection.

The City of Ashland nevertheless plans to develop water rights associated with extended permits, the city of Ashland is required to develop a leak repair and line replacement program within 5 years that will reduce system-wide leakage to less than 15 percent. Current annual unaccounted for water has averaged 8.4 percent.

- The City of Ashland will improve its audit system to increase report accuracy. The City is developing procedures to account for valid unbilled water uses, to further reduce unaccounted for water rates, and better identify actual water losses due to leakage, as outlined in the American Water Works Association (AWWA) manual titled Water Audits and Leak Detection (M-36, AWWA 1990).
- However, because the City's unaccounted-for water for years 2005 through 2009 averaged 8.4%, the City is not required to implement this conservation measure at this time.

System Input Volume (corrected for known errors)	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption (including water exported)	Revenue Water
			Billed Unmetered Consumption	
		Unbilled Authorized Consumption	Unbilled Metered Consumption	Non-Revenue Water (NRW)
			Unbilled Unmetered Consumption	
	Water Losses	Apparent Losses	Unauthorized Consumption	
			Customer Metering Inaccuracies	
			Systematic Data Handling Errors	
		Real Losses	Leakage on Transmission and Distribution Mains	
			Leakage and Overflows at Utility's Storage Tanks	
			Leakage on Service Connections up to point of Customer metering	

(b) Technical and Financial Assistance.

The City of Ashland will continue to provide technical and financial assistance through current programs as described in the preceding analysis to encourage efficient water use by customers. The City will other technical and financial assistance programs as well as:

- Continue its irrigation water audit program, likely expanding to commercial and industrial customers as well as targeting the city's highest volume users.
- Make available on the city's website, live weather data transmitted from a nearby weather station, which will include evapo-transpiration data for customers to reference when programming irrigation controllers.
- Continue to enhance the Water-Wise Landscaping website by adding features such as:
    - Partial name look up by common and botanical name. A search engine will find plants in the database by typing in the first couple of letters of the plant you are looking for.
    - Sharing feature where customers can share pictures and plants they like on Facebook, Twitter and email.
    - More hotlinks will be added identifying plants in current pictures on the website.
- Develop a water use calculator to provide customers with a resource for evaluating their water use. Factors would include family size, age of plumbing fixtures and water using appliances, total landscaped area and type of vegetation being irrigated during the summer.
- Implement a weather based irrigation controller incentive program that would provide residents with a rebate for purchasing and installing a "Smart" WaterSense labeled controller. The rebate would be contingent on successful completion of a "Smart" controller training.
- Correspond with the weekly watering hotline during the summer, a written version of the recorded message will be available on the City's Conservation Division webpage. Other resources will also be added including a sample water schedule, water savings tips for outdoors and indoors and more information on irrigation system components.

(c) Retrofit Incentive Programs.

The City of Ashland will continue with the current rebates for replacement of inefficient fixtures provided a cost benefit analysis confirms the effectiveness of the program. The city may implement

or consider the following for future programs:

- Since it is a main priority for staff to promote conservation activities to reduce peak summer use, a turf replacement program or incentives for new water-efficient landscapes will be considered to assist in meeting this goal.
- A weather based irrigation controller incentive program is currently being reviewed that would provide residents with a rebate for purchasing and installing a "Smart" WaterSense labeled controller. The rebate would be contingent on successful completion of a "Smart" controller training.
- Where significant per-site water use reductions can be realized, conservation staff will pursue opportunities with local hotels and motels and offer incentives on toilets, showerheads and bathroom aerators. Other areas such as laundries, kitchen facilities and pools could also be evaluated for potential savings opportunities and helpful information could be provided.
- Water savings could be realized in many of the areas restaurants. Staff will investigate potential savings and may support rebate incentives for purchase and installation of commercial kitchen appliances such as air cooled ice machines.

(d) Rates and Regulations.

- The City of Ashland currently uses monthly billing, with a quantity-based billing structure. There is also a base charge, which covers a portion of the City's fixed costs. Monthly billing, inclining block rates, and seasonal rates are all considered to be conservation-oriented rate strategies. While rates cannot be raised arbitrarily without relation to costs, the City of Ashland will study and evaluate whether the current rate structure appropriately encourages efficient water use and water conservation.
    - The City plans to conduct a cost of service rate study to evaluate whether demand has declined with current rate structure in place.
    - Discuss the value of converting customer bills to read in gallons rather than cubic feet. Customers tend to comprehend water measured in gallons better than cubic feet. Therefore, with an improved understanding of the amount of water being used, a change to gallons may result in a reduction of water use.
    - Evaluate irrigation meter water rates and determine whether current rates send a conservation message.

The City will conduct a rate study for the purpose of encouraging water conservation. The decision of which recommendations to implement will be made by the City Council.

(e) Water Reuse, Recycling and Non-Potable Water Opportunities.

- The City currently has water rights for 1,400 acre feet of water per year from the Talent Irrigation District (TID). This water is sold to 2,000 households delivered through a series of ditches for irrigation purposes. However, the irrigation water is limited to areas within the City that are piped for TID water. New subdivisions have not been permitted to extend this system. This source could provide significant relief from City resources during the summertime residential irrigation loads.

- The City will lobby for extending access to this water for subdivisions; purchasing lands with existing TID allocations before the land is subdivided; or investigate the possibility of purchasing TID allotments alone without the land. In addition, this water may be able to be diverted to the water treatment plant when it is need in severe droughts. This program will be trargeted at residential and non- residential customers with TID allotments.
- Capital improvements projects planned for the next five years include piping TID canals to serve irrigation water to more residents within the City.
- TID water will also be used to irrigate one of the City's largest cemeteries, which is currently being irrigated with potable water.

In response to public interest, the City will continue to provide information regarding rainwater and graywater catchment systems.

- A water use evaluation guide will be offered to help customers determine how much graywater they produce using plumbing fixtures such as showers and washing machines. When building a graywater system, this guide will help to calculate how much water will be available for irrigation purposes.

(f) Other Measures

Public Education. The City will continue to use a variety of methods to provide water conservation information to the public. The City will continue sponsoring events and will explore opportunities to provide additional customer services, both among customers and in schools, to encourage water conservation. The City may implement or consider the following to educate the public on water efficiency:

- Continue to enhance the City's Conservation Division webpage by adding more information and resources including a watering schedule based on type of sprinklers being used, tips for saving water indoors and outdoors, and a water use evaluation guide.
- Conservation staff has expressed interest in presenting to local schools to educate students about where the City of Ashland's water comes from and why it is important to use water resources wisely. Staff could potentially partner with North Mountain Park on this project.
- Future outreach efforts will also include internal education. Continue communication with staff and public officials within other departments to educate and encourage implementation of water-efficient guidelines within development standards.
- Send letters out to our highest water users offering indoor and outdoor water evaluations. Provide rebate forms and other educational materials as needed. Monitor water usage before and after implementing any changes to verify water savings.
- The City will continue to participate in events such as Earth Day and the Spring Garden Fair. Staff a booth and supply conservation information and resources to attendees.
- Increase outreach to developers and builders to encourage water efficient development practices, particularly with landscape designs. Encourage builders to become WaterSense partners and work towards developing a WaterSense Homes Certification program.
- As a partner with EPA WaterSense program, the City of Ashland will promote WaterSense products, including improving awareness of these products through newsletters, the website, and other venues.

Density Bonus. Ashland's current density bonus allows additional houses or apartments if the design meets **energy** efficiency criteria. The City would like to expand on this bonus with the following amendments.

- Under this program, the City would expand the density bonus to require that additional buildings and apartments meet both water and energy efficiency criteria.
- System development charge rebates would also be available to new buildings meeting water efficiency standards.
- The new housing constructed would be required to exceed state code in energy and water efficiency, and install low water-use landscape.

Landscape and Irrigation Plan Regulations. Current landscape regulations require some water efficiency measures; however the number of measures could be increased and better defined.

- Conservation Staff will work with the Planning Division to revise current landscape regulations to reduce the water use on new developments.
    - Including components such as, requiring that shrubs and lawn area be placed on separate irrigation zones, sprinkler heads have matched precipitation rates, and lawn areas shall be limited to 20% of the total landscape area.
- Staff will re-evaluate the current landscape and irrigation requirements in the Site Design and Use Standards to make sure they are clear and easy to follow.

Constraints. Conservation programs must operate within the parameters of the City's overall operations. Some desired activities may be constrained by seemingly unrelated limitations.

4. Water Curtailment

This section addresses the requirements of OAR 690-086-0160 (1) – (4).

Curtailment planning is the development of proactive measures to reduce demand during supply shortages as a result of prolonged drought or system failure from unanticipated catastrophic events (for example, flooding, landslides, or contamination).The goal of this curtailment plan is to have objective criteria that trigger actions that will ensure sufficient water to meet the water demands of the water supply system, without jeopardizing the health, safety, or welfare of the community. The curtailment plan presented in this section is based on portions of the City's Water System Rules and Regulations ordinance, presented in **Appendix D**, but is updated to comply with Division 86 requirements.

History of System Curtailments

This section addresses the requirements of OAR 690-086-160(1).

The City has experienced supply deficiencies twice during the past 10 years. In 2001, dry conditions were predicted in the early part of the dry season. In 2009, flows in Ashland Creek decreased unexpectedly in the early summer, causing Reeder Reservoir levels to drop to unusually low levels. In both circumstances, the City responded by diverting a portion of TID flows from irrigation use to supplement raw water supply for potable water production.

Introduction

Curtailment planning is the development of proactive measures to reduce water demand if the water supply is reduced temporarily. Supply shortages could result from a number of situations, including those identified below.

The goal of this plan is to define objective criteria and actions to prepare the City for management of water supplies in the event of diminished supply or reduced delivery capacity. This plan recognizes the need to maintain essential public health and safety while applying measures in an equitable manner that minimizes impacts on economic activity and lifestyle. This may include more restriction on uses deemed less essential.

This plan builds on curtailment procedures adopted by the City in 1992. These procedures have been revised, both to comply with Oregon Administrative Rules, Chapter 690, Division 86 and to reflect desired modifications. While this plan includes specific triggering conditions and defined procedures, it should be recognized that the circumstances to which this plan may apply could vary in terms of severity as well as whether they are anticipated or occur suddenly. The time of year during which curtailment is needed would also impact what types of actions might be appropriate. Some events might impact only a portion of the water system, with actions tailored accordingly.

This plan is intentionally thorough to enable a variety of options to be quickly identified for consideration in potentially stressed circumstances, with the understanding that some proposed actions might not be implemented or may be deferred to later curtailment stages. The objective of this plan is therefore to provide guidance while allowing flexibility to respond according to specific circumstances.

Authority

Article 16 the City Charter (amended in 2006) states the following:

> ***Section 1. Public Utilities - Water Works.*** *The City of Ashland, a municipal corporation, shall have the power to provide the residents of said City with such services as water, sewer, electric power, public transportation and such other public utilities as the people desire by majority vote; and to exact and collect compensation from the users of such public utility; provided, however, that any and all water and water works and water rights now owned or which may hereafter be acquired by said City, for the purpose of supplying the inhabitants thereof with water shall never be rented, sold or otherwise disposed of; nor shall the City ever grant any franchise to any person or corporation for the purpose of supplying the inhabitants of said City with water.*

In addition, City has asserted authority to implement non-voluntary curtailment or suspensions of water service through Section 14.060.010 of its Municipal Code (see appendix 4). This section of the code allows for the imposition of curtailment measures necessary to preserve supply relevant provisions of that code are paraphrased in this section. Review and revision of portions of the ordinance occurs as needed to assure consistency with this WMCP. Recent revisions to the code have included changes to the rate structure and curtailment-related rate surcharges intended to increase conservation.

Plan Implementation

Whenever possible, activation of this Curtailment Plan and stages thereof will be by a majority vote of the City Council. However, initial actions under the plan may be initiated upon a determination of urgency by the City Administrator. The City Council, by a majority vote, may rescind the determination upon finding that the emergency no longer exists, or that the original declaration was made in error.
The plan may be enacted for the entire system, or only in those geographic areas that are directly impacted by the water supply shortage. The City Administrator may broaden or restrict the scope of enactment at any time for the duration of the plan implementation.

The Medford Water Commission's 2009 Curtailment Plan is not directly applicable to or adopted by the City of Ashland at this point in time. This curtailment plan is not fully consistent with the MWC but has been formulated to align as much as possible with its framework. To the extent that is practical, City of Ashland will encourage actions that are regionally consistent and able to be communicated to the public with a unified message.

Water System Capacity Constraints and Historical Supply Deficiencies

The City's two water sources, Ashland Creek and the TID canal, have met the system's needs with service disruptions only during major flooding. Ashland Creek water is transported through a transmission line which has a capacity of 18 mgd and the TID supply pipeline has a capacity of approximately 2 mgd. These pipelines follow slightly different routes to the Water Treatment Plant. During droughts, the available supply of Ashland Creek has fallen below maximum demand for the community. In 2001 and 2009, the City declared water shortages and implemented curtailment in order to limit demand.

The current summer raw water capacity of the Ashland Creek supply of 18 mgd, is limited by the treatment capacity of the WTP to approximately 7.5 mgd. Current peak summer demands for the overall system have occasionally exceeded 7 mgd. Therefore, should either the Ashland Creek or TID supply be interrupted during peak summer periods, curtailment will become necessary. The water system currently relies entirely on the Ashland Creek supply during winter months, and failure of the pipelines, WTP, or

reservoir could also result in at least a short term need for curtailment.

Alternate sources of supply available to City are limited. Local groundwater tends to be marginal in quantity, so drilling of wells to supplement supplies is not a viable option. City is the supplier of potable water to most neighboring cities, none of whom operate treatment facilities of their own. While an interconnection with the City of Ashland might occur within the foreseeable future, it would be for the purpose of Ashland's water supplies being supplemented by City, with limited potential for the reverse. Ashland typically does not have surplus water available, and is generally more impacted by drought than City. However, if an inter tie is constructed, there might be potential to receive some water from the City of Ashland, depending upon future agreements, the time of year and whether the precipitating event was regional in nature. In extreme circumstances, limited amounts of potable water may be delivered via water truck from the Cities of Ashland, Grants Pass, Gold Hill, Rogue River or Butte Falls. If only a portion of City's system was compromised, limited amounts of water could also be trucked from other portions of the water system.

Level 4 treated wastewater from the Ashland wastewater treatment plant (WWTP) might be a potential source for non-potable uses that could utilize trucked water. TID water provides another potential option for both potable and non-potable water, provided that irrigation supplies were not similarly subject to shortage. Potential causes of water supply shortages include, but are not limited to the following:

. Long-term drought
. Fire in the BBS or Rogue River watersheds that affects water quality
. Contamination such as from a chemical spill, that necessitates shutting down either water source
. Flooding that forces shutdown of one or more facilities
. Landslides or other natural disaster that damage water pipelines or facilities.
  Power outages, particularly those impacting the WTP
. Facility or equipment failure, either from natural or human causes

Curtailment Stages

This section addresses the requirements of OAR 690-086-160(2), (3), (4)

The City's plan recognizes stages of increasingly stringent curtailment response. The initiating conditions for each stage are presented in Exhibit 4-1, along with the type of actions that would be taken. The list of initiating conditions provides guidelines, may not be all-inclusive, and might not impact customers within all portions of the City service area. It would be desired, but not mandatory that curtailment activities be implemented in lower stages first, with each stage building on the prior stage. Compliance measures would also likely be more acceptable to customers if voluntary and less restrictive measures have been attempted first. However, City could implement measures proportionate to a sudden disruption of service without prior notification or action. Upon implementation of a curtailment stage, there will be ongoing re-evaluation to determine the appropriate curtailment status.

Curtailment Stages

Stage	Initiating Conditions	Actions
Initial Determination	A series of indicators suggest that a future shortage is possible; these may include drought-related conditions or other supply factors	Raise public awareness about potential for water shortage through such means as general articles in newsletters, newspapers and Web site
Stage 1	Continued and / or further indicators raise concerns about the ability to meet supply needs unless demand levels are reduced, or	Enhanced public awareness and outreach efforts to convey potential water shortage message
	Sustained demand reaches 90 percent of supply	Request voluntary water use reductions
Stage 2	Indicators show that supply and/or delivery capacities are strained to meet current demand levels; these may include:	Strengthened notification messages and further outreach methods regarding water shortage conditions
	Sustained demand reaches 95 percent of supply or delivery capacities, or	Mandatory restrictions on water use. Potential enforcement of restrictions
	Water storage facilities are not routinely refilling, and City Administrator determines that continuation could result in inability to meet fire protection or other essential needs.	Consideration of rate surcharges
Stage 3	Series of indicators show that water consumption levels must be immediately reduced; indicators may include:	Urgent notification messages; significant outreach / customer notification
	Sustained demand is exceeding normal supply or delivery capacities, or	Further mandatory restrictions on water use
	Water storage facility(ies) is/are only 2/3 full, and City Administrator determines that ability to meet fire protection or other essential needs is jeopardized.	Significant enforcement of restrictions Rate surcharges
	Supply or delivery capacities have been reduced by up to 35%	
Stage 4	Major water use reductions are deemed necessary to avoid system failure, inadequate fire protection capability and/or to assure protection of water quality; indicators may include:	Extreme alert; urgent notification of customers, both by broadcast means and direct notification Only essential water use allowed
	Sustained demand continues to exceed supply or delivery capacities, or	Significant enforcement
	Water storage facility(ies) is/are only 1/3 full	Heightened rate surcharges
	Supply source or major facility is lost, reducing supply or delivery capabilities to less than 65% of normal capacities	

Curtailment Actions

Initial Determination

Initial Determination would be implemented to provide general awareness of the potential for water shortage based on preliminary indicators of reduced supplies. Voluntary, but non-specific conservation activities may be encouraged. Under Initial Determination, City may take the following actions:

1. Assemble a Water Shortage Action Team as identified in **Attachment 4**B at the end of this plan to determine the likelihood of a shortage and define outreach activities.

2. Notify Members of the City Council.

3. Define appropriate internal actions to minimize waste or perception of waste by City operations. Determine whether activities such as main flushing and reservoir cleaning should be immediately reduced or accelerated to complete in advance of a potential higher level of curtailment. Contact landscape maintenance contractor responsible for City sites to request that sprinkler maintenance needs be addressed, and appropriate sprinkling schedules followed.

4. Notify officials of the City and wholesale city customers of the potential for a water supply shortage.

5. Raise public awareness through general notification measures. This might consist of press releases or notices with monthly bills.

Stage 1

This status will activate more extensive outreach to inform customers of the potential for water shortages, and encourage voluntary conservation of water through specific recommended measures.

Stage 1 - **City Actions:** The City actions will include the following:

A) Convene the Water Shortage Action Team to assess the likelihood of a shortage, define demand reduction goals, define outreach activities, and evaluate the possible need for additional personnel to assist with outreach and customer assistance activities.

B) Notify members of the City Council.

C) Re-evaluate appropriate internal actions to minimize waste or perception of waste by City operations. Remind landscape maintenance contractors responsible for City sites that sprinkler maintenance needs must addressed and appropriate sprinkling schedules followed.

D) Notify City officials. Include information on actions relevant to the city.

E) Notify staff and/ or officials of wholesale city and water district customers of the curtailment determination, along with their need to enact equivalent provisions to assure that their efforts are no less intense than those imposed by City. Inform them of water reduction goals.

F) Consider providing direct notification to others on the Contact List included as Attachment C, such as:

a. Representatives from sectors that might be most influential in causing water usage reductions. At this stage, the focus would be on water uses that are considered less essential, such as landscape

irrigation, rather than those that would result in economic impacts.

b. Businesses that could be impacted if Stage 2 status becomes necessary, such as car washes, pool contractors and landscape contractors.

G) Provide general notification to customers. Such notification will include a description of the current water situation, the reason for the requested actions, and a warning that mandatory restrictions may be implemented if voluntary measures are not sufficient to achieve water use reduction objectives or if conditions worsen. Include drinking water quality information in notices, so that the public understands the role of flushing in maintaining water quality.

The City may request that notices be posted on bulletin boards, websites, public restrooms and similar venues. Guidelines and conservation information will also be placed on the City Website, including detailed information to facilitate customer's use of weather-based irrigation scheduling. Utilizing press releases to maximize notification would also be anticipated.

H) Consider initiating or expanding customer educational programs to assist customers in implementing curtailment actions. Examples might include presentations for homeowners and / or landscape managers, and site visits to provide assistance in adjusting sprinkler schedules.

I) Consider distribution of low cost items such as toilet dye tablets, efficient shower heads, low flow aerators, early closing toilet flappers and hose nozzles, which would yield water savings and raise awareness of the water shortage situation.

J) Monitor and report results of curtailment efforts and progress in meeting demand reduction goals. Keep City employees informed.

K) Implement stage 1 temporary rate surcharges.

Stage 1 - Customer Actions

The following voluntary actions may be requested of customers when Stage 1 is triggered:

1. Request reduction in water use by the percentage determined to be the goal based on the comparable month in the prior year.

2. Manage landscape watering. The following guidelines are encouraged:

a. Water landscapes only between the hours of 9:00 pm to 6:00 am, if on automatic timers, and between the hours of 7:00 pm to 9:00 am, if performed manually.

b. Encourage use of timing devices when watering with hoses.

c. Suggest adherence to weather-based irrigation schedules, provided on the City Web site, the City of Watering hotline, and other potential venues.

d. Encourage sprinkler maintenance and adjustment to repair leaks, and minimize conditions such as over spray and high pressure that result in obvious water waste.

3. When in use, hoses should be equipped with nozzles that maximize effectiveness of the spray pattern and shut off when not activated.

4. Encourage repair of all known customer leaks.

5. Reduce vehicle washing and use facilities that recycle water. Manual car washing should include use of a bucket and hose equipped with a shutoff nozzle for brief wetting and rinsing.

6. Request that exterior paved surfaces be swept, rather than washed. If washing is necessary for such reasons as public health or safety, use of water brooms that provide maximum cleaning with minimum water usage is encouraged.

7. Maintain swimming pools, hot tubs, ponds and other water features in a manner that minimizes the need to fill or refill.

8, Integrate recirculation/ reuse of water where appropriate. Examples include water features and heating/ cooling equipment

9. Request that the City and other public agencies set good examples with their internal operations by implementation of the applicable items above, as well as the following:

a. Reduce water used in street sweeping.

b. Ask Fire Department to limit or avoid training exercises that use water.

c. Consider reducing use of and pursue actions needed to retrofit any fountain or water spray recreational facility that does not re-circulate water

d. Identify important recreational facilities and fields in order to concentrate on preserving these, while decreasing water use at less critical facilities

Stage 2

Stage 2 is similar to Stage 1 except that the voluntary measures will be made compulsory. This may be because of a worsening water supply situation or of insufficient water savings from the voluntary measures. Additional non-essential water use will be prohibited.

Stage 2 - City Actions

1 Re-convene the Water Shortage Action Team to assess the effectiveness of actions taken in Stage 1 and re-define demand reduction goals. Sector-specific targets for water use reductions may be developed. Define additional outreach and enforcement measures, and re-assess the possible need for temporary staffing increases to assist with outreach, monitoring and enforcement.

2 Contact Members of the City Councilors.

3 Review actions to minimize waste or perception of waste by City operations. Make appropriate reductions in hydrant and water line flushing without compromising water quality. Determine what internal actions can be taken for City to meet the percentage reduction goal being requested of other customers. Confirm that irrigation of City-owned sites is in conformance with requirements below.

4 Notify City officials/ staff and of the changed curtailment status. Include direct notification to departments of any actions that may be relevant to their operations.

5 Notify staff and/ or public agency customers of the changed curtailment status. Inform them of water reduction goals. If possible, provide assessments of their performance in Stage 1, based on meter readings and/ or observations. Remind other cities of the need to enact equivalent provisions to assure that curtailment efforts are no less intense than those imposed by City.

6 Implement stage 2 temporary rate surcharges. These can be beneficial in promoting customer action, financing additional costs associated with curtailment (such as increased staffing, development and distribution of information materials and conservation devices), and in offsetting potential revenue losses from decreased sales.

7 Contact high use customers to encourage water use efficiency and the possible imposition of water reduction goals. Inform them of the potential future need for greater reductions, and solicit

their input on how such reductions might be most equitably applied, while minimizing economic impact.

8 Contact others on the Contact List included as Attachment 4C, with a focus on those who will be most impacted by current and possible future curtailment actions. As deemed appropriate, meetings may be convened to enable input to be received relative to potential actions that may be taken.

9 Expand notification and outreach activities to customers as defined by the Action Team. This may include targeting specific customer groups. For example, restaurants might be encouraged to avoid serving water except upon request, and motels might be encouraged to promote reduced linen laundering. Translation and dissemination of information through Spanish-speaking media will also be pursued.

10 Monitor and report results of curtailment efforts and progress in meeting demand reduction goals. Keep City employees informed.

Stage 2 - Customer Actions

Except as modified below, all voluntary customer actions recommended in Stage 1 become mandatory. The following modifications and additional restrictions also may be imposed:

1. Landscape watering shall be subject to some or all of the following conditions. Landscapes that were installed within the previous 40 days will be allowed some flexibility to enable plant establishment.

a) Time-of-day guidelines in Stage 1 become mandatory, except for areas irrigated completely with drip, soaker or other watering method that applies water directly to the root zone without spray.

b) Use of hose bib mounted timing devices required when sprinkling from hoses.

c) Landscape irrigation should follow a weather-based schedule, which will be provided on the City Web site, the Lawn Watering Info-line and by other means. This schedule may afford preference to ornamental trees and shrubs, which if lost would take years to re-establish. Lawn sprinkling schedules might encourage dormancy, watering at a lower percentage of ET to keep roots alive, but without the goal of maintaining a uniformly green appearance.

d) Sprinkling may be limited to certain days of the week. As an example, in July, properties with even addresses might irrigate on Sunday, Tuesday and Friday, while properties with odd addresses would water on Monday, Thursday and Saturday, with no irrigation occurring on Wednesdays to facilitate refilling of reservoirs. Schedules would vary according to season and specific circumstances.

e) Sprinklers and other irrigation components shall be repaired, adjusted and operated without waste. Prohibited waste may include, but would not be limited to leaks, over-spray of more than one foot onto paved surfaces, misdirected spray patterns, obvious runoff and operation at clearly excessive pressures.

2. Planting of new lawns and annual plants may be prohibited. Planting of shrubs and trees would be allowed, possibly subject to verified soil amendment and mulching (aimed at water retention) and/ or irrigating with drip, soaker hose or similar root zone water application method.

3. When in use, hoses must be equipped with nozzles that direct water and shut off when not activated.

4. Require repair of all known customer leaks.

5. No washing of personal motorbikes, motor vehicles or recreational vehicles except at commercial washing facilities that practice wash water recycling, or by using a bucket and hose equipped with a shut-off nozzle for brief wetting and rinsing.

6. Except for vehicles that must be cleaned to maintain public health and welfare such as food carriers and solid waste transfer vehicles, washing of commercial vehicles shall only be done in a facility that recycles water. Washing of vehicles for sale on commercial lots may be afforded less stringent washing regulations to enable limited washing on location, but at reduced schedules that result in significantly reduced water usage levels as compared to the prior year.

7. No washing sidewalks, walkways, driveways, parking lots, tennis court, and other hard-surfaced areas, except when necessary for public health and safety or to the minimal extent necessary to loosen caked-on mud or similar circumstances.

8. Except as needed for painting or construction, no washing of buildings and structures. No water for a fountain or pond for aesthetic or scenic purposes unless it recycles water and is leak free (with refill demands being equivalent to the current ET rate).

9. Non-compliant ponds that support fish will be afforded reasonable time to move fish or repair leaks.

10. Pools and hot tubs shall not be drained, and shall be managed to minimize the need to re-fill. This may include requirements for covering when not in use and other actions.

11. Water for initial filling of new swimming pools may be restricted. Pools already under construction prior to imposition of such regulations will be allowed to fill, but may be subject to rate and time of day restrictions.

12. Where potable water is used on golf courses, it shall be restricted to watering only tees and greens.

13. Use of potable water for dust control or street cleaning may be disallowed or made subject to regulations setting maximum frequency or rate of application.

14. Restrictions may be placed on use of water from hydrants for any purpose other than fire fighting and flushing deemed necessary to maintain water quality.

15. In addition to applicable items above, the City and wholesale city customers should adhere to the following:

a. Amend street sweeping activities to minimize or eliminate use of potable water. If non-potable water is used, this shall be advertised on the sweeper.

b. Fire Department should discontinue training exercises that use water

c. Cease use of decorative fountains

d. Reduce hours of operation or make relevant operational changes to manage water use at pools or other water recreational facilities. Cease use of any water spray recreational facility that does not re-circulate water.

e. Continue to decrease water use at fields and facilities determined to be less critical.

f. Retrofit restrooms in city-owned facilities with water efficient fixtures.

Stage 3

At Stage 3, nonessential water use must be severely curtailed, and economic impacts cannot be avoided. The goals of City's response will be to maintain water supplies necessary for health and safety needs of the community while minimizing economic hardship.

Stage 3 - City Actions

1.The Water Shortage Action Team will meet to define updated demand reduction goals, review and assess actions taken to date, and evaluate new actions to be taken. Rationing protocols should be defined and uses prioritized. For example, fire suppression and critical sanitation needs for hospitals will be among uses given the highest priority. Implement stage 3 temporary rate surcharges... The need for additional temporary staffing for expanded outreach and enforcement of mandatory water restrictions also will be re-assessed.

2. Contact members of the City Councilors. A special meeting may be called.

3. Re-evaluate actions to minimize waste or perception of waste by City operations. Make appropriate reductions in hydrant and water line flushing without compromising water quality. Consider prohibition on activation/ flushing of newly installed water lines or allow only during off-peak nighttime hours. Verify that irrigation of City owned sites is in conformance with requirements below.

4. Notify staff and officials of the City of the changed curtailment status and updated water reduction goals. Direct notification will be made to individual departments that may be impacted by new regulations

5. Notify staff and public agency customers of the changed curtailment status, updated water reduction

goals and the continued need to maintain actions equivalent to those being taken by City. If possible, provide assessments of their performance in Stage 2, based on meter readings and/ or observations.

6. Expand notification and outreach efforts to convey the severity of the conditions, and possibly include outreach options listed for prior stages, but not yet taken. Translation and dissemination of information through Spanish-speaking media will be continued.

7. Notify high use customers of water volume limits and rationing protocols.

8. Contact and/ or meet with others on the Contact List included as Attachment C, particularly those who will be most impacted by current and possible future curtailment actions.

9. Identify possible sources of water that may be used to supplement supply for specific functions. This may include provision of non-potable water for uses such as dust control or watering of high priority landscapes or gardens.

10. Re-consider or continue distribution of low cost items identified in Stage 2 that would yield water savings and raise awareness of the water shortage situation

11. Monitor and report results of curtailment efforts and progress in meeting demand reduction goals. Keep all City employees informed.

Stage 3 - Customer Actions

Except as modified below, provisions imposed on customers in Stage 2 will remain in effect, and options listed in that stage but not implemented, will be re-assessed. The following additional or modified measures may also be adopted:

1. Implement volume limits imposed on all customers.

2. Further restriction of landscape irrigation, with regulations to be provided on the City Web site, the Lawn Watering Info-line and other potential venues, are as follows:

a. Watering of turf may be prohibited or allowed only one day per week to keep roots alive while grass goes dormant.

b. Shrub watering will follow a restrictive schedule, reflective of current ET or a fraction thereof, along with plant survival needs.

c. Tree watering shall be accomplished with use of soaker hoses or similar methods that apply water directly to the root zone, rather than broadcast spraying. Frequency and volume allowed will be established through consultation with the City's Arborist and/ or other tree experts. Use of non-potable water for this purpose may be encouraged.

d. Time-of-day watering provisions imposed in Stage 2 remain in effect for all spray irrigation.

e. Use of hose bib mounted timing devices will be required when irrigating from hoses.

f. Sprinkling will be limited to certain days of the week. Allowances will vary according to season and plant type.

g. Sprinklers and other irrigation components must be repaired, adjusted and operated without waste as defined in Stage 2.

h. Exceptions to these regulations may be granted at the discretion of the City's conservation staff upon documentation that the landscape was installed within the previous 40 days or is deemed a high priority public use area.

3. No planting new landscapes during Stage 3.

4. No construction or installation of new pools or hot tubs shall be initiated during Stage 3, and existing pools and hot tubs may not be drained to less than 90% of capacity and refilled. Further restrictions on filling of pools and hot tubs might also be imposed. Exceptions may be granted by the City's conservation staff if the pool or hot tub's use is required by a medical doctor's prescription or is deemed a high priority community recreational or health facility.

5. No water for a fountain or pond for aesthetic or scenic purposes unless necessary to support fish, and is leak free as defined in Stage 2. Measures shall be taken to move fish to aquariums or other smallest reasonable tub or ponds.

6. Except for vehicles that must be cleaned to maintain public health and welfare such as food carriers and solid waste transfer vehicles, washing of vehicles shall only be done in a facility that recycles water. This shall apply to all vehicles, including motorbikes and recreational vehicles, whether or not personal, commercial or displayed on sales lots.

7. No potable water use for dust control or street cleaning.

8. Stop serving water in restaurants unless requested by the customer. This action generates awareness for curtailment, and reduces use of water for washing glasses.

9. Hotels and motels shall discourage daily linen replacement by providing procedures for guests to opt

for less frequent laundering.

10. No new water line extension work shall be initiated except as approved by City.

11. No use of water from hydrants except for fire fighting and flushing deemed necessary to maintain water quality.

12. No water running to waste onto paved surfaces or into gutters.

Stage 4

Stage 4 reflects an extreme circumstance in which water available is considerably less than normal demands, and it is imperative that all customer sectors participate in immediate demand reductions. This situation is most likely to result from a sudden event that severely impacts a major system component or affects multiple system components simultaneously. Examples might include failure of a transmission main or intake structure, a chemical spill impacting a water source, a malevolent attack on the system or multiple failures resulting from an earthquake or flood. However, a less dramatic event such as an extended power outage affecting the Ashland Water Treatment Plant, but not the majority of customers, could also lead to sudden and significant curtailment needs.

Stage 4 - City Actions

The goals of City's response are to avert system shut-down, and prevent adverse health and safety impacts to the community. City will respond with the following actions:

1. The Water Shortage Action Team will convene to define demand reduction needs, and critical actions to be taken. Rationing protocols will be defined and water uses prioritized. Fire suppression and critical sanitation needs for hospitals will be among the uses given the highest priority.

2. Implement stage 4 temporary rate surcharges, as well as volume limits imposed on all customers. Members of the City Council will be contacted. An emergency meeting may be called.

3. Notify the local news media to request their assistance in notifying the public of the severity of the situation. This will include dissemination of information through Spanish-speaking media.

4. Contact staff and public agency customers. Inform them of water rationing determinations.

5. Contact the largest customers to inform them of applicable water rationing.

6. Mobilize City resources to perform rigorous public outreach and enforcement.

7. If deemed necessary, contact local law enforcement and fire departments to enlist help in notifying customers.

8. If water in the system is unsafe to drink, the Oregon Drinking Water Program will be contacted, and their assistance requested for responding to the problem.

9. If applicable, consider options for renting a water hauling truck and purchasing water from nearby communities, sending customers to a per-designated water distribution location, and supplying bottled water.

Stage 4 - Customer Actions

Customer water use restrictions in Stage 4 will include those listed in Stage 3, except as modified below:

1. Limit water volume to limits set by the ordinance (all customers).

2. No irrigation of landscapes with potable water. 1f Stage 3 remains in effect for an extended duration, and ongoing actions are proving successful in adequately maintaining reservoir levels, limited watering directly to the root zones of significant large trees and shrubs may be exempted from this ban. Frequency and volume allowed will be established through consultation with the City's Arborist and/ or other tree experts. Use of non-potable water for this purpose may be encouraged.

3. No construction or installation of new pools or hot tubs shall be initiated, and existing pools and hot tubs shall not be drained and refilled. No water to refill swimming pools or hot tubs. Exceptions may be granted by the Manager if the pool or hot tub is deemed to serve an important community health function.

4. Strengthened rate surcharges will be imposed, particularly if Stage 4 curtailment is anticipated to be in place for an extended period.

Exemptions and Appeals

A. Any person who wishes to be exempted from a restriction imposed by any water curtailment stage shall request an exemption in writing on forms provided by the City and file the request for exemption in writing with the Utility Billing Office.

B. Requests will be reviewed after a water audit is conducted by the City and a determination made by the utility billing account representative as to the validity of the request for an exemption. No exemptions will be considered until the City has conducted a water audit.

C. Exemptions may be granted for the following:

1. Any person with substantial medical requirements as prescribed in writing by a physician. Examples would be hydrotherapy pools or life support systems.
2. Residential connections with more than four permanent residents in a single family residence or three permanent residents per unit in a multifamily dwelling can receive up to 350 cf per month per additional permanent resident. A census may be conducted to determine the actual number of permanent residents per living unit. Temporary or drop-in guests will not be considered for additional allocations.
3. For commercial or industrial accounts where water supply reductions will result in unemployment or decrease production, after confirmation by the City that the account has instituted all applicable water efficiency improvements.
4. For any other reason upon showing of good cause and where necessary for public health or safety.
5. For commercial accounts where water meter is undersized (as determined under the Uniform Plumbing Code) for the current occupancy, the allocation for such accounts may be increased up to the allocation for the water meter size designated for such occupancy in the Uniform Plumbing Code.

D. Exemptions will not be allowed for steam cleaning or similar uses of water. The amount allocated for any given customer will include such uses and no additional allocation will be allowed.

E. The utility billing account representative shall report to the Director of Public Works the findings and conclusions resulting from the review. The Director shall approve or deny the request for exemptions and may impose conditions. Such conditions may include the amount volume restrictions may be exceeded and that all applicable plumbing fixtures or irrigation systems be replaced or modified for maximum water conservation. If the Director and the applicant are unable to reach accord on the exemption, or if the applicant is dissatisfied with the decision, the applicant may appeal to the City Administrator in writing

who will make the final determination.

F. Except for an exemption granted under section 14.06.060.C.1, C.2 and C.5, the water consumption surcharge specified in section 14.06.080 shall apply to all exemptions. (ORD 2869, 2001)

Excess water consumption surcharge

For any full billing period that begins after the City Administrator's determination is made and ratified as provided in section 14.06.060:
(1) Any customer who exceeds the maximum volumes established in the Water Allocation Table for Stages 1,2 or 3 shall pay a surcharge of four times the rate for water delivered in excess of the established maximum volume.
(2) During Stage 4, any customer who exceeds the maximum volumes established in the Water Allocation Table shall pay a surcharge of ten times the rate for water delivered in excess of the established maximum volume.
(ORD 2869, 2001)

Penalties and enforcement

The penalties for violations of this chapter shall be cumulative in that they may be in addition to, not in lieu of, other penalties, remedies or surcharges established by this chapter.

A person shall not violate or procure aid or abet in the violation of any provision of this chapter. A violation of any provision of this chapter is an infraction and shall be punished as set forth in section 1.08.020 of the Municipal Code.

If a customer exceeds the maximum volume for more than one billing period, the City may install a flow restricting device at the service meter which reduces water flow and pressure. For services up to one and one-half inch size the City may install a flow restricting device of two gallon-per-minute capacity, and for larger services, comparatively sized restricting devices for larger services, for a period of seven days. Before normal service will be restored, a flow restriction installation and removal charge of $100 shall be paid by the person who subscribes for the water service.

Service may be terminated to any customer who knowingly and willfully violates any provision of the current curtailment ordinance.

5. Water Supply

This section fulfills the requirements of OAR 690-086-0170.

Delineation of Service Areas

This section addresses the requirements of OAR 690-086-0170(1)

As previously described, the planning area for this WMCP is the City's current USB. Ashland's service area includes all of the City of Ashland as well as the area inside the urban growth area located within unincorporated Jackson County.

Population Projections

This section addresses the requirements of OAR 690-086-0170(1)

Historic Populations

Historic populations and demands were reviewed to calculate the City's typical per capita usage. The Portland State University Population Research Center (PRC) provides current and historical population estimates for the State of Oregon, its counties, and its cities. PRC's Post-censal Estimates are the Annual Population Estimates prepared by the Center, based on the most recent Census and represent Oregon's July 1 populations each year during the decade until the next decennial Census. PRC Estimates are the official population numbers for Oregon and are used to disburse state revenues to Oregon counties and cities. The Estimates are certified yearly on December 15.

Projected Population

Population projections from the City's 1981 Comprehensive Plan were used for future projections, since they are the most recent projections accepted by City Council, and are preferred by the City of Ashland's Planning Department. The Comprehensive Plan projects an annual increase in population of 187 people. Projected populations are shown in Table 2 below.

Table 2 **Projected Population**
City of Ashland – Water Conservation and Reuse Study

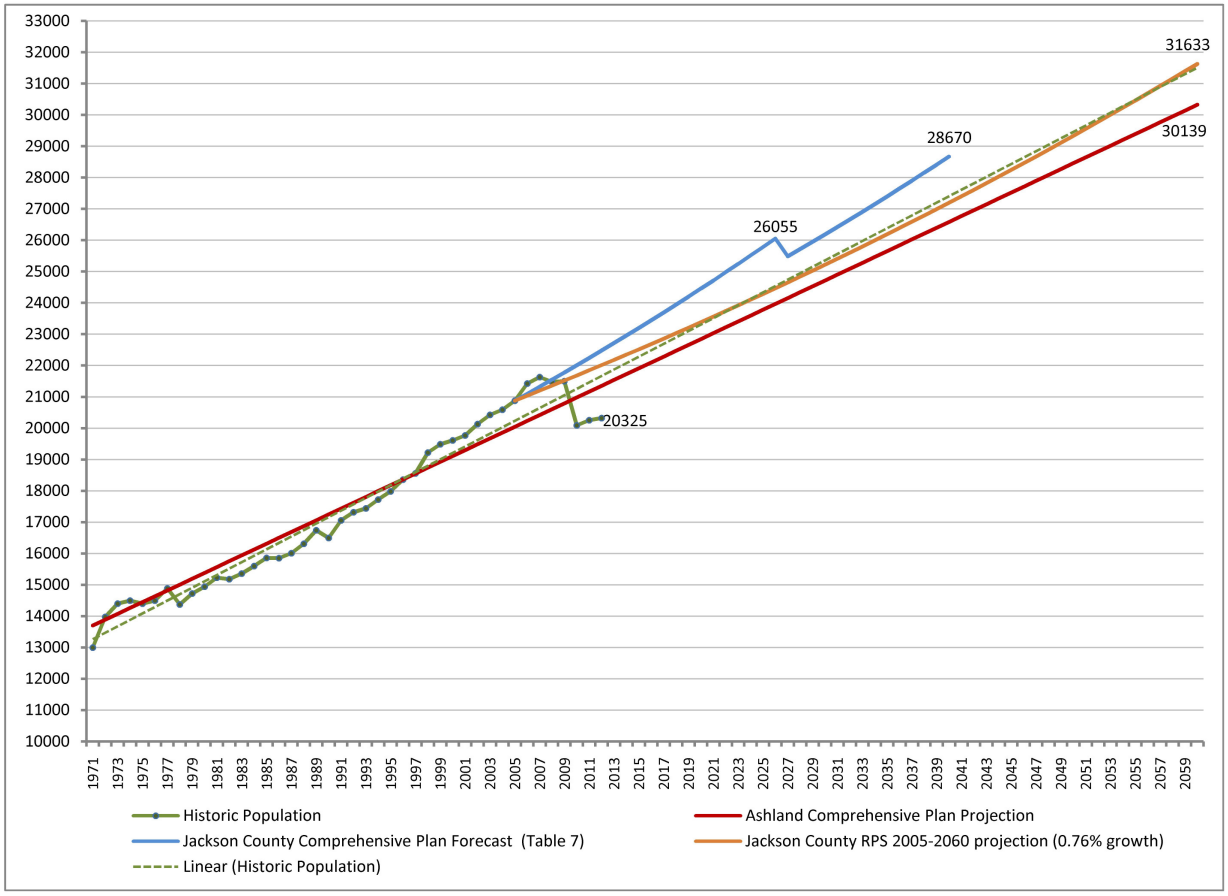
Year	Projected Population[1]
2020	22,846
2030	24,716
2040	26,586
2050	28,456
2060	30,326

Notes:
(1) Source: City of Ashland Comprehensive Plan (1981).

The historic population trend has been somewhat higher at times than the Comprehensive Plan

projections, as shown in Figure 5-1. For example, historic population from the PRC shows population in 2009 as 21,505, whereas the population projected in 2009 by the Comprehensive Plan is 20,793. However, given the unknowns inherent in projecting future populations, the Comprehensive Plan projections have been very accurate and City planning staff believes that these projections are representative of long-term trends. Jackson County's 2007 revised population forecast lists substantially lower values for Ashland than the City's comprehensive plan, but when the population of in the UGB and unincorporated area around Ashland are combined with Ashland's population in the blue line below, the County's forecast predicts more population in Ashland than historic data predicts (the green dashed linear regression line). The growth rates (the slopes of the curves) are similar, but the starting point differs. The 2013 PRC population in Ashland is 20,295, 1,300 less than the 2007 Jackson County forecast predicted.

Figure 5.1 Historic Population & Future Forecasts for the City of Ashland and USB



Demand Forecast

This section addresses the requirements of OAR 690-086-0170(3)

Future demands are projected through 2060 using historic per capita usage and population projections in the City's 1981 Comprehensive Plan. The effect of additional water conservation beyond what the City has already implemented on demands has not been included in this chapter, but is discussed separately.

The term "water demand" refers to all the water requirements of the system including residential, commercial, governmental, and unaccounted for water. Unaccounted for water is the difference between

the volume of water produced at the water treatment plant and the volume of water billed. It includes system losses (i.e. leakage), incomplete billings due to meter inaccuracies, and non-revenue uses such as pipeline flushing. This section presents the historical and projected demands for the City without taking into account the effects of additional water conservation beyond what the City has already accomplished. It is anticipated that the City will implement additional water conserving measures in the future, as documented in TM 3. Hence, actual projected requirements are anticipated to be lower than documented in this TM.

Historical Demands

The historical water demands are presented in Table 3. Note that since these data are based on production data at the water treatment plant, they include unaccounted for water. There are two main types of demands that are evaluated: average day demand (ADD), which is the total usage averaged over a one-year period and maximum day demand (MDD), which is the peak usage observed on any one day of the year. The City's ADD over the past five years ranged from 2.93 to 3.44 million gallons per day (mgd). The lowest demand year occurred in 2009; during that year there were both voluntary and mandatory curtailments during the summer which likely contributed to overall lower water use when averaged over the year. The City's MDD over the past five years ranged from 6.50 to 7.17 mgd. The average peaking factor (ratio of maximum day to average day Figure 1 Population Projections demand) was 2.06 over the 5-year period, excluding data from 2009. Data from 2009 were excluded from the average due to the curtailments in that year.

Table 3 Historical Water Demands
City of Ashland – Water Conservation and Reuse Study

Year	Average Day Demands[1] (mgd)	Maximum Day Demands[1] (mgd)	Peaking Factor (Max Day/Ave Day)
2005	3.33	7.17	2.15
2006	3.44	7.04	2.04
2007	3.33	6.96	2.09
2008	3.28	6.50	1.98
2009	2.93	6.74	2.30
Average(2)	3.35	6.92	2.06

Notes:
(1) Source: Ashland Water Treatment Plant production data for finished water; this number includes Unaccounted For Water, or losses.
(2) Excluding 2009 because of voluntary and mandatory curtailment in that year.

Average annual per capita demands were calculated based on two sets of data. First, usage was calculated based on production at the water treatment plant (supply). These data include unaccounted for water. Usage was also calculated based on historical billings; these data do not include unaccounted for water.

Per capita demands including unaccounted for water are presented in Table 4. These data are based on the average day production at the water treatment plant, as presented in Table 3, and the historical population, as presented in Table 1. The average per capita demand over the 5-year period was 157 gpcd. Data from 2009 were again excluded in the calculation of the average demands due to curtailments.

Table 4 Historical Per Capita Demands Based on Supply
City of Ashland – Water Conservation and Reuse Study

Year	Average Day Demands[1] (mgd)	Population	Per Capita Demands (gpcd)
2005	3.33	20,880	160

2006	3.44	21,430	161
2007	3.33	21,630	154
2008	3.28	21,485	153
2009	2.93	21,505	137
Average(2)	3.35		157

Notes:

1. Source: Water Treatment Plant production data for finished water; this number includes Unaccounted For Water, or losses.
2. Excluding 2009 because of voluntary and mandatory curtailment in that year.

Average annual per capita demands were also calculated excluding unaccounted for water, as shown in Table 5. These data are based on City billing data and the historical population, as presented in Table 1. The average per capita demand over the 5-year period was 144 gpcd. Data from 2009 were again excluded due to curtailments.

Table 5 Historical Per Capita Demands based on Historical Billing Data
City of Ashland – Water Conservation and Reuse Study

Year	Average Day Demands[1] (mgd)	Population	Number of accounts[1]	Per Capita Demands (gpcd)
2005	2.96	20,880	8,099	142
2006	3.17	21,430	8,428	148
2007	3.11	21,630	8,524	144
2008	3.04	21,485	8,608	142
2009	2.93	21,505	8,659	136
Average(2)	3.07		8,415	144

Notes:

☎🗁◑ Source: City billing data; excluding TID water and unaccounted for water.

☎🗎◑ Excluding 2009 because of voluntary and mandatory curtailment in that year.

The City also bills for Talent Irrigation District (TID) water served to properties in the lower portion of the Ashland Canal. There are also properties within the City limits along the upper portions of the Ashland Canal that are billed directly by TID. TID water is not produced at the City's water treatment plant, and is therefore not reflected in Tables 4 or 5.

Projected Demands without Additional Water Conservation

Estimates of future water demand were developed based on historic consumption and population forecasts presented in earlier sections. Current (2009) estimates are based on the current (2009) PRC population data. Projected average daily water demands are developed by multiplying the estimated per capita usage by the forecasted population for a given year. The projected demands presented in this memorandum do not consider the demand reductions expected due to additional water conservation beyond what the City is already achieving.

Table 6 presents the projected demands including unaccounted for water. These projections are based on an average per capita water use of 157 gpcd, as calculated in Table 4 above. The average day demands

were then multiplied by the average peaking factor of 2.06, as calculated in Table 3 above, to calculate projected MDD. Resulting MDD projections ranged from a current demand of 6.96 mgd up to 9.81 mgd in 2060.

Table 6 Projected Water Demands, Including Unaccounted for Water, No Additional Conservation
City of Ashland – Water Conservation and Reuse Study

Year	Projected Average Day Demands (mgd)	Projected Max Day Demands (mgd)[1]
2009 (current)	3.38	6.96
2020	3.59	7.40
2030	3.88	7.99
2060	4.76	9.81

Notes:
(1) Max Day Demand = Average Day Demand * Peaking Factor

Table 7 presents the projected demands excluding unaccounted for water. These projections are based on an average per capita water use of 144 gpcd, as calculated in Table 5 above. The average day demands were then multiplied by the average peaking factor of 2.06, as calculated in Table 3 above, to calculate projected MDD. Resulting MDD projections ranged from a current demand of 6.54 mgd up to 9.23 mgd in 2060.

Table 7 Projected Water Demands, Excluding Unaccounted for Water, No Additional Conservation
City of Ashland – Water Conservation and Reuse Study

Year	Projected Average Day Demands (mgd)	Projected Max Day Demands (mgd)[1]
2009 (current)	3.10	6.40
2020	3.29	6.78
2030	3.56	7.36
2060	4.37	9.03

Notes:
(1) Maximum Day Demand = Average Day Demand * Peaking Factor

The overall projections are shown in Figure 2. As noted above, these projections do not include the impact of additional conservation beyond what the City is already achieving.

Schedule to Exercise Permits & Comparison of Projected Need to Available Sources

This section addresses the requirements of OAR 690-086-0170(2) and (4)

The City of Ashland (City) receives water from Ashland Creek and Reeder Reservoir and from the Talent Irrigation District (TID). These supplies are treated at the Ashland Water Treatment Plant and delivered to the distribution system and the City's customers. The purpose of this technical memorandum (TM) is to evaluate the volume available from these supplies and estimate if they will meet the level of service goals developed by the Ashland Water Advisory Council (AWAC). This includes both an evaluation of the raw water supplies to meet projected demands over a multi-year period, as well as an evaluation of the ability of the water treatment plant to meet projected maximum day demands.

Ashland Creek

Ashland Creek is located in Jackson County, Oregon, United States, near Interstate 5 and the California border, in the south end of the Rogue Valley. The West Fork basin has an area of 10.5 square miles and the East Fork basin has an area of 8.14 square miles. Both branches of Ashland Creek drain to Reeder Reservoir. Water from Ashland Creek can be taken from Reeder Reservoir or from direct diversions on the East and West Forks of Ashland Creek.

Reeder Reservoir was formed by the construction of Hosler Dam in 1928. The dam is located just below the confluence of the East and West Forks and impounds 860 acre-feet (AF) or 280 million gallons (MG) of water. However, due to the reservoir configuration, it was assumed that 20 percent of the reservoir volume is unavailable, based on input from City staff. The volume of water available from the Ashland Creek/Reeder Reservoir supply is dependent upon yearly stream flow runoff.

Rights and Agreements

The City has owned water rights on Ashland Creek since the 1880's. Table 1 summarizes Ashland's ditch rights to this water. This information is based on the letter furnished to the City by State Watermaster in 1973. A copy of this letter is presented in Appendix A. A more detailed evaluation of existing water rights is presented in *TM 12 – Water Rights Evaluation*.

Reliability of Supply

The reliability of the Ashland Creek supply is determined by analyzing influent stream flows that can either be used directly or stored in Reeder Reservoir. Stream flows in Ashland Creek have been measured periodically since 1924 by the US Geological Survey (USGS) and the City. The USGS records include the periods October 1924 to January 1933, December 1974 to September 1982, and October 2002 to the present. In each case, the measurements were made in the East and West Forks separately near their confluence.

Table 1 Ashland Creek Water Rights[(1)]
City of Ashland – WCRS & CWMP

Total Creek Flow, cfs	Ashland Rights, cfs	Ditch Rights, cfs
2.33	0.992	1.338
7.33	6.181	1.342[(2)]
8	6.657	1.343
9	7.367	1.633
10	8.077	1.923
11	8.787	2.213
12	9.497	2.503
13	10.207	2.793
15	12.707	2.793

Notes:
4) Based on letter from State Engineer's office dated July 5, 1973.
(5) Ditch rights interpolated; value stated in the State Engineer's letter (1.149 cfs) appears incorrect.

Previous reports have estimated the flow from Ashland Creek for three drought conditions: a one-year critically dry period based on historical stream flow data from 1925-26 (Montgomery, 1977), a three-year critically dry period based on historical stream flow data from 1928-31 (Carollo, 1998), and a one-year critically dry period based on a drought scenario with an assumed probability of occurrence of 1 in 50 years (Beck, 1989).

For this evaluation the stream flow analysis was conducted similar to the work completed in 1998, using stream flow data from 1928 to 1931. For context, Figure 1 presents historical Ashland Creek stream flows to Reeder Reservoir during the two worst years of record (1930 and 1931) and compares them to the recent "dry" year (2009)

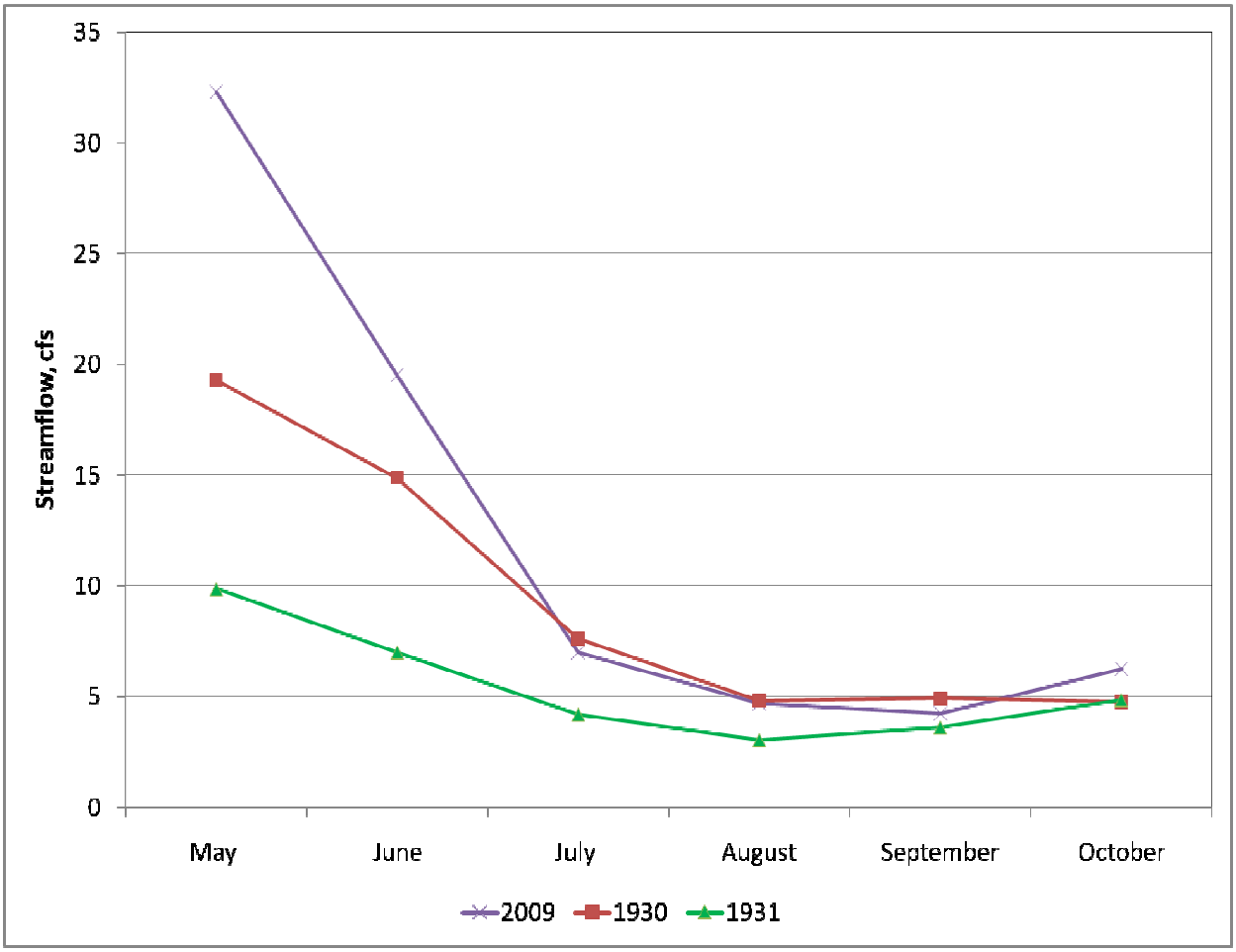


Figure 1Historical Stream flows to Reeder Reservoir

Talent Irrigation District (TID)

ID water is supplied to the City from the Ashland Canal, the lower portion of which is owned and operated by the City of Ashland. The TID water supply was developed through construction of a series of reservoirs and canals which deliver water to the Ashland, Talent, Phoenix, and Medford areas, primarily for irrigation.

TID water is delivered to customers within the City in two ways. Of importance to the current analysis are water rights owned by the City that are delivered to the City's water treatment plant via the Terrace Street Pump Station and distributed to customers through the potable water distribution system. In addition, there are a number of properties within the City that have TID water rights for irrigation use that are mostly delivered via the Ashland Canal. These irrigation rights are not considered in the supply analysis described in this TM; the usage is unmetered and has not been included in projected demands. Further information about the TID system is provided in *TM 10 – Talent Irrigation District Supply.*

Existing Rights and Contracts

Detailed information on TID contracts and historical TID usage is provided in *TM 10 – Talent Irrigation District Supply*. Ashland has a long-standing water supply contract with TID that provides 769 acre*feet (AF) from April

through October. However, a portion of this available supply is used by the City to provide irrigation service via the Ashland Canal to a number of properties, including Lithia Park and Southern Oregon University (SOU). Estimated annual usage by these properties is 546 AF, leaving 223 AF available for delivery to the Ashland Water Treatment Plant.

The City has also been using an additional 600 AF of TID water under an annual contract with the Bureau of Reclamation. The City is currently negotiating a long-term agreement for this water. This additional TID water was initially assumed to be reserved to meet regulatory requirements or mitigate environmental impacts associated with discharges from the City's Wastewater Treatment Plant, at the City's direction. However, based on current plans for the City's wastewater treatment plant discharges, it is now assumed that this additional TID water will be available for future water supply.

Reliability

The City's contract enables it to receive its entire allotment of water whenever full supply is available. However, the City's contracts provide for a reduction of flow during drought, depending on water availability within the TID supply system. A detailed discussion of contractual entitlements is beyond the scope of this document, however, a summary of the TID contracts is provided in TM 10 – Talent Irrigation District Supply. Previous reports estimate that the amount of available supply from TID during a drought will vary between 50 and 80 percent of maximum. Actual historical data varies between 60 and 80 percent during dry years but there is no established trend, particularly for sustained extreme drought conditions as occurred in 1928-31. For this evaluation it was assumed that the amount of available supply from TID during prolonged drought conditions (as is assumed for the third year of the 1928-31 drought conditions) will be 50 percent of the contractual entitlement. Curtailment of TID use during droughts is not included in the City's current curtailment program. However, for the purpose of this analysis, it was assumed that in years in which the TID supply is only 50 percent available that irrigation usage of the City's TID water would also be curtailed by 50 percent.

System Yield

Each of the City's sources has a theoretical "safe yield." The annual safe yield is the amount of water that can be reliably captured and distributed in one year during the most severe drought conditions. Yield estimates are based on a review of historical stream flow data and operational characteristics of the system (i.e., reservoir storage capability, seasonal use limitations prescribed by water rights, etc.). The actual yield estimate selected for planning purposes is based primarily on engineering judgment, and is often based on historical low flow because this condition provides a conservative basis for planning.

The current estimate of the yield from Ashland Creek based on the 1930-31 stream flow – the historical low flow period – is more conservative than the estimates in some of the previous studies. However, using these data to compute the yield estimate is not overly conservative, since the historical record includes other similar low flow conditions in the creek, most recently in 1976-77. Likewise, our assumption that available supply from TID will be 50 percent of the contractual entitlement is conservative; however, it is reasonable to predict reduced availability of supply from TID during prolonged drought conditions.

The total estimated yield including Ashland Creek flows and supply from TID are presented in Table 2. It is important to note that the full yield from Ashland Creek cannot usually be utilized. Due to the limited size of Reeder Reservoir, a portion of the Creek flows are spilled during the spring when available flows are in excess of demands and the reservoir is already full. In comparison, releases from the TID system are controlled and hence can be fully utilized.

Table 2 Estimated Yield from Existing Sources
City of Ashland – WCRS & CWMP

Source	Yield, acre-feet	Yield, MG
Ashland Creek(1)	4,634	1,510
TID(2)	385	125
Total	5,019	1,635

Notes:
(1) Based on 1931 stream flows less downstream ditch rights and evaporation from Reeder Reservoir.
(2) Assumes 50 percent TID available.

Climate Change Impacts

An analysis of the climate change impacts on the City was completed by Dr. Alan Hamlet of the Climate Research Center at the University of Washington. The study used a Distributed Hydrologic Surface Vegetation Model (DHSVM) to project anticipated alterations to water resources in the City's watershed. A total of eight climate change scenarios for year 1920 through 2006 were investigated. *TM 6 – Effects of Climate Change in Ashland Creek, Oregon* presents a detailed report of the models and analysis used for the climate change evaluation.

For the evaluation of climate change impacts on Ashland Creek, the average of the eight climate change scenarios was used. Figure 2 presents the modeled combined stream flows (east and west fork) from the eight different scenarios, averaged over the evaluated 1920 to 2006 period. The average stream flows projected under the climate change scenarios is compared to the historical flow. As illustrated in Figure 2, all of the climate change scenarios indicate increased Ashland Creek flows in spring but decreased flows in summer and fall. However, the various climate change scenarios vary in the predicated severity of these changes.

Though 1931 was the worst drought year on record, with the projected climate change impact, 1924 became the worst year on record (Figure 3). As shown in the figure, 1924 flows with climate change predict much greater spring flows with significantly lower flows available in June through September, consistent with the overall results.

These results are consistent with the climate change impacts projected in the report *Preparing for Climate Change in the Rogue River Basin of Southwest Oregon* (December 8, 2008) which was developed in cooperation by the Climate Leadership Initiative, the National Center for Conservation Science and Policy, and the MAPSS Team at the U.S.D.A Forest Service Pacific Northwest Research Station. Projections were based on down scaling three climate models and incorporating a global vegetation change model used by the Intergovernmental Panel on Climate Change. The report included an assessment of potential impacts of climate change on natural systems, as well as economic, built and human systems within the Rogue Basin. Similar to the current effort, the 2008 report projected increased stream flows in winter and early spring, with decreased flows during the summer and fall. A section on water supply predicted that water scarcity will become more common, especially in summer and fall.

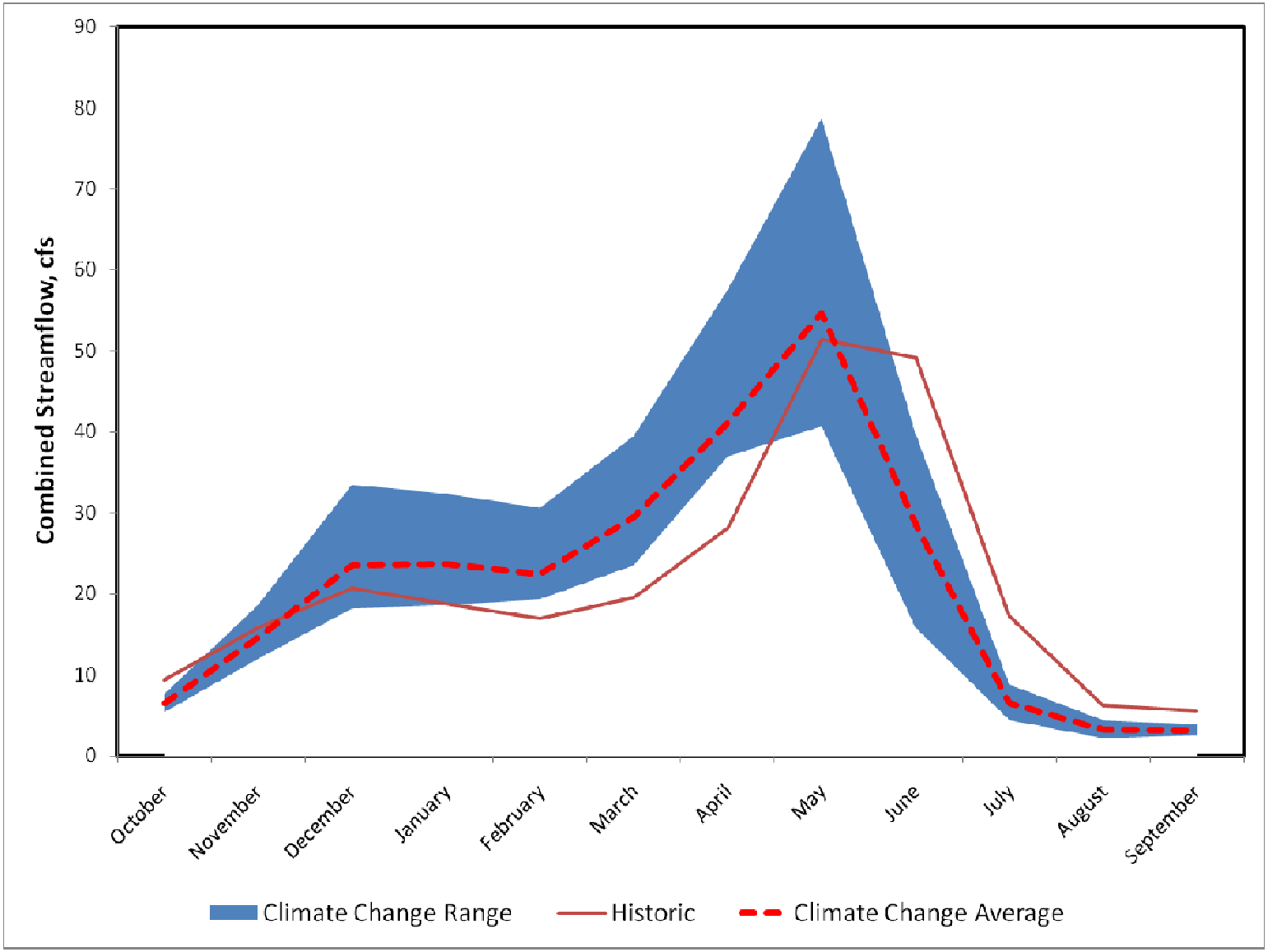
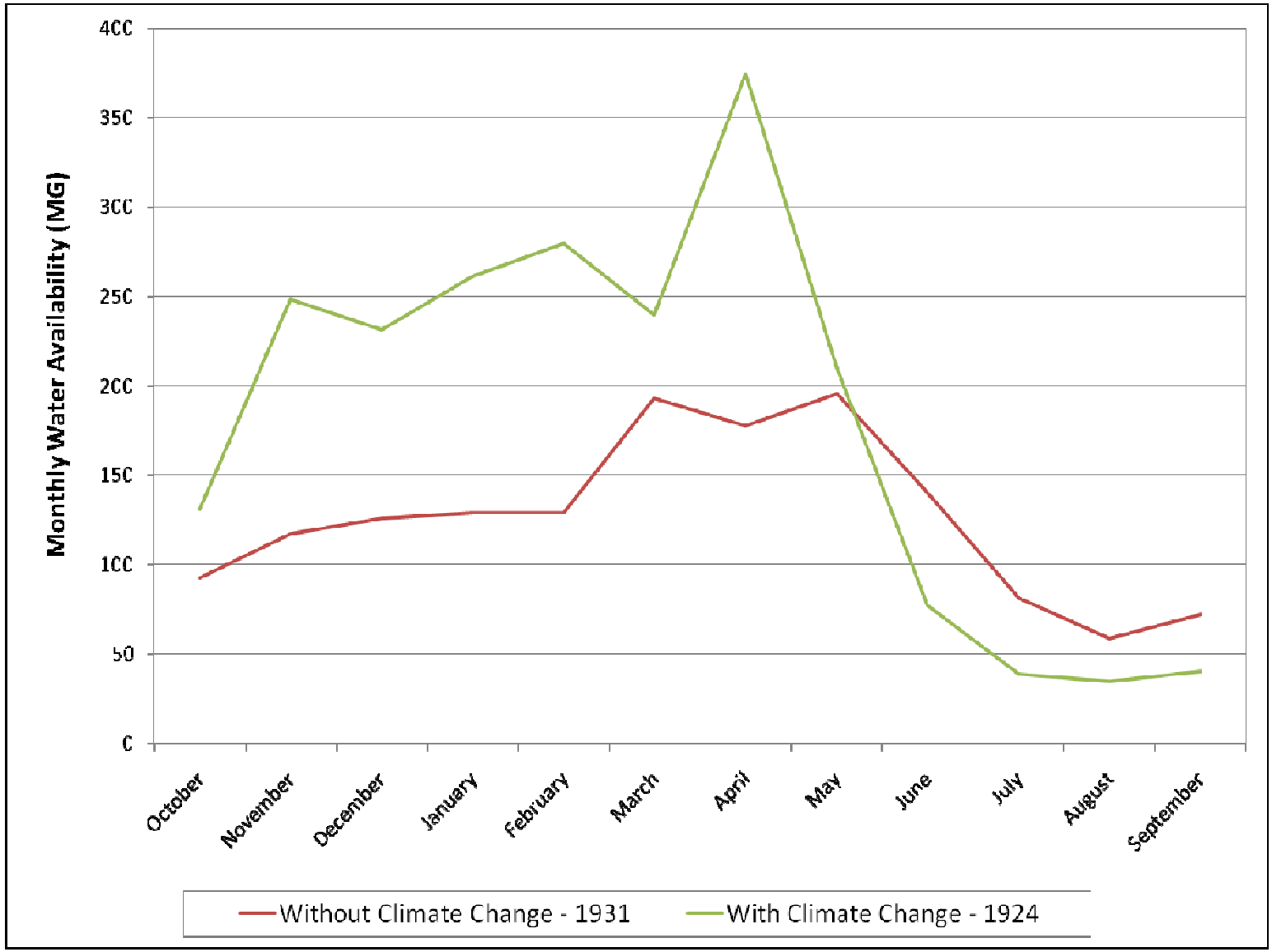


Figure 2 Estimated Stream flows Based on Climate Change Modeling



Worst Year on Record Based on Climate Change Analysis

Projected Demands

The City's historic water system demands and projected future demands are presented in *TM 2 – Water Needs Analysis.* The future demands are projected through 2060 using historic per capita usage and projected population. An evaluation of the impact that current and planned future water conservation will have on demands is presented in *TM 3 – Water Conservation*. This section briefly presents a summary of the current and projected demands to aid in evaluating if the existing raw water supply and treatment systems have adequate capacity to meet projected demands during the planning period. There are two types of demands used in the analysis:

Average monthly demands, which are used to evaluate the sufficiency of raw water supplies.

Maximum day demands, which are used to evaluate the capacity of the water treatment plant.

Other demands such as emergency needs during a supply outage, fire fighting demands, and peak hour supplies are assumed to be met through potable water storage tanks in the distribution system, as will be discussed in *Chapter 5 – Distribution System Analysis* of the *Comprehensive Water Master Plan.*

Level of Service Goals

The assumed demands for the existing supply analysis are based on the level of service goals established by the Ashland Water Advisory Council (AWAC). There are two key goals that impact the projected demands:

*Water System Capacity***.** The raw water supply system must be capable of meeting projected demands that have been reduced based on 5 percent conservation in addition to conservation already being achieved by the City. However, the City will have a goal of achieving 15 percent additional conservation.

Water System Reliability. The raw water supply system must be capable of meeting projected demands assuming 45 percent mandatory curtailments during a severe (approximately 1 in 100 year) drought, in addition to planned conservation levels.

Though it was originally intended that the level of service goals would be established prior to initiating the supply evaluation, additional information was needed to support the AWAC in selecting a level of service goal for raw water supply capacity. As such, this TM describes results of the existing supply analysis for three different potential conservation levels: 5, 10 and 15 percent conservation in addition to the conservation already achieved by the City. Information on the timing of additional raw water supply requirements is provided for the selected 5 percent conservation level only.

Average Monthly Demands

Average monthly demands were projected to evaluate the sufficiency of existing raw water supplies. As presented in *TM 2 – Water Need Analysis,* the average daily demands (ADD) were calculated based on the City's water production data. Table 3 presents the current and projected ADD for the City without taking into account the effects of additional water conservation beyond what the City is already achieving. The average monthly demands were then calculated by multiplying the ADD by the number of days in a month and the monthly peaking factor.

The projected average monthly demands for 2060 with and without additional conservation are presented in Figure 4. All evaluated levels of 5, 10 and 15 percent additional conservation are shown in the figure. All conservation levels are in addition to the conservation currently achieved by the City. Water use patterns including conservation were projected assuming 75 percent of water savings would come from outdoor use and 25 percent from indoor, as discussed in *TM 3 – Water Conservation.*

Figure 5 presents the projected average monthly demands for 2060 after applying the 45 percent curtailment level of service goal developed by the AWAC for each of the evaluated additional conservation levels. Further information on curtailment assumptions is provided in *TM 3 – Water Conservation.*

Table 3 Average Day Demands
City of Ashland – WCRS & CWMP

Year	Average Day Demand (mgd)	Maximum Day Demand (mgd)
2009 (Current)	3.38	6.96
2030	3.88	7.99
2050	4.47	9.21
2060	4.76	9.81

Maximum Day Demands

Maximum day demands were used to evaluate the capacity of the water treatment plant. The fluctuations in daily water use in the City are primarily influenced by temperature and rainfall. The water consumption during hot summer days is considerably higher than during the winter. Maximum day demands were calculated by multiplying the projected average day demands for each year by the historical peaking factor, as described in *TM 2 – Water Needs Analysis.* Seasonal variations in industrial/commercial and agricultural demands also cause fluctuations in daily water use. The projected maximum day demands are presented above in Table 3.

Water Supply Model

The objective of the water supply model is to compare the available supplies to the estimated demands and identify limitations of the existing supply system to meet future demands, especially under different drought conditions. Figure 6 presents a schematic of the existing supply model. As illustrated, both Ashland Creek (Reeder Reservoir levels) and TID supplies were considered to generate available water for the City's use.

Three drought scenarios were considered in this analysis, and the supply results were compared to projected year 2060 demands:

Worst Drought (1928-1931) without Climate Change.

Worst Drought (1924) with Climate Change.

1-in-10 year drought (1987) without Climate Change.

This section presents the details of each analysis and overall estimated supply deficits. For each scenario, the reservoir water level was modeled over a three-year period, taking into account monthly inflows and demands. The model for each scenario included three water years (October through September). However, the model was extended by an additional three months in the final year, as the most severe shortages were found to occur at the end of the drought period.

1931 Drought Scenario

Under this scenario the stream flow conditions in Ashland Creek were assumed to be the same as occurred during the 1928-31 droughts (worst drought on record). Although it is not known that the same (or similar) stream conditions will occur in the future, it is reasonable to use the actual historical record as the basis of the analysis. Due to its relatively small capacity, the reservoir was found to refill annually, even under the most severe drought conditions. Hence, though a three-year period was modeled, projected shortages in the final year were not affected by drought conditions in the previous years.

Table 4	1931 Drought Scenario: Additional Supply Requirements *City of Ashland – WCRS & CWMP*	
	Additional Supply Capacity Needed	
Additional Conservation Goal	MG	AF
5 percent	78	238
10 percent	11	34
15 percent	0	0

The following assumptions were made for this scenario:
Fifty percent of TID supply is available in the third drought year.
Five percent conservation would be applied to the demands.
Forty-five percent curtailment will be enforced during severe droughts.

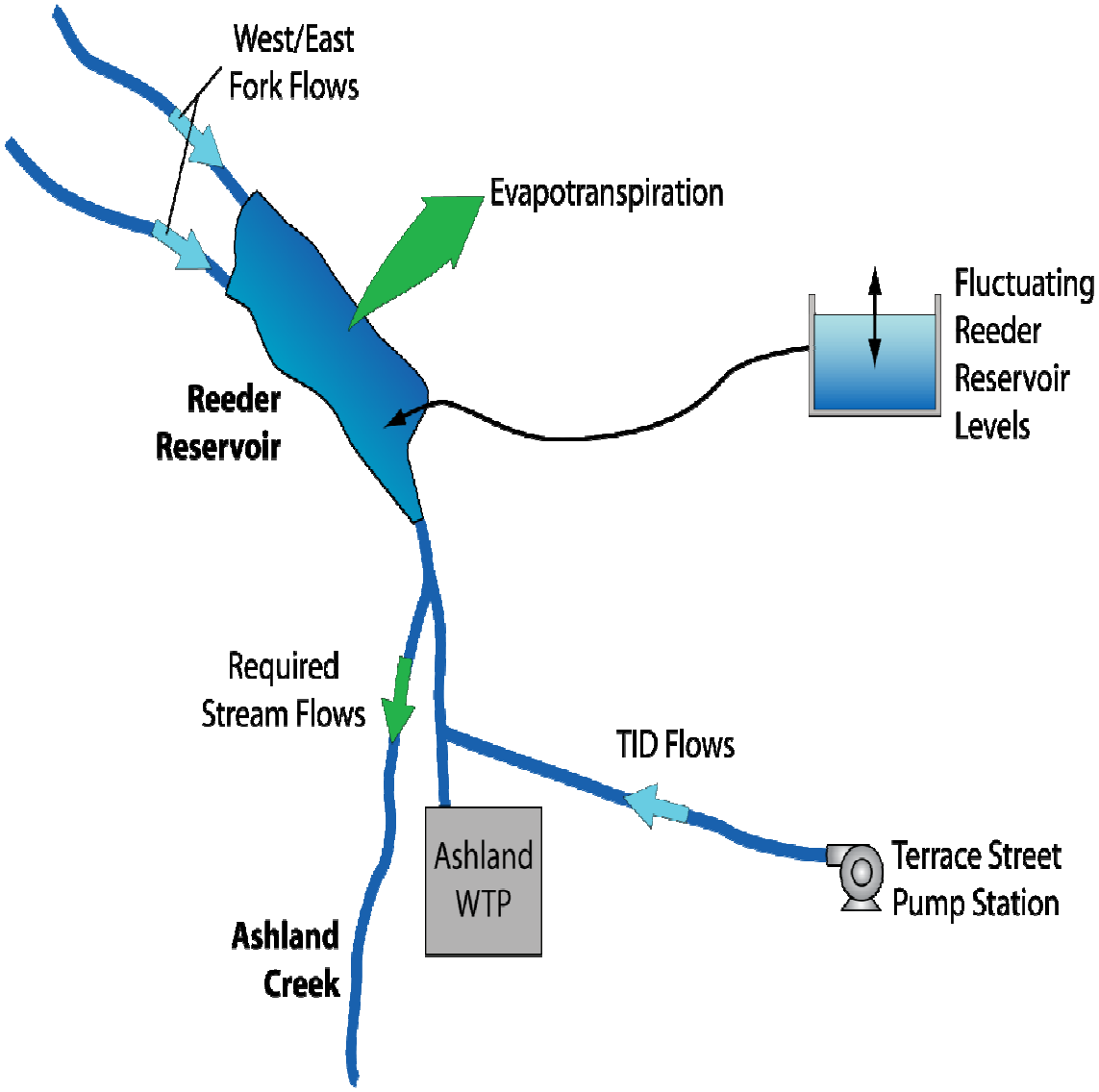


Figure 3Schematic of Existing Supply Model

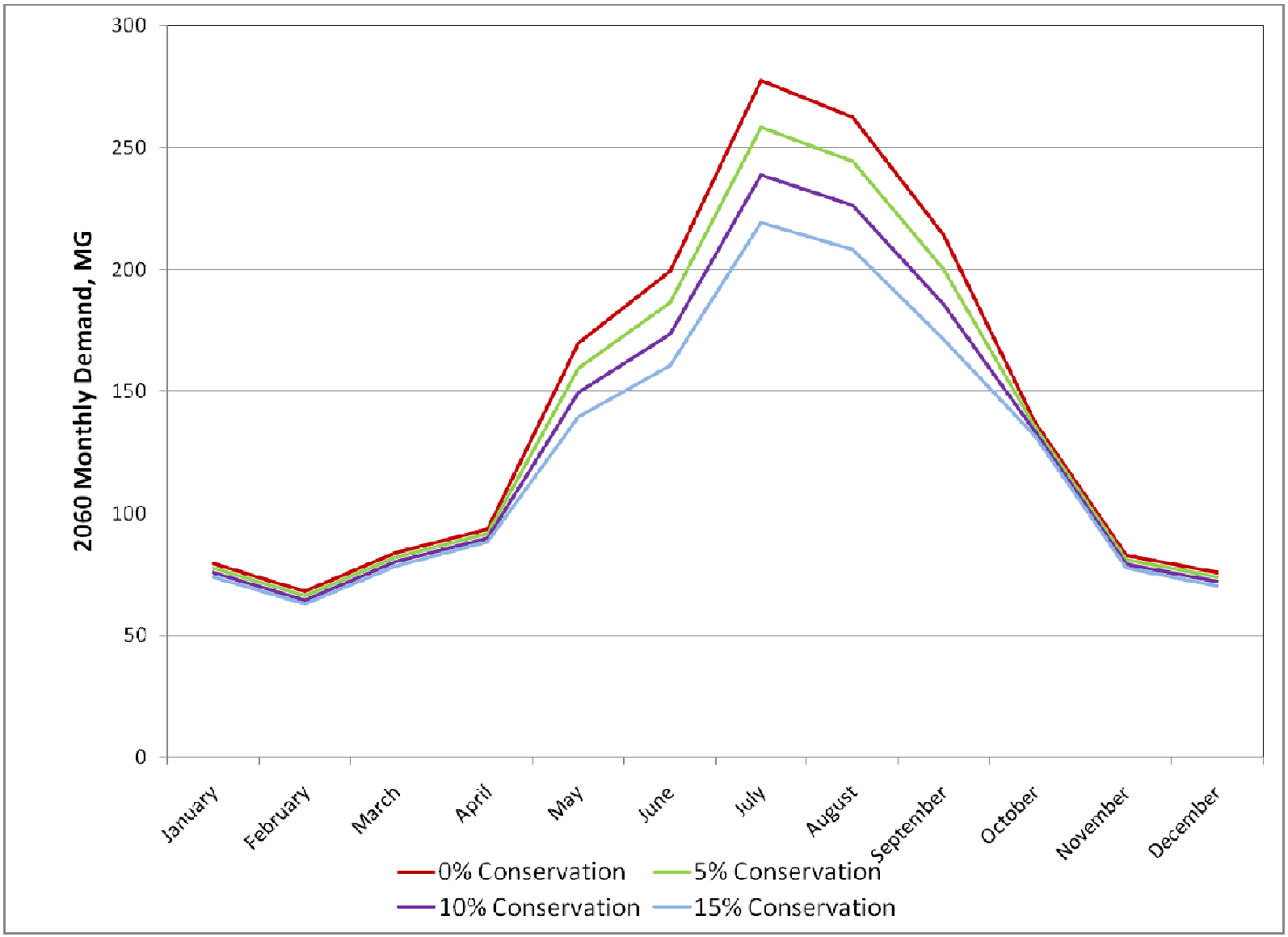


Figure 4Year 2060 Monthly Demands with Different Conservation Levels

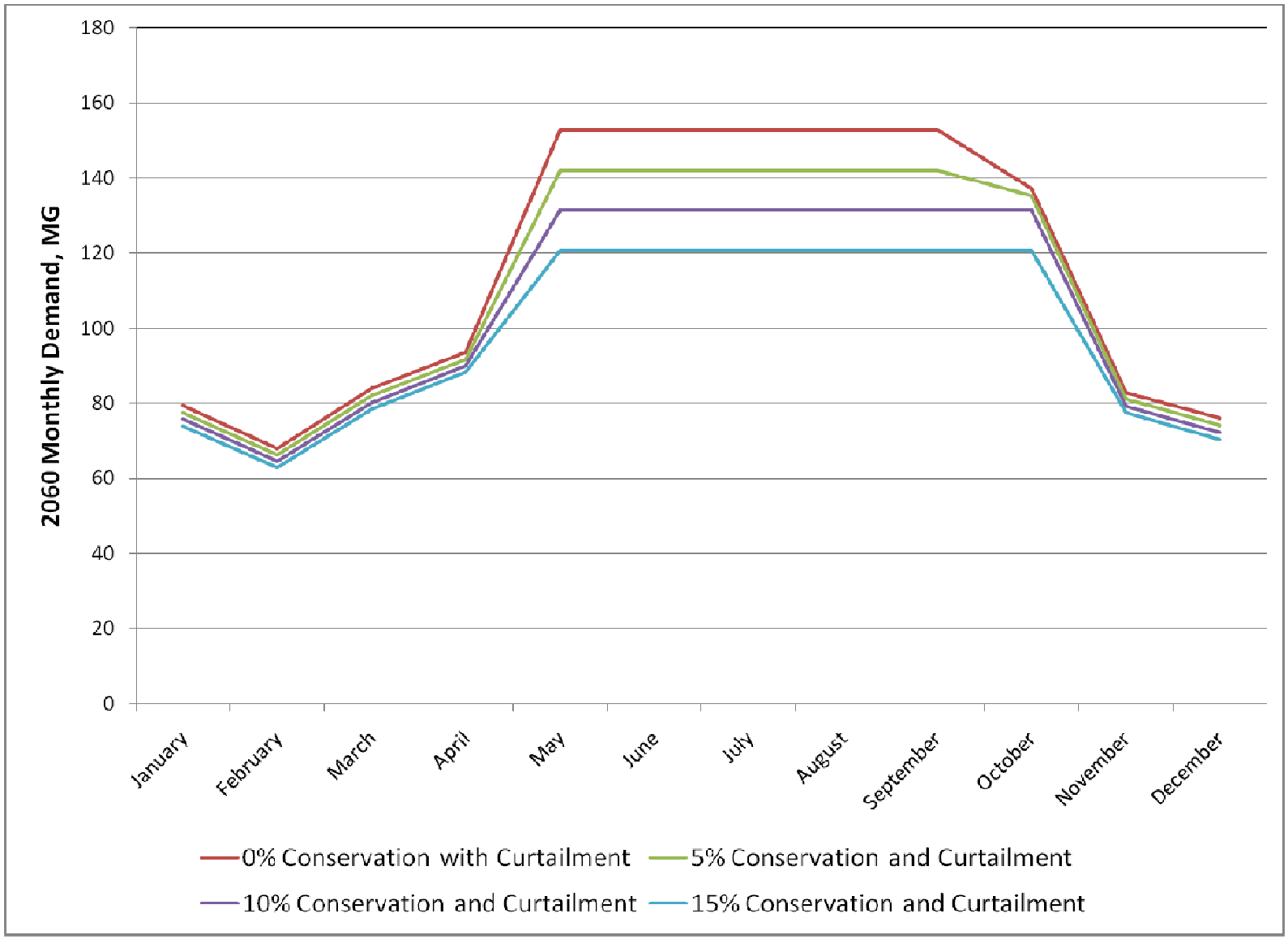


Figure 5Year 2060 Monthly Demands with Conservation and Curtailment

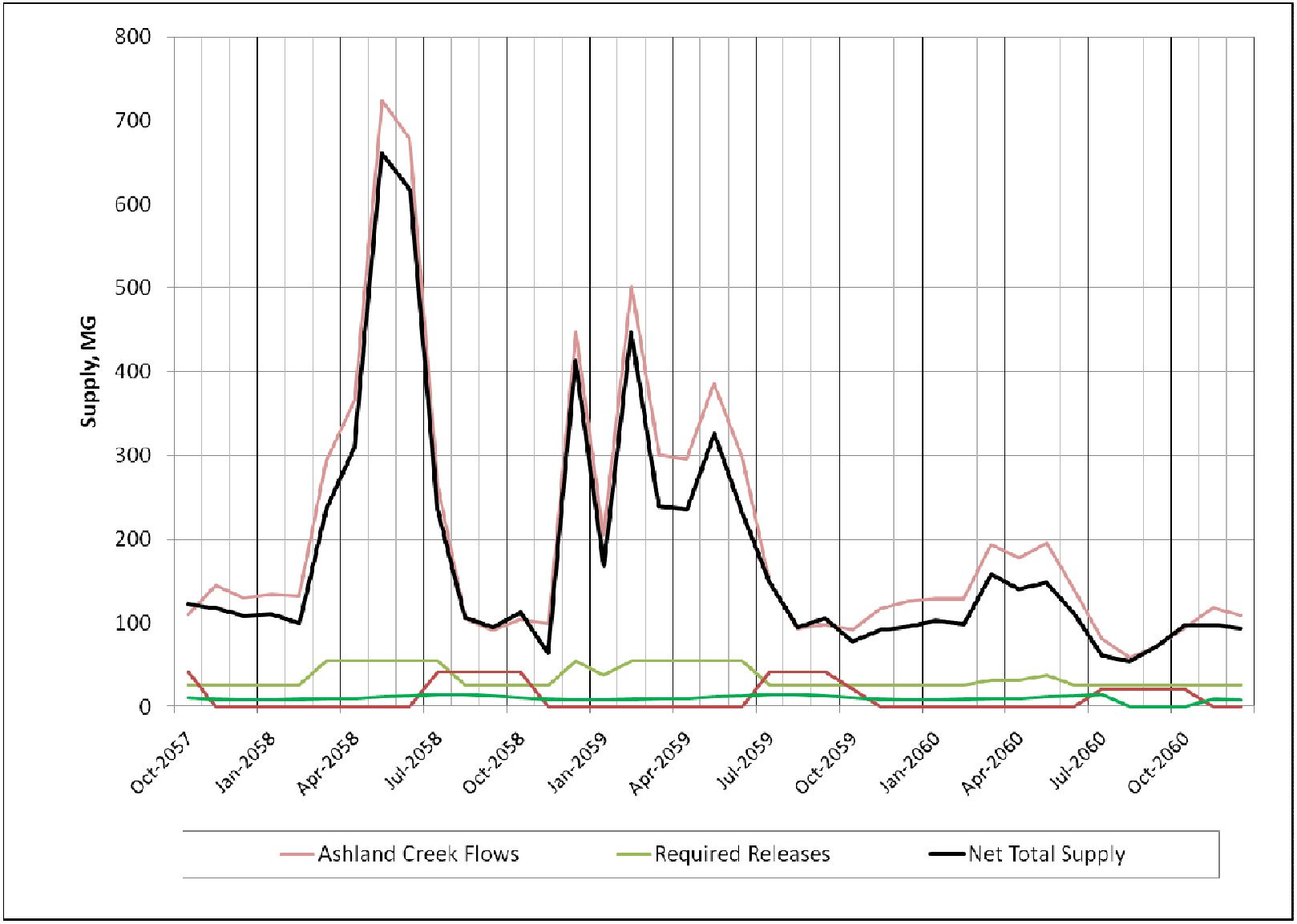


Figure 61931 Drought Scenario: Total Supplies

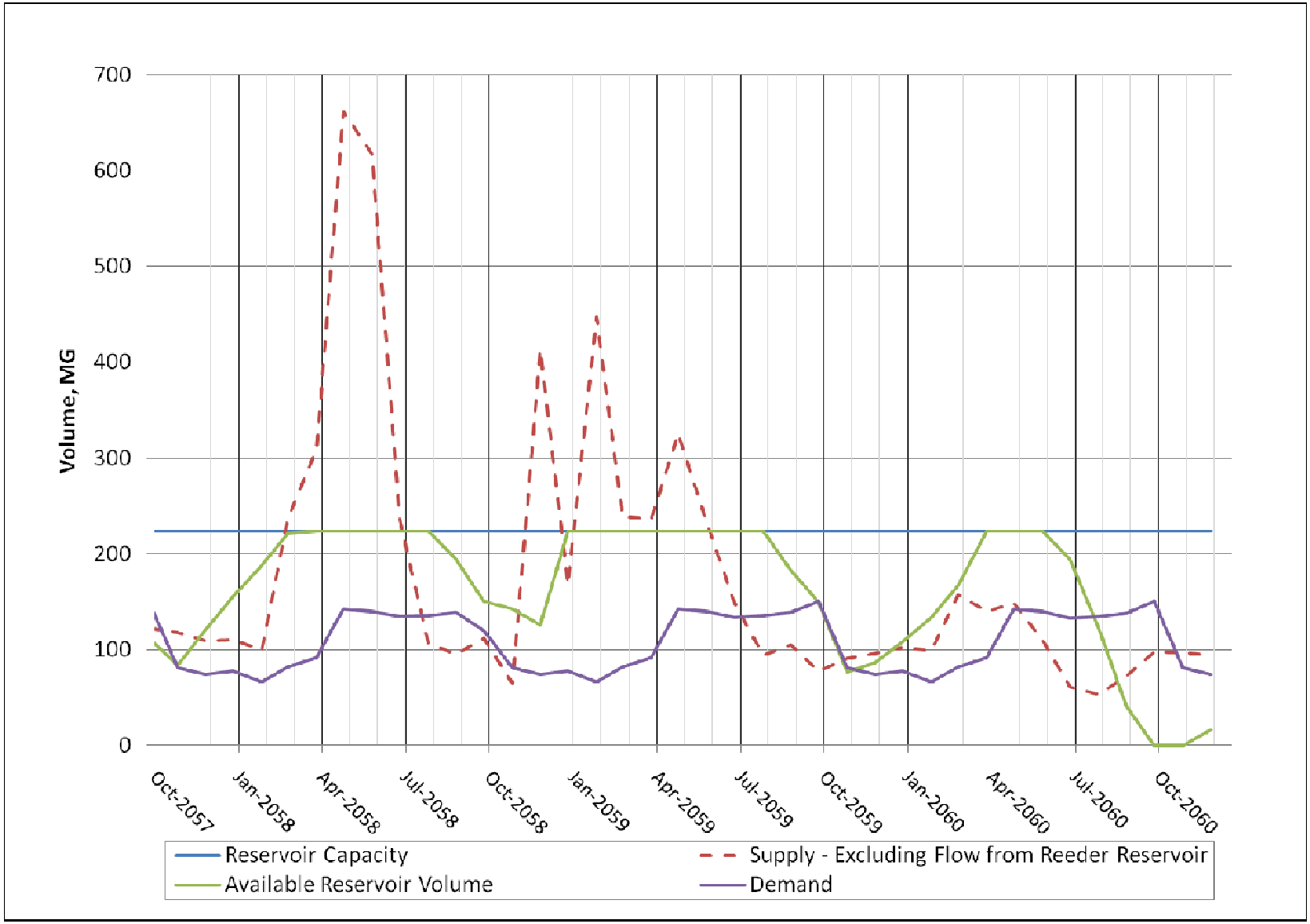


Figure 7 1931 Drought Scenario: Supply Analysis with 5 Percent Conservation

1924 with Climate Change

Under this scenario the historical stream flow conditions in Ashland Creek were simulated using the climate change model. With projected climate change impacts, the worst water supply year within the historical record became 1924. Similar to the previous scenario, the following assumptions were made:

Fifty percent of TID supply is available in the third drought year.

Five percent conservation would be applied to the demands.

Forty-five percent curtailment will be enforced during severe droughts.

Figure 9 presents the supply analysis with 5 percent conservation and 45 percent curtailment. Unlike the 1928-31 scenario, in this case, the flows for 1924 were modeled for three consecutive years. As shown in the figure, even under these severe drought conditions, the reservoir is projected to fill each year due to high projected stream flows in the spring. Hence, there is no carryover effect from previous years. The reservoir is projected to empty in September and not begin to refill until December, with supply shortages projected during this period.

As shown in Figure 9, projected climate change impacts resulted in more severe shortages. Table 5 presents additional supply requirements; additional supply is projected to be required under all conservation scenarios.

Table 5 **1924 with Climate Change Scenario: Additional Supply Requirements**
City of Ashland – WCRS & CWMP

Additional Conservation Goal	Additional Supply Capacity Needed	
	MG	AF
5 percent	202	619
10 percent	135	414
15 percent	68	210

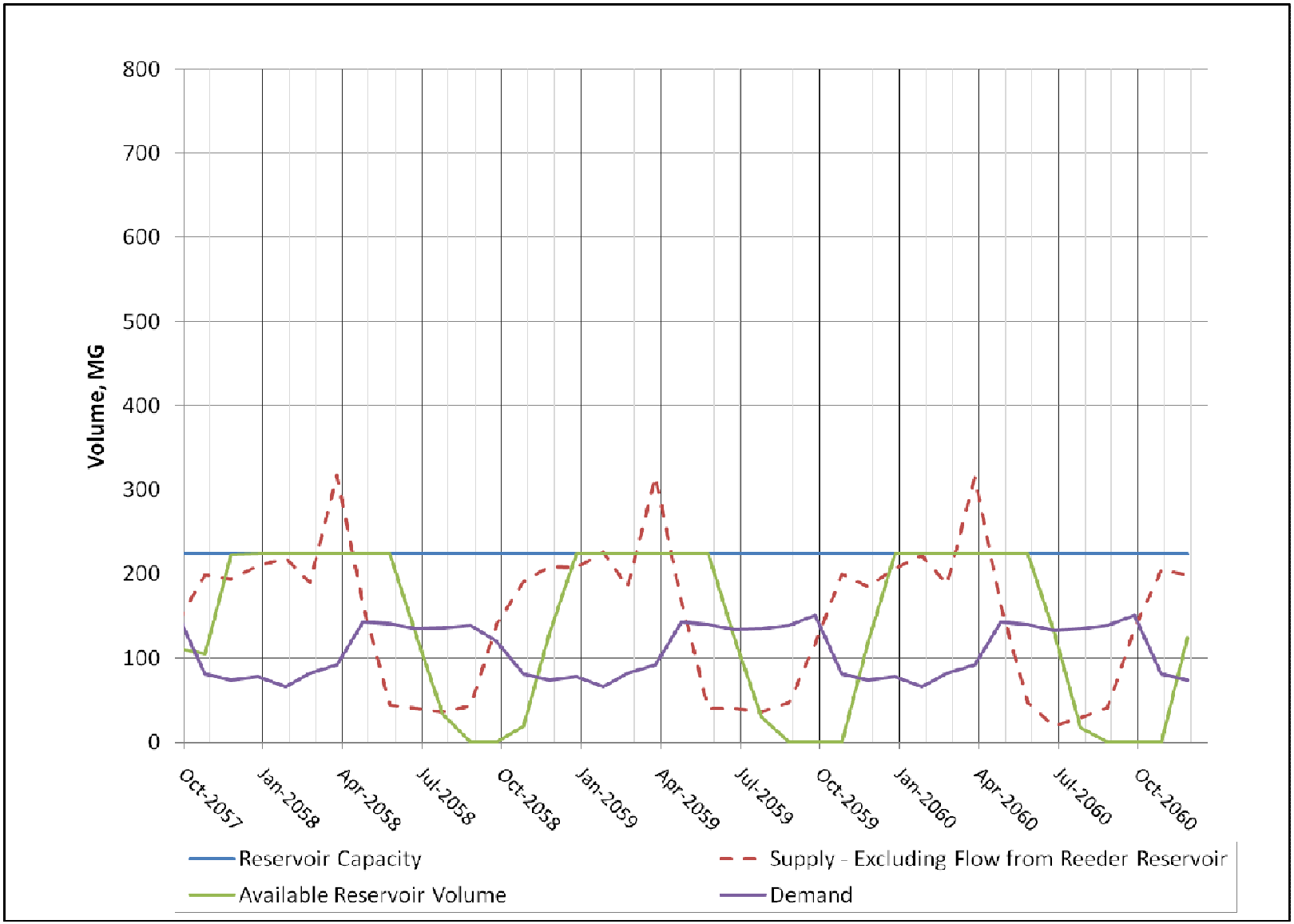


Figure 81924 with Climate Change Scenario: Supply Analysis with 5% Conservation

1-in-10 Year Drought

Based on the available data, an approximately 1-in-10 year drought for Ashland Creek occurred in 1987. These data were used in the supply model to calculate water requirements for year 2060 demands as shown in Figure 10. This scenario was evaluated to determine whether the aggressive curtailment goal selected by the AWAC under severe drought conditions would lead to frequent curtailments in more typical years.

Under this scenario, the following assumptions were made:

100 percent of the TID supply will be available.

5 percent conservation goal will be applied.

No curtailments will be enforced.

As shown in Figure 10, a shortage was predicted for the 5 percent additional conservation level. Table 6 presents the results of this analysis for the different conservation goals; there is a shortage projected for all conservation levels. However, it is important to note that these shortages are based on an assumption of no curtailments of either potable water demands or TID irrigation demands.

Table 6 **1-in-10 Year Scenario: Additional Supply Requirements**
City of Ashland – WCRS & CWMP

	Additional Supply Capacity Needed	
Additional Conservation Goal	**MG**	**AF**
5 percent	277	849
10 percent	210	645
15 percent	152	467

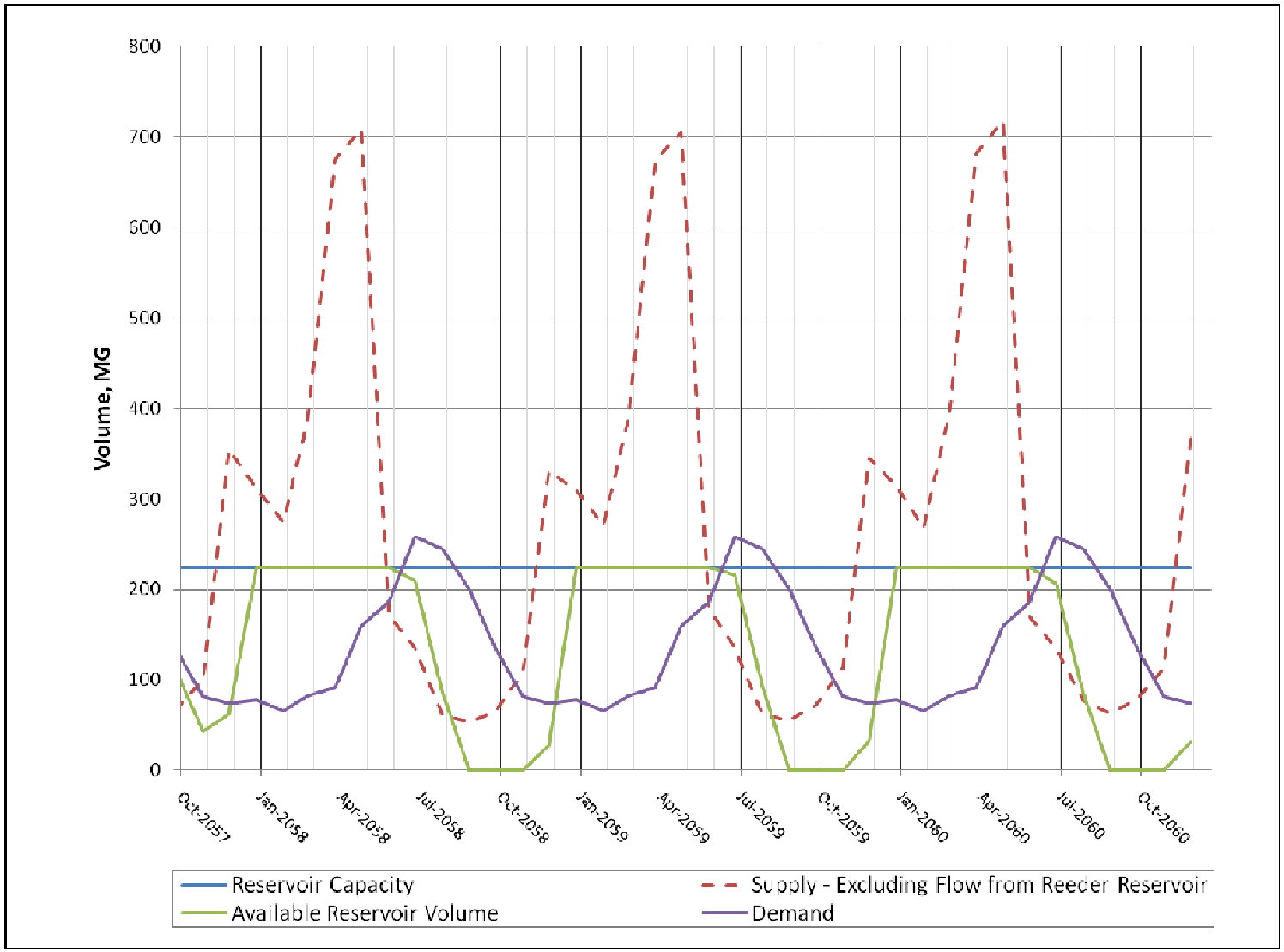


Figure 91-in-10 Year Scenario: Supply Analysis with 5% Conservation

Summary of Capacity Requirements

Table 7 presents a summary of the supply model analysis for the three supply scenarios and three conservation level scenarios. As anticipated, the 1924 climate change conditions resulted in more severe shortages than the 1928-31 conditions without climate change. The results from the climate change scenario were selected as the basis for developing the water supply packages.

Table 7 **Summary of Supply Model Analysis**
City of Ashland – WCRS & CWMP

Additional Conservation Goal	Additional Supply Capacity Needed, MG (AF)[1]					
	1928-1931 No Climate Change		1924 With Climate Change		1987 No Climate Change	
	MG	AF	MG	AF	MG	AF
5 percent	78	238	202	619	277	849
10 percent	11	34	135	414	210	645
15 percent	0	0	68	210	152	467

Notes:
1. MG – millions of gallons; AF – acre feet.

The shortages projected under the 1-in-10 year drought scenario without curtailments exceeded those for the 1924 climate change scenario. Hence, if the selected water supply package only meets the projected 1924 climate change scenario shortage, curtailments would be anticipated to be required during a 1-in-10 year drought. However, curtailments would not be as severe as the 45 percent curtailments assumed for the 1924 climate change scenario. Some water supply packages may exceed the minimum supply requirements and result in the lack of a need for curtailments under the 1-in-10-year drought scenario.

Timing of Additional Supply Requirements

To further evaluate the timing of required additional capacity, model scenarios for additional years were developed for the 5 percent conservation level for the years 2010, 2030, 2050, and 2060. Ashland Creek flows for years 2010 and 2030 were assumed to be per the 1928-31 drought conditions without climate change. Ashland Creek flows for years 2050 and 2060 were assumed to be per the 1924 conditions with projected climate change impacts.

The results of these scenarios are shown in Figures 11, 12, 13 and Table 8. Figure 14 shows that the demands are projected to exceed supplies in approximately 2038. It was assumed that additional supplies would need to be in place approximately two years prior, in 2036, to meet capacity requirements.

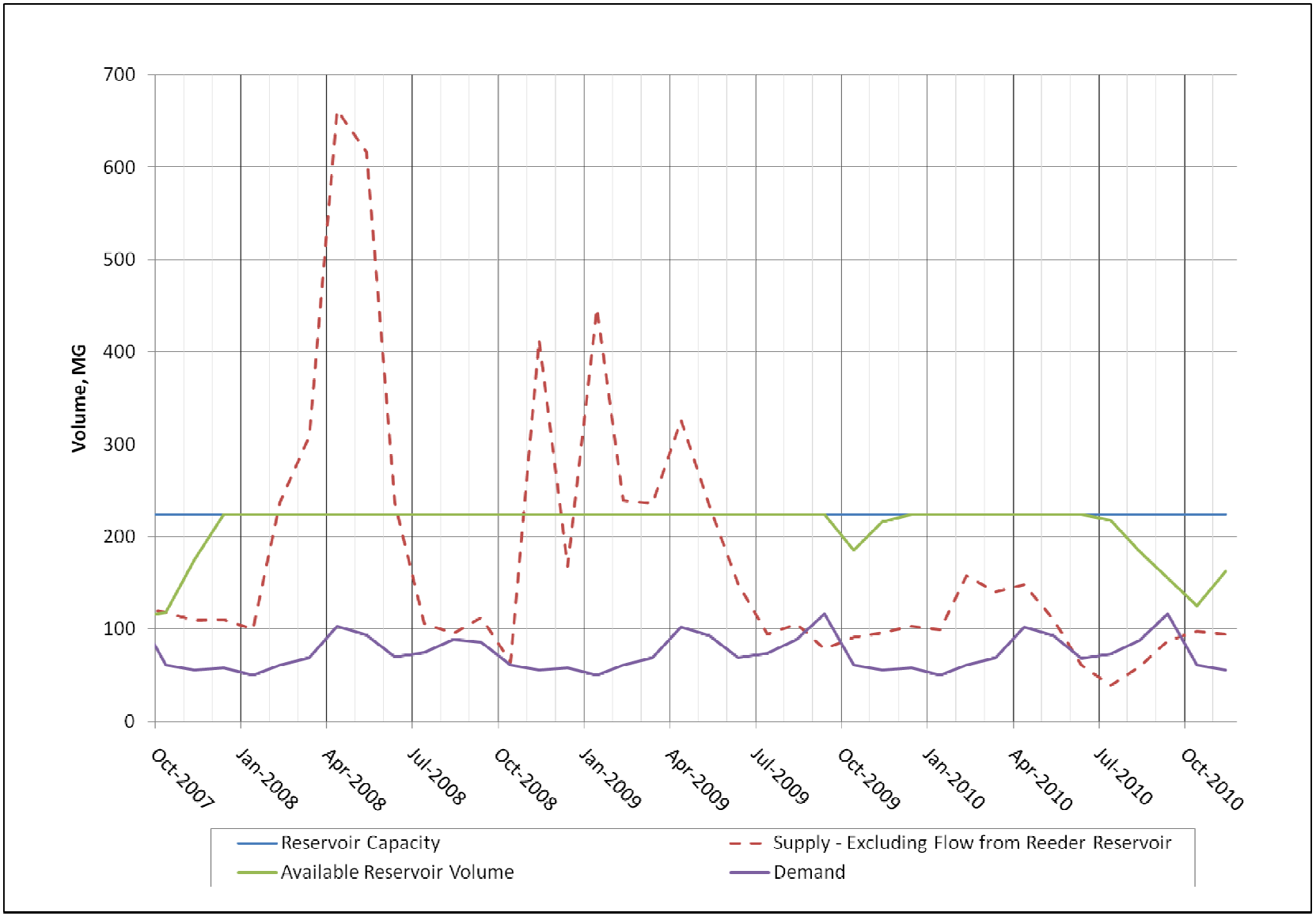


Figure 10 Year 2010 Supply Analysis without Climate Change and 5% Conservation

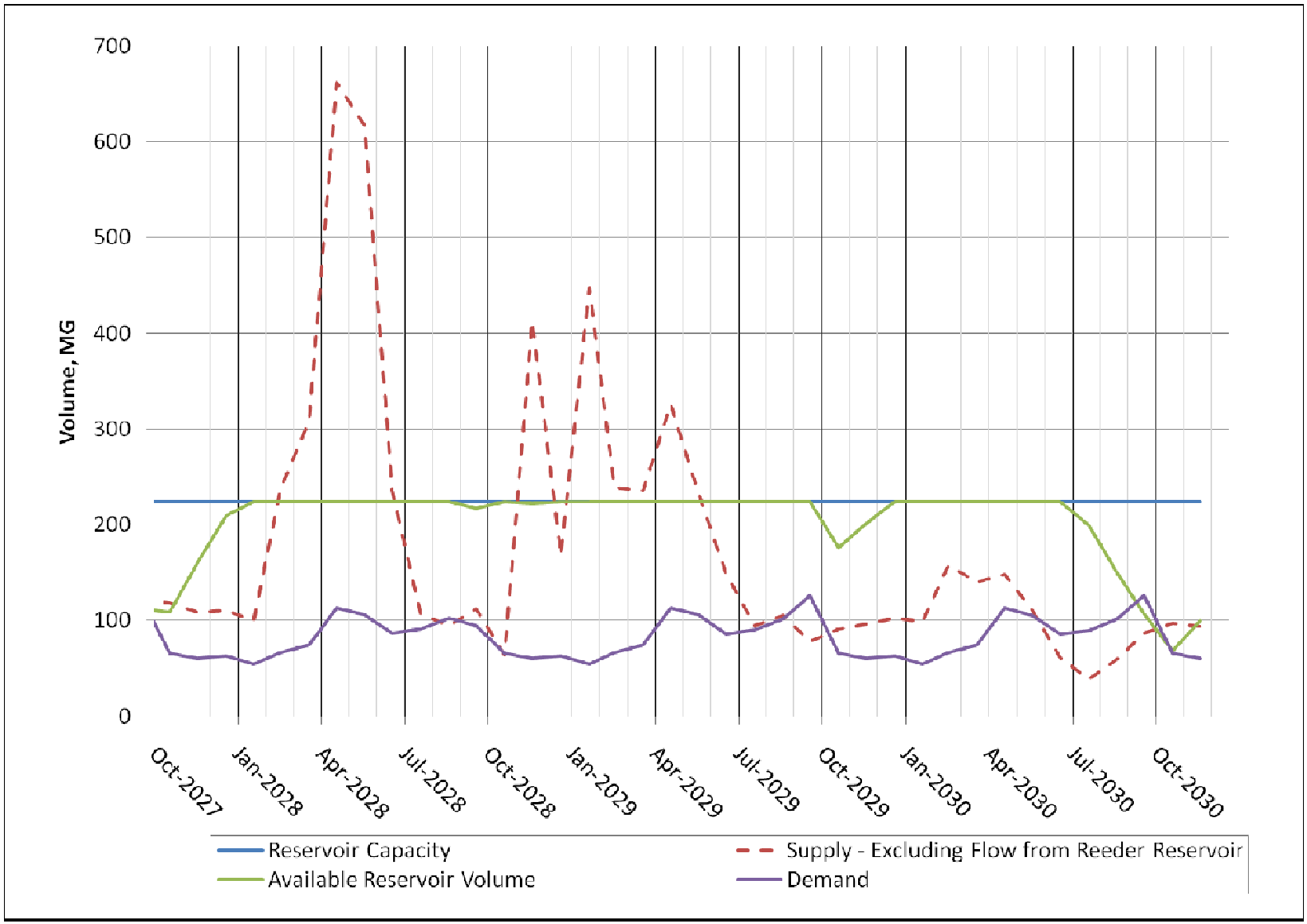


Figure 11 Year 2030 Supply Analysis without Climate Change and 5% Conservation

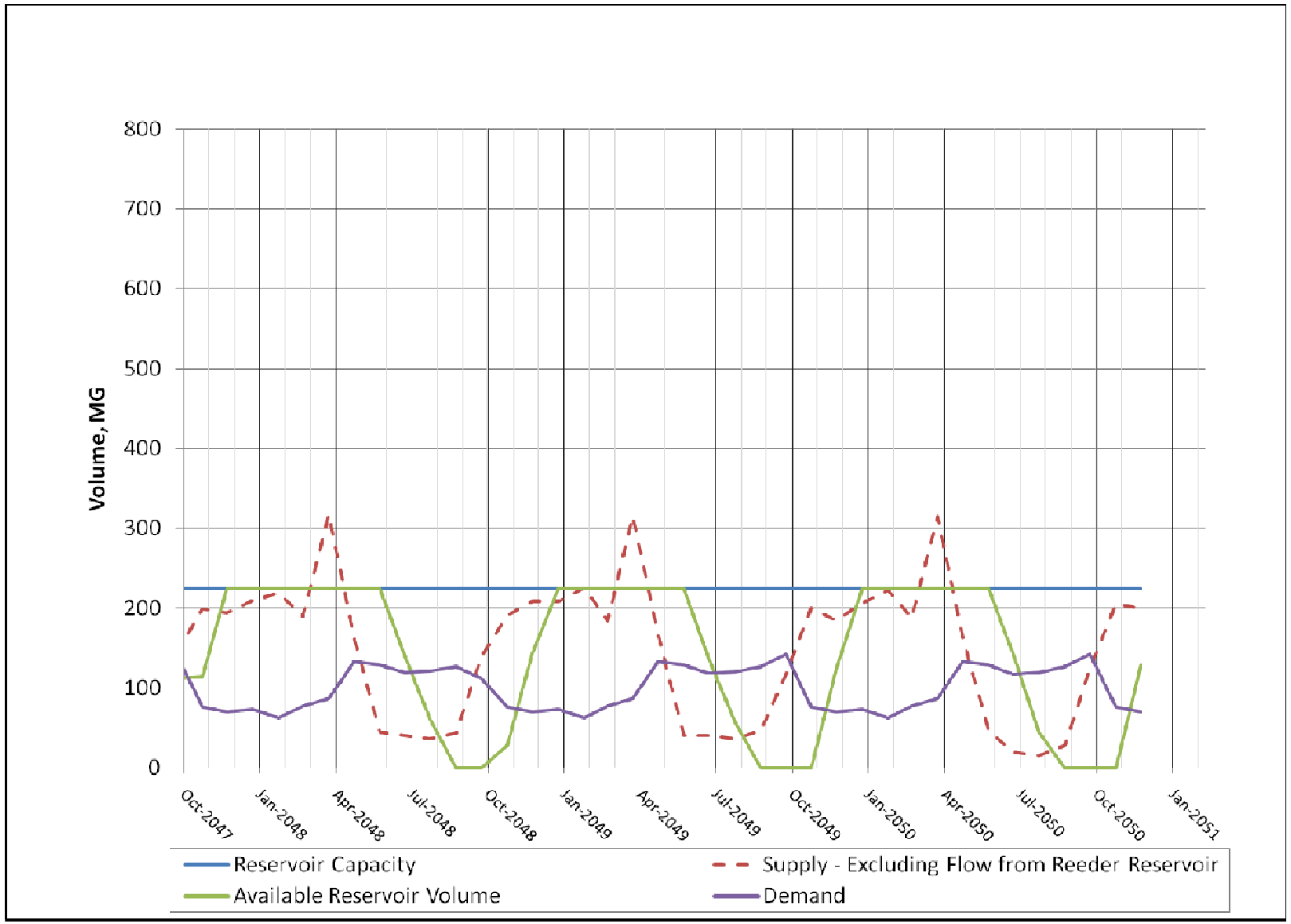


Figure 12 Year 2050 Supply Analysis with Climate Change and 5% Conservation

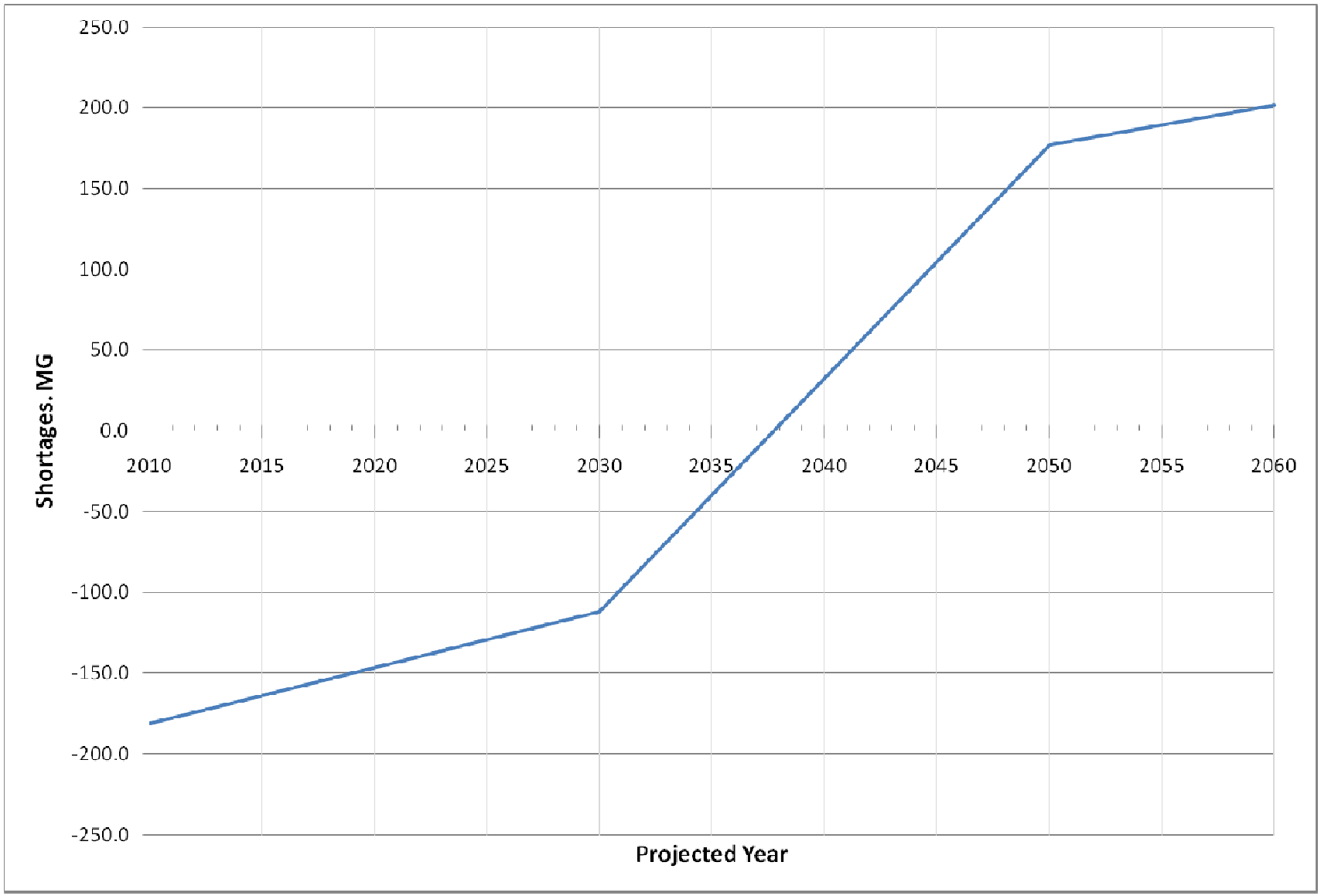


Figure 13 Supply Requirements Projected with 5 Percent Conservation

Table 8	**Timing of Additional Supply Requirements** ***City of Ashland – WCRS & CWMP***	
	Additional Supply Capacity Needed[2]	
Additional Conservation Goal	**MG**	**AF**
2010[1]	-181.2	-
2030	-111.2	-
2050	177.0	543
2060	201.5	619

Notes:
2) Surplus demand was calculated based on June through October demands when deficits were observed in the model.
3) 2010 and 2030 scenarios based on Ashland Creek flows available under the 1928-31 droughts without climate change impacts. 2050 and 2060 scenarios based on Ashland Creek flows available under the 1924 drought with projected climate change impacts. All scenarios assume 50 percent of TID flows are available.

As discussed above, shortages are also projected for the 1-in-10 year drought condition without curtailments. Though these shortages are not being used to size the water supply projects, they may provide a reason to implement those packages sooner than 2030. Table 9 shows the projected shortages for the 1-in-10-year drought for 2010 and 2060. As shown in the table, shortages are already projected for 2010; curtailments of approximately 21 percent would be required to eliminate the shortage. It is assumed that by 2060 a water supply package will be implemented that would at least meet the projected 619 AF shortage. Under this assumption, approximately 21 percent curtailments would also be projected to be required in 2060. If the selected water supply package exceeded the 619 AF requirements, the projected curtailments would be reduced.

Table 9	**Projected Shortages for the 1-in-10 Year Drought** ***City of Ashland – WCRS & CWMP***	
	Additional Supply Capacity Needed[2]	
Additional Conservation Goal	**MG**	**AF**
2010[1]	93	285
2060[2]	277	849

Notes:
☎🗁✆ Based on projected Ashland Creek flows during an approximately 1-in-10 year drought, as represented by historical 1987 flows. Additional capacity needed based on no conservation and curtailments on either the potable water or TID systems.
☎🗎✆ Additional capacity needed in 2060 based on 5 percent conservation level and no curtailments.

Water Treatment Capacity

The capacity of the Ashland Water Treatment Plant was evaluated for its ability to meet projected maximum day demands. The current capacity of the water treatment plant was assumed to be 7.5 million gallons per day (mgd). The theoretical capacity may be somewhat higher; however, the 7.5 mgd capacity reflects the experience of City staff and historical plant performance.

Figure 15 shows the projected maximum day demands for the three different conservation scenarios (5, 10 and 15 percent additional conservation), as well as the current water treatment plant capacity. These demands do not assume curtailments, as the City must be able to provide sufficient supply in non-drought years without curtailments. As shown in the figure, the demands are projected to exceed the capacity for all conservation levels. However, the higher conservation levels both reduce the magnitude of and delay the need for the required capacity expansions. The additional projected capacities required for the conservation level scenarios are summarized in Table 9 and vary from 0.5 mgd for the 15 percent conservation level to 1.9 mgd for the selected 5 percent conservation level. This additional capacity could theoretically be achieved by increasing treatment capacity, adding a new potable water source, or transferring existing irrigation to non-potable supplies. Total capacity needs are addressed through the water supply packages, as described in *TM 14 – Water Supply Packages*.

Table 9 Water Treatment Plant Capacity Evaluation
City of Ashland – WCRS & CWMP

Additional Conservation Goal	Additional Capacity Required in 2060	Year in Which Additional Capacity is Needed
5 percent	1.9 mgd	2018
10 percent	1.2 mgd	2032
15 percent	0.5 mgd	2048

Notes:
(1) MGD – millions of gallons per day.

Summary

Based on the analyses contained in this chapter and the level of service goals established by the City, the following conclusions can be made:

Additional raw water supply will be needed in approximately 2037; a total 202 MG (619 AF) of additional supply will be needed by 2060. These estimates are based on planning for 5 percent conservation in addition to what the City is already achieving and 45 percent curtailments in addition to conservation during severe drought years.

Unless additional conservation exceeding 5% can be sustained through a normal economic and weather conditions, which we believe it can, additional maximum day treatment capacity will be needed by approximately 2018; an additional 1.9 mgd of capacity will be needed by 2060. This additional capacity could be achieved by increasing treatment capacity, adding a new potable water source, or transferring existing irrigation to non-potable supplies. These estimates are based on planning for 5 percent conservation in addition to what the City is already achieving and no curtailments during typical years.

The City is currently preparing plans to construct an emergency intertie between Ashland and Talent, as well as to purchase SDCs from the Medford Water Commission for treatment and transport, which will allow the City to perfect the use of water rights permit S-54337 within the next 5 years if successful. The implementation of this plan is contingent on a number of budgetary and political hurdles yet to be run, but the plan is currently to complete pipeline construction in 2016 and perfect the rights as soon after as conditions will allow.

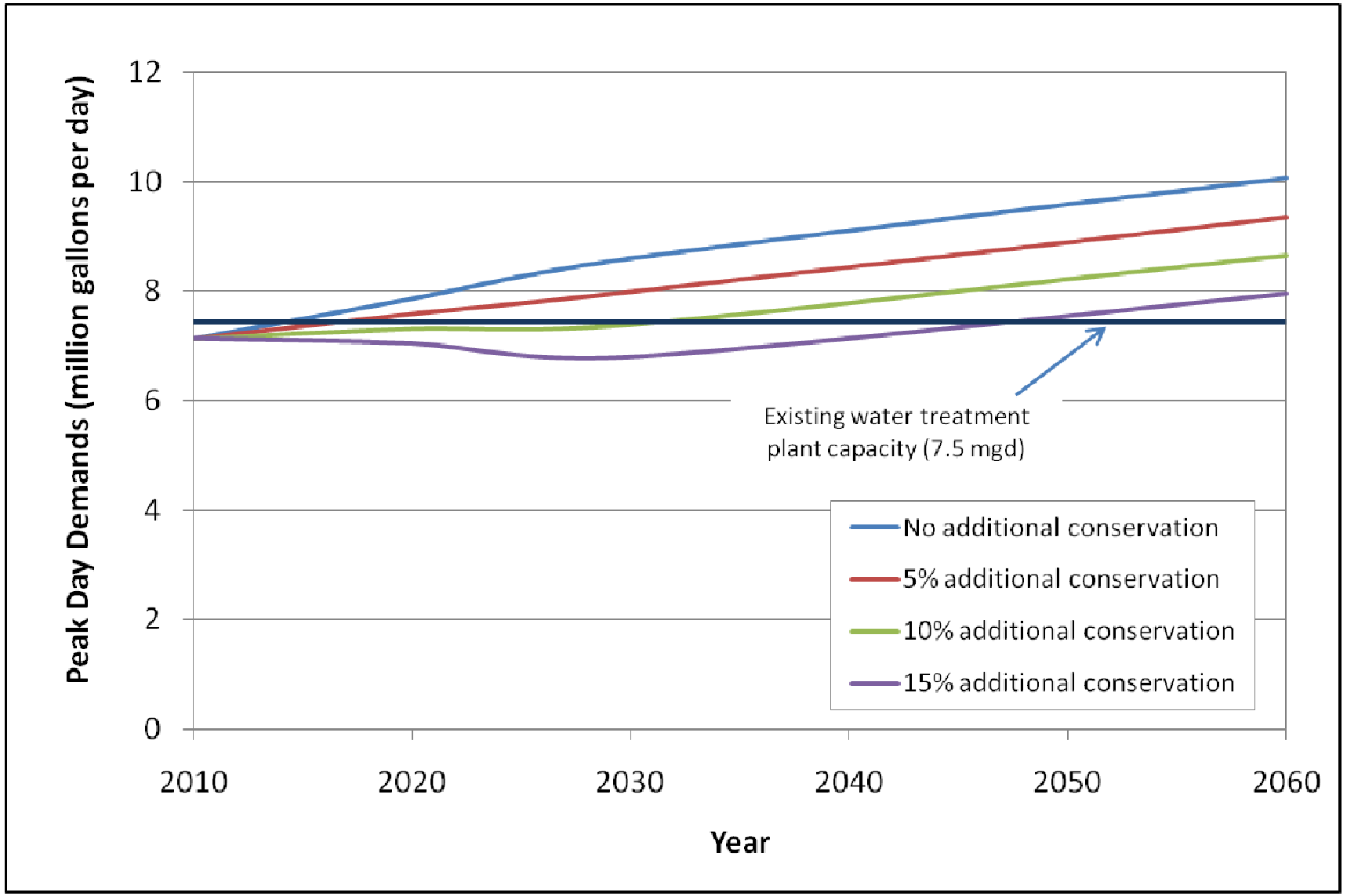


Figure 15 Project Water Treatment Plant Capacity Requirements

Alternative Sources

This section addresses the requirements of OAR 690-086-0170(5)

No expansion or initial diversion of water allocated under existing City permits is expected to be necessary to meet the City's needs in the next 10 or 20 years. Consequently, this section is not applicable. Nonetheless, the City has invested significant effort to analyze the alternative sources of water for meeting its projected water needs. The City continues to invest in conservation measures to reduce its current water demand. Although the City's MDD continues to increase over time, its average and maximum per capita demands have decreased during the last several years. The City attributes this decrease in per capita demand, in part, to its conservation efforts.
The City has thoroughly investigated cooperative regional water management to meet its long-term needs. As a result, the City is actively pursuing an emergency water supply alternative with the Medford Water Commission, and will continue to participate with the Talent Ashland Phoenix Intertie (TAP) to assure alternative and back-up emergency water supplies in the future.

Quantification of Maximum Rate and Monthly Volume

This section addresses the requirements of OAR 690-086-0170(6).

No expansion or initial diversion of water allocated under existing City permits is expected to be necessary to meet the City's needs in the next 20 years. Consequently, this section is not applicable.

Mitigation Actions

This section addresses the requirements of OAR 690-086-0170(7).

No expansion or initial diversion of water allocated under existing City permits is expected to be necessary to meet the City's needs in the next 20 years. Consequently, this section is not applicable. The City is unaware of any required mitigations actions.

Acquisition of New Water Rights

This section addresses the requirements of OAR 690-086-0170(8).

No acquisition of new water rights is necessary in the next 20 years, but the City plans to actively pursue acquisition of municipal TID rights recently forfeited by the City of Talent, as well as Senior Ashland Creek rights that would allow additional withdrawals in the future.