

## WATER DISTRICT

### WATER MANAGEMENT and CONSERVATION PLAN

Adopted April 2014

#### Executive Summary

The Southwest Lincoln County Water District presents its 2014 Water Management and Conservation Plan (WMCP) to the Water Resources Department (WRD) and interested parties. The Water District submitted a Water Management and Conservation Plan in 2004 in response to the requirements of WRD Permit S-52498. This Water Management and Conservation Plan is an update of that plan as directed by Oregon Administration Rules (OAR) 690-315 and 690-086.

The Water District believes this WMCP outlines a plan to effectively manage its present water rights; both certificated and permitted, and provide a means for developing a comprehensive strategy for meeting its municipal water supply needs over the next twenty years. The plan attempts to enhance management techniques of the state's water resources by maintaining and improving the efficiency of the Water District's water system, thereby meeting the intent of the regulations defined under the Division 86 rules.

#### E.1 Meeting the WMCP Criteria

Approval of this WMCP is contingent upon the Southwest Lincoln County Water District meeting the criteria outlined under OAR 690-086-0130. In accordance, the Southwest Lincoln County Water District has prepared a concise statement addressing each of the review criteria cited in that regulation.

Inclusion of specific elements under 690-086-125: The current plan includes specific sections that address each – a description of the Water District's water supply system and history, an updated conservation plan, a curtailment plan, a twenty year supply strategy, a list of affected local governments to whom the plan has been made available and a proposed schedule for update in 2024.

Projections of future water need; The Water District is projecting to need only a limited increase in water over the next twenty years. Presently the Water District uses about 0.16 mgd on an average annual day, with a peak demand of about 0.40 mgd. By 2033, this demand increases to approximately 0.30 mgd for an average annual day. The 2033 peak day is will increase to approximately 0.67 mgd. These projections are consistent with the Water District's planning data for increases in population and commercial development and are consistent with comprehensive plans developed by Lincoln County, the City of Waldport, and the City of Yachats.

Water Conservation Measures under OAR 690-086-0150: The Water District has developed a conservation program targeted at reducing the demand on the water supply. The program incorporates each of the elements noted under OAR 690-086-0150 (4) and addresses the expected demands for years 2023 and 2033.

Table ES-1 summarizes the actions and related benchmarks for the conservation program. Over the next twenty years, the Water District proposes to submit an updated WMCP at the end of the ten year period in 2024.

## SECTION 1

### Overview

#### 1.1 General System Description

The Southwest Lincoln County Water District is a municipal Water District located within a 1/2 mile to 1 mile wide by eight long mile strip of land between the City of Waldport on the North and the City of Yachats on the South along Highway 101. Southwest Lincoln County Water District is responsible for supplying water to approximately 1250 customers within the District boundaries. The Pacific Coastline forms the west border and the U.S. Forest Service or sparsely developed forestland lies to the east. U.S. Highway 101 is the primary transportation link and most District water users are within this corridor. Topography within the Water District is flat to gently sloping except at some eastern limits, where foothills begin. Few locations are higher than 200 feet elevation. Most water users reside below an elevation of 100 feet. The Water District encompasses approximately 8640 acres.

Over 95% of the Water District's water connections are residential customers, including both single and multi-family accounts, using about 89% of the Water District's water production. Approximately 3% of the Water District's water connections are commercial customers, mostly motels using about 4% of the Water District's water production. The other 2% of the Water District's water connections are public institutions, state and federal parks, school, and federal office sites using about 7% of the Water District's water production.

The Water District has permits or certificates to divert water from four creeks totaling 2.30 cfs (1.94 mgd), of which 0.4 cfs cannot be diverted in the month of July. Operational constraints limit normal production treated water capacity to between 0.79 and 0.87 mgd. Enlarging the Water District's largest water treatment plant will eliminate this constraint. To date three of the Water District's water rights have been certificated. The last two were submitted for certification in 2003.

#### 1.2 Purpose

Recently the Water District applied for a permit extension and submitted two final proof surveys. This action triggered the need to update the Water District's Water Management and Conservation Plan (WMCP) in compliance with Oregon Administrative Rule (OAR) 690-315 and 690-086.

The Water District submitted a WMCP in 2004 to the Water Resources Department (WRD). The Water District has made many changes since the submittal of the WMCP in 2004 and is looking to coordinate this new plan with ongoing efforts to comply with Division 86 rules.

### 1.3 Proposed Progress Report and Update Schedule

Following the administrative rules, the Water District proposes to submit a progress report on or before October 2014 to review noted benchmarking and water use progress. Since Southwest Lincoln County Water District does not anticipate the need for any new source water over the next twenty years, the Water District is not planning to submit an updated WMCP until the required ten-year period in 2024.

### 1.4 Summary of Data Sources

Throughout this WMCP are references to data obtained from District files. This data includes records of water diverted from creeks, customer billing, conservation program implementation, and the Lincoln County Land Use Plan. Historical data related to service area, such as connections and demand, was obtained from the District's billing records and the Water System Master Plan. Historic and future demographic data was obtained from Water District records and the Lincoln County Planning Department.

### 1.5 Input During Plan Development

A draft WMCP was submitted to Lincoln County with a request for comments. The Water District Board of Commissioners approved this plan on April 9, 2014.

### 1.6 Document Organization

This WMCP is organized in a manner consistent with the Division 86 rules. Section 2 describes the water supply system, including key demographic information, water consumption, and the type of infrastructure present in the water system. Section 3 identifies the conservation measures the Water District has implemented and proposed new measures with associated benchmarks for each new measure. Section 4 describes the tools available to the Water District in the event of a water emergency, including a water curtailment plan. Section 5 uses the information presented in Section 2 to forecast future demand, compare that demand to present water rights, and assesses the need for additional source water diversions.

## Section 2

### Municipal Supplier Description

#### 2.1 Service Area and Population

##### 2.1.1 Service Area

The Southwest Lincoln County Water District is a municipal Water District located within a 1/2 mile to 1 mile wide by eight long mile strip of land between the City of Waldport on the North and the City of Yachats on the South along Highway 101. The Water District encompasses approximately 8640 acres.

Southwest Lincoln County Water District currently has 1250 active water services ranging in size from 3/4-inch to 6-inch. This represents an estimated permanent population of 2250 people. The population figures rise to approximately 6000 people at times during the summer months. Except

for parts of the Water District within the city limits of Waldport, the entire Water District is zoned as residential use. All of the commercial uses within the Water District are Grand fathered uses. The Pacific Coastline forms the west border of the Water District and the U.S. Forest Service or sparsely developed forestland forms the eastern border of the Water District. U.S. Highway 101 is the primary transportation link and most District water users are within this corridor. Topography within the Water District is flat to gently sloping except at some eastern limits, where foothills begin. Few locations are higher than 200 feet elevation. Most water users reside below an elevation of 100 feet. Over 95% of the Water District's water connections are residential customers, including both single and multi-family accounts, using about 89% of the Water District's water production. Approximately 3% of Water District's water connections are commercial customers, mostly motels using about 4% of the Water District's water production. The other 2% of Water District's water connections are public institutions, state and federal parks, school, and federal office sites using about 7% of the Water District's water production.

### 2.1.2 Population Estimates

The population served fluctuates from approximately 2000 people in the winter, when many of the District residents move to drier climates, to approximately 6000 people in the summer when all campgrounds and motels are full. These numbers are based upon observation, as there is no accurate population count for the areas of the county outside of cities. Other studies for the Water District have used a figure of 1.8 people per equivalent dwelling unit. This appears to fit on-the-ground observations. The Water district has experienced a .05% growth in new services for the past five years. This growth rate is a little less than other residentially zoned areas of the county. The Water District could possibly experience an unusual growth spurt in the area of the Water District within the city limits of Waldport, if the City of Waldport's industrial complex were to be sewered. Approximately 300 homes could be added to the Water District if this were to be completed. The Water District does not foresee this event within the next five years. A summary of estimated population data for years 2008 to 2013 are shown in Table 2-1.

Table ES-1

### 5-Year Conservation Benchmarks

#### On-Going Efforts

Benchmark	Date	Frequency
Visual inspection of reservoirs	July 2014	Monthly
Customer Leak detection visits		On-call
Reduced operational water usage at treatment plants		Daily
Perform water audit		Monthly
Commercial Meter Testing or replacement >1 ½"		10 years or 10,000,000 cu ft.
Conservation Incentive Program		Annually

Water Line Replacement		As needed
Leak Detection and Repair		As needed
Low Water Landscaping		As Requested
Fixture Replacement Program		In Conjunction with others
Water Rates Review		Annually
Water Reuse		Not allowed
Raw Water Meter Testing		Every five years or as needed
Residential Meter Testing		Ten to Twenty years
Public Education		Annually

#### New Programs

Benchmark	Date	Frequency
Initiate revolving meter replacement	As budget allows starting 2015	20 years
Create water conservation page for web site	Done	Updated every 10 years

Identification of Resources Issues: The sources of water for the Water District are exclusively surface water from local streams. The issues defined under OAR 690-086-140 (5) do apply. Curtailment Plan: The Southwest Lincoln County Water District developed a water emergency plan in February 2008.

A curtailment plan that was prepared pursuant to ORS 536.780 and consistent with ORS 690-019-0090. The curtailment plan represents one of the tools available to the Water District to meet a water emergency. The curtailment plan includes five stages, triggers for each stage, and curtailment actions that will satisfactorily promote conservation practices.

Use Beyond Permit Extension: As part of this submittal the Water District has developed a schedule for using water under each of its water rights to serve its anticipated twenty year demand. The Water District will not be looking for any new water rights during the next twenty years, but will seek to make optimal use of its existing permits. By year 2033, the Water District will be diverting as much as 0.30 mgd on an average daily basis over the year and utilize as much as 0.67 mgd on a peak day – thereby utilizing between 24%-54% of its present inventory of municipal rights totaling 1.23 mgd.

#### E.2 Proposed Schedule for Updating Plan

Following the administrative rules, the Water District proposes to submit a progress report on or before October 2014 to review noted benchmarking and water use progress. Since the Southwest Lincoln County Water District does not anticipate the need for any new source water.

Table 2-1

## Southwest Lincoln County Water District Population Estimates

Year	No. Services	Est. Population
2008	1230	2214
2009	1242	2236
2010	1249	2248
2011	1249	2248
2012	1250	2250
2013	1252	2254

## 2.2 Source of Supply

## 2.2.1 Summary of Existing Sources

The Water District currently takes water from four separate surface water sources located on Big Creek, Starr Creek, Vingie Creek and Dicks Fork. Each source is the culmination of surface waters within separate watersheds. The drainages flow directly to the Pacific Ocean. Each watershed is timber-covered and situated within the Siuslaw National Forest except the Vingie Creek source which does have some private land in the lower end of the water shed. The watershed properties are owned by the Federal Government and managed by the U.S. Forest Service. Accesses to all intakes except Vingie Creek are via Forest Service Roads with locked gates. There are areas within the Big Creek and Starr Creek watersheds that were logged in the 1980's.

Table 2-2

## Southwest Lincoln County Water District Water rights summary

Permit No.	Priority Date	Certificate No.	Rate	Use	Local Name	Authorized Completion Date
S-19165	06/08/1945	29022	0.3 cfs	Municipal	Big Creek	Unknown
S-16464	06/08/1945	29023	0.3 cfs	Municipal	Starr Creek	Unknown
S-31979	09/06/1966	Pending	0.3 cfs	Municipal	Vingie Creek	3/2002
S-52498	01/13/1989	Pending	1.0 Cfs/ 11 mo. 0.6 cfs/ 1 mo.	Municipal	Vingie Creek	3/2002
S-36270	06/07/1971	80664	0.4 cfs	Municipal	Dicks Fork	1994

These sources have been identified as having low microbiological contamination potential and high turbidity potential. To date the District has found that the periods of high turbidity coincide with heavy winter rains. The District has been able to shut off the intake structures and operate on treated water storage at these times.

## 2.3 Summary of Recent Use

### 2.3.1 Average Annual Usage

Table 2-3 summarizes the annual production from each of the Water District's sources over the past five years, as well as their relative percentage with regards to the Water District's total water production. No one source serves as the primary source for the Water District.

Table 2-3

#### Southwest Lincoln County Water District Water rights summary

##### Total Production in Million Gallons

Location	Permit No.	2008	2009	2010 & 2011	2012	2013	5-year Ave	% of Supply
Starr Creek	S-16464	21.9	21.2	22.7	21	23.9	22.14	37
Vingie Creek	S-31979 S-52498	9.0	9.8	8.7	7.5	5.6	8.12	14
Big Creek	S-19165	23.7	22.7	23.8	21.7	22.9	22.96	38
Dicks Fork	S-36270	7.5	7.4	6.1	5.8	6.0	6.56	11
Total (MG)		62.1	61.1	61.3	56.0	58.4	59.78	100
Ave Day (MG)		0.17	0.17	0.17	0.15	0.16	0.16	

The numbers shown in Table 2-3 are consistent with the Water District annual water use reporting as required under OAR 690-085.

### 2.3.2 Seasonal Usage

A review of the usage between 2008-2013 indicates that peak days of water use in the Water District normally occur in the months of July and/or August. This fact is comparable to the communities north and south of the Water District. The type of weather affects this peak usage as much as by the number of tourists visiting the area. Long periods of sunny weather on the coast encourage an influx of tourists as well as localized lawn and garden watering.

## 2.4 Water Customers Served

The Water District categorizes its customers under the following classifications: Residential, Commercial, Public/Institutional, Irrigation, and Fire flow.

The customers identified as "Residential" represent at least one dwelling unit. Single family, multifamily, and condominiums are found within this class. The customers identified as "Commercial" represent motels, mobile home parks, churches and all other customers not included in another class designation. The customers identified as "Public/Institutional" represent the federal, state, county, municipal connections, and schools. The customers identified as "Irrigation" are those services that provide only irrigation water. The customers identified as "Fire flow" are those services that provide water only for fire protection. As of 2013, the Water District had 1252 customer accounts. A summary of the account history from 2008 to 2013 is shown in Table 2-4. The residential class currently makes up about 96% of the total number of accounts.

Table 2-4

Southwest Lincoln County Water District Accounts per Customer Class

	2008	2009	2010 & 2011	2012	2013
Residential	1186	1198	1205	1205	1207
Commercial	30	30	30	30	30
Public/Institutional	12	12	12	12	12
Irrigation	1	1	1	1	1
Fire Meter	1	1	1	2	2
Total	1230	1242	1249	1250	1252

It is sometimes advantageous to convert various meter sizes to Equivalent Residential Units (ERUs) to characterize potential water usage throughout a wide range of connection sizes. This can be accomplished by converting all meter sizes to their equivalent residential meter size. The standard meter size used by the Water District on a residential service is a 5/8-3/4 meter rated at 20 gpm. Using this as a base, Tables 2-5 through 2-9 are created for years 2008-2013.

Table 2-5

Southwest Lincoln County Water District 2008 Summary of Connections and ERUs (in Parentheses)

Meter Size	ERU Equivalent	Residential	Commercial	Public/ Institutional	Irrigation	Fire Meter
5/8-3/4"	20 gpm=(1)	1186 (1186)	18 (18)	6 (6)		
1"	50 gpm=(2.5)	2 (5)	8 (20)	1 (2.5)		
1 1/2"	100 gpm=(5)		3 (15)	1 (5)		
2"	160 gpm=(8)		1 (8)	5 (40)		

6"	1000 gpm=(50)			1 (50)		1 (50)
Total Meters	1230	1188	30	14		1
Total ERUs	(1405.5)	(1191)	(61)	(103.5)		(50)

Table 2-6

Southwest Lincoln County Water District 2009 Summary of Connections and ERUs (in Parentheses)

Meter Size	ERU Equivalent	Residential	Commercial	Public/ Institutional	Irrigation	Fire Meter
5/8-3/4"	20 gpm=(1)	1198 (1198)	18 (18)	6 (6)		
1"	50 gpm=(2.5)	2 (5)	8 (20)	1 (2.5)		
1 1/2"	100 gpm=(5)		3 (15)	1 (5)		
2"	160 gpm=(8)		1 (8)	5 (8)		
6"	1000 gpm=(50)			1 (50)		1 (50)
Total Meters	1242	1200	30	14		1
Total ERUs	(1417.5)	(1203)	(61)	(103.5)		(50)

Table 2-7

Southwest Lincoln County Water District 2010 & 11 Summary of Connections and ERUs (in Parentheses)

Meter Size	ERU Equivalent	Residential	Commercial	Public/ Institutional	Irrigation	Fire Meter
5/8-3/4"	20 gpm=(1)	1205 (1205)	18 (18)	5 (5)		
1"	50 gpm=(2.5)	2	8	1		

		(5)	(20)	(2.5)		
1 ½"	100 gpm=(5)		3  (15)	1  (5)		
2"	160 gpm=(8)		1  (8)	4  (32)	1  (8)	
6"	1000 gpm=(50)			1  (50)		1  (50)
Total Meters	1249	1207	30	12	1	1
Total ERUs	(1423.5)	(1210)	(61)	(94.5)	(8)	(50)

Table 2-8

Southwest Lincoln County Water District 2012 Summary of Connections and ERUs (in Parentheses)

Meter Size	ERU Equivalent	Residential	Commercial	Public/ Institutional	Irrigation	Fire Meter
5/8-3/4"	20 gpm=(1)	1205  (1205)	18  (18)	5  (5)		
1"	50 gpm=(2.5)	2  (5)	8  (20)	1  (2.5)		
1 ½"	100 gpm=(5)		3  (15)	1  (5)		
2"	160 gpm=(8)		1  (8)	4  (8)	1  (8)	1  (8)
6"	1000 gpm=(50)			1  (50)		1  (50)
Total Meters	1250	1207	30	12	1	2
Total ERUs	(1431.5)	(1210)	(61)	(94.5)	(8)	(58)

Table 2-9

Southwest Lincoln County Water District 2013 Summary of Connections and ERUs (in Parentheses)

Meter	ERU	Residential	Commercial	Public/	Irrigation	Fire
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Size	Equivalent			Institutional		Meter
5/8-3/4"	20 gpm=(1)	1207 (1207)	18 (18)	5 (5)	1 (1)	
1"	50 gpm=(2.5)	2 (5)	8 (20)	1 (2.5)		
1 1/2"	100 gpm=(5)		3 (15)	1 (5)		
2"	160 gpm=(8)		1 (8)	4 (8)	1 (8)	1 (8)
6"	1000 gpm=(50)			1 (50)		1 (50)
Total Meters	1252	1209	30	12	2	2
Total ERUs	(1434.5)	(1212)	(61)	(94.5)	(9)	(58)

As shown in Tables 2-5 through 2-9, the Water District had 1405.5 ERUs in 2008, 1417.5 ERUs in 2009, 1423.55 ERUs in 2010 & 11, 1431.5 ERUs in 2012, and 1434.5 ERUs in 2013. The Water District's largest customer class is residential, representing 85% of the ERUs in the system. 58 ERUs are fire flow connections, which have no effect on overall water usage, due to very infrequent or no use. There are 9 ERUs of irrigation use during the high water use times of the year. Calculations within this WMCP do not incorporate "Fire Meter" accounts unless otherwise noted.

The water usage per ERU for years 2008-2013 was calculated by dividing the average daily use from table 2-3 for each year with the corresponding adjusted total of ERUs for that year. See Table 2-10.

Table 2-10

Southwest Lincoln County Water District Historic Average Annual Water Use (GPD / ERU)

Year	Annual Water Use (mgd)	ERUs	Water Use/ERU (GPD/ERU)
2008	0.17	1405.5	121
2009	0.17	1417.5	120
2010	0.17	1423.5	119
2011	0.17	1423.5	119
2012	0.15	1431.5	105
2013	0.16	1434.5	112
Average	0.16	1422.5	116

The Water District usage per ERU appears to be slightly lower than the water users on either side of the Water District. Actual figures are not available to the Water District.

## 2.5 Facilities Description

### 2.5.1 Source/Treatment

The Water District's four raw water sources supply water to two water treatment plants. Pumps are used to deliver the water from the treatment plants to the receiving reservoirs. The Big Creek and Starr Creek sources are at the same elevation (238 feet). Water from these two sources is first diverted from the creeks into settling basins and then piped by gravity to the Blodgett Water Treatment Facility at elevation 160 feet. Water from Vingie Creek is diverted into a large manhole (there is no settling basin on this source) from which the water is pumped into the waterline bringing Starr Creek water to the treatment plant. The Blodgett Water Treatment Facility has a current rated capacity of 350 gpm and can be operated periodically at 450 gpm during the summer months. This plant will be expanded to a rated capacity of 700 gpm in the future, when demand warrants it. After treatment, the water is pumped to the 1,000,000 gallon Blodgett reservoir, near the treatment plant, which is at elevation 185 feet. The Dicks Fork source is at elevation 434 feet. Water from this source flows to a settling basin at elevation 372 feet and then flows to the Dicks Fork Treatment Facility at elevation 310 feet (near the Dicks Fork reservoir). The Dicks Fork Treatment Facility plant has a capacity of 200 gpm. After treatment, the water is pumped to the 200,000 gallon Dicks Fork reservoir at elevation 330 feet. At this point in time, Big Creek, Starr Creek, and Vingie Creek provide water to approximately 90% of the District's customers. Dicks Fork serves the remaining 10%. If one of the sources is damaged or not available for use during low flow conditions, the remaining three are able supply the District's water needs within the District's current water rights.

### 2.5.2 Transmission/Distribution

Development within the District is concentrated on the coast along State Highway 101. A 12-inch distribution line from the Blodgett Treatment Facility conveys the water westerly to a 10-inch line lying approximately 1300 feet east of and parallel to Highway 101, which runs from the Angell Job Corp. site on the north to Starr Creek Drive on the south. This line is connected to a 6-inch north/south line along Highway 101, which extends the full length of the District, from the City of Yachats on the south northerly to the City of Waldport, approximately 6.8 miles. The distribution system off the above-mentioned lines consist of two, four, and six-inch lines. About 50% of these lines are not looped, which causes some water quality and quantity problems. The two different service elevations are connected by pressure-reducing valves at two locations allowing water from the Dicks Fork reservoir to feed into the lower system if needed and a pump station, which is capable of supplying the water needed in the higher service area from the Seabrook Reservoir.

Table 2-11

Southwest Lincoln County Water District Summary of System Pipe Sizes

Nominal Pipe Size	Total Length (ft)	% of Total
2	15,000	14
4	5,000	5
6	35,500	33
8	10,000	10
10	35,000	33
12	5,000	5

	105,500	
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The Water District pipelines are 99% PVC, with Asbestos Cement pipe and Iron pipe making up the other 1%.

### 2.5.3 Water Storage

The Water District's treated water storage consists of two concrete storage tanks and three steel storage tanks. The Water District's raw water storage currently consists of three settling basins, one near each of the three gravity water sources. There is no settling basin for the Vingie Creek source. Present and future storage capacities are as follow:

Table 2-12

Southwest Lincoln County Water District Raw and Finished Water Storage Summary

Reservoir Name	Construction Material	Storage Capacity (Gal.)	Overflow Elevation (Ft)
Starr Creek (Raw Water)	Concrete	120,000	235
Crabapple (Treated Water)	Glass Lined Bolted Steel	50,000	335
Eastline (Treated Water)	Glass Lined Bolted Steel	500,000	180
Blodgett (Treated Water)	Glass Lined Bolted Steel	1,000,000	185
Big Creek (Raw Water)	Concrete	60,000	235
Dicks Fork (Raw Water)	Concrete	120,000	410
Dicks Fork (Treated Water)	Concrete	100,000	335
Seabrook (Treated Water)	Concrete	100,000	180
Wakonda Beach (treated Water)	(Future Reservoir)	500,000 (Min.)	180
Dicks Fork II (treated Water)	(Future Reservoir)	500,000	330

### 2.5.4 Pump Stations

The District has two treated water distribution pump stations and a raw water pump station.

Alder Street Pump Station - This pump station is located at the intersection of Eastline and Alder Streets. Water is taken from the low-level system and delivered into the high level system as needed. This pump station is controlled by the water level in the Crabapple Reservoir. The pump station has two pumps, each capable of delivering 50 gallons per minute to the Crabapple reservoir.

Seabrook Pump Station – This pump station is located at the east end of SW Seabrook Lane. Water is taken from the low-level system and delivered into the high level system (the Dicks Fork treated water reservoir) at the North end of the District, when needed for domestic and firefighting

purposes. The pump station has two pumps, a domestic pump with a capacity of 150 gallons per minute, and a fire pump rated at 450 gallons per minute.

Vingie Creek Pump Station – This pump station is located at the diversion point on Vingie Creek. There are three submersible pumps. Each pump is capable of delivering 170 gallons per minute to the Blodgett Treatment Plant.

## 2.6 Interconnections

The Water District’s water distribution system is connected to the City of Waldport and to the City of Yachats. There are intergovernmental agreements relating to the use of these interties. Use of the interties has been limited and what use there has been is from the Water District to the Cities. The Water District can give water to the City of Waldport by opening a valve. If the Water District needs water from Waldport, the Water District has to make some internal valvular changes. In the future, another connection may be made with Waldport, which would eliminate this valvular change. The connection with Yachats is through a pump station from the Water District to Yachats and through a pressure-reducing valve from Yachats to the Water District.

## 2.7 System Efficiency

Unaccounted for water over the past 5 years has generally been between 3-11% for treated water and between 0-6% for raw water. These numbers are accounted for as follows: raw water loss equals raw water diverted minus water leaving the treatment plant minus estimated unmetered raw water used in filter backwash divided by raw water diverted. Treated water loss equals treated water leaving the plant minus metered water delivered to customers minus estimated unmetered uses minus estimated losses from known leaks divided by treated water leaving plant.

A summary of the water audits for the period 2008-2013 is shown in table 2-13.

Table 2-13

Southwest Lincoln County Water District Leakage Volume as a percent of Production

Water Year	Raw Water Loss	Treated Water Loss
2007-08	6%	4%
08-09	1%	3%
09-10	4%	3%
10-11	1%	6%
11-12	1%	3%
12-13	1%	3%

The overall goal of the Water District is to maintain a raw water loss 3% or less and a treated water loss of 5% or less.

## Section 3

### Conservation Element

In 1999, Southwest Lincoln County Water District submitted a Water Conservation Plan to the Water Resources Department describing the conservation measures available to the District. With the passage of the new Division 86 rules, the Water District is updating the conservation plan requirements. The Water District's limited financial resources hamper the Water District's ability to offer a full scale conservation program as seen at large water suppliers, but the District is committed to encourage its customers to conserve water.

On the following pages, the Water District describes the conservation measures used as per Division 86 rules. For easy reference, organization of this section of this WMCP closely matches the organization of the new rules.

### 3.1 Previous Efforts

As stated earlier, the Water District submitted a WMCP to the WRD in 1999. This plan identified conservation measures requiring response from the Water District. The conservation measures and the District's responses are listed below.

a) Incentive programs to encourage conservation - The District's only program, which could be called an incentive program, is its high water rates. These rates are progressive in that they get higher as more water is used. Rates are projected to be going a little higher each year. It is felt that normal water use is probably near the lowest use point.

b) System-wide leak repair or line replacement program that will reduce loss to 10 percent - The District has always had an aggressive leak repair program and the water lines are generally of a young age. The District has always had a 11% or less unaccounted for water. There is no more water conservation available in this area as all leaks are repaired immediately.

c) Programs to encourage low-water use landscaping - The Nature of the flora in the District is such that less than 10% of the Customers have areas that require extensive irrigation. Those that do a lot of irrigation usually try to get the water from another source because the metered water is too expensive for irrigating.

d) Retrofit or fixture replacement programs to replace existing, inefficient water using fixtures - In this area the older homes are slowly being sold and remodeled. At the time of remodeling, they are subject to the new plumbing codes, which the Water District has no control over. Those homes not being remodeled are generally homes that are not occupied for many months at a time. Encouraging more efficient water-using devices on any basis, except low key, would result in a large expenditure with no measurable water conservation.

e) Adoption of a water rate structure that will promote efficient water use - The District has already implemented this measure to reduce water use and to build up the funds needed to keep the infrastructure in good condition.

f) Water reuse - The District customers are encouraged to use water for multiple purposes if possible and are also encouraged to try and capture rain water for irrigation.

g) Water audit - The District compares water sold and used in other ways on a monthly, quarterly, and yearly basis with water diverted from its water sources. It is possible to detect leaking faucets and toilets during the meter reading process and those customers are notified so that the problem can be corrected.

- h) Meter Status - The District currently is fully metered and has a meter replacement plan.
- i) Meter Testing - The use rate the District is currently experiencing on its small meters suggested that no meter testing or scheduled maintenance program will be needed for at least the next ten years. Fourteen customers use approximately 16.8% of the total District water production. The meters serving these customers may need to be tested or replaced in the next five years.
- j) Leak detection - Leak detection in the District's transmission and distribution systems is and has been an ongoing task. The District has no leaks. When it becomes apparent that there is a leak, the leak is promptly found and repaired.
- k) Public Education - A formal public education program on efficient water use is not a part of the District's operational policies at this time because the cost-benefit ratio does not justify it. The District does educate their customers on an as requested basis and participates in area-wide educational events when asked.
- l) Identified Conservation Measure - One conservation measure that is being suggested to those customers that are concerned with conservation and lower water rates is to store rainwater for irrigation of small gardens and lawns.

### 3.2 Water Use and Reporting

Southwest Lincoln County Water District's water use reporting is done in compliance with OAR 690-085. The Water District uses the "Flow Meter Method" approved by the Water Resources Department. The report is submitted annually, by December 31, on forms provided by the Water Resources Department. Toshiba brand electronic flow meters are located in the discharge lines of three of the Water District's sources. The fourth source has a Master Meter brand mechanical meter on it. These meters are read weekly by District personnel, There have been no diversions in the last twenty years that were not recorded and the reported monthly volumes are accurate within plus or minus 10%.

### 3.3 Rate Structure and Metering

The District measures the water as it is diverted from each source with an in-line meter. The water that has been filtered is metered as it leaves the treatment plants on its way to the distribution system. The water is then metered as the customers use it. The District also calculates or measures all water used in flushing water lines or firefighting. All of the treated water used by the Water District during its operation is also metered. Raw water used during the filtration process to backwash the filters is unmetered, but is estimated using other methods. These figures are used to determine the District's water losses. This measurement process complies with the requirements of the Oregon Water Resources Department. The District (before 1993) was an unmetered system and had no conservation discussions or needs unless drought conditions reduced the water supplies or a water line from one of the water sources broke, at which time the customers would reduce water use because of low pressure. In the fall of 1992 and spring of 1993, Central Lincoln PUD provided low flow showerhead and low flow devices for the kitchen sink. The District encouraged the use of these devices and approximately three percent of the District's customers at that time installed them. The District began installing meters on all water services during the fall of 1991. This project was completed in the spring of 1994. The District started billing customers by metered water use in July of 1994. At this time, water rates were raised from \$135/year., use all you want, to a base rate of \$11.25/mo., plus \$1.40/Ccf of water used. Water use rates have been increased yearly since that

time. The rates for fiscal year 2013 are; Base rate of \$26.70/mo., Bond charge \$9.20/mo., plus a progressive use rate. This progressive rate is as follows: \$2.40/cu ft. for 101 to 300cuft, \$3.25/Cu ft. for 301 to 1000cf, \$3.70/Cu ft. for 1001 to 2000cf, and \$4.10/Cu ft. for uses over 2001cf. This had the effect of reducing the district-wide water use in 1996 by approximately 20% compared to the 1993 water use, even though the customer base had risen approximately 10%. As the District installed its water meters, many leaks were discovered on customer lines between the meter and their house. Conversations with those customers using water saving devices seem to indicate that if water rates had not increased the devices would not have saved a lot of water as the devices are used for a longer period of time. It should be noted that by the end of 1998-1999 an increased customer base has brought the water use back up to near the 1993 level. The Water District actively notifies its customers of potential leaks on their side of the water meters to keep water waste to a minimum

### 3.4 Additional Conservation Measures

At the present time, the Water District is of the opinion that there are no conservation measures to be implemented that would be cost effective or would result in measurable water use reduction.

### 3.5 Planned Conservation Measures

The conservation program described within the following subsections was developed based upon careful analysis of the characteristics of historical demand patterns and customer demographics as described below.

The Water District's available water rights will meet annual and peak period demands for the at least the next twenty years if the current water use rate remains stable. The Water District will focus its conservation measures on the efficient use of water by the residential customers. The Water District will also continue encouraging its governmental customers to use water in a more efficient and responsible manner. The Water District experiences high consumption in the months of July and August (high levels of tourist activity). The Water District does not feel that the use per person changes, only the number of users. The Water District use of water, outside of the uses involved with the operation of water treatment plants, is limited to the office and equipment cleaning. The Water District does not irrigate any of its work sites.

In the year 2013, the estimated per capita daily water use for the residential class was approximately 112 gallons. This is a low number when compared to industry standards. The Water District attributes this to the rates charged for water and the fact that many of the residences have been remodeled or built after 1990. Most of the commercial establishments have also upgraded their water using devices in order to reduce their water bills.

The Water District will continue to promote conservation.

#### 3.5.1 Water Auditing

The District compares water sold and used in other ways on a monthly basis with water diverted from its water sources. In the process of reading the customer's meter it is possible to determine if a customer is using more water than his neighbors. The Water District's current meter reading process makes it possible to detect leaking faucets and toilets during the meter reading process and those customers are notified so that the problem can be corrected. An analysis of the water usage

for the District, from October 1, 2012 to September 30, 2013, shows the amount of unaccounted for water to be 3 % of the water leaving the water treatment plants.

### 3.5.2 Meter Testing and Maintenance

The District has been fully metered since June 1994. The use rate the District is currently experiencing on its small meters suggested that no major meter testing or replacement will be needed for the next ten years. There are 14 customers whose water use constitutes approximately 16.8% of the total District water production. The meters serving these customers are monitored and if the meter appears to be starting to fail or has recorded over 10,000,000 cubic feet, the meters are replaced. At the end of the next ten years, the Water District should look at installing new meters that can be read via radio frequencies and converting any existing meters to this technology.

### 3.5.3 Leak Detection and Repair

The District has always had an aggressive leak repair program and the water lines are generally of a young age. Leak detection in the District's transmission and distribution systems is and has been an ongoing task. The District does not have any current leaks that are large enough to register as a leak when water diverted is compared with water use. When it becomes apparent that there is a leak, the leak is promptly found and repaired.

The District has always had a 10% or less unaccounted for water. There is no more water conservation available in this area, as all leaks are repaired immediately.

### 3.5.4 Public Education

Public education is important to the Water District, but a formal public education program on efficient water use is not a part of the District's operational policies because of the costs. The District does educate their customers on an as-requested basis and participates in area-wide educational events when asked. The Water District provides free leak checks for any customer requesting them. The District also checks for customer leaks each month when the meters are read. Those customers having leaks are notified and the District helps them determine the location of the leak. The Water District also provides, at its office, information on conserving water inside and outside of the home when good articles appear and they can be copied. The Water District has developed a web site and conservation information will be included.

### 3.5.5 Additional Conservation Measures

Under Division 86 rules, the Water District is not required to specifically address the items listed under OAR 690-086-0150(6). However the Water District is planning to continue the following practices.

- a) Water Rates. The rates are progressive in that they get higher as more water is used. Rates are projected to be going a higher each year. It is felt that normal water use is probably near the lowest use point.
- b) Low Water Use Landscaping. The Nature of the flora in the District is such that less than 10% of the Customers have areas that require extensive irrigation. Those that do a lot of irrigation usually

try to get the water from another source because the metered water is too expensive for irrigation use.

c) Retrofit or Fixture Replacement Programs. In this area, the older homes are slowly being sold and remodeled. At the time of remodeling, they are subject to the new plumbing codes, which the District has no control over. Those homes not being remodeled are generally homes that are not occupied for many months at a time. Encouraging more efficient water-using devices on any basis except low key would result in a large expenditure with no measurable water conservation. The local Power Company did provide low flow devices for kitchen and bathroom in the early 1990 and may people took advantage of this offer.

d) Water Reuse - This is encouraged on a low-key level as it is not openly permitted in the State of Oregon at this time. District customers who ask are encouraged to try and capture rain water for irrigation.

### 3.5.6 Conservation Savings

The Water District anticipates that the conservation measures now being promoted by the District will keep the total system demand at the level that it currently is for the foreseeable future.

Table 3-2

5-Year Conservation Benchmarks Savings

Measure	Savings
Conservation Incentive Program	0.1%
Water Line Replacement	0%
Leak Detection and Repair	0.1%
Low Water Landscaping	0%
Fixture Replacement Program	0%
Water Rates Review	1%
Water Reuse	n/a
Water Audit	1%
Raw Water Meter Testing	0.1%
Commercial Meter Testing	0.1%
Residential Meter Testing	0%
Public Education	0.1%

## Section 4

### Curtailement Plan Elements

The water use in the Water District is affected by the amount of rainfall the area receives. This area of the Oregon Coast is quite wet during the months of October through June averaging 106 inches of rain. During the months of July through September the area is quite dry averaging 8 inches of rain. The average water use in the District has declined after July 1, 1994 when the Water District

installed water meters. The addition of meters and the raising of water rates yearly have caused the Water District customers to be conservative in their water use. In 1986-1987, the peak daily use was 95% of the combined developed water right permitted use of 648,000 gallons to a low in 1995-1996 of 40% of the developed permitted use. As the customers adjust to the higher rates, the water use is beginning to rise. The 2012-2013 peak use was 54% of the developed permitted amount.

The District is able to deliver to its treatment plants the water permitted from each of its developed water sources assuming the water is available in the streams.

There are three scenarios in which the District may not be able to meet the system demand. They are unexpected short-term growth, failure of the infrastructure, and low stream flows.

#### 4.1 Tools at the Water District's Disposal

The Water District has at this time three ways to decrease the effects of an emergency and ensure at least some water for domestic use. The ways are: rely on the District system-wide treated water storage, utilize the connections with the cities of Waldport and Yachats, and reduce water consumption by the customers using a water curtailment plan.

In some cases, an emergency for the Water District may also be an emergency for the two cities thereby eliminating them as a source of water.

#### 4.2 Water Emergency Response

The Water District defined two scenarios that constitute a water emergency. The first is a point in time when there is not enough water in the creeks to meet the system demand if the treatment plants operate for a continuous 108 hr. period. The second is a system failure that prevents water from the treatment plants from being delivered to a part of the water system. The method that would be used to respond to an emergency would be determined by the estimated length of time the emergency might last. In the case of emergency that is anticipated to last a week or less, water would be obtained from the neighboring cities and from storage. An emergency situation of longer duration would invoke the District's water curtailment plan.

It must be noted that no plan can anticipate the myriad of emergency scenarios. Factors such as weather, availability of mechanical parts, and customers' response to the curtailment plan, among other factors, will dictate the degree and speed to which the District responds to an actual event. Accordingly, the District anticipates that any emergency plan will have to remain flexible and be adjusted according to various factors at hand.

#### 4.3 The Curtailment Plan

The District per capita water use is low and would only be lower if the District implemented strict water use restrictions. These would only be put into effect if there was a drought severe enough to dry up the creeks to a point where the permitted amounts of water we are allowed is not available, or water use exceeded current water treatment plant capacities. There have been no raw water supply deficiencies in the District in the last ten years that were related to actual stream flows.

##### 4.3.1 Reasons for water curtailment

There are four scenarios that could result in a reduction in the amount of water the Water District would be able to supply to its customers.

- 1) Damage to a water shed by land owner actions - Damage by the land owner through logging, mining, road building, road use, etc., could affect the water supply from two days to five years, maybe longer depending upon the type of damage. An oil spill could result in a permanent loss of the water supply affected. Damages caused by the property owner in the watersheds or near the headworks may or may not be known about before it was too late to prevent the damage or to mitigate it. The actual damage would have to be assessed to see to what extent the water supply was compromised. Appropriate notification methods to obtain the needed conservation would then be initiated.
- 2) Damage to head-works or other infrastructure - Damage to a head-works or a transmission line would affect the water supply from one week to six months depending upon what happened and where it happened. Nature or vandalism could cause the actual damage. The damage that the District has experienced in the past has not caused a problem for its customers. Any damage would have to be assessed to see to what extent the water supply was compromised. Appropriate notification methods to obtain the needed conservation would then be initiated, if needed.
- 3) Drought conditions that deplete the water in the creeks - Drought conditions in the area would normally be expected to be one to three months in length during the late summer and early fall months. Full recovery to non-drought conditions is expected immediately upon the arrival of the fall rains. If there were to be an extended time of reduced rain year round, the recovery period could be much greater. Drought situations can be tracked and different levels of water restrictions imposed. The water levels in the supply creeks are monitored daily as well as the rainfall at each diversion point. As the creek levels drop, the amount of water in the creeks is compared to the amount withdrawn. Should the creek levels drop to the point where it appears that most of the water is being used by the District, then a decision to begin water restrictions would be made. This would continue in force until the water supply again became adequate to provide water at the customer's normal use rate.
- 4) Accelerated growth could cause a demand for water that is greater than ability of the Water District's facilities to supply. The water levels in the treated water reservoirs are monitored daily. As the levels drop, the amount of water being treated is compared to the amount withdrawn from the reservoirs. When this comparison shows that more water is being used than is being produced, then a decision to begin water restrictions would be made. This would continue in force until the District was able to supply water at the customer's use rate.

#### 4.3.2 Current supply limitations

The District's current water supply limitations are its water rights and the size of the Blodgett treatment facility. Through the implementation of a "domestic use only" policy, the District could easily survive a long-term drought (6 months) at its current population. At the highest population level, a long-term drought would most probably require some type of severe water rationing.

### 4.3.3 Water curtailment plans

In all cases, if it were apparent that the water supply would be reduced, announcements on the local radio station and in the local paper would be used to inform the customers. If necessary, a door hanger would be placed on the customer's doors.

The following steps would be implemented as needed to achieve the level of conservation needed.

Step 1 - Voluntary Conservation - This step would go into effect when the treatment plants have to operate for more than 108 hours per week. This could be caused by either of two conditions. One, the amount of raw water available for treatment causes the treatment plants to operate at less than rated capacity, thereby lengthening the time required to fill reservoirs. Two, consumption is such that the treatment plants have to operate more than 108 hrs. per week to be able to meet customer demands. A notice would be posted that water conservation is being requested and that all irrigation, car washing and all other unnecessary water uses should be stopped. If this action causes the water use to be reduced to a level commensurate with the treated water supply, all action would stop here until the water supply is again able to meet all demands. If this action does not cause the needed reduction in water use, step two will be initiated.

Step 2 - Mandatory Conservation 1 - This step would go into effect when the treatment plants had to operate for more than 120 hours per week to be able to meet customer demands or low creek flow cause the treatment plants to operate at less than rated capacity. All water service to recreational services (such as campgrounds) would be shut off. If this action causes water use to be reduced to a level commensurate with the treated water supply, all action will stop here until the water supply is again able to meet all demands. If this action does not cause the needed reduction in water use, step three will be initiated.

Step 3 - Mandatory Conservation 2 - This step would go into effect when the treatment plants are operation for more than 144 hours per week and did not cause water use to be reduced to a level commensurate with the water supply. All water services to businesses and schools would have water restrictors installed in them that would limit the amount of water available for use and all motels would be ask to limit their capacity to one half of their available rooms. If this action causes water use to be reduced to a level commensurate with the water supply, all action will stop here until the water supply is again able to meet all demands. If this action does not cause the needed reduction in water use, step four will be initiated.

Step 4 - Mandatory Conservation 3 - This step would go into effect when the treatment plants had to operate for more than 144 hours per week and did not cause water use to be reduced to a level commensurate with the water supply. At this point, the services to all customers that were not classified as domestic would be shut off. If this action causes water use to be reduced to a level commensurate with the water supply, all action will stop here until the water supply is again able to meet all demands. If this action does not cause the needed reduction in water use, step five will be initiated.

Step 5 - If none of the above worked the water rates would be raised in such a way as to make it uneconomical to use more water than necessary.

#### 4.4 Staff Responsibilities

The Water District has six employees and in an emergency, all will be involved with notifying customers or stabilizing the water supply. Those employees working in the office will answer customer questions and notify those who need to know the nature of the emergency.

### Section 5

#### 5.1 Future Service Area

There is no anticipated change to the District service area in the next five years. Under current, county zoning laws, there are approximately 200 lots outside of the city limits that may be developed in the future. Most of the land outside of the city limits that can be developed has been developed. That part of the District that is within the City limits of Waldport could have approximately 200 homes built with-in the next ten years.

##### 5.1.1 Population

The area has had annual population increases of approximately 1% per year. Projections are that population growth within the Water District for the next 10 to years will increase .05 % per year and commercial use would also increase approximately .05% per year. The distribution of the customer classes is expected to remain comparable to the present. There is expected to be a sudden increase of approximately 200 homes in the area served by the Water District, which lies inside of the City of Waldport in about ten years. For this report, it is assumed that there are 1.8 people per service or a population of 2254 in year 2013.

Table 5-1

#### Southwest Lincoln County Water District

##### Population Summary

Year	Total Population	ERU's
2010	2248	1423.5
2012	2250	1431.5
2013	2254	1434.5
2020	3180 (includes 200 homes because of sewer changes)	1920
2030	3826 (includes 200 homes because of sewer changes)	2310
2040	4530 (includes 200 homes because of sewer changes)	2735
2050	4938	2982

##### 5.1.2 Employment

There are two areas of employment in the Water District. One area is the motel business and the other is the potential for business to develop in the City of Waldport's industrial park. At this time, employment is not very high.

### 5.1.3 Land Use Development

The county has zoned all of the land in the Water District as R-1 or R-2 and this makes commercial development next to impossible. There are also rules and regulations in place that discourage the development of an area-wide sewer system. If an area-wide sewer system were to be developed, approximately 1000 lots could be developed outside of the current city limits. There does exist the possibility that the District and the water systems in the City of Yachats and the City of Waldport could one day be operated as one system under one entity. This probably will not happen in the next five years.

## 5.2 Future Demand

The rate of growth in water demand is presumed to be driven by the largest customer class (residential). It is assumed that use by the other customer classes will remain steady and will have little impact on future water consumption. It is also assumed that the character of the customer classes will remain relatively the same.

### 5.2.1 Average Annual demand

Future demand was calculated by estimating the future number of ERU's and applying a standard rate of use per ERU. Table 5-2 was created using the average number of 154 gallons per day per ERU that was calculated in Table 2-10.

Table 5-2

### Southwest Lincoln County Water District

#### Average Daily Demand Forecast

Year	5 Year Average gal/day/ERU	ERUs	Total (mgd)	Raw Water Available (mgd)	Treated water capacity (mgd)
2012	105	1431.5	0.150	1.2312	0.7632
2013	112	1434.5	0.161	1.2312	0.7632
2014	154	1293	0.199	1.2312	0.7632
2020	154	1920	0.295	1.2312	1.2672
2030	154	2310	0.356	1.2312	1.2672
2040	154	2735	0.421	1.2312	1.2672
2050	154	2982	0.459	1.2312	1.2672

### 5.2.2 Peak Day and Conservation Measures

To determine the Maximum Day Demand a number of techniques are available. The demand values can be based upon actual production data over recent years, common peaking factors, statistical

analysis, or a combination of these techniques. A peaking factor of 2.23 has been used in reports done for the Water District by other parties. When comparing the water diversion records for the district over the years a factor of 2 appears as a high value. For this report a 2.23 peaking factor will be used. This would indicate that the Maximum Day Demand would range from 0.161 mgpd in 2013 to 1.0236 mgpd in 2050. In the year 2050 this is about equal to the low flow conditions expected at the end of the month of September.

### 5.3 Long Range Supply Plan

The Water District has as part of its long-range plans developed diversion structures on all of the streams on which permits are held. With these diversion structures, the Water District has the capacity to divert 2.1 cfs or 945 gpm. All of these diversion points are used at different times of the year. As the Water District grows, the water diversion from these sites will increase up to the permitted water rights.

#### 5.3.1 Capacity Assessment

The Water District has four diversion sites. Three of the sites are at such an elevation that the diverted water flows by gravity to the water treatment plants. The fourth site requires that all of the diverted water be pumped up to the treatment facility. The three gravity sources have a capacity of 1 cfs or approximately 450 gpm. Current operation policy dictates that these three sources are used the majority of the time in order to keep power costs down. As the Water District grows, the higher-cost water source will be utilized more often.

#### 5.3.2 Projected 20-year Withdrawal

The Southwest Lincoln County Water District plans to use water from its permitted sources in such a way as to minimize the impact of this use on the environment, while maintaining a high level of service to its customers. The Water District expect to expand its use as the customer load increases and also plans promote conservative water use to slow this expanded use.

### 5.4 Schedules for Beneficial Use

The Southwest Lincoln County Water District currently has three certificated water rights and two that have certificates pending. All of the Water District's water permits should be certificated within two years.

#### UPDATE SCHEDULE

Following the administrative rules, the Water District proposes to submit a progress report on or before October 2014 to review noted benchmarking and water use progress. Since the Southwest Lincoln County Water District does not anticipate the need for any new source water over the next twenty years, the Water District proposes to submit an updated WMCP at the end of the ten-year period in 2024.