

# Water Management and Conservation Plan



April 2018

**WATER MANAGEMENT AND CONSERVATION PLAN**  
**FOR**  
**SPRINGFIELD UTILITY BOARD**  
**AND**  
**RAINBOW WATER DISTRICT**

**APRIL 2018**

**Springfield Utility Board  
202 South 18th Street  
Springfield, OR 97477**

**Rainbow Water District  
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# Section 1

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## SECTION 1

### INTRODUCTION

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#### 1.0 Authorization

The Springfield Utility Board (SUB) and Rainbow Water District (RWD) authorized staff to prepare an update to the Water Management and Conservation Plan (WMCP) that was approved by the Oregon Water Resources Department (OWRD) on August 16, 2012 (the “2012 WMCP”). A copy of the final order that approved the 2012 WMCP and cover letter from OWRD are included in Appendix A.

#### 1.1 Purpose

In October 2014, OWRD issued the Final Order for Extension of Time for SUB Permit S-22200. Pursuant to OWRD rules, the final order required SUB to update the 2012 WMCP within three years after the date of the final order. The purpose of this WMCP is to update the 2012 WMCP, as required by the final order and consistent with the requirements for WMCPs contained in Oregon Administrative Rules (OAR) chapter 690, division 86. This WMCP presents an assessment of SUB’s and RWD’s current water conservation programs and identifies and presents a plan for potential future conservation measures. This WMCP also presents the SUB and RWD water curtailment plans, an assessment of long-term source needs, and an anticipated development schedule for existing water rights.

The 2012 WMCP and the Water System Master Plan (MSA, 2010) serve as the source of the majority of the data used in the preparation of this WMCP. Major updates to the planning data incorporated in this WMCP include:

- Water demand forecasts
- Water production capabilities and construction of new facilities since 2000
- New storage and supply source evaluations and analyses

Traditionally, water management planning to accommodate increased water demand has focused on the development of new water supply projects, such as new groundwater supply wells and the expansion of surface water supply facilities. This supply-side planning approach has historically viewed demand-side management, such as the implementation of conservation measures, as merely a temporary response to an emergency or drought situation. Current water management planning practice puts demand-side management on equal footing with supply-side management. This approach has been termed “integrated resource planning” (IRP). Water conservation, an element of demand-side management, is a modification of the timing and magnitude of water use by consumers, most commonly through increased efficiency.



A comprehensive, optimized water management planning approach considers both supply- and demand-side management to achieve the most feasible economic and ecological balance. Water conservation is implemented as a partnership between the utility and the consumer with benefits to both, including the following:

- Water conservation has potentially favorable economic and environmental costs compared to supply development or expansion.
- Water conservation can usually be implemented more quickly than a traditional supply project.
- Water conservation can be designed to affect base load consumption, peak consumption or both, like a supply project.
- Water conservation generally has lower environmental impacts than a supply project.
- Water conservation can also reduce energy consumption and wastewater treatment cost, unlike a supply project.

The combination of supply- and demand-side management strategies reflect SUB's and RWD's commitment to efficiently manage the water resources of the Springfield area and to apply IRP principles to the maximum benefit of the water systems' customers and the region.

## **1.2 Water System Overview**

The water system described in this WMCP is co-managed and operated by SUB and RWD under a set of Intergovernmental Agreements (IGAs). In accordance with the 1992 Withdrawal and Operations Agreement between RWD and SUB, the 1995 Urban Water Service Agreement between RWD and SUB, and the 2006 Water Supply and Services Agreement between SUB and Glenwood Water District (GWD), future annexations of land within the Springfield Urban Growth Boundary (UGB) will be served by SUB. Copies of these IGAs are included in Appendix B. All areas inside the UGB, including areas served by RWD and GWD, are included in the study area of this WMCP. SUB and RWD staff have traditionally treated the North distribution system as one planning unit due to the co-mingling of source, storage and distribution facilities. RWD has provided data for customer demands and source capabilities within the RWD service area.

As of 2016, SUB and RWD served approximately 68,663 people living in Springfield and in the surrounding unincorporated areas within the City of Springfield UGB. In 2016, the two utilities supplied approximately 9.9 million gallons per day (mgd) of drinking water on an average daily basis. During the peak use period in the summer of 2013, the utilities supplied approximately 19.1 mgd, or 13,265 gallons per minute (gpm), to meet customer water needs.

The current Springfield water system is divided into three separate service areas termed the West, East and North systems. Customers in the North System are served jointly by SUB and RWD. While the West and East systems are served only by SUB, RWD provides water to SUB that is used by SUB customers in the West and East systems. The three areas are interconnected with existing piping.

The current Springfield water distribution system configuration is the product of the multiple acquisitions and mergers of four different historical water systems. These systems include:

#### Springfield East System

- In 1960 SUB acquired the McKenzie Highway Water District system.

#### Springfield West System

- In 1975 SUB acquired the Mountain States Power/Pacific Power and Light systems.
- In 2001 SUB acquired portions of the Glenwood systems as the Glenwood area was transferred from the City of Eugene UGB into the City of Springfield UGB.

#### Springfield North System

- In 1992 SUB acquired portions of the RWD system within the Springfield city limits through the 1992 and 1995 IGAs.

Although the Glenwood area was included in the City of Springfield UGB, a large portion of the water customers in this area are in the GWD. SUB provides wholesale water supply and water system operations to the GWD.

The water system service area for this WMCP includes all the developed and developable land within the current City of Springfield UGB. Further description of the water system service areas and system configuration is presented in Section 2.

### **1.3 Report Organization**

This report includes five sections and an *Executive Summary*.

The *Introduction* (Section 1) explains the purpose of this WMCP and its basis in OAR chapter 690, division 86. This section also provides an overview of the history of the SUB and RWD water systems, this WMCP's relationship to other planning documents, major sources of information for this WMCP, the proposed dates of submission for the next progress report and WMCP update, the organization of this WMCP, and a summary checklist of required content and where it is located.

Section 2 is the *Water Supplier Description* as described in OAR 690-086-0140. Section 2 details water supply information and includes current water sources, water rights, production, storage, transmission, intertie and regulation facilities, system capacities, customer water use characteristics, water demand projections and past demand management practices.

Section 3 is the *Conservation Element* as described in OAR 690-086-0150. Section 3 summarizes SUB's and RWD's current water conservation programs, presents an analysis of other water conservation measures as required, and where required, provides benchmarks for proposed conservation activities or for conservation activities that have been proposed but not yet achieved.

Section 4 is the *Municipal Water Curtailment Element* as described in OAR-690-086-160. Section 4 presents the curtailment plan jointly developed by SUB and RWD and closely coordinated with Eugene Water & Electric Board (EWEB) to address local and regional water shortage events.

Section 5 is the *Municipal Water Supply Element* as described in OAR-690-086-170. Section 5 presents an analysis of water supply needs for the SUB and RWD service areas, including documentation of source need for the 20-year planning horizon and a presentation of alternative source analysis.

## **1.4 Compliance**

OAR 690-086, 690-315

This WMCP complies with the water management and conservation planning requirements of OAR chapter 690, division 86 and applicable elements of division 315. In 2010, SUB and RWD also prepared a Water System Master Plan (WSMP) that complies with OAR chapter 331, division 61. A WSMP update was started in January 2017 and is anticipated to be ready for State of Oregon plan review in early 2018.

The final order that approved the 2012 WMCP required an update of the plan by February 16, 2022, and a progress report by August 16, 2017. Since 2000, SUB has worked to perfect certain water rights within its portfolio, further define long-term water supply needs, address system water losses, and participate in regional water supply planning efforts with EWEB and other Lane County water suppliers. The extension of time for water right permit S-22200 in October 2014, requires SUB to submit an updated WMCP by October 17, 2017.

Table 1.1 presents a summarized list of the information required under OAR chapter 690, division 86 for the completion of this WMCP and the location of that information in this document.

## **1.5 Plan Update Schedule**

OAR 690-086-0125(6)

SUB and RWD propose to submit a progress report on or before 2022, approximately five years after submittal of this WMCP, to provide a status report on benchmarks, water use and an update on water supply and water rights planning. SUB and RWD propose that the deadline for submission of the next WMCP update be in 2027. These proposed dates are coordinated with updates to the 2017 WSMP, with the goal of simultaneously submitting a Water System Master Plan and WMCP update on or before 2028.

## **1.6 Stakeholder Review and Input**

OAR 690-086-0125(5)

This WMCP was provided in draft form to affected local governments for their review and comment relating to consistency with the local government's comprehensive land use plan. SUB and RWD provided this WMCP to the following entities:

- Eugene Water and Electric Board
- City of Springfield
- Glenwood Water District
- Lane County

Copies of responses from these entities are presented in Appendix C of this WMCP.

<b>Table 1.1 Oregon Administrative Rule Requirements</b>		
<b>Item</b>	<b>OAR Reference</b>	<b>Report Section</b>
<b>Water Supplier Description</b>		
Description of Supplier's Source(s)	690-086-0140 (1)	2.1
Delineation of Current Service Area	690-086-0140 (2)	2.2
Assessment of Adequacy and Reliability of Existing Supplies	690-086-0140 (3)	2.5
Quantifications of Present and Historic Use	690-086-0140 (4)	2.4
Summary of Water Rights Held	690-086-0140 (5)	2.3
Description of Customers Served and Water Use Summary	690-086-0140 (6)	2.6
Identification of Interconnections with Other Suppliers	690-086-0140 (7)	2.7
System Schematic	690-086-0140 (8)	2.8
Quantification of System Leakage	690-086-0140 (9)	2.9
<b>Water Conservation Element</b>		
Full Metering of Systems	690-086-0150 (4)(b)	3.3.2
Meter Testing and Maintenance Program	690-086-0150 (4)(c)	3.3.3
Annual Water Audit	690-086-0150 (4)(a)	3.3.1
Leak Detection Program	690-086-0150 (4)(e)	3.3.5
Leak Repair or Line Replacement Program	690-086-0150 (6)(a)	3.3.5
Rate Structure Based on Quantity of Water Metered	690-086-0150 (4)(d)	3.3.4
Rate Structure/Billing Practices that Encourage Conservation	690-086-0150 (6)(d)	3.3.4
Public Education Program	690-086-0150 (4)(f)	3.3.6
Technical and Financial Assistance Programs	690-086-0150 (6)(b)	3.3.7
Retrofit/Replacement of Inefficient Fixtures	690-086-0150 (6)(c)	3.3.8
Reuse, Recycling, Non-potable Opportunities	690-086-0150 (6)(e)	3.3.9
Other Measures, If Identified by Supplier	690-086-0150 (6)(f)	3.10
Progress Report on Previous WMCP	690-086-0150 (1)	3.1
Documentation of Water Use Measurement and Reporting	690-086-0150 (2)	3.2
Measures Already Implemented or Required Under Contract	690-086-0150 (3)	3.3
<b>Water Curtailment Element</b>		
Assessing Water Supply	690-086-0160 (1)	4.1
Stages of Alert	690-086-0160 (2)	4.2
Triggers for Each Stage of Alert	690-086-0160 (3)	4.3
Curtailment Actions	690-086-0160 (4)	4.4
<b>Water Supply Element</b>		
Delineation of Current and Future Service Areas	690-086-0170 (1)	5.1
Population Projections for Service Area	690-086-0170 (1)	5.2
Prepare Schedule to Fully Exercise Each Permit	690-086-0170 (2)	5.8
Prepare Demand Forecast	690-086-0170 (3)	5.3
Comparison of Projected Need and Available Sources	690-086-0170 (4)	5.4
Analysis of Alternative Sources	690-086-0170 (5)(8)	5.5
Quantification of Maximum Rate and Monthly Volume	690-086-0170 (6)	5.6
Mitigation Actions Under State and Federal Laws	690-086-0170 (7)	5.7
<b>Other Items</b>		
List of Affected Local Governments and Their Comments	690-086-0125 (5)	1.6
Date for Submittal of Next Update	690-086-0125 (6)	1.5
Additional Time Requested to Meet Previous Benchmarks	690-086-0125 (7)	N/A



## Section 2

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## SECTION 2

### WATER SUPPLIER DESCRIPTION

OAR 690-086-0140

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#### 2.0 General

This section presents a description of the Springfield Utility Board (SUB) and Rainbow Water District (RWD) water systems. This section includes a description of the water supply sources and their adequacy, current service area, water rights, current customer and water use characteristics, and an overview of the distribution systems.

#### 2.1 Water Sources

OAR 690-086-0140(1)

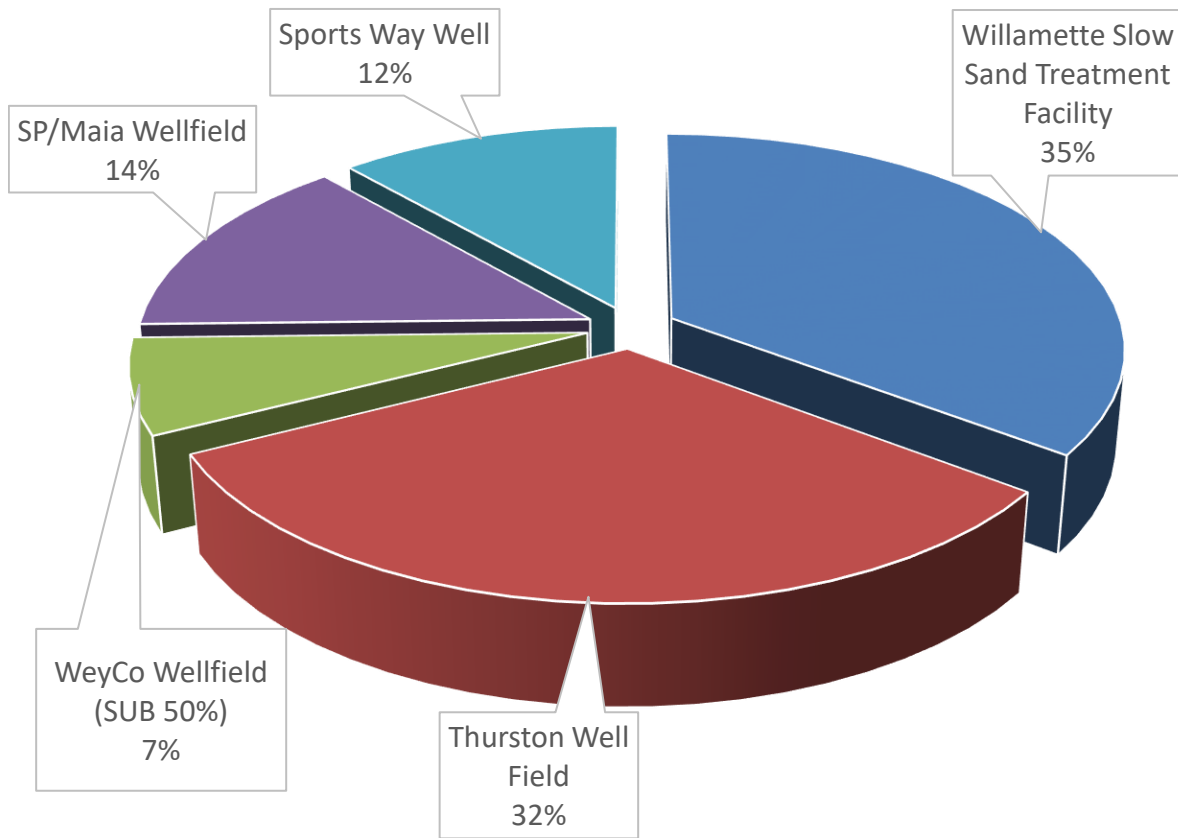
SUB relies on a combination of five source water facilities that use surface water or groundwater from over thirty points of diversion. Figure 2.1 provides the production capacity of each source water facility as a percentage of the total capacity of all five facilities. Table 2.1 provides the current summer season capacity of each surface water intake or groundwater well from which the source water facilities receive water.

The Willamette Slow Sand Treatment Facility (WSSTF) provides approximately 35 percent of SUB's water production capacity. The WSSTF is located in the southern portion of Springfield and serves SUB's West and East Water Systems. The remaining approximately 65 percent of SUB's source water supply is produced by four groundwater source facilities that supply water to customers in the North and East Systems: northwest (Sports Way Well), central west (SP/Maia Wellfield), central east (Weyerhaeuser (WeyCo) Wellfield), and northeast (Thurston Wellfield). The total production capacity for SUB's five source water production facilities is **18.7 million gallons per day (mgd)**.

The WSSTF withdraws source water from a surface water intake on the Middle Fork Willamette River, groundwater from 12 wells and groundwater from the filter bed perimeter underdrain dewatering system. SUB blends these surface water and groundwater sources for treatment at the WSSTF. The Thurston Wellfield is located in the northeast portion of Springfield and serves the East System. Thurston Wellfield is the second largest source for SUB yielding about 32% of SUB's water production capacity. This wellfield relies on nine ground water wells for supplying the Thurston Treatment facility. Located in the central east portion of Springfield is the Weyerhaeuser (WeyCo) Wellfield, which consists of three shared ground water wells (SUB and RWD share the production of these wells 50/50). The Weyco Wellfield provides approximately 7% percent of SUB's water production capacity and is SUB's smallest production source. The Weyco Wellfield water is split between the North System and the East System. SP/Maia is the third largest water production source for SUB and provides approximately 14% of SUB's water production capacity. This wellfield is located in central west Springfield and relies on two ground water wells for

supplying the SP/Maia Treatment Facility. SP/Maia well water supplies the East System. Located in the northwest corner of Springfield is the Sports Way Well, which provides about 12% of SUB’s water production capacity and supplies the North System. The total production capacity for SUB's five source water production facilities is **18.7 million gallons per day (mgd)**.

Figure 2.1 SUB’s Source Production Capacity per Source Water Facility





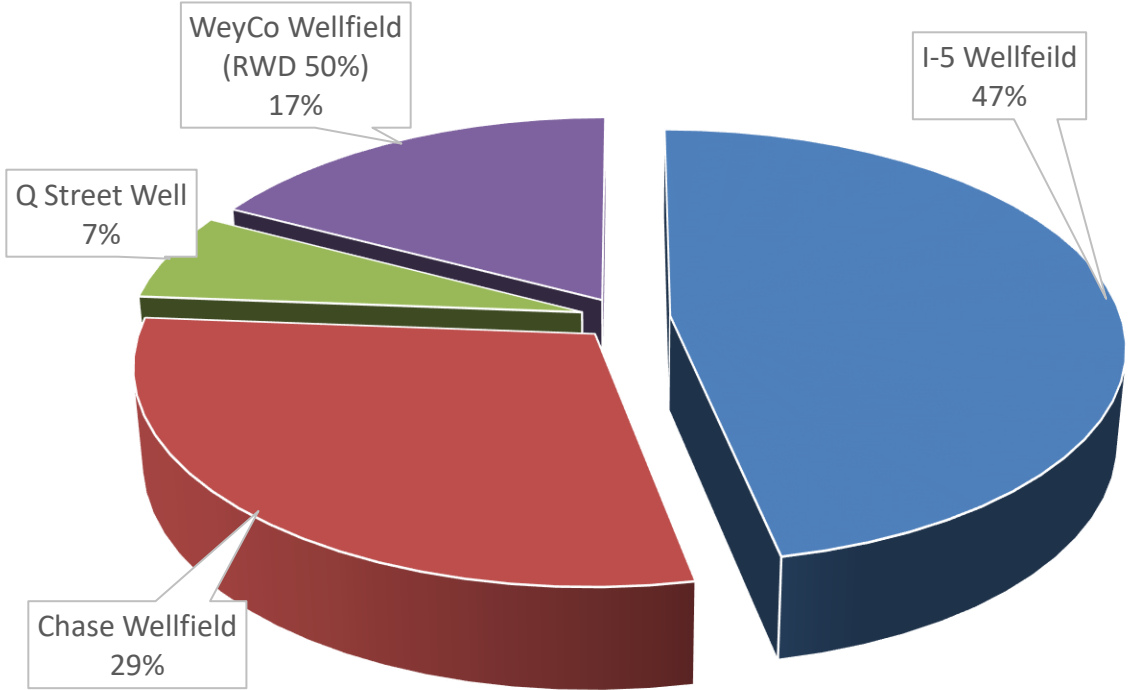
<b>Table 2.1 SUB's Detailed Source Production Capacity</b>		
<b>Springfield Utility Board's Water Source Facility Name</b>	<b>Current Summer Season Production Capacity</b>	
	<b>(gpm)</b>	<b>(mgd)</b>
<b>Willamette Slow Sand Treatment Facility (WSSTF) - Groundwater &amp; Surface Water Source</b>		
Willamette Well 1	250	0.36
Willamette Well 3	300	0.43
Willamette Well 4	100	0.14
Willamette Well 6	600	0.86
Willamette Well 7	400	0.58
Willamette Well 8 <sup>1</sup>	(not in use)	--
Willamette Well 9 <sup>1</sup>	(not in use)	--
Willamette Well 10	500	0.72
Willamette Well 11	750	1.08
Willamette Well 12	250	0.36
Willamette Well 13	200	0.29
Willamette Well 15	75	0.11
<b>Total Well Production Capacity:</b>	<b>3,425</b>	<b>4.93</b>
MF Willamette River Intake <sup>2</sup>	5,790	8.34
Perimeter Drain	440	0.64
<b>WSSTF Blended Production Capacity <sup>3</sup>:</b>	<b>4,583</b>	<b>6.60</b>
<sup>1</sup> Wells #8 and #9 are currently not in use due to turbidity issues.		
<sup>2</sup> The river intake is limited by the filter bed pumping capacity 12.9 mgd and there is a water right development limitation of 12.28 cfs (7.94 mgd).		
<sup>3</sup> The WSSTF's uses a combination of groundwater and surface water to produce up to 6.6 mgd and is currently operated at a maximum rate of 4.5 mgd.		
<b>Thurston Wellfield - Groundwater Source</b>		
Thurston Well 1 <sup>4</sup>	750	1.08
Thurston Well 2 <sup>4</sup>	960	1.38
Thurston Well 3	500	0.72
Thurston Well 4	200	0.29
Thurston Well 5	600	0.86
Thurston Well 6	500	0.72
Thurston Well 7	355	0.51
Platt Well 1	200	0.29
Platt Well 2 <sup>5</sup>	(not in use)	--
<b>Thurston Wellfield Production Capacity:</b>	<b>4,065</b>	<b>5.85</b>
<sup>4</sup> Thurston Wells 1 and 2, the capacity is limited by the water right.		
<sup>5</sup> Platt Well 2 not in use due to turbidity issues.		

<b>Table 2.1 SUB's Detailed Source Production Capacity (continued)</b>		
<b>WeyCo Wellfield (SUB-50 percent) - Groundwater Source</b>		
WeyCo Well1	450	0.94
WeyCo Well 2	600	0.86
WeyCo Well 3	600	0.86
<b>WeyCo Wellfield Production Capacity (50 percent):</b>	<b>825</b>	<b>1.33</b>
<b>SP/Maia Wellfield - Groundwater Source</b>		
Maia Well 1	1,000	1.44
SP Well 1	800	1.15
<b>SP/Maia Wellfield Production Capacity:</b>	<b>1,800</b>	<b>2.59</b>
<b>Sports Way Well - Groundwater Source</b>		
Sports Way Well 1 <sup>6</sup>	2,000	2.88
<b>Sports Way Well Production Capacity:</b>	<b>1,600</b>	<b>2.30 <sup>5</sup></b>
<sup>6</sup> Sports Way Well limited to 1,600 gpm after interference		
<b>SUB's Total Source Production Capacity</b>	<b>12,873</b>	<b>18.67</b>

The WSSTF withdraws source water from a surface water intake on the Middle Fork Willamette River, groundwater from 12 wells and groundwater from the filter bed perimeter underdrain dewatering system. SUB blends these surface water and groundwater sources for treatment at the WSSTF. SUB independently operates three additional groundwater source facilities using a combination of 12 wells. For the fourth groundwater source facility, SUB shares the operation of 3 wells with RWD. SUB's designed source pump capacities (rated nameplate capacity) are summarized in Appendix D.

RWD relies solely on groundwater as its source water supply. RWD independently operates 8 wells at three facilities and shares operation of 3 wells with SUB at a fourth facility. Figure 2.2 provides the production capacity of each source water facility as a percentage of the total capacity of all four facilities. Table 2.2 provides the capacity of each groundwater well from which the source water facilities receive water. The I-5 Wellfield represents the greatest source of supply at 47 percent, followed by the Chase Wellfield at 29 percent. RWD's groundwater source facilities are located in the northwest, north central and northeast areas of Springfield and primarily serve water customers in the North System. SUB purchases supplemental water from RWD to serve West System customers. The total production capacity of RWD's four groundwater source facilities is **7.3 mgd**. RWD's designed source pump capacities (rated nameplate capacity) are summarized in Appendix D.

Figure 2.2 RWD’s Source Water Production Capacity per Source Water Facility

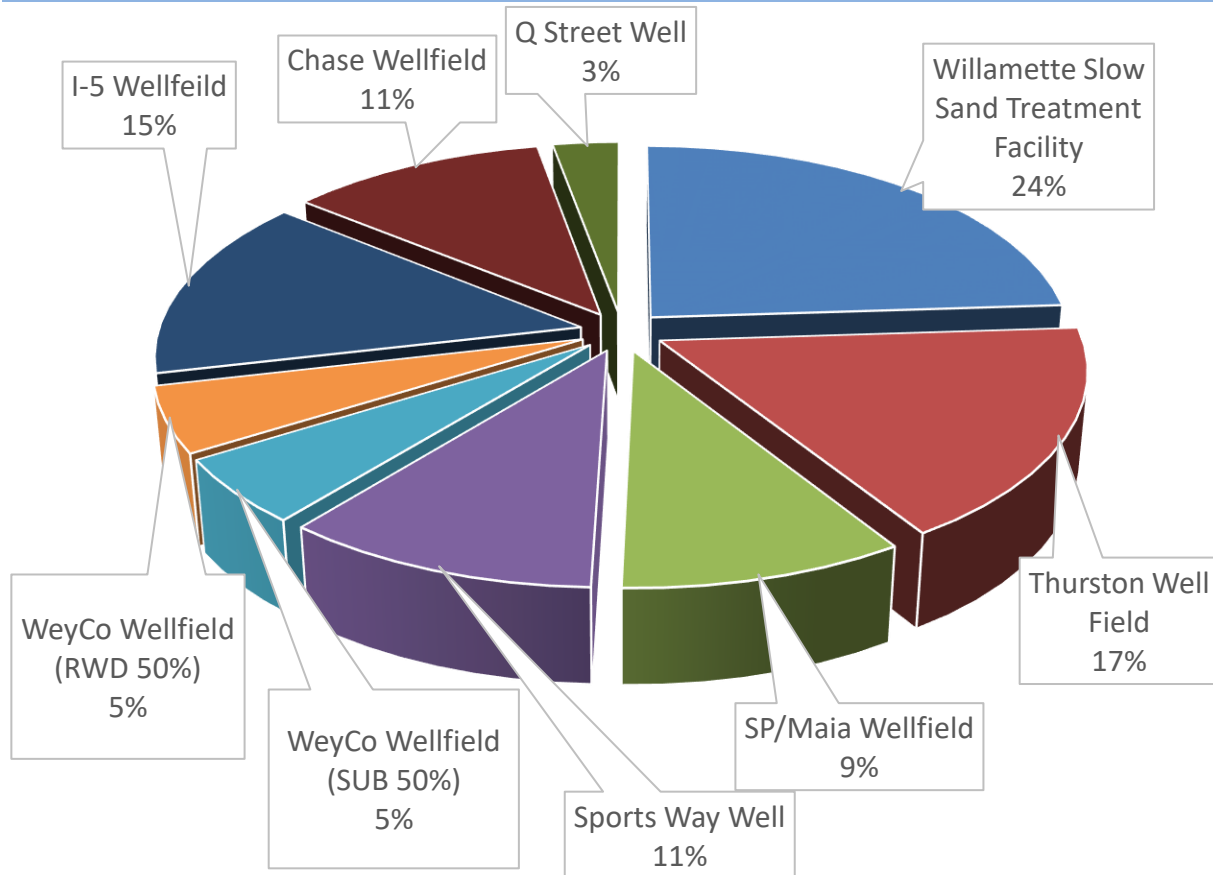


SUB and RWD work as partners to supply water to Springfield water customers. RWD’s groundwater sources and SUB’s surface water and groundwater sources provide a current combined total source production capacity of 26.0 mgd. Table 2.3, demonstrates that SUB’s total source production capacity represents 72 percent of Springfield’s source water and RWD’s source production capacity contributes 29 percent to the City’s total source water capacity. Figure 2.3 illustrates the relative contribution of each source water facility to the total source production capacity of SUB and RWD source water facilities.

Table 2.2 RWD's Detailed Source Production Capacity		
Rainbow Water District's Water Source Facility Name	Production Capacity (gpm)	Production Capacity (mgd)
<b>I-5 Wellfield - Groundwater Source</b>		
I-5 Well 1 <sup>1</sup>	1,180	1.70
I-5 Well 2 <sup>1</sup>	1,550	2.23
<b>I-5 Wellfield Production Capacity:</b>	<b>2,500</b>	<b>3.60</b>
<b>Chase Wellfield - Groundwater Source</b>		
Chase Well 1	400	0.58
Chase Well 2 <sup>2</sup>	(not in use)	--
Chase Well 3	250	0.36
Chase Well 4	600	0.86
Chase Well 5	250	0.36
<b>Chase Wellfield Production Capacity:</b>	<b>1,500</b>	<b>2.16</b>
<b>Q Street Well - Groundwater Source</b>		
Q Street 1 <sup>3</sup>	250	0.36
<b>Q Street Well Production Capacity:</b>	<b>250</b>	<b>0.36</b>
<b>WeyCo Wellfield (RWD-50 percent) - Groundwater Source</b>		
WeyCo 1	450	0.65
WeyCo 2	600	0.86
WeyCo 3	600	0.86
<b>WeyCo Wellfield Production Capacity (50 percent):</b>	<b>825</b>	<b>1.19</b>
<b>RWD's Total Source Capacity</b>	<b>5,075</b>	<b>7.31</b>
<sup>1</sup> I-5 Wellfield limited to combined 2,500 gpm after interference. <sup>2</sup> Chase Well 2 has been determined to be under the influence of surface water and requires new treatment facilities <sup>3</sup> The Q Street well had a recent rehabilitation effort that didn't increase production much. The capacity may be reduced by an aquifer issue instead of the well.		

Table 2.3 SUB and RWD Percent of Total Source Production Capacity			
SUB/RWD Source Water Supply	Percent of Total Production Capacity	Production Capacity	Production Capacity
		(gpm)	(mgd)
Springfield Utility Board	72%	12,873	18.67
Rainbow Water District	28%	5,075	7.31
Total SUB/RWD's Source Production Capacity		17,948	25.98

Figure 2.3 SUB/RWD Source Production Capacity per Source Water Facility



Each of the eight source water facilities that supply SUB's and RWD's systems is metered as it enters the West, East, or North System. All interties between the West, East, and North Systems are metered, allowing SUB and RWD to accurately account for the water entering and leaving the individual distribution systems. This data, in combination with metered consumption and authorized unmetered usage data, allows an accurate calculation of unaccounted-for water in each system. It also provides an accurate accounting of water supplied by RWD to SUB and by SUB to the Glenwood Water District (GWD), meeting the terms outlined in the respective Intergovernmental Agreements (IGAs) between districts.

The IGAs between SUB and RWD provide for the joint ownership and operation of the WeyCo Wellfield; the operation and maintenance of the interconnected distribution systems; the contractual purchase of water from RWD by SUB; the orderly transition of annexed properties and facilities from RWD to SUB; and the responsibilities of each district for the necessary expansion or modification of certain facilities that may be required by operational or regulatory changes.

The IGA between SUB and GWD provides for the supply of water from SUB to GWD; the operation and maintenance of GWD's distribution system by SUB; the orderly

transition of annexed properties and facilities from GWD to SUB; and the eventual dissolution of GWD and transfer of assets to SUB.

## 2.2 Delineation of Current Service Area

OAR 690-086-0140(2)

SUB and RWD's combined current service area includes all land within the existing City of Springfield city limits (approximately 19,500 service connections) and a limited area outside the city limits but within the City of Springfield UGB (approximately 3,400 service connections). SUB also provides wholesale water to GWD, which is located southwest of the city limits within the UGB. RWD's service area is within the City of Springfield UGB and is located north and west of the city limits. Figure 2-4 illustrates the current SUB, RWD and GWD current water service areas.

The Springfield water system service area is divided into the three systems. The approximate locations for each system are listed below:

- West System: *South of Oregon Route 126 and West of 28th Street*
- East System: *East of 28th Street*
- North System: *North of Oregon Route 126*






SUB supplies water to the West and East Systems, which include the wholesale water supply to GWD. SUB and RWD jointly supply water to the North System. SUB purchases water from RWD to supplement supply to the West System. The three water systems are connected by metered intertie facilities at several locations. Although water can flow from one water system to another, these three areas represent distinct operating systems. The North System and the East System operate at a similar hydraulic grade. Most of the West System operates at a hydraulic grade that is approximately 70 feet (about 30 psi) lower than the East or North System. SUB maintains a lower pressure in the West System to minimize leakage from older distribution mains and to reduce pumping costs.

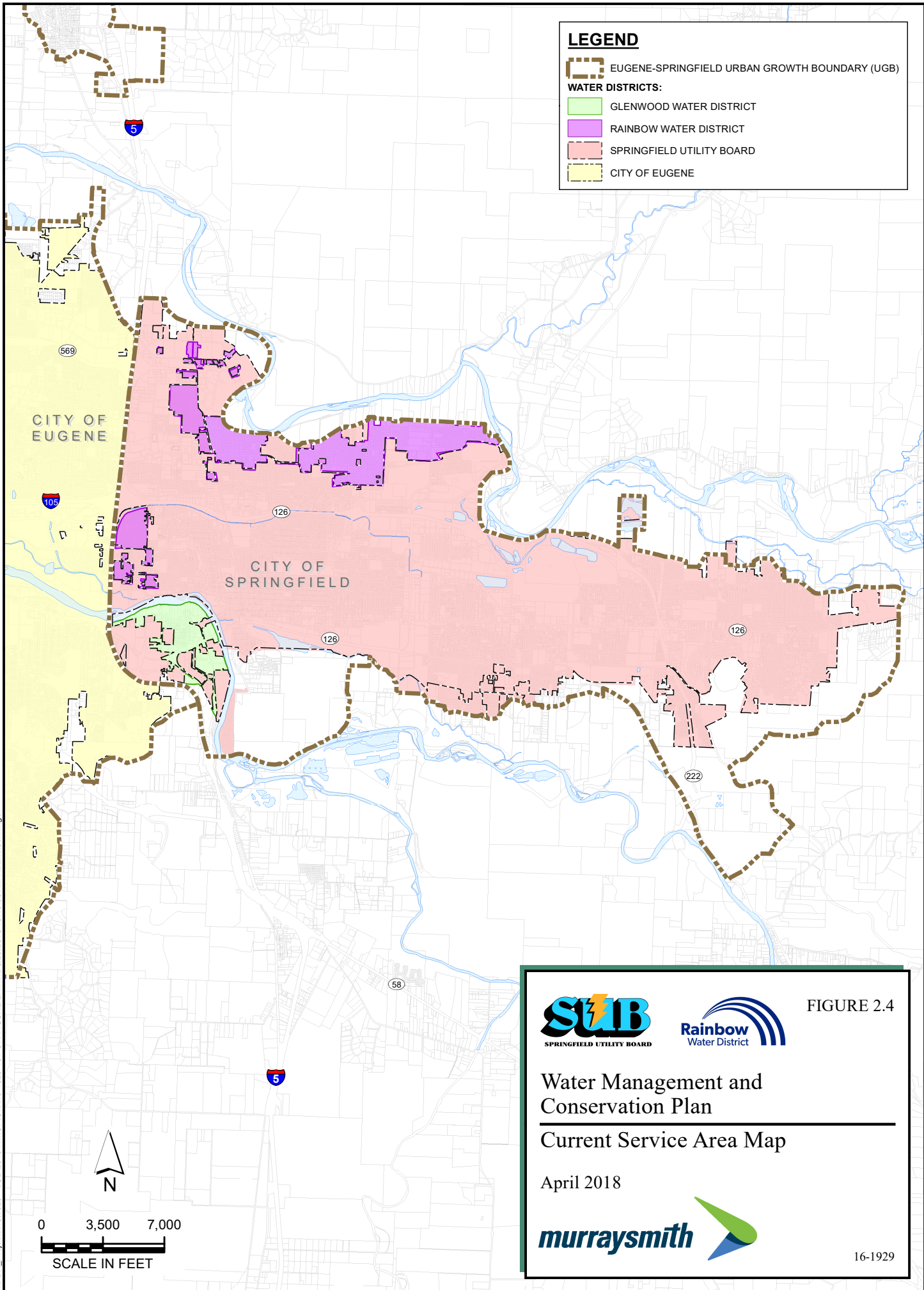
SUB, RWD, and GWD served approximately 68,663 people living in Springfield and in surrounding unincorporated areas within the City of Springfield's UGB. This estimated population for the combined service area is based on the following:

- PSU-PRC population inside Springfield city limits 60,140
- 2010 U.S. Census Bureau persons per household = 2.5
- 2016 non-fire protect water services outside the city limits:
  - SUB meter count = 757 1,893
  - RWD meter count = 2,374 5,968
  - GWD meter count = 265 663

**Total Service Area Population: 68,663**



**LEGEND**

-  EUGENE-SPRINGFIELD URBAN GROWTH BOUNDARY (UGB)
- WATER DISTRICTS:**
-  GLENWOOD WATER DISTRICT
-  RAINBOW WATER DISTRICT
-  SPRINGFIELD UTILITY BOARD
-  CITY OF EUGENE



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**FIGURE 2.4**

**Water Management and Conservation Plan**

**Current Service Area Map**

April 2018



16-1929

## **2.3 Water Rights Summary**

OAR 690-086-0140(5)

Table 2.4 presents a tabulation of existing water rights held by SUB and RWD, and represents all of the required data identified in OAR 690-086-0140(5). Table 2.5 provides a summary of listed streamflow-dependent species and listed 303(d) water quality limited parameters for each water source for which SUB and RWD hold surface water rights or groundwater rights connected to surface water flows. These tables show information as it currently stands. There are some outstanding transfer applications that were submitted recently that will change this table in future updates if approved.

## **2.4 Quantification of Present and Historical Use**

OAR 690-086-0140(4)

In accordance with ORS 537.099, SUB and RWD file an annual report with the Oregon Water Resources Department that quantifies the monthly use on each active water right.

SUB and RWD also track daily production from each source. Tables 2.6-2.15 summarize total annual volume and monthly volume of water produced by source for 2012-2016. Table 2.16 and 2.17 summarize average daily water production, peak day production, peak season demand, and peak hourly demand by system for 2012-2016. Figure 2.5 illustrates graphically the water production data for 2012-2016



Table 2.4 Existing Water Rights Summary								
Facility	Water Use	Application Number	Permit Number	Certificate Vol./Page	Priority Date	Authorized Rate (cfs)	Maximum Instantaneous Flow (cfs)	Authorized Date of Completion
<b>Springfield Utility Board Groundwater Sources</b>								
Maia Well	Municipal	G-11217	G-10349	82801	1/20/1984	2.23	2.23	
Platt 1	Municipal	G-10642	G-9984	51/56428	2/4/1982	0.56	0.56	
Platt 2	Municipal	G-10643	G-9985	51/56429	2/4/1982	1.00	0.89	
S.P. Well	Municipal	G-10775	G-9989	51/56430	7/12/1982	1.78	1.90	
Sports Way Well	Municipal	G-14179	G-12845	87007	10/6/1995	4.46	4.46	
Thurston 1	Municipal	G-3463	G-3267	34/42085	4/21/1966	1.67	1.70	
Thurston 2	Municipal	G-4854	G-4570	34/42086	4/28/1969	2.14	2.34	
Thurston 3	Municipal	G-5724	G-4989	34/42088	2/10/1972	1.11	1.00	
Thurston 4	Municipal	G-10641	G-9983	51/56427	2/4/1982	0.45	0.56	
Thurston 5	Municipal	G-15243	G-16148		12/11/2000	1.34	1.34	1/2/2027
Thurston 6	Municipal	G-15243	G-16148		12/11/2000	1.34	1.34	1/2/2027
Thurston 7	Municipal	G-15243	G-16148		12/11/2000	0.89	0.89	1/2/2027
Thurston 8	Municipal	G-15244	G-16149		12/11/2000	1.34		1/2/2027
Thurston 9	Municipal	G-15244	G-16149		12/11/2000	1.34		1/2/2027
Thurston 10	Municipal	G-15243	G-16148		12/11/2000	1.34		1/2/2027
Thurston 11	Municipal	G-15244	G-16149		12/11/2000	1.34		1/2/2027
School 1	Municipal	G-15241	G-16147		12/11/2000	0.89		1/2/2027
School 2	Municipal	G-15241	G-16147		12/11/2000	0.89		1/2/2027
WeyCo A	Municipal	G-283	G-237	37/45301	3/29/1956	1.10		
WeyCo B(1)	Municipal	G-283	G-237	37/45301	3/29/1956	1.80	2.68	
WeyCo C(2)	Municipal	G-283	G-237	37/45301	3/29/1956	1.80	0.78	
WeyCo D	Municipal	G-283	G-237	37/45301	3/29/1956	0.90		
WeyCo E(3)	Municipal	G-3000	G-2795	45302	12/16/1964	1.70	2.01	
Willamette 1	Municipal	GR-3175			Nov-50	2.01	0.56	
Willamette 2	Municipal	GR-3181			Nov-50	2.79		
Willamette 3	Municipal	GR-3178			Nov-50	2.79	1.00	
Willamette 4	Municipal	GR-3177			Nov-50	2.79	0.89	
Willamette 5	Municipal	GR-3180			Nov-50	1.34		
Willamette 6	Municipal	GR-3176			Nov-50	2.79	1.34	
Willamette 7	Municipal	GR-3179			Apr-53	2.79	0.89	
Willamette 8	Municipal	G-397	G-266	20/27979	6/18/1956	2.00	0.56	
Willamette 9	Municipal	G-3212	G-3027	27/35650	8/30/1965	0.89		
Willamette 10	Municipal	G-3298	G-3075	27/35754	11/1/1965	2.40	1.00	
Willamette 11	Municipal	G-3297	G-3074	27/35651	11/1/1965	3.30	1.67	
Willamette 12	Municipal	G-3296	G-3073	47/52375	11/1/1965	2.22	0.45	

Table 2.4 Existing Water Rights Summary								
Facility	Water Use	Application Number	Permit Number	Certificate Vol./Page	Priority Date	Authorized Rate (cfs)	Maximum Instantaneous Flow (cfs)	Authorized Date of Completion
Willamette 13	Municipal	G-12555	G-11558	85381	6/4/1991	0.72	0.73	
Willamette 15	Municipal	G-12555	G-11558	85381	6/4/1991	0.72	0.67	
SSF Perimeter Drain	Quasi-Municipal	G-2761	G-2643	T-9367	6/8/1964	1.00	1	10/1/2005
Rainbow Water District Groundwater Sources								
WeyCo A(see Note 2)	Municipal	G-283	G-237	37/45301	3/29/1956	1.10		
WeyCo B(1) (see Note 2)	Municipal	G-283	G-237	37/45301	3/29/1956	1.80	2.68	
WeyCo C(2) (see Note 2)	Municipal	G-283	G-237	37/45301	3/29/1956	1.80	0.78	
WeyCo D (see Note 2)	Municipal	G-283	G-237	37/45301	3/29/1956	0.90		
WeyCo E(3)	Municipal	G-3000	G-2795	45302	12/16/1964	1.70		
I-5 Well # 1	Municipal	G-15840	G-16477		9/18/2002	3.05	2.78	4/30/2029
I-5 Well # 2	Municipal	G-15840	G-16477		9/18/2002	3.95	3.67	4/30/2029
Chase 1 & 2	Municipal	G-3000	G-2795	37/45302	12/16/1964	2.50	2.90	
Chase 3	Municipal	G-4991	G-4709	37/45303	9/12/1969	0.89	0.89	
Chase 4	Municipal	G-5301	G-5132	37/45304 (see Note 4)	9/1/1970	2.00	1.33	
7th & Q Street	Quasi-Municipal	G-9832	G-9945	65691	7/14/1980	1.56	1.22	
Springfield Utility Board Surface Water Sources								
McKenzie River	Municipal	S-85336	S-54378		11/8/2002	35.90		1/2/2027
McKenzie River	Municipal	S-85336	S-54378		11/8/2002			1/2/2027
McKenzie River	Municipal	T-10402	S-54378		6/6/07	4.10	4.10	1/2/2027
Mid Fork Willamette River	Municipal	SW-131			1852	3.00 (see Note 1)	3.00 (see Note 1)	
Mid Fork Willamette River	Municipal	S-28213	S-22200	None	3/18/1953	20.00 (see Note 3)	12.28	10/1/2030

## Notes:

- On page 2 of OWRD's Review Worksheet, OWRD commented that there is an agreement between the City of Springfield and SUB that allocates a certain portion of the surface water registration claim to municipal purposes. No specific agreement regarding the apportionment of Claim SW 131 exists. The portion of SW 131 that is allocated to municipal use will be determined through adjudication. However, for planning purposes, SUB cannot rely on this claim because, in adjudication, OWRD could determine that SUB is not entitled to any water under the claim. Given that the headgate installed will limit diversions to 3.0 cfs, SUB has used that amount for purposes of this table.
- Application G283/Permit G-237/Certificate 45301 is for 4 wells in the Weyerhaeuser Well field jointly owned by SUB and RWD (50%/50%). The Contact information listed in the Water Rights Information System is City of Springfield, PO Box 8, Springfield OR 97478 which is understood to be the name of the original water right applicant.
- There is a development limit of 12.28 cfs as of the extension filed 10/17/14.
- Transfer T-12739 cancelled Certificate 45304.

Water Source	Permit Number(s)	Water Quality Limited Listing			Listed Streamflow Dependent Species
McKenzie River	S-54378	Alkalinity Ammonia Arsenic Atrazine Bis(2-Ethylhexyl) phthalate Chlorophyll a Chromium (hex)	Copper Cycloate Dissolved Oxygen E coli. Fecal Coliform Iron Manganese	Nickel Nutrients Pesticides pH Phenol Phosphate Phosphorous Sedimentation Temperature	Upper Willamette River Chinook Salmon, Willamette Bull Trout Oregon Chub
Cedar Creek	G-16147, G-16148, G-16149		pH		Upper Willamette River Chinook Salmon, Willamette Bull Trout
Middle Fork Willamette River	S-22200 Application SW-131	Alkalinity Ammonia Chloride Chlorophyll a Dissolved Oxygen	E coli. Fecal Coliform Flow Modification Iron Manganese	Mercury pH Phosphate Phosphorous Sedimentation	Upper Willamette River Chinook Salmon, Willamette Bull Trout, Oregon Chub

## 2.5 Adequacy of and Reliability of Existing Supplies

OAR690-086-140(3)

The SUB and RWD public water systems currently have water resources that are of sufficient quantity and reliability to meet the current water demand of Springfield. The production capacity of SUB is 18.7 mgd and the production capacity of RWD is 7.3 mgd. SUB and RWD combined have a production capacity of 26.4 mgd. In 2016, SUB and RWD had an annual average day demand (ADD) of **9.9 mgd**. Within the last five years, the peak maximum day demand (MDD) was **19.1 mgd**, in 2013. SUB and RWD have adequate existing source capacity to meet peak day demand.

Facility	Application #	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Avg. Day
MAIA 2 (LANE 1024)	G-11217	0.20	0.00	0.21	0.11	0.13	0.00	0.6	0.65	1.30	3.02	2.07	0.00	8.34	0.02
PLATT WELL 1 (LANE 10687)	G-10642	5.28	3.71	4.49	6.13	4.53	4.11	4.3	5.90	7.25	11.73	9.30	0.00	66.76	0.18
PLATT WELL 2 (LANE 10690)	G-10643	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S PACIFIC WELL 1 (LANE 10758)	G-10775	0.17	0.00	0.18	0.10	0.11	0.00	0.5	0.55	1.11	2.57	1.76	0.00	7.09	0.02

SPORTS WY WELL 1 (LANE 16446)	G-14179	0.22	0.20	0.95	0.03	0.03	0.03	1.2	0.02	1.18	12.73	17.61	0.00	34.22	0.09
THURSTON WELL 1 (LANE 10672)	G-3463	19.7	13.8	16.8	22.9	16.9	15.37	16.	22.06	27.10	43.88	34.79	0.00	249.6	0.68
THURSTON WELL 2 (LANE 10666)	G-4854	25.3	17.7	21.5	29.3	21.7	19.71	20.	28.28	34.74	56.26	44.61	0.00	320.1	0.87
THURSTON WELL 4 (LANE 10686)	G-10641	5.28	3.71	4.49	6.13	4.53	4.11	4.3	5.90	7.25	11.73	9.30	0.00	66.76	0.18
THURSTON WELL 3 (LANE 10666)	G-5724	13.1	9.26	11.2	15.3	11.3	10.28	10.	14.74	18.11	29.33	23.26	0.00	166.9	0.46
THURSTON WELL 5	G-15243	15.8	11.1	13.4	18.3	13.6	12.33	13.	17.69	21.74	35.20	27.91	0.00	200.2	0.55
THURSTON WELL 6	G-15243	13.1	9.26	11.2	15.3	11.3	10.28	10.	14.74	18.11	29.33	23.26	0.00	166.9	0.46
THURSTON WELL 7	G-15243	9.37	6.58	7.97	10.8	8.05	7.30	7.7	10.47	12.86	20.83	16.51	0.00	118.5	0.32
WEYCO A (LANE 10742)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEYCO B / WELL 1 (LANE 10744)	G-283	0.00	10.3	0.00	0.00	0.00	0.00	0.0	0.00	4.63	22.26	17.17	0.00	54.36	0.15
WEYCO C / WELL 2 (LANE 10743)	G-283	0.00	9.51	0.00	0.00	0.00	0.00	0.0	0.00	4.27	20.55	15.85	0.00	50.18	0.14
WEYCO D / WELL 4 (LANE 10741)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEYCO E / WELL 5	G-3000	0.00	9.51	0.00	0.00	0.00	0.00	0.0	0.00	4.27	20.55	15.85	0.00	50.18	0.14
WILLAMETTE 1 (LANE 16086)	GR-3175	5.52	4.23	4.03	5.08	4.07	4.08	4.6	4.63	5.01	7.47	6.01	0.00	54.79	0.15
WILLAMETTE 10	G-3298	9.93	7.62	7.26	9.14	7.32	7.34	8.3	8.33	9.02	13.44	10.83	0.00	98.62	0.27
WILLAMETTE 11 (LANE 16098)	G-3297	16.5	12.6	12.0	15.2	12.2	12.24	13.	13.88	15.04	22.41	18.04	0.00	164.3	0.45
WILLAMETTE 12	G-3296	4.41	3.38	3.22	4.06	3.25	3.26	3.7	3.70	4.01	5.98	4.81	0.00	43.83	0.12
WILLAMETTE 13	G-12555	7.17	5.50	5.24	6.60	5.29	5.30	6.0	6.01	6.52	9.71	7.82	0.00	71.23	0.19
WILLAMETTE 15 (LANE 2789)	G-12555	6.62	5.08	4.84	6.09	4.88	4.89	5.6	5.55	6.01	8.96	7.22	0.00	65.75	0.18
WILLAMETTE 2 (LANE 16093)	GR-3181	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILLAMETTE 3 (LANE 16094)	GR-3178	9.93	7.62	7.26	9.14	7.32	7.34	8.3	8.33	9.02	13.44	10.83	0.00	98.62	0.27
WILLAMETTE 4 (LANE 16091)	GR-3177	8.83	6.77	6.45	8.12	6.51	6.53	7.4	7.40	8.02	11.95	9.62	0.00	87.66	0.24
WILLAMETTE 5 (LANE 16092)	GR-3180	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILLAMETTE 6 (LANE 16089)	GR-3176	13.2	10.1	9.67	12.1	9.76	9.79	11.	11.10	12.03	17.93	14.44	0.00	131.4	0.36
WILLAMETTE 7 (LANE 16095)	GR-3179	8.83	6.77	6.45	8.12	6.51	6.53	7.4	7.40	8.02	11.95	9.62	0.00	87.66	0.24
WILLAMETTE 8 (LANE 16100)	G-397	5.52	4.23	4.03	5.08	4.07	4.08	4.6	4.63	5.01	7.47	6.01	0.00	54.79	0.15
WILLAMETTE 9	G-3212	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M FK WILLAMETTE	S-28213	4.59	3.52	3.35	4.22	3.38	3.39	3.8	3.85	4.17	6.21	5.00	0.00	45.58	0.12
PERIMETER DRAIN	G-2761	9.89	7.58	7.22	9.10	7.29	7.31	8.3	8.29	8.98	13.38	10.78	0.00	98.18	0.27

Table 2.7 2015 SUB Water Usage (MG)															
Facility	Application #	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Avg. Day
MAIA 2 (LANE 1024)	G-11217	0.23	0.29	1.16	0.00	0.02	0.01	0.0	0.35	0.62	1.05	2.01	0.26	6.00	0.02
PLATT WELL 1 (LANE 10687)	G-10642	4.45	4.58	4.93	4.45	3.31	3.49	5.0	6.84	7.56	8.85	9.95	4.23	67.65	0.19
PLATT WELL 2 (LANE 10690)	G-10643	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S PACIFIC WELL 1 (LANE 10758)	G-10775	0.20	0.25	0.98	0.00	0.02	0.01	0.0	0.29	0.52	0.89	1.71	0.22	5.10	0.01
SPORTS WY WELL 1 (LANE 16446)	G-14179	0.15	0.06	0.57	0.04	0.06	0.00	0.0	0.11	2.85	10.00	25.32	4.11	43.25	0.12
THURSTON WELL 1 (LANE 10672)	G-3463	16.6	17.1	18.4	16.6	12.3	13.07	18.	25.60	28.29	33.08	37.23	15.81	253.0	0.69
THURSTON WELL 2 (LANE 10666)	G-4854	21.3	21.9	23.6	21.3	15.8	16.76	23.	32.82	36.27	42.42	47.73	20.27	324.3	0.89
THURSTON WELL 4 (LANE 10686)	G-10641	4.45	4.58	4.93	4.45	3.31	3.49	5.0	6.84	7.56	8.85	9.95	4.23	67.65	0.19
THURSTON WELL 3 (LANE 10666)	G-5724	11.1	11.4	12.3	11.1	8.27	8.74	12.	17.11	18.91	22.11	24.88	10.57	169.1	0.46
THURSTON WELL 5	G-15243	13.3	13.7	14.7	13.3	9.92	10.48	15.	20.53	22.69	26.54	29.86	12.68	202.9	0.56
THURSTON WELL 6	G-15243	11.1	11.4	12.3	11.1	8.27	8.74	12.	17.11	18.91	22.11	24.88	10.57	169.1	0.46
THURSTON WELL 7	G-15243	7.90	8.14	8.75	7.90	5.87	6.20	8.8	12.15	13.43	15.70	17.67	7.50	120.0	0.33
WEYCO A (LANE 10742)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEYCO B / WELL 1 (LANE 10744)	G-283	11.5	7.77	6.62	8.39	7.29	5.47	0.1	3.89	13.50	21.14	19.90	16.97	122.7	0.34
WEYCO C / WELL 2 (LANE 10743)	G-283	10.6	7.18	6.11	7.74	6.73	5.05	0.1	3.59	12.46	19.52	18.37	15.67	113.2	0.31
WEYCO D / WELL 4 (LANE 10741)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEYCO E / WELL 5	G-3000	10.6	7.18	6.11	7.74	6.73	5.05	0.1	3.59	12.46	19.52	18.37	15.67	113.2	0.31
WILLAMETTE 1 (LANE 16086)	GR-3175	4.46	5.15	4.78	5.26	4.17	4.32	4.4	4.67	5.16	6.21	7.01	5.39	61.06	0.17
WILLAMETTE 10	G-3298	8.03	9.27	8.61	9.46	7.50	7.78	8.0	8.40	9.29	11.19	12.62	9.70	109.9	0.30
WILLAMETTE 11 (LANE 16098)	G-3297	13.3	15.4	14.3	15.7	12.5	12.97	13.	14.00	15.49	18.64	21.04	16.17	183.1	0.50
WILLAMETTE 12	G-3296	3.57	4.12	3.83	4.20	3.33	3.46	3.5	3.73	4.13	4.97	5.61	4.31	48.85	0.13
WILLAMETTE 13	G-12555	5.80	6.69	6.22	6.83	5.41	5.62	5.8	6.07	6.71	8.08	9.12	7.01	79.38	0.22
WILLAMETTE 15 (LANE 2789)	G-12555	5.36	6.18	5.74	6.31	5.00	5.19	5.3	5.60	6.20	7.46	8.42	6.47	73.27	0.20
WILLAMETTE 2 (LANE 16093)	GR-3181	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILLAMETTE 3 (LANE 16094)	GR-3178	8.03	9.27	8.61	9.46	7.50	7.78	8.0	8.40	9.29	11.19	12.62	9.70	109.9	0.30
WILLAMETTE 4 (LANE 16091)	GR-3177	7.14	8.24	7.65	8.41	6.66	6.92	7.1	7.46	8.26	9.94	11.22	8.62	97.70	0.27
WILLAMETTE 5 (LANE 16092)	GR-3180	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILLAMETTE 6 (LANE 16089)	GR-3176	10.7	12.3	11.4	12.6	10.0	10.38	10.	11.20	12.39	14.91	16.83	12.93	146.5	0.40

WILLAMETTE 7 (LANE 16095)	GR-3179	7.14	8.24	7.65	8.41	6.66	6.92	7.1	7.46	8.26	9.94	11.22	8.62	97.70	0.27
WILLAMETTE 8 (LANE 16100)	G-397	4.46	5.15	4.78	5.26	4.17	4.32	4.4	4.67	5.16	6.21	7.01	5.39	61.06	0.17
WILLAMETTE 9	G-3212	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M FK WILLAMETTE	S-28213	3.71	4.28	3.98	4.37	3.47	3.60	3.7	3.88	4.30	5.17	5.84	4.48	50.80	0.14
PERIMETER DRAIN	G-2761	8.00	9.22	8.57	9.42	7.46	7.75	8.0	8.36	9.25	11.14	12.57	9.66	109.4	0.30

Table 2.8 2014 SUB Water Usage (MG)

Facility	Application #	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Avg. Day
MAIA 2 (LANE 1024)	G-11217	0.13	0.08	0.00	0.07	0.00	0.04	0.0	0.06	0.91	3.15	2.44	0.24	7.13	0.02
PLATT WELL 1 (LANE 10687)	G-10642	5.24	5.07	4.96	4.74	4.47	3.75	2.9	5.98	8.10	9.56	8.54	4.54	67.87	0.19
PLATT WELL 2 (LANE 10690)	G-10643	5.24	5.07	4.96	4.74	4.47	3.75	2.9	5.98	8.10	9.56	8.54	4.54	67.87	0.19
S PACIFIC WELL 1 (LANE 10758)	G-10775	0.11	0.07	0.00	0.06	0.00	0.04	0.0	0.05	0.78	2.68	2.07	0.20	6.06	0.02
SPORTS WY WELL 1 (LANE 16446)	G-14179	0.03	0.07	0.00	0.00	0.05	0.00	0.0	0.04	12.59	19.93	30.97	1.55	65.24	0.18
THURSTON WELL 1 (LANE 10672)	G-3463	19.6	18.9	18.5	17.7	16.7	14.03	10.	22.37	30.30	35.74	31.93	16.98	253.8	0.70
THURSTON WELL 2 (LANE 10666)	G-4854	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
THURSTON WELL 4 (LANE 10686)	G-10641	5.24	5.07	4.96	4.74	4.47	3.75	2.9	5.98	8.10	9.56	8.54	4.54	67.87	0.19
THURSTON WELL 3 (LANE 10666)	G-5724	13.1	12.6	12.4	11.8	11.1	9.38	7.3	14.96	20.26	23.89	21.34	11.35	169.6	0.46
THURSTON WELL 5	G-15243	15.7	15.2	14.8	14.2	13.4	11.26	8.7	17.95	24.31	28.67	25.61	13.62	203.6	0.56
THURSTON WELL 6	G-15243	13.1	12.6	12.4	11.8	11.1	9.38	7.3	14.96	20.26	23.89	21.34	11.35	169.6	0.46
THURSTON WELL 7	G-15243	9.30	9.00	8.81	8.41	7.93	6.66	5.1	10.62	14.38	16.96	15.15	8.06	120.4	0.33
WEYCO A (LANE 10742)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEYCO B / WELL 1 (LANE 10744)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	17.71	20.10	23.47	19.90	81.18	0.22
WEYCO C / WELL 2 (LANE 10743)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	16.35	18.55	21.66	18.37	74.93	0.21
WEYCO D / WELL 4 (LANE 10741)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEYCO E / WELL 5	G-3000	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	16.35	18.55	21.66	18.37	74.93	0.21
WILLAMETTE 1 (LANE 16086)	GR-3175	4.49	5.10	4.89	4.11	4.59	4.50	4.2	5.25	6.55	6.93	7.14	4.78	62.55	0.17
WILLAMETTE 10	G-3298	8.09	9.18	8.81	7.40	8.26	8.09	7.6	9.45	11.78	12.48	12.85	8.60	112.5	0.31
WILLAMETTE 11 (LANE 16098)	G-3297	13.4	15.3	14.6	12.3	13.7	13.49	12.	15.75	19.64	20.80	21.42	14.34	187.6	0.51
WILLAMETTE 12	G-3296	3.59	4.08	3.91	3.29	3.67	3.60	3.3	4.20	5.24	5.55	5.71	3.82	50.04	0.14
WILLAMETTE 13	G-12555	5.84	6.63	6.36	5.34	5.97	5.84	5.4	6.83	8.51	9.01	9.28	6.21	81.32	0.22

WILLAMETTE 15 (LANE 2789)	G-12555	5.39	6.12	5.87	4.93	5.51	5.39	5.0	6.30	7.86	8.32	8.57	5.74	75.06	0.21
WILLAMETTE 2 (LANE 16093)	GR-3181	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILLAMETTE 3 (LANE 16094)	GR-3178	8.09	9.18	8.81	7.40	8.26	8.09	7.6	9.45	11.78	12.48	12.85	8.60	112.5	0.31
WILLAMETTE 4 (LANE 16091)	GR-3177	7.19	8.16	7.83	6.58	7.34	7.19	6.7	8.40	10.47	11.09	11.42	7.65	100.0	0.27
WILLAMETTE 5 (LANE 16092)	GR-3180	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILLAMETTE 6 (LANE 16089)	GR-3176	10.7	12.2	11.7	9.87	11.0	10.79	10.	12.60	15.71	16.64	17.13	11.47	150.1	0.41
WILLAMETTE 7 (LANE 16095)	GR-3179	7.19	8.16	7.83	6.58	7.34	7.19	6.7	8.40	10.47	11.09	11.42	7.65	100.0	0.27
WILLAMETTE 8 (LANE 16100)	G-397	4.49	5.10	4.89	4.11	4.59	4.50	4.2	5.25	6.55	6.93	7.14	4.78	62.55	0.17
WILLAMETTE 9	G-3212	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M FK WILLAMETTE	S-28213	3.74	4.24	4.07	3.42	3.82	3.74	3.5	4.37	5.45	5.77	5.94	3.98	52.04	0.14
PERIMETER DRAIN	G-2761	8.05	9.14	8.77	7.37	8.22	8.06	7.5	9.41	11.73	12.42	12.79	8.57	112.0	0.31

Table 2.9 2013 SUB Water Usage (MG)

Facility	Application #	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Avg. Day
MAIA 2 (LANE 1024)	G-11217	0.00	0.00	0.63	0.04	0.17	0.14	0.0	0.54	2.97	4.18	1.09	0.52	10.37	0.03
PLATT WELL 1 (LANE 10687)	G-10642	4.71	4.98	5.55	4.05	5.19	5.01	4.8	5.74	8.84	9.03	9.84	6.77	74.52	0.20
PLATT WELL 2 (LANE 10690)	G-10643	4.71	4.98	5.55	4.05	5.19	5.01	4.8	5.74	8.84	9.03	9.84	6.77	74.52	0.20
S PACIFIC WELL 1 (LANE 10758)	G-10775	0.00	0.00	0.54	0.04	0.15	0.12	0.0	0.46	2.53	3.55	0.92	0.44	8.81	0.02
SPORTS WY WELL 1 (LANE 16446)	G-14179	0.00	0.11	0.05	0.00	1.05	0.03	0.0	0.04	0.51	1.65	1.84	0.44	5.69	0.02
THURSTON WELL 1 (LANE 10672)	G-3463	17.6	18.6	20.7	15.1	19.4	18.75	17.	21.46	33.06	33.75	36.79	25.33	278.7	0.76
THURSTON WELL 2 (LANE 10666)	G-4854	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
THURSTON WELL 4 (LANE 10686)	G-10641	4.71	4.98	5.55	4.05	5.19	5.01	4.8	5.74	8.84	9.03	9.84	6.77	74.52	0.20
THURSTON WELL 3 (LANE 10666)	G-5724	11.7	12.4	13.8	10.1	12.9	12.53	12.	14.34	22.10	22.56	24.60	16.93	186.3	0.51
THURSTON WELL 5	G-15243	14.1	14.9	16.6	12.1	15.5	15.04	14.	17.21	26.52	27.08	29.51	20.32	223.5	0.61
THURSTON WELL 6	G-15243	11.7	12.4	13.8	10.1	12.9	12.53	12.	14.34	22.10	22.56	24.60	16.93	186.3	0.51
THURSTON WELL 7	G-15243	8.35	8.84	9.85	7.19	9.22	8.90	8.5	10.18	15.69	16.02	17.46	12.02	132.2	0.36
WEYCO A (LANE 10742)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEYCO B / WELL 1 (LANE 10744)	G-283	0.15	0.00	0.00	0.00	0.00	0.00	0.0	0.00	11.36	23.60	24.57	16.16	75.84	0.21
WEYCO C / WELL 2 (LANE 10743)	G-283	0.14	0.00	0.00	0.00	0.00	0.00	0.0	0.00	10.49	21.78	22.68	14.92	70.00	0.19
WEYCO D / WELL 4 (LANE 10741)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00

WEYCO E / WELL 5	G-3000	0.14	0.00	0.00	0.00	0.00	0.00	0.0	0.00	10.49	21.78	22.68	14.92	70.00	0.19
WILLAMETTE 1 (LANE 16086)	GR-3175	5.18	5.22	4.97	4.85	4.34	5.13	5.0	4.84	6.27	6.92	6.86	5.53	65.15	0.18
WILLAMETTE 10	G-3298	9.33	9.40	8.94	8.73	7.82	9.24	9.0	8.72	11.28	12.46	12.35	9.95	117.2	0.32
WILLAMETTE 11 (LANE 16098)	G-3297	15.5	15.6	14.9	14.5	13.0	15.40	15.	14.53	18.80	20.76	20.58	16.58	195.4	0.54
WILLAMETTE 12	G-3296	4.15	4.18	3.97	3.88	3.48	4.11	4.0	3.88	5.01	5.54	5.49	4.42	52.12	0.14
WILLAMETTE 13	G-12555	6.74	6.79	6.46	6.30	5.65	6.68	6.5	6.30	8.14	9.00	8.92	7.19	84.69	0.23
WILLAMETTE 15 (LANE 2789)	G-12555	6.22	6.27	5.96	5.82	5.21	6.16	6.0	5.81	7.52	8.30	8.23	6.63	78.18	0.21
WILLAMETTE 2 (LANE 16093)	GR-3181	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILLAMETTE 3 (LANE 16094)	GR-3178	9.33	9.40	8.94	8.73	7.82	9.24	9.0	8.72	11.28	12.46	12.35	9.95	117.2	0.32
WILLAMETTE 4 (LANE 16091)	GR-3177	8.30	8.36	7.95	7.76	6.95	8.22	8.0	7.75	10.02	11.07	10.97	8.85	104.2	0.29
WILLAMETTE 5 (LANE 16092)	GR-3180	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILLAMETTE 6 (LANE 16089)	GR-3176	12.4	12.5	11.9	11.6	10.4	12.32	12.	11.63	15.04	16.61	16.46	13.27	156.3	0.43
WILLAMETTE 7 (LANE 16095)	GR-3179	8.30	8.36	7.95	7.76	6.95	8.22	8.0	7.75	10.02	11.07	10.97	8.85	104.2	0.29
WILLAMETTE 8 (LANE 16100)	G-397	5.18	5.22	4.97	4.85	4.34	5.13	5.0	4.84	6.27	6.92	6.86	5.53	65.15	0.18
WILLAMETTE 9	G-3212	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M FK WILLAMETTE	S-28213	4.31	4.35	4.13	4.03	3.61	4.27	4.1	4.03	5.21	5.76	5.71	4.60	54.20	0.15
PERIMETER DRAIN	G-2761	9.29	9.36	8.90	8.69	7.79	9.20	9.0	8.68	11.23	12.40	12.29	9.91	116.7	0.32

Table 2.10 2012 SUB Water Usage (MG)

Facility	Application #	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Avg. Day
MAIA 2 (LANE 1024)	G-11217	0.16	0.00	0.00	0.16	0.00	1.34	0.4	2.42	3.48	4.06	0.93	0.07	13.02	0.04
PLATT WELL 1 (LANE 10687)	G-10642	7.18	3.84	4.03	4.56	3.54	3.85	4.9	7.16	9.00	9.16	5.34	2.81	65.39	0.18
PLATT WELL 2 (LANE 10690)	G-10643	14.3	7.68	8.05	9.12	7.07	7.70	9.8	14.32	18.01	18.31	10.67	5.63	130.7	0.36
S PACIFIC WELL 1 (LANE 10758)	G-10775	0.13	0.00	0.00	0.14	0.00	1.14	0.3	2.06	2.96	3.45	0.79	0.06	11.06	0.03
SPORTS WY WELL 1 (LANE 16446)	G-14179	0.12	0.29	0.00	0.00	0.00	0.04	0.2	0.09	0.20	6.95	2.72	0.12	10.82	0.03
THURSTON WELL 1 (LANE 10672)	G-3463	26.8	14.3	15.0	17.0	13.2	14.40	18.	26.78	33.67	34.24	19.96	10.52	244.5	0.67
THURSTON WELL 2 (LANE 10666)	G-4854	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
THURSTON WELL 4 (LANE 10686)	G-10641	7.18	3.84	4.03	4.56	3.54	3.85	4.9	7.16	9.00	9.16	5.34	2.81	65.39	0.18
THURSTON WELL 3 (LANE 10666)	G-5724	17.9	9.60	10.0	11.4	8.84	9.63	12.	17.90	22.51	22.89	13.34	7.03	163.4	0.45
THURSTON WELL 5	G-15243	21.5	11.5	12.0	13.6	10.6	11.55	14.	21.48	27.01	27.47	16.01	8.44	196.1	0.54



THURSTON WELL 6	G-15243	17.9	9.60	10.0	11.4	8.84	9.63	12.	17.90	22.51	22.89	13.34	7.03	163.4	0.45
THURSTON WELL 7	G-15243	12.7	6.82	7.15	8.10	6.28	6.84	8.7	12.71	15.98	16.25	9.47	4.99	116.0	0.32
WEYCO A (LANE 10742)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEYCO B / WELL 1 (LANE 10744)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	2.33	23.89	21.46	24.19	71.87	0.20
WEYCO C / WELL 2 (LANE 10743)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	2.15	22.05	19.81	22.33	66.34	0.18
WEYCO D / WELL 4 (LANE 10741)	G-283	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEYCO E / WELL 5	G-3000	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	2.15	22.05	19.81	22.33	66.34	0.18
WILLAMETTE 1 (LANE 16086)	GR-3175	5.72	4.94	5.05	5.08	4.57	5.33	4.7	5.03	6.45	7.07	7.01	6.40	67.43	0.18
WILLAMETTE 10	G-3298	10.3	8.90	9.09	9.14	8.23	9.59	8.6	9.06	11.61	12.72	12.62	11.52	121.3	0.33
WILLAMETTE 11 (LANE 16098)	G-3297	17.1	14.8	15.1	15.2	13.7	15.99	14.	15.10	19.35	21.21	21.03	19.21	202.3	0.55
WILLAMETTE 12	G-3296	4.58	3.95	4.04	4.06	3.66	4.26	3.8	4.03	5.16	5.66	5.61	5.12	53.95	0.15
WILLAMETTE 13	G-12555	7.44	6.42	6.56	6.60	5.94	6.93	6.2	6.55	8.38	9.19	9.11	8.32	87.66	0.24
WILLAMETTE 15 (LANE 2789)	G-12555	6.87	5.93	6.06	6.09	5.48	6.39	5.7	6.04	7.74	8.48	8.41	7.68	80.92	0.22
WILLAMETTE 2 (LANE 16093)	GR-3181	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILLAMETTE 3 (LANE 16094)	GR-3178	10.3	8.90	9.09	9.14	8.23	9.59	8.6	9.06	11.61	12.72	12.62	11.52	121.3	0.33
WILLAMETTE 4 (LANE 16091)	GR-3177	9.16	7.91	8.08	8.12	7.31	8.53	7.6	8.06	10.32	11.31	11.22	10.24	107.8	0.29
WILLAMETTE 5 (LANE 16092)	GR-3180	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILLAMETTE 6 (LANE 16089)	GR-3176	13.7	11.8	12.1	12.1	10.9	12.79	11.	12.08	15.48	16.97	16.83	15.37	161.8	0.44
WILLAMETTE 7 (LANE 16095)	GR-3179	9.16	7.91	8.08	8.12	7.31	8.53	7.6	8.06	10.32	11.31	11.22	10.24	107.8	0.29
WILLAMETTE 8 (LANE 16100)	G-397	5.72	4.94	5.05	5.08	4.57	5.33	4.7	5.03	6.45	7.07	7.01	6.40	67.43	0.18
WILLAMETTE 9	G-3212	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M FK WILLAMETTE	S-28213	4.76	4.11	4.20	4.22	3.80	4.43	3.9	4.19	5.37	5.88	5.83	5.33	56.10	0.15
PERIMETER DRAIN	G-2761	10.2	8.86	9.05	9.10	8.19	9.55	8.5	9.02	11.56	12.67	12.56	11.47	120.8	0.33

Table 2.11 2016 RWD Water Usage (MG)

Facility	Application #	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Avg. Day
CHASE WELL 1	G-3000	13.03	1.79	14.89	5.08	9.58	13.59	17.06	17.12	17.27	16.96	17.86	17.27	161.50	0.44
CHASE WELL 2	G-3000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CHASE WELL 3 (LANE 11335)	G-4991	13.03	1.92	5.09	0.74	1.20	2.30	16.53	13.15	9.92	9.67	11.10	11.88	96.53	0.26
CHASE WELL 4 (LANE 11335)	G-5301	0.00	0.00	31.02	30.32	23.34	24.50	29.71	25.69	25.61	23.86	24.55	25.27	263.87	0.72

Q ST WELL (LANE 11390)	G-9832	1.81	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.20	0.01
I-5 WELL 1 (LANE 11118)	G-15840	31.10	47.50	2.90	13.50	17.00	17.40	0.50	18.50	46.70	44.60	49.00	35.00	323.70	0.88
I-5 WELL 2 (LANE 11119)	G-15840	36.30	15.00	10.10	9.90	14.10	21.40	50.40	48.60	43.00	65.30	67.00	52.50	433.60	1.18

Table 2.12 2015 RWD Water Usage (MG)

Facility	Application #	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Avg. Day
CHASE WELL 1	G-3000	12.26	5.83	3.07	12.08	7.28	7.56	2.18	9.24	13.21	17.03	17.86	17.28	124.88	0.34
CHASE WELL 2	G-3000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CHASE WELL 3 (LANE 11335)	G-4991	11.16	5.49	3.00	10.40	8.09	6.70	1.89	14.31	16.48	18.05	17.74	17.28	130.59	0.36
CHASE WELL 4 (LANE 11335)	G-5301	34.58	31.25	19.04	7.34	16.14	1.08	0.00	0.00	0.00	0.00	0.00	0.00	109.43	0.30
Q ST WELL (LANE 11390)	G-9832	9.81	0.43	7.53	11.81	11.01	12.85	10.26	11.68	16.95	16.31	13.65	4.85	127.13	0.35
I-5 WELL 1 (LANE 11118)	G-15840	50.50	64.62	0.83	42.38	42.58	16.32	41.77	47.39	48.97	53.29	49.92	51.13	509.70	1.40
I-5 WELL 2 (LANE 11119)	G-15840	7.09	49.43	2.17	15.09	5.48	65.81	65.83	59.99	65.78	68.01	67.97	36.94	509.59	1.40

Table 2.13 2014 RWD Water Usage (MG)

Facility	Application #	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Avg. Day
CHASE WELL 1	G-3000	13.42	12.96	13.38	9.51	1.66	10.72	15.05	14.50	9.07	12.14	12.19	11.73	136.33	0.37
CHASE WELL 2	G-3000	9.40	0.30	25.06	16.12	9.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.32	0.17
CHASE WELL 3 (LANE 11335)	G-4991	0.00	0.00	0.00	3.95	1.29	7.46	11.17	11.60	8.44	11.02	10.74	10.66	76.33	0.21
CHASE WELL 4 (LANE 11335)	G-5301	28.42	35.52	34.56	24.67	14.61	9.90	25.54	36.78	33.51	35.36	33.31	32.13	344.31	0.94
Q ST WELL (LANE 11390)	G-9832	0.00	0.00	0.00	6.00	4.18	4.59	6.36	5.27	9.76	15.86	13.43	1.09	66.54	0.18
I-5 WELL 1 (LANE 11118)	G-15840	25.10	45.90	13.40	32.70	24.00	37.70	21.70	4.60	21.60	39.30	42.30	40.50	348.80	0.96
I-5 WELL 2 (LANE 11119)	G-15840	27.00	0.00	30.70	18.60	39.60	34.30	27.50	60.00	62.00	62.20	60.90	49.40	472.20	1.29

Table 2.14 2013 RWD Water Usage (MG)

Facility	Application #	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Avg. Day
CHASE WELL 1	G-3000	1.16	5.52	11.10	8.72	0.09	9.23	7.43	9.43	12.44	11.80	7.28	2.81	87.01	0.24
CHASE WELL 2	G-3000	26.11	8.20	0.00	0.00	23.01	25.44	9.08	29.32	30.11	30.73	30.91	23.66	236.57	0.65
CHASE WELL 3 (LANE 11335)	G-4991	0.13	0.50	0.14	4.05	0.10	2.21	5.74	0.48	1.66	4.64	2.64	0.09	22.38	0.06
CHASE WELL 4 (LANE 11335)	G-5301	19.19	21.46	30.12	18.02	34.02	37.73	26.92	38.41	35.58	33.44	33.21	15.60	343.70	0.94
Q ST WELL (LANE 11390)	G-9832	0.93	0.64	4.17	8.30	12.78	7.74	6.70	0.30	13.16	13.42	8.50	1.77	78.41	0.21

I-5 WELL 1 (LANE 11118)	G-15840	23.30	35.80	26.50	16.70	13.60	20.80	11.00	12.70	16.00	42.30	31.00	31.00	280.70	0.77
I-5 WELL 2 (LANE 11119)	G-15840	43.60	32.10	32.50	48.20	11.60	5.00	39.60	64.70	57.30	61.00	59.00	34.50	489.10	1.34

Table 2.15 2012 RWD Water Usage (MG)

Facility	Application #	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Avg. Day
CHASE WELL 1	G-3000	0.00	0.00	0.00	0.26	12.22	14.22	13.84	14.38	3.08	9.24	13.31	8.56	89.11	0.24
CHASE WELL 2	G-3000	23.89	4.05	23.41	3.04	1.58	0.33	0.16	7.50	9.68	27.58	29.18	26.34	156.74	0.43
CHASE WELL 3 (LANE 11335)	G-4991	5.52	5.07	7.87	8.58	8.86	11.06	11.14	10.81	4.39	8.72	11.07	2.53	95.62	0.26
CHASE WELL 4 (LANE 11335)	G-5301	13.40	32.45	10.57	34.38	16.96	16.53	17.31	29.49	33.39	34.31	31.43	26.02	296.24	0.81
Q ST WELL (LANE 11390)	G-9832	0.00	0.00	0.00	0.00	0.00	0.50	0.86	7.35	8.79	12.53	16.61	0.56	47.20	0.13
I-5 WELL 1 (LANE 11118)	G-15840	0.20	24.20	9.80	2.30	1.60	0.50	1.20	5.20	25.10	45.50	44.10	46.40	206.10	0.56
I-5 WELL 2 (LANE 11119)	G-15840	19.70	10.90	54.90	65.00	61.90	66.80	65.30	63.30	61.90	62.40	55.50	23.50	611.10	1.67

**Table 2.16 Historical Water Use Quantification (Thousands of Gallons)**

Year	Source	Annual	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2012	Sports Way	4,523	0	2	0	551	0	30	1,592	1,825	523	0	0	0
	I-5, Chase, Q St	1,572,300	111,514	112,043	105,160	111,529	126,447	147,886	174,802	203,762	151,690	122,465	103,761	101,241
	WeyCo	242,488	0	0	0	0	0	0	34,464	96,564	95,258	16,202	0	0
	Thurston	648,966	36,787	27,073	28,439	30,837	54,796	73,207	69,923	100,735	68,444	75,733	40,523	42,469
	SP/Maia	5,581	0	0	321	144	320	1,102	1,433	1,971	0	290	0	0
	Willamette	1,208,298	101,992	85,341	88,888	97,299	105,178	98,534	109,341	110,324	123,349	104,897	90,597	92,558
	<b>Total</b>	<b>3,682,156</b>	<b>250,293</b>	<b>224,459</b>	<b>222,808</b>	<b>240,360</b>	<b>286,741</b>	<b>320,759</b>	<b>391,555</b>	<b>515,181</b>	<b>439,264</b>	<b>319,587</b>	<b>234,881</b>	<b>236,268</b>
Year	Source	Annual	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2013	Sports Way	10,400	0	0	17	308	87	104	2,911	6,626	347	0	0	0
	I-5, Chase, Q St	1,551,294	103,180	104,808	99,311	105,549	147,228	160,898	197,693	190,524	140,190	94,942	99,251	107,720
	WeyCo	244,004	0	0	0	0	0	0	66,386	89,264	88,354	0	0	0
	Thurston	691,881	48,124	37,298	40,631	51,965	75,532	94,988	96,597	56,296	29,686	49,643	52,559	58,562
	SP/Maia	24,959	305	0	2,471	738	4,480	6,436	7,511	1,715	134	0	1	1,168
	Willamette	1,230,004	93,057	83,770	97,689	87,636	92,299	118,215	129,586	128,517	117,367	95,040	95,744	91,084
	<b>Total</b>	<b>3,752,542</b>	<b>244,666</b>	<b>225,876</b>	<b>240,119</b>	<b>246,196</b>	<b>319,626</b>	<b>380,641</b>	<b>500,684</b>	<b>472,942</b>	<b>376,078</b>	<b>239,625</b>	<b>247,555</b>	<b>258,534</b>
Year	Source	Annual	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2014	Sports Way	5,611	0	1,045	27	0	40	507	1,257	1,596	1,069	0	70	0
	I-5, Chase, Q St	1,512,110	116,551	103,500	95,203	107,987	116,619	151,811	161,026	173,595	162,568	127,751	105,508	89,991
	WeyCo	295,868	0	0	0	0	0	27,968	85,884	87,738	83,806	10,472	0	0
	Thurston	816,543	42,734	54,802	82,879	50,756	60,531	93,251	95,216	103,793	71,464	55,282	53,469	52,366
	SP/Maia	18,403	77	320	252	170	1,000	5,497	7,724	2,008	966	240	148	1
	Willamette	1,177,983	88,890	79,651	94,132	92,188	88,798	114,851	126,862	125,730	101,342	82,353	93,476	89,710
	<b>Total</b>	<b>3,826,518</b>	<b>248,252</b>	<b>239,318</b>	<b>272,493</b>	<b>251,101</b>	<b>266,988</b>	<b>393,885</b>	<b>477,969</b>	<b>494,460</b>	<b>421,215</b>	<b>276,098</b>	<b>252,671</b>	<b>232,068</b>
Year	Source	Annual	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2015	Sports Way	64,344	0	0	0	0	43	1,796	23,414	29,667	9,362	0	62	0
	I-5, Chase, Q St	1,362,332	97,824	102,638	93,694	120,311	118,062	152,649	148,063	154,159	134,334	102,417	73,740	64,441
	WeyCo	396,320	0	0	0	0	0	36,154	82,158	83,290	79,742	59,948	29,156	25,872
	Thurston	702,227	49,978	47,123	39,581	30,862	63,113	85,477	100,809	90,069	47,912	46,970	48,354	51,979
	SP/Maia	15,909	136	2	79	1	106	1,692	5,832	4,509	439	433	537	2,143
	Willamette	1,145,010	75,366	84,118	82,403	77,391	96,266	120,011	127,094	130,871	87,621	81,823	94,365	87,681
	<b>Total</b>	<b>3,686,142</b>	<b>223,304</b>	<b>233,881</b>	<b>215,757</b>	<b>228,565</b>	<b>277,590</b>	<b>397,779</b>	<b>487,370</b>	<b>492,565</b>	<b>359,410</b>	<b>291,591</b>	<b>246,214</b>	<b>232,116</b>
Year	Source	Annual	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2016	Sports Way	44,020	602	0	54	0	0	1,105	6,146	21,365	13,042	381	234	1,091
	I-5, Chase, Q St	1,355,092	65,499	68,989	69,629	112,372	118,826	128,906	147,486	158,489	148,116	125,335	111,545	99,900
	WeyCo	390,235	27,470	30,174	27,148	2,691	3,402	54,268	82,230	71,738	71,850	19,264	0	0
	Thurston	708,566	46,941	34,895	36,869	52,752	72,204	79,805	93,325	105,007	44,606	55,677	39,095	47,390
	SP/Maia	8,757	2	43	26	1	639	1,140	1,945	3,722	472	372	0	395
	Willamette	1,108,079	96,339	76,358	79,270	82,058	85,530	94,650	113,916	128,571	98,783	101,155	77,560	73,889
	<b>Total</b>	<b>3,614,749</b>	<b>236,853</b>	<b>210,459</b>	<b>212,996</b>	<b>249,874</b>	<b>280,601</b>	<b>359,874</b>	<b>445,048</b>	<b>488,892</b>	<b>376,869</b>	<b>302,184</b>	<b>228,434</b>	<b>222,665</b>

Table 2-17 Historical Water Use Quantification					
Year	System	East	West	North	Combined
2012	ADD (mgd)	3.60	2.81	3.65	10.06
	MDD (mgd)	6.83	4.69	7.15	18.67
	PHD/ADD	3.29	1.98	3.56	2.99
	PHD (mgd)	11.84	5.56	12.99	30.12
2013	ADD (mgd)	3.74	2.81	3.76	10.31
	MDD (mgd)	7.05	4.54	7.48	19.07
	PHD/ADD	3.27	1.92	3.62	2.98
	PHD (mgd)	12.22	5.39	13.59	30.77
2014	ADD (mgd)	3.93	2.72	3.74	10.39
	MDD (mgd)	6.71	4.60	6.59	17.89
	PHD/ADD	2.96	2.01	3.20	2.78
	PHD (mgd)	11.63	5.46	11.96	28.86
2015	ADD (mgd)	3.69	2.57	3.83	10.09
	MDD (mgd)	6.74	4.13	7.53	18.40
	PHD/ADD	3.17	1.91	3.57	2.94
	PHD (mgd)	11.69	4.90	13.67	29.68
2016	ADD (mgd)	3.67	2.48	3.77	9.92
	MDD (mgd)	6.86	4.07	7.25	18.18
	PHD/ADD	3.25	1.95	3.49	2.96
	PHD (mgd)	11.90	4.83	13.16	29.33

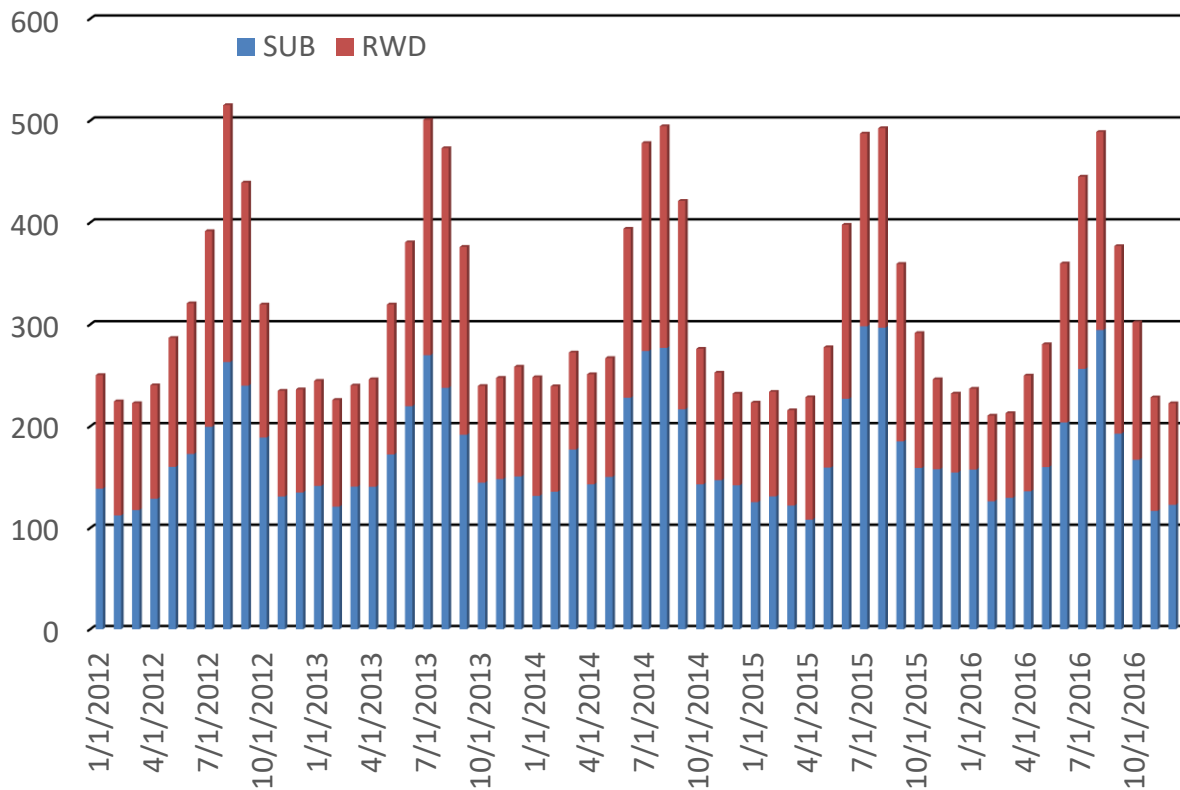
## Notes:

ADD: Average day demand

MDD: Maximum day demand

PHD: Peak hour demand

Figure 2.5 2012-2016 Water Use Records



The SUB and RWD public water systems are diverse and flexible. SUB and RWD combined have eight major source water supplies and share the groundwater WeyCo Wellfield. All of these water sources are distributed throughout Springfield. These eight water sources withdraw water from a combination of groundwater and surface water supplies. Each of the eight source water supplies receives electric power from a different source. Sources include different substations in SUB's electrical system and different electrical power providers such as the Eugene Water and Electric Board (EWEB). The WSSTF has equipment in place to automatically switch between two separate electrical feeders in SUB's system. SUB and RWD use an integrated water resource planning (IRP) strategy that considers water supply, water demand, source water protection, maintaining healthy ecosystems and balancing economic issues.

Given SUB's and RWD's diversified sources of water, SUB and RWD will be able to serve their customers even if some of their supply sources become contaminated or fail. Further the connections between the West, East and North Systems allow SUB and RWD to provide water from any source to any customer. The combination of surface and groundwater supplies also enable SUB and RWD to continue service during drought conditions. Thus, the SUB and RWD systems are currently adequate to meet

existing demand and have a high level of reliability as a result of diverse sources, multiple source water facilities, and interties between systems.

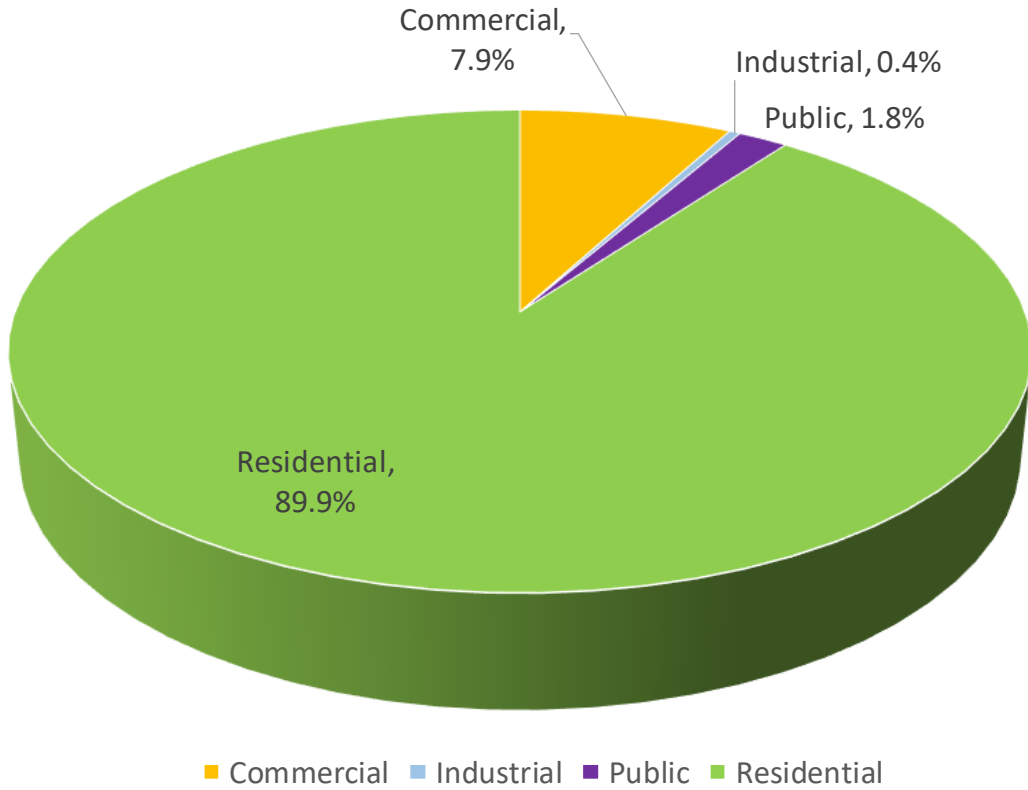
Further discussion of expanded supply sources to improve redundancy and meet long-term needs associated with continued population growth is presented in Section 5 of this WMCP.

## **2.6 Description of Customers Served and Water Use Summary**

OAR 690-086-0140(6)

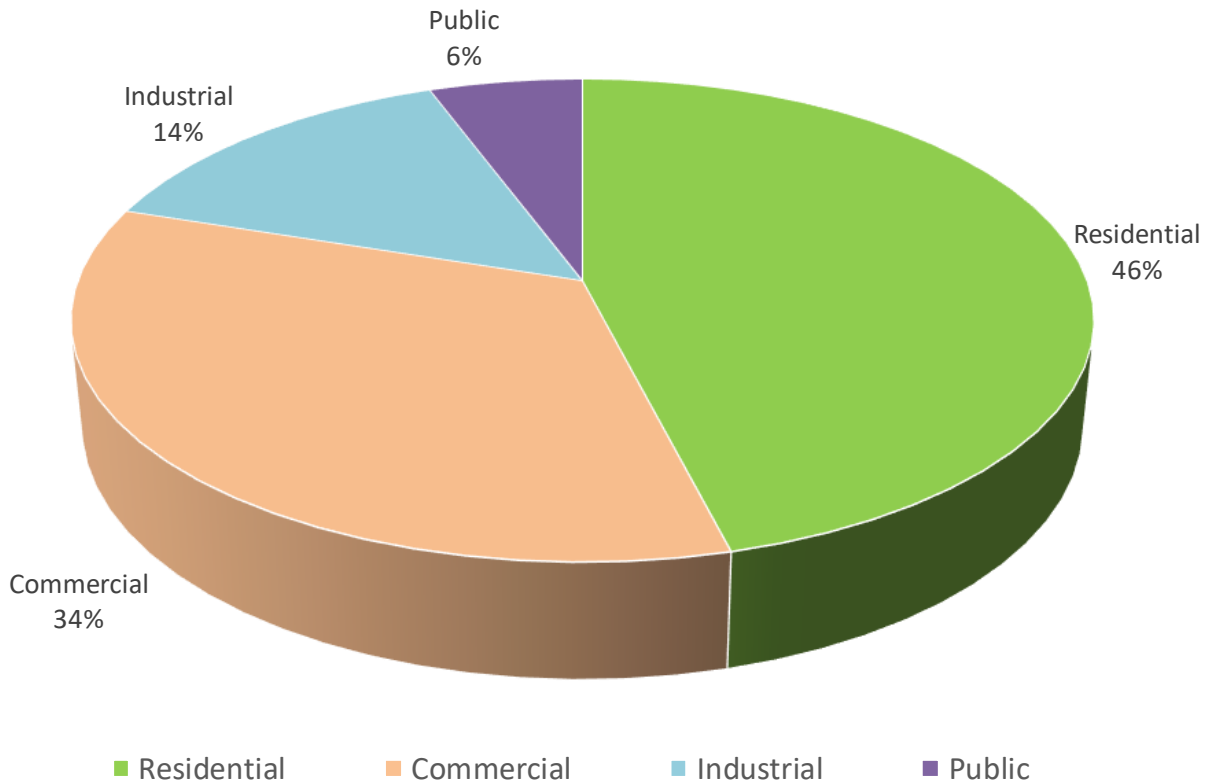
SUB and RWD provide water service to residential, commercial, industrial and public water users within the current service area boundary. The RWD service areas are outside of the existing city limits and are primarily residential in nature with the majority of services connections having ¾-inch or 1-inch diameter meters serving single-family residential lots. Figure 2.6 presents the 2016 relative percent of customers of each type in the SUB and RWD system. Figure 2.7 presents the percent of total water consumption by customer type for 2016, including contract water sales to GWD. These two figures illustrate the significance of non-residential (commercial, industrial and public water users) demand within the SUB/RWD service area. The non-residential water users make up 10 percent of the services in Springfield but are responsible for 54 percent of the total water consumption.

Figure 2.6 Water Services by Customer Type, 2016





**Figure 2.7 Water Use by Customer Type, 2016**



## 2.7 Identification of Interconnections with Other Municipal Supplies

OAR 690-086-140(7)

SUB and RWD have interconnections with the EWEB distribution system at key locations for use during a water supply emergency. An IGA has been signed between the three neighboring utilities to provide for the operation of these interconnects during an emergency. A copy of this IGA is included in Appendix B. During normal operations, no water is exchanged between SUB/RWD and EWEB. There are multiple interties between SUB and RWD which are used during normal operations. The Glenwood area is served through a west SUB intertie, and can be served through an existing emergency intertie with EWEB.

## 2.8 System Schematic

OAR 690-086-140(8)

The SUB/RWD water system is divided into three individual systems, as described in Section 2.2. Each of the three service areas are divided into service levels according to ground elevation. The valley floor is referred to as the “First Level” and the upper level zones stair-step up the surrounding hills. A description of each system is presented

below. Figure 2.8 is a schematic of the SUB/RWD water systems illustrating the three service areas, source facilities, storage reservoirs, pumping facilities and emergency interconnections with EWEB.

### **West, East and North Systems - Key Features**

#### **West System:**

- *SUB's Source Water Facility:* Willamette Slow Sand Treatment Facility (WSSTF)
- *System Interties:* 2 connections to North System (uni-directional to West), 2 connections to East System (1 uni-directional gravity to West and 1 pumped connection West to East) and 1 connection to Glenwood area (uni-directional to Glenwood)
- *Emergency Interties:* 1 connection in West System (Glenwood area) with EWEB
- *System Elevations:* 1st level (< 570 ft) and 2nd level (570 ft to 720 ft)
- *Typical Pressure Range:* 50 to 60 psi

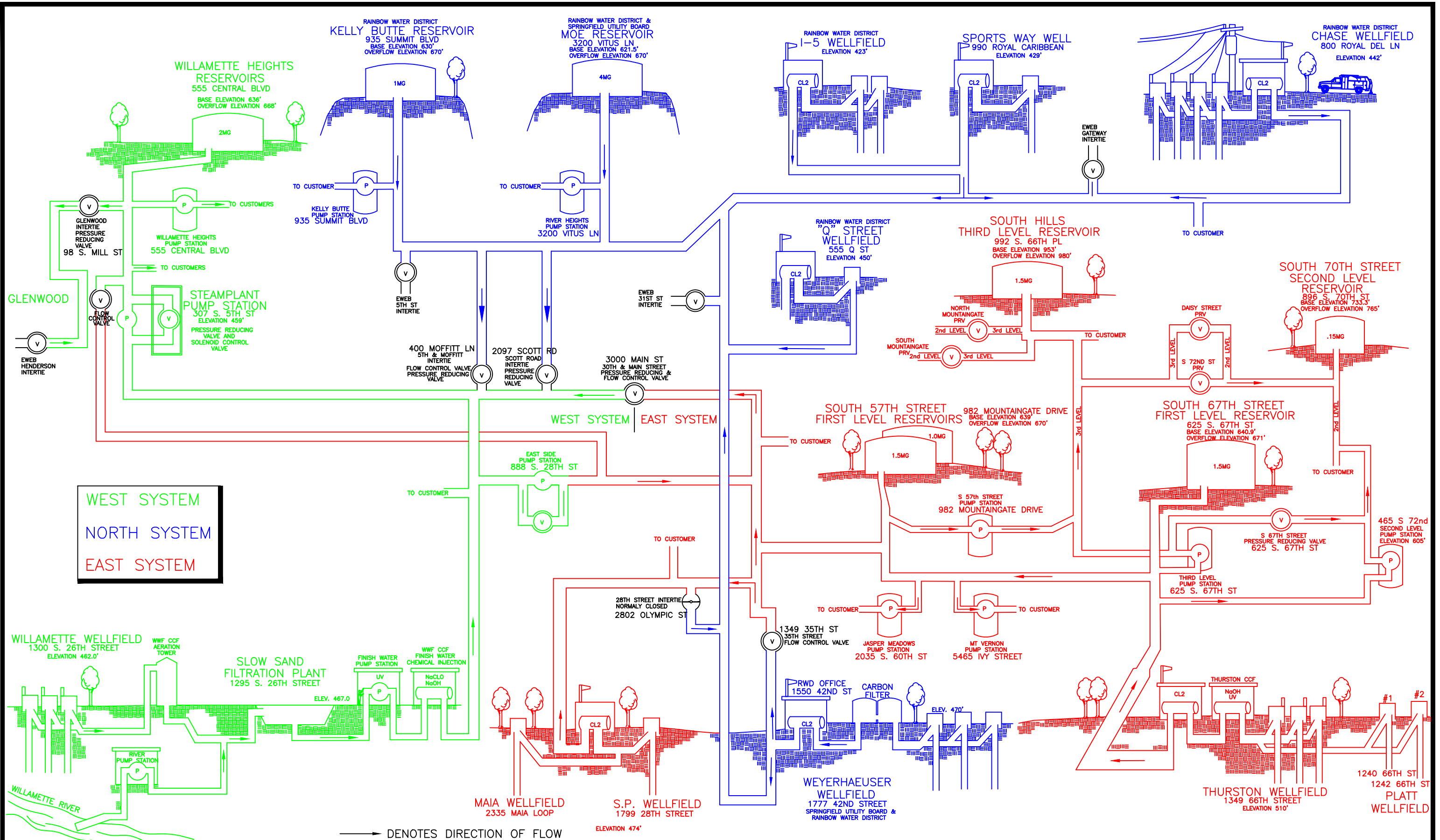
#### **East System:**

- *SUB's Source Water Facilities:* Thurston Wellfield, SP/Maia Wellfield, and WeyCo Wellfield (50 percent)
- *System Interties:* 2 connections to West System (1 uni-directional gravity to West and 1 pumped connection West to East) and 2 connections to North System (1 bi-directional butterfly valve, and 1 uni-directional flow control valve)
- *System Elevations:* 1st level (< 570 ft), 2nd level (570 ft to 720 ft) and 3rd level (720 ft to 870 ft)
- *Typical Pressure Range:* 70 to 85 psi

#### **North System:**

- *SUB's Source Water Facility:* Sports Way Well
- *RWD's Source Water Facilities:* I-5 Wellfield, Q St Well, Chase Wellfield, and WeyCo Wellfield (50 percent)
- *System Interties:* 2 connections to West System (uni-directional to West) and 2 connections to East System (1 bi-directional butterfly valve, and 1 uni-directional flow control valve)
- *Emergency Interties:* 6 connections in the North System with EWEB
- *System Elevations:* 1st level (< 570 ft) and 2nd level (570 ft to 720 ft)
- *Typical Pressure Range:* 75 to 100 psi

c:\pdx\_projects\16\1929 - SUB 2016 WMCP\CAD\Incoming\FF12152 springfield pressure systems.dwg - Apr 24, 2018 - 2:20pm Plotted by: mim



WEST SYSTEM  
NORTH SYSTEM  
EAST SYSTEM

→ DENOTES DIRECTION OF FLOW

SPRINGFIELD PRESSURE SYSTEMS

SCALE	NONE	DRAWN	EJN
DATE	03-02-01	ENG	JR
DIST	MAP #	APPR	
REVISION	4/19/2018	SHEET	0F



SPRINGFIELD UTILITY BOARD  
WATER ENGINEERING DIVISION  
SPRINGFIELD, OREGON

DRAWING NUMBER	FF 12 152
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## 2.9 Quantification of System Leakage

OAR 690-086-140(9)

Generally, a distribution system is considered to be in good condition when unaccounted-for water is 10 percent or less. OAR 690-086-0150(4)(e) requires that a leak detection and repair program be implemented when system leakage exceeds 10 percent. In the past, the SUB/RWD/GWD water system has experienced unaccounted-for water approaching 24 percent of the metered water produced. Historical unaccounted-for water in the West, East or North Systems have reached 30 percent of the metered water produced for each individual system. In 2008, water efficiency targets were adopted by SUB and a leak detection program was initiated in 2009.

In 2016, the unaccounted-for water for the total SUB/RWD/GWD system is about 13 percent of the metered water production, continuing the improvements over the 17 percent seen in 2012 and 23 percent seen in 2008.

RWD performed a leak survey in January 2007. Approximately 8 miles were surveyed including all intersecting lines. A total of six leaks at meters and hydrants were pinpointed, with water loss estimated at 13,320 gallons per day. All leaks have been repaired.

Water production and meter records were reviewed for the SUB/RWD water system for 2012 through 2016. Table 2.18 describes the amount of unaccounted-for water in the entire SUB/RWD/GWD water system and also breaks down the unaccounted-for water by West, East and North Systems

Both public water systems have implemented an aggressive leak detection and repair program to reduce the levels of water loss and the data presented in Table 2.18 indicates that this program has already resulted in significant reductions in water loss, with a 4 percent reduction across the entire system and an approximate 11 percent reduction in the West System over the last 5 years.

SUB and RWD recognize the value in improving the efficient use of water and the source development cost savings opportunity. By reducing the unaccounted-for water from 2012 to 2016 by 4 percent, the SUB/RWD/GWD water system has a potential annual water savings of about 165 million gallons of water annually. This annual water savings is also equivalent to a flow of about 313 gallons per minute.

Figure 2.9 graphically describes the amount of unaccounted-for water in the West, East, North and entire SUB/RWD/GWD water systems. A further discussion of SUB's and RWD's water loss reduction programs is presented in Section 3, *Water Conservation Element*.

<b>Table 2.18 Unaccounted-for Water Summary</b>					
<b>Year</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>East</b>					
Net Production	1,314,235,000	1,365,960,000	1,434,904,000	1,345,656,000	1,338,391,000
Metered Consumption	1,175,653,292	1,209,878,032	1,243,074,272	1,216,411,812	1,203,229,808
Misc. Consumption	2,380,662	5,000,883	6,135,122	7,784,281	8,050,395
Unaccounted for Water	136,201,046	151,081,085	185,694,606	121,459,907	127,110,797
<b>% Unaccounted for Water</b>	<b>10.4%</b>	<b>11.1%</b>	<b>12.9%</b>	<b>9.0%</b>	<b>9.5%</b>
<b>West (without Glenwood)</b>					
Net Production	905,409,484	897,098,928	850,167,808	794,683,700	766,827,676
Metered Consumption	660,632,104	665,741,692	670,043,440	656,848,720	640,380,752
Misc. Consumption	2,374,715	1,817,851	4,273,531	3,750,281	3,320,011
Unaccounted for Water	242,402,665	229,539,385	175,850,837	134,084,699	123,126,913
<b>% Unaccounted for Water</b>	<b>26.8%</b>	<b>25.6%</b>	<b>20.7%</b>	<b>16.9%</b>	<b>16.1%</b>
<b>North</b>					
Net Production	1,331,107,000	1,372,082,000	1,365,189,000	1,398,895,000	1,377,070,000
Metered Consumption	1,103,999,890	1,156,502,727	1,166,002,969	1,206,301,915	1,188,847,169
Misc. Consumption	5,763,110	1,359,273	1,381,031	6,588,085	1,568,804
Unaccounted for Water	221,344,000	214,220,000	197,805,000	186,005,000	186,654,027
<b>% Unaccounted for Water</b>	<b>16.6%</b>	<b>15.6%</b>	<b>14.5%</b>	<b>13.3%</b>	<b>13.6%</b>
<b>Glenwood</b>					
Net Production	121,938,000	127,848,000	141,381,000	144,275,000	137,281,000
Metered Consumption	89,111,484	88,237,080	96,530,148	98,211,652	106,419,456
Misc. Consumption	131,190	67,950	461,449	1,009,052	0
Unaccounted for Water	32,695,326	39,542,970	44,389,403	45,054,296	30,861,544
<b>% Unaccounted for Water</b>	<b>26.8%</b>	<b>30.9%</b>	<b>31.4%</b>	<b>31.2%</b>	<b>22.5%</b>
<b>West with Glenwood</b>					
Net Production	1,027,347,484	1,024,946,928	991,548,808	938,958,700	904,108,676
Metered Consumption	749,743,588	753,978,772	766,573,588	755,060,372	746,800,208
Misc. Consumption	2,505,905	1,885,801	4,734,980	4,759,333	3,320,011
Unaccounted for Water	275,097,991	269,082,355	220,240,240	179,138,995	153,988,457
<b>% Unaccounted for Water</b>	<b>26.8%</b>	<b>26.3%</b>	<b>22.2%</b>	<b>19.1%</b>	<b>17.0%</b>
<b>Total, All Systems</b>					
Net Production	3,672,689,484	3,762,988,928	3,791,641,808	3,683,509,700	3,619,569,676
Metered Consumption	3,029,396,770	3,120,359,531	3,175,650,829	3,177,774,099	3,138,877,185
Miscellaneous Consumption	10,649,677	8,245,957	12,251,133	19,131,699	12,939,210
Unaccounted for Water	632,643,037	634,383,440	603,739,846	486,603,902	467,753,281
<b>% Unaccounted for Water</b>	<b>17.2%</b>	<b>16.9%</b>	<b>15.9%</b>	<b>13.2%</b>	<b>12.9%</b>

Figure 2.9 North, West and East System Areas

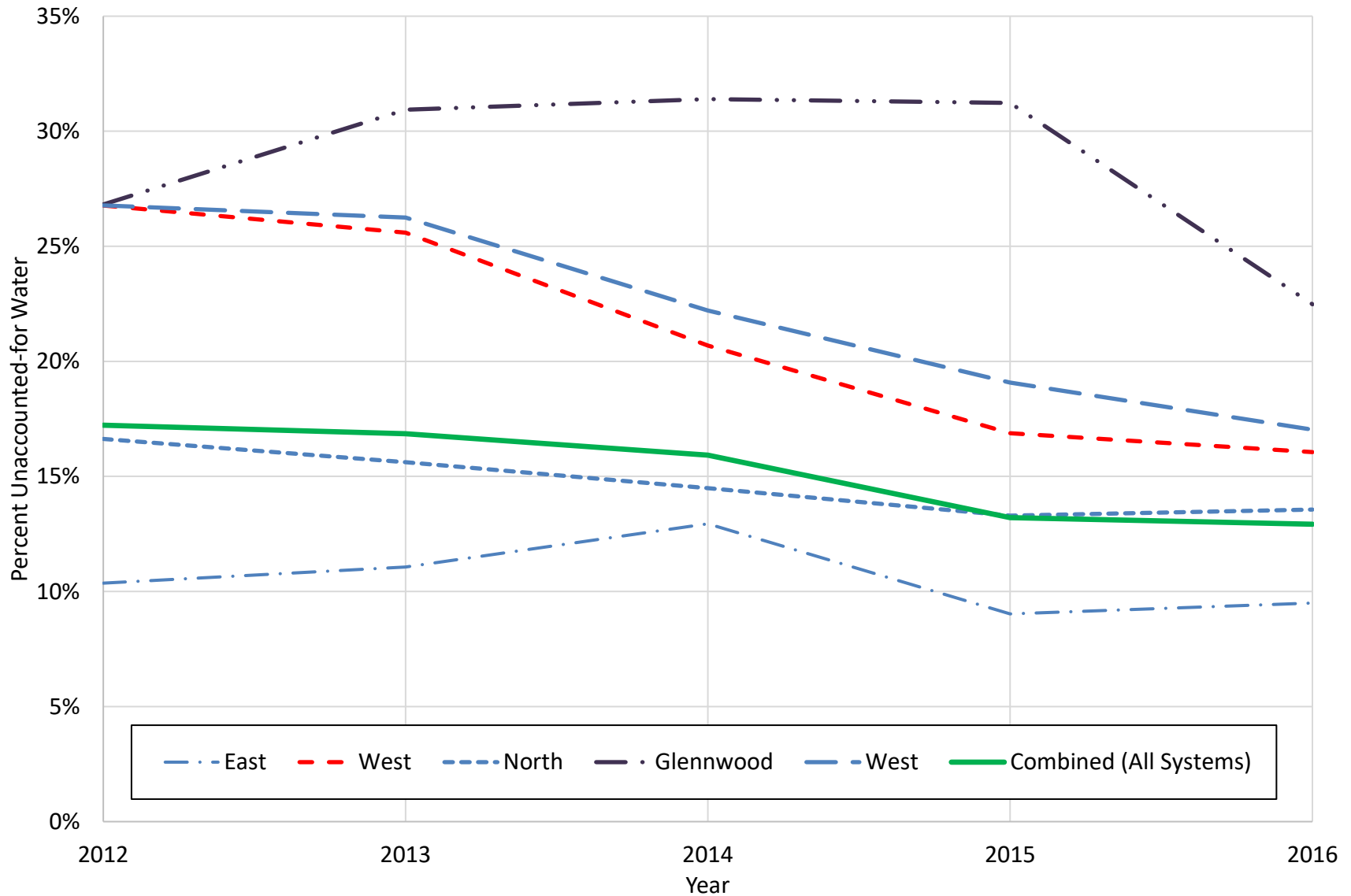
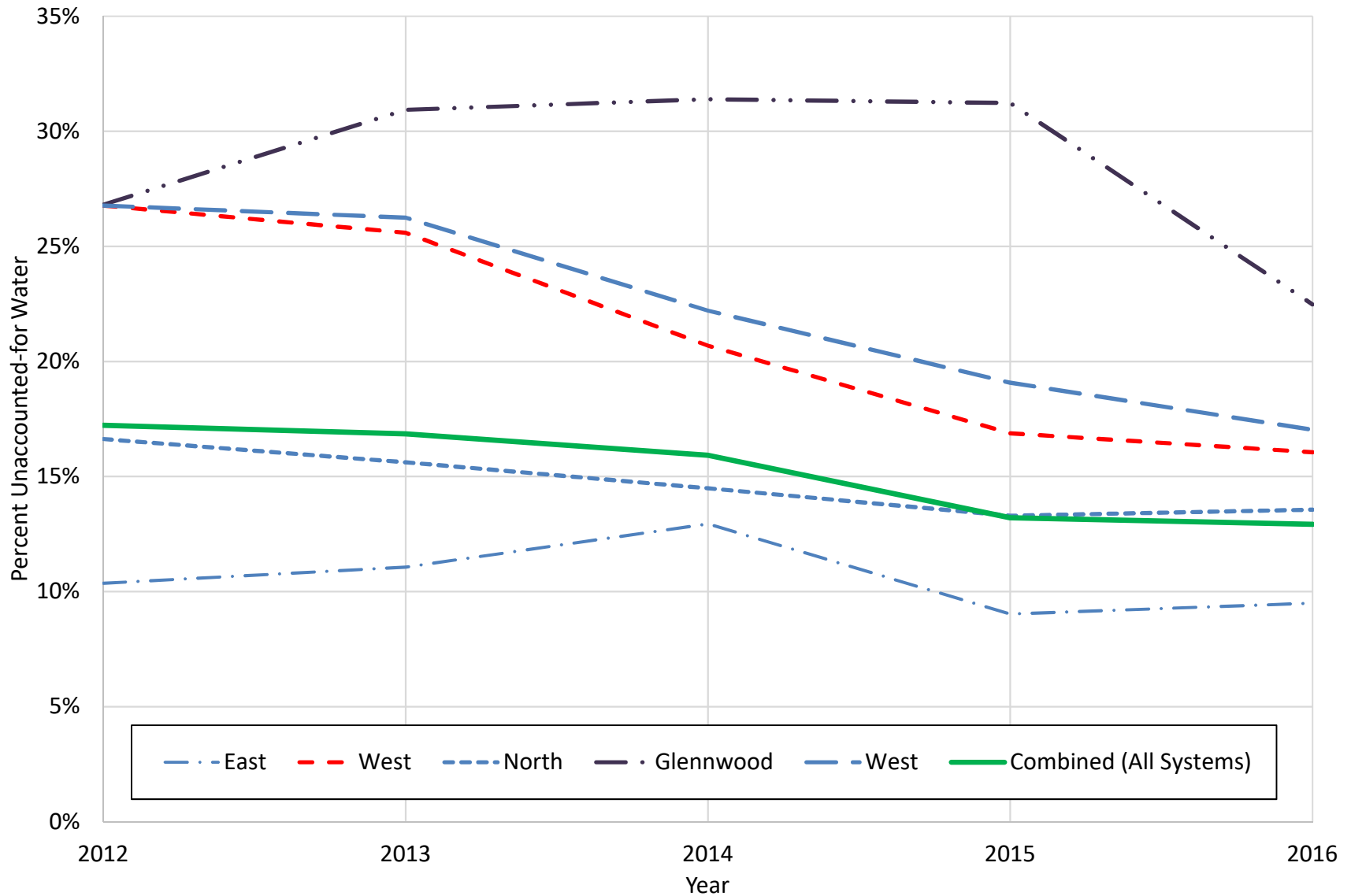


Figure 2.9 North, West and East System Areas





## Section **3**



## SECTION 3

# WATER CONSERVATION ELEMENT

### 3.0 General

This section analyzes current water conservation programs implemented by the Springfield Utility Board (SUB) and Rainbow Water District (RWD). This section also analyzes water conservation measures required by the Oregon Administrative Rules (OAR) chapter 690, division 86 for all municipal water suppliers and those measures required for large municipal water suppliers, such as SUB. Finally, this section summarizes progress on water conservation programs identified in the 2012 Water Management and Conservation Plan (2012 WMCP).

### 3.1 Progress Report on Previous Water Conservation Plan

*OAR 690-086-0150(1)*

The Oregon Water Resources Department approved the 2012 WMCP on August 16, 2012. The 2012 WMCP identified eight conservation program measures for implementation. These measures are:

- Annual Audit of all Water Supplied
- Leak Detection Program
- Regular Meter Testing and Maintenance Program
- Public Education Programs
- Rate Structure Encouraging Conservation
- Installation of Meters on all Service Connections
- Large Customer Audits
- Water Audits without Devices

Table 3.1 provides a summary of the progress on the implementation schedule of conservation and demand management measures presented in the 2012 WMCP and describes progress made since completion of that plan in implementing each of these measures. Detailed descriptions of the conservation measures identified above and summarized in Table 3.1 that have been implemented by SUB and RWD are presented later in this section.

SUB has committed substantial resources and effort to improving the efficient use of water within the City of Springfield and has a demonstrated record of successful conservation of the valuable water resources of the State through measured reductions in per customer water usage that has offset the need for substantial additional supply development to meet the demands of the growing Springfield community. This has been achieved through the identification of a water efficiency target and the focusing of

Table 3.1 Progress for Implementation Schedule of Conservation Measures		
Type of Measure	Measure	Target Date
System Improvements & Maintenance	Annual Audit of all Water Supplied <i>SUB prepares a Monthly Water Report that includes the last month and a rolling 12-month audit of water supply and usage.</i>	Ongoing, Monthly and Annually
	Leak Detection Program <i>SUB implemented a formal leak detection program beginning with an initial leak survey initiated in August 2009. RWD performed a leak survey in January 2007. Between 2013-2017, 190 Leaks were found and repaired in the SUB and RWD systems.</i>	Ongoing
	Regular Meter Testing and Maintenance Program <i>SUB/RWD have an ongoing program for meter testing and replacement. SUB's program includes replacement of small residential meters on a 20-year cycle and current efforts to formalize and document a large meter testing program. Between 2013-2017, 2,716 meters have been replaced in SUB. RWD tested 5% of customer meters per year, replacing as necessary, until 2014 (366 meters between 2011-2014). In 2012, the District started the process of upgrading its meters to AMR, and in 2014, they temporarily suspended the testing program so it could focus on meter replacements. Half of RWD meters can now record water usage and indicate when a leak started and ended, so it can better work with customers to fix leaks. RWD has replaced 1174 meters since 2012.</i>	Source/ Residential, Ongoing/ Annually. Large Meter as Needed
Education	Aggressive Media Campaign for Peak Reduction. Includes water audits, ET hotline, Water-Wise Presentations. <i>Water audits occur when a high bill complaint is processed. Prescheduled residential water audits were discontinued in mid-late 2008 as was the ET hotline due to low participation rates and reallocation of resources. Water-Wise presentations are conducted to entities such as the Willamalane Senior Center.</i>	Some Parts still Ongoing Seasonally, Others Discontinued
	Water by the Numbers & One Task at a Time, Voluntary Watering Programs <i>Ongoing programs, implemented annually to influence seasonal water use</i>	Ongoing Seasonally
	Water Curtailment Participation List <i>SUB has a Participation List of large irrigation users but has not implemented this program since the 2000 Water Conservation Plan.</i>	Ongoing Seasonally Utilized as Needed.
	Filbert Festival (discontinued) <i>SUB's participation in the Filbert Festival has been discontinued. However, SUB has taken opportunities to raise water awareness in other community venues, including the 4th of July Light of Liberty community event coordinated by SUB.</i>	Annually
	Springfield School District Water Conservation Curriculum <i>SUB funds this program. A multi-year agreement is in place between the SUB Board of Commissioners and the School District.</i>	Ongoing Annually
	Maintain and Improve Conservation Written Information and Materials (Brochure, Articles, Etc...) <i>Customers are given materials at the time they initiate a service request that includes information on a variety of topics – including conservation efforts. Regional conservation articles, brochures and web site postings are coordinated by SUB/RWD and Eugene Water &amp; Electric Board for the metropolitan area.</i>	Ongoing
	Rate Structure	Summer Surcharge (SUB) <i>Still in place, rates reviewed annually.</i>
	Increasing Block Rate (RWD) <i>Still in place, rates updated annually in June.</i>	Began April 14, 1995
Equipment Retrofit	Installation of Meters on all Service Connections <i>This program was complete prior to the 2000 Water Conservation Plan</i>	Complete
Water Audit Programs	Large Customer Water Audits <i>Water audits occur when a high bill complaint is processed. Large customers appear to consistently be conducting their own water usage analysis and a water audit may be redundant.</i>	Ongoing
	Water Audits without Devices <i>Water audits occur when a high bill complaint is processed. Also, SUB's billing system flags higher than average monthly usage which often triggers bill and usage review.</i>	Ongoing

resources to achieve desired conservation goals. The water efficiency target for the SUB/RWD service area is to reduce losses to 10 percent of water system demand over the next 20-year planning horizon. About 80 percent of this target is met with water supply-side measures like a leak repair program to reduce water loss. About 20 percent of this target is met with water demand-side measures like conservation programs to reduce water use.

The water efficiency target was established in 2008 and was adopted in the 2012 WMCP. Meeting these water efficiency targets will result in a reduction in maximum day demand and result in a reduction of approximately 1.5 mgd (1,040 gpm) in additional source water production, using current water use and water loss characteristics. Water supply-side measures like leak repair are projected to achieve about 1.2 mgd (830 gpm) in reduced water loss and demand-side measures are expected to conserve approximately 0.3 mgd (210 gpm). Water demand projections are discussed in detail in Section 5.

Target markets are an identifiable group of water consumers that require a unique mixture of conservation and demand management measures and delivery mechanisms. SUB's target markets are defined by the utility's concern for peak demand management. Target markets can be placed in an order of importance:

1. Residential customers
2. Commercial large landscape irrigators
3. Public institutions
4. Industrial facilities

SUB established this order of importance by analyzing increased usage during summer months, which influences the maximum daily demand for the entire utility. As described in Section 2, residential customer water use makes up almost half of the total water use for the SUB/RWD service area (see Figures 2.6 and 2.7). In addition, the residential market is the primary water user during the peak summer months making it the most important market to continue to target for peak water use reduction. Landscape irrigation for both commercial and public agency customers has lower overall usage but much of the usage is in the summer months. Irrigation makes up the second largest target market. As industrial water usage exhibits less seasonal peaking, conservation efforts are not focused on industrial customers.

Table 3.2 below provides a comparison of historical SUB water consumption data, in hundred cubic feet (ccf), and growth in the number of water connections (as a function of equivalent residential meters) for each customer class between 2008 and 2016. As Table 3.2 shows, even as the number of equivalent meter connections increased between 2008 and 2016 by approximately 2.1 percent, overall water consumption decreased by 5.1 percent.

<b>Customer Class</b>	<b>Water Consumption 2008 (ccf)</b>	<b>Water Consumption 2016 (ccf)</b>	<b>Percent Change</b>	<b>Connections Equivalent Meters 2008</b>	<b>Connections Equivalent Meters 2016</b>	<b>Percent Change</b>
Residential	1,963,766	1,793,433	-8.7%	17,696	18,430	4.1%
Commercial	1,341,002	1,325,941	-1.1%	5,314	5,503	3.6%
Industrial	457,733	556,426	21.6%	1,261	1,474	16.9%
Public	279,082	221,511	-20.6%	1,334	1,474	10.5%
Contract*	67,265	0	N/A	1,106	383	-65.4
<b>Total</b>	<b>4,108,848</b>	<b>3,897,311</b>	<b>-5.1%</b>	<b>26,711</b>	<b>27,263</b>	<b>2.1%</b>

Contract\* - Includes all Customer Classes in the Glenwood service area.

### **3.2 Water Use Measurement and Reporting**

*OAR 690-086-0150(2)*

Each of the source water facilities that supply SUB's and RWD's systems is metered as it enters the West, East, or North System. All interties between the systems are metered allowing SUB and RWD to accurately account for the water entering and leaving the individual systems. This data, in combination with metered consumption and authorized unmetered usage data allows an accurate calculation of unaccounted-for water in each system. It also provides an accurate accounting of water supplied by RWD to SUB and by SUB to Glenwood Water District (GWD), meeting the terms outlined in the respective IGAs between districts.

SUB and RWD use the meter data to perform a monthly and annual water audit to account for the total volume of water supplied to the system, consumed by customers through metered service connections, and authorized unmetered water uses for the combined SUB/RWD system and the GWD. The monthly report, which includes a comparison to the previous year's data for the same month and an analysis of a rolling 12-month total provides SUB and RWD with a detailed accounting of all water production, consumption, miscellaneous uses and estimates of unaccounted-for water.

In compliance with annual water use reporting requirements defined in OAR chapter 690 division 85, SUB and RWD have submitted annual water use data for each of their water rights.

### **3.3 Other Conservation Measures Already Implemented**

*OAR 690-086-0150(3)*

SUB continues to maintain a voluntary irrigation curtailment list for commercial, industrial and public agencies. If implemented, customers on the list are called and asked to curtail landscape watering when daytime temperatures during the hottest days of the year or extended periods of warm weather, with little or no rainfall, cause peak demand to exceed production capacity. This determination is made by SUB's Water Service Center. The list includes 26 customers.

### **3.4 Required and Additional Water Conservation Measures**

*OAR 690-086-0150(4), (5) and (6)*

This section discusses each of the conservation measures required of all municipal water suppliers including a description of specific activities, schedule for implementation (if not already implemented) and 5-year benchmarks for implementation, as necessary. This section also presents additional conservation measures that must be considered by SUB along with an implementation schedule or an explanation of the reason why it is not feasible to implement the measure at this time. Although this section includes information regarding RWD, neither OAR 690-086-0150 (5) or (6) applies to RWD as RWD is not proposing to expand or initiate diversion under an extended permit.

#### **3.4.1 Annual Water Audit**

*OAR 690-086-0150(4)(a)*

As described above in Section 3.2, SUB maintains a monthly audit of all water production and metered consumption in the Monthly Water Report and performs an annual water audit using the data documented in this report. The Monthly Water Report includes quantification of authorized, unmetered usage by SUB, RWD and City of Springfield Public Works Department staff. Authorized, unmetered uses of water include water system flushing, street washing and sweeping, fire protection, and dust control for construction sites. Water system flushing is estimated using pitot gauge readings and time of flow. Other uses are estimated by tracking truckloads of a known tank size. All miscellaneous usage is tracked and reported monthly. Unauthorized usage is included in the unaccounted-for water total. Efforts to define and limit system losses, or unauthorized and unmetered uses, are described later in this section.

RWD performs its own annual water audits. RWD obtains monthly meter reading data from SUB, as well as flow through interties and from Sports Way Well. A spreadsheet is updated monthly with this information, providing a rough measure of unaccounted for water as consumption divided by production. Annually the production and pumping records are compared, factoring in known leaks or losses, to provide a better estimate of unaccounted for water.

#### **3.4.2 Full Metering of System**

*OAR 690-086-0150(4)(b)*

The SUB and RWD systems are fully metered, including metering of all source facilities and customers service connections.

#### **3.4.3 Meter Testing and Maintenance Program**

*OAR 690-086-0150(4)(c)*

Both SUB and RWD have established programs for testing, maintenance and replacement of meters throughout the system. A description of the programs for each class of meter is presented below. Small customer meters are up to 1-inch diameter, and large customer meters, and source/production meters are 1-1/2-inch diameter and larger.

*Small Customer Meters (3/4-inch and 1-inch diameter)* – For small customer service meters, SUB targets replacement of these meters on a 20-year cycle. This is achieved through replacement of a minimum of 1,000 3/4-inch diameter meters per year based on age and response to unusual meter reads. Since 2010, SUB has tracked changes in volumes of metered flow for services with replaced meters. This data was used to validate the effectiveness of this program, and it is still currently in place.

RWD tests 5 percent of the total customer meters in the system annually and replaces meters that are damaged or fail the accuracy test. Based on the findings of the meter accuracy testing, RWD has not developed a formal program for routine replacement of meters based on age. A copy of RWD's Meter Accuracy Testing Procedure is included in Appendix E. This program applies to all RWD meters as all but three of the RWD's 2,387 service connections are 3/4-inch or 1-inch diameter.

*Large Customer Meters (1-1/2-inch diameter and larger)* – SUB currently selects large customer meters for testing, maintenance and replacement based on annual volume of water through the meter (highest use customer meters receive the highest priority) with consideration of meter age, model and repair history. SUB is currently developing a formal program document for meter testing, working with the Meter Reading and IT Departments to develop objective criteria for selecting meters to test. SUB has established a benchmark and met the date of June 30, 2011, to have this program defined and in place. Details of this program can be found in Appendix I of this WMCP.

*Source and Production Meters* – All source master meters and intertie meters are tested annually for SUB by an independent contractor using a calibrated test meter.

#### **3.4.4 Rate Structure based on Usage and Encouraging Conservation**

*OR 690-086-0150(4)(d) and (6)(d)*

Both SUB and RWD have established rate structures based on customer water usage and have developed a rate structure component that encourages conservation. A description of each system's rate structure is presented below.

*Springfield Utility Board* – Water usage in Springfield is metered and billed according to the amount of water used. Water meters are read and customers billed on a monthly cycle so that customers receive timely feedback in the form of higher water bills during peak summer usage. Because SUB's primary concern is with peak management, a summer surcharge was implemented in May 1996. SUB revises the water and irrigation rate yearly to further encourage conservation. Overall rate increases also help provide the utility a means by which facility costs, O&M costs and debt service expenses continue to be met. Table 3.3 presents SUB's adopted rate structure (current as of January 1, 2017).

As of 2009, during the months of June through September, SUB customers are charged at increasing amounts for water usage beginning at 14 units and through 100 units. Prior to 2009, the first block ended at 11 units instead of 13. The change in the first block was part of an overall ratemaking strategy that included a restructuring of customer classes. In 2009, SUB's modified rate classes included the elimination of declining block rates for service to meters 3 inches and greater. A 14-unit threshold

allows for additional units to be utilized for summer irrigation and other outside water needs and allowing limited and fixed income households access to low cost water in order to meet basic needs. The objective of the summer surcharge is to discourage excessive water use by targeting heavy landscape irrigation, household and recreational usage.

Class	Period	Block (units)	Usage Rate (2017)
All customers with meters less than 3"	Oct. – May	Up to 13	\$1.783
		14 and over	\$1.897
	June – Sept.	First 13	\$1.783
		Units 14 to 100	\$1.936
		Units 101 and over	\$2.048

\*1 unit = 100 cubic feet (CF) = 748 gallons

*Rainbow Water District* – RWD’s rate structure includes a base rate plus a three-tier usage rate that is reviewed and typically revised each June. Table 3.4 presents the current usage rate for each tier of the inclining block rate structure adopted by RWD. In addition to a rate structure to encourage conservation, water meters are read and customers billed on a monthly cycle so that customers receive timely feedback in the form of higher water bills during peak summer usage.

Rate Tier	Single Family (R-1)	Multi-Family (R-M)	Commercial	Current Usage Rate
First	Up to 2,500 cf	Up to 2,000 cf/living unit	Up to 2x average winter flow	\$1.10
Second	2,500-5,000 cf	2,000-4,000 cf/living unit	2x to 4x average winter flow	\$1.80
Third	Over 5,000 cf	Over 4,000 cf/living unit	Over 4x average winter flow	\$2.50

### **3.4.5 Leak Detection, Leak Repair and Line Replacement Program**

*OAR 690-086-0150(4)(e), (5) and (6)(a)*

Both SUB and RWD have implemented leak detection, leak repair and line replacement programs. Both public water systems are committed to reducing water loss through continued improvement in the water distribution systems and repairing leaks. Leak detection and repair are primary components of both systems’ water conservation strategy. A description of each system’s programs and strategies is presented below.

*Springfield Utility Board* – As explained in Section 2, the SUB/RWD systems have experienced historical levels of unaccounted-for water near 26 percent with the highest levels occurring within the SUB East and West Systems. Most of this unaccounted-for water is likely water loss through system leakage. Current metering, accounting and water use audit practices have effectively defined the extent of authorized unmetered water usage. SUB has also included an annual budget for Leak Detection and Repair in the Capital Improvements Program of approximately \$275,000.

In December 2010, SUB developed a formal documented Leak Detection Program. A copy of this document is included in Appendix F. Benchmark action items for this program have been identified and completed and are listed below:

- Compile a complete record of all pipeline segments, fire hydrants, and water services surveyed;
- Analyze leak detection results to establish ongoing leak detection needs and priorities;
- Proceed with the annual leak detection program, completing a minimum of one system (East, West, North, Glenwood) each year starting with 2010; and
- RWD has adopted a leak detection schedule of once per three years to coincide with SUB's schedule.

Implementation of this program in the SUB East System resulted in a water loss savings of approximately 240 million gallons annually from 2008 through 2010. Between 2010 and 2012, system-wide unaccounted-for was reduced from 18.7 to 17.2 percent, a further savings of approximately 62 million gallons annually. Unaccounted-for water loss in 2017 was 12.9 percent. The Waterline Replacement Program developed in December, 2010 spells out the priorities for replacement of 2-inch diameter galvanized, OD steel, wrought iron, and unlined cast iron pipe. This has been the focus for SUB since acquiring the West SUB System from Pacific Power & Light Company in July, 1975. At that time there was approximately 310,000 feet of these types of pipe in the water system. SUB plans to complete replacement of these types of pipe in 2020. The Waterline Replacement program will be re-written later this year to reflect this. Going forward the program will focus on 4-inch diameter AC pipe which is approaching failure due to age and wall saturation, replacements triggered by City of Springfield street reconstruction projects, and system deficiencies, primarily inadequate fire flows, found through expanded use of SUB's water system hydraulic model. In the years 2013-2017, 190 leaks were detected and repaired. Previous benchmark action items for this program will be carried forward and are listed below:

- SUB established a minimum goal of a 2 percent reduction in system leakage annually; and
- SUB set a target to have no more than 15 percent system leakage by 2016 and no more than 10 percent system leakage by 2031. As of February, 2017, system leakage was measured at 12.9 percent.

SUB also implemented a formal Waterline Replacement Program with program documentation developed in December 2010. A copy of this document is included in Appendix G. In the years 2013-2017, 8420 linear feet of pipe were replaced. Benchmark action items for this program have been identified and are listed below:

- Compile a complete record of all pipeline segments constructed of galvanized steel or OD steel pipe and developed preliminary cost estimates for replacement
- Develop a prioritized list of pipeline replacements
- Design and implement a leak tracking database and analysis tool



- Analyze main leak repair history to confirm pipeline replacement needs and priorities
- Proceed with annual main replacement program, completing a minimum of 2,000 linear feet of replacement each year starting with 2012. SUB has consistently exceeded this length of main replacement each year since 2012 and plans to continue at this rate or greater over the next 20 years.

*Rainbow Water District* – RWD’s distribution system is constructed in large part of cast iron, ductile iron and steel water mains ranging in size from 4-inches to 24-inches in diameter. The majority of water leaks occurring in the system consist of cast iron circle breaks, and corrosion pinhole leaks in steel pipe. As a preventive measure, the district has installed electrical bonding on approximately 1.6 miles of 16-inch diameter steel water main where corrosion leaks had been occurring regularly. An aggressive program for replacement of galvanized steel water services and small diameter mains that were installed during the 1950s and 1960s is also nearly complete.

In 2007, RWD contracted a private leak detection service to survey the distribution system. RWD staff located and marked water main locations prior to the survey, allowing the complete survey of 8.3 miles (approximately 65 percent) of the system using an electronic acoustic leak detector. Several significant leaks were found and corrected (4 fire hydrants, 2 mains, 4 services). After evaluating the benefits of the equipment, RWD purchased its own SubSurface LD-12 Acoustic leak detector for use in the system. Table 3.5 presents an inventory of RWD distribution and transmission system pipe size, material and extent of leak survey completed.

**Table 3.6 RWD January 2010 Distribution and Transmission System Inventory and 2007 Leak Survey Summary**

Dia. (in)	Material	Year Installed <sup>1</sup>	Inventory Length (ft)	2007 Leak Survey <sup>2</sup>	
				Length (ft)	% of System
1.5	Galvanized	Unknown	470	470	100%
2	Galvanized	1960-1967	1,600	200	12.5%
2	PVC	1966	330	330	100%
4	Cast Iron	1950-1965	17,480	12,740	72.9%
6	Cast Iron	1953-1965	14,500	8,860	61.1%
6	Ductile Iron	1975-2001	1,470	470	32.0%
8	Cast Iron	1953-1965	14,130	8,110	57.4%
8	Ductile Iron	1975-1996	930	930	100%
10	Cast Iron	1950-1961	2,890	1,000	34.6%
16	Concrete Cylinder	1960	3,240	3,240	100%
16	Steel <sup>3</sup>	1956	7,240	7,240	100%
24	Concrete Cylinder	1956	2,160	-	0%
<b>Total Length (ft)</b>			<b>66,440</b>	<b>43,590</b>	
<b>Total Length (mi)</b>			<b>12.58</b>	<b>8.26</b>	<b>65.6%</b>

- Notes:
1. RWD's main replacement program has identified 470 ft of 1.5-inch diameter galvanized iron and 6,000 ft of 4-inch diameter cast iron as priority projects within the next 5 years due to leak history and/or capacity limitations.
  2. Leak survey in 2007 discovered 10 leaks: 2 mains, 4 hydrants, 4 services
  3. Cathodic protection installed in 2009-2010 to extend useful life of steel transmission mains

RWD's approach is to continue working through the water distribution system to complete the original survey objectives using district personnel as time permits. The leak detection equipment has proven invaluable in narrowing down the exact location of leaks that have surfaced in order to reduce repair cost. In evaluating water leaks for repair, RWD typically uses a combination of experience and equipment to determine whether leakage is coming from RWD facilities, customer service lines, or adjacent utilities. In this analysis, the District uses operator experience, system maps, pipe locating equipment, chlorine detection, water quality characteristics and the acoustic leak detector.

RWD continues to systematically perform water main replacements based on the results of the ongoing leak detection program, analysis of repair histories, and identification of pipe material and age characteristics that indicate a high likelihood of main breaks, leaks or failure.

### **3.4.6 Public Education Program**

*OAR 690-086-0150(4)(f)*

Public education of efficient water use is a critical component of SUB's and RWD's conservation programs. Public education programs focus on the use of media campaigns and teaching materials to educate consumers on water usage issues and to promote water conservation. Information and education measures can produce water savings when customers change their water use habits. Unless otherwise noted, these programs will remain ongoing as a constant educational tool. SUB routinely distributes water awareness and water conservation information to customers in a variety of forms. Programs and information SUB provides to customers include the following:

- Each year, SUB reserves marketing dollars to be used to fund a radio campaign encouraging responsible water use. It is placed on the air whenever temperatures are forecast to remain in the high 90s for three or more days, or whenever other conditions merit placement.
- Through a grant from SUB, the Springfield School District curriculum includes a water awareness and conservation program for grades 1 through 12. These programs are incorporated into the curriculum as a chapter(s) of the Science, Biology and Math classes. The school district has a full time staff member who facilitates water conservation and guardianship into the school curriculum.
- SUB gives out brochures during site visits and makes the brochures available at its offices. Information found in these brochures includes: how to fix leaky toilets, sink and shower faucets.
- Articles are written on a variety of water conservation issues and are mailed to customers via inserts in SUB's billing statements, as well as in SUB's customer newsletter, *SUB Reports*, and in the community Team Springfield newsletter. Specifically, SUB reserves the March bill cycle for a brochure jointly produced by SUB, Eugene Water and Electric Board (EWEB) and RWD that focuses on fixing leaks.
- SUB includes water conservation tips and facts on its on-hold phone message system, as well in lobby displays in the main office and in the Conservation

Connection. SUB also includes conservation messages on the foyer message board along with relevant handouts and posts conservation tips regularly on Facebook during the summer as well.

- SUB hosts a free water bottle refilling station at the Lane County Fair with our partners at RWD and EWEB. Booth messaging cover water conservation and quality, and staff are available to answer questions.
- SUB has participated in the Emergency Water storage campaign for the last two years, and will do it again this year during May (drinking water week).
- SUB is preparing a series of short instructional videos for the website and other distribution channels that would include at least one video on water conservation topics.
- SUB creates and infographic that shows different components of water use and supply.
- SUB has a program called One Task at a Time to promote more conservation.
- There is a voluntary watering program where users can self-regulate conservation and use the green grass gage which if they choose.

RWD has recognized the growing need and responsibility to provide public education for both drinking water protection and water conservation. RWD is currently working to further expand the District's public education program. RWD's first website was launched by in 2011. In partnership with SUB and EWEB, RWD direct-mailed a water conservation brochure to customers in March 2011. Additional conservation and protection messages will be mailed and/or posted to the website several times each year. A line item will be placed in the annual budget to reserve funds for these efforts. Examples of conservation materials distributed by RWD are presented in Appendix H.

### **3.4.7 Technical and Financial Assistance Program**

*OAR 690-086-0150(6)(b)*

Large Customer Water Audits and Residential Water Audits without Devices were two conservation measures described and evaluated in the 2000 Water Conservation Plan and 2012 WMCP. This section provides a brief description of each measure, together with an update on the measures' implementation.

Because industrial water usage has declined, in part, due to water conservation measures implemented by the industries themselves, SUB determined in 2012 that the projected need for *Large Customer Audits* had not been realized. Water conservation resources have been focused in other areas. It is important to emphasize that SUB has transitioned away from declining block rates for larger meters as well as higher per unit rates in the summer. Rate design, and associated actions taken by end users as a result of rate changes, is intended to encourage internal customer audits.

SUB will continue to evaluate and prioritize Large Customer Audits over time. Rather than establish a specific window of time and a specific audit cycle, SUB will examine the need for Large Customer Audits on an ongoing basis and prioritize audits along with other measures. If other measures are deemed to be potentially more effective, SUB will dedicate resources accordingly.

*Residential Water Audits without Devices* was a program that began January 1, 2000. This program operated in coordination with SUB's Residential Weatherization and Billing Inquiry program. This measure included checking all indoor faucets, showers, dishwashers, and washing machines for obvious leaks. A SUB Energy Services Representative (ESR) would also check to see if the customer is using low-flow showerheads and faucet aerators. Appropriate water saving information would be left with the customer, including landscape and irrigation information and basic evapotranspiration (ET) information. Participation numbers were estimated based on completed annual historical energy audits and billing inquiries.

Currently, SUB's Energy and Conservation Services personnel review the water history of residential customers during home energy audits, reviewing anomalous or consistently high water usage, taking into account the number and ages of persons in the household. Customized recommendations are made as appropriate.

Unlike Large Customer Audits, this measure was implemented, but only for a relatively short period of time. In late 2002, primarily as a result of unachieved savings expectations, the program was redesigned to respond solely to high water bill inquiries. Conservation staff would query the customer on their particular situation in an attempt to discover if there was indeed a legitimate cause for their increased billing as compared to their historical usage. In approximately 50 percent of the cases, it was found the increased billing could be attributable to increased wastewater charges. A majority of the remaining number of inquiries generally involved increased usage which the customer had not taken into consideration as possibly affecting their bill. Lastly, it was found that a small number of high bill inquiries were a result of leakage. An ESR would, as needed, make a site visit to confirm that the possibility of a leak did exist. The program in this configuration is still currently in effect.

*Other Technical and Financial Assistance Efforts:* SUB continues to provide water conservation assistance to several customer sectors since the year 2000. SUB's aim in participating in these specific activities is to provide customers with a means of utilizing their water resource more wisely while helping to reducing their overall water expense.

To aid the public sector in managing its irrigation requirements for parks and school athletic fields, SUB invested over \$11,000 in the purchase and installation of an industrial weather station, complete with central control irrigation system software and radio interface hardware. SUB placed this equipment in Springfield at the maintenance facility for Willamalane Park and Recreation District. By agreement, Springfield Public Schools District 19 was also allowed to access the weather station data. By using the weather station's ET information, both the park district and the school district are able to establish irrigation rates for a number of their respective sites. At the time the agreements were signed and continuing for the next five-year period, the park district was to install automated irrigation control capability at 15 of their park facilities. Likewise, the school district was to install during the same time period controls at 10 of their school and sports' athletic fields. To date, the park district has no park sites under automatic controls while the school district has connected 13 of their large irrigation sites to this automated systems' control. The agreements signed by SUB and the two districts expired in 2005. SUB has installed a weather station at its main office location

and is exploring interest and capability of sharing that information with the public. The weather station is still in use.

A conservation program offered by SUB, and designed specifically for residential customers, provides a rebate for high efficiency horizontal axis clothes washers. This program started in 2000 and is still currently offered. By making local appliance retailers aware of the incentive available, SUB believes it has helped to foster the market transformation to these types of water saving clothes washers. Since beginning its rebate program in 2000 and through 2016, SUB has paid out over \$472,835 for 5,420 clothes washers purchased by SUB customers. The total number of rebates, cost of these incentives, and annual water savings associated with these incentives are presented in Table 3.6. The water savings attributable to these more efficient machines as compared to conventional, large capacity V-axis washers is estimated to be 30 to 40 percent, with a total annual water savings of 44,257 ccf, or 33.1 million gallons of water.

<b>Year</b>	<b>Number of Rebates</b>	<b>Annual Water Savings (ccf)</b>
2000	221	1,860 Units
2001	203	1,572 Units
2002	314	2,592 Units
2003	399	3,308 Units
2004	516	3,900 Units
2005	458	3,809 Units
2006	512	4,204 Units
2007	448	3,686 Units
2008	423	3,480 Units
2009	432	3,554 Units
2010	479	3,941 Units
2011	465	3,826 Units
2012	237	1,950 Units
2013	147	1,209 Units
2014	81	666 Units
2015	43	354 Units
2016	42	346 Units
<b>Total</b>	<b>5,420</b>	<b>44,257 Units</b>

RWD provides technical assistance to its customers through information sharing and advice regarding lawn watering techniques and water efficient irrigation methods. Since the same RWD maintenance staff also perform meter testing and read water meters monthly, they have a regular opportunity to observe potential leaks or other unaccounted-for water sources and to communicate directly with customers.

### **3.4.8 Fixture Retrofit and Replacement Program**

*OAR 690-086-0150(6)(c)*

SUB implemented a showerhead replacement program covering a four-year period, beginning in March 1993. The program's goal was to replace existing fixtures in as many residential single family and multi-family homes as possible with more efficient

showerheads and aerators. Fixtures were installed for customers free of charge. Each installation included a 30-day return policy for customers who were more satisfied with their original fixtures. The program targeted the residential market as it was determined that the commercial market would not realize significant savings from this measure. The number of motels existing before the plumbing code required low flow fixtures are few and no significant benefit was anticipated by targeting this class of customer.

The program proved to be a great success for SUB as well as being enthusiastically received by Springfield's residential customers. During the four-year period a total of 41,826 fixtures were installed. Less than two percent of participating customers were dissatisfied and returned their new fixtures. The program, which provides a savings in electricity use for water heating, saved residential customers a total of 3,642,739 kWh over the life of the measure. The kWh savings is derived from a calculation of the deemed savings number reported by the Bonneville Power Administration and the total number of fixtures installed. For the same number of fixtures installed, there were 153,338,289 gallons of water saved, each year, over the life of the measure. The total number of gallons saved is derived from the reported number of kitchen faucet aerators, and showerheads (both single family and multi-family) installed, multiplied by the amount of savings due to those improvements (E-Source Atlas: Water Heating, pp. 10 & 78). Table 3.7 illustrates the number of fixtures installed between 2009 and 2016.

Table 3.7 Quantity of Fixtures Installed Each Year	
Year	Number of Rebates
2009	5,485
2010	4,777
2011	136
2012	22
2013	20
2014	29
2015	92
2016	32
<b>Total</b>	<b>10,593</b>

Since 1997, SUB's Energy and Conservation Services department has continued to provide low-flow showerheads and aerators to customers upon request. Not only are these devices given free of charge to those who did not participate in the original installation, but they are provided to many of the customers who were part of the program and wish to replace the fixtures that are no longer working effectively.

SUB completed a second roll-out of a showerhead replacement program in 2010. The 2009-2010 program was a direct mail program. Customers were given coupons with the option to get 1 or 2 free showerheads. The program had approximately a 20 percent participation rate which is typical of this type of program (some may have already had new showerheads installed, did not like them, or elected not to participate).

In total, about 10,262 showerheads were replaced, based on residential electric customers.

This 2009/2010 showerhead program is estimated to conserve approximately 37.6 million gallons a year.

SUB continues to give low-flow showerheads to residential customers at no cost.

SUB also participates in the regional retail promotion “Simple Steps, Smart Savings™” which, since 2010, provides automatic discounts to purchasers of qualifying showerheads (as well as efficient lighting products) at participating retailers. Data available from 2013-2016 indicates that SUB customers purchased 1,964 qualifying low-flow showerheads from local retailers.

SUB collaborated with Housing and Community Services Agency (HACSA) of Lane County (a CAP agency) in 2015 to install 164 low-flow showerheads in HACSA-owned residences for limited income households.

SUB provided rebates to residential customers for purchases of ENERGY STAR® certified dishwashers for the year 2000-2010. SUB paid a total of \$31,200 in incentives for 1,622 dishwashers. These dishwashers are estimated to save over 6,277,000 gallons of water over their lifetimes.

SUB offers incentives to commercial kitchens to install more efficient pre-rinse spray valves. In 2016, there were 7 such installations at restaurants in Springfield.

RWD customers also participated in previous Bonneville Power Administration showerhead replacement programs and RWD customers located within the SUB Electric service area were eligible for and participated in the 2009-2010 program.

### **3.4.9 Reuse, Recycling and Non-Potable Opportunities**

*OAR 690-086-0150(6)(e)*

In the City of Springfield there is no wastewater treatment plant or facility for treatment and transmission of water for reuse. Wastewater from the City of Springfield goes to a wastewater treatment plant located in the City of Eugene that is operated by the Metropolitan Wastewater Commission. As such, SUB and RWD have not identified any current opportunities for wastewater reuse.

Regarding water recycling activities, several motorized car wash businesses have begun operating in Springfield since 2000. Prior to 2000, only one car wash was located in Springfield. Now there are a total of five facilities offering full car wash services. In speaking with representatives of each business, the typical range of the amount of water that can be reclaimed and reused in the wash/rinse process is 40 percent to 75 percent. The treated and filtered reclaimed water is typically used in the initial soap and water application and first rinse of the vehicle.

SUB and RWD have not investigated the development of other non-potable water supply opportunities. Given the significant expense of developing a separate distribution piping system for non-potable supply within a largely developed urban area, this type of system is not deemed feasible at this time. In addition, development of non-potable water supplies would likely draw from the same surface water or groundwater

resources currently relied upon for potable drinking water supply within the Eugene-Springfield area.

SUB is not aware of any large water users located near potential non-potable water demands such as sports fields, parks and golf courses. SUB is open to recycling opportunities and will evaluate future opportunities as they arise.

### **3.4.10 Other Conservation Measures**

*OAR 690-086-0150(6)(f)*

The City of Springfield enforces and inspects the requirements of the Uniform Plumbing Code and plumbing portions of the International One-and Two-Family Dwelling Code for water conserving plumbing fixtures.

At this time, SUB and RWD do not anticipate implementing other conservation measures beyond the programs already underway and described above. Current programs have provided demonstrated value in improving customer water use efficiency, and future programs are primarily focused on reducing system leakage. The water supply analysis in Section 5 presents use of the water efficiency goals in evaluating the long term water supply needs that allows for a reduction in the need for expanded water supply to meet the continued growth of the Springfield community.





## Section 4

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## SECTION 4

### WATER CURTAILMENT PLAN

OAR 690-086-0160

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#### 4.0 Introduction

Curtailment planning is the development of proactive measures to reduce water demand during water supply shortages due to prolonged drought, system failure from unanticipated events including catastrophic events (flooding, landslides, earthquakes and contamination), mechanical or electrical equipment failure, structural failure, or events not under control of the Springfield Utility Board (SUB) and the Rainbow Water District (RWD) (e.g., localized or area-wide power outages and intentional malevolent acts).

#### 4.1 Supply Capacity Constraints and Historical Curtailment Episodes

OAR 690-086-0160(1)

##### *Supply Capacity Constraints*

The combined SUB and RWD water system is comprised of water supply facilities that are geographically diverse and draw from both groundwater and surface water sources. As such, the supply system is robust with low risk of a loss of numerous supply sources simultaneously. However, prolonged drought events would likely result in reduced surface water supply capacity as well as declines in groundwater levels resulting in reduced water production capacity. In addition, catastrophic events impacting multiple major source facilities such as the Willamette Slow Sand Treatment Facility (WSSTF) could reduce the available production capacity to levels that would result in a water shortage event.

While operating as two separate utilities, the SUB and RWD production, storage, and distribution systems are significantly commingled. As a result, day to day operations are closely coordinated in accordance with an Urban Water Service Agreement, see Appendix B, that provides authority for coordinated operations between the two utilities. The 2010 Water System Master Plan was a joint effort between SUB and RWD, recognizing that both utilities are critical to Springfield's drinking water supply. Because the SUB and RWD water systems are so integrated, the triggers and reduction targets for each system's curtailment stages are the same. The SUB/RWD water system is connected to the Eugene Water and Electric Board's (EWEB) water system by several interties. All three public water systems have worked together to develop metro-wide curtailment messaging for the Eugene and Springfield area.

As summarized below, the peak demand between 2012 and 2016 of the SUB and RWD systems was 19.1 million gallons per day (mgd) in 2013. The significant reductions in water loss have lowered this peak demand from the historical peak of 23.8 mgd in 2006.

The current combined production capacity of all SUB/RWD source facilities is 26.0 mgd. As shown in Table 4.1, the existing SUB and RWD source facilities are adequate to meet current peak demand conditions when all facilities are in operation.

Table 4.1 SUB/RWD Production Capacity and Peak Maximum Day Demand (MDD)	
SUB Production Capacity	18.7 mgd
RWD Production Capacity	7.3 mgd
Total SUB/RWD Production Capacity	26.0 mgd
SUB/RWD Peak MDD between 2012 to 2016	19.1 mgd
SUB/RWD Historical Peak MDD in 2006	23.8 mgd

As described in Section 2, the WSSTF is the largest single source of supply to the SUB/RWD service area and accounts for approximately 6 mgd of available supply. Loss of this facility would reduce the total supply capacity to less than the historical peak demand of the systems, likely requiring the implementation of the water curtailment plan.

The production capacity for Springfield's water system is derived from the combination of 22 wells and the WSSTF. In cases of emergency, SUB and RWD have an Intergovernmental Agreement (IGA) with EWEB to receive water through existing and future interties among the three systems. This IGA specifically calls for the water utility in need to be ready to activate its respective curtailment plan if requested by the providing utility.

In the past 15 years, there have not been any supply deficiencies and hence no curtailment events have been necessary. The most recent known event was a voluntary curtailment request in 1981.

## 4.2 Curtailment Stages

OAR 690-086-0160 (2)

The curtailment plan is intended to be implemented in four progressive stages depending on the severity of the supply shortage. Each curtailment stage is associated with a specific demand reduction target varying from 15 percent for Advisory Stage One to 50 percent reduction in Emergency Stage Three. In order to meet the targets set out by the district, the recommendations to the public are greater than the overall target reductions. The targets assume that not every person will receive the curtailment messages immediately and some may choose not to follow it because of medical necessity or other reasons. Often public perception of how much water they are saving can be easily overestimated. Stage Four implements isolation of all or specific parts of the water system to preserve storage for human consumption, health care and sanitation needs. A description of each of the four stages is shown in Table 4.2

Table 4.2 Overview of Curtailment Stages	
<b>Stage 1 - Advisory</b>	<p><u>Trigger:</u> Water System demand reaches <b>90 percent</b> of production capacity for a sustained period of time and/or specific reservoirs are dropping below <b>50 percent</b> for extended periods during the daily fill and draw cycle.</p> <p><u>Overall Demand Reduction Target:</u> 15 percent of MDD.</p>
<b>Stage 2 - Alert</b>	<p><u>Trigger:</u> Water system demand reaches <b>95 percent</b> production capacity for a sustained period of time and/or first level reservoirs are not routinely refilling, production capacity has been reduced by <b>18 percent</b> (one major wellfield) and interties are not able to provide sufficient replacement water.</p> <p><u>Overall Demand Reduction Target:</u> 30 percent of MDD.</p>
<b>Stage 3 - Emergency</b>	<p><u>Trigger:</u> Sustained demand is <b>exceeding</b> production capacity and/or first level reservoirs are projected to be below <b>50 percent</b> for an extended period of time.</p> <p><u>Overall System Demand Reduction Target:</u> 50 percent of MDD or 100 percent of average daily demand (ADD) whichever is less.</p>
<b>Stage 4 - Shutdown</b>	<p><u>Trigger:</u> Major water use reductions are required to prevent the distribution system from going dry. Reservoirs will be shut down.</p> <p><u>Operational Mode:</u> Remaining water in reservoirs will be rationed.</p>

### 4.3 Curtailment Event Triggers and Actions

OAR 690-086-0160 (3) & OAR 690-086-0160(4)

Initiating events or triggers that may cause this plan to be activated would include but not be limited to the following:

- Abnormal weather conditions preceding the peak summer supply season that present a high likelihood for below normal summer groundwater levels or stream flows in the McKenzie or Willamette Rivers.
- Declaration of a drought for Lane County by the Governor pursuant to ORS 536.720.
- Catastrophic natural disaster that damages individual critical facilities or extensive portions of the SUB/RWD's distribution system.
- Structural, mechanical, or electrical malfunction of critical pumping facilities at either utility's wells or the WSSTF.
- Interruption of local utility electrical service.

- Terrorist act perpetrated on any of the SUB/RWD critical facilities.
- The contamination of source water and/or water in the distribution system.

If there is an initiating event in the Eugene or Springfield area, consistent metro-wide curtailment messaging will be used. Development of this messaging was a joint effort between EWEB, SUB and RWD and will keep public messaging consistent in the event water curtailment measures are needed in the Eugene-Springfield metro area.

The SUB/RWD curtailment plan has four distinct stages, each of which is triggered or initiated by one or more of the events listed above and grouped as follows:

General messages to consider for any stage of curtailment:

- “SUB and RWD are coordinating closely with other agencies and water providers.”
- “We are ready to provide assistance to each other. There are existing interconnections between SUB, RWD, and EWEB, should those supplies become necessary. There is also an agreement between the three utilities for mutual aid.”
- “We are all in this together. Many of us live in Springfield and work in Eugene, or vice versa. We are approaching this (advisory/alert/emergency) as the good neighbors we are and looking for ways to help each other.”

The general messages include a water reduction target to help customers gage the severity of the curtailment effort. It is not expected that all customers will be aware, able and willing to make water use reductions. As such, the general message will include a water use reduction in excess of the desired target reduction.

Language to use at each level:

**Advisory:** The “need” stage

**Alert:** The “must have” stage

**Emergency:** The “mandatory reductions” stage

**Shutdown:** The “boil water” stage

**Stage One - Advisory**

*Trigger:* Water system demand reaches **90 percent** of production capacity for a sustained period of time and/or specific reservoirs are dropping below **50 percent** for extended periods during the daily fill and draw cycle. Table 4.3 illustrates the daily source water production flows that would result if the system demand reached 90 percent of production capacity.

Table 4.3 SUB/RWD Source Water Production at 90% of Production Capacity		
Stage 1 – Advisory (Trigger)	100% Production Capacity (mgd)	90% Production Capacity (mgd)
SUB Production Capacity	18.7	16.8
RWD Production Capacity	7.3	6.6
Total SUB/RWD Production Capacity	26.0	<b>23.4</b>

***SUB/RWD/GWD Demand Reduction Target: 15 percent of MDD***

Table 4.4 shows the daily 15 percent demand reduction target.

Table 4.4 SUB/RWD/GWD Demand-side 15% Reduction Target		
Stage 1 – Advisory (Target)	100% Peak MDD 2012-2016 (mgd)	15% Peak MDD Reduction Target (mgd)
Historical Peak MDD	19.1	<b>16.2</b>

***Initiating Conditions:***

- Continuation of hot dry weather predicted.
- Declining groundwater or river levels.
- Extended mechanical or electrical malfunction causing the loss of any combination of wells or high service pumps.
- Extensive repairs needed on raw or treated water transmission mains.

***General Public Message:*** Voluntary reduction of **25 percent** in daily water usage.

***Joint Metro Public Message:***

- “SUB/RWD/EWEB is issuing a Stage One water advisory for customers in (*specific geographic region, if applicable*) area because (*reason for advisory*).”
- “This Stage One advisory includes only SUB/RWD/EWEB customers in the (*specific geographic region*) area. Those customers outside the (*specific geographic region*) area **are not** affected by this advisory.”
- “Reminder that water supplies are very local, and that \_\_\_\_\_ can exist elsewhere in the state without directly impacting local supplies.”
- “At this time, EWEB/SUB/RWD needs a voluntary reduction in water use of 25 percent until (*the situation*) has passed. This 25 percent reduction can be accomplished with minimal changes to daily activities.”

- “Given the (*reason for Stage One advisory*), the potential for a reduced water supply exists. SUB, RWD and EWEB are asking customers to monitor the news media in case the situation evolves and we need to ask for further reductions.”

Action messages:

- Use the Green Grass Gauge to give your lawn and landscape just enough water.
- Be mindful of peak time watering, and when to use drip vs. sprinklers.
- Postpone new plantings.
- Do not use water to clean off driveways/sidewalks.
- Check for and repair leaks (yard sprinklers, plumbing).
- Educate yourself on water conservation by going to SUB/EWEB websites.
- Every little bit helps!
- Have you reduced water use today?
- Voluntary reductions today could negate the need for mandatory reductions tomorrow.

Primary vehicles for messages:

- Utility websites
- Radio
- TV
- Newspaper
- Neighborhood newsletters
- E-mail

SUB is pursuing potential use of social media for public notifications. Currently, no process is in place.

**Stage Two - Alert**

*Trigger:* Water system demand reaches **95 percent** production capacity for a sustained period of time and/or first level reservoirs are not routinely refilling, production capacity has been reduced by **18 percent** (one major wellfield) and interties are not able to provide sufficient replacement water. Table 4.5 lists the daily source water production flows that would result if the system demand reached 95 percent of production capacity and if there was an 18 percent loss of production capacity.

Table 4.5 SUB/RWD Source Water Production at 95% and Loss of 18% of Total Source Water Production Capability			
Stage 2 – Alert (Trigger)	100% Production Capacity (mgd)	95% Production Capacity (mgd)	18% Production Capacity Loss (mgd)
SUB Production Capacity	18.7	17.8	14.6
RWD Production Capacity	7.3	6.9	5.9
Total SUB/RWD Production Capacity	26.0	<b>24.7</b>	<b>20.5</b>

SUB/RWD/GWD Demand Reduction Target: 30 percent of MDD

Table 4.6 shows the daily water flow targeted for consumption during a stage 2 curtailment event.

Table 4.6 SUB/RWD/GWD Demand-side 30% Reduction Target		
Stage 2 – Alert (Target)	100% Peak MDD (mgd)	30% Peak MDD Reduction Target (mgd)
Historical Peak MDD	19.1	<b>13.4</b>

Initiating Conditions:

- Declaration of drought by Governor pursuant to ORS 536.720.
- Continuous hot dry weather predicted.
- The Willamette River level at the WSSTF intake has dropped to sea level elevation of 447.0 feet.
- Loss of a portion of a wellfield (Willamette, Thurston, Sports Way, SP/Maia, I-5 or Chase).
- Extended loss of utility electrical service at a wellfield or treatment plant.
- Multiple failures of raw or treated water transmission mains.

General Public Message:

Mandatory prohibitions to obtain a **50 percent** reduction in daily water usage.



Joint Metro Public Message:

- “SUB/RWD/EWEB is issuing a Stage Two water alert for customers in (geographic region, if applicable) area because (reason for alert).”
- “This Stage Two water alert includes **only** SUB/RWD/EWEB customers in the (geographic region) area. Those customers outside the (geographic region) area **are not** affected by this advisory.”
- “At this time, EWEB/SUB/RWD **MUST HAVE** a voluntary reduction in water use of 50 percent until (the situation) has passed.”
- “This 50 percent reduction will require some changes to daily activities.”
- “Given the (reason for alert), the potential for a reduced water supply exists. SUB, RWD and EWEB are asking customers to monitor the news media in case the situation evolves and we need to ask for further reductions.”

Action messages:

- We are all in this together. Each of us **must** reduce water use today.
- We are asking all customers to limit water use to only those uses necessary for human health and safety.
- We ask all customers not to water lawns and landscapes until this situation passes.
- Use the Green Grass Gauge to give your vegetable garden just enough water.
- At this time we are asking people to avoid washing their personal or business vehicles themselves (use car washes that utilize recycled water).
- Do not fill private pools and spas.
- Implement water conservation by going to utility websites and applying tips.
- Halt all pressure washing except for construction purposes.
- We ask you not to wash sidewalks or driveways.
- If we don’t get enough voluntary reduction, the next step is mandatory cutbacks that will be enforced.

Primary vehicles for messages:

- Utility websites
- Radio
- TV
- Newspaper

- Neighborhood newsletters
- E-mail

### **Stage Three - Emergency**

#### *Trigger:*

Sustained demand is exceeding production capacity and/or first level reservoirs are projected to be below **50 percent** for an extended period of time.

#### *SUB/RWD/GWD System Demand Reduction Target:*

**50 percent of MDD or ADD whichever is less.**

Table 4.7 illustrates the daily water flows targeted for consumption during a stage curtailment event.

<b>Table 4.7 SUB/RWD/GWD Demand-side 50% MDD and ADD Reduction Targets</b>				
<b>Stage 3 – Emergency (Target)</b>	<b>100% Peak 2012-2016 MDD (mgd)</b>	<b>50% Peak MDD Reduction Target (mgd)</b>	<b>100% ADD (mgd)</b>	<b>50% ADD Reduction Target (mgd)</b>
Historical Peak MDD	19.1	9.55	9.9	4.95

#### *Initiating Conditions:*

- The Willamette River level at SUB’s intake has declined to such a level as to impede adequate suction conditions for raw water pump suction.
- Severe drought conditions.
- Extended loss of utility electrical service at the WSSTF or an entire wellfield.
- Major mechanical or electrical malfunctions causing loss of multiple pumps, wells, or water treatment plant.
- Extensive transmission main failures.
- Fire at a wellfield or water treatment plant causing significant damage to production facilities.
- Imminent terrorist threat against supply system.
- Contamination of source of supply.

General Public Message:

All water uses banned except for domestic sanitation and health care. Curtailment is mandatory to achieve necessary reduction. Water service will be turned off to those customers not in compliance.

Joint Metro Public Message:

- “SUB/RWD/EWEB is issuing a Stage Three water emergency for customers in (geographic region, if applicable) area because (reason for emergency).”
- “This Stage Three water emergency includes only SUB/RWD/EWEB customers in (geographic region) area. Those customers outside the (geographic region) area **are not** affected by this advisory.”
- “At this time, EWEB/SUB/RWD is instituting **MANDATORY RESTRICTIONS** on water uses until (the situation) has passed. These mandatory reductions will require significant changes to daily activities.”
- “Utilities (or EWEB/SUB/RWD is) are instituting **mandatory** water restrictions to reduce demand because voluntary decreases are not producing enough of a reduction. We must achieve a \_\_\_\_\_ percent reduction.”
- “Given the (reason for emergency), the potential for a reduced water supply exists. SUB, RWD and EWEB are asking customers to monitor the news media in case the situation evolves and we need to **require** further reductions.”
- “We continue to rely on the support and cooperation of the public, but we also need to restrict certain water uses to make sure there is enough water for public health and safety.”
- “Anyone violating the mandatory restrictions is subject to fines. (Detail dollar amount of fines.) We have established a hotline for the public to report violators.”

Action messages:

- SUB/EWEB/RWD (or all of us) is/are now in a Stage Three water emergency.
- Thank you for temporarily reducing your water use.
- We are informing you of mandatory reductions in water use, or we face an accelerated risk of compromised water quality.
- Prohibit all car washing, except at commercial car washes that recycle water.
- Prohibit the washing of sidewalks, streets and driveways.
- Prohibit the filling of private and recreational public swimming pools and spas.
- Prohibit all landscape, turf and garden watering and installation of new turf/ landscape.
- Prohibit all uses of water except those for domestic sanitation, drinking, and health care

Primary vehicles for messages:

- Utility websites
- Radio
- TV
- Newspaper
- Neighborhood newsletters
- E-mail
- Door-to-door

**Stage Four - Shut-Down**

Trigger:

Major water use reductions are required to prevent the distribution system from going dry. Reservoirs will be shut down.

Operational Mode: Remaining water in reservoirs will be rationed.

Initiating conditions:

- Continuation of severe drought conditions.
- Extensive damage to transmission, pumping or treatment.
- Processes caused by natural disaster.
- Intentional, natural or accidental acts or fire, contamination of source or any other event resulting in immediate, sustained depletion of water supply.

General Public Message:

Boil water. All water use other than for human consumption, health care and sanitation needs is prohibited.

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Joint Metro Public Message:

- “Utilities (or EWEB/SUB/RWD is) are instituting mandatory water rationing.”
- “This Stage Four shutdown includes only SUB/RWD/EWEB customers in the (geographic region) area. Those customers outside the (geographic region) area **are not** affected by this advisory.”
- “In order to provide water for emergencies and for health and human safety, we must achieve a \_\_\_\_\_ percent reduction in water use.”
- “There are existing interconnections between SUB, RWD and EWEB, as well as an agreement between the three utilities for mutual aid.”
- If providing mutual aid: “EWEB/SUB/RWD customers are asked to follow these regulations to help in this joint effort.”

Action messages:

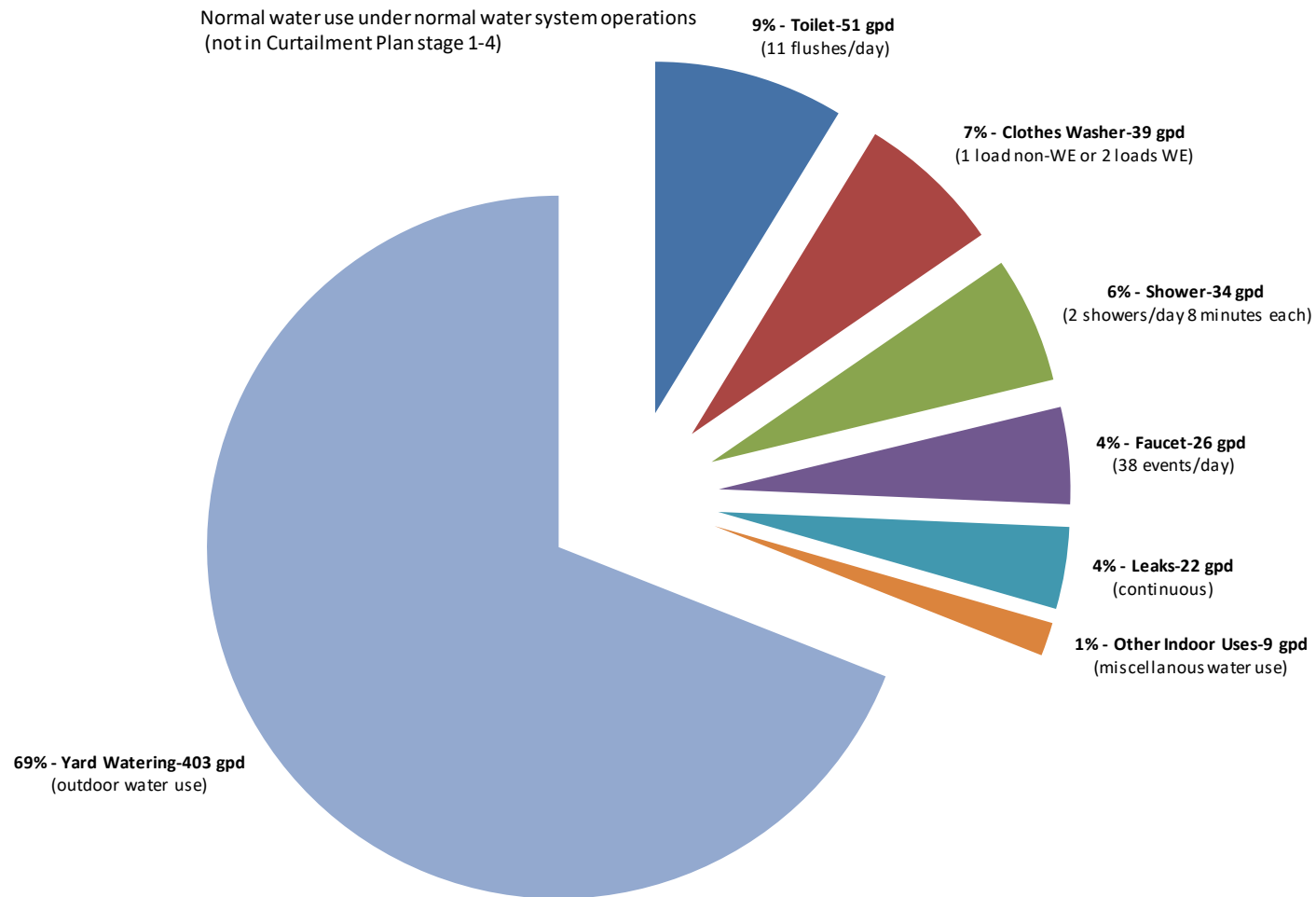
- “At this time, SUB/RWD/EWEB is requiring all customers to boil water for drinking, cooking and other public health and safety purposes.”
- “EWEB/SUB/RWD has set maximum usage requirements on all residential, commercial and industrial users.”

Primary vehicles for messages:

- Utility websites
- Radio
- TV
- Newspaper
- Neighborhood newsletters
- E-mail
- Door-to-door

Figure 4.1 summarizes typical residential water usage for the Eugene-Springfield area and target water use reductions for each stage of the Curtailment Plan.

Figure 4.1 EWEB/SUB/RWD Average Daily Residential Water Use



**Normal Average Daily Water Use** (2.34 persons/household): 584 gallons/day  
**Stage 1** - Curtailment Plan Daily Water Use (2.34 persons/household): Voluntary 25% reduction to 438 gallons/day  
**Stage 2** - Curtailment Plan Daily Water Use (2.34 persons/household): Voluntary 50% reduction to 292 gallons/day  
**Stage 3** - Curtailment Plan Daily Water Use (2.34 persons/household): Mandatory reduction of average daily water use  
**Stage 4** - Curtailment Plan Daily Water Use (2.34 persons/household): Emergency mandatory water rationing.



## Section 5

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## SECTION 5

### WATER SUPPLY ELEMENT

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#### 5.0 General

This section presents a summary of the water supply needs of the Springfield Utility Board (SUB), the Rainbow Water District (RWD) and Glenwood Water District (GWD) over the 20-year planning horizon of this Water Management and Conservation Plan (WMCP). This section includes a delineation of the current and future service areas of the SUB/RWD/GWD system, population projections and water demand forecasts for the service area, a schedule to fully exercise each water right permit held by SUB/RWD, a comparison of projected water supply needs and available sources, an analysis and quantification of expanded diversions under existing permits required in the 20-year planning horizon, and identification of mitigation action required under state and federal laws for the expanded diversion.

#### 5.1 Delineation of Current and Future Service Areas

OAR 690-086-0170(1)

As described in Section 2, the service area of SUB includes all areas within the City of Springfield city limits, the service area of GWD, and the service area of RWD. The service areas of RWD and GWD are generally the urban areas within the Urban Growth Boundary (UGB) but outside the Springfield city limits. Eugene Water and Electric Board (EWEB) provides water service to the west of the SUB/RWD/GWD service areas. As the municipal water provider for the City of Springfield, SUB's water service area will continue to expand as the city annexes additional land within the UGB into the City, consistent with the City of Springfield Comprehensive Plan. Figure 2.4, presented in Section 2, delineates the current service areas of SUB/RWD/GWD and illustrates the future service areas as those areas in the current UGB not currently supplied by SUB or RWD.

##### 5.1.1 Service Area Population Projections

OAR 690-086-0170(1)

Population projections for the City of Springfield urban growth boundary (UGB) were prepared by the Portland State University Population Research Center (PRC). The UGB area is roughly analogous with the SUB/RWD/GWD service area. SUB performed a separate analysis of the service area population using the number of residential services and the 2010 US Census population per dwelling unit (2.5 people per unit) which corroborated the service area population. The estimated current service area population of 68,663 is assumed using the PRC estimate. Approximately 8,000 people are estimated to live within the service area but outside the current city limits, depending upon the methodology used to determine population.



The PRC forecasts a 1.0 percent growth rate in the population over the planning horizon. As such, the service area population is forecasted to be 83,996 by 2037.

## 5.2 Schedule to Fully Exercise Each Water Right Permit

OAR 690-086-0170(2)

This section presents a discussion of water rights, their status and a schedule for full utilization. This discussion is broken into five parts covering each class of water right held by SUB: Ground Water Registrations, SUB Certificated Ground Water Rights, Joint SUB/RWD Certificated Ground Water Rights, Ground Water Permits, and Surface Water Permits and Claims. Section 2 presents the listing and description of all water rights to include their beneficial uses.

### 5.2.1 Ground Water Registrations

Table 5.1 presents the SUB ground water registrations that have been put to full use pursuant to their registration statements. These water rights will be determined and certificated upon adjudication of the registrations.

Table 5.1 SUB Ground Water Registrations			
Well Location	Registration No.	Registration Certification	Rate (mgd)
Willamette Wellfield	GR-3175	3134	1.30
Willamette Wellfield	GR-3181	3140	1.80
Willamette Wellfield	GR-3178	3137	1.80
Willamette Wellfield	GR-3177	3136	1.80
Willamette Wellfield	GR-3180	3139	0.86
Willamette Wellfield	GR-3176	3135	1.80
Willamette Wellfield	GR-3179	3138	1.80

### 5.2.2 SUB & RWD Certificated Ground Water Rights

Table 5.2 presents the SUB and RWD certificated ground water rights that have been put to full use pursuant to their certificates.

<b>Table 5.2 SUB &amp; RWD Certificated Ground Water Rights</b>				
<b>Well Location</b>	<b>Appl. No.</b>	<b>Permit No.</b>	<b>Certificate No.</b>	<b>Rate (mgd)</b>
<b>Springfield Utility Board</b>				
Willamette Wellfield	G-397	G-266	27979	1.29
Willamette Wellfield	G-3212	G-3027	35650	0.58
Willamette Wellfield	G-3298	G-3075	35754	1.55
Willamette Wellfield	G-3297	G-3074	35651	2.13
Willamette Wellfield	G-3296	G-3073	52375	1.43
Willamette Wellfield	G-12555	G-11558	85831	0.93
Thurston	G-3463	G-3267	42085	1.08
Thurston	G-4854	G-4570	42086	1.38
Thurston	G-5724	G-4989	42088	0.72
Thurston	G-10641	G-9983	56427	0.29
Platt	G-10642	G-9984	56428	0.36
Platt	G-10643	G-9985	56429	0.65
S.P.	G-10775	G-9989	56430	1.15
Maia	G-11217	G-10349	82801	1.72
Sports Way	G-14179	G-12845	87007	2.88
<b>Rainbow Water District</b>				
Chase 1 & 2	G-3000	G-2795	45302	2.50
Chase 3	G-4991	G-4709	45303	0.89
7th & Q Street	G-9832	G-9945	65691	1.56

### 5.2.3 Joint SUB/RWD Certificated Ground Water Rights

Table 5.3 presents the ground water permits jointly owned by SUB and RWD that are certificated and have been put to full use pursuant to their certificates.

<b>Table 5.3 Joint SUB/RWD Certificated Ground Water Rights</b>				
<b>Well Location</b>	<b>Appl. No.</b>	<b>Permit No.</b>	<b>Certificate No.</b>	<b>Rate (mgd)</b>
WeyCo	G-283	G-237	45301	3.61
WeyCo	G-3000	G-2795	45302	1.10

### 5.2.4 SUB & RWD Ground Water Permits

Table 5.4 presents the SUB ground water permits which have been developed or are being developed as identified in the "Development Notes" column. Refer to Section 5.2.6 for further discussion of the implementation schedule.

<b>Table 5.4 SUB Ground Water Permits</b>					
<b>Well Location</b>	<b>Appl. No.</b>	<b>Permit No.</b>	<b>Rate (mgd)</b>	<b>Authorized Date of Completion (C-Date)</b>	<b>Development Notes</b>
<b>Springfield Utility Board</b>					
Willamette Wellfield (SSF Perimeter Drain)	G-2761	G-2643	0.65	10/1/2005 CBU 6/2/2015	The point of appropriation for this permit was transferred pursuant to T-9365. This use has been developed as part of the Perimeter Drain system at SUB’s Willamette Slow Sand Treatment Facility (WSSTF) and has been put to full beneficial use. SUB filed a claim of beneficial use for this permit in 2015.
Thurston	G-15243	G-16148	3.15	1/2/2027	Three wells associated with this permit are developed and operating. SUB anticipates filing a claim of beneficial use for this permit within the 20-year planning horizon.
Thurston	G-15244	G-16149	2.58	1/2/2027	The works associated with this permit have not been developed. SUB will develop this permit in light of and consistent with its ongoing analysis of alternative sources as described in the Surface Water Claims Section below. Refer to Section 5.2.6 for further discussion.
Thurston Middle School	G-15241	G-16147	1.14	1/2/2027	The works associated with this permit have not been developed. SUB will develop this permit in light of and consistent with its ongoing analysis of alternative sources as described in Surface Water Claims Section below. Refer to Section 5.2.6 for further discussion.
<b>Rainbow Water District</b>					
I-5 Well 1 & 2	G-15840	G-16477	7.0	4/30/2029	The wells associated with this right are developed and operating. RWD anticipates filing a claim of beneficial use prior to the C-Date and within next 5 years.
Chase 4 & 5	G-5301	G-5132	2.0	10/1/2027	Transfer T-12739 cancelled Certificate 45304 which was associated with Well 4. Once Well 5 has been constructed, Wells 4 & 5 will allow for the full beneficial use. RWD anticipates filing a claim of beneficial use prior to the C-Date.

## 5.2.5 Surface Water Rights

SUB holds two surface water permits, one on the Middle Fork Willamette River and one on the McKenzie River. SUB also has an interest in the City of Springfield's surface water claim on the Middle Fork Willamette River. The permits are in various stages of development that are key elements of long-term water supply planning. Complete development of each permit requires capital investment that needs to be weighed against future demand and options for other supply alternatives. Several studies have examined development of these surface water sources. Based on these studies, SUB intends to develop a new treatment facility to put the McKenzie River source to beneficial use before SUB expands treatment capacity for the Middle Fork Willamette River source.

### Middle Fork Willamette River

Permit No. S-22200 (Application No. S-28213) is for 20.0 cubic feet per second (cfs) from the Middle Fork of the Willamette River. The permit has a priority date of March 18, 1953 and has been extended multiple times since first being issued, with the current extended completion date being October 2030. SUB has developed facilities for a nameplate capacity of 12.9 cfs. The final order approving the most recent extension of time imposed a development limit of 12.28 cfs that can only be removed through a "greenlight" water request pursuant to OAR 690-086-0130(7). To date, only 12.28 cfs has been put to beneficial use. The final amount of water put to beneficial use will depend on the final capacity of the WSSTF and any regulatory restrictions placed on the water right.

### McKenzie River

Permit No. S-54378 (Application No. S-85336) is for 40.0 cfs from the McKenzie River, 35.9 cfs of which is for municipal use and 4.1 cfs for fish and wildlife use. The permit was issued January 2, 2007 and carries a priority date of November 8, 2002. The current completion date is October 2027. The entire 4.1 cfs for fish and wildlife use has been put to beneficial use according to the permit. No works have been completed to put the municipal portion of the permit to beneficial use, but SUB's capital improvement plan anticipates starting construction in 2021 to put this water to beneficial use starting in approximately 2025.

### Surface Water Claim

In 1992 the City of Springfield filed a surface water registration statement claiming a pre-1909 vested water right. This Springfield claim is for 150 cfs from the Middle Fork of the Willamette River diverted into the Millrace for industrial and municipal use. A portion of the water right is put to municipal use by SUB via the Gorrie Creek diversion from the Millrace. The water right will be determined and certificated upon adjudication of the claim.

The Gorrie Creek diversion is currently limited to 3 cfs by installation of a fixed screen, but could be increased in the future using other screening methods or opening and allowing fish passage in Gorrie Creek.

### 5.2.6 Strategy for Implementation Schedule and Quantification

RWD holds one water use permit that is not fully exercised: Permit G-16477. The authorized rate under the permit is 7.0 cfs (4.52 mgd). RWD has developed and applied to beneficial use up to 6.45 cfs (4.16 mgd). RWD plans to develop and apply to beneficial use the remaining 0.55 cfs (0.36 mgd) by 2023. At that time, RWD expects to submit a Claim of Beneficial Use.

SUB has fully developed Permit G-2643 and has applied that water to beneficial use. SUB submitted a Claim of Beneficial Use for the permit in June 2015.

SUB holds five water use permits that are not fully exercised: Permits G-16147, G-16148, G-16149, S-22200, and S-54378. SUB's total undeveloped capacity is 32.72 mgd. The undeveloped portion of each permits is as follows:

- Permit G-16147: 1.14 mgd (1.76 cfs) (Thurston Middle School)
- Permit G-16148: 0.86 mgd (1.33 cfs) (Thurston Wellfield)
- Permit G-16149: 2.58 mgd (3.99 cfs) (Thurston Wellfield)
- Permit S-22200: 4.98 mgd (7.72 cfs) (Middle Fork Willamette)
- Permit S-54378: 23.16 mgd (35.83 cfs) (McKenzie River)

SUB intends to prioritize development of a new surface water treatment plant on the McKenzie River to address the planning window supply deficiency. SUB anticipates developing and putting to beneficial use an initial capacity of approximately 10 cfs by the 2027 authorized date of completion (C-date). The capacity will include a combination of municipal, fish life, and wildlife uses. Development of this source will locate the new supply in the portion of the service area that is currently lacking in supply and is also the portion of the service area in which growth will occur.

In addition to the new McKenzie River source development, additional capacity will be necessary for some, if not all, of the following reasons:

- To provide redundancy in the event of the failure of aging infrastructure.
- To replace aging sources that may no longer be capable of meeting their current production capacities.
- To replace the current 3.03 mgd production from SUB's groundwater registrations in the event that, in an adjudication, the Department were to determine that SUB is not entitled to any water under these registrations.

- To replace the 4.65 mgd that SUB will be able to divert under SW-131 in the event that, in an adjudication, the Department were to determine that SUB is not entitled to any water under this claim.
- To provide diversity of major sources. The water systems currently receive approximately 40 percent of their source from the WSSTF. Extended interruption of this source for any reason would require replacement of a substantial portion of SUB's and RWD's source capacity.
- To replace sources lost either permanently or temporarily due to contamination. The Weyco Wellfield has had detection of contaminants migrating from the International Paper mill site to the south of the wellfield. The SP Well experienced a low-level detection of industrial solvents in the mid-1990s and was taken off line for five years. No source was found for the contaminants. When testing indicated non-detection, the well was returned to service and is tested frequently for re-occurrence. After nearly 30 years of producing clean water, the Platt Well 2 developed a significant problem with iron bacteria growth and use of the well has been taken out of service after rehabilitation efforts were unsuccessful. Use of the well is problematic at this time. RWD's 7th and Q Street Well is located in an urbanized area with nearby historic (and potential for future) industrial contamination.
- The Weyco and Chase Wellfields are adjacent to the McKenzie River and at risk for contamination from flooding in high water events.
- Neighboring water suppliers are exploring options for increasing the reliability and redundancy within their systems. There will be a growing need to have reserves available for mutual aid and emergency water supply as the region plans for a pending Cascadia Subduction Zone quake that could damage major water infrastructure.
- To provide capacity in the event of a large increase in demand. The demand growth in the 2017 WMCP is based on population growth projections. It is likely that a major water using industrial facility will be sited in the north Springfield area or in EWEB's service area, which is near the I-5 and Sports Way wells. There is also a substantial area of heavy industrial property in the Natron area in the southeast portion of the UGB which is anticipated to have high water use customers.

Based on these factors, which are difficult to quantify with certainty, SUB cannot limit its development plans over the 20-year planning horizon to the deficit discussed subsequently in Section 5.4.2. Rather, it is likely that SUB will need to develop some of the undeveloped capacity of Permits G-16147, G-16148, G-16149, and S-22200 during the 20-year planning horizon. If SUB has not fully developed these permits by 2027, (or 2030 for Permit S-22200), SUB will be required to submit applications for extensions of

time and will be required to show good cause to allow OWRD to approve the extension. See OAR 690-315-0040 & -0070.

It is possible that not all of the permitted capacity will be developed within the 20-year planning horizon:

- As noted above, SUB intends to prioritize development of the McKenzie River surface water source during the 20-year planning horizon. This means SUB might not fully develop the Middle Fork Willamette River Permit (S-22200) during the next 20 years. However, this source may be expanded to replace aging or retiring groundwater facilities, to offset McKenzie River diversion capacity that may be limited by future permit conditions, or to provide source redundancy or backup capacity both for SUB or as part of a future regional supply agreement.
- The Thurston Middle School Permit (G-16147) and undeveloped Thurston Permits (G-16148 and G-16149) require offsetting mitigation water to be diverted to Cedar Creek. Consequently, these sources are less attractive for development in the planning window.

It is also important to note that SUB developed a conservative estimate of its water needs based on the maximum daily demand (MDD) for water. However, as SUB explained when it applied for Permit S-54378, “[w]ater rights needed by a municipal agency will lay between the water demands defined by the maximum day demand and the peak demands defined by the peak hour. SUB must have secure water rights higher than MDD in order to meet its peak demands.”<sup>1</sup> OWRD relied in part on that letter when it issued Permit S-54378 in 2007. In this WMCP, SUB has relied on MDD as a basis for predicting water needs to remain consistent with its 2012 WMCP and other planning documents.

### 5.2.7 Rainbow Water District Water Rights Schedule

RWD has certificated and is fully exercising of all its water rights, with the exception of Permit G-16477 and Permit G-2795

- The current authorized date for completion of development of Permit G-16477 is April 30, 2029. RWD anticipates perfection of Permit G-16477 within 5 years (2023).
- Transfer T-12739 canceled Certificate 45302 associated with Permit G-2795. RWD will use the existing Chase Well 4 and a new Chase Well 5 under this revised right to allow full beneficial use. RWD anticipates perfection of this right by the completion date of October 1, 2027.

## 5.3 Water Demand Forecast

OAR 690-086-0170(3)

<sup>1</sup> Letter from Ken Cerotsky, Director, Water Division, SUB, to Cory Engel, Water Rights Processing Technician, Oregon Water Resources Department (July 16, 2003).

This section summarizes water use records and presents projections for future water use for the SUB and RWD systems. This section also includes documentation of available water use data and records and the methodology for projecting future demands.

A number of terms are used in the development and presentation of water demand projections. A brief discussion of those terms not already defined in Section 2 is presented below along with definitions that are intended to clarify and illustrate the development of water demand projections.

*Water Efficiency Targets (WET):* This is the SUB/RWD/GWD service area goal to reduce losses to 10 percent of water system demand by 2031. This target is met with water supply side measures such as a leak repair program to reduce water loss.

*Equivalent Meters (EMs):* A normalized value representing the number of customers using different sized water meters. The number of equivalent meters is calculated by assigning each meter size a relative weight. The relative weights are in proportion to the maximum rated flow for a given meter size, compared to the maximum rated flow of a 3/4-in meter at 20 gpm. Table 5.5 lists equivalent meter values.

<b>METER SIZE (in)</b>	<b>MAXIMUM RATED FLOW (gpm)</b>	<b>EQUIVALENT METERS</b>
3/4	20	1
1	50	2.5
1-1/2	100	5
2	160	8
3	300	15
4	500	25
6	1,000	50
8	2,000	140
10	4,000	200

Water demand projections used in this WMCP are developed and supported by several sources including the City of Springfield Planning Department, the PRC, and SUB's internal studies and databases. Some of the information, particularly in the upper level areas of the East System, is based on current understanding of development variables including potential development costs and steep slope stability analyses in specific areas to better estimate future development patterns and ultimate densities.

Based on a review of recent available historical water demand data by customer class from 2012 to 2016 and PRC population forecasts, water demand projections were developed for the 20-year planning horizon. Population growth was observed at an annual rate of 0.125 percent, which was five times lower than the water demand annual growth rate of 0.54 percent, which includes all customer classes. The PRC population forecast predicts an approximate 1 percent annual growth rate over the next 20 years. Because SUB's industrial customer class water demand has been growing at



approximately 3.9 percent annually over the last 5 years and is anticipated to continue to grow, an annual water demand growth rate of 1.25 percent was used in the water demand forecast. This corresponds to a 3 percent growth rate for the industrial class, and a 0.5 percent growth rate for all non-industrial classes.

Using the water demand forecasting methodology presented above water demand projections were developed for the entire service area. Table 5.6 summarizes maximum day demand projections for the entire SUB/RWD/GWD system with the current water loss, and the projected demands after the water loss target is met. By the end of the 20-year planning horizon, the MDD will be 25.8 mgd. The forecasted water demands include the effects of SUB/RWD efforts to reduce the distribution system water loss to the 10 percent target as discussed in Section 3.

<b>Table 5.6 SUB/RWD/GWD Total System Source Water Need</b>			
<b>Year</b>	<b>Maximum Day Demand (mgd)</b>		
	<b>At Current Water Loss</b>	<b>Meeting 10% Water Loss Target by 2031</b>	<b>With 10% Reserve at Target Water Loss</b>
2022	19.9		21.9
2027	20.9		23.0
2032	22.3	21.7	23.9
2038	24.0	23.4	25.8

## **5.4 Comparison of Projected Need and Available Sources**

OAR 690-086-0170(4)

SUB and RWD have adequate water supply to meet customer needs in the near future but additional supply will be required within the 20-year planning horizon to meet the projected growth in water demands. The actual timing of supply development or expansion will depend on actual growth rates and the impacts of ongoing and new conservation measures and the water use characteristics of future non-residential customers.

SUB has previously adopted a policy of maintaining a 10 percent reserve supply source capacity. This policy allows for timely development of new supply sources to meet increasing demands associated with growth and to provide a level of insurance against unexpected increases in water demands. Incursion into the 10 percent reserve is a decision based on acceptable risk balanced with the financial constraints placed on the utility.

Reserve capacity is also provided to ensure reliable service in the event of mechanical equipment failure or power outages. If the total daily demand on a high use day exceeds the source capacity, storage reservoirs are unable to refill completely during the night. A series of high use days could further deplete storage, leaving inadequate

water for fire or emergency. Compared to other communities, 10 percent reserve capacity is relatively low, but is justified based on the diversity of the SUB/RWD supply, a history of short duration power outages, and the existence of interties, both inter-system and intra-system. Source needs discussed in this section will be presented with the 10 percent reserve capacity.

In the last 20 years, SUB has made numerous improvements to the transmission mains that facilitate moving water from one system to another. This ability to import or export water from one system to another provides more flexibility to share production capacity between systems.

#### **5.4.1 SUB/RWD/GWD Combined System Source Capacity**

SUB/RWD operate numerous source facilities with operational and regulatory restrictions and challenges. Common challenges include well interference, the need to add treatment to existing groundwater wells, aging equipment, and typical loss of well productivity with age. As such, SUB does not anticipate consistently operating every source at its maximum authorized capacity over the long term. SUB intends to continue operating all existing sources in the short term, but any major capital costs that arise will require careful analysis of how best to invest SUB/RWD resources.

For purposes of determining reliable future source production capacity, SUB and RWD have excluded certain sources that, for various reasons, may not provide a reliable long-term supply at maximum authorized rates.

Due to multiple considerations, SUB and RWD might be forced to cease diversion from currently authorized points of appropriation for the WeyCo source. Although transferring this capacity to new points of appropriation might be feasible, SUB and RWD have elected to exclude this capacity for planning purposes due to uncertainty. Factors that could influence future use of the WeyCo source include the existing groundwater contamination plume from the International Paper facilities, which may hamper the WeyCo facility future operations, as well as operational challenges at the site.

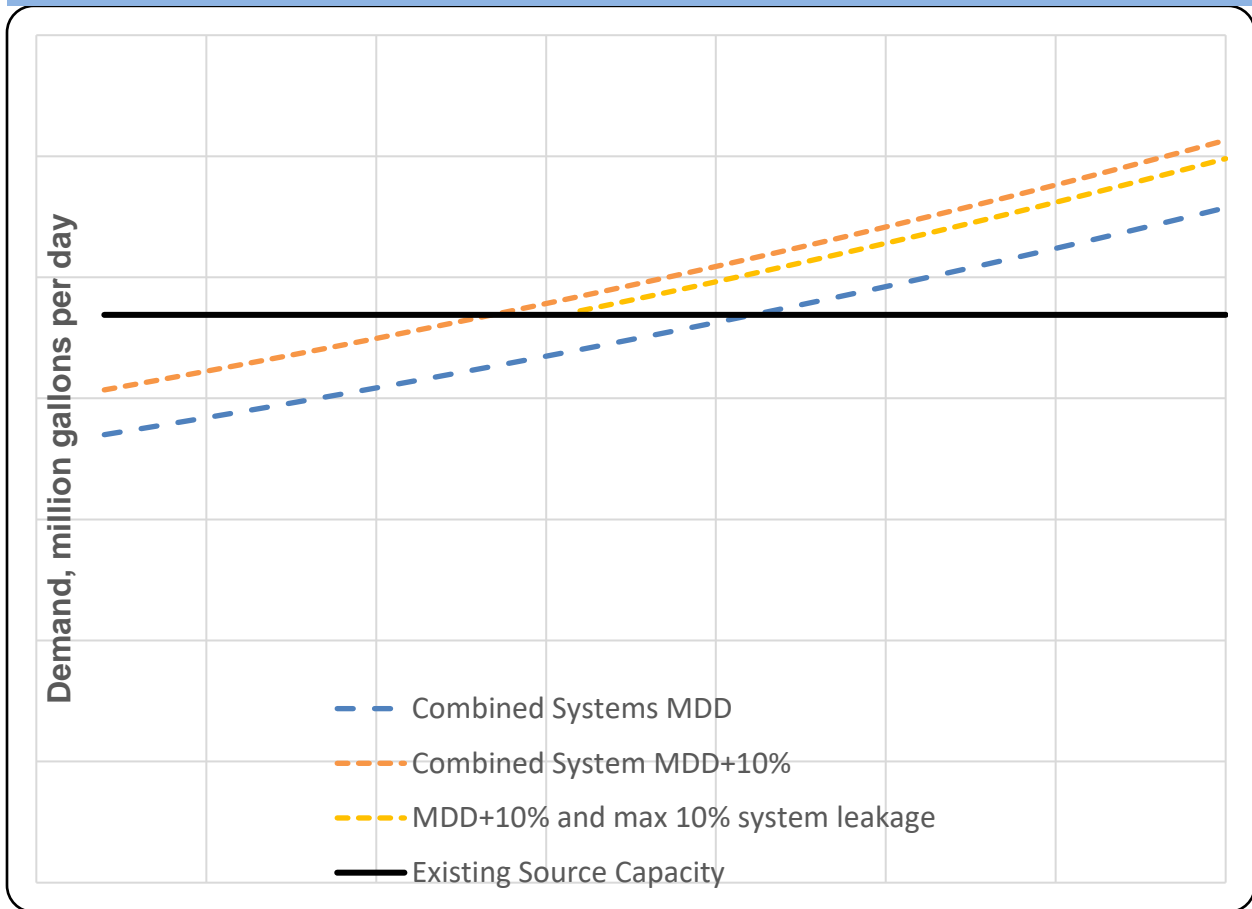
The Sports Way source has limited sustained capacity due to interference from nearby EWEB wells. As such, the reliable capacity is limited to 1,600 gpm. RWD anticipates that the Chase facilities will only have a long-term capacity of 1,250 gpm due to declining well performance. Table 5.7 presents the future 23.45 mgd source capacity of SUB and RWD considering the long-term disposition of current facilities.

<b>Table 5.7 Future Source Production Capacity</b>		
<b>Springfield Utility Board's Water Source Facilities</b>	<b>Production Capacity</b>	
	<b>(gpm)</b>	<b>(mgd)</b>
Willamette Slow Sand Treatment Facility (WSSTF)	4,583	6.60
Thurston Facilities (Thurston & Platt wells)	4,205	6.05
WeyCo <sup>1</sup>	--	--
S.P./Maia	1,800	2.59
Sports Way <sup>2</sup>	1,600	2.30
<i>Total SUB Future Source Capacity</i>	<i>12,188</i>	<i>17.54</i>
<b>Rainbow Water District Water Source Facilities</b>		
I-5	2,500	3.60
Chase <sup>3</sup>	1,250	1.80
Q St.	350	0.50
WeyCo <sup>1</sup>	--	--
<i>Total RWD Future Source Capacity</i>	<i>4,100</i>	<i>5.90</i>
<b>Total Future Source Capacity</b>	<b>16,288</b>	<b>23.45</b>
<sup>1</sup> WeyCo facilities to be out of service <sup>2</sup> Sports Way facility reduced due to interference <sup>3</sup> Chase facilities reduced due to productivity declines.		

### 5.4.2 Comparison of Supply Needs and Capacities

The SUB/RWD/GWD system has a current MDD of 20.35 mgd, with the 10 percent reserve, with a source capacity of 26.0 mgd. The 20-year forecasted demand, with 10 percent reserve, is for 25.8 mgd and the anticipated reliable future supply capacity is 23.4 mgd which results in a 2.4 mgd overall source deficit. Figure 5.1 illustrates this anticipated source water need for the SUB/RWD/GWD system, with and without the desired 10 percent supply reserve capacity. The graph also shows what the projected source water need would be with and without the 10 percent water loss target.

Figure 5.1 SUB/RWD/GWD Water Demand Forecast



## 5.5 Analysis of Alternatives With No New Water Rights

OAR 690-086-0170(5)

### 5.5.1 Conservation Measures

As described in Section 3 and Section 5.3, SUB and RWD have established targets for reduced water usage through conservation and reduction of unaccounted-for water. This has reduced unaccounted-for water by 4.3 percent over the last 5 years. These efforts are expected to result in a further reduction in the current water supply needs of approximately 0.5 mgd once the 10 percent water loss target is met. While conservation can be expected to allow SUB and RWD time to implement development of additional water supply sources, the continued population growth in the Springfield area will ultimately result in an increase in water demands beyond the capacity of existing supply sources. As such, while SUB and RWD continue to invest in the development and implementation of water conservation measures, analysis and planning for development of expanded water supply under existing permits is being planned.

## 5.5.2 Interconnection and Cooperative Regional Water Management

SUB and RWD have participated in cooperative investigations of regional water supply development with other Lane County water providers. Discussions and investigations of opportunities to cooperatively utilize the region's water resources to the maximum benefit of the water users within the County remains a high priority for SUB, RWD and EWEB. Intergovernmental agreements provide short-term relief in emergencies, but these agreements do not currently provide reliable, long-term supply. At this time, SUB and RWD are unable to consider the use of interconnection or other cooperative regional water management as a reliable alternative source of supply as such regional planning has not resulted in the identification and development of such a regional source. Future development of the McKenzie River or Willamette River source may present opportunities for regional management of these sources and will continue to be explored by SUB and RWD.

## 5.5.3 Other Conservation Measures

As described in Section 3, and further discussed in this section, SUB and RWD have aggressively implemented water conservation measures and established goals for reduction in water loss with the objective of improving efficient use of the region's water resources and reducing the need for further development of water supply sources. Based on the ongoing analysis of potential conservation measures to support these goals, SUB and RWD have not identified other conservation measures beyond those which have been evaluated and implemented which could provide water (through reductions in water demands) at a cost lower than the available source options described in this section.

## 5.6 Quantification of Maximum Rate and Monthly Volume

OAR 690-086-0170(6)

As described in Sections 5.2 and 5.4, SUB anticipates development of additional supply under existing permits to meet water demands within the planning horizon and to provide source redundancy.

SUB is prioritizing development of an initial McKenzie River source capacity of approximately 25 percent of the 40 cfs (25.8 mgd) water right capacity under Permit S-54378. At the initial diversion rate of 10.0 cfs (6.46 mgd), the maximum monthly withdrawal would be 194 million gallons. This rate is tentative and will be refined as appropriate during preliminary design of the new facilities.

Although SUB will prioritize development of the McKenzie River source over the 20-year planning horizon, SUB will continue to look for opportunities to further develop its Middle Fork Willamette River permit through the expansion of WSSTF production capacity. This expansion may become necessary to replace aging or retiring groundwater facilities, to offset McKenzie River diversion capacity that may be limited by future permit conditions, or to provide source redundancy or backup capacity both for SUB or

as part of a future regional supply agreement. Without the expansion of WSSTF production capacity, the maximum rate of water to be diverted under Permit S-22200 will be the greenlighted rate of 12.28 cfs. Maximum monthly withdrawal at this rate would be 320 million gallons. However, in order to use more than 12.28 cfs the development limit of 12.28 cfs would need to be increased through a request for additional greenlight water as part of a WMCP Final Order.

SUB intends to develop some, if not all, of the undeveloped capacity of Permits G-16147, G-16148, and G-16149 by 2030 to ensure a diversity of sources in the system. Based on SUB's current plans, the maximum rate of water to be diverted under each permit would be the maximum rate authorized under the permit: 1.14 mgd (1.78 cfs) for Permit G-16147, 3.17 mgd (4.91 cfs) for Permit S-16148, and 2.58 mgd (4.02 cfs) for Permit G-16149. The maximum monthly withdrawals under the permits will be:

- Permit G-16147: 34,675,000 gallons
- Permit G-16148: 95,850,000 gallons
- Permit G-16149: 78,475,000 gallons

RWD plans to divert water under Permit G-16477 at the I-5 Well facilities:

- The I-5 Wells have a maximum instantaneous rate of 7.0 cfs (3.05, Well No. 1; 3.95, Well No. 2).
- The I-5 Wells have a maximum monthly volume of 2.42 million gallons (1.06, Well No. 1; 1.36, Well No. 2).

RWD plans to divert water under Permit G-2795 at the Chase Well 4 and 5 facilities:

- The Chase 4 & 5 wells have a maximum instantaneous rate of 2.0 cfs (1.33 cfs, Well 4; 0.67 cfs, Well 5).
- The Chase 4 & 5 wells have a maximum monthly volume of 38.78 million gallons (25.79 million gallons, Well 4; 12.99 million gallons, Well 5).

At the time these permits are fully exercised, SUB and RWD will potentially be operating a total of 48 points of diversion to meet peak demands. The monthly withdrawals from each point of diversion during the off-peak months of the year will be dependent upon system demands and the operational and maintenance decisions made by production staff in their selection of sources to meet those demands.

## **5.7 Mitigation Actions Under State and Federal Law**

OAR 690-086-0170(7)

Division 86 rules require water suppliers to provide a description of mitigation actions being taken to comply with legal requirements, such as the federal Endangered Species Act, Clean Water Act and the Safe Drinking Water Act. As identified in Section 2, Table

2.5, a number of fish species present in the McKenzie and Willamette River basins are listed as “Threatened” under the Endangered Species Act, though SUB has not conducted studies to determine whether further development of those water sources will affect protected species. As SUB pursues further development of water supply under the existing surface water permits, SUB will take action to mitigate impacts as required by federal and state law.

Currently, 4.1 cfs of SUB’s 40.0 cfs McKenzie River permit (Permit No. S-54378) is designated for fish and wildlife beneficial use to mitigate presumed surface water impacts associated with the development of the Thurston Wellfield.

## **5.8 New Water Rights**

OAR 690-086-0170(8)

SUB and RWD do not anticipate the need to acquire new water rights within the 20-year planning horizon to meet current and future water supply needs.





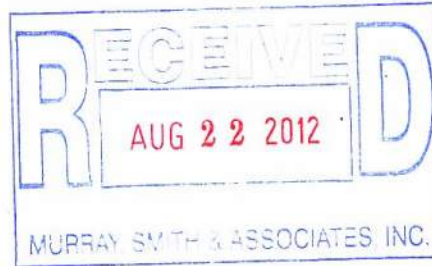


# Oregon

John A. Kitzhaber, MD, Governor

Water Resources Department  
North Mall Office Building  
725 Summer Street NE, Suite A  
Salem, OR 97301-1271  
503-986-0900  
FAX 503-986-0904

August 20, 2012



Springfield Utility Board  
Attn: David Embleton  
202 S. 18<sup>th</sup> Street  
Springfield, OR 97477

Rainbow Water District  
1550 42<sup>nd</sup> Street  
Springfield, OR 97477

Subject: Water Management and Conservation Plan

Dear Water Suppliers:

Thank you for your response to my review of the Springfield Utility Board's (SUB) and Rainbow Water District's (RWD) joint Water Management and Conservation Plan (plan) and submittal of revisions to the plan.

The Department has reviewed the revised plan and determined it to be generally consistent with the relevant requirements under OAR Chapter 690, Division 086. Therefore, please find the enclosed final order approving the joint Water Management and Conservation Plan.

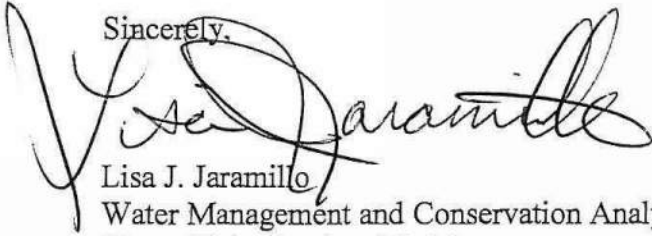
Please note that the attached final order specifies that SUB and RWD's joint plan shall remain in effect until August 16, 2022. Additionally, SUB and RWD are required to submit a progress report to the Department by August 16, 2017, detailing progress made toward the implementation of conservation benchmarks scheduled in the joint plan. Finally, SUB and RWD must submit an updated Water Management and Conservation Plan to the Department by February 16, 2022.

**NOTE:** *The deadline established in the attached final order for submittal of an updated water management and conservation plan (consistent with OAR Chapter 690, Division 086) shall not relieve the Springfield Utility Board or the Rainbow Water District from any existing or future requirement(s) for submittal of a water management and conservation plan at an earlier date as established through other final orders of the Department.*



We appreciate your cooperation in this effort. Please do not hesitate to contact me at 503-986-0880 or [Lisa.J.Jaramillo@wrds.state.or.us](mailto:Lisa.J.Jaramillo@wrds.state.or.us) if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Lisa J. Jaramillo". The signature is fluid and cursive, with the first name "Lisa" and last name "Jaramillo" clearly distinguishable.

Lisa J. Jaramillo  
Water Management and Conservation Analyst  
Water Right Services Division

Enclosure

cc: WMCP File  
Appl. G-12555 (Permit G-11558)  
Appl. G-14179 (Permit G-12845)  
Michael Mattick, District #02 Watermaster  
Springfield Utility Board, Attn: Ray Meduna, 202 S. 18<sup>th</sup> Street, Springfield, OR 97477  
Murray, Smith & Assoc., Inc., Attn: Michael McKillip, 121 SW Salmon, Ste. 900, Portland, OR 97204  
Stoel Rives, LLP, Attn: Greg D. Corbin, 900 SW Fifth Ave., Ste. 2600, Portland, OR 97204

**BEFORE THE WATER RESOURCES DEPARTMENT  
OF THE  
STATE OF OREGON**

In the Matter of the Proposed Water	)	FINAL ORDER APPROVING A
Management and Conservation Plan for the	)	WATER MANAGEMENT AND
Springfield Utility Board and the Rainbow	)	CONSERVATION PLAN
Water District, Lane County	)	

**Authority**

OAR Chapter 690, Division 086, establishes the process and criteria for approving water management and conservation plans required under the conditions of permits, permit extensions and other orders of the Department.

**Findings of Fact**

1. The Springfield Utility Board (SUB) and the Rainbow Water District (RWD) submitted a joint Water Management and Conservation Plan (plan) to the Water Resources Department (Department) on July 29, 2011. The plan was required by a condition set forth in the final order issued on December 14, 2000 (Sp. Or. Vol. 54, Pg. 916) approving SUB's previous plan.
2. The Department published notice of receipt of the plan on August 2, 2011, as required under OAR Chapter 690, Division 086. No comments were received.
3. The Department provided written comments on the plan to SUB and RWD on October 20, 2011, and in response, SUB and RWD submitted plan revisions on February 1, 2012 and August 3, 2012.
4. The Department reviewed the revised plan and finds that it is consistent with the relevant requirements under OAR Chapter 690, Division 086.

**Conclusion of Law**

The joint Water Management and Conservation Plan submitted by the Springfield Utility Board and the Rainbow Water District is consistent with the criteria in OAR Chapter 690, Division 086.

**Now, therefore, it is ORDERED:**

1. The Springfield Utility Board and Rainbow Water District joint Water Management and Conservation Plan is approved and shall remain in effect until August 16, 2022, unless this approval is rescinded pursuant to OAR 690-086-0920.

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080, you may petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

2. The Springfield Utility Board and the Rainbow Water District shall submit an updated plan meeting the requirements of OAR Chapter 690, Division 086 (effective November 1, 2002) within 10 years and no later than February 16, 2022.
3. The Springfield Utility Board and the Rainbow Water District shall submit a progress report containing the information required under OAR 690-086-0120(4) by August 16, 2017.
4. The deadline established herein for the submittal of an updated Water Management and Conservation Plan (consistent with OAR Chapter 690, Division 086) shall not relieve the Springfield Utility Board or the Rainbow Water District from any existing or future requirement(s) for submittal of a Water Management and Conservation Plan at an earlier date as established through other final orders of the Department.

Dated at Salem, Oregon this 16 day of August, 2012.

  
Dwight French, Water Right Services Administrator for  
PHILLIP C. WARD, DIRECTOR

Mailing date: AUG 21 2012



WITHDRAWAL AND OPERATIONS AGREEMENT

Between

Rainbow Water District and Springfield Utility Board

1992

**RAINBOW WATER DISTRICT AND SPRINGFIELD UTILITY BOARD  
WITHDRAWAL AND OPERATIONS AGREEMENT**

**PREAMBLE**

THIS AGREEMENT, made and entered into by and between the Springfield Utility Board, the agency of the City of Springfield, Oregon, (a municipal corporation of the State of Oregon) designated by the charter of the City of Springfield as the agency responsible for water and electric utility operations within and for and on behalf of the City of Springfield, Oregon, hereinafter referred to as SUB, and the Rainbow Water District, a municipal corporation of the State of Oregon, a special service district providing water service within its boundaries and to certain areas formerly within its boundaries and now part of the City of Springfield, Oregon, hereinafter referred to as Rainbow; and

WHEREAS, the parties wish to carry out the provisions of the May 5, 1982, Withdrawal and Service Agreement, signed by the City of Springfield, SUB and Rainbow; and

WHEREAS, the parties wish to have a new written agreement define their performance of the water utility service functions and activities of each by means of a joint review of facilities, equipment and proposed development of the respective parties to provide for high quality, efficient methods of water service to residents of the Springfield area now and in the future, and

WHEREAS, a portion of the boundaries of Rainbow are contiguous with the boundaries of the city of Springfield, Oregon, and certain annexations to the city of Springfield have occurred in the past and may be expected to occur in the future by the City of Springfield; and

WHEREAS, upon such annexations, the territory so annexed by the City of Springfield is withdrawn from Rainbow by action of the City taken through, or in conjunction with, the Lane County Boundary Commission; and

WHEREAS, upon such annexation and withdrawal, the City of Springfield and SUB as its agent, become entitled to ownership of all water mains, service installations, structures, facilities, improvements and other property in the area withdrawn not necessary for the continued operation of the Rainbow water system. All other water mains, service installations, structures, facilities, improvements and other property which are necessary to continue the operation and maintenance of Rainbow, continues to be the property of Rainbow regardless of its location; and

WHEREAS, the City of Springfield upon withdrawal from Rainbow has followed the practice and does in the future intend to continue such

practice, of assuming obligations of Rainbow in withdrawing territory to avoid double taxation for the same services thereof by payment to Rainbow of an amount equal to the proportion of the outstanding obligations of Rainbow which the assessed valuation of the property withdrawn bears to the assessed valuation of the entire district on the effective date of withdrawal; and

WHEREAS, the City of Springfield states its intention to assume such portion of the obligation upon such effective date of withdrawal as the same may occur from time to time in the future and does hereby provide for the payment of the same in the manner provided in this agreement, and Rainbow does hereby agree to accept the consideration hereinafter set forth as payment in full for the obligations so assumed by the City of Springfield; and

WHEREAS, upon such annexation, withdrawal and assumption, the property withdrawn is no longer liable for taxes or indebtedness of Rainbow and the City of Springfield by and through SUB becomes entitled to certain properties as herein set forth and to customers and revenues derived therefrom within such withdrawn territory,

NOW THEREFORE, Rainbow Water District and SUB (acting by and for the City of Springfield, Oregon) do hereby agree as follows, each in consideration of the mutual promises, covenants, agreements and performances hereinafter set forth, of the other party:



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ASSUMPTION OF OBLIGATIONS by THE CITY OF SPRINGFIELD  
FOR TERRITORY WITHDRAWN FROM THE RAINBOW WATER DISTRICT

The City of Springfield shall continue to withdraw territory from the Rainbow Water District when annexed to the city. Within 60 days of withdrawal, the City of Springfield acting by and through the Springfield Utility Board (SUB), shall pay to Rainbow Water District an amount equal to the proportion of the outstanding obligations of Rainbow Water District which the assessed valuation of the property withdrawn bears to the assessed valuation of the entire district on the effective date of the withdrawal. Rainbow Water District does hereby agree to accept such consideration thereof as payment in full for the obligation assumed by the City of Springfield. The properties annexed to the city shall be relieved of further obligation to Rainbow Water District.

Rainbow Water District agrees that the above assumption shall apply to outstanding obligations incurred for the water utility only and no other public service function in which Rainbow may be engaged. SUB (and the City of Springfield) agree to make no claim to any other property for which such obligations were incurred for other than the water utility, except as provided by law in the event of dissolution.

JOINT OPERATIONS

A. MAINTENANCE

1. Both utilities are to agree upon and map a single service boundary for operation and maintenance purposes that would clearly identifies valves, hydrants, services, distribution mains, etc. before February 28, 1992. This map is to be updated each February and will show valves to be located and operated annually.
2. Planned maintenance of leaks along the service boundary line will be discussed by both utilities prior to any work, except in the case of emergencies, (i.e. major break). Items such as responsibility for work, locate requests, and customer notifications shall be coordinated in a timely manner. The intent is to arrive at a joint decision on which utility will be responsible for repairing the leak. If the leak is a service leak, the utility billing the customer for water will be responsible for the repair. If the leak is a main leak, the criteria for establishing responsibility will be the location of the main distribution line. if the main distribution line lies within the county, then Rainbow will be responsible for the repair. If the main distribution line lies within the city, then SUB will be responsible for the planned maintenance. If a decision cannot be agreed to, SUB will take the reponsibility to repair the leak. If it is found that the leak is on RWD facilities, SUB will bill RWD for the work.
3. In the case of an emergency repair along the service boundary line (large main or service break along the city limits boundary), the first responding utility shall be responsible for the complete repair of the break. Financial reimbursement from one utility to another shall be negotiated if the repair was the responsibility of the nonresponding utility.
4. The interties that connect the Rainbow Water District system to the SUB system are the responsibility of SUB and shall be maintained and operated only by SUB personnel unless otherwise agreed herein. Exercising of valves and hydrants, line flushings, etc. will be done by the utility owners, unless agreed otherwise herein.
5. Utility locate requests along the service boundary line shall be reviewed and discussed between the two utilities. A decision shall be made as to which utility shall provide the locate services. The main distribution line will the criteria for establishing responsibility for locate requests. SUB shall provide locates for the mains and services per the agreed upon service boundary map, where the main distribution line lies within the city limits.

6. Some maintenance and construction projects may require the joint cooperation of the two utilities. This may include leaks, main replacement, valve maintenance and repair, hydrant maintenance and repair, and flushing. In all boundary areas, SUB and Rainbow Water District agree to discuss each of the joint projects prior to beginning them, including cost sharing opportunities and agreement on responsibilities. The intent of those discussions will be to maintain good customer relations, high levels of service, low cost, efficient project completion, and minimal inconvenience to one another's utility.

#### B. OPERATIONS

1. All water customers within the city limits will become customers of SUB regardless of the location of the service line and distribution line. When customer services are required for any affected customers, the utilities will cooperate as necessary in order to have the customer contact the appropriate utility. It is intended that the customer contact only one utility for service or information.
2. Where city, state, or local road improvements require modification of facilities, both utilities agree to meet and confer in those boundary areas. SUB will be responsible within the city limits and Rainbow Water District will be responsible within its service area. Both utilities may agree to enter into a cost sharing agreement, whereby, one utility would be responsible for the construction of the improvements and bill the other utility a proportional amount. Any water replacements required as a result of road improvements will be a minimum of 6" in diameter, unless mutually agreed otherwise.
3. Rainbow Water District will provide copies of its customer records to SUB. This is intended to allow a smooth transition of records, customers, and personnel. The schedule for viewing the records is as follows:
  - a. SUB and Rainbow Water District agree to meet and review facility/maintenance records by November 1, 1991. Facility/maintenance records include but are not limited to leak records, construction records, facility records, meter records, backflow records, etc.
  - b. SUB and Rainbow Water District agree to meet and confer on transfer of customer records by November 1, 1991. This is to include, but not be limited to:
    1. List and information on all Rainbow Water District fire protection services within the city limits.
    2. Information on any special contracts Rainbow Water District may have and how they are to be transferred to

SUB. Example: Landlord agreements, winter agreements, social agencies and collection agencies.

3. Pending service orders due subsequent to the date of transfer for lock-ins, lock-outs and disconnects.
  4. List and information on backflow prevention devices and records.
- c. SUB and Rainbow Water District agree to meet and review by December 1, 1991, the material inventory requirements in order for SUB to perform work in the areas withdrawn under the 1982 Withdrawal and Service Agreement.
- d. Rainbow Water District and SUB representatives will meet by December 1, 1991 to discuss and resolve problems associated with merger of financial records. These include such records as accounts payable, accounts receivable, customer bills, utility adjustments, refunds, fixed assets, etc.
1. Customer Deposits - At the time of account transfer, Rainbow Water District shall remit to SUB all security deposits received from Rainbow's city customers along with a detailed accounting thereof as a part of transferred city customer account information.
  2. Accounts Receivable - At the time of account transfer, SUB will pay to Rainbow all amounts due from transferred customers for water, basic monthly meter fees and services which were provided previous to the transfer, but which have not been paid less all amounts previously turned over to a collection agency and adjusted for the average winter quarter city customer payment percentage for January - March, 1991 as reported by Rainbow in its its quarterly payment report to SUB. This compensation shall be calculated at the regular in-city residential and commercial rates. Rainbow will prorate and pay to SUB as part of its regular quarterly payment the appropriate portions of these funds which are due SUB as defined in the 1982 Withdrawal and Service Agreement. Rainbow shall provide necessary documentation to SUB for these amounts due. Rainbow will remit to SUB all payments received inadvertently or otherwise from its former city customers after account transition to SUB with appropriate identification.
- e. For record keeping purposes, Rainbow will read all of its city customer meters for the last time during the period May 14 - 21, 1992. Rainbow will provide these meter readings to SUB as soon thereafter as possible for future SUB billing. Rainbow will mail its city customers their

final water bill based on these meter readings and direct customers to make payment to SUB for this amount. The account transfer for each account will be considered to occur on the date that the meter was last read by Rainbow during this period.

- f. SUB will provide a monthly report providing an accurate accounting of all consumption and sales in areas formerly served by Rainbow Water District. The reports will be in summary form. Rainbow Water District has the right to review detailed supporting documents in order to verify summaries. SUB will provide the monthly report beginning on January 1, 1992.
4. At the time of withdrawing the areas covered under the 1982 Withdrawal and Service Agreement, it is probable that Rainbow Water District and SUB will owe water to one another. Under the terms of this agreement, the balance of water would be billed at the agreed upon wholesale rates (SUB's or Rainbow Water District's).
  5. Water system construction/reconstruction by Rainbow Water District and financed by developer fees may be underway when the area covered under the 1982 Withdrawal and Service Agreement is withdrawn. SUB may ask Rainbow Water District to complete the work and keep the fees collected. As an option, SUB may complete the work and receive a prorated reimbursement from Rainbow Water District. If no field construction has started, all new meter charges and/or existing facility charges collected but not expended on projects by Rainbow Water District for improvements inside the city limits shall be transferred to SUB.
  6. The quarterly payment paid by Rainbow Water District to SUB shall be prorated for any time after the last full quarter up to the date of transfer based on historical amounts and historical city payment percentages for that quarter of the year.
  7. Flushing of distribution lines will require a joint effort by SUB and Rainbow Water District. Rainbow Water District will flush their system every other year in cooperation with SUB's flushing activity in the areas covered under the 1982 Withdrawal and Service Agreement. In addition, both SUB and Rainbow Water District agree to flush all dead end lines every year.
  8. New services shall be coordinated and installed by the utility which collects the system development charges for the installation of that service.
  9. Kelly Butte and Moe Hill reservoirs will be inspected once each year by video camera or other mutually agreeable means. Cleaning of the interior of the reservoir will be a joint decision, based

upon the results of the inspection.

10. SUB and Rainbow Water District shall install and maintain high pressure shut-offs, chlorine fail alarms/shut-offs, continuous chlorine monitoring/recording equipment and continuous pressure recording on all facilities which can deliver water into the Rainbow Water District system.
11. Rainbow Water District shall provide a current set of water distribution maps for its facilities inside the city limits to SUB on May 1, 1992. The purpose is to provide SUB with the most accurate and up to date facility information available in order to efficiently and effectively meet customer requirements.
12. Either utility may contract help from the other utility for constructing water system improvements. These joint construction projects shall be based on a mutually agreeable scope of work, mutually agreeable billing and accounting procedure and mutually agreeable schedule. The help might be in the form of labor, vehicles, or a combination.
13. At such time as the Rainbow Water District ceases its water supply and distribution function, SUB agrees to maintain water service consistent with prudent utility practice to all customers located in the former Rainbow Water District service area and further agrees that it will charge those customers the same rates as it charges its customers inside the city limits.

MARCOLA ROAD INTERTIE

1. SUB and Rainbow Water District agree to reconstruct the intertie between the present Rainbow water system and the SUB water system. The reconstructed intertie will allow water to flow from Weyerhaeuser wellfield into the present Rainbow water system, via the present interconnection on Marcola Road near 31st St.
2. Cost of reconstruction will be shared equally between the two utilities. The estimated cost of construction is approximately \$42,000.
3. The intertie reconstruction work shall be completed by February 1, 1992.
4. The work will include the following:
  - a. Vault and piping at 35th and Olympic, including new valves, tees, and flow regulation/monitoring equipment in the 18" transmission line. SUB will provide the construction plans and lead the construction crew. Rainbow will provide help in the construction.
  - b. Construction of a short by-pass around the new intertie to allow water from SUB's Maia well to flow into the east SUB system without affecting Weyerhaeuser water.
  - c. Installation of a new mag-meter at 35th and Olympic. SUB will provide construction plans and perform the work.
5. Water from the Weyerhaeuser wellfield shall flow south into the SUB system and north into the Rainbow water system. SUB's total share shall be equal to one-half of the Weyerhaeuser wellfield production, including adjustments for a few SUB customers on the north side of the new metering point. A monthly accounting statement will be prepared by SUB and water quantities reconciled for payment.



WATER ACCOUNTING

1. Water production accounting by both utilities will be calculated for daily 24-hour periods with sufficient detail to allow an understanding of water produced by each source facility. Interties will be read daily by Rainbow.
2. All source and intertie meters shall be tested at a frequency no longer than every twelve (12) months. Calibration will be performed to the manufacturer's maintenance standards, but with a minimum accuracy of +/- two (2) percent of actual flow rate within manufacturer's recommended accuracy range. It is further agreed that +/- two (2) percent of actual flow rate is the standard for mid and high flow ranges.
3. Calculation of water production from pump hours will be allowed as a temporary replacement for water source metering only where accurate head-discharge curves (calibrated within the previous eighteen (18) months) are available for each pump affected and an accurate record of actual pump hours (accurate to within a tenth (10th) of an hour) is maintained. This alternative is considered for the purposes of this agreement to be an emergency alternative only. Both parties agree that the inaccurate meter will be either repaired or replaced within a thirty (30) day period.
4. At month end, consumption records for all customers within areas covered under the 1982 Withdrawal and Service Agreement will be tabulated and exchanged no later than the tenth (10th) of the following month. Bills calculated and presented for payment will be paid within thirty (30) days after invoice date. The water billed to SUB shall be calculated as follows: SUB's net metered customer usage from Rainbow, as adjusted (increase or decrease) by intertie flows, multiplied by the unit cost of water as per the water cost and water transfer sections of this agreement. One component will be the actual intertie flow minus unaccounted-for water using Rainbow's figures for the previous year. The second component will be the intertie flow out of areas covered under the 1982 Withdrawal and Service Agreement into the remaining SUB system and shall be charged at the wholesale water rate per the water cost section of this agreement. Rainbow sales plus SUB sales will be added and compared against Rainbow production records for the month as a cross-check for accuracy. Noticeable discrepancies will be examined by both SUB and Rainbow. Billing disputes shall be subject to negotiation and the arbitration process agreed upon in a separate section. The unit cost of water shall be that determined in the water cost section of this agreement.
5. Unaccounted-for water is defined as the difference between the amount of water produced minus the amount of water sold and shall include any water provided by SUB to Rainbow. The annual unaccounted-for water rate shall be adjusted annually at the February water cost meeting as described elsewhere in this agreement and shall take effect in the water use month ending in

the following March and shall be applied to all bills for the following year.

6. All service meters (meters within the Rainbow Water District and service meters which shall fall within the areas covered under the 1982 Withdrawal and Service Agreement) will be calibrated to recommended AWWA new meter standards for the meter size and type. Approximately five percent of the meters will be tested each year. When a meter fails to meet AWWA standards, it shall be replaced. In addition, when an unacceptable level of inaccurate meters is noted (as determined by cost benefit analysis), the respective utility will schedule a meter replacement program based on brand, age, service and test results. Meter test data will be provided by both utilities upon request.
  
7. SUB agrees to read the water meters within areas covered under the 1982 Withdrawal and Service Agreement within eight business days. SUB will notify Rainbow if adjustments in the schedule of the eight business days becomes necessary due to illness or injury of readers, inclement weather, or other extraordinary causes. The schedule for meter reading will be provided to Rainbow annually at the beginning of each calendar year. The intent is to coordinate meter reading in the areas covered under the 1982 Withdrawal and Service Agreement with the Rainbow service area outside the city limits in order to monitor water sales in the respective service areas.

WATER COST DETERMINATION

Both SUB and the Rainbow Water District shall calculate the average unit production cost of water each February based upon the previous fiscal year of cost data, subject to adjustments after auditing. This calculation will establish the wholesale cost of water between the two utilities and be used as the basis for establishing the amount of water to be purchased by SUB from the Rainbow Water District. It is important that both utilities maintain the same system for calculating these costs. Costs are divided into operation and maintenance costs, depreciation costs and administrative/general costs. These cost components are defined as follows:

- a. OPERATION AND MAINTENANCE - This is a general category to recover the annual short term (twelve (12) month) costs of operating water source facilities. It includes such things as power for pumping of source (no pump stations for repumping), lease payments for telephone lines, chemical cost for chlorination and testing, and the miscellaneous expenses for materials and services to maintain the source facilities. For the purposes of this section, reservoirs are considered part of water production. The O&M costs include direct labor, materials and equipment expenses.
- b. DEPRECIATION - Depreciation will be calculated using recognized and accepted methods of accounting and will follow the Useful Life Depreciation Schedule below. Capital improvements (permanent improvements to source facilities of more than \$500) shall be used in the depreciation calculation. Open work orders (jobs begun, but not yet closed to plant) may be used in the depreciation calculation if the work is essentially complete, but not yet closed to plant. Depreciation shall also include a proportional amount of general plant depreciation such as offices, furniture and computers. Only twenty-five percent (25%) of the total general plant depreciation costs are allocated to source.
- c. ADMINISTRATION AND GENERAL - This cost is composed of overheads within the organization to produce the water at the source and administrative overheads in order to support those people and resources that produce the water at the source. Only twenty five percent (25%) of administration overheads are allocated to source.

Therefore, the total production cost is equal to operation and maintenance + depreciation + administration & general overheads.

The percentages identified in b. and c. above that are allocated to source will be reviewed and adjusted bi-annually based on a mutually agreeable cost-of-service study. The study will be jointly funded. Each utility is to pay for their share of the costs of the study, prorated on gross water revenue. The study of each utility's operations shall be performed by an independent auditor. The results of the study will be reviewed and incorporated into the calculation

of average unit production cost of water during the February meeting establishing the cost of water to SUB.

The average unit production cost of water for the Springfield Utility Board is calculated by dividing each of the above cost components by the number of units of water produced by the Springfield Utility Board. The three unit costs are then added together and divided again by the twelve (12) month running average of accounted-for water in the SUB system as determined annually.

The average unit production cost of water for the Rainbow Water District applied to the SUB purchase agreement is calculated by dividing each of the above cost components by the actual amount of water sold to customers (both in the Rainbow Water District and water sales to the Springfield Utility Board). The three unit costs are then added together.

Useful Life Depreciation Schedule

Item	Depreciation Life (years)
Buildings	39
Chlorination Equipment	22
Chlorination Eq. (Small)	10
Pumping Equipment	25
Pumping Plant Rehabilitation	10
Reservoirs	60
Roads	50
Telemetry Control System	20
Vehicles	9
Water Mains	50
Water Quality Equipment	10
Wells	50
Well Rehabilitation	10

WATER QUALITY AGREEMENT

1. This section relates to the quality of all water produced by Rainbow Water District facilities and all water produced by SUB facilities which cannot be physically excluded from entering the water service area of the Rainbow Water District. If Rainbow's water source capacity which was in existence on or before October 1, 1991 is removed from service for water quality reasons then Rainbow's requirement to provide water as described elsewhere herein and SUB's requirement to purchase water as described elsewhere herein is reduced. The basis for the reduction will be Rainbow's long term pumping capacity for that well and/or facility as determined and documented on October 1, 1991.
2. Both utilities agree that all water supplied within the area defined above shall meet all federal and state water quality standards and be acceptable to the majority of both utilities' respective constituencies.
3. Rainbow and SUB agree to exchange information as requested on water chemistry, bacteriology and other water quality test analyses which have been performed, whether mandatory or voluntary.
4. The other utility is to be consulted if water quality test results reveal any contamination in any of the following categories: volatile organic compounds, radionuclides, bacteriological/biological materials, synthetic organic compounds, disinfection by-products or inorganic compounds, whether regulated or not.
5.
  - a. A water quality resolution committee of five members will be established to help solve disputes on water quality issues. The committee will be composed of one board member and one employee from each utility and a representative from the Oregon State Health Division. The majority decision of the committee will serve as the recommendation to the respective boards of commissioners.
  - b. SUB and Rainbow must mutually agree on operation of water production facilities if any of the regulated contaminants in paragraph 4. above are detected and confirmed to exist at a level of one-tenth (0.1) or more of the Maximum Contaminant Level (MCL).
  - c. Pursuant to the water transfer section of this agreement, contamination exceeding federal or state standards or unacceptable to the majority of both utilities' respective constituencies shall be considered a loss of water production capacity equal to the long term pumping capacity of the facility until mitigated or treated to an acceptable level.
6. Disinfection of all water described in section 1. above will comply with minimum, current state standards. The operational target for disinfection is to be equivalent to 0.5 mg/l free chlorine residual under current regulations and normal operating procedures.
7. The other utility is to be informed and invited to comment if any

major changes in treatment type/process, disinfection type/process, backflow prevention programs and line flushing programs, etc. are planned.

8. Water system pressures in the areas covered under the 1982 Withdrawal and Service Agreement are expected to remain at historical levels.
9. To help protect the ground water resource in the Springfield area aquifers, both utilities shall complete a ground water protection study by December, 1992. As a minimum, the study will inventory, assess and make recommendations to mitigate the risks of contamination to all wells owned by the two utility systems. The studies will be conducted cooperatively, and each utility will be responsible for the study of its own resources. Results of the the studies will be reviewed by the water quality resolution committee and forwarded to the respective utility boards with recommendations for implementation of a ground water protection plan.

WATER TRANSFER AGREEMENT

1. In May, 1982 SUB and Rainbow Water District agreed that in May, 1992 Rainbow Water District would transfer all its customers within the city limits of Springfield to SUB and provide water supply to those customers at historical levels of usage thereafter. Rainbow Water District has water that is surplus to its present needs and expects to have surplus water in the future. SUB desires to purchase additional water for its customers inside the areas covered under the 1982 Withdrawal and Service Agreement and other SUB customers. Therefore both SUB and Rainbow Water District agree to enter into the following water transfer agreement under the provisions of ORS 190.

The minimum amounts of water to be provided by Rainbow Water District to SUB from all operating or operable wells active October 1, 1991, under the conditions set forth below shall be:

- a.) SUB agrees to purchase a minimum of 0.53 MGD for the months of September through June, inclusive; and 1.4 MGD for the months of July and August.
- b.) If Rainbow Water District's unit cost of wholesale water, as defined elsewhere herein, is at or below 140 percent of SUB's unit cost of wholesale water, as defined elsewhere herein, then SUB agrees to purchase a minimum of 125 percent of the amounts shown in a.) above (0.6625 MGD and 1.75 MGD, respectively).
- c.) If Rainbow Water District's unit cost of wholesale water, as defined elsewhere herein, is at or below 125 percent of SUB's unit cost of wholesale water, as defined elsewhere herein, then SUB agrees to purchase a minimum of 200 percent of the amounts shown in a.) above (1.06 MGD and 2.8 MGD, respectively).
- d.) If Rainbow Water District's unit cost of wholesale water, as defined elsewhere herein, is at or below 100 percent of SUB's unit cost of wholesale water, as defined elsewhere herein, then SUB agrees to purchase a minimum of 2.5 MGD for the months of September through June, inclusive and 5.0 MGD, for the months of July and August.
- e.) The cost components used to determine SUB's unit cost of wholesale water will be based on the same components and methodology as for determining Rainbow's unit cost of wholesale water. SUB's unit cost of water for comparison purposes shall include a water loss adjustment, such that the comparison to Rainbow's wholesale water cost rate is made on the same basis. SUB's water loss rate for the prior year shall be used. The water loss rate (unaccounted for water) is defined as the difference between the amount of water produced minus the amount of water sold and then divided by the total water produced, with the result expressed as a

percentage.

For the determination above, SUB's unit cost of wholesale water will be calculated annually, with a commitment on a minimum water quantity to be purchased by SUB, based on the comparison called for under Section 2 herein, made in writing by February 28th for each ensuing year.

2. SUB may purchase up to an additional 2.0 MGD above the historical level of usage of customers in areas covered under the 1982 Withdrawal and Service Agreement which is defined here to be 4.2 MGD under the terms of this agreement. In the event of a long term or short term loss of water production capability by Rainbow, then the maximum amount of purchased water shall be reduced on a prorated gallon-for-gallon basis based on a formula comparing SUB's option to purchase water to the total long-term pumping capacity of Rainbow as tested before October 1, 1991. Long-term pumping capacity is defined here to mean maximum continuous pumping determined for each well for seven days or longer in August or September.

SUB is to be consulted if a well is taken out of service as described elsewhere in this agreement. In the event that Rainbow Water District makes other discretionary, long term decisions that reduce the long-term pumping capacity defined above, then SUB shall be consulted prior to making such decision. The ultimate decision whether to operate a well will be the owner's and will be based on public health, water quality and/or aquifer protection.

3. If Rainbow Water District constructs a new well in the future and determines that some portion of its capacity is surplus to its needs then SUB may contract for as much of this well's surplus capacity as it agrees to purchase on the basis of 100% of the daily amount purchased during the months of July and August (summer) and 75% of the same daily amount for the remaining 10 months of the year (winter). The amount that SUB agrees to purchase shall be a permanent addition to the minimum purchase amounts described in paragraph 1.a through 1.d above.
  - a. For additional water source capacity, SUB may contract with Rainbow to construct all or a portion of this required water source capacity under the same provision described in paragraph 3. above.
4. Rainbow Water District agrees to test pump all operable wells which existed on October 1, 1991, at least every 18 months. Based on the results and economic analysis, Rainbow Water District may rehabilitate the wells to bring them back to their optimum practical capacity, or to pursue other options for maintaining their water production capability in the most economic, cost effective fashion. Their combined capacity shall not fall below 80 percent of long term capacity as established in Section 2. above, subject to the above conditions.



Rainbow Water District also agrees to repair any pump, motor or other wellfield mechanical difficulty as soon as possible. As soon as possible shall be defined as Rainbow Water District's ability to find parts, and/or schedule repairs, even if the repairs are provided by private contractor.

5. It is the intent of all parties hereto that unless otherwise provided herein, SUB will have the right to provide water to its customers within the areas covered under the 1982 Withdrawal and Service Agreement from SUB's own source facilities. This right is equal to or less than all water actually consumed by them each month. All water provided from SUB water source facilities to their customers within the areas covered under the 1982 Withdrawal and Service Agreement that is in excess of their customer needs at the end of the accounting month is considered for the purposes of this agreement to be excess water and will not be carried forward as a credit against future water provided from Rainbow's source facilities.
6. Subsequent to assumption of water service by SUB in areas covered under the 1982 Withdrawal and Service Agreement, combined SUB and Rainbow water demand within the former and present Rainbow service area shall not result in lower Kelly Butte and Moe Reservoir levels than the standards described below:

It is agreed that when the water level in either Kelly Butte or Moe Reservoir reaches 70% of capacity, throttling of the intertie flow (by valve operation of up to 50% of intertie flow immediately before throttling) may be exercised by Rainbow Water District. When either of the reservoirs reaches 60%, Rainbow may close off all intertie flows into the pre-May, 1992 SUB system. SUB will be informed of all throttling actions by Rainbow Water District personnel as they occur.

This procedure is intended to maintain a minimum reservoir level of 50%.

Interties to the SUB system will be re-opened to their previous flow rate immediately before throttling when the lower reservoir returns to 80% full.

7. The intent of this section is that SUB will be entitled to all amounts of water up to the agreed limits and that both parties will pay a fee for overdraws from the other utility's source facilities. It is recognized that customer water usage is the main indicator of water demand. Monthly customer usage averaged over the water accounting month will be the indicator of overdraws of source water. Subsequent to SUB assumption of water service to customers in areas covered under the 1982 Withdrawal and Service Agreement, combined SUB and Rainbow customer demand shall not result in lower Kelly Butte and Moe Reservoir levels than the agreed upon minimum described herein.

The fee is intended to be a strong disincentive for exceeding this agreement. It is recognized that averaging water usage over the water accounting month for determination of the fee decreases the likelihood of incurring the fee since the climate in Springfield has few very hot days which cause customers to demand large amounts of water. Averaging these high demand days over the water accounting month biases the method toward the recipient. For this reason, the fee is set at the following amounts:

Water Sold to SUB Customers within Areas covered under the 1982 Withdrawal and Service Agreement	Multiplier applied to Unit Cost of Wholesale Water
>100% and <105%	5 times
105% to <115%	25 times
115% and greater	100 times

The fee will be applied to all water sold to city customers that is above the agreed monthly amount allowed in Sections 1, 2, and 3 herein. It shall apply to any water sold to Rainbow, unless sold under terms of a separate, mutually agreed arrangement and except water conveyed to Rainbow by SUB under the conditions defined in Section 5. above.

8. SUB agrees that it will provide the necessary water production capacity in its own system that will allow SUB to comply with and meet the water use requirements that arise from development within areas covered under the 1982 Withdrawal and Service Agreement and without intentionally calling upon Rainbow Water District for well capacity under the terms of the fee provision described herein.

In the event SUB develops additional well capacity for the areas covered under the 1982 Withdrawal and Service Agreement and the water produced from this additional water resource is drawn upon or utilized by the Rainbow Water District either inadvertently or under emergency conditions, the provisions of Section 5 herein notwithstanding, for water used by Rainbow will be SUB's unit cost of wholesale water for up to 2.0 MGD. All amounts of water above that amount shall be subject to the fee schedule described above.

9. Future transfers of facilities from Rainbow to SUB shall alter the terms of this agreement by the transferred well capacities as determined at the time of transfer.

This agreement may be enforced as a contract between the parties. Without limiting any other remedy which may be available for enforcement of this agreement, it is specifically understood and agreed that the remedy of specific performance shall be available to either party to this agreement to assure performance of the agreement according to its terms during the duration.

IN WITNESS WHEREOF, the parties have hereunto set their hands and respective corporate seals this 23 day of JANUARY, 1992.



SPRINGFIELD UTILITY BOARD

by: W. Matt Hall  
Chairman

by: Steve J. Javeland  
Secretary



RAINBOW WATER DISTRICT

by: Roy Wise  
Chairman

by: Ferneth D. Glavin  
Secretary

APPROVED: CITY OF SPRINGFIELD, a municipal corporation

by: Bill Morrisette  
Mayor

ATTEST: Gileen Stein  
City Recorder

Urban (Water) Service Agreement  
Between Rainbow Water District,  
Springfield Utility Board and  
City of Springfield, Oregon

This Urban Service Agreement is made and entered into by and between the Rainbow Water District, a municipal corporation of the State of Oregon and special service district providing water service, hereinafter referred to as "Rainbow," the Springfield Utility Board, the agency of the City of Springfield designated by the charter of the City of Springfield as the agency responsible for water and electric utility operations within and for and on behalf of the City of Springfield, Oregon, hereinafter referred to as "SUB," and the City of Springfield, a municipal corporation of the State of Oregon.

RECITALS:

WHEREAS, the parties wish to comply with the requirements of ORS 195.020, et. seq., including ORS 195.065, and have considered and addressed the following factors:

- a. Financial, operational and managerial capacity of providing water services;
- b. The effect on the cost of water service to the users of the service, the quality and quantity of the service provided and the ability of urban service users to identify and contract service providers, and to determine their accountability with ease;
- c. Physical factors related to the provision of the water services;
- d. The feasibility of creating a new entity for the provision of water services;
- e. The elimination or avoidance of unnecessary duplication of facilities;
- f. Economic, demographic and sociological trends and projections relevant to the provision of water services;
- g. The allocation of charges among urban service users in a manner that reflects differences in costs of providing services to the users;
- h. Matching the recipients of tax supported urban services with the payers of the tax;
- i. The equitable allocation of costs between new development and prior development; and

- j. Economies of scale; and

WHEREAS, the parties have considered and addressed the following additional factors:

- a. Their Agreement's effect on the financial integrity and operational ability of each service provider and its projection of solvency and commitment on affected service providers; and
- b. Capital debt of the providers and short- and long-term finances; rates; employee compensation, benefits and job security; and equality of services; and

WHEREAS the parties accept as a goal cost-effective resource utilization and the parties acknowledge that, with time, Rainbow will cease to exist as a water supply and distribution utility; and

WHEREAS the parties are committed to cooperation between all Rainbow, SUB, and City of Springfield operational groups and the parties agree that all Rainbow, SUB and City of Springfield employees are an important and valuable resource in meeting customer needs and that satisfied customers are a primary reason for utilities to exist; and

WHEREAS additional well head protection studies and the sharing of water quality information will continue between the parties and the parties commit themselves to educating city counselors, board members, planning commissioners, boundary commissioners, and others on a variety of water issues; and

WHEREAS the parties agree on the importance of long-range planning and Rainbow and SUB will remain committed to providing the best possible long and short-term service, including investment in facilities, to all customers in the urban growth boundary; and

WHEREAS the parties commit themselves to resolving any remaining issues between Rainbow and SUB so as to be able to concentrate on providing water service the community; and

WHEREAS the parties wish to have a new written agreement define their respective performance of the water utility service functions and activities by each to provide for high quality, efficient methods of water services to the residents of the Springfield, Oregon area now and in the future; and

WHEREAS the parties signed a Withdrawal and Operations Agreement dated January 23, 1992, which was amended May 7, 1992, the parties desire that such Withdrawal and Operations Agreement not be affected by this Agreement, remaining in full force and effect unless changed by specific reference in this Agreement.

NOW THEREFORE, Rainbow, SUB and the City of Springfield do hereby agree as follows, each in consideration of the mutual promises, covenants, agreements and performances hereinafter set forth, of the other parties:

1. 1992 Withdrawal and Operations Agreement

The 1992 Withdrawal and Operations Agreement between the parties is hereby restated and reconfirmed by the parties. Such Agreement is attached to this Agreement as Exhibit "A" and, by such reference, is fully incorporated herein as though fully set forth. Such 1992 Agreement shall remain in full force and effect.

2. Financial Integrity and Operational Ability of Each Service Provider

The respective parties to this Agreement confirm that they have considered the Agreement's effect on the financial integrity and operational ability of their utility and that no substantial problems are expected in these regards. Further, each party confirms that each service provider's solvency will not be jeopardized nor customer service be negatively affected by this Agreement.

3. Capital Debt; Rates; Employee Compensation; and Equality of Service

As described on page 4 of the parties 1992 Withdrawal and Operations Agreement (Exhibit "A") with regard to Assumption of Obligations by the City of Springfield for Territory Withdrawn from the Rainbow Water District, Rainbow and SUB have comprehensively addressed issues of their capital debt and short- and long-term finances.

Further, the parties confirm that they have addressed the issue of rates in such 1992 Agreement (Exhibit "A") on page 9, at paragraph 13, and hereby reconfirm such understanding as follows: At such time as the Rainbow Water District ceases its water supply and distribution function, SUB agrees to maintain water service consistent with prudent utility practice to all customers located in the former Rainbow Water District service area and further agrees that it will charge those customers the same rate as it charges its customers inside the city limits.

All issues of employee compensation, benefits and job security have been comprehensively addressed in the parties' 1992 Agreement (Exhibit "A"), specifically the Personnel Transfer Agreement Between SUB and Rainbow dated May 7, 1992, which provisions begin on page 22 of Exhibit "A."

4. Compliance with ORS 195.020 et seq.

By this Urban Service Agreement, the parties intend to meet all of the requirements of ORS 195.020 et. seq., including ORS 195.065. The purpose of this Intergovernmental Agreement is to:

- recognize the eventual merger of the two utilities into one water supply and distribution utility;
- provide a rational plan leading to the merger of water services with meaningful involvement of both parties; and
- insure that the high quality water and service both utilities presently provide to water utility customers in the community is maintained for the future.

The parties further agree as follows:

a. Provision of Water Services Within the Urban Growth Boundary

The parties agree that SUB will, eventually, provide all water services within the Springfield Urban Growth Boundary (UGB). Until such time, Rainbow will be the exclusive provider of water services within its boundaries in accordance with federal, state and other pertinent law.

b. Functional Roles for Each Service Provider

The parties agree that the functional roles for each service provider with regard to the provision of urban services within the Springfield UGB shall be as follows: The Rainbow Water District will be an interim water service provider to properties within the district boundaries plus the Gamebird Village and Raleighwood Subdivisions, as these boundaries come to be adjusted consistent with this Agreement and Oregon law, hereinafter: "Rainbow's Boundaries." SUB will be the future provider of water services within the entire Springfield UGB.

c. Future Service Area for Each Provider

The future service area for SUB will be the area within the Springfield UGB. The future service area for the Rainbow Water District will be existing Rainbow Boundaries, as defined above, as these boundaries come to be adjusted consistent with this Agreement and Oregon law.

d. Responsibilities for Planning and Coordinating

The City of Springfield shall be responsible for land use planning and coordinating the provision of water services with other urban services within the Springfield UGB. This will occur according to the terms of this Urban Service Agreement and the Water Services Cooperative Agreement under ORS 195.020 between the City of Springfield, Rainbow Water District and Springfield Utility Board.

e. Planning, Constructing and Maintaining Service Facilities

The City of Springfield, by and through SUB, will, eventually, consistent with the terms of transition included in this Agreement, plan, construct and maintain all water service facilities within the Springfield Urban Growth Boundary. Until the completion of this transition, Rainbow will maintain water services exclusively within its boundaries in accordance with federal, state and other pertinent law.

f. Management and Administration of Water Services to Urban Users

For the purposes of this Agreement, urban users of water services are defined to be present or future customers who receive water service from one of the parties to this Agreement.

1. Rainbow will manage and administer water service exclusively to customers within its boundaries and for the Gamebird Village and Raleighwood Subdivisions, until otherwise agreed upon.
2. SUB will manage and administer water services exclusively to all other areas within the Springfield UGB.
3. SUB will succeed Rainbow to service those customers transferred by Rainbow as otherwise provided.

g. Terms of Transition

The parties agree to the following terms of transition:

1. **Water Master Plan Development**

SUB and Rainbow will jointly fund a 20 year Water Master Plan (plan) for all of the area within the Springfield UGB. The intent of the plan is to meet state resource planning requirements, provide long-term protection to the area's groundwater resources,



provide safe drinking water that meets all water quality regulations now and in the future, and to insure the development of an infrastructure capacity able to efficiently deliver water to the current and future customers of the planning area in the quantities needed.

The contents of the plan will be developed by the staffs of SUB and Rainbow and will require approval by the boards of directors of SUB and Rainbow. The contents of the plan will also include a careful description of the duties of the consultant, criteria for carrying out those duties, and standards for exercising those duties. Both Boards will ensure that the plan is structured so that present and future facility needs are scheduled for construction based on projected water demands for defined sub-areas within the study area based upon the plan, as it is initially approved and updated by the SUB and Rainbow Boards.

A mutually agreeable consultant shall be chosen to assemble the data provided by the staffs of SUB and Rainbow, to analyze the data, to request further data as needed and to write a draft version of the plan for approval by the commissioners of Rainbow and SUB. SUB and Rainbow have the right to suggest changes to the draft copy. Changes approved by both such parties will be included in the final master plan report.

The consultant fees for this report will not exceed \$50,000, to be split equally by Rainbow and SUB. Upon final approval of the draft version of the Water Master Plan, the consultant will incorporate all approved changes and provide the final Water Master Plan.

The Water Master Plan will become effective upon approval of both the Rainbow and SUB Boards. The Water Master Plan shall be developed and approved by the parties over a twelve month time period. Rainbow and SUB agree to promptly begin the process of consultant selection beginning with the date of the full signing of this Urban Service Agreement. These parties agree that the consultant's work (in active and continuing consultation with both Rainbow and SUB staff) will be completed within nine months of the date of the full signing of this Urban Service Agreement. The respective Boards of Directors of SUB and Rainbow will take action upon the consultant's recommended Water Master Plan for approval by not later than twelve months after the date of the signing of this Agreement. All decisions about new or improved capital facilities and expenditures shall be made consistent with the Water Master Plan. If the Water Master Plan is not fully approved by both the SUB and Rainbow Boards of Directors within such twelve month time period, the Water Master Plan shall be the plan of the mutually acceptable consultant, including any and all changes agreed upon by the SUB and Rainbow Boards of Directors. The Rainbow and SUB Boards of Directors can agree in writing to modify such plan at any time. Upon Board approval or adoption of the Water Master Plan or implementation of the consultant's plan, the SUB and Rainbow Boards of Directors and staff fully commit themselves to implementing the Water Master Plan.

Rainbow and SUB further agree that the Water Master Plan shall be formally updated at least every five years with the meaningful involvement of a mutually acceptable consultant. Further, a joint committee of Rainbow and SUB may, at any time, recommend changes to the Water Master Plan to the commissioners of Rainbow and SUB. Changes approved by both Rainbow and SUB shall be effective upon approval by both the SUB and Rainbow Boards of Directors.

## 2. Capital Improvements under Water Master Plan

SUB and Rainbow agree to construct capital improvements in the SUB-North/Rainbow area, as defined in the map attached to this Agreement as Exhibit "B," according to the Water Master Plan. In addition to other capital improvements to be described in the Water Master Plan, Rainbow and SUB agree that the capital improvements provisions of the Water Master Plan shall include the following:

- A. SUB will contribute thirty percent (30%) of the total costs, not to exceed \$600,000 (September 1994 dollars) toward Rainbow replacing and expanding the existing 2.0 million gallon (MG) Moe Hill Reservoir with a new 4.0 MG reservoir on the same site. Such \$600,000 maximum SUB contribution shall be adjusted based upon the Seattle Engineering News Record Construction Cost Index. For reference, such index was, as of September 1994, at 5843. Such index adjustment shall be performed upon the awarding of the Moe Hill Reservoir construction contract. Such construction project shall be coordinated by Rainbow. Rainbow will advertise for construction bids within six months of the full signing of this Agreement and proceed with due diligence thereafter to completion. SUB's financial contribution will be paid proportionately throughout the project based upon documentation and invoices submitted to SUB by Rainbow. SUB's Ownership of the new Moe Hill Reservoir will be joint, based on the proportion of funding provided by each party (anticipate SUB 30% and Rainbow 70%). This facility shall be operated and maintained in accordance with the parties' 1992 Withdrawal and Operations Agreement.
- B. Rainbow will retain present ownership of the Q Street well and Kelly Butte reservoir.
- C. SUB will construct one additional source in the North SUB/Rainbow water system which will be in production by July 1, 1995, to provide approximately 800 GPM or more of new capacity.
- D. To the extent that Rainbow and SUB combined system development charges for new construction are not sufficient to pay for capital improvements in the SUB-North/Rainbow areas called for in the Water

Master Plan, each utility will fund such capital improvements in proportion to the relative amounts of water consumed by their customers in the SUB-North/Rainbow areas the previous year.

- E. Each six months, beginning six months after approval of the Water Master Plan, and until final cessation of the water supply and distribution function of Rainbow, a joint committee of Rainbow and SUB will meet to coordinate the management of projects and schedules for completion of projects consistent with the Water Master Plan. Such committee may also recommend that the Water Master Plan be modified. Such modifications shall only take effect as provided above.
- F. Both parties agree that the Water Master Plan shall have wellhead protection as a priority.
- G. The parties agree that any substantial conflicts that develop between them with regard to the implementation of the Water Master Plan shall be submitted to confidential mediation prior to either party initiating any court action.

### 3. Ownership of Facilities

Except for the above-described 4 million gallon reservoir on Moe Hill (ownership of which is described in Section 4.g.2.A., above), SUB will have exclusive ownership of all water source, storage and transmission facilities constructed pursuant to this Agreement located within the City of Springfield, within the Springfield UGB but outside Rainbow's Boundaries. The Rainbow Water District hereby releases SUB from any claim for any compensation for SUB's exclusive ownership of facilities constructed pursuant to this Agreement located within the City of Springfield, within the Springfield UGB but outside Rainbow's Boundaries.

Ownership of new water source and storage facilities constructed within the Rainbow service area with funds from both SUB and Rainbow will be joint, based on the proportion of funding provided, as such proportionality is annually determined and adjusted in June each year beginning June, 1996. Ownership percentage will be effective from July 1st through June 30th of the following year. Ownership will be determined as follows:

#### a. Construction Period and Initial Use Period Ending June 30th

Ownership of each facility constructed under this agreement will be based on the proportion of total funds contributed to its construction by each utility according to Sections 4.g.2.D and 4.g.6 of this Agreement..

b. Annually Thereafter

Ownership percentage will be adjusted according to the relative amounts of water consumed by each utility's customers in the SUB-North/Rainbow system during the previous year (June - May).

For the purposes of this Agreement, the initial fund of Connection Charges contributed by each utility will be the amount collected from all new customers who were billed and paid on or after May 20, 1992. Within sixty (60) days of the signing of this Agreement, each party hereto will develop a list of all new customers added in the Rainbow/SUB North system since that date, the size of the water meter installed, the connection charges paid, the address(es) to which the charge benefits, and the date and constructed facility(ies) to which the charges are allocated. This list will be updated as new customers in the Rainbow/SUB North system pay for new development.

4. Terms of Annexation

As property within the boundaries of Rainbow is annexed to the City and withdrawn from Rainbow, customers of Rainbow will be transferred to SUB in accordance with ORS 222.465.

5. Terms of Transfer of Monies  
and Project Responsibility

Except as described elsewhere in this Agreement or in the 1992 Withdrawal and Service Agreement, no transfer of monies or project responsibility will occur. *Both* Rainbow and SUB will keep and utilize their own capital improvement funds for use implementing the Water Master Plan. This provision does not limit the parties from future agreement(s) on transfers of monies or project responsibilities that are approved by the SUB and Rainbow Boards. Specific project responsibility will be determined by the joint committee of Rainbow and SUB that will meet to coordinate the management of projects and schedules for completion of projects under the Water Master Plan, as described above.

6. New Development

The Rainbow Water District will be responsible for all new development and redevelopment within the Rainbow Boundaries. SUB will be responsible for all new development and redevelopment to all other areas within the Springfield Urban Growth Boundary, including all those areas within the urban growth boundary not presently served by SUB or Rainbow. All system development charges for source, transmission and storage paid to the Rainbow Water District and SUB from new development or redevelopment in the SUB-North/Rainbow areas shall be devoted to future capital improvements in the SUB-North/Rainbow areas, unless otherwise agreed by both the SUB and Rainbow Boards of Directors, as are planned and described in the Water Master Plan. As described in Section

4.g.2. of this Agreement, above, to the extent that such system development charges are insufficient to pay for future capital improvements in the SUB-North/Rainbow areas, SUB and Rainbow will fund such capital improvements in proportion to the relative amounts of water consumed by their customers in the SUB-North/Rainbow areas the previous year.

SUB and the Rainbow Water District further agree to charge comparable system development charges for new development or redevelopment. Further, both SUB and Rainbow agree to perform water line and water service construction according to the standards attached to this Agreement as Exhibit "C," or as such parties come to otherwise agree in a signed writing.

The parties further agree that there shall be no reimbursement or other payment to Rainbow for any front footage investment for distribution lines made by Rainbow in the SUB North system transferred to SUB in May, 1992. The Rainbow Water District fully releases SUB from any claims in this regard.

#### 7. Eventual Merger of Service Providers

Rainbow agrees to cease its water supply and distribution function six months after the date at which its customer count drops below 400. Customers are defined for the purpose of this agreement as equal to the number of water meters.

Further, Rainbow and SUB agree to meet and confer about the advisability of a merger of their water services every five years, as part of Rainbow's and SUB's updating review of their Master Water Plan.

#### 8. Process for Review and Modification

This Agreement may be modified by written application from one party to the others, and written concurrence by the responding parties. All such amendments shall be approved by all governing bodies and, upon such approval, be made part of this Agreement.

The parties to this Agreement hereby acknowledge and agree that the City of Springfield may reopen negotiations with regard to the city's possible utilization of the urban service boundary annexation plan method (ORS 195.205). Rainbow and SUB agree in good faith to take part in any such requested negotiations.

The parties will meet to negotiate resolution of problems or conflicts concerning interpretation or implementation of the terms of this Agreement. A neutral third party may be used, if parties agree, to help facilitate the negotiations.

h. Continuation of an Adequate Level of Water Services

The continuation of an adequate level of water services to the entire areas that each provider serves will be provided for according to the Water Master Plan to be developed by the parties.

i. Affordable Service to Remaining Portion of District

The remaining portion of the Rainbow District shall receive water services in an affordable manner according to the terms of The 1992 Withdrawal and Operations Agreement between the Rainbow Water District and Springfield Utility Board as follows: At such time as the Rainbow Water District ceases its water supply and distribution function, SUB agrees to maintain water service consistent with prudent utility practice to all customers located in the former Rainbow Water District service area and further agrees that it will charge those customers the same water rate as it charges its customers inside the city limits.

j. Consistency with Acknowledged Comprehensive Plans and Land Use Regulations

This Agreement is consistent with the Eugene-Springfield Metropolitan Plan (adopted and acknowledged by the Lane Conservation and Development Commission in 1982 and subsequently amended).

5. An Enforceable Contract

This Agreement may be enforced as a contract between the parties. Without limiting any other remedy which may be available for enforcement of this Agreement, it is specifically understood and agreed that the remedy of specific performance shall be available to either party to this Agreement to assure performance of the Agreement according to its terms during the duration.

IN WITNESS WHEREOF, the parties have hereunto set their hands and respective corporate seals:



SPRINGFIELD UTILITY BOARD

By: Thomas J. Cochran  
Chairman (date)

By: Steve J. Ireland 6/19/95  
Secretary (date)

Seal



RAINBOW WATER DISTRICT

By: Douglas W. White 6/21/95  
Chairman (date)

By: Terry Schuman 6/21/95  
Secretary (date)

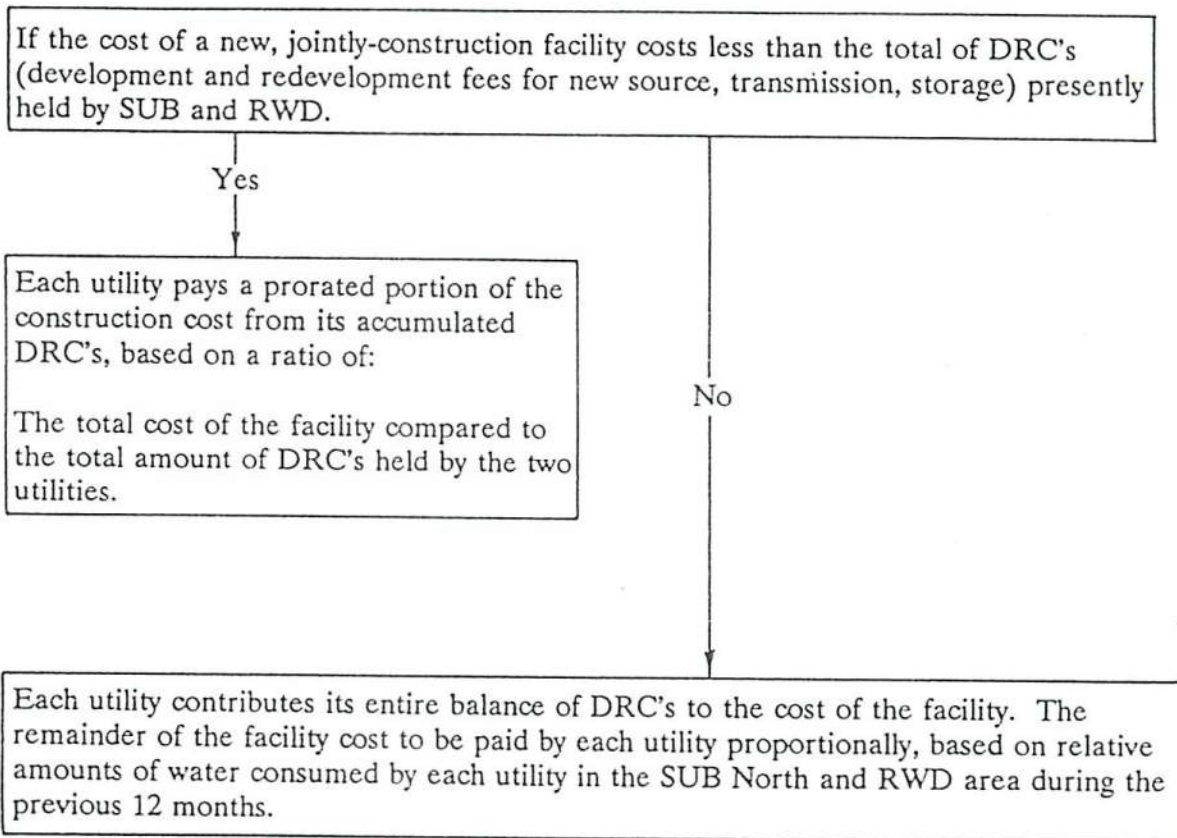
CITY OF SPRINGFIELD,  
a municipal corporation

By: Bill Morduck 7-20-95  
Mayor (date)

Attest: Eileen Steen  
City Recorder (date)

# I. FINANCING OF JOINTLY CONSTRUCTED FACILITIES

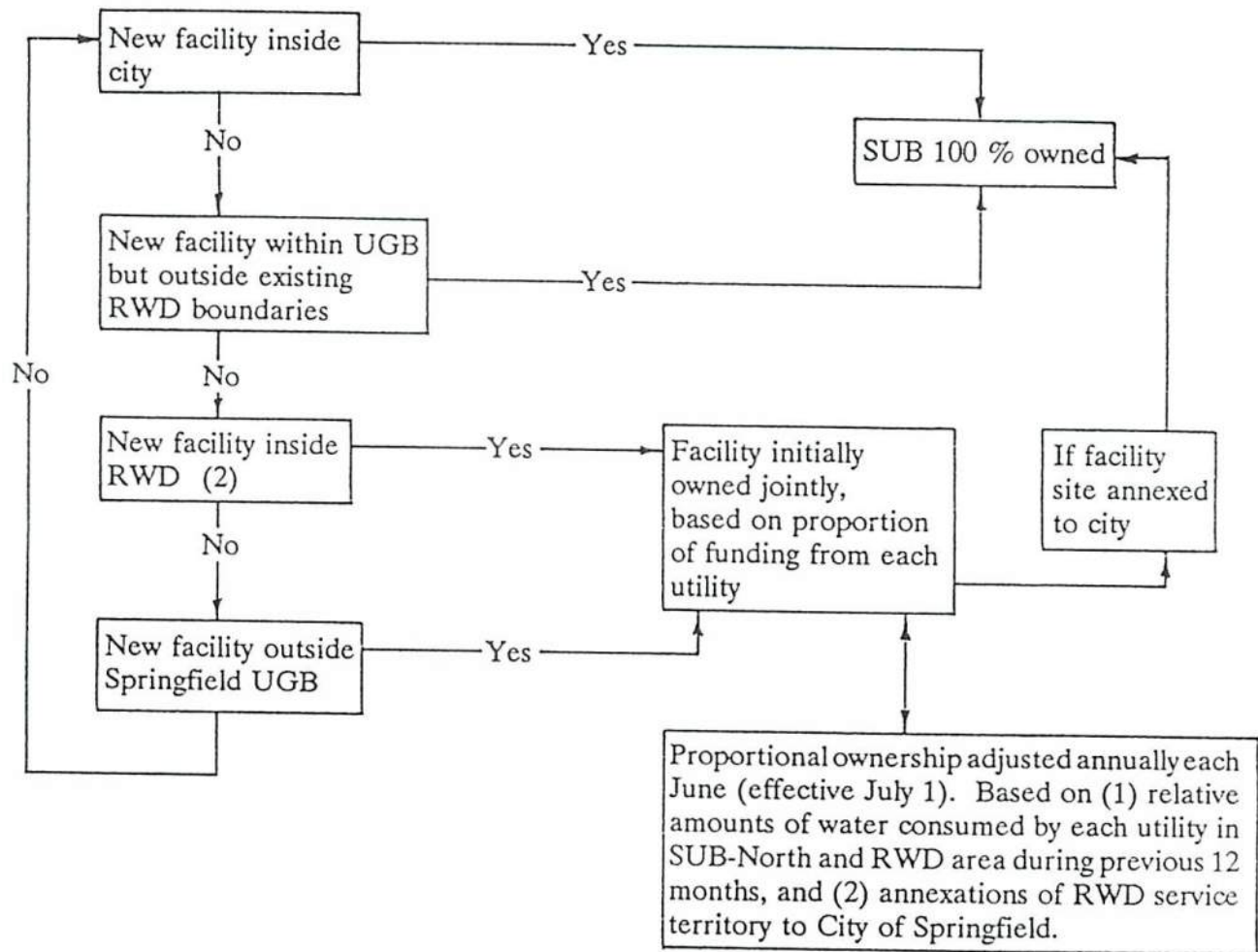
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NOTE: TO DETERMINE RELATIVE OWNERSHIP OF THE FACILITY, SEE FLOWCHART, II.



## II. OWNERSHIP OF JOINTLY CONSTRUCTED FACILITIES (1) (source, storage, transmission)



- (1) Exclusive of Moe Hill Reservoir.  
 (2) If transmission facility, the portion within RWD is owned by RWD; the portion outside RWD is owned by SUB.

**WATER SUPPLY AND SERVICES AGREEMENT**

August 4, 2006

BY AND BETWEEN

**The Springfield Utility Board (“SUB”)**

AND

**Glenwood Water District (“GWD”)**

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12.3	<u>Neither Party Pays For Transfer of Customers or Assets.</u>	<u>11</u>
12.4	<u>SUB Shall Not Assume Liabilities.</u>	<u>11</u>

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THIS AGREEMENT is made and entered into as of the 4<sup>th</sup> of August, 2006, between the Springfield Utility Board ("SUB"), acting by and on the behalf of the City of Springfield, Oregon, and Glenwood Water District ("GWD"), and are sometimes referenced in this Agreement individually as "Party" and collectively as "Parties."

### **RECITALS**

1. Glenwood Water District is a municipal corporation organized under the laws of the State of Oregon.
2. The City of Springfield is a municipal corporation and Springfield Utility Board provides municipal water utility services as provided under the City of Springfield's charter.
3. The Parties agree that it is mutually beneficial for Springfield Utility Board to provide water supply and related services to Glenwood Water District.
4. Glenwood Water District's service area resides within the City of Springfield's urban growth boundary.
5. The Parties acknowledge that, due to expected future annexations of property into the City of Springfield, Glenwood Water District may cease to exist as a water supply and distribution utility and SUB will eventually provide all water service within the Springfield Urban Growth Boundary (UGB).
6. This Agreement formalizes water supply and related services provided by Springfield Utility Board to Glenwood Water District and provides for the orderly transition of facilities and water services.
7. Pursuant to stipulation of the Parties, upon execution of this Agreement, the prior agreement between GWD and SUB entitled "Agreement of Supplying Water And Services" entered into on October 4, 2001 shall terminate on September 1, 2006. All obligations by either Party specified in the prior agreement shall cease to exist with the exception of any outstanding billing of wholesale water supply and related services that SUB provided under the prior agreement and any payments due GWD from SUB for retail revenues collected by SUB on GWD's behalf under the prior agreement.

### **AGREEMENTS**

NOW, THEREFORE, in consideration of the mutual covenants, agreements and undertakings contained herein, the Parties agree as follows:

**ARTICLE 1.  
DEFINITIONS**

- 1.1 "Wholesale Water" means water provided by SUB to GWD for GWD's use to ultimately serve the Retail Water needs of GWD's customers. SUB is not responsible for Retail Water quality or pressure on GWD's water utility system.
- 1.2 "Retail Water" means water provided by GWD to GWD's water customers. Retail Water is metered consistent with SUB's policies, rules, and regulations for metering retail water service. In some instances, such as private hydrants for fire protection, service may be provided without a meter. Retail Water service provided by GWD to its customers that is not metered shall be provided in a manner consistent with SUB's policies, rules and regulations for service that is not metered.

**ARTICLE 2.  
TERM**

- 2.1 Initial Term. This Agreement shall begin on September 1, 2006 and shall end on the earlier of August 31, 2011 or the Transfer Date described in Article 12 of this Agreement, whichever comes first.
- 2.2 Renewal and Termination. It is the intent of the parties that this Agreement shall renew on a monthly basis unless GWD elects to cease providing water utility services and that Parties should have twelve (12) months notice of any termination to allow a reasonable amount of time for either Party to make necessary changes to their systems due to termination. After the Initial Term, this Agreement will automatically renew on a monthly basis unless either Party provides written notice of termination or GWD elects to cease providing water supply and distribution services. Beginning on or after September 1, 2010, either Party may provide a notice of termination to terminate this Agreement with twelve (12) months notice.

**ARTICLE 3.  
WHOLESALE WATER SUPPLY**

- 3.1 Points of Delivery. GWD's and SUB's water systems are interconnected at multiple points and SUB shall deliver water supply at these points of interconnection.
- 3.2 Description of Water Supply. Under normal operating conditions, SUB shall provide the same or similar water quality and water pressure to GWD as SUB provides to SUB's other customers. GWD is ultimately responsible for water quality and water pressure within its own distribution system.

- 3.3 Compliance With SUB's Policies, Rules, and Regulations. GWD agrees to comply with policies, rules, and regulations of SUB now in effect or as SUB may from time to time prescribe. Nothing contained in this Agreement shall be deemed to modify, alter, or repeal any SUB policies, rules, or regulations now or hereafter adopted; provided, however, that no policy, rule, or regulation that only applies to GWD or its customers (and is not a general policy, rule, or regulation) shall be implemented without GWD's written consent.
- 3.4 No Sale or Transfer of SUB's Water Rights. The sale of water to GWD does not constitute any sale or transfer of SUB's water rights. Nothing in this Agreement shall be construed or interpreted as a sale or transfer of SUB's water rights to GWD.
- 3.5 Implementation of Retail Water Conservation. GWD has two options with regards to implementing water conservation related to Wholesale Water purchases from SUB:
- 3.5.1 By default, SUB shall offer the same water conservation measures to GWD's Retail Water customers that SUB offers to its other water customers, or
- 3.5.2 GWD may create and implement its own water conservation measures for its Retail Water customers. GWD's water conservation plan must comply with federal and state guidelines and not result in a reduction in SUB's water rights. GWD shall provide SUB with ninety (90) days notice that it will implement its own water conservation plan prior to the implementation any GWD water conservation measure.
- SUB and GWD agree to work cooperatively to communicate water conservation measures available to GWD's customers.
- 3.6 Curtailement of Wholesale Water Supply. GWD shall be subject to curtailment of Wholesale Water supply consistent with SUB's curtailment policies. Future changes to SUB's curtailment policies shall not result in GWD Retail Water customers being intentionally curtailed before other SUB customers, however GWD Retail Water customers may be curtailed at the same time as other SUB customers. GWD shall cooperate fully with SUB in a timely manner to establish and comply with the implementation of curtailment policies.

**ARTICLE 4.  
CHARGES FOR WHOLESALE WATER SUPPLIED BY SUB TO GWD**

- 4.1 Charges for Wholesale Water. In addition to the Monthly Service Fee discussed in Article 6 of this Agreement, SUB shall charge GWD for Wholesale Water based upon the equivalent amount of revenue SUB would receive as if each individual GWD service provided to GWD Retail Water customers were served under SUB's



then-current water rates for customers within the City of Springfield. Residential, commercial, and industrial services shall be charged under RCI-1 rate schedule, or its successor. Fire protection services shall be charged under SUB's FPS-1 rate schedule, or its successor. Services within GWD that do not fall under the services provided under SUB's RCI-1 or FPS-1 schedules shall be assessed a rate equivalent to the same or similar service SUB provides to customers within the City of Springfield, as determined by SUB. An example of this is provided in Exhibit A of this Agreement.

- 4.2 Rate for Wholesale Water Subject to Change. GWD recognizes that SUB's rate schedules are subject to change and GWD shall be notified of any proposed rate changes consistent with Oregon state law prior to the implementation of any new rate schedules, or their successors.
- 4.3 Losses Do Not Apply. SUB shall determine individual GWD customer revenues associated with usage based on metered usage and GWD customer usage shall not be adjusted for losses when applying the applicable rates.

**ARTICLE 5.  
WATER UTILITY SERVICES PROVIDED BY SUB TO GWD**

- 5.1 Water Utility Services. SUB shall provide the following Water Utility Services to GWD:
- a) Take orders from customers served by GWD for connects to existing services and make same
  - b) Take orders from customers served by GWD for disconnects and make same.
  - c) Read all meters
  - d) Calculate, prepare, and mail all GWD customers' bills. GWD and SUB agree that the billing determinant for usage under GWD's retail rate schedule shall be based upon units of water. A unit is seven-hundred forty-eight (748) gallons.
  - e) Collect GWD's water charges in accordance with SUB's regular procedures.
  - f) Remove and reset faulty meters.
  - g) Perform all necessary flushing of all hydrants and dead ends, and check all valves.
  - h) Investigate the water system for reported leaks.
  - i) Receive and handle all complaints and/or questions relating to service, consistent with SUB's policies.
  - j) Maintain maps and records fo GWD's distribution system as SUB deems advisable. SUB shall furnish GWD with a copy of the entire distribution system at GWD's request, provided, however that GWD shall not make more than one request in any six (6) month period.
  - k) Furnish all it's own office supplies necessary to carry on the above listed functions.

- l) Be responsible for the review and comment on all new development and redevelopment site plans developed by the City. SUB shall be the primary point of contact with developers and landowners and will consult with GWD on the requirements for water system improvements or installations.
- m) Provide locate services for GWD's facilities.
- n) Ensure that all SUB programs (courtesy connections, meter shutoff valve locations, etc...) generally available to other water utility customers are also made available to GWD customers.
- o) Provide consultation services to GWD in the creation and modeling of rate design for GWD customers.

**ARTICLE 6.  
MONTHLY SERVICE FEE FOR WATER UTILITY SERVICES**

- 6.1 Monthly Service Fee. GWD shall be required to pay a Monthly Service Fee to SUB for Water Utility Services provided in Article 5 of this Agreement. The Monthly Service Fee shall be equal to the Service Rate multiplied by the number of GWD customer services billed each month. An example of the calculation of the Monthly Service Fee is provided in Exhibit A of this Agreement.
- 6.2 Service Rate. The Service Rate shall equal One Dollar and Ninety-Five Cents (\$1.95) for the first twelve billing months under this agreement. For each twelve month period thereafter, the Service Rate shall be adjusted by the percent change in the Applicable Consumer Price Index (CPI) from March of the current year compared to the Applicable CPI in March of the prior year. The Service Rate shall be rounded to the nearest penny. The Applicable CPI shall be the Consumer Price Index for All Urban Consumers for West Urban Cities, Size B/C (50,000 to 1,500,000 population), as reported by the United States Department of Labor, or its equivalent (\*see example below). Should the Consumer Price Index for All Urban Consumers for West Urban Cities, Size B/C (50,000 to 1,500,000 population) be discontinued, the Parties agree to use a mutually agreeable replacement index. If the Parties cannot agree on a replacement index, the U.S. City Average CPI-U (seasonally unadjusted) shall be used as the Applicable CPI.

\*For example:

The Consumer Price Index for All Urban Consumers for West Urban Cities, Size B/C (50,000 to 1,500,000 population) for March 2005 was 120.4. The Consumer Price Index for All Urban Consumers for West Urban Cities, Size B/C (50,000 to 1,500,000 population) for March 2006 was 124.2.

CPI for March 2006	124.2
Less CPI for March 2005	120.4
Equals index point change	3.8
Divided by CPI for March 2005	120.4
Equals the percent change of	0.03156146

Using these figures for the annual calculation of the Service Rate and a Service Rate of \$2.00 from the prior year, the Service Rate used each month for the following 12 months would be \$2.06 per GWD Retail Water service billed each month or  $(\$2.00) \times [1 + .03156146] = \$2.06$  (rounded to the nearest penny).

**ARTICLE 7.  
OTHER OBLIGATIONS OF GLENWOOD WATER DISTRICT**

- 7.1 Ongoing Costs Associated With GWD's System. GWD shall be responsible for the capital investment and operations and maintenance costs associated with GWD's water system.
- 7.2 Planned Maintenance. GWD shall be responsible for planned maintenance and may request that SUB perform planned maintenance of GWD's system at GWD's expense.
- 7.3 New Service Requests. GWD shall be responsible for responding to, and paying the costs associated with, new service requests in the area served by GWD that are not being annexed to the City of Springfield. GWD may submit a request in writing to SUB to designate SUB to act on GWD's behalf to respond to new service requests and construct facilities for new services in the area served by GWD. GWD shall be obligated to reimburse SUB's costs associated with responding to new service requests. SUB's costs for the new service requests shall be defined as the direct cost of all supervision, labor, material, and equipment rental at SUB's costs, plus all of SUB's overhead charges on each.
- 7.3.1 SUB shall not assess any SUB System Development Charge for new service requests upon GWD or GWD's customers that are not being annexed into the City of Springfield.
- 7.4 Construction Requirements. Any extensions of GWD's mains, services, or other facilities during the term of this Agreement, shall be done at GWD's expense and shall be done in accordance with SUB's standard practices for engineering, location, material, and construction. Any extensions of GWD mains shall be a minimum of eight inches (8") in diameter.
- 7.5 Development of Maps and Records. GWD shall work with SUB to develop adequate maps and records of all water mains and services.
- 7.6 Use of GWD's System by Third Parties. GWD shall not permit or cause any water other than from the municipal water system of SUB or EWEB to be carried or transported in any part of GWD's water distribution system physically connected to or with the water system of SUB, nor permit any cross connection through which this could possibly be done, without written consent of SUB and the State Board of Health.

- 7.7 Development of Retail Rates and Charges for GWD Retail Water Customers. GWD is responsible for the development of rates and charged to GWD Retail Water customers, GWD is also responsible for communicating rates and rate changes to GWD Retail Water customers. Any rate design that would require additional modifications to SUB's billing system shall require SUB's consent and shall be performed at GWD's expense.
- 7.8 Notification To SUB of Rate Changes. GWD shall provide SUB timely notice of any changes to GWD's rate schedules or customer information necessary to implement this Agreement.
- 7.9 Liability Coverage. GWD shall purchase and carry in full force and effect during the term of this Agreement, a liability insurance policy in the amount of Five Hundred Thousand Dollars (\$500,000) Comprehensive General Liability coverage protecting SUB and GWD from liability of any nature whatsoever incurred in the performance of this Agreement. Beginning July 2007 and every year thereafter, GWD shall provide a certificate of insurance to SUB indicating the amount of Comprehensive General Liability under GWD's insurance policy.

**ARTICLE 8.  
EMERGENCY MAINTENANCE, WATER QUALITY TESTS,  
AND WATER METER TESTS**

- 8.1 Emergency Maintenance. SUB shall provide maintenance of GWD's system due to an Emergency Event. An Emergency Event is any unplanned disruption on GWD's water system. GWD shall be obligated to reimburse SUB's costs associated with responding to an Emergency Event on GWD's system. SUB's costs for the Emergency Event shall be defined as the direct cost of all supervision, labor, material, and equipment rental at SUB's costs, plus all of SUB's overhead charges on each.
- 8.2 Water Quality Tests Requested By GWD. GWD may request that SUB perform water quality tests in GWD's system. Water quality tests performed at GWD's request shall be billed to GWD based upon the actual cost to perform the test plus SUB's cost for collect and preparing the samples.
- 8.3 Water Quality Tests Not Requested By GWD. SUB may perform water quality tests in GWD's system. Costs associated with water quality tests not requested by GWD shall be at SUB's expense.
- 8.4 Water Meter Testing and Replacement. SUB may perform water meter accuracy checks on GWD's service meters each year. Reimbursement to SUB for this work shall be at cost by GWD. SUB's costs for the water meter accuracy checks shall be defined as the direct cost of all supervision, labor, material, and equipment rental at SUB's costs, plus all of SUB's overhead charges on each and shall not exceed one thousand dollars (\$1,000) per year. The service meters shall be

calibrated to meet recommended AWWA standards for the meter size and type. When a meter fails to meet AWWA standards, it shall be replaced at cost to GWD. In addition, when an unacceptable level of inaccurate meters is noted (as determined by a cost-benefit analysis), GWD shall schedule a meter replacement program based on brand, age, service, and test results. Meter test data will be provided by SUB upon request.

## **ARTICLE 9. BILLING TO GLENWOOD WATER DISTRICT**

- 9.1 Billing Statement. On or before the 30<sup>th</sup> day of each month, SUB shall submit to GWD an itemized statement showing the following for the previous month:
- a) Amount charged for sale of Wholesale Water from SUB to GWD for usage in the previous month in accordance with Article 4 of this Agreement.
  - b) Amount charged for Water Utility Services from SUB to GWD for the previous month in accordance with Article 6 of this Agreement.
  - c) Amount collected from GWD's water users for usage in the previous month.
  - d) Charges to GWD for operation of the GWD's water system in the previous month and for maintenance, repairs, meters, service connections, and new construction in the previous month.
- 9.2 Payment From GWD to SUB. GWD shall provide a payment to SUB for charges identified above in accordance with SUB's payment policies.
- 9.3 Remedy for Late Payment to SUB. In the event GWD does not reimburse SUB within the time frame allowed under SUB's payment policies, SUB may withhold any payment due GWD in Article 10 of this Agreement, until GWD's obligations to SUB are fulfilled.

## **ARTICLE 10. PAYMENT TO GLENWOOD WATER DISTRICT**

- 10.1 Payment From SUB to GWD. On or before the 30<sup>th</sup> day of each month, SUB shall provide a payment to GWD equivalent to the amount collected from GWD's water users for usage in the prior month using GWD's applicable rate schedule.
- 10.2 Delinquent and Uncollectable Accounts. In the event SUB collects GWD revenues from delinquent accounts, SUB shall provide these revenues to GWD in the following payment cycle. Once each year and at the request of GWD, SUB shall furnish a list of outstanding receivables to the authorized accounting firm representing GWD or to GWD.

**ARTICLE 11.**  
**TRANSFER OF CUSTOMERS AND ASSETS OF GWD TO SUB**  
**DUE TO ANNEXATION**

- 11.1 Transfer Due to Annexation. As areas served by GWD are annexed to the City of Springfield water service to and maintenance authority for the annexed area shall become the responsibility of SUB and the customers shall become SUB customers upon the next regular billing date after the annexation becomes effective. Title shall pass to SUB for each such water mains, fire hydrants, valves, meters, and other portions of water service installations owned by GWD, on in which GWD may have any interest, and located within each annexation, not to include any real property, upon the next regular billing date after the annexation becomes effective. Following annexation by the City of Springfield, all water service installations transferred in title from GWD to SUB shall become the property and responsibility of SUB.
- 11.2 No Affect Upon Other GWD Retail Water Customers. SUB agrees that the annexation of areas of GWD shall not otherwise affect the water supplied and service to the remaining residents or occupants of GWD, who receive services through transferred mains, valves, or meters.
- 11.3 GWD Receipt of Past Due Amounts. If any past-due monies are owed on a customer's account at the time the customer becomes a SUB customer due to annexation, GWD shall be entitled to receipt of those sums as they are collected.
- 11.4 Transfer of Easements. Upon the next regular billing date after annexation becomes effective, GWD shall assign and transfer to SUB all easements, or portions thereof, held by GWD in connection with its operations in the annexed area.
- 11.5 Method of Determining Ownership. For the purposes of determining ownership and responsibility for water mains, where a street is adjacent to an area annexed and the water main serving that area is not included within the annexation but is in the adjacent street, it shall become the property and responsibility of SUB if it is located from the center line of the street toward the area annexed. The water main shall remain the property and responsibility of GWD if it situated in the area from the center line of the street away from the annexed area. If ownership cannot be determined as provided under this section, then ownership shall be determined as provided by ORS 222.540. Regardless of the location of the main, all water customers within the city limits shall become customers of SUB.
- 11.6 Neither Party Pays For Transfer of Customers or Assets. Neither Party shall pay the other upon acquisition of any part of GWD's assets by SUB due to annexation. Except as provided in 10.3 of this Agreement, neither Party shall pay the other Party due to any costs or lost revenues associated with the transfer of customers due to annexation.

- 11.7 SUB Shall Not Assume Liabilities. SUB shall not assume any of GWD's liabilities due to annexation.

#### ARTICLE 12.

#### TRANSFER OF CUSTOMERS AND ASSETS OF GWD TO SUB DUE TO GWD ELECTING TO CEASE WATER UTILITY OPERATIONS

- 12.1 Transfer Due To GWD Electing To Cease Water Utility Operations. In the event that GWD elects to cease providing water supply and distribution services, GWD shall submit a written notification to SUB that it is ceasing to provide water utility services. Thirty (30) days after SUB's receipt of GWD's written notice to cease providing Retail Water service, GWD water utility assets, GWD water utility facilities, and GWD Retail Water customers will transfer to SUB ("Transfer Date"). The Transfer Date shall be changed to a date mutually agreeable by both Parties if it is not commercially reasonable to transfer assets or customers within a thirty (30) day period. On the Transfer Date water service to and maintenance authority for all GWD customers shall become the responsibility of SUB and the customers shall become SUB customers upon the next regular billing date after the Transfer Date. Title shall pass to SUB for each water main, fire hydrant, valve, meter, and other portions of water service installations owned by GWD, or in which GWD may have any interest, not to include any real property, upon the next regular billing date after Transfer Date. Following the Transfer Date, all water service installations transferred in title from GWD to SUB shall become the property and responsibility of SUB.
- 12.2 Transfer of Easements. Upon the next regular billing date after Transfer Date, GWD shall assign and transfer to SUB all easements, or portions thereof, held by GWD in connection with its operations.
- 12.3 Neither Party Pays For Transfer of Customers or Assets. Neither Party shall pay the other upon acquisition of any part of GWD's assets by SUB. Neither Party shall pay the other Party due to any costs or lost revenues associated with the transfer of customers, provided, however that GWD shall still be obligated to pay SUB any outstanding financial obligation associated with water supply and water utility services provided in this Agreement that existed as of the Transfer Date.
- 12.4 SUB Shall Not Assume Liabilities. SUB shall not assume any of GWD's liabilities due to the transfer of assets or customers.

#### ARTICLE 13.

#### REPRESENTATIONS AND WARRANTIES

- 13.1 GWD and SUB represent that, to each of their knowledge, after due inquiry, it has the right and authority to enter into this Agreement and grant the rights contained herein.

- 13.2 SUB makes no warranty regarding the level of reliability of water service to GWD. SUB shall make commercially reasonable efforts consistent with the efforts provided to SUB's other customers to restore GWD's water service should disruptions occur.

**ARTICLE 14.  
ASSIGNMENT AND TRANSFER**

- 14.1 Neither Party shall assign, transfer or sublet any interest in this Agreement without the prior written consent of the other Party.

**ARTICLE 15.  
INDEMNIFICATION**

- 15.1 To the extent allowed by the Oregon Constitution and the Oregon Revised Statutes, each of the Parties hereto agrees to defend, indemnify, and save the other harmless from any claims, liability or damages including attorney fees arising out of any error, omission or act of negligence on the part of the indemnifying Party, its officers, agents, or employees in the performance of this Agreement.
- 15.2 In providing the services specified in the Agreement (and any associated services) both parties are public bodies and maintain their public body status as specified in ORS 30.260. Both Parties understand and acknowledge that each retains all immunities and privileges granted them by the Oregon Tort Claims Act (ORS 30.260 through 30.295) and any and all other statutory rights granted as a result of their status as local public bodies.
- 15.3 The other provisions of this Agreement notwithstanding, neither SUB nor GWD shall be liable to the other or to any third party for indirect, consequential, business loss, or similar damages because of any interruption, outage, partial outage, or partial or complete failure of water supply or services.

**ARTICLE 16.  
DEFAULT**

- 16.1 If during the term of this Agreement, including, but not limited to, the Initial Term of this Agreement, either Party has an outstanding financial obligation to the other Party for a period of ninety (90) days, the Party to whom the financial obligation is owed ("Aggrieved Party") may terminate this Agreement. Termination shall be provided from the Aggrieved Party through a written Termination Notice to the other Party. Aside from paying any outstanding balance due to either Party, neither Party shall be entitled to damages, including consequential damages.



**ARTICLE 17.**  
**GENERAL PROVISIONS**

- 17.1 Costs. Except as otherwise expressly provided above, each party shall bear all of its own attorney's fees and other expenses related to this Agreement.
- 17.2 No Third Party Beneficiaries. None of the terms or conditions in this Agreement shall give or allow any claim, benefit, or right of action by any third person not a party hereto. Any person or entity other than SUB or GWD receiving services or benefits under this Agreement shall be only an incidental beneficiary.
- 17.3 Prohibition on Resale. Glenwood Water District agrees not to resell water sold under this Agreement to customers other than retail customers of Glenwood Water District without prior written permission from SUB.
- 17.3 No Partnership. The Parties acknowledge and agree that this Agreement does not create a partnership between, or a joint venture of, SUB and GWD.
- 17.4 Binding Effect. This Agreement shall be binding upon, and shall inure to the benefit of, the Parties hereto and their respective successors and assigns.
- 17.5 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Oregon without giving effect to the principles of conflicts of laws.
- 17.6 Severability. In the event any term, covenant or condition of this Agreement, or the application of such term covenant or condition, shall be held invalid as to any person or circumstance by any court having jurisdiction, all other terms, covenants and conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect unless a court holds that the invalid term, covenant or condition is not separable from all other terms covenants and conditions of Agreement.
- 17.7 Force Majeure. Neither Party shall be liable to the other for any failure of performance under this Agreement due to causes beyond its control, including, but not limited to: acts of God, fire, flood, third party damages to facilities or other catastrophes, adverse weather conditions, material or facility shortages or unavailability not resulting from such Party's failure to timely place orders therefore, lack of transportation, the imposition of any governmental codes, ordinances, laws, rules, regulations or restrictions, national emergencies, insurrections, riots, wars, or strikes, lock-outs, work stoppages or other labor difficulties.
- 17.8 Waiver. No delay or omission by either Party to exercise any right or power occurring upon non-compliance or failure of performance by the other Party shall impair that right or power or be construed to be a waiver thereof. A waiver by either Party of any of the covenants, conditions or agreements to be performed by

the other Party shall not be construed to be a general waiver of any such covenants, conditions or agreements, but the same shall be and remain at all times in full force and effect.

17.9 Headings. The Article headings herein are for convenience and reference only, and in no way define or limit the scope and content of this Agreement or in any way affect its provisions.

17.10 Notices. All notices, requests or other communications (other than those normally required during the installation process) under this Agreement or required by law shall be in writing and shall be hand-delivered, sent by overnight delivery service, mailed by first-class, registered or certified mail, postage prepaid and return receipt requested, or transmitted by telegram or facsimile, addressed to the following:

**General Notices**

**Springfield Utility Board**

Jeff Nelson  
Power Resource Manager

Springfield Utility Board  
P.O. Box 300  
250 A Street  
Springfield, Oregon 97477  
(541) 746-8451

**Glenwood Water District**

Dave Carvo

Glenwood Water District  
P.O. Box 562  
Springfield, Oregon 97477-0080

**Emergency Contact**

**Springfield Utility Board**

Supervisor On Call  
(541) 501-8960

**Glenwood Water District**

Dave Carvo  
(541) 744-2692

17.11 No Implied Representations. No representations, agreements, covenants, warranties, or certifications, express or implied, shall exist as between the Parties, except as specifically set forth in this Agreement.

17.12 Integrated Agreement and Amendments. This Agreement is an integration of the entire understanding of the Parties with respect to the matters set forth herein. The Parties shall only amend this Agreement in writing and with the proper official signatures.

17.13 Mediation. Both Parties agree to non-binding mediation if the Parties cannot resolve any issues during the life of this Agreement. Each party shall pay one-half of the cost of such mediation.

17.14 Third Party Liability. In the event that either Party under this Agreement employs a third party to perform construction, maintenance, or operations requirements as specified in this Agreement, the Party employing such third party shall be solely responsible for payment of such third party.

17.15 Use of Exhibit A. If there is any conflict between the articles of this Agreement and the Exhibit A of this Agreement, the articles of the Agreement shall govern.

IN WITNESS WHEREOF, the Parties have hereunto placed their hand and seals this 4th Day of August, 2006.

**SPRINGFIELD UTILITY BOARD ("SUB")**

By: Robert C. Linahan  
Name: Robert C. Linahan  
Title: General Manager

**Glenwood Water District ("GWD")**

By: David V. Carne  
Name: DAVID V. CARNE  
Title: Chair

## EXHIBITS

## Exhibit A

This page is for illustrative purposes only to show how GWD would be billed for Wholesale Water under then-current RCI-1, FPS-1, or other rate schedules for service within the city of Springfield. Rates are subject to change. The number, type, and usage shown below for billing determinants are also subject to change. The Service Rate will change consistent with Article 6 of the Agreement.

The example provided below uses GWD's customer profiles for the month of May 2006 and SUB's rates effective February 2006. SUB's current rate schedule contains seasonal rates and any seasonal rate charges would also apply to GWD. If a different month were selected, different usage, services, and rates would be used.

### Residential

Meter Size	5/8"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	Other	Total
Number of Services	151	11	4	0	1	0	0	0	0	0	167
Rate	\$ 6.90	\$ 6.90	\$ 14.10	\$ 17.42	\$ 26.54	\$ 54.74	\$ 72.99	\$ 108.66	\$ 146.82		
Meter Charges	\$ 1,041.90	\$ 75.90	\$ 56.40	\$ -	\$ 26.54	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,200.74
Blocks (Size in Units)	0-11	12-100	101-1000	1001+							
Units per Block	857	247	0	0							
Rate \$/Unit	\$ 0.681	\$ 0.681	\$ 0.658	\$ 0.658							
Usage Charges	\$ 583.62	\$ 168.21	\$ -	\$ -							\$ 751.82
<b>Total Residential Charges Under RCI-1 Rates</b>											<b>\$ 1,952.56</b>

### Commercial

Meter Size	5/8"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	Other	Total
Number of Services	55	4	14	9	6	0	0	0	0	0	88
Rate \$/Unit	\$ 6.90	\$ 6.90	\$ 14.10	\$ 17.42	\$ 26.54	\$ 54.74	\$ 72.99	\$ 108.66	\$ 146.82		
Meter Charges	\$ 379.50	\$ 27.60	\$ 197.40	\$ 156.78	\$ 159.24	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 920.52
Blocks (Size in Units)	0-11	12-100	101-1000	1001+							
Units	534	928	1674	0							
Rate \$/Unit	\$ 0.681	\$ 0.681	\$ 0.658	\$ 0.658							
Usage Charges	\$ 363.65	\$ 631.97	\$ 1,101.49	\$ -							\$ 2,097.11
<b>Total Commercial Charges Under RCI-1 Rates</b>											<b>\$ 3,017.63</b>

### Public

Meter Size	5/8"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	Other	Total
Number of Services	1	0	0	0	2	0	0	0	0	0	3
Rate \$/Unit	\$ 6.90	\$ 6.90	\$ 14.10	\$ 17.42	\$ 26.54	\$ 54.74	\$ 72.99	\$ 108.66	\$ 146.82		
Meter Charges	\$ 6.90	\$ -	\$ -	\$ -	\$ 53.08	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 59.98
Blocks (Size in Units)	0-11	12-100	101-1000	1001+							
Units	0	0	0	0							
Rate \$/Unit	\$ 0.681	\$ 0.681	\$ 0.658	\$ 0.658							
Usage Charges	\$ -	\$ -	\$ -	\$ -							\$ -
<b>Total Commercial Charges Under RCI-1 Rates</b>											<b>\$ 59.98</b>

### Industrial

Meter Size	5/8"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	Other	Total
Number of Services	0	0	0	0	0	0	0	0	0	0	0
Rate	\$ 6.90	\$ 6.90	\$ 14.10	\$ 17.42	\$ 26.54	\$ 54.74	\$ 72.99	\$ 108.66	\$ 146.82		
Meter Charges	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Blocks (Size in Units)	0-11	12-100	101-1000	1001+							
Units	0	0	0	0							
Rate \$/Unit	\$ 0.681	\$ 0.681	\$ 0.658	\$ 0.658							
Usage Charges	\$ -	\$ -	\$ -	\$ -							\$ -
<b>Total Industrial Charges Under RCI-1 Rates</b>											<b>\$ -</b>

*Glenwood Water District Had No Industrial Accts in May 2006*

### Fire Protection

Meter Size	5/8"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	Other	Total
Number of Services	0	0	0	0	0	0	0	6	4	0	10
Rate						\$ 8.50	\$ 9.75	\$ 12.75	\$ 15.50		
Meter Charges	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 76.50	\$ 62.00	\$ -	\$ 138.50
Blocks (Size in Units)	0-11	12-100	101-1000	1001+							
Units	0	0	0	0							
Rate \$/Unit	\$ 0.681	\$ 0.681	\$ 0.658	\$ 0.658							
Usage Charges	\$ -	\$ -	\$ -	\$ -							\$ -
<b>Total Fire Protection Charges Under RCI-1 Rates</b>											<b>\$ 138.50</b>

**Subtotal Charges For Wholesale Water: \$ 5,168.68**

Total Number of Services	268
Service Rate	\$ 1.95
Monthly Service Fee	\$ 522.60
Wholesale Water	\$ 5,168.68
<b>Total Billed GWD</b>	<b>\$ 5,691.28</b>

**COOPERATIVE AGREEMENT FOR WATER SYSTEM INTERTIES  
BETWEEN THE EUGENE WATER AND ELECTRIC BOARD, THE  
SPRINGFIELD UTILITY BOARD, AND THE RAINBOW WATER  
DISTRICT**

This agreement is between the Eugene Water and Electric Board, hereinafter EWEB, the Springfield Utility Board, hereinafter SUB, and the Rainbow Water District, hereinafter RWD.

**RECITALS**

- A. EWEB, SUB, and RWD (“the Utilities”) all own and operate water supply and distribution systems which supply drinking water to Federal and State standards to their respective customers; and
- B. The Utilities recognize the vital importance of providing a reliable source of drinking water to all of their respective customers; and
- C. The Utilities value the important role each utility plays in meeting the water supply needs of the metropolitan Eugene-Springfield (“metro”) area; and
- D. The Utilities recognize the importance of close cooperation for planning and coordinating a reliable water supply to all customers of the metro area; and
- E. The Utilities acknowledge that mutual cooperation during times of potential or actual water shortages is of critical importance to water system reliability; and
- F. The Utilities enter this agreement in a spirit of good will and mutual cooperation understanding that a long term agreement to improve the reliability of their individual and collective water supplies is in the highest public interest; and
- G. The Utilities acknowledge that during times of potential or actual water shortages it is beneficial for public health and prudent water utility operation that the customers of all the utilities share the burdens and benefits of a unified and coordinated approach to remedy water supply shortages; and
- H. The Utilities acknowledge that the reliability of their respective water systems during periods of planned critical work, operational difficulties, unanticipated reductions in supply and declared drought emergencies would be enhanced by

the construction and operation of intertie facilities between the systems that enable the exchange of water; and

- I. The Utilities are willing to fund, construct, and maintain the intertie facilities that will permit the exchange of water; and
- J. The Utilities enter the following agreement in a spirit of mutual cooperation to define the detail and set forth the responsibilities for the design, construction, operation and maintenance of water system intertie facilities.

## AGREEMENT

EWEB, SUB and RWD agree as follows:

### I. RECITALS / PURPOSE

The above recitals are true and correct and are specifically adopted and incorporated herein as the Purpose of this Agreement.

### II. DEFINITIONS

- A. Annual Meeting means a yearly meeting of the Intertie Committee and the Intertie Operation and Maintenance Committee.
- B. Connection Point means the point in each utility's facilities where the utility's solely owned facilities end and the Intertie Facilities begin. For the purposes of this agreement, each utility's connection point will be considered the point of service for the providing utility.
- C. Construction Costs means monetary costs of design, land acquisition, permitting and physical construction of Intertie Facilities constructed under this agreement.
- D. Declared Drought means an Executive Order issued by the Governor of Oregon declaring a drought emergency in Lane County due to drought and low water conditions.
- E. Demand Management is a technique to use in accordance with the Utilities curtailment and conservation plans. The intent is that all Utilities will work together to increase supply and decrease demand until the supply can meet the demand.

- F. Emergency means (1) Actual or imminent failure of facilities, such as major pipelines, treatment plants, or pumping stations; or (2) Major disruptions in Water supply caused by natural conditions or manmade disasters.
- G. Emergency Aid means Water made available by the Provider(s) during times of Emergency or Declared Drought. Emergency Aid will include forms of Supply Augmentation by the Provider(s) and coordinated Demand Management by the Utilities.
- H. EWEB means the Eugene Water and Electric Board.
- I. EWEB Facilities means the facilities of the Eugene Water and Electric Board.
- J. In Kind Payment means repayment of Water provided during an intertie event on a gallon for gallon basis.
- K. Intertie Committee consists of the EWEB Water Division Director, the SUB Water Division Director and the RWD Superintendent (or their designated representatives).
- L. Intertie Event – The period of time during which one or more of the Intertie Facilities provide the Recipient Utility (ies) with significant amounts of Water supply (other than incidental amounts used for maintenance purposes). Water supply can be in the form of Water Exchange, Operational Aid, and/or Emergency Aid.
- M. Intertie Operation and Maintenance Committee (O&M Committee) will be made up of one representative from each Utility that is appointed by their respective Intertie Committee representative.
- N. Intertie Facilities means the permanent and portable facilities used to connect the Water supply and distribution systems of the Utilities together at the locations specified in this Agreement. The boundaries of each intertie facility shall be the Connection Points to the permanent piping of the respective Utilities, unless otherwise agreed.
- O. Maintain or Maintenance means work necessary to allow the Intertie Facilities to be utilized for their intended purposes, including, but not limited to, pump lubrication and testing; meter calibration; pipeline painting and repair; periodic exercising of the Intertie Facilities to verify



its ability to function as intended; normal inspections, repairs, valve exercising and flushing.

- P. Operational Difficulties means an inability or imminent inability to meet Water demand due to reductions in normal supply, treatment, transmission or distribution capacity (excludes Emergency).
- Q. Operating Standards means procedures for activation, deactivation, Maintenance, and operation of the Intertie Facilities, which are agreed to by the Utilities.
- R. Operational Aid means Water made available by the Provider(s) during times of an Unanticipated Reduction in Supply, Operation Difficulties, and Planned Critical Work.
- S. Planned Critical Work means work scheduled to be performed by a Utility on its Separate Facilities where the functionality of the source, treatment, transmission or distribution facility is interrupted or anticipated to be interrupted and where because of the length of time needed to complete such work, complexity, or cost would otherwise be difficult to perform without the operation of the Intertie Facilities.
- T. Provider means the Utility (ies) that agree(s) to provide Water to one or more Recipient Utilities during an Intertie Event.
- U. Ramp Time means the time durations necessary to provide additional Water supply by the Provider(s).
- V. Recipient means the Utility (ies) which initiate an Intertie Event by requesting additional Water supply from one or more other Utility (ies).
- W. RWD means the Rainbow Water District.
- X. RWD Facilities means the facilities of the Rainbow Water District.
- Y. Separate Facilities means EWEB, SUB, or RWD Facilities.
- Z. SUB means the Springfield Utility Board.
- AA. SUB Facilities means the facilities of the Springfield Utility Board.
- BB. Supply Augmentation means the Provider operate(s) available Water sources necessary to meet the Recipient(s) request.

- CC. Total Intertie Quantity means the sum of each Intertie Facility capacity measured in both directions, that is, the amount which can flow into EWEB Facilities system during an Intertie Event plus the amount which can flow into SUB and RWD Facilities during a separate Intertie Event. The component flow amounts will initially be the design capacity in each direction and will be modified after testing if the actual capacities differ significantly from the design capacities.
- DD. Unanticipated Reduction in Supply means a reduction or imminent reduction in ground or surface Water supply that could not be reasonably foreseen or planned for based on the design reliability standards of the contracting Utilities.
- EE. Urgent Notice means the initiation of an Intertie Event with minimal notice due to an Emergency that precludes a normal request due to the importance of a timely supplementation of a Utility's (ies') Water supply.
- FF. Utilities: EWEB, SUB and RWD
- GG. Utility: either EWEB, SUB or RWD
- HH. Water means water that meets the potable drinking water standards as set forth in Chapter 333 of the Oregon Administrative Rules, as may be amended from time to time.
- II. Water Exchange means a routine transfer of Water among mutually agreeing utilities to optimize operational efficiencies as may be provided in future appendices of this Agreement.
- JJ. Water Exchange Rate means a unique rate mutually agreed by the Utilities that is based on the residential retail rate of the first block/tier of each utilities rate structure. The Water Exchange Rate will be mutually agreed to at the Annual Meeting.

III. RESPONSIBILITIES / BOARDS/ INTERTIE COMMITTEE / O&M COMMITTEE

A. BOARDS

1. Changes in the intent of the Agreement are reserved for the Utilities' Boards of Directors.
2. If changes in this Agreement are considered necessary by any of the Utilities, that Utility will be responsible for making a proposal to the Intertie Committee for consideration. If the Intertie Committee agrees by consensus, it may modify the changes, as necessary, and each member will present the changes to their respective Board of directors for approval. If approved by all three Utility Boards, the changes will become effective on the day indicated in the approved changes or, lacking a specific date, will become effective on the first of the month following the approval by the last Utility.
3. If the Boards of directors of one or more of the Utilities do not approve the proposed changes, the Intertie Committee will work to modify the proposal to meet the dissenting utility's concerns and resubmit the revised changes to all three Utility Boards for approval in the same manner and with the same effective date as above.

B. INTERTIE COMMITTEE

1. It is recognized and agreed that one or more of the Utilities may assume individual responsibilities under this Agreement, which differ from those of the other Utilities. These individual responsibilities will be listed in appendices to this Agreement, which may be changed and revised occasionally by common consent of the Utilities and shall be dated and signed by the responsible Utility or their designated representative. It is understood and agreed that modifying the appendices as needs arise is intended to improve the operation, maintenance and engineering of the Intertie Facilities and is not intended to change the spirit of this Agreement.

2. The Intertie Committee function will be to oversee the implementation of this Agreement, to facilitate changes to it necessary to ensure its continued effectiveness in meeting the needs of the Utilities and to settle differences in interpretation of its provisions and execution.
3. The Intertie Committee will appoint one representative from their respective Utilities to serve as a member of the O&M Committee.

C. O&M COMMITTEE

The O&M Committee will be responsible for developing and implementing the Operating Standards, updating and maintaining a list of emergency contact persons within each Utility with authority to authorize Intertie Facility operation, construction and maintenance.

IV. WATER SUPPLY TRANSFER

A. NOTIFICATION

1. Except as provided below, all notices shall be made in writing and may be given by personal delivery or by mail. Notices sent by mail shall be addressed as follows:

EWEB Water Division Director, EWEB, PO Box 10148,  
Eugene, Oregon 97440

SUB Water Division Director, SUB, 202 S 18<sup>th</sup> Street,  
Springfield, Oregon 97477

RWD Superintendent, RWD, PO Box 8,  
Springfield, Oregon 97477

2. And when so addressed, shall be deemed given upon deposit in the United States mail, postage prepaid. In all other instances, notices shall be deemed given at the time of actual delivery. Changes may be made in the names and addresses of the person to whom notices are to be given by giving notice pursuant to this paragraph.
3. Urgent Notices requesting the Provider(s) begin, change or start Operational or Emergency Aid may be made by telephone to each Utility's 24-hour contact person. The requesting Recipient will

deliver written confirmation of the request in writing within 24 hours of the phone request.

**B. 24 HOUR CONTACT**

**EWEB**            24-Hour Water Emergency Contact, (541) 484-2400

**SUB**             Water Division Director, (541) 746-8451

**RWD**             Superintendent, (541) 746-1676

**C. WATER SUPPLY RESPONSIBILITIES**

1. Utilities are responsible for prudent planning and financing capital improvements needed in order to adequately support the growing demands of their own service areas.
2. The Recipient will operate all its available Water supply facilities to meet its demands.
3. The Recipient will make the initial request to one or both other Utilities for Water supply.
4. The Recipient will disclose reasons for requesting a Water supply transfer and the operational status of their water system.
5. The Recipient and Provider(s) will agree on the type of Water transfer (i.e. Water Exchange, Operational Aid, and Emergency Aid).
6. Provider(s) then respond according to their ability to provide Water supply to Recipient(s) as mutually agreed. The Provider in assessing their ability to meet the request has the right to refuse the request or to offer a proposal of the degree in which Water supply could be provided to the Recipient(s) given the list of objective criteria discussed under each of the three types of Water transfer discussed below.
7. Mandatory or elective Demand Management may be needed by all Utilities to achieve a minimum service level as mutually agreed under an Emergency Aid transfer.

8. Documentation of requests for Water supply transfers shall be made in writing by the recipient to the persons designated in this Agreement, and responses shall be made in writing as soon as reasonably possible but not later than 10 days of receipt of a request.
9. In the event of an Urgent Notice for Operational Aid or Emergency Aid, the initiation of an Intertie Event may occur by telephone, email or other expeditious means between the designated contacts or their representatives as provided herein. The intended Provider will respond as expeditiously as possible. Documentation will be as provided above.

#### D. TRANSFER OF WATER

To the extent of agreement with Recipient(s), each Utility agrees to commence transfers of Water to the Recipient(s) expediently at the quantities and within such timeframes mutually agreed to. Rejection, changes, or termination of quantities of Water and/or timeframes for transfer of Water will be determined by the Provider and communicated to the Recipient(s) based on consideration of reasonable criteria.

The three types of Water supply transfer envisioned in this Agreement are Water Exchange, Operational Aid, and Emergency Aid.

##### 1. WATER EXCHANGE

A Water Exchange is a routine Water supply transfer to optimize operational efficiencies among mutually agreeing utilities.

##### Criteria of Water Exchange:

Provider(s) and Recipient(s) will mutually agree to terms of quantity, timeframe, and reliability.

##### 2. OPERATIONAL AID

Any Utility may request Operational Aid during periods of Unanticipated Reductions in Supply, Operational Difficulties, and/or Planned Critical Work.

Criteria of Operational Aid:

The Provider(s) is/are expected to make reasonable efforts to make Water available by engaging in Supply Augmentation.

The Utilities understand that meeting existing system demands within the Providers water system is the first priority in responding to the request for Operational Aid.

3. EMERGENCY AID

Any Utility may request Emergency Aid during an Emergency, or during an Operational Aid event if it is determined to be an Emergency by the Recipient.

Criteria for Emergency Aid:

The Provider(s) is/are expected to make concerted efforts to make Water available by engaging in Supply Augmentation.

It is agreed that collaborative Demand Management will be exercised under an Emergency Aid request if Water demands exceed the capacity of the Provider(s) and Recipients(s). Levels of Demand Management will be mutually agreed to by the Utilities.

The Utilities understand that meeting existing system Water demands within the Providers water system is the first priority in responding to the request for Emergency Aid and reserves the right to terminate or adjust quantities and locations during the Intertie Event to maintain this priority.

E. REPORTING

At the end of an Intertie Event, and on a monthly basis, if necessary, Provider will report to Recipient the quantity of Water delivered under this Agreement. The format of the report is to be developed and mutually agreed to as part of the Operating Standards.

V. INTERTIE FACILITY COST

Intertie Facility Cost: All Utilities will agree on location and benefits of each planned Intertie Facility. The Utilities will provide for design and construction of Intertie Facilities. The Utility responsible for design and construction oversight for each facility will propose a percentage allocation of design and Construction Costs based on the proportional benefit to each utility of the Total Intertie Quantity for each Intertie Facility location. The Intertie Committee will review, modify as necessary and make a consensus decision for the proportional cost and benefit.

VI. OPERATION AND MAINTENANCE COST

- A. Operation Costs: All labor, utilities, fuel, and other costs required to operate the Intertie Facilities during an Emergency or Planned Critical Work incurred by the Provider Utility shall be borne by the Recipient. The Provider Utility will bill operating costs directly to the Recipient.
- B. Maintenance Costs: Maintenance costs will be proportionally allocated as shown in Appendix C, unless specifically identified otherwise in this Agreement or as specified in subsequent agreements between the Utilities. This cost allocation may be re-evaluated at the Annual Meeting.

VII. WATER SUPPLY COST

Following an Intertie Event, or monthly during the event, the Provider will bill the Recipient based on the following schedules:

- A. For Operational or Emergency Aid, the Recipient Utility shall pay the Water Exchange Rate plus direct costs for items, which are directly attributable to the Intertie Event (e.g. electrical demand cost).
- B. For Water that is received through the Intertie Facility that is a Water Exchange, the cost of water may be determined by the methodology above or using other methodologies agreeable to all Utilities.

VIII. INTERTIE FACILITY PAYMENT

The Utilities will be responsible for providing the necessary funds through approved budgets to construct a given Intertie Facility as mutually agreed.



IX. OPERATION AND MAINTENANCE PAYMENT

A. Operation Payment

The Provider and the Utility performing operational activities shall bill Recipient(s) within 30 days for the operating costs of the facilities as defined in this Agreement, and shall include the supporting accounting system documentation as appropriate. Such invoices shall include sufficiently detailed information to explain the types of costs incurred during the billing period.

B. Maintenance Payment

The Recipient Utility will bill the other Utilities according to the proportional allocation as shown in Appendix C. At the Annual Meeting, there will be a "Square up" of actual costs and any differences paid within 30 days. Utilities shall provide clarifications of any invoice to any other Utility upon written request.

C. Operation and Maintenance In Kind Payment

A Utility may request the Provider to make In Kind payment, in lieu of payment in U.S. currency, for Operation and Maintenance charges. The request must include a proposed rate, location(s), and schedule of payment. The decision whether to accept In Kind payment and the location and rate of In Kind payment, in lieu of U.S. currency, is at the discretion of the Provider.

X. WATER SUPPLY PAYMENT

A. The Recipient and Provider may mutually agree to several methods for payment of water supply, which can include In Kind or monetary payment, or a combination of the two.

B. Recipient(s) will make monetary payment(s) to Provider(s) within 30 days of billing by Provider(s). In Kind payment will be made as scheduled at the delivery point agreed between the Provider and Recipient.

XI. PROTECTION OF A UTILITY'S SEPARATE FACILITIES

Each Utility shall exercise reasonable care in the performance of its obligations and rights under this Agreement to ensure that another Utility's separate facilities and operations are not impaired or damaged.

If any occurrence or conditions during operation or maintenance of the Intertie Facilities threaten the physical integrity or operational capability of a Utility's Separate Facilities, upon notification to the other Utilities the affected Utility may stop operation or maintenance of the Intertie Facility and/or take any action that the affected Utility determines to be necessary to protect its own Separate Facilities. Any Utility may remove part of the Intertie Facility, if required, for emergency repair of its Separate Facilities provided that such affected Intertie Facilities are restored as soon as possible by the removing Utility. Notice shall be provided as far in advance as reasonably practical.

XII. RESPONSIBILITY FOR DAMAGES TO INTERTIE FACILITIES

If damages occur to Intertie Facilities during the operation of Intertie Facilities under this Agreement, then responsibility to pay for any necessary repairs of said damaged facilities shall be as follows:

- A. If damages occur when the Intertie Facilities are being operated within the Operating Standards (said Operating Standards to be agreed upon in writing by the Utilities subsequent to execution of this Agreement as part of the design of the Intertie Facilities), then responsibility to pay for any necessary repairs to said damaged Intertie Facilities shall be mediated between Utilities.
- B. If damages occur when the Intertie Facilities are not being maintained and/or operated in accordance with Operating Standards, then responsibility to pay for any necessary repairs to said damaged Intertie Facilities shall be allocated to the Utility responsible for nonstandard operations.
- C. If damages occur to Separate Facilities during operation of the Intertie Facilities under this Agreement, then responsibility to pay for any necessary repairs to said damaged Separate Facilities shall be as follows:

1. If damages occur when the Intertie Facility is being operated within the Operating Standards, then responsibility to pay for any necessary repairs to said damaged Separate Facilities shall be allocated to the owner of said damaged Separate Facilities.
2. If damages relating to operation of Intertie Facilities occur when the Intertie Facilities are being maintained and/or is operated beyond the Operating Standards, then responsibility to pay for any necessary repairs to said damaged Separate Facilities shall be allocated to the Utility responsible for nonstandard operations.

### XIII. SECURITY

Each Utility will take precautions to insure that the Intertie Facilities are protected from unauthorized entry and operations. The Utilities shall mutually develop security procedures for entry into and operation of the Intertie Facilities.

### XIV. MAINTENANCE AND REPAIR OF SEPARATE FACILITIES

Any Utility may perform or contract for work on its own Separate Facilities. Other Utilities shall cooperate with such work, conduct their operations in such a manner as not to cause any unnecessary delay or hindrance, and adjust and coordinate their work so as to permit proper completion of all work in the area. Notification of work near Intertie Facilities which may affect intertie operation or maintenance will be given to respective Utilities as far in advance as reasonably practical.

Other Utility operations of Separate Facilities that may affect Water quality through operation of Intertie Facilities will be coordinated in advance among the affected parties.

### XV. ANNUAL MEETING AND JOINT OPERATIONS EXERCISE PROGRAM FOR THE INTERTIE AND O&M COMMITTEES

The Intertie Committee and O&M Committee shall hold an Annual Meeting in May at a mutually agreed site. An annual operational exercise will be scheduled between the Utilities. Intertie Facilities will be visited and operational and maintenance needs identified. Water Exchange Rate will also be reviewed.

XVI. LIABILITY, INDEMNITY AND HOLD HARMLESS

- A. INDEMNIFICATION. To the extent allowed by the Oregon Constitution and the Oregon Revised Statutes not to exceed monetary limits of the Oregon Tort Claim Act, each of the Utilities hereto agrees to defend, indemnify, and save the other harmless from claims, liability or damages including attorney fees arising out of any error, omission or act of negligence on the part of the indemnifying utility, its officers, agents, or employees in the performance of this Agreement.
- B. STATUS. In providing the services specified in this Agreement (and any associated services) all Utilities are public bodies and maintain their public body status as specified in ORS 30.260. All Utilities understand and acknowledge that each retains all immunities and privileges granted them by the Oregon Tort Claims Act (ORS 30.260 through 30.295) and any and all other statutory rights granted as a result of their status as local public bodies.

XVII. UNCONTROLLABLE FORCES.

If any Utility is precluded in whole or in part from performing operation and maintenance activities as a result of uncontrollable forces, all Utilities are relieved from the obligations to the extent they are reasonably unable to complete the obligations due to the uncontrollable force. Uncontrollable forces shall include, but are not limited to, earthquakes, fires, floods and other natural and human caused disasters. However, each Utility shall be responsible for repaying any costs incurred on its behalf by another Utility before the occurrence of the uncontrollable force.

XVIII. DISPUTES

Any disputes occurring under this Agreement shall first be reviewed and attempted to be settled by the Intertie Committee. All payments must be made and regular operation and maintenance responsibilities undertaken, pending resolution of disputes by the Utilities.

In the event that the Utilities cannot resolve such disputes between them, then, upon 30 days written notice, the Utilities agree to engage an outside mediator to attempt to resolve the issues.

If within 30 days of commencement of the mediation is unsuccessful in resolving a dispute or claim arising in relation to this agreement, it will be resolved by arbitration pursuant to ORS 36.300, et seq. Any party may give notice of arbitration. Within 30 days of a notice of arbitration, the arbitrating parties will agree upon an arbitrator. If no arbitrator is agreed upon, the presiding judge of the Lane County Circuit Court will select the arbitrator.

The Utilities agree that dispute(s) will not prejudice the mutual cooperation which is essential to the successful operation of the Intertie Facilities described herein the prime reason for this Agreement.

**XIX. TERM AND TERMINATION OF AGREEMENT**

The initial term of this agreement shall be for 15 years from the date of this agreement. Upon the expiration of 15 years, the agreement shall automatically renew on a continuing 10-year term. At that point, beginning on July 31 of each year, the agreement shall be considered renewed for an additional one-year term, unless at least 30 days prior to July 31 of that year a party shall notify the other parties to the agreement, in writing, of the intent to terminate the agreement. Upon giving such notice of termination, the agreement will terminate 10 years from the date of notice of termination.

**XX. FINAL EXPRESSION**

This Agreement may not be modified, nor may compliance with any of its terms be waived, except by written instrument executed and approved in the same manner as this Agreement. Should any provision(s) of this Agreement be stricken by judicial decree the Agreement shall remain in force and effect, as to all other provisions.

This writing is intended both as the final expression of the agreement between the Utilities hereto with respect to the included terms and as a complete and exclusive statement of the terms of the agreement. No modification of this Agreement shall be effective unless and until such modification is evidenced by a writing signed by all Utilities.

IN WITNESS WHEREOF, the Utilities hereto have executed this Agreement to be effective on the date first above written.

**EWEB**

BY: *Randy L. Berggren* DATE: 8/23/06  
RANDY L. BERGGREN  
GENERAL MANAGER

BY: *Michael* DATE: 8-7-06  
EWEB ATTORNEY

**SUB**

BY: *Robert L. Linahan* DATE: 8/21/06  
ROBERT L. LINAHAN  
GENERAL MANAGER

REVIEWED & APPROVED  
AS TO FORM  
*Joseph J. Leahy*  
DATE: 8/17/06  
LEGAL COUNSEL  
SPRINGFIELD UTILITY BOARD

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
SUB ATTORNEY

**RWD**

BY: *Doug Wise* DATE: 8/25/06  
DOUG WISE  
BOARD CHAIR

BY: *Stephen J.* DATE: 8/24/06  
RWD ATTORNEY

**APPENDIX A  
OWNERSHIP OF INTERTIE FACILITIES**

The Utilities have allocated percentage ownership of the permanent and/or portable Intertie Facilities based on their proportional benefit of the Total Intertie Quantity for each Intertie Facility.

Intertie Facility	Ownership Percentages		
	EWEB	SUB	RWD
5 <sup>th</sup> Street Intertie			
31 <sup>st</sup> Street Intertie			
Franklin Intertie			
Henderson Intertie			
Nugget Intertie			

The Utilities hereto have executed this Appendix to be effective.

**EWEB**

**BY: \_\_\_\_\_ DATE: \_\_\_\_\_**

**SUB**

**BY: \_\_\_\_\_ DATE: \_\_\_\_\_**

**RWD**

**BY: \_\_\_\_\_ DATE: \_\_\_\_\_**

**APPENDIX B  
CONSTRUCTION OF INTERTIE FACILITIES**

The Utilities will provide for design and construction of permanent and/or portable Intertie Facilities. The Utility responsible for design and construction oversight for each Intertie Facility and the percentage allocation of design and Construction Costs based on their proportional benefit of the Total Intertie Quantity for each Intertie Facility:

Intertie Facility	Responsible Utility	EWEB	SUB	RWD
		%	%	%
5 <sup>th</sup> Street Intertie				
31 <sup>st</sup> Street Intertie				
Henderson Intertie				
Nugget Intertie				
Pioneer Intertie				

The Utilities hereto have executed this Appendix to be effective.

**EWEB**

**BY: \_\_\_\_\_ DATE: \_\_\_\_\_**

**SUB**

**BY: \_\_\_\_\_ DATE: \_\_\_\_\_**

**RWD**

**BY: \_\_\_\_\_ DATE: \_\_\_\_\_**



**APPENDIX C  
MAINTENANCE OF INTERTIE FACILITIES**

Except as provided elsewhere in this Agreement, the Utility responsible for maintenance for each Intertie Facility and the percentage allocation of routine maintenance based on their proportional benefit of the Total Intertie Quantity for each Intertie Facility:

Intertie Facility	Responsible Utility	EWEB	SUB	RWD
		%	%	%
5 <sup>th</sup> Street Intertie				
31 <sup>st</sup> Street Intertie				
Franklin Intertie				
Henderson Intertie				
Nugget Intertie				

The Utilities hereto have executed this Appendix to be effective.

**EWEB**

**BY: \_\_\_\_\_ DATE: \_\_\_\_\_**

**SUB**

**BY: \_\_\_\_\_ DATE: \_\_\_\_\_**

**RWD**

**BY: \_\_\_\_\_ DATE: \_\_\_\_\_**

**APPENDIX A  
OWNERSHIP OF INTERTIE FACILITIES**

The Utilities have allocated percentage ownership of the permanent and/or portable Intertie Facilities based on their proportional benefit of the Total Intertie Quantity for each Intertie Facility.

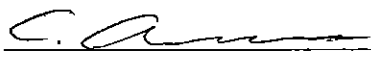
Intertie Facility	Ownership Percentages (%)		
	EWEB	SUB	RWD
5 <sup>th</sup> Street Intertie	100	0	0
31 <sup>st</sup> Street Intertie			
To SUB	0	50	50
To EWEB	100	0	0
31 <sup>st</sup> Meter Vault	50	42.5	7.5
Henderson Intertie	TBD	TBD	TBD
Nugget Intertie	TBD	TBD	TBD

The Utilities hereto have executed this Appendix to be effective.

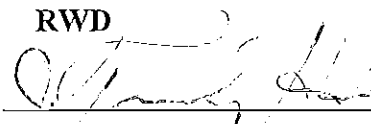
**EWEB**

BY:  DATE: 8/2/07

**SUB**

BY:  DATE: 8/2/07

**RWD**

BY:  DATE: 8/2/07

**APPENDIX B  
CONSTRUCTION OF INTERTIE FACILITIES**

The Utilities will provide for design and construction of permanent and/or portable Intertie Facilities. The Utility responsible for design and construction oversight for each Intertie Facility and the percentage allocation of design and Construction Costs based on their proportional benefit of the Total Intertie Quantity for each Intertie Facility:

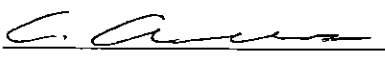
Intertie Facility	Construction Percentages (%)		
	EWEB	SUB	RWD
5 <sup>th</sup> Street Intertie	100	0	0
31 <sup>st</sup> Street Intertie			
To SUB	0	50	50
To EWEB	100	0	0
31 <sup>st</sup> Meter Vault	50	42.5	7.5
Henderson Intertie	TBD	TBD	TBD
Nugget Intertie	TBD	TBD	TBD

The Utilities hereto have executed this Appendix to be effective.

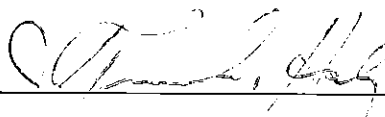
**EWEB**

BY:  DATE: 8/2/07

**SUB**

BY:  DATE: 8/2/07

**RWD**

BY:  DATE: 8/2/07

**APPENDIX C**

**MAINTENANCE OF INTERTIE FACILITIES**

Except as provided elsewhere in this Agreement, the Utility responsible for maintenance for each Intertie Facility and the percentage allocation of routine maintenance based on their proportional benefit of the Total Intertie Quantity for each Intertie Facility:


Intertie Facility	Maintenance Percentages (%)		
	EWEB	SUB	RWD
5 <sup>th</sup> Street Intertie	100	0	0
31 <sup>st</sup> Street Intertie			
To SUB	0	50	50
To EWEB	100	0	0
31 <sup>st</sup> Meter Vault	50	42.5	7.5
Henderson Intertie	TBD	TBD	TBD
Nugget Intertie	TBD	TBD	TBD

The Utilities hereto have executed this Appendix to be effective.

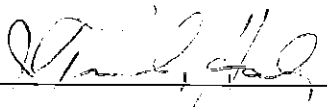
**EWEB**

BY:  DATE: 8/2/07

**SUB**

BY:  DATE: 8/2/07

**RWD**

BY:  DATE: 8/2/07

**Addendum #1**  
**Cooperative Agreement for Water System Interties**  
**Between EWEB, SUB, and the RWD**  
**May 10, 2007**

Item Number	Section	Location and Description of Change
1	Section II (JJ)	<p><b>REPLACE</b> the definition of Water Exchange Rate with:</p> <p>“Water Exchange Rate means the highest of the Utilities’ individual, first level wintertime residential rates, or other mutually agreed rate between the Provider(s) and the Recipient(s). The Water Exchange Rate will not be affected by volume, flow rate or other factors, which would otherwise affect any of the Utilities first level residential water rates. The Water Exchange Rate will be mutually agreed to at the Annual Meeting for the upcoming year.”</p>
2	Section III (A)(3)	First sentence. <b>REPLACE</b> “directors” with “Directors”.
3	Section III (B) (3)	First sentence. <b>ADD</b> “and an alternate” after the word “representative”

*ca*

WATER EXCHANGE RATE RESOLUTION OF THE WATER SYSTEM INTERTIES  
BETWEEN THE EUGENE WATER & ELECTRIC BOARD, THE SPRINGFIELD  
UTILITY BOARD, AND THE RAINBOW WATER DISTRICT

This resolution is between the Eugene Water & Electric Board, herein after EWEB, the Springfield Utility Board, herein after SUB, and the Rainbow Water District, herein after, RWD.


RECITALS

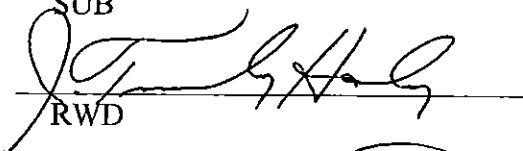
- A. EWEB, SUB and RWD ("the Utilities") have signed and enacted the "Cooperative Agreement for Water System Interties Between the Eugene Water & Electric Board, the Springfield Utility Board, and the Rainbow Water District" ("Intertie Agreement") as of August 2006; and
- B. Definition K of the Intertie Agreement states "the Intertie Committee consists of the EWEB Water Division Director, the SUB Water Division Director and the RWD Superintendent (or their designated representatives); and
- C. Definition JJ. of the Intertie Agreement states: "Water Exchange Rate means a unique rate mutually agreed by the Utilities that is based on the residential retail rate of the first block/tier of each utilities rate structure;" and
- D. Water Exchange Rate further means the highest of the Utilities' individual, first level wintertime residential rates, or other mutually agreed rate between the Provider(s) and Recipient(s); and
- E. The Water Exchange Rate will not be affected by volume, flow rate or other factors, which would otherwise affect any of the Utilities first level residential water rates;

**Now Therefore Be It Resolved, that:**

1. At the Annual Meeting conducted on May 10<sup>th</sup>, 2007, the utilities' authorized representatives determined SUB's winter rate of the **\$1.07 per 1,000 gallons** shall be the Water Exchange Rate for the period June 1, 2007 to May 31, 2008.

In Witness Whereof, the Utilities authorized representatives hereto have executed this Water Exchange Rate as part of the Intertie Agreement for the time period stated above.

By:  Date 5/10/07  
SUB

By:  Date 5/10/07  
RWD

By:  Date 5/10/07  
EWEB

**Cancellation of "Emergency Intertie Agreement" of December 31, 1999  
Between the Eugene Water and Electric Board (EWEB), Springfield Utility Board (SUB)  
and the Rainbow Water District (RWD)**

**WHEREAS**, EWEB, SUB and RWD executed an agreement, "Emergency Intertie Agreement", effective December 31, 1999, ("1999 Agreement") for emergency water supply to one another during emergencies or other occasions; and

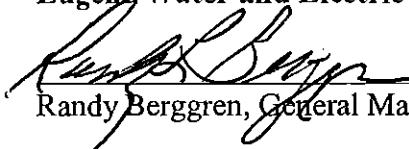
**WHEREAS**, the provisions of the 1999 Agreement were limited in location and scope; and

**WHEREAS**, EWEB, SUB and RWD executed an agreement intended to be more expansive in location, scope and detail known, as the "Cooperative Agreement for Water System Interties Between EWEB, SUB and Rainbow" dated August 25, 2006 ("2006 Agreement").

**NOW, THEREFORE THE PARTIES HERETO AGREE AS FOLLOWS:**

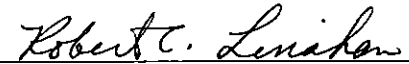
- 1) The 2006 Agreement is intended to supercede the 1999 Agreement; and
- 2) EWEB, SUB and RWD agree that the 1999 Agreement is hereby cancelled in its entirety.

**Eugene Water and Electric Board**

By:   
Randy Berggren, General Manager

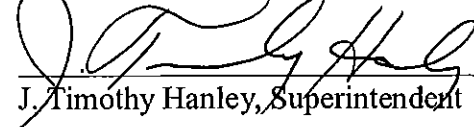
3/19/07  
date

**Springfield Utility Board**

By:   
Robert L. Linahan, General Manager

2/26/07  
date

**Rainbow Water District**

By:   
J. Timothy Hanley, Superintendent

2/20/07  
date

**Memorandum of Understanding Concerning the Cooperative Agreement for Water System Interties Between EWEB, SUB and Rainbow**

Whereas the Springfield Utility Board and the Rainbow Water District executed a "Withdrawal and Operations Agreement" with additional approval by the City of Springfield, in 1992; and

Whereas the same three parties executed an "Urban (Water) Service Agreement Between Rainbow Water District, Springfield Utility Board and City of Springfield, Oregon" ("Urban Service Agreement") dated July 20, 1995; and

Whereas, the Springfield Utility Board ("SUB"), the Rainbow Water District ("Rainbow") and the Eugene Water and Electric Board ("EWEB") have approved in 2006 a "Cooperative Agreement for Water System Interties Between EWEB, SUB and Rainbow" ("Intertie Agreement"); and

Whereas, it is beneficial to SUB and Rainbow to have agreed guidelines to determine the priority of these agreements when there appears to be inconsistencies among them.

Now therefore be it resolved that:

It is the intent of SUB and Rainbow that with respect to SUB and Rainbow in the event the provisions of the Intertie Agreement conflict with the "Withdrawal and Operations Agreement" the provisions of the Withdrawal and Operations Agreement shall take precedence; and, in the event the provisions of the Intertie Agreement conflict with the Urban Service Agreement, the provisions of the Urban Service Agreement shall take precedence. In the event of such a conflict, the parties may review the provisions of the Intertie Agreement in accordance with Section XVIII of the Intertie Agreement; Provided However, it is specifically understood that nothing herein or in the Intertie Agreement affects the priority of the Withdrawal and Operations Agreement and the Urban Service Agreement, and those Agreements shall not be subject to Section XVIII, "Disputes" of the Intertie Agreement.

Springfield Utility Board

Robert C. Luvaan  
Signature

8/21/06  
Date

Rainbow Water District

Doug White  
Signature

8/30/06  
Date

N:SUB/Water/IntertieAgmt/EWEBIntertieMOUwithSUBV21

**RECEIVED**

DEC 08 2006

SUB WATER DIV

**REVIEWED & APPROVED**  
AS TO FORM  
JOSEPH J. LAMM  
DATE: 8/17/06  
LEGAL COUNSEL  
SPRINGFIELD UTILITY BOARD





## Michael McKillip

---

**From:** KAYE Lydia <Lydia.KAYE@co.lane.or.us>  
**Sent:** Tuesday, November 14, 2017 3:11 PM  
**To:** Natalie Jennings  
**Subject:** Re: Local Agency Comments for Springfield Utility Board's Water Management and Conservation Plan

Thanks Natalie,

We have reviewed and have no comments.

Thanks,

Lydia Kaye  
Land Management Division Manager

On Nov 14, 2017, at 2:46 PM, Natalie Jennings <[Natalie.Jennings@murraysmith.us](mailto:Natalie.Jennings@murraysmith.us)> wrote:

Hello,  
Did you have any comments regarding the Springfield Utility Board's Water Management and Conservation Plan in how it relates to you system? The plan was mailed on October 16<sup>th</sup>. If you didn't receive it, we can send it again. Oregon Water Resources Department requires local agencies to be contacted, and they have 30 days to respond.  
Thanks,

—

### Natalie Jennings

Civil Engineer  
888 SW 5th Ave., Suite 1170, Portland, OR 97204  
P 503-225-9010  
Murraysmith | [www.murraysmith.us](http://www.murraysmith.us)

## Michael McKillip

---

**From:** ENDICOTT Nathan <Nathan.Endicott@EWEB.ORG>  
**Sent:** Monday, November 20, 2017 4:59 PM  
**To:** Michael McKillip  
**Cc:** Natalie Jennings  
**Subject:** RE: SUB/RWD WMCP comments

Hi Mike,

Thank you for the email! I have corrected your email below.

Thanks,

**Nathan Endicott** • Staff Engineer • Water Engineering  
Ph 541.685.7367 • [Nathan.Endicott@eweb.org](mailto:Nathan.Endicott@eweb.org)  
Eugene Water & Electric Board  
Roosevelt Operations Center • 4200 Roosevelt Blvd • Eugene, OR 97402  
Mailing Address: PO Box 10148 • Eugene, OR 97440

**From:** Michael McKillip [mailto:Michael.McKillip@murraysmith.us]  
**Sent:** Monday, November 20, 2017 03:57 PM  
**To:** ENDICOTT Nathan <Nathan.Endicott@EWEB.ORG>  
**Cc:** Natalie Jennings <Natalie.Jennings@murraysmith.us>  
**Subject:** SUB/RWD WMCP comments

Hi Nathan,

Thank you for giving us a call in regards to the Springfield Utility Board/Rainbow Water District Water Management and Conservation Plan to pass along EWEB's comment regarding the curtailment triggers and reduction targets.

I pulled the stage triggers and the associated public message water reduction goals, shown below. EWEB's comment is that the relationship between the trigger demand and the reduction in use could be more clearly explained.

Stage One: Trigger is demand at 90% of capacity, SUB/RWD/GWD demand reduction target is 15% but the general public message to reduce water use by 25%. (Explain why you are asking for 25% but the target is 15%)  
Stage Two: Trigger is demand at 95% of capacity, SUB/RWD/GWD demand reduction target is 30% but the general public message to reduce water use by 50%. (Explain why you are asking for 50% but the target is 30%)  
Stage Three: Trigger is demand exceeds capacity, SUB/RWD/GWD demand reduction target is 50% but the general public message ~~to reduce water use by 50% or to average day demand, whichever is less~~ all water use is banned except for domestic sanitation and health care. (Explain why)

Looking back at some recent plans for other water providers, I note that there isn't a clear relationship between the two and that the water use reductions have typically been provided by the providers. We'll take a look this and see if more rigor can be applied.

Please respond to this email to confirm that we've understood EWEB's comment correctly and for documentation.

Much appreciated. -Mike

**Michael McKillip** PhD, PE

Civil Engineer | Licensed in OR

888 SW 5th Avenue, Suite 1170, Portland, OR 97204

P 503.225.9010

Murraysmith | [www.murraysmith.us](http://www.murraysmith.us)



16-1929.0101

Date: October 16, 2017

Mr. Mel Damewood  
Engineering Manager  
Eugene Water Electric Board  
P.O. Box 10148  
Eugene, OR 97440

Re: Springfield Utility Board, Water Management and Conservation Plan, local agency review

Dear Mr. Damewood,

Pursuant to Oregon Administrative Rules (OAR) 690-086, the draft joint Water Management and Conservation Plan for the Springfield Utility Board and Rainbow Water District is being provided to the local jurisdictions for review and comment relating to consistency with comprehensive land use planning.

The plan will also be submitted to the Oregon Water Resources Department (OWRD) for review and public comment. As such, we would appreciate receipt of comments by November 20, 2017, in order to incorporate these comments into the final document and allow OWRD to complete their review. Please do not hesitate to contact Mike McKillip (503-225-9010; Michael.McKillip@murraysmith.us) if you have any questions or comments during your review.

Sincerely,

A handwritten signature in blue ink that reads "Michael L. McKillip".

MURRAYSMITH  
Michael L. McKillip, PE  
Project Engineer

MLM:mlm

Enclosures:

cc: Bart McKee, Springfield Utility Board; Kirk Maag, Stoel Rives LLP



16-1929.0101

Date: October 16, 2017

Ms. Lydia McKinney  
Planning Director  
Lane County Land Management Division  
3050 N. Delta Hwy  
Eugene, OR 97408

Re: Springfield Utility Board, Water Management and Conservation Plan, local agency review

Dear Ms. McKinney,

Pursuant to Oregon Administrative Rules (OAR) 690-086, the draft joint Water Management and Conservation Plan for the Springfield Utility Board and Rainbow Water District is being provided to the local jurisdictions for review and comment relating to consistency with comprehensive land use planning.

The plan will also be submitted to the Oregon Water Resources Department (OWRD) for review and public comment. As such, we would appreciate receipt of comments by November 20, 2017, in order to incorporate these comments into the final document and allow OWRD to complete their review. Please do not hesitate to contact Mike McKillip (503-225-9010; Michael.McKillip@murraysmith.us) if you have any questions or comments during your review.

Sincerely,

A handwritten signature in blue ink that reads "Michael McKillip".

MURRAYSMITH  
Michael L. McKillip, PE  
Project Engineer

MLM:mlm

Enclosures:

cc: Bart McKee, Springfield Utility Board; Kirk Maag, Stoel Rives LLP



16-1929.0101

Date: October 16, 2017

Mr. Jim Donovan  
Planning Supervisor  
City of Springfield, Planning Department  
225 Fifth Street  
Springfield, OR 97477

Re: Springfield Utility Board, Water Management and Conservation Plan, local agency review

Dear Mr. Donovan,

Pursuant to Oregon Administrative Rules (OAR) 690-086, the draft joint Water Management and Conservation Plan for the Springfield Utility Board and Rainbow Water District is being provided to the local jurisdictions for review and comment relating to consistency with comprehensive land use planning.

The plan will also be submitted to the Oregon Water Resources Department (OWRD) for review and public comment. As such, we would appreciate receipt of comments by November 20, 2017, in order to incorporate these comments into the final document and allow OWRD to complete their review. Please do not hesitate to contact Mike McKillip (503-225-9010; Michael.McKillip@murraysmith.us) if you have any questions or comments during your review.

Sincerely,

A handwritten signature in blue ink that reads "Michael L. McKillip".

MURRAYSMITH  
Michael L. McKillip, PE  
Project Engineer

MLM:mlm

Enclosures:

cc: Bart McKee, Springfield Utility Board; Kirk Maag, Stoel Rives LLP



16-1929.0101

Date: October 16, 2017

Glenwood Water District  
PO Box 562  
Springfield, OR 97477

Re: Springfield Utility Board, Water Management and Conservation Plan, local agency review

Dear Glenwood Water District,

Pursuant to Oregon Administrative Rules (OAR) 690-086, the draft joint Water Management and Conservation Plan for the Springfield Utility Board and Rainbow Water District is being provided to the local jurisdictions for review and comment relating to consistency with comprehensive land use planning.

The plan will also be submitted to the Oregon Water Resources Department (OWRD) for review and public comment. As such, we would appreciate receipt of comments by November 20, 2017, in order to incorporate these comments into the final document and allow OWRD to complete their review. Please do not hesitate to contact Mike McKillip (503-225-9010; Michael.McKillip@murraysmith.us) if you have any questions or comments during your review.

Sincerely,

A handwritten signature in blue ink that reads "Michael McKillip".

MURRAYSMITH  
Michael L. McKillip, PE  
Project Engineer

MLM:mlm

Enclosures:

cc: Bart McKee, Springfield Utility Board; Kirk Maag, Stoel Rives LLP





Springfield Utility Board & Rainbow Water District  
Source Design Capacity Summary Tables

<b>Table D-1 SUB's Water Supply Design Capacity</b>			
<b>Water Supply Source</b>	<b>Source ID</b>	<b>Design Capacity (gpm)</b>	<b>Design Capacity (mgd)</b>
Thurston Wellfield	Thurston 1	760	1.09
	Thurston 3	500	0.72
	Thurston 4	250	0.36
	Thurston 5	600	0.86
	Thurston 6	500	0.72
	Thurston 7	355	0.51
	Platt 1	250	0.36
	Platt 2	400	0.58
Sports Way Well	Sports Way 1	2,000	2.88
Weyco Wellfield (see note 1)	Weyco B(1)	1,200	1.73
	Weyco C(2)	600	0.86
	Weyco E(3)	600	0.86
Willamette Slow Sand Treatment Facility	Willamette 1	250	0.36
	Willamette 2	450	0.65
	Willamette 3	400	0.58
	Willamette 4	600	0.86
	Willamette 6	600	0.86
	Willamette 7	400	0.58
	Willamette 8	250	0.36
	Willamette 9	450	0.65
	Willamette 10	500	0.72
	Willamette 11	750	1.08
	Willamette 12	250	0.36
	Willamette 13	325	0.47
	Willamette 15	300	0.43
	MF Willamette R.	3,500	5.04
SP/Maia Wells	Maia Well	1,000	1.44
	S.P. Well	800	1.15
<b>Design Capacity</b>		<b>17,640<sup>1</sup></b>	<b>25.40<sup>1</sup></b>

Note 1: Weyco Wellfield capacity is allocated 50/50 between RWD and SUB. Total design capacity for each system includes 50% of the Weyco Wellfield source capacity.

<b>Water Supply Sources</b>	<b>Percent of Total Water Supply</b>	<b>Design Capacity (gpm)</b>	<b>Design Capacity (mgd)</b>
Thurston Wellfield	14%	3,615	5.21
Sports Way Well	8%	2,000	2.88
Weyco Wellfield	5%	2,400	1.73
Willamette Slow Sand Treatment Facility	36%	9,025	13
SP/Maia Wells	7%	1,800	2.59
<b>Design Capacity</b>		<b>17,640</b>	<b>25.4</b>

<b>Water Supply Source</b>	<b>Source ID</b>	<b>Design Capacity (gpm)</b>	<b>Design Capacity (mgd)</b>
<b>Chase Wellfield</b>	Chase 1	299	0.43
	Chase 2	653	0.94
	Chase 3	299	0.43
	Chase 4	951	1.37
<b>I-5 Wellfield</b>	1	1,111	1.60
	2	1,479	2.13
<b>7th &amp; Q Street Well</b>	1	700	1.01
<b>Design Capacity</b>		<b>6,692<sup>1</sup></b>	<b>9.64<sup>1</sup></b>
<b>Combined SUB/RWD Design Capacity</b>		<b>24,332</b>	<b>35.04</b>

Note 1: Weyco Wellfield capacity is allocated 50/50 between RWD and SUB. Total design capacity for each system includes 50% of the Weyco Wellfield source capacity.

<b>Water Supply Sources</b>	<b>Percent of Total Water Supply</b>	<b>Design Capacity (gpm)</b>	<b>Design Capacity (mgd)</b>
Weyco Wellfield (50%)	5%	1,200	1.73
I-5 Wellfield	13%	3,142	4.52
Chase Wellfield	10%	2,419	3.48
7th & Q Street Well	3%	700	1.01
<b>Design Capacity</b>		<b>7,461</b>	<b>10.7</b>
<b>Combined SUB/RWD Design Capacity</b>		<b>25,101</b>	<b>36.1</b>



## **RAINBOW WATER DISTRICT - METER ACCURACY TESTING PROCEDURE**

RWD tests 5% of total meters annually and replaces meters that are damaged or fail accuracy testing. Widescale meter replacements have not been justified after reviewing meter accuracy testing data.

- 1.** Contact customer and request permission to test their meter. Explain that we are testing meters to determine their accuracy and ask them not to use water or flush toilets during the test procedure. The test should take approximately twenty minutes.
- 2.** Observe the customer's meter to confirm that there are no leaks. There should be no movement of the meter that would indicate water use or leakage. If there is leakage try to eliminate it if time permits. If you cannot, note the address and the problem on the test result sheet and coordinate an outage with the customer so that the meter can be removed for testing.
- 3.** Set the test meter on the ground next to the customer's meter and run a hose from a hose bibb on the customer's house to the inlet side of the test meter. If the customer's meter must be removed for testing, place both meters close together so that the test can be easily observed and connect the customer's meter in series ahead of the test meter.
- 4.** For low and intermediate flows, place the appropriate orifice disk into the inlet fitting of the test meter. Sandwich the disk between two hose gaskets to prevent leakage.
- 5.** Connect the supply hose to the inlet side of the test meter. Open the hose bib and allow any air to pass completely out of the hose, customer's meter if connected in series, and test meter. Close the flow control valve on the outlet side of the test meter and check all connections for leakage. Repeat this procedure until all leaks have been eliminated.
- 6.** Using the flow control valve, flow water until customer's meter is set at a desired control number. Note the starting point.
- 7.** Set the movable bezel on the test meter to zero.
- 8.** Open the flow control valve and flow water until customer's meter registers exactly 0.5 cubic feet of water for low flow (0.7 gpm) and 1.0 cubic feet of water for intermediate (3.1 gpm) and high flows (15 gpm).
- 9.** Check and record the exact amount of water that passed through the test meter. Record this amount in the "Test Meter" column for the appropriate flow on the test sheet.
- 10.** Divide the set customer meter value (0.5 or 1.0 gpm) by the test meter value for each flow to determine the percent of accuracy ( $\text{Customer meter} \div \text{Test meter} \times 100 = \text{percent of accuracy}$ ). Record the results in the "% accuracy" column for the appropriate flow. Since 15 GPM may not be available at some services, measure and record the actual GPM on the test sheet. To do this, time the unrestricted flow through the test meter for one minute. Record the number of cubic feet flowed through the test meter during this period, and multiply by 7.48. For example: 1.73 cubic feet per minute  $\times 7.48 = 12.9$  GPM.
- 11.** Repeat the test procedure for: 0.7 GPM, 3.1 GPM, and 15.0 GPM or highest flow rate attainable.
- 12.** Repeat the procedure for each meter that appears to have an accuracy outside of the acceptable range of 90% to 110% at the intermediate flow rate.
- 13.** If test results are confirmed, and the customer meter tests outside of the acceptable range, replace the meter and record meter exchange information for utility billing purposes.



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# **LEAK DETECTION PROGRAM**

**BART E. MCKEE, P.E.  
SENIOR CIVIL ENGINEER**

**DECEMBER 2010**



**SPRINGFIELD UTILITY BOARD  
WATER DIVISION  
202 S. 18<sup>TH</sup> STREET  
SPRINGFIELD, OR 97477-5240  
(541) 726-2396**

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**Definition of Leak Detection**

**Principles and Procedures of Leak Detection**

**Factors Affecting Leak Detection**

**SUB's Leak Detection Program**

**Results Through September 2010**

**Benefits of SUB's Leak Detection Program**



## **DEFINITION OF LEAK DETECTION**

Leak detection is the systematic search for leaks within a utility's distribution system. While many leaks are detected when utility personnel or citizens observe water flowing out of the ground, an effective leak detection program uses electronic equipment to identify leak sounds and to pinpoint the precise locations of underground leaks. Because leaks can develop at any time, detection must be an ongoing program rather than a one-time project.

## **PRINCIPLES AND PROCEDURES OF LEAK DETECTION**

When a gas or liquid flows through any opening in a pressurized system, it creates vibrations which travel an indeterminate distance along the containment structure. These vibrations result from the transfer of pressurized energy to the molecules within the wall of the containment structure and are the basis for sonic leak detection. Using an electronic instrument that converts vibrations to sound, the leak detection operator listens to access points on the distribution system for telltale sounds created by a breach in pipes containing pressurized water. An access point is any component where direct contact can be made with the distribution system. Listed in order of preference, the five most commonly used access points are water mains, in-line valves, fire hydrant valves, fire hydrants, and service lines/meters.

Leak detection is accomplished in two phases. During the first phase, the entire system is surveyed for "leak sounds." When a sound is heard, the location is noted as a potential leak site. Actually, any condition which interferes with the normal flow of water can produce vibrations similar to the vibrations caused by leaks. During the second phase, each location is further investigated. If necessary, a computerized leak correlator that works on sonic transmission (speed of sound) principles is used to pinpoint the exact location of the leak. The correlator eliminates the need for extensive hit-or-miss excavation, and the unnecessary destruction of expensive pavement. Without the correlator, finding many leaks would be like searching for the proverbial needle in a haystack.

## **FACTORS AFFECTING LEAK DETECTION**

Since current leak detection techniques rely on vibrations that travel from molecule to molecule along the wall of the pipe, the most important factor affecting leak detection is the pipe material itself. The denser the wall of the pipe, the greater the distance leak sounds will travel. Density is a function of molecular proximity. Cast iron, ductile iron, galvanized steel, and copper pipes are all extremely dense and exhibit excellent transmission qualities. Asbestos-cement pipe (AC), or transite as it is often called, is not as dense and dampens vibrations much quicker than metallic pipes. Due to their lack of density, PVC and polyethylene pipe absorb, or attenuate, vibrations rather quickly. As a result, leak sounds do not travel great distances on these plastics.

To compensate for transmission shortcomings, the leak detection operator will, if at all possible, choose access point intervals appropriate for the pipe material. Pipe diameter also affects sound transmission characteristics. Large diameter pipes tend to attenuate vibrations. Thus, a six-inch iron main will transmit leak sounds further than a 12-inch iron main. In addition, the degree of soil compaction around a pipe often alters its transmission characteristics. When the soil around a pipe is firmly compacted, the pipe wall loses some of its elasticity, and sound transmission is improved.

Due to its low cost and easy handling characteristics, PVC pipe has been used in many new installations. Unfortunately, if a leak cannot be heard or seen it goes undetected. Until leak detection technology improves, detecting leaks on plastic pipes will remain difficult.

Access points are ranked in order of preference, as follows: Water mains, in-line valves, fire hydrant valves, fire hydrants, and service lines (account meters). Since direct contact with a water main is often impossible because water mains are normally underground, valves and fire hydrants are most often used as access points. Service lines are only used as access points when other access points are not available, or when special conditions exist such as PVC mains where every available access point is used.

## **SUB'S LEAK DETECTION PROGRAM**

As a part of the preparation for updating SUB's Water System Master Plan in 2009, a comprehensive review was made of the water production, consumption, and unaccounted for water statistics. Unaccounted for water as a percentage of water produced in SUB's East System had risen from 22.23% in January 2008 to 28.38% in March of 2009. After additional review of the records to verify the accuracy of the reports, SUB hired Utility Services Associates, LLC to conduct a leak survey of a portion of the East System distribution piping. Several miles of 1950's era cast iron and steel pipelines were surveyed in August 2009, resulting in the discovery of a number of significant, non surfacing leaks. The leaks found as a result of USA's work were repaired over the next few months. The result was a reduction in the percentage of unaccounted for water in the East System from 28.38% (975 GPM) in March 2009 to 23.77% (763 GPM) in December 2009.

SUB has purchased the necessary equipment for leak survey and correlation and has assigned staff and equipment to a dedicated leak detection and repair program.

The first system wide leak detection survey is a very systematic approach. The East system was selected as the first system to test since we had already started there with USA, and the crew is methodically surveying the entire system from one end to the other using every available contact point. They are correlating and repairing leaks as they are found. When the East system is completed, they will move to the West, North, and Glenwood systems in turn and complete each one.

The results of the leak detection survey will be tabulated and combined with an examination of the system based on leak repair history. A matrix will be developed based on pipe type, pipe age, and the number and type of main and service leaks repaired. The proposed focus of the leak detection and repair program in future years will be those pipes with the most extensive history of repairs first and working through the entire system from worst to best on a regular cycle.

## **RESULTS THRU OCTOBER 2010**

SUB's leak detection crew members spent the first four months of 2010 selecting equipment and training in leak detection theory and field practices. They have focused their initial efforts on the East system and have found and repaired a number of leaks that were not surfacing, further reducing the unaccounted for water in the East system.

In the first 10 months of 2010 the unaccounted for water as a percentage of production in the East System has been reduced to 21.59% (615 GPM) for a total reduction since March 2009 of 360 GPM of unaccounted for water or 189,216,000 gallons per year.

The unaccounted for water as a percentage of production system wide over the same time period from March 2009 through October 2010 has dropped from 23.54% (1,962 GPM) to 20.46% (1,474 GPM), a total of 488 GPM or 256,492,800 gallons per year.

The percentage reduction in unaccounted for water in terms of GPM over this time period is 24.87%.

## **BENEFITS OF SUB'S LEAK DETECTION PROGRAM**

An effective leak detection program yields many benefits.

First and foremost, there is an immediate savings in pumping and treatment (production) costs. The above cited 488 gpm reduction in unaccounted for water translates into a production cost savings at \$0.25 per unit of nearly \$86,000 per year.

Second, leaks discovered during a survey can be scheduled for repair, often eliminating the need to pay overtime wages when the leak results in a "middle of the night or a weekend emergency."

By finding and fixing leaks, a utility can reduce its level of unaccounted-for water (UAW). On the other hand, if a leak survey indicates that leakage is not a problem, the utility knows to look for other causes of UAW.

Also, the utility personnel assisting with the leak detection survey traverse the distribution system and can note areas needing minor maintenance before these areas develop into major problems.

In some cases, eliminating system leakage can alleviate or postpone the need to develop additional water sources. A new well in one of SUB's existing wellfields would require an estimated investment of \$500 to \$1,000 per gpm.

A leak detection survey often identifies trends. In one utility study reviewed while developing this program, for example, 17 of the 18 hydrants found to be leaking were the same brand. The utility manager was informed of the trend. Since the manufacturer is no longer in business and repair parts are not available, he could budget for and place a high priority on replacement of the same brand of hydrant system-wide.

Because the leak survey brings the survey team into local neighborhoods, public perception is also enhanced. The District is observed taking steps to save water and hold water costs down.



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# **WATERLINE REPLACEMENT PROGRAM**

**BART E. MCKEE, P.E.  
SENIOR CIVIL ENGINEER**

**DECEMBER 2010**



**SPRINGFIELD UTILITY BOARD  
WATER DIVISION  
202 S. 18<sup>TH</sup> STREET  
SPRINGFIELD, OR 97477-5240  
(541) 726-2396**

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**Introduction**

**Water System Background**

**Waterline Replacement Criteria**

**Conclusions**

**Program Action Items**

**Attachment 1 – Waterline Repair Data**

**Attachment 2 – Prioritized Waterline Replacement List**

## **INTRODUCTION**

The Springfield Utility Board (SUB) is responsible for maintenance of approximately 250 miles of water distribution and transmission lines in the Springfield Metropolitan area. The waterlines are constructed of a variety of materials and range in age from new to over 95 year old.

SUB is committed to a replacement of aging waterlines. Determining the most cost effective schedule for waterline replacements can be achieved using an objective analysis of historical repair data to create a prioritized list of projects. The waterline replacement projects will be designed in order of priority and scheduled for construction each year as budgets allow.

The Water Division has prepared this document to provide guidance for determining the criteria to be used in evaluating replacement of waterlines in SUB's system and the methodology used to select and prioritize waterlines for replacement.

## **WATER SYSTEM BACKGROUND**

The Springfield Utility Board's water distribution system is an amalgamation of a number of water systems. They are:

- Oregon Water Company/Mountain States Power/ Pacific Power and Light (PP&L) system, aka SUB's West System.  
The first water supply and distribution system in Springfield was constructed in 1906. The waterlines were constructed using 2" galvanized steel and 4"-10" wrought iron pipe. The wrought iron pipe is a cast steel pipe with a thick wall and was manufactured in 10' lengths connected with threaded couplings. The wrought iron pipe remaining in SUB's system was installed between 1914 and 1926. During the mid 1920's there was a transition to cast iron pipe for 4" and larger main lines. This pipe is in 13' lengths with bell and spigot joints sealed with oakum and poured lead. Lead joint cast iron pipe was installed up until the mid 1950's at which time rubber gaskets were introduced. Cast iron pipe was used until the introduction of ductile iron pipe in the late 1960's. Ductile iron pipe in 18' or 20' lengths with rubber gaskets is still used today. During the early 1940's, as metallic pipe became harder to acquire due to demands for iron and steel for war materials, water systems started using thin walled (10 gauge) steel pipe with a mastic impregnated paper wrapping. This pipe known as OD steel was manufactured in 40' lengths and connected with compression couplings. The ends of the pipe were left bare so the rubber gaskets in the couplings would seal tightly against the steel pipe. In most cases the installation contractor failed to coat the 1-2 inches of bare steel pipe next to the couplings after installation. OD steel pipe was used until the mid 1960's. In 1959 PP&L began using asbestos cement (AC) pipe. AC pipe comes in 13' lengths with rubber gasketed couplings. AC pipe was used extensively until 1981. Polyvinyl chloride (PVC) pipe was introduced in the late 1960's and much of the water system installed during the late 1970's through the 1990's was PVC pipe. PVC pipe is still used today. In the last



10 years SUB has started to use high density polyethylene (HDPE) pipe for special applications such as directionally drilled pipe under roads.

- **Glenwood Water System**  
Glenwood's water system which is partially owned by SUB and partially by Glenwood Water District was originally constructed in 1943 using galvanized pipe for 2" waterlines and universal joint cast iron pipe for 4"-8" waterlines. The universal joint is a machined, bolted connection without a gasket. As portions of Glenwood were annexed, first into the City of Eugene and then into the City of Springfield, other pipe materials including rubber gasketed cast iron, ductile iron, AC, and PVC were installed.
- **McKenzie Highway Water District, aka SUB's East System**  
The McKenzie Highway Water District was formed in 1951. The original system was constructed in 1951 of 2" galvanized pipe, OD steel pipe, and cast iron pipe with leadite packed joints. Leadite is a lead compound that is poured like lead but is much more brittle and cannot be repacked if it leaks. Since SUB acquired McKenzie Highway Water District in 1960 the system has been expanded using many pipe materials including rubber gasketed cast iron, ductile iron, AC, PVC, and HDPE.
- **Rainbow Water District/Oakway Water District, aka SUB's North System**  
Rainbow Water District (RWD) was formed in 1951 at the same time as McKenzie Highway Water District. RWD acquired the assets of Oakway Water District in the Gateway area about 1971. In 1992 SUB acquired the parts of RWD's distribution system inside the Springfield city limits. The water system was originally constructed using primarily 2" galvanized pipe and cast iron pipe. There are also ductile iron pipe and a small amount of AC pipe in the North System and SUB has used PVC and HDPE in construction of several new subdivisions in this system.

## **WATERLINE REPLACEMENT CRITERIA**

In a water system constructed over the last 100+ years with a diverse selection of materials and construction standards there are many factors that may impact the useful life of the waterlines in the system. The following list contains the various criteria reviewed during evaluation of the condition of the water system and the selection and prioritization of waterlines for replacement.

- Age
- Pipe materials
- Type of pipe jointing
- Service materials
- Water main line repair history
- Water service line repair history

When setting out to select which waterlines to replace, it cannot be assumed that the oldest pipes should be replaced first. In the case of SUB's system the wrought iron pipes have exhibited very few main leaks. Metallic pipe becomes pitted over time due to contact with soils and water. Eventually pinholes develop and the pipe begins to leak. The lack of leaks in the wrought iron

pipe is primarily due to the thickness of the pipe wall and the length of time it takes to corrode through. The cast iron pipe has a similarly thick wall and has little history of corrosion induced leaks. The weak point with the lead joint cast iron is in the joint. Any ground movement over time will cause displacement of the lead and cause the joint to leak. Nearly all of the leaks repaired on lead joint cast iron are due to the joints leaking. Leadite joint cast iron pipe does not exhibit the same tendency for the joints to loosen and leak as the lead joint pipe. Although it is newer than the wrought iron or lead joint cast iron pipes, OD steel pipe, where it is not protected by the coating, exhibits many pinhole leaks due to corrosion of the thin wall of the steel cylinder. Ductile iron pipe has not been in use in SUB's system long enough to have failed due to corrosion. The few leaks experienced on ductile iron have been due to faulty materials or improper installation. The AC, PVC, and HDPE waterlines have very low leak repair rates. They are impervious to corrosion and generally only leak when impacted by external force. There is a growing body of evidence in other water systems to indicate that AC pipe has a limited range of life depending to some extent on the chemical makeup of the water and the installation practices used. Over time the AC pipe wall becomes saturated and softens to the point of failure. The time to failure varies from system to system but appears to be in the range of 50-70 years before significant failures begin to occur.

## **WATERLINE REPLACEMENT SELECTION AND PRIORITIZATION METHODOLOGY**

The SUB Water Engineering Department has tracked field generated reports for all water service and water main line leaks for the last 30 years. They have compiled a collect of repair sheets for over 3600 leak repairs. The leaks are categorized as service leaks, main leaks, and miscellaneous repairs to valves, hydrant, flush point, etc. In addition to collecting and filing the repair sheets by address, each leak was logged in red on a set of 1"=100' distribution system maps. Over the last few years the information on the leak maps has been transferred to the electronic maps in AutoCad and identified by a small S or M icon. The icon is electronically linked to a scanned image of the repair sheet making the repair data available directly from the map.

When personal computers became available to SUB's Engineering staff in the late 1980's, a spreadsheet list was developed to track the "Bad Pipe" in the system and provide for a list of pipelines sorted by the number of leak repairs per 100 feet of waterline. Repairs were segregated by service and main. The list of pipelines was populated by a visual survey of the leak maps. The waterlines with the most red were put on the list. Over time the list was updated to include all of the wrought iron, OD steel, galvanized iron, and pre-1950 cast iron waterlines. Other pipe materials were excluded as being too new or having had too few leaks to make the list. The list currently contains pipelines with a total of 204 main leak repairs and 475 service leak repairs.

The next step to be taken in this program is to create a more extensive database of main leaks and include data from all of the 688 main leak repair sheets in the files. Ultimately the database may be expanded to include all 3600 leak repair sheets. Creation of the expanded database will include tools for updating, reporting, and analyzing the information on a regular schedule.

## **CONCLUSIONS**

It appears from the data reviewed to date that the program for replacement of water main lines should be primarily driven by pipe material and repair history. Many of the waterlines that have a high number of leak repairs are not failing. The repairs are service repairs or joint repairs where the structure of the water main line is good. In the past service lines were repaired, sometimes several times, before they were replaced which has been found not to be cost effective. Service lines are now replaced when there is a problem with them. Joint repairs on cast iron pipe are completed by installing a gasketed bell joint repair clamp. We no longer repack lead joints. Both the service replacement and bell joint leak clamp are one time solutions. If the pipe itself is in good condition the relative cost of service and joint repairs spread out over many years does not justify complete replacement of the waterline. Waterline replacement priorities should be directed to those cases where the basic integrity of the water main line is failing. In SUB's system these are 2" galvanized pipe and OD steel pipe.

Complete analysis of all of the leak repair history will be completed to determine if this preliminary conclusion is supported by the full complement of data available. As a part of the development of the comprehensive database Water Department engineering staff will compile a complete record of all pipeline segments constructed of galvanized or OD steel pipe. A preliminary prioritization will be done based on the data currently available in order to provide a list of replacement projects for the design process.

## **PROGRAM ACTION ITEMS**

Compile a complete record of all pipeline segments constructed of galvanized or OD steel pipe. The pipelines on the list will be evaluated and a preliminary cost of replacement estimated for each pipeline. Factors such as pipeline location, street surface, street width, and history of success with pulling new services on the existing pipeline need to be examined as part of the estimate.

From this analysis a prioritized list of pipeline replacements will be developed and provided to the engineering staff to begin design.

Complete design and implementation of the leak tracking database and analysis tools.

Enter all of the main leak repairs first and complete the analysis of the data to determine if it supports the preliminary conclusions and the priorities assigned for pipeline replacement.

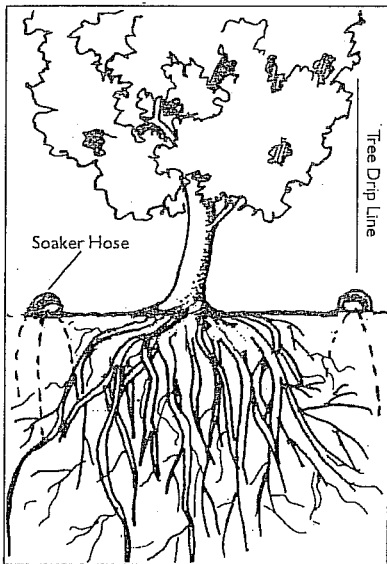
Complete design of the pipelines proposed for replacement in the next budget year by the end of each year starting with a minimum of 2,000 feet of replacement for 2012.



# TIPS

## For Wise Watering

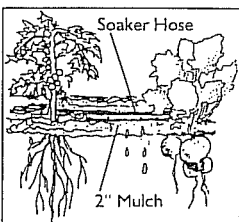
Too much water increases your water bill and leaches fertilizer away. Plant roots need oxygen as well as water and too much water prevents air from reaching the roots. Wise watering is done in the **early morning (5-8 AM)** when plants and soils can best absorb the water. Try these ideas in your yard:



**Trees & Shrubs** - Soak deeply with a soaker hose pointing down under the drip line (outer edge of branches). Established trees need slow, **deep watering only once a month**. Several inches of mulch will help

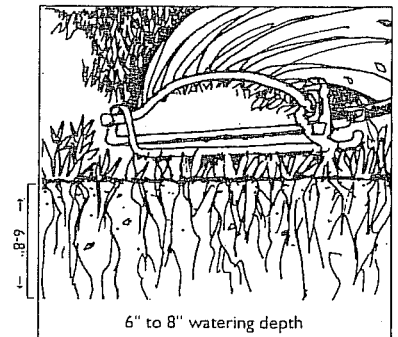
them use water efficiently.  
(Trees once a month, and Shrubs  $\frac{1}{2}$ " per week.)

**Gardens** -  $\frac{3}{4}$ " / week. Keeping weeds out will save water for garden plants. A 2" mulch helps prevent weeds from starting and keeps moisture in the soil. A soaker hose along the row or drip irrigation around



larger individual plants like tomatoes, squash and peppers put water where plants can best use it.

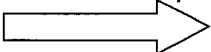
**Lawns** - Grass needs deep roots to survive and flourish. Water only when grass starts to show signs of drought stress, like discoloration and wilting. If leaves roll up in the late afternoon and footprints remains after walking across the lawn, then water 1" or more within 24 hours to a soil depth of 6-8".



- **Lawn Mowing Height** -  $\frac{3}{4}$ " to 1 $\frac{1}{2}$ " is best for grasses in our areas. Do not increase grass height during summer.

**Measuring Sprinkler Rates** - To determine how much water your sprinkler delivers, set out several small empty cans (tuna fish size) in an area to be watered and measure how much water each can collects in 15 minutes. Use this information to figure out how long to run your sprinkler to deliver the amounts recommended above. If your sprinkler delivers a lot of water in a short period, try watering in two applications about 15-30 minutes apart. This allows the soil to absorb the water and helps prevent wasteful runoff.

## Watering Your Lawn

Fasten this reminder sticker on your irrigation controller 

Lawns and gardens account for the vast majority of summertime water use. Keep your bill under control by following these easy tips.

Water your lawn at the best times. Watering when water demand is high (before work in the morning or in the early evening) can reduce sprinkler system performance due to lower water pressure, resulting in poorly distributed water across your landscape. Set your sprinkler times to the "green zones" of best performance times (9 pm to 3 am) or good performance times (9 am to 3 pm).

Lawns need a total of about one inch of water per week. Place several coffee cans or other wide-mouthed containers on your lawn while you're watering to determine when you've watered enough (it should take just 20-40 minutes).

Check automated sprinkler systems to make sure they're not overwatering or watering unwanted areas. Also check to make sure the system is not leaking and wasting water. If you see soggy areas along buried irrigation lines or near sprinkler heads, you may have a problem.

Position your sprinklers to avoid watering a sidewalk, driveways and other paved areas.

Set your lawn mower blades one notch higher since longer grass means less evaporation. In very dry weather, leave the grass clippings in your yard to retain moisture and protect your grass from the heat.

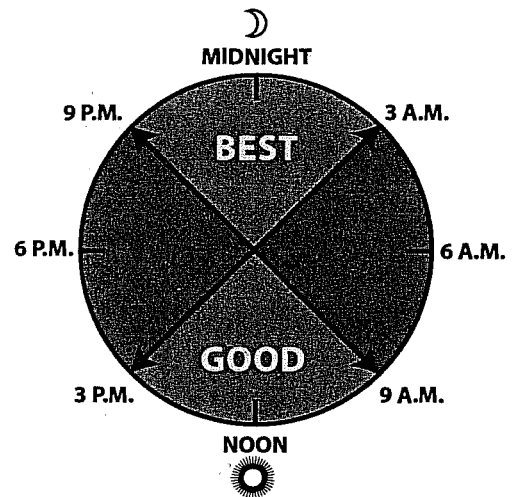
Check for leaks in pipes, hoses, faucets, fixtures and couplings. A faucet leaking one drop of water per second wastes 60 gallons of water per week, or almost 200 gallons in a month.

### Landscaping Tips

Along with the good outdoor watering and maintenance habits, another way to keep summertime water bills under control is to use native and drought-tolerant plants in your landscaping. Called xeriscaping (pronounced "zeriscaping"), this practice can help you save time and money in the garden. Here are some basic xeriscaping principles:

- ❖ Replace water-intensive grass with bark or drought-resistant grass. Grasses that require little water include Zoysia, Maiden Grass, Indian Grass, Autumn Moor Grass, and turf-type Tall Fescue. Check your lawn and garden store to see if they carry these varieties or can order them for you.
- ❖ If you enjoy having a lawn, make it small and place it close to your house where you will get the most use of it. Then, water your lawn only as often and as much as necessary, using the tips described in the section above. Remember, if the grass springs back when you step on it, there's no need to water. Lawns grow better when they're watered deeply and less frequently.

**For best performance**, set your sprinkler system to turn on and off anytime in the "green zone" shown below.



- ❖ Trees are excellent choices for xeriscaping because they require little water and help prevent evaporation by shading your yard. Here are some trees that are good candidates for a water-saving landscape: Flowering Magnolia, Weeping Larch, Mock Orange and vine maple. (Note: When placing trees adjacent to city streets, please follow the City of Springfield's guidelines for appropriate species.)
- ❖ Bushes and shrubs can be both attractive and practical. Look at the varieties that have been naturally successful in your yard and use those as a guide for adding new plants and removing water-intensive bushes. Some suggestions for good xeriscaping flora include sword fern, Blue Carpet Juniper, Lilac and Spring Flowering Heather.
- ❖ Plant flowers not just for their attractiveness but for their ability to use water efficiently. Here are some good examples of flowers that will brighten your yard but keep you water meter quiet: Siberian Iris, Lavender, Sunset Cosmos and yarrow.
- ❖ Check with local garden shops for additional xeriscaping options. Plant with a plan in mind to avoid replanting or invalidating the water-saving properties of the grasses, trees, shrubs and flowers.
- ❖ Group plants with similar water needs together to simplify watering and avoid using too much water.
- ❖ Place plants with higher water needs in areas where water drains naturally, such as in depressions or at the bottom of a hill.
- ❖ Place a layer of mulch around trees and plants. It slows evaporation and discourages weed growth.

## General Conservation Tips

- ❖ Use a broom, not a hose, to clean driveways and sidewalks.
- ❖ Have your children play in the sprinkler only when it's time to water the lawn.
- ❖ Don't run the hose while washing your car. Clean the car with a bucket of soapy water and use the hose just to rinse it off.
- ❖ Use covers to cut down on water evaporation from outdoor pools and hot tubs.
- ❖ Check for household water leaks on a regular basis. Next time your house is empty for the weekend, check your water meter before you leave. Check it again when you get back before anyone has a chance to use any water. If the meter has moved, you may have a leak.
- ❖ You can also leave a piece of paper under your faucets overnight to check for leaks.
- ❖ While you wait for hot water to come through your pipes, catch the flow in a watering can to use later on house plants or in the garden.

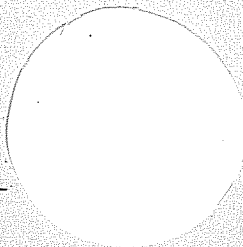
**Hot Weather Program** – When the weather gets very hot, even good water management habits may not be enough. During those times, Rainbow and SUB implement programs designed to spread water use over the course of the day. This keeps well systems from getting stressed, and allows us to keep from drilling more wells, which keeps our rates low for everyone.

**Water advisories** – If weather forecasts predict temperatures above 97 degrees over the course of several days, SUB and Rainbow will broadcast water advisories asking customers to spread their water use across the day, helping to decrease “peak” times that can stress water systems. On those rare occasions when Springfield has extended periods of hot, dry weather, SUB may ask customers to join together in limiting optional water use until the temperatures return to normal.

# RAINBOW WATER DISTRICT

PO Box 8, Springfield, Oregon 97477

Phone 541-746-1676



Date: \_\_\_\_\_

Dear Customer:

Your water meter was read and showed an unusually high water use. You may be aware of this usage. If so, we are glad to sell you the water.

However, as a service to our customers we are taking this opportunity to let you know, as you may have a leak in your service pipes, faucets or toilets.

Here is some information that you can use to help determine if you have a leak.

### How to read your water meter

Most meters read straight across like the odometer on your car. Your meter is read in cubic feet. Remember that your meter is never reset.

1 cubic foot = 7.48 gallons

10 cubic feet = 74.8 gallons

100 cubic feet = 748 gallons

Your Water Usage:

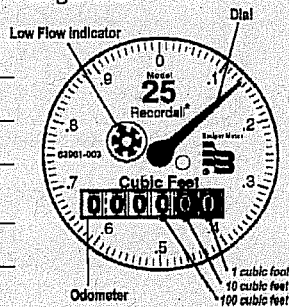
Month \_\_\_\_\_

This Year \_\_\_\_\_

Last Year \_\_\_\_\_

Notes: \_\_\_\_\_

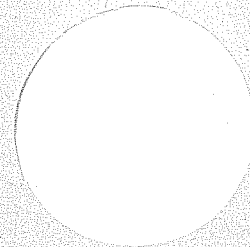
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



### How to use your water meter to check for leaks

1. Locate your water meter. It is usually found in a meter box in a small concrete vault near the street. (Contact Rainbow Water District if you need assistance locating your water meter.)
2. Turn off all water using appliances in the home. This includes all indoor and outdoor faucets.
3. Check and record the current meter reading.
4. Wait 15 minutes (minimum) although overnight is better. **Remember, do not use any water while you are waiting!**
5. Read the water meter again. If the reading has changed, then you have a leak that may require immediate attention.

**See other side for information on how to locate and fix a leak**



### How to locate a leak

Many leaks (dripping faucets or showerheads) are caused by worn washers which are easy to fix. Your local hardware, plumbing supply or home improvement store will have the correct parts and complete do-it-yourself instructions.

Leaks may also occur in your underground pipes. Here are some tips on locating leaks underground.

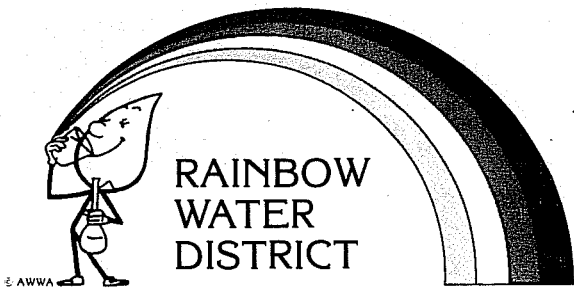
1. Look for any areas in your lawn that seem greener than the rest. This could be an indication that the area is getting more water.
2. Look for any areas that seem soft or squishy when you walk on them.
3. Use a long screwdriver or other metal object to probe in the ground for soft spots not visible on the surface.

If replacing a washer does not work or the problem is underground and you are not able to fix it, contact a certified plumber for assistance.

**If you need any help with these or other techniques please call the Rainbow Water District at 541-746-1676.**

**Did you know:** A single dripping faucet can waste far more water in a single day than one person needs for drinking in an entire week. Conserve water and save money by finding and fixing leaks.





© AWWA

"Proudly serving North and West Springfield."

Dear Customer,

During Previous cold weather periods, we received a report of frozen pipes at your address. To help prevent this problem occurring during the present cold snap, here are some suggestions which may help you prevent this problem.

### **FREEZING WEATHER PRECAUTIONS**

**1. Close vents and other openings to the crawl space under the house.**

- a. This helps keep warmth from the house in the crawl space.
- b. Use newspaper, rags, or soft material to block the foundation vents to prevent cold air from circulating into the area around the water pipes.
- c. Open the vents when the weather warms to prevent dry rot.

**2. Close the garage door and seal off any drafts.** Many houses in our area have their water heater in the garage. Although the water heater is warm, the other pipes in the garage or utility room are not and may freeze.

- a. Put a small space heater in the garage to keep some heat in it. **(Make sure the space heater is set away from combustible material.)**

**3. Disconnect garden hoses from hose bibbs.** Wrap the hose bibb with rags or newspaper and seal with plastic bags and tape. Make sure that rooms located inside from the hose bibb have their doors open so house heat can keep them from freezing. **Even freeze-proof hose bibbs can freeze!** This will happen inside of the walls if not enough heat comes from the room to keep the water in the pipes from freezing.

**4. Open cabinet doors under sinks to allow room heat to reach the pipes.**

**5. On very cold days, let a thin stream of water trickle on all faucets located on outside walls. Let both cold and hot water run.** Hot water pipes can freeze if water does not move through them.

### **FROZEN PIPES**

1. If pipes are leaking, shut off water at your shutoff valve in the water meter box. Begin thawing the pipes to prevent further damage. Consult a plumber if needed.
2. If frozen pipes are not broken and leaking but no water is flowing:
  - a. Leave shutoff valve in water meter box **and** faucets in house **open** to let water escape once the ice melts.
  - b. Use **hair dryer**, not a torch, to warm the pipes, starting at the faucet.
  - c. Once the water begins to flow, let it run until flow returns and then allow it to flow continuously with a small stream until the weather warms above freezing again.



## Water Meter History Database

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### Purposes:

- Identify large water meters that should be tested for accuracy of registration.
- Store testing results on large water meters.
- Organize information about selected meters for 3<sup>rd</sup> party testing company.
- Replace manual method and cumbersome spreadsheets that tracked testing history before.
- Provide water engineering staff with additional info needed to select meters for annual testing.

**Scale:** Over 700 metered water services are 1 ½" or larger.

**Variables:** Identify meters that should be tested, based on:

- Amount of usage in a single year
- Interval of time since last meter test
- A comparison to a five-year average (System will calculate prior year's consumption and 5-year average and identify meters with usage that is significantly higher or lower than the 5-year average).

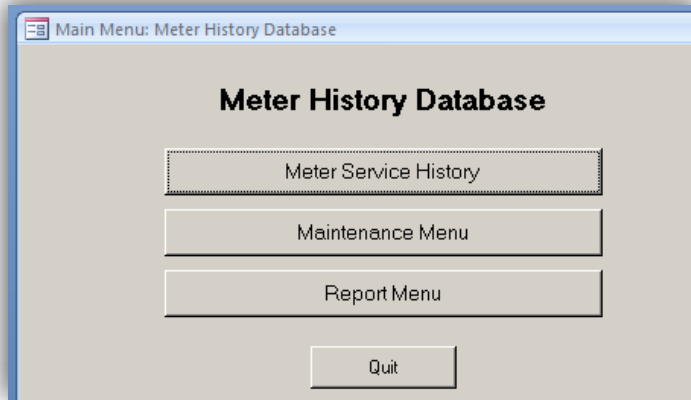
### History:

The manual testing system tracked routine tests of meters over 3" in size and didn't consider total meter registration. Staff wanted to analyze meters over 3" in size, meters that registered over 20,000 units in a single year, and to consider models & manufacturers. The manual system and the spreadsheets couldn't accomplish that, so I.T. built a data base in 2012.

The database actually holds information on all water meters 1 ½" and larger. This allows for future testing of smaller meters, and picks up smaller meters related to the larger meters, such as a ¾" detector meter or a 1 ½" meter paired with a 3" meter at a service.

### Practices:

- WSC does not test detector check meters on fire lines
- WSC will test smaller registers if they are on a compound meter where at least one of the other registers is over 1".
- Customers with Fire Protection service should receive notification of fire protection usage consistently, (ideally every 5 years, minimum), or every time a customer changes. (How will Mtr History db flag user that cust changed? Or, a report out of PCS?)



An icon on the desk top will open the Meter History Database.

## Report: Meter Test Edit report

The report identifies meters for possible testing, based on different variables:

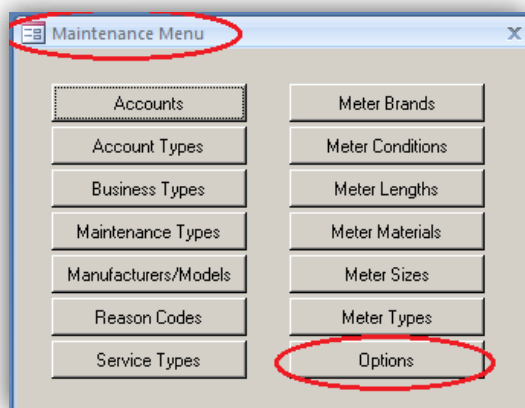
1. Program will find meters of type and size entered at run time and sort by date of last test.
2. Program will analyze volume of water run thru a meter and determine if testing is needed:

The usage analysis will identify:

- Meters with annual average consumption above a flat amount (ex: 20,000 units)
- Meters with unusual consumption: calculate last year's annual usage and compare to 5 year average usage. Select if the difference between the last year and the five year average exceeds a certain %.
  - Different percentages can be set for meters that have been tested within the look back period or which have not been tested. A tested meter has a 'maintenance type' of 'TEST' dated within the "Max # years untested", defined when report is run.

## Procedure: How to run Meter Test Edit Report

Use the "Options" button on the 'Maintenance Menu' to define the variables you wish to use when filtering all the meters in the data base to focus on the ones mostly likely in need of testing.



Report will prompt whether you want to create an Excel Spreadsheet as well as the report. You will need the Excel Spreadsheet for the third party meter test/repair company.

Fill in the variables to focus on the meters most in need of repair:

Variable for Report	Definition
<b>Division:</b>	2 (Water)
<b>Max Years Untested:</b>	Define the maximum number of years that should pass before a meter is tested again. Goal: once caught up, test every 5 years. (Service type is needed because fire lines don't need to be tested as frequently as other services).
<b>Max Annual Usage</b>	Define the maximum usage that should run through one meter in a year's time.
<b>Meter Type</b>	All meters, single dial meters, or compounds Selecting a 'meter type' of 'single' will activate the prompts for meter size.

Variable for Report	Definition
<b>Usage Variances:</b>	Several variables define the criterion the program should use to evaluate the meter's usage history. The basic formula is: Program will find X years of usage history and will calculate the average. Program will calculate the prior's usage and compare to the multi-year average. Will report the meter if the prior year's usage differs from the multi-year average by a given percentage. Different 'Percentages' of variance can be set for tested and untested meters.
Look Back Years	How many years of history should the program look at when calculating averages?
Untested Low %	Find untested meters where last year's usage is lower than this %
Untested High%	Find untested meters where last year's usage is higher than this %
All Low %	Find tested/untested meters where last year's usage is lower than this %
All High%	Find tested/untested meters where last year's usage is higher than this %

### Procedure: Create list of Meters for Testing by Oregon Meter Repair (SUB's 3<sup>rd</sup> party testing service)

1. Enter the variables and run the program that selects meters for Meter Test Edit report.
2. When prompted, say 'yes' to create the Excel spreadsheet.
3. Engineering reviews the meters identified for possible testing on the Meter Test Edit report. Engineering may add or delete suggested meters.
4. Send spreadsheet to OMR. They will perform the tests based on manufacturer's recommendations for each type of meter to determine accuracy and will provide SUB the testing results.
5. SUB will enter the testing results in the data base. Will use 'maint type' to flag situations such as 'waiting for follow-up', 'waiting for parts', 'repairs', 'replaced gears' etc. SUB staff will then follow up on those main types.

### The Data that Drives the Meter Test Edit Report

A significant amount of data must be imported from PCS and entered into this data base to provide the program with sufficient information to produce the Meter Test Edit Report. The following sections of this documentation explain the background work that must be done to keep the data base up to date and accurate.

#### Relationship between Water Meter History and PCS Billing System:

PCS is the source of meter and service information, location information, meter usage, account information, and the meter manufacturer master file. Each night after the billing program completes in PCS, a job will populate Water Meter History database.

**Special note on Compound water meters:** Compounds will be presented as parent/child services for the sake of consistency. Eventually all compounds will become parent/child services in the PCS






system. Parent/child services know they are related, thus making it easy to tally usage for all registers on the same meter.

PCS identifies only the “billing” size of a compound meter—the size of the largest register. The Meter History database will allow entry and retention of the actual sizes of smaller registers.

## Meter Service History screen

**Purpose:** Find meters in the data base in order to enter maintenance records, review usage, update service type, add removal reason, flag by-pass meters.

**First screen:** An Inquiry screen which allows staff to look up meters by service address, meter number or register.

Edit	Service Address	Meter	Register
	100 INTERNATIONAL WAY	37716217	1
	1000 ROYAL CARIBBEAN WAY	29577438	1
	1000 ROYAL CARIBBEAN WAY	32002572	1
	1001 35TH ST	00002819W	1
	1001 35TH ST	00006441W	1

To view a meter in detail, or to enter Test results, click the “edit” button.

SAD: 3315 MARCOLA RD

Notes: **Notes about the address (such as a compound being replaced with two separate meters)**

Meter No.	Reg	Manufacturer	Model	Meter Size	Billing Size	Install Date	Removal Date	Reason	Description	Dwellings	By Pass
01372772	1	H	FM-CT	8	8	2/27/2009			can come from PCS. Or, can enter directly here.		<input checked="" type="checkbox"/>
01372771	1	H	MHR 2	2	8	2/27/2009			Notes about a particular meter	1	<input checked="" type="checkbox"/>

Notes: **Notes about a particular meter**

**Maintenance** | Usage | Service Types

Maint. Date	Maint. Type	Maint. By	Notes
12/31/2006	T	TEST	See Dial A.
12/31/2001	T	TEST	
*			

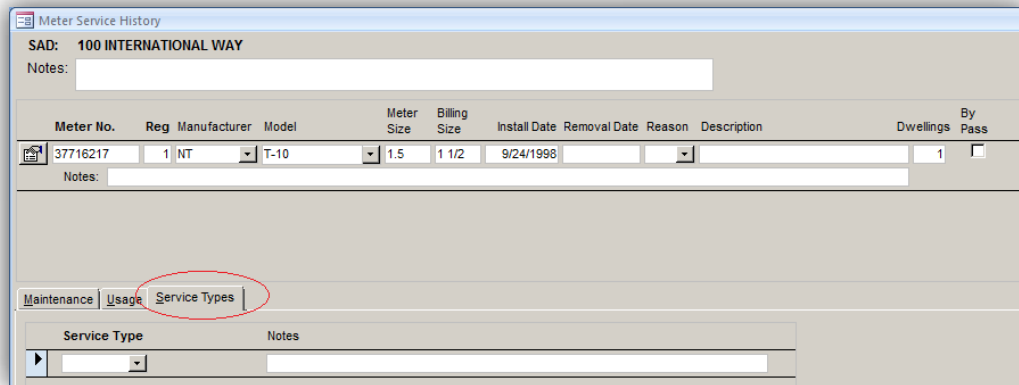
To enter Maintenance information, use the ‘maintenance tab’

<b>Mtr Svc History Data</b>	<b>Where it comes from? How maintained?</b>
Mtr #/ Mfr, model, size, dates	Comes from PCS
Meter Description	If exists in PCS, will be populated. Can also be entered here, but won't be part of PCS if entered here.
# Dwelling units	Data not available from PCS. Must be entered here, if needed
By-Pass	Flag meters that have a by-pass meter. "By-pass" exists in this data base only, not in PCS.
Maint Type & Date	'Maint types' are 'actions' taken on a meter. The "TEST" code is what system looks at when determining meter was tested last.

**Notice the other two tabs: Usage and Service Types**

**Usage** tab pulls usage history directly from PCS.

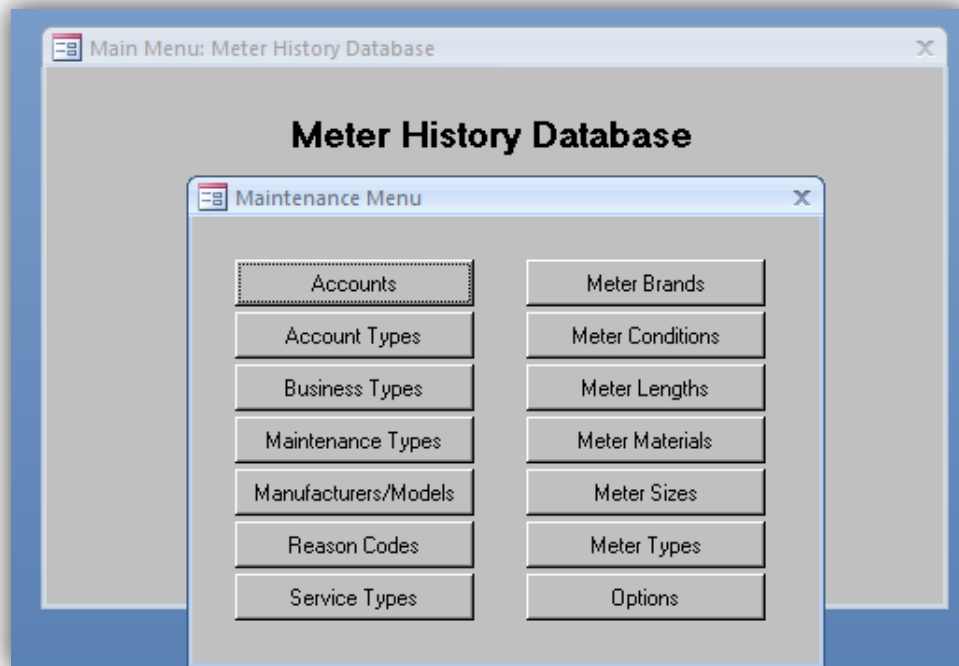
**Service Types** allows WSC to enter information on how the water service is used. This info is not tracked in PCS. ('Service Types' is explained below).



## Meter Set Up Files

The Maint Menu provides access to the set-up files that allow staff to populate and customize the database:





**Accounts:** retrieves all water meters over 1” and displays in account number order.

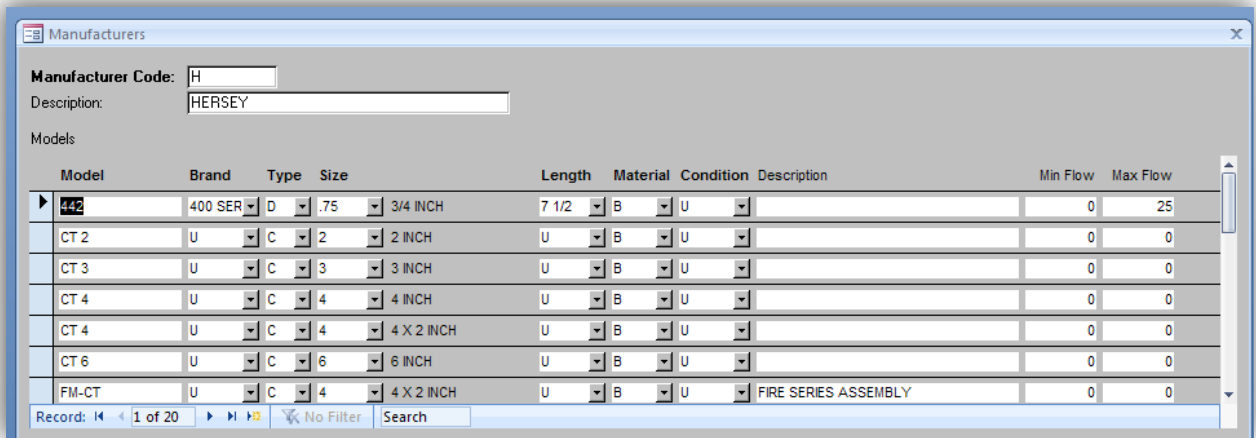
- Displays data found in PCS: account number and customer name, date the account became responsible for the water service, and account type.
- Water Service Center users would enter the ‘type of business’ served by the meter (since that data does not exist in PCS).

**Account Types:** A master file table accounts. Data is pulled from PCS as “service.revenue code” (residential, commercial, industrial, public, and SUB).

**Business Types:** A master file table used to define types of businesses. The data does not exist in PCS and would have to be entered into the Meter History database, and would need to be updated when customers change.

**Maintenance Types:** A master file table. Holds data such as “gear, repair, test, unknown”.

**Manufacturers/Models:** A master file table that provides additional details about meters, including manufacturer’s recommendations about minimum and maximum flows.



**Meter Model Codes:** See CSS Data Dictionary in Help Scribble, Meter Type Codes

- The information comes from PCS
- Other attributes, such as brand, type, size, length, material, condition, min/max flow are defined in other set up files (and are explained here).
- Min/max flow: Each meter type has a minimum and maximum range of flow recommended by a manufacturer. Flows under or over these thresholds might not be measured accurately. This info helps determine if a meter is “right sized” for a service or not. This ‘manufacturer’ table defines these min/max values by manufacturer and meter model. Jan 2015: this has not been implemented. SUB’s third party meter testing company has this information).

**Meter manufacturer (these are master tables in PCS, maintained by I.T.)**

Code	Desc
BN	Badger, new
BR	Badger, rebuilt
GE	General Electric
HN	Hersey, New
HR	Hersey, Rebuilt
NN	Neptune/Trident, New
NR	Neptune/Trident, Rebuilt
RN	Rockwell, New
RR	Rockwell, Rebuilt
RS	Rockwell, Sensus
SCHL	Schlumberger
SEN	Sensus
SENO	Sensus, Omni
SIEM	Siemens
U	Unknown Manufacturer
R	Rainbow Water Meter

### Reason Codes – for Change Outs

- **Purpose:** Record the reason for the change out in order to track possible trends in failures, such as failures by a particular manufacturer or model.
- Source of info: Meter Master Information comes from PCS. The information on change outs comes from PCS; it's entered by WSC's CSR through the "Device Management" module (Meter\ Water Meter\ Test – comment)

1	Routine/Periodic	Ex: changed out while work done on service. Or, old meter (downtown Rockwells) were targeted because of their purchase date.
2	Meter Not Working	Meter stopped working or may have registration problems
3	Meter hard to read	Meter reported as fogging up frequently or having scratched glass
4	Frozen	Meter froze during cold weather
5	Damaged	Meter glass broke and meter physically damaged. Could be due to vandalism or tampering
6	Radio Device Installed	Used rarely, but identifies a meter changed out to accommodate a firefly device or Itron Radio meter.
7	Other	No other code applies. Ex: customer requested. Provide additional detail on the meter change out order

### Service Types

**Purpose:** Identify the type of water service the meter supplies. This information is not usually tracked in PCS since all water is billed at the same rate. WSC staff would have to enter as needed.

Service Type	Desc
D	Domestic or mixed
M	Mixed – domestic/fire protection/irrigation
F	Fire Line Only
I	Irrigation only
U	unknown

### Meter Brands

The screenshot shows a window titled "Meter Brands". Inside the window, there are two input fields. The first field is labeled "Meter Brand:" and contains the text "RA". The second field is labeled "Description:" and contains the text "RECORDALL".

These values are not imported from PCS. Water Service Center enters. The information provides the data for the drop downs in the Manufacturer/Model set up table.

**Meter Conditions**

New, Rebuilt, unknown. Used to provide drop down values for the Meter Manufacturer/Model table. WSC would enter and maintain for individual meters.

**Meter Lengths**

Define the standard lengths. Used to provide drop down values for the Meter Manufacturer/Model table. WSC enters and maintains for individual meters

**Meter Materials**

Define the materials out of which a meter is made.

Code	Desc
B	Bronze
P	Plastic

**Meter Sizes**

Defines meter diameter, in inches, starting with 1 ½". The info provides the drop down values for the Meter Manufacturer/Model table.

**Meter Types**

Code	Description
C	Compound
D	Disk
O	Omni
T	Turbine
U	Unknown
FSaa01	Fire service assembly
FSma01	Fire service

**Options**

**Purpose:** define the variables that drive which meters the program selects for testing. (This is explained above in [How to Run Meter Test Edit report](#).)

# Meter Test Edit

Options: Test Yrs (Yrs): 5 Max Usg (Usg): 1000 Untested Low (Low%): Untested High (HI%): Look-Back Yrs (Avg Usg): 5 All Low Usg (All Low%): All High Usg (All HI%):  
 Meter Type: Single From Size: 3 To Size: 12

Service Address	Customer Name	Meter #	Reg	Mf	Model	Size	Inst Date	Pass	Svc Typ	Last Test	Yrs	Usg	Low%	HI%	All Low%	All HI%	Last Yr	Avg Usg
205 S 54TH ST	CHALET VILLAGE MHC LLC	72910741	1	SEN	OMNI-413	3 INCH	08/12/2011			11/27/2012	X	X					12120	11424
		00000005	1	S	FM-CT	6 X 3 INCH	08/12/2011			01/03/2011	X						89	0
2900 GATEWAY ST	CINEMARK USA INC	01546823	1	R	W-350 DR	3 INCH	04/27/1999				X	X					1852	1602
3315 MARCOLA RD	KINGSFORD MFG COMPANY	01372771	1	S	MHR 2	2 INCH	02/27/2009			12/31/2006	X	X					35708	29577
		01372772	1	S	FM-CT	8 X 4 INCH	02/27/2009			12/31/2006	X	X					41830	14052
3333 RIVERBEND DR CUP	PEACEHEALTH OREGON REGION	67403407	1	SEN	W-350 DR	3 INCH	02/29/2008				X	X					16637	6108
3333 RIVERBEND DR HOSPITAL	PEACEHEALTH OREGON REGION	06300937	1	B	RECORDALL CS800	4 BY 1 INCH	04/18/2007			11/26/2012	X	X					2838	1770
		06300938	1	B	RECORDALL CS800	4 BY 1 INCH	04/18/2007			11/26/2012	X	X					1356	1
3950 MARCOLA RD	OR INDUSTRIAL LUMBER PROD	70940699	1	SEN	OMNI-213	3 INCH	08/05/2011				X	X					3411	2978
		00005958	1	S	MFV-MCT	10 X 6 INCH	08/05/2011				X						0	0

# Meter Test Edit

Options: Test Yrs (Yrs): 5 Max Usq (Usq): 1000 Untested Low (Low%): Untested High (HI%): Look-Back Yrs (Avg Usq): 5 All Low Usq (All Low%) All High Usq (All HI%):  
 Meter Type: Single From Size: 3 To Size: 12

**Service Address**

**Customer Name**

Meter #	Reg	Mf	Model	Size	Inst Date	Pass	Svc Typ	Last Test	Yrs Usq	Low% HI%	All Low% All HI%	Last Yr	Avg Usq
520 HARLOW RD CL OPCO LLC	1	R	W-350 DR	3 INCH	08/25/1998			11/22/2011	X	X		5069	4485
5335 MAIN ST WTR/SWR SANTIAGO ESTATES ASSOC LLC	1	R	W-1000 DR	4 INCH	08/17/1998				X	X		30169	26900
6330 MAIN ST VILLAGE EAST APARTMENTS LP	1	S	MFIM-MCT	6 X 3 INCH	08/20/1998			11/21/2011	X	X		2869	3431
969 KRUSE WAY TALOS LLC	1	R	W-350 DR	3 INCH	08/20/2002			01/05/2011	X	X		3373	2974