

Water Management Conservation Plan

*Heceta Water
People's Utility District
(formerly
Heceta Water District)*

July 2020

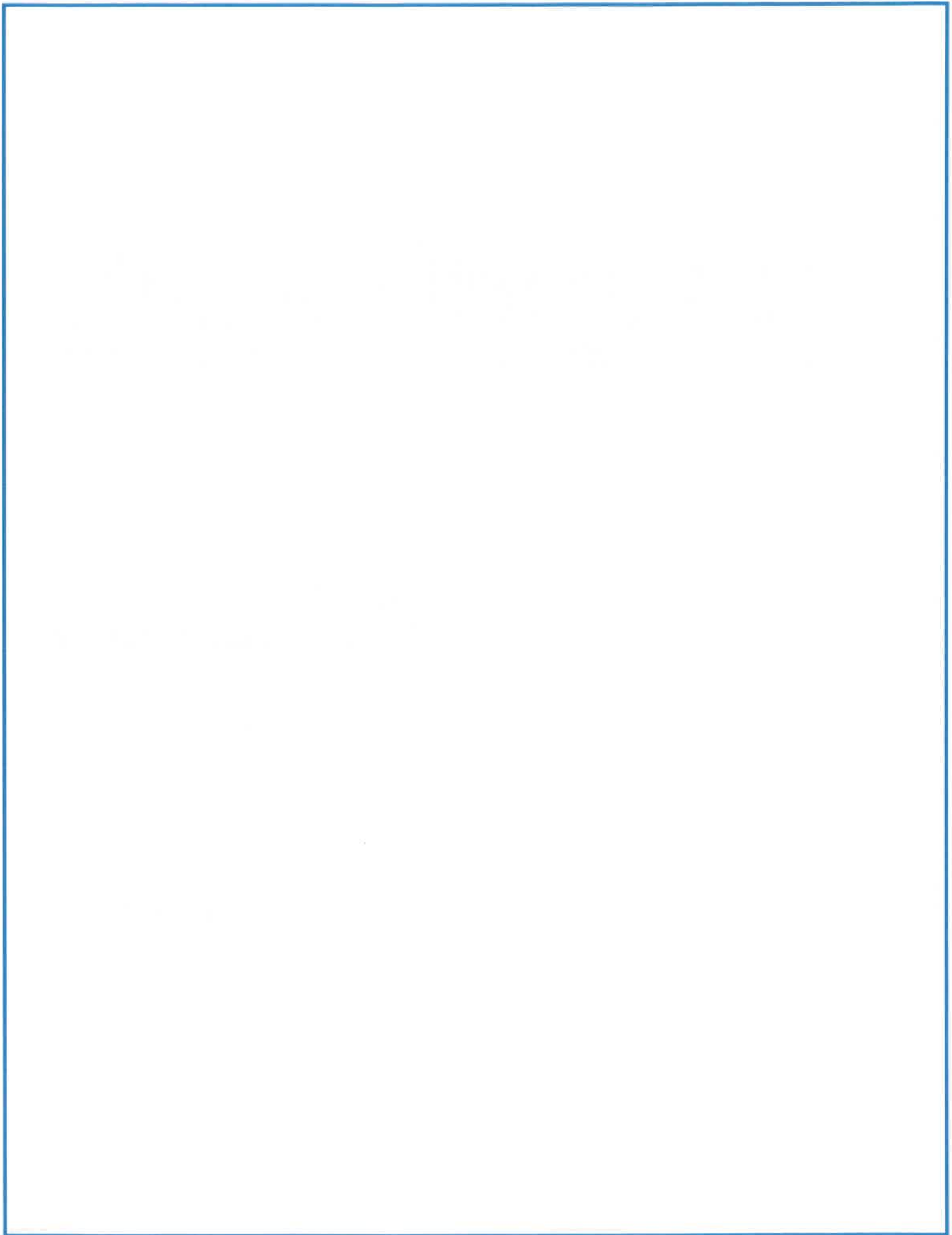


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EXECUTIVE SUMMARY

The Heceta Water People's Utility District (HWPUD) submits this Water Management and Conservation Plan (WMCP) for assessment and approval by the Oregon Water Resources Department (OWRD). HWPUD operates and maintains a community water system that serves a population of approximately 4,921 through 2,192 connections.¹ Situated north of the City of Florence, the community is encompassed by the Pacific Ocean to the West and the coastal ranges to the East.

¹ -Section 6, Table 6.2.1 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc.

This WMCP satisfies Oregon Administrative Rules (OAR) 690-086-0120, including each of the required elements in 690-086-0125. This plan is organized into the following sections.

- Introduction
- Section 1 – Municipal Water Supplier
- Section 2 – Water Conservation Element
- Section 3 – Water Curtailment
- Section 4 – Water Supply Element
- Section 5 – Other Items

Water Supplier Description:

HWPUD obtains its water from Clear Lake, which is capable of retaining an average volume of 6,100 acre feet. When compared to 0.38 million gallons per day (mgd)¹ usage or 1.16 acre-foot/day, HWPUD uses 0.02 percent of the lake's daily capacity. This equates to 14.4 years' supply if no water were to continue to fill the lake.

¹ -Section 6, Table 6.3.1 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc.

All in all, total water right permits equal 6.25 cfs or 2,805 gallons per minute (gpm) with authorization of 3.05 cfs or 2,282 gpm. Using 262 gpm, based on 2018 annual average, it is clear that the HWPUD has a sufficient water source. Currently the water system and its customers are using approximately nine percent of their water rights.

The HWPUD water system is outlined by an urban growth boundary, which limits the potential growth of the area. A map in appendix C, from the 2019 Master Plan, depicts the service area including the urban growth boundaries.¹

¹ -Section 5, Figure 5.4.1 – 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc.

Water Conservation Element:

This submittal is a supplemental plan being sent to the OWRD. The concern of HWPUD is for conservation due to the understanding of potential water shortages and limitations of the water if supply were to become contaminated.

The operational focus has been increasing system efficiency. The majority of work has been implementing leak repairs throughout the distribution system to reduce the amount of lost water.

Having 100 percent of the water system metered, continued efforts towards raising the level of understanding with our customers are the next steps. Educational information in the form of pamphlets, brochures, and the HWPUD web page with conservation initiative links will aid in conservation ideas.

HWPUD currently has a rate structure that is sufficient to allow HWPUD to operate responsibly under its fiscal budget. HWPUD utilizes an "ascending block rate" billing structure that is adjusted as costs per unit increase when more water is consumed. HWPUD has a base rate per month of \$28.50 for a 5/8 inch meter; \$49.75 for a 1 inch meter; \$158.00 for a 2 inch meter; and \$517.25 for a 4 inch meter inside the district. An additional charge per 1,000 gallons separated into four tiers: Tier One charge is \$2.50 for every 1,000 gallons up to 8,000 gallons; Tier Two charge is \$3.00 for every 1,000 gallons from 8,001 gallons to 16,000 gallons; Tier Three charge is \$3.75 for every 1,000 gallons from 16,001 gallons to 40,000 gallons; and the final tier is for over 40,000 gallons at \$4.75 per 1,000 gallons. The Rates and Fees schedule is included in Appendix A.

Five-Year Benchmarks:

These recommendations are the beginning steps towards water conservation for HWPUD. Being both practical and feasible, these steps are as follows:

- Continue to conduct annual water audits and evaluate production and consumption data, tracking water use trends and rate structures.
- Communicate with customers through billing statements, customer confidence reports, the HWPUD website, and/or educational pamphlets.
- Review system with focus on aging structures for pipe replacement using leak detection methods.
- Progress report and revision of the WMCP for the OWRD.

Water Curtailment Element:

The section "water curtailment" describes the steps to be taken by HWPUD when a disruption of normal water flow is experienced. The process is separated into five levels of response actions initiated by specific conditions. The response corresponds to higher percentage of water reductions as the conditions become more severe.

Water Supply Element:

HWPUD currently serves 4,921 people within its boundaries. Estimates for growth were calculated using the Portland State University population research and census report released April 2020. Water use per capita was anticipated to remain either the same or reduced as a number of programs will be implemented in the future that will provide a more precise recording of the water stability and usage.

Through the year 2040, an average monthly usage of water is projected to be 5.32 million gallons, with a monthly maximum demand to be 0.78 million gallons.¹ The water rights authorize HWPUD diversion from Clear Lake of 6.25 cfs under four permits. The water source is included in an area designated by the National Oceanic & Atmospheric Administration (NOAA) and the Oregon Department of Fish and Wildlife (ODFW) that supports streamflow-dependent species listed as sensitive, threatened and endangered (ST&E). Those species listed include Pacific Eulachon, Western Brook Lamprey, Pacific Lamprey, Coho Salmon, Chinook Salmon and Steelhead.

1 –Section 6, Table 6.3.1 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc.

Sources:

We wish to recognize the following which allowed the compilation of materials possible to create this WMCP:

The numerous web sites, i.e. Portland State University, Oregon Climate Services, Oregon Economic & Community Development Department, National Oceanic Atmospheric Association, Department of Fish and Wildlife, as well as the Water Master Plan prepared by The Dyer Partnership, Engineers & Planners, Inc.

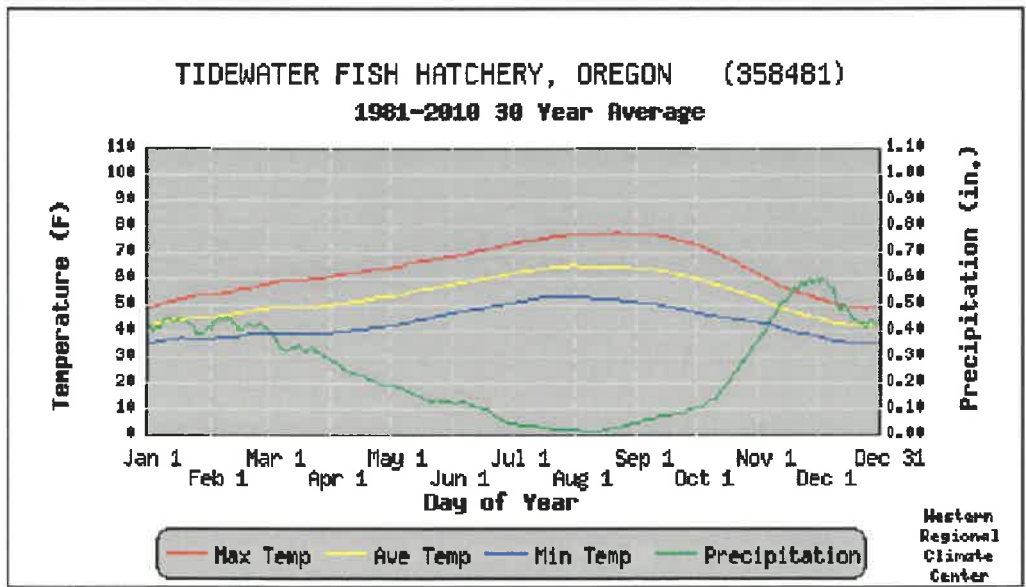
WATER MANAGEMENT CONSERVATION PLAN
(Heceta Water People's Utility District)

INTRODUCTION:

In a coastal community just north of the City of Florence Oregon, HWPUD settles along Highway 101 and the Pacific Ocean. Named after the Spanish explorer, Bruno de Heceta, the area was discovered in the 1770's. The area's coastline was formed by remnants of ocean floor lava flows that buckled up by advancing North American continental plates.

HWPUD is located in Lane County which serves a population of 378,880, with an increase of 0.80 percent annually from 2000 – 2019, as coastal communities increased 1.00 percent during the same period. Predicted annual growth for the general area is 0.60 percent estimated from 2019 – 2044.¹

Annual rainfall is almost 92 inches, with 60 percent occurring between November and February. Like many areas of Oregon, the hottest month occurs in August while the coldest month is usually January. The average minimum temperature is 43⁰ F as the average maximum temperature is 77.1⁰ F. ² See Tidewater Fish Hatchery table below.



Source: 1 – 2019 Coordinated Population Forecast for Lane County, its Urban Growth Boundaries (UGB), and Area Outside UGBs 2019-2069, Portland State University. 2 - Western Regional Climate Center / Oregon Climate Services /Oregon State University, map provided by Western Regional Climate Center.

SCOPE:

The scope of this WMCP is to look at the workings of the water system from various points of consideration as it is operated by HWPUD. The primary concern is the management of existing water sources; based on the OARs under OWRD, for the sustainability of those sources as they relate to the understanding of the growth in and around the area. Equally important is continuing to supply water to both existing and future customers in regard to conservation ideals and methods. Management of the water under continual satisfactory conditions is a priority for both water system personnel and the community.

PURPOSE:

The purpose of this WMCP is to gain a better understanding of the connection of water from the source, through the water system to eventual use by the customers, while meeting OAR requirements and guidelines towards water management and conservation. HWPUD does meet the criteria established under OAR 690-0860150 (6), serving an estimated population of 4,921 through approximately 2,192 connections in the year 2018.

This WMCP is a supplemental report to a plan originally submitted to OWRD in June 2015 and is written as a guideline for HWPUD's continued efforts towards water conservation.

In September 2020, HWPUD will update OWRD with a progress report on how the benchmarks are being implemented as well as any changes in the efforts of water management and conservation. The date for submittal of a complete updated WMCP will be submitted in 2025.

Following the administrative rules, HWPUD proposes to submit a progress report as key benchmarks are completed and water use progress is established. Progress reports will be written and sent to OWRD as addenda to this plan.

The organization of this document is compiled by Oregon Association of Water Utilities with authorization from HWPUD. This WMCP complies with OAR Chapter 690, Division 86.

SECTION ONE
MUNICIPAL WATER SUPPLIER

1.1 Municipal Water Supplier Description: OAR 690-086-0140 (1) A description of the supplier's source(s) of water; including diversion, storage and regulation facilities; exchange agreements; intergovernmental cooperation agreements; and water supply or delivery contracts;

Water Source:

Clear Lake is the second in a chain of four lakes located on the central Oregon coast, a half mile northeast of Florence. The lake lies in a trough between the buildup of extensive accumulation of sand deposits, known as "dune sheet" to the west and the bedrock of the Coast Range foothills to the east. About 40 percent of the watershed for Clear Lake is lush forest, while 15 percent is sand dunes and the lake itself comprising of approximately 25 percent. The remaining land is residential area and non-forested vegetation. The lake's average water capacity is estimated to be 6,100 acre feet.¹

1 – Portland State University - Center for Lakes and Reservoirs – 1985 Atlas of Oregon Lakes Page

1.1.1 Water Certificates / Permits

HWPUD gathers water from Clear Lake just east of Highway 101, not to be confused with Clear Lake south of Reedsport. Clear Lake flows into Munsel Creek, which is a tributary to the Siuslaw River. HWPUD currently is permitted water usage under two certifications and two permits used since 1968, and has used Clear Lake as the source of water since the formation of Heceta Water District, currently HWPUD. The water rights summary is as follows:

S - 33171: Under permit number S - 33171, HWPUD has a maximum rate of 1.55 cubic feet per second (cfs). In review of the permit, the beneficial use applied to this permit is municipal usage with a priority date of January 19, 1968. This permit was proven to the satisfaction of the Water Resources Director, and was certified on July 2, 1987 under certificate number 56356

S - 37524: Under permit number S - 37524, the allowance of water is 1.50 cfs with a priority date of April 30, 1974. The beneficial use applied to this permit is municipal usage. This permit was proven to the satisfaction of the Water Resources Director, and was certified on April 22, 2004 under certificate number 80690

S - 50036: This permit associated with Clear Lake has an permitted rate of 2.25 cfs with a priority date of May 4, 1987. The beneficial use applied to this permit is municipal usage.

S - 52090: This permit associated with Clear Lake has an permitted rate of 0.95 cfs with a priority date of October 13, 1994, limited to a season of use from November 1 through September 30. The beneficial use applied to this permit is municipal usage.

1.1.2. Diversions

The raw water intake at HWPUD was upgraded in 2002-2003, using a 16 inch HDPE intake pipeline that extends approximately 70 feet out into the lake. The end of the intake at a depth of approximately 15 feet below the surface is fitted with a screen to eliminate both fish and debris from entering the pump station. The pump station is capable of reversing the flow of water in the pipeline to back wash the screen and keep debris from building up. The pump station consists of two 40HP vertical turbine pumps (one being redundant) that delivers raw water through a 1.25 mile transmission line to the Water Treatment Plant (WTP).

1.1.3. Storage Capacities

The WTP is located approximately 0.8 miles west of Clear Lake. The WTP consists of the following major components: A surge control tank; three two-stage treatment units consisting of contact adsorption, clarification, and tri-mixed media filtration; filter backwash and air scouring system; chemical feed system; a 250,000 gallon finished water tank; water booster station; and stand-by generator.

HWPUD currently uses four separate storage reservoirs to maintain water flow for both normal usage and fire flows. Total storage capacity is 1.83 million gallons. All reservoirs are in fair to good condition. There is currently no need for reservoir replacement based on the condition. Regular inspection and maintenance of each reservoir is required to extend the useful life of the infrastructure. Based upon the May 2016 inspection report, the Clear Lake, Collard Lake, and finished water reservoirs will need their interiors recoated within the 20 year planning period¹. Spot recoating repairs of the interior were conducted in September 2019.

1 -Section 8, 8.4 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc.

1.1.4. Interties and Inter-Governmental Agreements:

Currently, HWPUD has two interties with the City of Florence. The Mutual Emergency Water Inter-Governmental Agreement (IGA) allows both parties to provide safe drinking water to one another for temporary emergency conditions. Since 2003 with expansions of the city's well-field, the city has not needed supplemental water supplies. The IGA was amended in July 2014 between HWPUD and the City of Florence.

1.2 Current Service area: 690-086-0140 (2) [A delineation of the current service areas and an estimate of the population served and a description of the methodology\(ies\) used to make the estimate;](#)

HWPUD serves approximately an area of 11 square miles using 47 miles of pipeline, encompassing the beach and lake areas (around Sutton, Mercer, and Collard Lakes). The southern boundary of HWPUD is within the City of Florence urban growth boundary, south east along Munsel Lake Road and south west along Rhododendron Drive to the junction of Rhodowood Drive. The northern boundary takes in small subdivisions north of Sutton Lake. The west boundary is the Pacific Ocean as the east boundary lies on the outskirts of Mercer Lake, as indicated in the study area map in Appendix D.¹

1 - Section 3, Figure 3.1.2 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc.

The population served by the water system is currently 4,921 people, based on the number of services and an average number of people per service of 2.1. There is an estimated 2,300 connections¹ with water served mainly to residential and commercial customers. The area demand for water is primarily for domestic use, with a presence of vacation homes among the permanent residences reducing the daily average demand recognized as normal for western state communities.

1 - Oregon Health Authority Drinking Water Program Data Online Webpage

1.3 Adequacy and Reliability of Existing Water: OAR 690-086-0140 (3) An assessment of the adequacy and reliability of the existing water supply considering potential limitations on continued or expanded use under existing water rights resulting from existing and potential future restrictions on the community's water supply;

Current water permits allow for a total of 6.25 cfs or 2,805 gpm, with authorization of 3.05 cfs or 2,282 gpm. Based on historical water usage patterns and known populations, the water service area's highest peak daily demand has been approximately 1.67 mgd or (1,160 gpm).¹ Currently HWPUD is using approximately nine percent of their combined total water rights based on 2018 annual average.² See Table 1-1 below.

1 - Section 6, Table 6.2.5 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc. 2 – Section 6, Table 6.2.4 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc.

Table 1-1: Water Production / Rights Relationship:					
Intake Name	Water Right Permit	Certified	Water Allowance (cfs)	Actual Usage (cfs)	% of Total Water Right
Clear Lake	S - 33171	56356	1.55	0.58	37
	S – 37524	80690	1.50	0.00	0
	S – 50036	NA	0.00	0.00	0
	S – 52090	NA	0.00	0.00	0
Total			3.05	0.58	9

During review of the Water Master Plan, dated July 2019, the highest peak daily demand was 1.67 mgd in years 2016-2017. In years 2015 through 2018, the average daily demand was 0.33 mgd.¹ The average peak daily demand for HWPUD during the same period has leveled to an average of 1.61 mgd.² At 0.38 mgd average daily demand, the one million gallon limitation imposed by an agreement with Lane County would come into effect in 62 years with one percent growth. HWPUD anticipates no limitation issues in the next 20 years due to increased water conservation through education and improvements to infrastructure.

1 –Section 6, Table 6.2.4 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc. 2 –Section 6, Table 6.2.5 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc.

HWPUD can also increase its treatment efficiency and decrease its distribution water loss through improvements. This reduction in water use is attributable to continual repair of key infrastructure throughout the water system, which was originally constructed in 1968.

Due to the hilly, sandy terrain, the Clear Lake watershed is unlikely to support large scale agriculture. It does, however, have large stands of unharvested timber and sparse residential neighborhoods with on-site waste management through septic tanks and drain fields. HWPUD is focused on public education and increased land use awareness with its Conservation Tips and annual newsletter. All tests to date show little or no change in the water quality of Clear Lake.

Clear Lake has been identified as being within the North Florence Dunal Aquifer, which is a sole source aquifer under the U.S. Environmental Protection Agency’s (EPA) Sole Source Aquifer Program. HWPUD feels that this designation has increased community awareness of our natural resources.

As we look to the future water needs of HWPUD, at the current rate of use, growth and conservation measures being implemented, we anticipate that we will use the total water allowance provided by S-33171 in 2080, and the total water allowance provided by S-37524 in 2177. Although we do have two other permits, we don't anticipate that we will need to utilize them until the end of the 21st century.

1.4 Quantification of Present and Historical Use: 690-086-0140 (4) A quantification of the water delivered by the water supplier that identifies current and available historic average annual water use, peak seasonal use, and average and peak day use;

Table 1-2: Heceta Water District Water Production:

Month	2015	2016	2017	2018	Average Bi-monthly Pumping
Dec / Jan	19,321,000	17,190,000	19,196,000	17,147,000	18,213,500
Feb / Mar	15,133,000	17,214,000	15,447,000	16,806,000	16,150,000
Apr / May	17,309,000	24,102,000	19,611,000	20,528,000	20,387,500
Jun / Jul	29,096,000	26,183,000	33,775,000	32,920,000	30,493,500
Aug / Sep	32,622,000	29,965,000	33,705,000	35,438,000	32,932,500
Oct / Nov	24,113,000	20,662,000	19,107,000	23,211,000	21,773,250
Mo. Average	11,466,167	11,276,333	11,736,750	12,170,833	Annual Average
Annual Totals	137,594,000	135,316,000	140,841,000	146,050,000	139,950,250

The term “use” will include both sold water and water utilized to “flush” the distribution

system. Total water produced and loss percentage will be discussed later in this plan. Table 1-2, above illustrates the peak seasonal use to be occurring in the months of June and July.

The average daily use for the past four years has ranged between 256,492 – 580,951 gallons; which when based on the population of 4,921, equates to approximately 52 to 118 gallons per capita daily. Water utilized for flushing equals approximately 2,500,000 gallons annually.

Peak seasonal use, identified above in Table 1-2, is estimated at 35,438,000 shown in “blue” translates to a peak day use of 580,951 gallons per day. The average day use is figured using a four year annual average of 139,950,250 gallons, equaling approximately 0.38 mgd.

This average day use figure is higher when compared to the 2019 Water Master Plan, which represents data calculated from 2015 through 2018, showing an average daily demand of 0.33 mgd.

1.5 Water Rights: OAR 690-086-0140 (5) A tabular list of water rights held by the municipal water supplier that includes the following information:

- (a) Application, permit, transfer, and certificate numbers (as applicable);
- (b) Priority date(s);
- (c) Source(s) of water;
- (d) Type(s) of beneficial uses specified in the right;
- (e) Maximum instantaneous and annual quantity of water allowed under each right;
- (f) Maximum instantaneous and annual quantity of water diverted under each right to date;
- (g) Average monthly and daily diversions under each right for the previous year, and if available for the previous five years;
- (h) Currently authorized date for completion of development under each right; and
- (i) Identification of any stream flow-dependent species listed by a state or federal agency as sensitive, threatened or endangered that are present in the source, any listing of the source as water quality limited and the water quality parameters for which the source was listed, and any designation of the source as being in a critical ground water area;

Table 1-3: HWPUD Source Permits					
Current Authorized Date for Completion of Permit Development					
Permit S – 33171 = Certified – 56356			Permit S – 37524 = Certified – 80690		
Permit S – 50036 = 10-1-2120			Permit S – 52090 = 10-1-2145		
Application #	Permit #	Source	Beneficial Use	Priority Date	Authorized Amount cfs (mgd)
S -44408	S - 33171	Clear Lake*	Municipal	01/19/1968	1.55 ^A (1.00)
S -52076	S - 37524	Clear Lake*	Municipal	04/30/1974	1.50 ^A (0.97)
S -69079	S – 50036	Clear Lake	Municipal	05/04/1987	0.00 ^A (0.00)
S -74717	S – 52090 ¹	Clear Lake	Municipal	10/13/1994	0.00 ^A (0.00)
¹ Limited to season of use from Nov 1-Sep30				Totals	3.05^A (1.97)

A – 1 cfs = 449 gallons per minute, * permit was perfected and certified.

Permit #	Maximum Instantaneous Allowed (gpm)	Daily Maximum Allowed (mgd)	Annual Quantity Allowed (MG)	Monthly (MG) / Daily Average Diversions ¹ (mgd)		Annual Water Diverted (MG)	Max. Month Instantaneous Diverted ² (MG)
S -33171	695	1.00	365.7	11.4	0.38	138.7	16.8
S -37524	673	0.97	353.6	NA	NA	NA	NA
S -50036	0	0.00	0.0	NA	NA	NA	NA
S -52090	0	0.00	0.0	NA	NA	NA	NA

1 – calculated based on Table 1-2

2 – based on largest single month found in Table 1-2, Jun/Jul 2018

Permit #	Date	Amount	2018	2023	2028	2033	2038	A
S - 33171	01/19/1968	1.55 cfs 695 gpm	0.58 cfs 262 gpm	0.57 cfs	0.60 cfs	0.63 cfs	0.66 cfs	NA
				36.8%	38.7%	40.6%	42.6%	
S - 37524	04/30/1974	1.50 cfs 673 gpm	0.00 cfs					NA
S - 50036	05/04/1987	0.00 cfs 0 gpm	0.00 cfs					NA
S - 52090	10/13/1994	0.00 cfs 0 gpm	0.00 cfs					NA

Column A = Designates if water right is identified as a stream flow dependent species listed by the federal agency as sensitive, threatened, or endangered that are present in the source or considered an area of critical ground water source. See details below.

Estimates for projection of water use were based on an annual growth of one percent using the U.S. Census Bureau annual estimates. The user rate of 77 gallons per capita daily is based on population of 4,921 in the year 2018. The decisive factors do not take in account a surge in building or development in the service area for HWPUD where the consumption of water may be required.

Located in the Siuslaw sub-basin, it is noted that Clear Lake water source is included in an area designated by the National Oceanic & Atmospheric Administration (NOAA) and the Oregon Department of Fish and Wildlife (ODFW) that supports streamflow-dependent species listed as Sensitive, Threatened and Endangered (ST&E). The streamflow-dependent species listed as ST&E by ESA or ODFW for this area include:

Table 1-5a: Streamflow-dependent Species		
Species	ODFW	ESA
Pacific Eulachon	N/A	Threatened
Western Brook Lamprey	Sensitive	N/A
Pacific Lamprey	Sensitive	N/A
Coho Salmon	Sensitive	Threatened
Chinook Salmon	Sensitive-Spring run	N/A
Steelhead	Sensitive	N/A
Chum Salmon	Sensitive-Critical	N/A
Green Sturgeon	Sensitive-Critical	Threatened
Millacoma Dace	Sensitive	N/A
Oregon Chub	Sensitive-Critical	N/A

The Department of Environmental Quality has listed Clear Lake as having water quality limited only because of the water quality parameter of phosphorus. Since HWPUD does not hold any water rights for ground water sources, both the critical groundwater and groundwater management standards are non-applicable.

1.6 Water use characteristics: OAR 690-086-0140 (6) [A description of customers served including other water suppliers and the estimated numbers; general water use characteristics of residences, commercial and industrial facilities, and any other uses; and a comparison of the quantities of water used in each sector with the quantities reported in the water supplier’s previously submitted water management and conservation plan and progress reports;](#)

HWPUD serves an approximate population of 4,921 through 2,192 connections in an area of land primarily zoned as residential yet surrounded by non-impacted and impacted forest. The current limits of HWPUD account for approximately 11 square miles of land with the majority of water use being domestic. Typical water usage ranges from 60 to 82 gallons per day capita, with the average being 72 gallons per day capita. There are many vacation homes among the permanent residences, which will lower the average daily use.

In year 2018, of the total 2,192 customer connections, HWPUD has 2,172 residential customers and 20 commercial accounts compared to year 2014 with total of 2,248 customer connections, with 2,216 residential customers and 32 commercial accounts.

Table 1-6: Water Use		
Classification	Consumption	
2018	Gallons per day	% of total gallons
Residential	261,277	82.6
Commercial / Industrial	54,866	17.4
Totals	316,142	100
2014	Gallons per day	% of total gallons
Residential	207,138	98.4
Commercial / Industrial	3,286	1.6
Totals	210,424	100

1.7 Interconnections with other systems: OAR 690-086-0140 (7) Identification and description of interconnections with other municipal supply systems;

Presently, HWPUD does have two interties with the City of Florence. The Intergovernmental Agreement with the City of Florence was adopted July 6, 2010, originally with Heceta Water District and amended in July 2014 between HWPUD and the City of Florence.

1.8 System Schematic: OAR 690-086-0140 (8) A schematic of the system that shows the sources of water, storage facilities, treatment facilities, major transmission and distribution lines, pump stations, interconnections with other municipal supply systems, and the existing and planned future service area;

The water system schematic for HWPUD was derived from the July 2019 Water Master Plan completed by The Dyer Partnership, Engineers & Planners, Inc. Appendix B depicts an aerial view using a drawn map¹ outlining the service boundary limits of HWPUD from the 2019 Master Plan. In the July 2019 Water Master Plan the HWPUD land use zoning map² included in Appendix C, details a diagram of the land use comprehensive plan per Lane County Public Works.

1 - Section 5, Figure 5.4.1 - 2019 Water Master Plan - The Dyer Partnership, Engineers & Planners, Inc. 2 - Section 3, Figure 3.3.1 - 2019 Water Master Plan - The Dyer Partnership, Engineers & Planners, Inc.

1.9 Quantification of System Leakage: OAR 690-086-0140 (9) A quantification and description of system leakage that includes any available information regarding the locations of significant losses;

Utilizing information from reports of water production and Caselle, a billing program that tracks water usage, dated from 2015 through 2018, and presented in Table 1-7 below, HWPUD currently operates with an average water loss of 18.8 percent.

Quantification of system leakage is defined under OAR 690-086-0030 (8) as "all water that is lost from a municipal water supply system, not including major breaks that are expeditiously repaired, and un-metered authorized or un-authorized uses." Typically the method for estimating system leakage is to take the difference between the metered diversions at the source and metered customer use, corrected for any un-metered use such as main flushing, street cleaning and all other known uses.

Table 1-7: Water Loss Quantification					
Year	Water Demand	Water Sold	Un-metered Authorized	Un-accounted	Loss %
Table is in gallons					
2015	137,594,000	83,164,313	2,500,000	51,929,687	37.7
2016	135,316,000	80,024,621	2,500,000	52,791,379	39.0
2017	140,841,000	115,626,360	2,500,000	22,714,640	16.1
2018	146,050,000	116,065,942	2,500,000	27,484,058	18.8
Annual Avg:	139,950,250	98,720,309	2,500,000	38,729,941	27.9

The Table 1-7 above indicates an average water loss of 27.9 percent for the past four years, which takes into account flushing the water system periodically. Even though these maintenance procedures are necessary in maintaining good water quality, the quantities of water used during these procedures are calculated for a better understanding of the system operations.

According to the 2019 Water Master plan, the unaccounted water from 2015 through 2018 was averaging 26.2 percent with a highest percentage of 36 percent¹ in fiscal year 2015-2016. See Table 6.2.6 from the 2019 Water Master Plan, below.

Table 6.2.6 Comparison of Water Produced, Backwash, Pumped and Consumed					
Time Period	Raw Water (gpy)	Backwash (gpy)	Water Pumped (gpy)	Water Consumed (gpy)	% Nonaccount
2015-2016	146,452,000	9,604,000	136,848,000	87,520,526	36%
2016-2017	149,226,000	11,183,000	138,043,000	109,337,452	21%
2017-2018	156,579,000	11,754,000	144,825,000	113,232,588	22%

Source: Section 6, Table 6.2.6 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc.

In updating the WMCP it was discovered that the water usage number provided by Caselle was inaccurate due to data purged from the system twice annually. In calculating the water produced and water used in 2019 and 2020, the water loss is calculated at 15.5 percent.

Table 1-8: Water Loss Quantification					
Year	Water Demand	Water Sold	Un-metered Authorized	Un-accounted	Loss %
Table is in gallons					
2019	147,332,133	120,830,018	1,015,600	25,486,515	17.3
2020	144,898,860	119,265,744	5,749,520	19,883,596	13.7
Annual Avg:	146,115,497	120,047,881	3,382,560	22,685,055	15.5

Some inaccuracies with the flow meters at the WTP registered at the PLC and the total flow meter indicated a three percent variable between the two monitoring devices.

When comparing the timeframes of 2011-2014 and 2015-2018, we find a discrepancy of 11.6 percent (15.9% – 27.5%) with a flow meter variable factor of three percent. After adjusting for the three percent variability between the flow monitoring devices, it has been concluded that the unaccounted water as reported for HWPUD has been above 15 percent threshold for the last four years. Having identified the water usage number as inaccurate for the same period and using more accurate numbers, HWPUD unaccounted water is just above 15 percent.

As routine repair and distribution system upgrades are scheduled for the future, HWPUD is expected to fall well under the 15 percent threshold based on 2020 loss.

SECTION TWO
WATER CONSERVATION ELEMENT

Water conservation activities provide an important factor towards the sustainability of water for the future. Not all conservation efforts are going to be equally effective; it is those that have continued efforts behind them that will show the greatest results.

HWPUD will employ a number of water conservation efforts which may include water system audits, leak detection, public education, and retrofit of inefficient water devices as well as others.

2.1 Progress Report: 690-086-0150 (1) [A progress report on the conservation measures scheduled for implementation in a water management and conservation plan previously approved by the Department, if any;](#)

Since the 2015 WMCP, HWPUD has completed 98% of replacing meters with touch read meters which allows for identification of high usage in one to two days instead of six to seven days. All 5/8" meters will be replaced by the end of FY 2020-21. We anticipate majority completion of the 1" and over meters by the end of FY2021-22 with meters over 2" to be completed by FY 2022-23. HWPUD personnel will continue to enhance the ideals of conservation through system repair and customer's knowledge. HWPUD plans to go to monthly meter readings starting as of July 2021. Conservation Tips have been added to HWPUD website and conservation supplies are available for customers.

2.2 Measurements and Reporting: 690-086-0150 (2) [A description of the water supplier's water use measurement and reporting program and a statement that the program complies with the measurement standards in OAR Chapter 690, Division 85, that a time extension or waiver has been granted, or that the standards are not applicable;](#)

The measurement and reporting information is taken from the Annual Report, due December 31 of each year, to OWRD for the amount of water that is pumped during the previous year – October 1 through September 30. Flow meters are placed on each of the process units that report to the programmable logic controller. On the effluent side of the WTP is a finished water flow meter used to identify how much water is produced and pumped to the customers. All services are metered and read every two months. Caselle is designed to perform comparison readings on how much water passes through to the customers. HWPUD and this WMCP comply with the measurement standards in OAR Chapter 690, Division 85. Such standards include submittal of the annual water use report, and methods for measuring and computing water use. HWPUD applies the "flow meter method" to determine the quantities of water diverted and put to beneficial use. An additional item included in the water measurement chart is the annual water usage for line flushing. Neither time extensions nor waivers are necessary to meet this standard.

2.3 Implemented Measures: 690-086-0150 (3) A description of other conservation measures, if any, currently implemented by the water supplier, including any measures required under water supply contracts;

HWPUD has taken steps towards water conservation in the following manner:

- Continuous updated link on the HWPUD webpage encouraging customers to be water wise. Customers can view water saving tips as well as water trivia facts.
- HWPUD's policies which encourage repair of water leaks beyond the district's meters for example, a 50 percent adjustment of excessive water bills resulting from leaks on customer's property.

As progress in water conservation expands, the primary focus will be assisting the residential customers, which makes up 82.6 percent of usage, with continued educational materials regarding water saving devices. Since 2012, HWPUD has given out low flow shower heads, other devices and literature to assist in educating customers.

2.4 Annual Water Audit: OAR 690-086-0150 (4) A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following conservation measures that are required of all municipal water suppliers:

(4)(a) An annual water audit that includes a systematic and documented methodology for estimating any un-metered authorized and unauthorized uses;

HWPUD regularly performs an annual water audit by means of reviewing water usage characteristics per customer along with determining the difference in both amount of water produced at the source in comparison to the amount of water tallied by the meters of those customers.

Table 1-7 on page 10, outlines HWPUD's demand, sold, un-metered authorized and un-accounted water reports that indicate an average of 27.9 percent loss or unaccounted water. Using the more accurate figures from Table 1-8 on page 11, indicates an average of 15.5 percent loss or unaccounted water.

The 27.9 percent water loss is an unacceptable number in regard to water loss percentages. After self-identifying inaccuracies with the water usage figure produced in part by Caselle, the 15.5 percent water loss is just above the 15 percent requirement, and with new infrastructure improvements to the distribution system, this number is expected to be lowered in the future. Key infrastructure was completed in 2015 by HWPUD, including replacing 5,170 lineal feet (LF) of water lines to Mercer Creek, Sutton Lake, Roth Creek Marsh, North Mercer Lake Road and Leverage Creek. HWPUD also replaced the Enchanted Valley Reservoir with a stainless steel potable water tank. Since the 2015 WMCP, changes to infrastructure include adding and replacing 6,950 LF of water lines at Collard Lake, Ocean View, 1st Avenue, Nordahl, Mercer Lake and Rustic Lane. In addition, replacement of the

Mercer Creek pump station completed in 2017 and the Sutton pump station went online by July 2020, with anticipated completion in the fall of 2020. In 2018, three Pressure Reducing Valve (PVR) stations were replaced on Collard Lake Road. In 2019, HWPUD replaced flow meters in the treatment plant for more accurate water readings and reduce the percentages of water loss, looking at a benchmark of five percent unaccounted for water.

2.5 Full Metering of System: OAR 690-086-0150 (4) (b) [If the system is not fully metered, a program to install meters on all un-metered water service connections. The program shall start immediately after the plan is approved and shall identify the number of meters to be installed each year with full metering completed within five years of approval of the water management and conservation plan;](#)

HWPUD is a fully metered water system which includes meters on both the single source and customer connections. At this time, the water system is considered fully metered.

2.6 Meter Testing and Maintenance: OAR 690-086-0150 (4) (c) [A meter testing and maintenance program;](#)

HWPUD currently does not have a formal meter testing program in place. Although HWPUD is not yet testing customers' meters, we do monitor high and low usage through bi-monthly meter reading soon to be monthly starting in August 2021. We also monitor pressure zones, so that HWPUD can pinpoint zones that are experiencing high usage. Funding to replace meters began in FY2012-13 and will continue through FY 2021-22. Currently 98 percent of meters have been replaced with touch read meters. The major part of the program is replacing the 5/8 inch meters and the project is expected to be complete in FY2021-22. 1" and larger meters will be replaced in FY2021-22. The plan is then to maintain and calibrate HWPUD diversion and production meters and meters over 2" during FY2020-21.

Benchmark: HWPUD will implement a regular scheduled, formal meter reading testing and maintenance program by FY 2024-25. HWPUD will be replacing Neptune meters and installing touch read meters by FY 2022-23. Monthly usage monitoring will begin in August 2021.

2.7 Rate Structure: OAR 690-086-0150 (4) (d) [A rate structure under which customers' bills are based, at least in part, on the quantity of water metered at the service connections;](#)

HWPUD utilizes a monthly base rate assigned by size of meter with an "ascending block rate" billing structure. The monthly base rate ranges from \$28.50 to \$517.25, inside the district with an additional per unit cost with the first tier of \$2.50 for every 1,000 gallons consumed up to 8,000 gallons above the base rate amount. Additional tiers are implemented that increases the per unit charge to a top rate of \$4.75. Current charge is based on a two month cycle. A copy of the water rates can be found at the end of this section.¹

1- About Us at HWPUD – Rates and Fees - Heceta Water People's Utility District webpage, hwpud.com

2.8 Excessive Leakage: OAR 690-086-0150 (4) (e) If the annual water audit indicates that system leakage exceeds 10 percent, a regularly scheduled and systematic program to detect leaks in the transmission and distribution system using methods and technology appropriate to the size and capabilities of the municipal water supplier;

Currently, HWPUD estimates that an annual 27.9 percent system leakage has not been properly estimated. Due to inaccuracy of the water usage figures in prior years, using 2020 year's figures, the annual percentage is estimated at 13.0 percent. Staff is replacing all 5/8 inch residential meters with new touch meters and will have that done by the end of the 2020-21 fiscal year. In 2012, HWPUD received monies from the State Revolving Fund to upgrade the aging infrastructure. These projects, total of six, consist of replacing aging infrastructure (stream and swamp crossings) in the northern and remote part of HWPUD, and are currently complete. In the 2019-20 fiscal year, HWPUD will calibrate and replace the four flowmeters in the plant to be completed by FY2020-21. This will eliminate known leak issues facing HWPUD. We will then be able to accurately measure leakage and move forward in isolating, by pressure zones, where excessive water is being used.

When the scheduled projects are completed, and with accurate water usage numbers to calculate water loss, it is expected that the 15.5 percent water loss will be reduced.

Two year Benchmark: HWPUD has identified inaccuracies with system usage numbers and has changed procedures so proper usage records are maintained. With the updated flowmeters already installed, water is calibrated for accurate plant production. Infrastructure improvements are planned for FY 2021-22 that include replacing 13,000 LF of Asbestos Cement (AC) piping and adding a leak detection program.

Five year Benchmark: If the two year benchmark fails to get HWPUD below 10% system leakage, HWPUD has scheduled additional infrastructure improvements to replace the Enchanted Valley pump station including upgrading fire flows of 8 and 6-inch line to a 12-inch line and upgrading the Supervisory Control and Data Acquisition (SCADA) system to automate the pump stations and deliver real time system information back to the WTP.

2.9 Public Education Program: 690-086-0150 (4) (f) A public education program to encourage efficient water use and the use of low water use landscaping that includes regular communication of the supplier's water conservation activities and schedule to customers;

Written on the webpage for HWPUD, linked to the topic "Conservation Tips" are educational points that encourage customers of HWPUD in water conservation. Included but not limited to are:

- Landscape with native plants to reduce water needs. Our native plants are ideally suited for our climate and seldom need extra watering.
- Sweep patios, drives and sidewalks, don't hose them. Water runoff from concrete and pavement carry contaminants into the groundwater.

- Fix leaks promptly. Dripping sinks and running toilets can waste thousands of gallons of water - and increase your water bill.
- Water in early morning or late evening. Less water will be lost to evaporation. And try not to water things that don't grow, like sidewalks and fences
- Annual budget of \$500 for educational items to promote water conservation.

HWPUD will continue the efforts of water conservation by providing additional information to the customers through the annual Consumer Confidence Report which includes the EPA website for Water Sense, updating HWPUD's webpage, distributing brochures encouraging the use of water saving devices and gardening techniques.

Table 2-1: Conservation Goals						
	Year	2018	2019	2020	2021	2022
Measure						
Annual Audit		√	√	√	√	√
Metered System		√	√	√	√	√
Meter Testing					√	
Rate Structure					√	
Excessive Leakage						
Public Education		√	√	√	√	√

2.10 Expansion / Diversion: OAR 690-086-0150 (5) If the municipal water supplier proposes to expand or initiate diversion of water under an extended permit for which resource issues have been identified under OAR 690-086-0140(5)(i), identification of any stream flow-dependent species listed by a state or federal agency as sensitive, threatened or endangered that are present in the source, any listing of the source as water quality limited and the water quality parameters for which the source was listed, and any designation of the source as being in critical ground water area. A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of a system-wide leak repair or line replacement program to reduce system leakage to no more than 15 percent or sufficient information to demonstrate that system leakage currently is no more than 15 percent;

HWPUD has been and will continue to be proactive about the final destination of its produced water. The primary water source is Clear Lake and this source has not been identified as a stream flow-dependent species source, nor is the area considered a critical groundwater area. The area (HUC4 Siuslaw -17100206) is considered an evolutionary significant unit (ESU) for threatened Coho Salmon. The sub-basin area is also designated as a species management unit (SMU) for Chinook salmon by the

Oregon Department of Fish and Wildlife, though no species have been found in the source. A complete list of endangered species is available on the U.S. Fish & Wildlife Service webpage.¹

1- Endangered Species for Lane County – U.S. Fish & Wildlife Service webpage, [fws.gov/endangered](https://www.fws.gov/endangered)

The Department of Environmental Quality has listed Clear Lake as having water quality parameters of aquatic weeds, algae, pH concerns, and phosphorus. Since HWPUD does not hold any water rights for ground water sources, both the critical groundwater and groundwater management standards are non-applicable.

2.11 Population Criteria: OAR 690-086-0150 (6) If the municipal water supplier serves a population greater than 1,000 and proposes to expand or initiate diversion of water under an extended permit for which resource issues have been identified under OAR 690-086-0140(5)(i), identification of any stream flow-dependent species listed by a state or federal agency as sensitive, threatened or endangered that are present in the source, any listing of the source as water quality limited and the water quality parameters for which the source was listed, and any designation of the source as being in a critical ground water area, or if the municipal water supplier serves a population greater than 7,500, a description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following measures; or documentation showing that implementation of the measures is neither feasible nor appropriate for ensuring the efficient use of water and the prevention of waste;

HWPUD obtains its water from Clear Lake, which has no sensitive, threatened, or endangered stream flow-dependent species as listed by the state or federal agency. The quality of water obtained from the lake is generally excellent. Chemical constituents exist in low concentrations due to the relatively inert quality of fresh sands and the high flushing rate from heavy rainfall and rapid groundwater movement. HWPUD currently serves a population of 4,921 people which is under the criteria of 7,500. At this time, and based on the predictions of water usage for the next 20 years, HWPUD does not believe it will be proposing an expansion of water diversion under its current permits or certificates.

2.12 System Leakage: OAR 690-086-0150 (6) (a) A system-wide leak repair program or line replacement to reduce system leakage to 15 percent, and if the reduction of system leakage to 15 percent is found to be feasible and appropriate, to reduce system leakage to 10 percent;

As per subsection 2.8, HWPUD's plan is 98 percent complete with an extensive system upgrades to the distribution system, specifically in the northern section. Looking at the water usage and loss reports from 2017 through 2020, or the composite Table 2-2 "Water Loss Quantification" below, are example years that demonstrate that system leakage is just above 16 percent and speculatively should be lowered in the future based on 2020 loss.

Table 2-2: Water Loss Quantification					
Year	Water Demand	Water Sold	Un-metered Authorized	Un-accounted Water	Loss %
Table is in gallons					
2017	140,841,000	115,626,360	2,500,000	22,714,640	16.1
2018	146,050,000	116,065,942	2,500,000	27,484,058	18.8
2019	147,332,133	120,830,018	1,015,600	25,486,515	17.3
2020	144,898,860	119,265,744	5,749,520	19,883,596	13.7
Annual Avg:	144,780,498	117,947,016	2,941,280	23,892,202	16.5

The above Table 2-2 indicates that the efforts performed by the operations of HWPUD conclude that water loss is manageable; attributed to the on-going tasks currently being performed, and are indicative that such efforts are effective.

2.13 Technical and Financial Assistance: OAR 690-086-0150 (6) (b) [Technical and financial assistance programs to encourage and aid residential, commercial, and industrial customers in implementation of conservation measures;](#)

HWPUD provides a "Water Leak Adjustment Policy" that says; "A 50% adjustment of charges exceeding a billing cycle annual average consumption caused by a leak or broken water pipe after the district's water meter. The leak must be promptly repaired and any requested adjustments must be submitted within 30 days after the end of the billing cycle in which the leak was repaired." This is a single item implemented February 2009, along with a webpage link titled "Conservation Tips" which provides conservation tips to HWPUD customers.

HWPUD provides commercial accounts with water saving techniques that can reduce their consumption. Ideas can be found in the "Water Conservation Guide for Commercial, Institutional and Industrial Users" found on the Office of the State Engineer (OSE) webpage, under Water Use & Conservation, Water Conservation Program, Conservation, Industrial, Commercial, Institutional (ICI).¹ Even though commercial clientele accounts for a small percentage of total consumption, there can be positive results toward water conservation in areas of commercial applications, i.e. kitchens with dishwashers, ice making machines, garbage disposals, and the method in which running water is a step in many of the processes.

1-A Water Conservation Guide for Commercial, Institutional and Industrial Users – OSE webpage, ose.state.nm.us/index.php

2.14 Financed Retrofitting: OAR 690-086-0150 (6) (c) Supplier financed retrofitting or replacement of existing inefficient water using fixtures, including distribution of residential conservation kits and rebates for customer investments in water conservation;

Retrofitting is the adaptation or replacement of older water using fixtures with one that is more water efficient and ultimately offers considerable water saving potential in the home and business. Over the past five years, HWPUD has provided approximately 120 low flow shower heads to customers at no charge. Other items have also been provided along with literature on how to conserve water.

2.15 Rate Structures: OAR 690-086-0150 (6) (d) Adoption of rate structures, billing schedules, and other associated programs that support and encourage water conservation;

In subsection 2.7, details to the increased base rate structure is provided as well as a copy of the current rates and fees schedule also available on HWPUD's webpage at <http://hwpud.com> under "About Us at HWPUD" along with links discussing upcoming rates from Board meetings under "Board of Directors". Bi-monthly billing, tiered base and per unit rates, show awareness towards the importance of water supply and the management of the source. HWPUD will continue to study and evaluate whether the current rate structure appropriately encourages efficient water use and water conservation.

2.16 Recycle / Reuse: OAR 690-086-0150 (6) (e) Water reuse, recycling, and non-potable water opportunities;

Reuse, recycling and use of non-potable water has not been considered as there are relatively few customers using the City of Florence sanitary sewer system within the boundaries of HWPUD. Cost effectiveness of implementing a recycle / reuse program of non-potable water is relatively high as compared to those techniques currently in place. The HWPUD webpage does include information about the subject for customers' reference.

Future contemplation of such will be determined if rules permit such actions and the cost associated with such a task makes it feasible. HWPUD would be open to learning about this type of usage, but presently no conversations have been initiated, as the idea seems too far into the future.

2.17 Other Conservation Measures: OAR 690-086-0150 (6) (f) Any other conservation measures identified by the water supplier that would improve water use efficiency;

Water conservation activities provide an important facet for the sustainability of water for the future. Not all conservation efforts are going to be equally effective; it is those that have continued efforts behind them that will show the greatest results. HWPUD will continue to review all possible activities that provide greater benefit of water use, and are more cost effective, feasible, and long-lasting. In past years, the actions of HWPUD have proven to be proactive in regard to water use efficiency and conservation.

SECTION THREE
WATER CURTAILMENT ELEMENTS

Water curtailment is designed to minimize the impacts of a short term emergency water shortage by reducing the demand and finding alternative water supply. Generally, conservation measures and a secondary supply, or a combination of the two are the most important tools water suppliers can use to immediately reduce the demand. Curtailment plans usually develop through voluntary and mandatory restrictions of usage, depending on the severity of the shortage.

3.1 Assessing Water Supply: 690-86-0160 (1) A description of the type, frequency and magnitude of supply deficiencies within the past 10 years and current capacity limitation. The description shall include an assessment of the ability of the water supplier to maintain delivery during long-term drought or other source shortages caused by a natural disaster, source contamination, legal restrictions on water use, or other circumstances;

Since the inception in 1966 of Heceta Water District, currently HWPUD, lack of water from the source has not been an issue in regard to adequacy. With records dating back to 1994, consumption has decreased, discussed below, as HWPUD continues to improve the overall efficiency of operations.

The water supplied to HWPUD is from Clear Lake, second lake in a chain of four lakes that eventually flows into the Siuslaw River, and has an average volume of 7.54 million cubic meters. Clear Lake has excess in-flows, with slightly more than 2.0 billion gallons in storage capacity and an average inflow of 1 -2 cfs¹ or 0.96 mgd. The average daily demand from HWPUD is in a range of 0.38 to 0.55 mgd².

1 - Portland State University - Center for Lakes and Reservoirs - 1985 Atlas of Oregon Lakes Page 2 - Section 6, Table 6.3.1 - 2019 Water Master Plan

Supply deficiencies for HWPUD have been non-existent and prior to 2003, HWPUD maintains two interties with the City of Florence to supply their community with water. The interties have not been used since 2003, thus reducing the overall demand on the source.

Our average accounted monthly water usage based on 2018 actuals, is nearly 9.7 million gallons; with the average peak volume used being 14 million gallons per month occurring in the months of June and July. Short of a complete source contamination, the water quantity in Clear Lake and the watershed appears to be sufficient in supply. Based on peak daily demand, consumptions equaling 0.47 mgd or 0.73 cfs, HWPUD applies a beneficial use of approximately 24 percent of the certifiable water rights and approximately 12 percent of their total water rights.

3.2 Stages of Alerts: 690-86-0160 (2) A list of three or more stages of alert for potential shortage or water service difficulties. The stages shall range from a potential or mild alert, increasing through a serious situation to a critical emergency;

HWPUD has steadily viewed the magnitude of available water or the loss of a water supply in a proactive manner. Putting in place curtailment actions, both on a voluntary basis or as a mandatory requirement is yet another step towards accountability in water service.

The Board of Directors of HWPUD adopted an ordinance in December 2016 that outlines a five stage and a five level approach for curtailment of water use, with the primary goal of maintaining sufficient supplies to meet essential uses such as drinking, cooking, sanitation and fire flow. A secondary goal is to maintain flow under normal conditions for customers at all times. The five stages of alert will be designated as low, mild, moderate, high, and emergency.

Events causing this plan to be activated would include but not limited to the following:

- Mechanical or electrical malfunctions of pumping capabilities or one of the booster stations.
- Interruption of the local power company supply.
- Abnormal weather conditions, determined by low rainfall during winter months reducing levels in Clear Lake
- Declaration of a drought for any particular area by the Governor pursuant to Oregon Revised Statute 536.720
- Natural disasters that damage critical infrastructure hindering the water system to operate under normal conditions.
- The deliberate act of contaminating at various points in the water system.

3.3 Alert Triggers: 690-86-0160 (3) A description of pre-determined levels of severity of shortage or water service difficulties that will trigger the curtailment actions under each stage of alert to provide the greatest assurance of maintaining potable supplies for human consumption;

The indication that a low alert level will be necessary is based on the following:

Low Alert Level

- Water usage reaches 80% of capacity for three consecutive days.
- Construction efforts that impede full capacity flow of system for more than 5 days.
- A complete shut down or any action that may reduce flow capacity below 80%.
- A drop in normal levels of Clear Lake, indicating a slower recovery than normal.

The indication that a moderate alert level will be necessary is based on the following:

Mild Alert Level

- Usage equals historic peak for three consecutive days.
- Usage reaches 85 percent of capacity.

The indication that a moderate alert level will be necessary is based on the following:

Moderate Alert Level

- Water use reaches 90% of capacity for three consecutive days.
- Pumping capacity is reduced to 80%.
- Normal flow is reduced to 80%.

The indication that a high alert level will be necessary is based on the following:

High Alert Level

- Water use reaches 95% of capacity for three consecutive days.
- Pumping capacity is reduced to 70%
- Normal flow is reduced to 70%
- The area is declared in a severe drought.

The indication that an extreme alert level will be necessary is based on the following:

Extreme Alert Level

- Pumping capacity is reduced to 50%
- Normal flow is reduced to 50%
- A natural disaster that incapacitates the water system, or contaminates the water source.
- Intentional act causing long term disabling of the water system
- Other event resulting in a sustained deficit of water.

3.4 Curtailment Actions: 690-86-0160 (4) A list of specific standby water use curtailment actions for each stage of alert ranging from notice to the public of a potential alert, increasing through limiting nonessential water use, to rationing and/or loss of service at the critical alert stage;

Curtailment triggers establish when to impose restrictions, so curtailment actions establish the type of restriction to impose. There is no defined method on the types of restrictions, yet curtailment actions must start with a "notice" to the public of the potential alert, increase to the limiting of non-essential uses of water and ending with rationing and/or loss service at the most critical stage of alert.

All users will be notified in any of the following manner: Telephone call, door to door, leaflets placed in conspicuous locations, (i.e. water system's office, post office, and bank) and possibly a public announcement in the local newspaper or on the local radio station.

Actions may be applied to the entire water system or to those zones which are directly affected by the water storage.

The General Manager, with the most knowledge of the functions of the water system in agreement with the Board of Directors; will be responsible for executing the plan provisions once the level of emergency has been declared. Working in conjunction with the Board President or Board Members the

effectiveness of the established criteria will be evaluated to determine further actions to be taken, maintained, or rescinded.

Plan provisions will remain in effect until the emergency is declared ended by the General Manager. These goals established by each level of curtailment action are based on the reduction of peak demand.

Low Level Action

The General Manager or Board President shall issue a general request for a voluntary reduction in water use by all water users. The request will be made at a time when there is a strong indication that the water supply of HWPUD will be reduced below the capacity or maximum flow is reduced so not to provide adequate service to all water customers.

The request will include a summary of the current water situation, the reason for the requested reduction in use, and a warning that mandatory cutbacks will be required if the voluntary measures do not sufficiently reduce water usage by 5-10 percent. Also a time frame for the voluntary reduction will be established, indicating the date and time when the reduction will be concluded.

Mild Level Action

A second step would be to implement mandatory reduction in water use by all customers. This step will assure normal capacity flow during reduce production or delivery schedules and eliminate peak demands that may create other concerns for the water system. This step is the next natural level of curtailment moving towards a moderate level of action.

The goal of the mild level is to maintain 95% flow rates using a 10% reduction.

Moderate Level Action

HWPUD will put into place the following:

- No flushing of system line unless essential.
- Implement schedules for irrigation of lawns and landscape.
- Commercial use to be reduced by 10% and residential use by 20%.
- Washing of vehicles will be prohibited.

The goal of the moderate level is to maintain 85% flow rates using a 20% overall reduction in usage.

High Level Action

HWPUD will put into place the following:

- All outdoor use of water is prohibited.
- All customers will be set at a daily allotment in number of gallons per day. Water service will be disconnected if allotment is disregarded.
- Commercial users will be reduced to 70% of the previous year allotment.
- All new connection work will be terminated until further notice

The goal of the high level is to maintain a 75% flow rate using a 30% overall reduction in usage.

Extreme Level Action

It is not "if" an emergency is going to occur, but when an emergency situation will take place.

HWPUD will put into place the following:

- There are a number of circumstances that can result in an emergency response condition, all resulting in the water system being incapable of supplying water to the customers.

The extreme level is launched to provide the minimum of 70 gallons per person per day.

Table 3-1: Action Levels of Curtailment:			
Water Curtailment and Reduction Goals			
Shortage Condition	Level	Reduction Usage Goal	Type of Rationing
5%	1	10%	Voluntary
10%	2	10%	Mandatory
15%	3	20%	Mandatory
25%	4	30%	Mandatory
Water System Failure	5	75 - 85%	Mandatory

Note: The goals established by each level of curtailment action are based on the reduction of off-peak demand, therefore consistently leaning towards the conservative benchmark of water flow rates.

**SECTION FOUR
WATER SUPPLY ELEMENT**

Municipal Water Supply Element 690-086-0170 the water supply element shall include at least the following:

4.1 Delineation of Current and Future service areas: OAR 690-086-0170 (1) A delineation of the current and future service areas consistent with state land use law that includes available data on population projections and anticipated development consistent with relevant acknowledged comprehensive land use plans and urban service agreements or other relevant growth projections;

The current area of service for HWPUD’s boundaries has been collaborated under the County’s Comprehensive Land Use Plan. Land use designations are classified into four various descriptions with the majority in F-1, non-impact forest, and F-2, impacted forest. The remainder of land is urbanization zone of residential properties mixed with small parcels of rural commercial, limited industrial, and natural resources. Appendix C from the 2019 Water Master Plan depicts the land use for HWPUD.

4.2 Populations Projections: OAR 690-086-0170 (1) An estimate schedule that identifies when the water supplier expects to fully exercise each of the water rights and water use permits currently held by the supplier;

As of the year 2018, HWPUD is serving an estimated population of 4,921 in an area approximately 11 square miles. Population estimates can be difficult to project since communities from decade to decade may experience both growth and decline. Taken from the water facilities plan as well as data from the Office of Economic Analysis, the growth rate for the area of Lane County is expected to increase an average of 0.73 percent annually for the years 2010 through 2040. Using a 1.0 percent annual population increase, the service area for HWPUD could see a projected growth of 514 persons over 10 years (10 year projection at 5,435 persons) or 227 residential connections, averaging 2.4 persons per connection. Total number of connections could reach 2,728 with a population growth figured at 6,125 by the year 2040.¹

1 – Section 6, Table 6.3.1 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc.

Population Forecasts Estimate						
County	2010 -2015	2015 -2020	2020 -2025	2025 -2030	2030 -2035	2035-2040
Lane	0.53%	0.91%	0.86%	0.76%	0.67%	0.61%
Average	0.73%					

Source: Forecasts of Oregon’s County Populations and Components of Change, 2010-2050 - Office of Economic Analysis, Department of Administrative Services, State of Oregon March 2013

Water management and conservation planning will be based on a 20+ year term of recognizing, sustaining, and improving the efficiency in amounts of water consumed by each classification of customer.

Examined from the existing records of consumption and population served, an estimated usage of 80 – 100 gallons per capita daily was averaged based on historical figures. Applying the average to the potential 6,125 customers in year 2040, water production necessity will increase by 72 percent from 104 million gallons annually to 144 million gallons annually, which converts to 0.62 cfs.

4.3 Schedule of Permit Usage: OAR 690-086-0170 (2) An estimated schedule that identifies when the water supplier expects to fully exercise each of the water rights and water use permits currently held by the supplier;

According to the Water Master Plan, predictions for population estimates were factored to year 2038; using past historical growth data. The U.S. Census Bureau annual average growth rate for Florence is 1.5 percent for 2000-2010. Growth from 1994 through 2006 was 2.3 percent annually. The average growth rate for Lane County for the years 2015 to 2035 is 0.80 percent, while Portland State University predicts a population growth rate of 0.90 percent. Using water demand levels and projection of one percent growth, the water master plan shows average daily demand at 0.43 mgd through the year 2038.¹ Carrying the estimates to year 2040 a total of 0.44 mgd can potentially become the average demand.

¹ – Section 6, Table 6.3.1 - 2019 Water Master Plan – The Dyer Partnership, Engineers & Planners, Inc.

The water supply source under two certificates currently allows for 3.05 cfs or 1,369 gpm or 1.97 mgd. In preparing a schedule that pertains to fully exercising each water right, HWPUD is obligated to determine usage by forecasting and justifying the need for more water. Using the calculations provided in the July 2019 water master plan, water demand estimates are based on population forecasts and gallons per capita per day.

Historically, the average per day consumption over years 2015 through 2018 has been approximately 0.38 mgd or 77 gallons per capita daily. Maximum day demand for the same period has reached 0.81 mgd or 164 gallons per capita daily. The anticipated population growth, factored at 5 year intervals, will be multiplied by the maximum day demand and applied to the appropriate water use permit in Table 4-2 on page 27.

HWPUD currently supplies water under two certificates, which are labeled as municipal use. HWPUD has water rights that are greater than current usage. HWPUD is currently reviewing and administering the extension of their permits, to allow for growth and prove beneficial use as they develop the current water source of Clear Lake. Permits S-50036 and S-52090 need approval to remove development limitations prior to use.

HWPUD estimates based on year 2038 average daily demand that Certificates and Permits will reach full requirements as follows: Certificate 56356 in 2096; and Certificate 80690 in 2193

Table 4-2 on page 27 outlines both the current usage, based on actual pumping records and the anticipated schedule, based on maximum daily demand as to when HWPUD will apply a percentage or expect to fully exercise each of its water certificates and permits.

Table 4-2: Permit Usage Forecast based on actual pumping records from 2015-2018								
Permit Number	Certificate	Priority Date	Use	Permit Rate ¹	Pump Rate ²	Source	% of total allowed by permit	
S-33171	56356	01-19-1968	M	1.55 cfs 695 gpm	0.63 cfs 0.41 mgd / 283 gpm	Clear Lake	41%	
S-37524	80690	4-30-1974	M	1.50 cfs 673 gpm	0.0cfs 0.00 mgd / 000 gpm	Clear Lake	0%	
S-50036	NA	05-04-1987	M	00 cfs 00 gpm	0.0 cfs 0.00 mgd / 000 gpm	Clear Lake	0%	
S-52090	NA	10-13-1994	M	0.00 cfs 00 gpm	0.0 cfs 0.00 mdg / 000 gpm	Clear Lake	0%	
Totals				3.05 cfs 1,368 gpm	0.63 cfs 0.41 mgd / 283 gpm		10%	
Notes: M – municipal use, 1- Maximum water allowed by certificate/permit, 2 –Average gallons diverted from 2015-2018								
Year	Population ₁	Daily Usage Total Gals ₂	GPM	Total % All Permits	Clear Lake			
<i>Associated Permit</i>					56356*	80690*	S-50036	S-52090
2018	4,921	806,400	560	20.0%	80.6%	0%	0%	0%
2023	5,172	787,680	547	19.5%	78.7%			
2028	5,435	828,000	575	20.5%	82.7%			
2033	5,713	869,760	604	21.5%	86.9%			
2038	6,004	914,400	635	22.7%	91.4%			
2043	6,310	957,600	665	23.8%	95.7%			
Notes: 1 –based on 1.0% growth annually, 2- forecast usage based on maximum daily demand at 164 gallons per capita, actual historical usage is approximately 80-100 gallons per day capita. * - water right is certified.								

4.4 Demand Forecast: OAR 690-086-0170 (3) Based on the information provided in section (1) of this rule, an estimate of the water supplier's water demand projections for 10 and 20 years, and at the option of the municipal water supplier, longer periods;

The rate at which HWPUD will grow is predicated on how the various classifications of users expand. In sub-section 4-2, it was estimated the service area; based on 1.0 percent annual growth, could eventually serve a population of 6,310 by the year 2040. Based on a population of 6,310 multiplied by a maximum daily consumption of 164 gallons per user; equates to 31.0 million gallons per month. Operating 24 hours a day, the current capacities of the two active raw water pumps total 2,000

gpm. Adjustment of the flow rate based on seasonal demands varies from 275 gpm during winter to 403 gpm during summer.

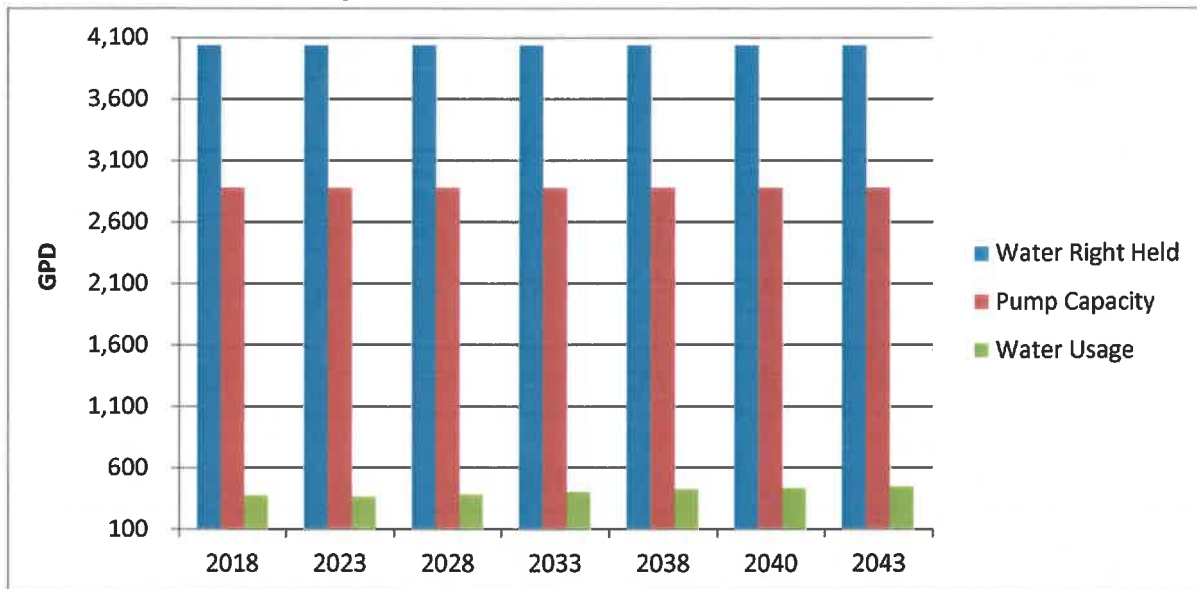
Table 4-3: Water Projection Demand						
Heceta Water PUD	Projected Year					
	2018	2023	2028	2033	2038	2043
	Million Gallons					
Avg. Month Demand ¹	24.2	25.4	26.7	28.1	29.5	31.0

Note: 1-Based on maximum day demand at 164 gallons per day per capita

4.5 Comparison of Future Needs / Sources: OAR 690-086-0170 (4) A comparison of the projected water needs and the sources of water currently available to the municipal water supplier and to any other suppliers to be served considering the reliability of existing sources;

Chart 4-1 outlines the comparison of the projected water needed for HWPUD approximately 957,600 gallons per day, based on maximum daily demand for the year 2043. Currently, Clear Lake has an estimated capacity of 273 million cubic feet, slightly more than 2 billion gallons. Average daily demand of 0.38 mgd, capacity of the lake equals almost 14.4 years of estimated required water by HWPUD.

Chart 4-1: Future Water Requirements:



4.6 Expansion / Initial Diversions: OAR 690-086-0170 (5)(a) If any expansion or initial diversion of water allocated under existing permits is necessary to meet the needs shown in section (3) of this rule, an analysis of alternative sources of water that considers availability, reliability, feasibility and likely environmental impacts. The analysis shall consider the extent to which the projected water needs can be satisfied through: (a) Implementation of conservation measures identified under OAR 690-086-0150;

HWPUD estimates based on year 2038 average daily demand needing access to permits S-50036 and S-52090 with approval and certification in 2338 and in 2429, respectively.

4.7 Interconnections: OAR 690-086-0170 (5) (b) Interconnection with other municipal supply systems and cooperative regional water management;

Presently, HWPUD has two interties with the City of Florence that have not been used since September 2003. The primary connection is located on Hwy 101 south of Munsel Lake Road and consists of a valve and flow meter. The second intertie is located at the southern end of Rhododendron Drive and is not metered. The interties allows for water to flow in emergency situations from and to both the City and HWPUD.

4.8 Cost Saving Measures: OAR 690-086-0170 (5) (c) Any other conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources;

At this time, HWPUD has not developed any other conservation measures that will affect the cost of supplying water. The primary focus in the conservation efforts is to reduce the demand on their existing supplies in order to maintain current sources.

4.9 Permit Diversions: OAR 690-086-0170 (6) If any expansion or initial diversion of water allocated under existing permits is necessary to meet the needs shown in section (3) of this rule, a quantification of the maximum rate and monthly volume of water to be diverted under each of the permits;

No expansion of water allocated under existing permits is necessary to both current and future needs. Table 4-4 below, shows usage rates as they relate to the permit or certificate. Also included are the single monthly maximum water diverted to date.

Permit #	Instantaneous Maximum Rate Allowed	Daily Maximum Rate Allowed	Monthly Maximum Quantity Allowed	Monthly Maximum Diverted to Date ¹
56356 *	695 gpm	1.000	30.06 MG	20.1 MG
80690 *	673 gpm	0.97 mgd	29.07 MG	NA
S – 50036	0 gpm	0 mgd	0 MG	NA
S – 52090	0 gpm	0 mgd	0 MG	NA

* - certified water right, 1 – based on historical records 2015-2018, NA – not applicable See appendices for permits, extension, final orders.

4.10 Mitigation Actions: OAR 690-086-0170 (7) For any expansion or initial diversion of water under existing permits, a description of mitigation actions the water supplier is taking to comply with legal requirements including but not limited to the Endangered Species Act, Clean Water Act, Safe Drinking Water Act;

Since the inception of Heceta Water District, currently HWPUD, mitigation actions such as intake screen with backflow capabilities, participation or review of water shed characteristics, (i.e. hydraulic continuity, water quality impacts), are completed to better understand the watershed.

4.11 New Water Rights: OAR 690-086-0170 (8) If acquisition of new water rights will be necessary within the next 20 years to meet the needs shown in section (3) of this rule, [based on the information provided in section (1) of this rule, (1) A delineation of the current and future service areas consistent with state land use law that includes available data on population projections and anticipated development consistent with relevant acknowledged comprehensive land use plans and urban service agreements or other relevant growth projections; an estimate of the water supplier's water demand projections for 10 and 20 years, and at the option of the municipal water supplier, longer periods] an analysis of alternative sources of the additional water that considers availability, reliability, feasibility and likely environmental impacts and a schedule for development of the new sources of water. The analysis shall consider the extent to which the need for new water rights can be eliminated through;

Under the County's Land use comprehensive plan, the zoning classifications established the water service area for HWPUD. Data from the Portland State University indicated future annual average growth rate at 1 percent until 2040 or a total population of 6,125. Evidence of the current source proves adequate for probable future requirements in terms of quantity. There has been no analysis of alternative sources for additional water by HWPUD.

4.12 Identified Conservation Methods: OAR 690-086-0170 (8) (a) Implementation of conservation measures identified under OAR 690-086-0150;

At present, HWPUD will sustain their efforts towards implementing conservation practices through the following steps a) customer awareness, b) water system operations, c) education information, and d) replacement of existing inefficient water using fixtures, i.e. low flow devices. HWPUD also has a tiered rate structure.

4.13 Regional Management: OAR 690-086-0170 (8) (b) Interconnection with other municipal supply systems and cooperative regional water management;

Discussions regarding regional water management are construed to be both beneficial and educational for HWPUD, something they would welcome openly. One recommendation is developing annual meetings with other water systems within the immediate area for general discussions inviting local area experts to bring an enhanced scientific understanding of the present and future sustainability of the regional resources. These steps should gather pertinent information to assist in better management of resources to maintain available waters, their reliability, and the environmental impacts.

4.14 Cost Appropriations: OAR 690-086-0170 (8) (c) Any other conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources;

Presently; and in future speculations, HWPUD, with available water rights at 6.25 cfs, see Table 1-1 on page 5, will not require the acquisition of new water rights. HWPUD will focus on maintaining existing water source through continued efforts from a managerial perspective. Long term cost of these endeavors will keep HWPUD from having to look at additional sources and be substantially less expensive than developing new sources.

**SECTION FIVE
OTHER ITEMS**

5.1 Affected Local Governments: 690-086-0125 (5) A list of the affected local governments to whom the draft plan was made available pursuant to OAR 690-086-0120 (6) and a copy of any comments on the plan provided by the local governments;

HWPUD will send single copies of this WMCP to the City of Florence and Lane County. The urban growth boundary of the City of Florence encompasses some of the southern zone of HWPUD.

5.2 Updated Plan Submittal: 690-086-0125 (6) A proposed date for submittal of an updated plan within no more than 10 years based on the proposed schedule for implementation of conservation measures, any relevant schedules for other community planning activities, and the rate of growth or other changes expected by the water supplier; or an explanation of why submittal of an updated plan is unnecessary and should not be required by the Department;

Following regulations OAR 690-086-0125(6); HWPUD is proposing to submit an updated conservation plan in 2025, being the maximum time allowed. However, HWPUD understands that as changes occur in system improvement or pumping capacity, requiring a review every five years by the Board of Directors.

Conservation and water use practices are constantly evolving; section 2.6 will be reviewed annually by management, enabling HWPUD to determine progress of the management conservation plan.

All efforts towards management and conservation will be noted and kept for the progress report submitted every five years by HWPUD. The next progress report will be due in 2025.

5.3 Additional Time: 690-086-0125 (7) If the municipal water supplier is requesting additional time to implement metering as required under OAR 690-086-0150 (4)(b) or a benchmark established in a previously approved plan, documentation showing additional time is necessary to avoid unreasonable and excessive costs.

HWPUD is a fully metered water system and will not need additional time to implement metering as required by OAR 690-086-150 (4)(b).

APPENDIX A

**RATES AND FEES
OF
HECETA WATER PEOPLE'S UTILITY DISTRICT
Adopted March 19, 2019
Effective March 1, 2019**

The following fees and rates are set by the Board of Directors, and may be revised from time to time.

Fees:

Application for Service	\$20.00
Meter (5/8 by 3/4)*	535.00
Valve and Gate Inspection	15.00
System Development Charge	<u>2,500.00</u>
	\$3,070.00

*Fee for larger meter available upon request

Water Service Rates:

Water service is provided on the basis of a monthly base rate plus a per gallon usage rate.

Inside District

THESE RATES DO NOT INCLUDE A 5% FRANCHISE FEE FOR CITY OF FLORENCE RESIDENCE

Service Turn-on Fee	\$20.00	101	Res/Comm – 5/8"	28.50
Delinquent Fee	25.00	103	Res/Comm – 1"	49.75
Late Charge Fee	5.00	107	Res/Comm – 2"	158.00
After Hours Service Charge	30.00	109	Res/Comm – 4"	517.25
Duplicate Billing per cycle	1.00			
Backflow Testing Charge	35.00	102	<u>Outside District</u> Res/Comm – 5/8"	42.75
Bulk Rates:		106	Res/Comm – 1"	74.40
Per Gallon Rate: Tiered rate per 1,000 gallons		108	Res/Comm – 2"	237.25
Service Charge \$10.00 per day		110	Res/Comm – 4"	742.00

The base rate is charged regardless of the meter being off or on.

Charge Per 1,000 gallons Per 2 Month Cycle

Up to 8,000 Gallons	\$2.50	per 1,000 Gallons
8,000 to 16,000 Gallons	\$3.00	per 1,000 Gallons
16,000 to 40,000 Gallons	\$3.75	per 1,000 Gallons
Over 40,000 Gallons	\$4.75	per 1,000 Gallons

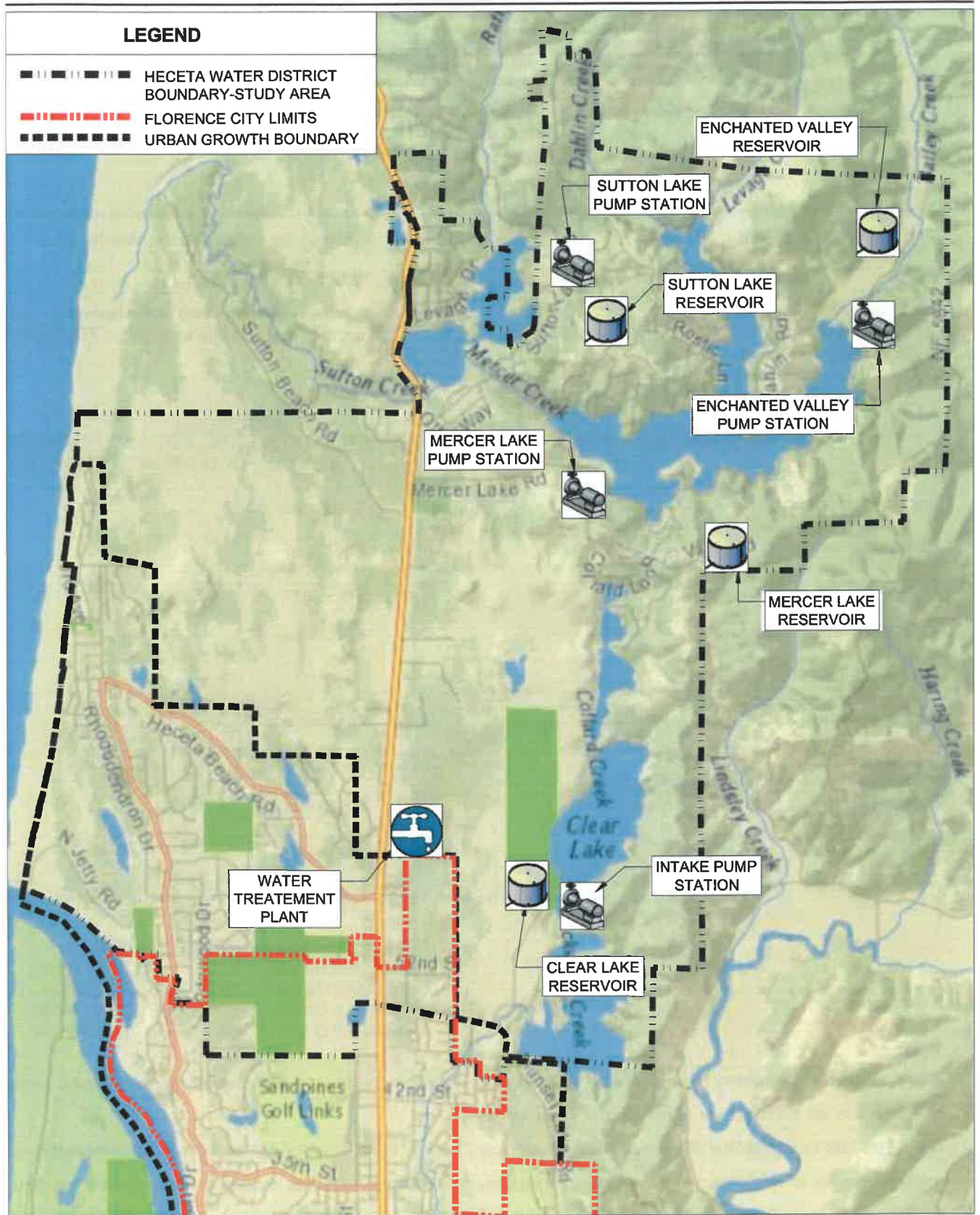
Billing:

Billing shall be on a monthly or bi-monthly basis and payment is due by the 25th of the month for the previous period.

Non-payment will be cause for termination of water service.

If a meter fails to register the amount of water used for any period, the charge for that period will be calculated based on the average quantity of water used in the previous billing period. Any water user may request a meter check if the water usage records appear unreasonable. If the readings appear unreasonable to the General Manager, the General Manager will assist in determining the cause for the reading.

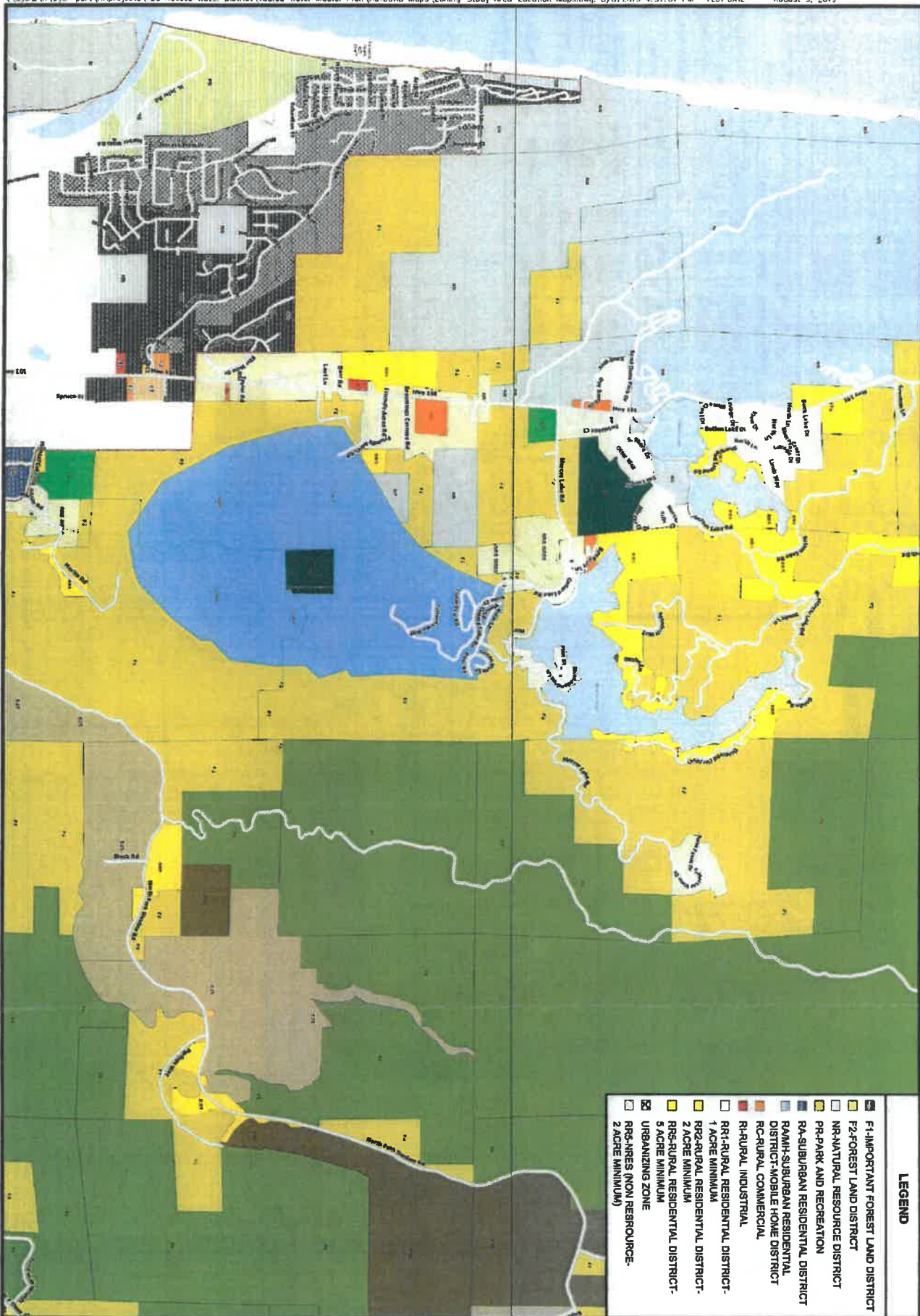
APPENDIX B



THE DYER PARTNERSHIP ENGINEERS & PLANNERS, INC.	HECETA WATER PUBLIC UTILITY DISTRICT WATER MASTER PLAN	FIGURE NO. 3.1.2
DATE: JULY, 2019 PROJECT NO.: 188.05	STUDY AREA	

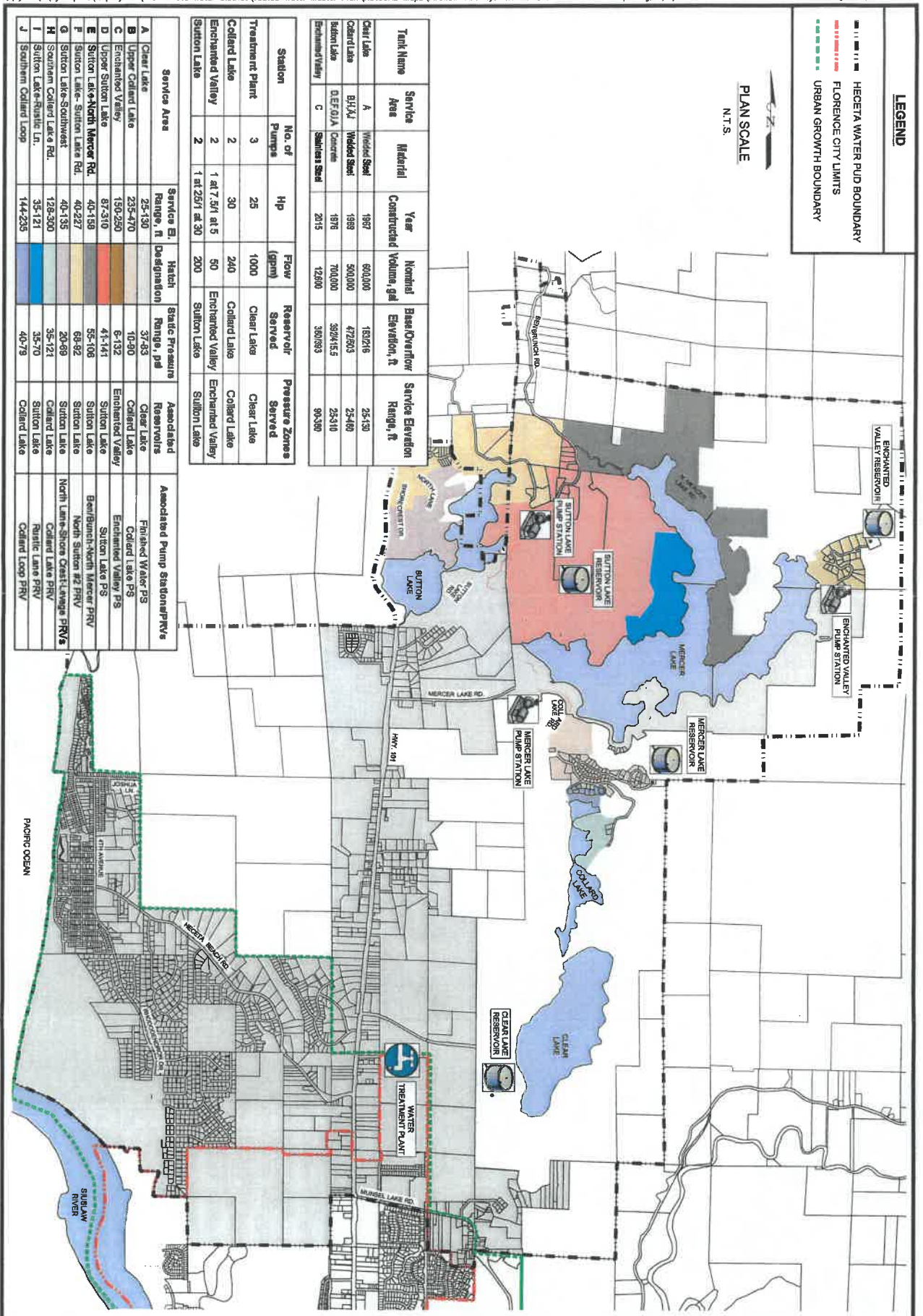
APPENDIX D

\\dyer2\h\dyer-part\A\projects\188 Heceta Water District\188.05 Water Master Plan\AutoCAD Maps\Zoning-Study Area-Location Maps.awg, 8/8/2019 4:57:07 PM PLOT DATE August 9, 2019



LEGEND	
[Dark Blue Box]	F-1-IMPORTANT FOREST LAND DISTRICT
[Light Blue Box]	F2-FOREST LAND DISTRICT
[Green Box]	NR-NATURAL RESOURCE DISTRICT
[Yellow Box]	PR-PARK AND RECREATION
[Light Green Box]	RA-SUBURBAN RESIDENTIAL DISTRICT
[Dark Green Box]	RAAH-SUBURBAN RESIDENTIAL DISTRICT-ADBELE HOME DISTRICT
[Light Yellow Box]	RC-RURAL COMMERCIAL
[Brown Box]	RI-RURAL INDUSTRIAL
[Light Brown Box]	RR1-RURAL RESIDENTIAL DISTRICT-1 ACRE MINIMUM
[Yellow-Green Box]	RR2-RURAL RESIDENTIAL DISTRICT-2 ACRE MINIMUM
[Green Box]	RR3-RURAL RESIDENTIAL DISTRICT-5 ACRE MINIMUM
[Dark Green Box]	URBANIZING ZONE
[Light Green Box]	RRS-NRES (NON RESOURCE-2 ACRE MINIMUM)

APPENDIX C



LEGEND

- HECETA WATER PUD BOUNDARY
- FLORENCE CITY LIMITS
- URBAN GROWTH BOUNDARY

PLAN SCALE
N.T.S.

Tank Name	Service Area	Material	Year Constructed	Nominal Volume, gal	Base/Overflow Elevation, ft	Service Elevation Range, ft
Clear Lake	A	Welded Steel	1987	600,000	163/216	25-130
Colard Lake	B, D, J	Welded Steel	1989	500,000	472/503	25-489
Sutton Lake	O, E, F, G, H	Concrete	1978	700,000	392/415.5	25-310
Enchanted Valley	C	Galvanized Steel	2015	12,600	380/393	90-390

Station	No. of Pumps	HP	Flow (gpm)	Reservoir Served	Pressure Zones Served
Treatment Plant	3	25	1000	Clear Lake	Clear Lake
Colard Lake	2	30	240	Colard Lake	Colard Lake
Enchanted Valley	2	1 at 25ft at 5	50	Enchanted Valley	Enchanted Valley
Sutton Lake	2	1 at 25ft at 30	200	Sutton Lake	Sutton Lake

Service Area	Service Elevation Range, ft	Match Designation	Static Pressure Range, psf	Associated Reservoirs	Associated Pump Stations/PRVs
A Clear Lake	25-130		37-83	Clear Lake	Finished Water PS
B Upper Colard Lake	235-470		10-90	Colard Lake	Colard Lake PS
C Enchanted Valley	150-250		6-132	Enchanted Valley	Enchanted Valley PS
D Upper Sutton Lake	87-310		41-141	Sutton Lake	Sutton Lake PS
E Sutton Lake + North Mercer Rd.	40-158		55-108	Sutton Lake	Ben/Bunch-North Mercer PRV
F Sutton Lake - Sutton Lake Rd.	40-227		69-92	Sutton Lake	North Sutton #2 PRV
G Sutton Lake - Southwest	40-135		20-69	Sutton Lake	North Linn-Shore Crest-Lavage PRVs
H Southern Colard Lake + Rd.	128-300		35-121	Colard Lake	Colard Lake PRV
I Sutton Lake + Rustic Ln.	35-121		35-70	Sutton Lake	Rustic Lane PRV
J Southern Colard Loop	144-235		40-79	Colard Lake	Colard Loop PRV

THE DYER PARTNERSHIP
ENGINEERS & PLANNERS
DATE: JULY, 2018
PROJECT NO.: 188.05

HECETA WATER PUD WATER MASTER PLAN
PRESSURE ZONE, SERVICE AREA, AND SYSTEM INFORMATION MAP

FIGURE NO.
5.4.1